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Short Sea Shipping on the East Coast of North America:

An analysis of opportunities and issues

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Final Report

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EXECUTIVE SUMMARY

INTRODUCTION

The aim of this study has been to advance the Federal Government's appreciation of the potential for short sea shipping activities on the East Coast of Canada and the US. The issues are complex and the potential for a service is somewhat marginal. Much depends on further investigation of the demand, the ability of a carrier to induce switching and the willingness of the Federal Government to address the regulatory and commercial impediments to the launching of a successful service.

We see the potential of short sea service as a set of four pieces in a jigsaw puzzle, all of which must be fitted together for a successful service to be established:

1. The demand for the service must be large enough to support service development.
2. The service must meet the requirements of shippers.
3. A short sea operator must be sufficiently convinced of the commercial potential to decide to offer the service.
4. The business and regulatory climate must support its development.

This report is not definitive in its findings. It indicates areas where a potential operator needs to contemplate further due diligence in any decision to invest. It delves deeply into the challenge of finding a business opportunity with potential. It also identifies those impediments within the purview of Government to address and rectify.

KEY FINDINGS: THE DEMAND FOR THE SERVICE

- Four markets along the eastern seaboard appear to have sufficient demand. We conclude that the distance to Maine is too short to make short sea competitive against truck. Three others merit further consideration: Massachusetts, the cluster of New York/New Jersey/Pennsylvania/ Maryland, and South Carolina. The last of these featured data discrepancies between the sources that indicated further investigation by a potential operator is required.
- We also concluded that the trade is unbalanced and, without the opportunity to engage in cabotage on the return leg, it is highly likely there will be poor capacity utilization northbound.
- Our assessment of the pattern of distribution centre development along the I-95 corridor indicated that a short sea operator from Atlantic Canada might find additional inbound feeder traffic destined for the Pennsylvania area to complement the existing demand.

- Further due diligence will be required of any potential operator to supplement these pre-business case findings. Such further enquiry may lead to results that will convert a marginal operation into a viable one.

KEY FINDINGS: WHAT SHIPPERS WANT AND NEED

- The shippers of Atlantic Canada fall into two very distinct groups: those for whom time to market is critical (e.g., seafood shippers) and those for whom a slower service (short sea or truck) is still acceptable.
- Short sea was not perceived to be less reliable, but a majority of shippers have a tight delivery window and so transit time is important.
- Documentation requirements indicate that trucking companies and potential short sea operators need to contemplate a service that retails an integrated transport package.
- Scheduling requirements indicate that 25 percent of the shippers are unlikely to switch to short sea shipping unless trucking service deteriorates drastically; it is instructive to note that a majority of companies reported road congestion, with about one-half of those indicating it to be serious enough to encourage them to consider switching to short sea shipping.
- Customs clearance was perceived to be more difficult for shipping than for trucking and this perception may be more of a barrier to service adoption than expected.
- Levels of price discounting do not need to be as large as found in Europe. Our research indicates that appropriate pricing can induce trial, encourage switching and that, for some shippers, premium pricing for a better transit time may be acceptable.
- The existence of the US Harbor Maintenance Tax is clearly a factor militating against the use of short sea for some companies. The result is continued use of trucking, which does not have this extra charge assessed against the cargo.

KEY FINDINGS: TECHNICAL CONSIDERATIONS

- Most short sea options studied are competitive with trucking, based on current costs plus fuel surcharges.
- A potential operator will not easily find available a vessel that can meet both trailer and container segments without excessive cost and diminished flexibility.
- The best vessel option from a cost perspective would appear to be a relatively new, time chartered Ro-Ro vessel capable of carrying highway trailers.
- The slow-speed Incat option seems viable for a market relatively close to Halifax, such as Gloucester and, transit time–wise, with Wilmington and Savannah.

- In terms of cost, short sea shipping including a truck move 50, 100 and 150 miles inland is quite competitive with trucking. Transit times are slower than "effective" trucking times, but faster than the advertised times of at least one trucking firm.
- Much of the success of a service will be determined by the willingness of trucking interests to retail the service and partner with the potential operator. This is a critical area for further assessment.

KEY FINDINGS: POLICY CONSIDERATIONS

As a result of a detailed examination of the current policy environment, we conclude that the government should give some consideration to possible initiatives in the following broad areas:

- Examination, and rectification where necessary, of policy, costing or process circumstances or impediments (for example the absence of full environmental costing) that disadvantage the marine mode in relation to land mode alternatives.
- The possible need to provide some form of stimulus to make it attractive for shippers to explore use of a new and (at least in terms of perception) more complex transportation option.
- The need for expanded, more substantive, cooperation between Canada and its NAFTA partners, particularly the US, sufficient to achieve tangible progress in moving towards a harmonized marine transportation regulatory framework within the free trade area, including cabotage arrangements, harbor maintenance tax, customs' processing, and advanced notification and documentation requirements.
- A program of research and development focused upon ship design and cargo handling arrangements, and directed at identifying the specific technological parameters that maximize the chances for success of an optimum East Coast integrated short sea shipping service.
- Improved data gathering in a format that can provide a more accurate insight into the potential or otherwise for short sea shipping options on the East Coast.
- Examination of the current insurance and liability arrangements as they apply to each element in the integrated transport chain, with a view to identifying ways in which liability insurance might be rendered more commercially competitive.

This report concludes that there are a number of actual or perceived impediments, which have the potential to impact the viability of short sea shipping operations on the East Coast, and which fall within the ambit of responsibility of government to address and, as necessary rectify. It also provides the available data in a format that we hope potential operators will find useful in preparing a business case.

THE STUDY TEAM

Dr. Mary R. Brooks is the William A. Black Chair of Commerce at Dalhousie University, Halifax, Canada. She was Membership Secretary and Treasurer of the International Association of Maritime Economists from 1994 to 1998 and a Director of the Halifax International Airport Authority from its inception in 1995 to 2004. She currently chairs the Committee on International Trade and Transportation, Transportation Research Board, Washington, DC, and is a Member of the Chartered Institute of Logistics and Transport. She was a Canada–US Fulbright scholar at George Mason University in 2005. Dr. Brooks received her undergraduate degree from McGill University, her MBA from Dalhousie University and her Ph.D. in Maritime Studies from the University of Wales in 1983.

James D. Frost is President of MariNova Consulting Ltd., in Halifax, Nova Scotia, and Executive Director (part-time) of the Halifax Gateway Council. Also a part-time professor at Saint Mary's University, he is a marketing and business development specialist, experienced in port marketing, container shipping, and cruise and ferry operations. He has carried out many studies for transhipment and feeder services and managed a container feeder/transhipment service operating between the traditional trading links of Halifax and Boston. Mr. Frost received his undergraduate training at McGill University (B.A. Honours), his M.A. from Queen's University in 1976 and his MBA from Saint Mary's University in 2002. He is the author of *Merchant Princes: Halifax's First Family of Finance, Ships and Steel* (James Lorimer and Company); the book was a finalist for two Atlantic literary awards.

J. Richard Hodgson is presently engaged by Dalhousie University as a professor in marine transportation policy and administration. This follows a two-year assignment as a visiting professor with the University and, prior to that, a three-year engagement as an Associate Professor with the World Maritime University, a UN subsidiary of the International Maritime Organization, in Malmö, Sweden. He has extensive past experience (holding positions at the Director General level since the mid-1980s) in all facets of Canadian and international maritime administration, including the economic, safety/security and environmental dimensions of shipping, marine support services and port operations. Mr. Hodgson also has wide experience in modern governance options and New Public Management. This expertise includes such aspects as the commercialization and/or privatization of marine programs or services, contracting out, revenue generation through user charges and partnership arrangements. He is a Fellow of

the Chartered Institute of Logistics and Transport, and the author of a number of papers and reports.

Scott Garinther was a Research Associate with the Centre for International Business Studies at Dalhousie University, Halifax, Canada, in the summer of 2005. Mr. Garinther received his undergraduate degree from Queen's University (1995), his Master of Engineering from the University of Calgary (2001) and his MBA from Dalhousie University in 2005.

Stephen Kymlicka will receive his MBA from Dalhousie in May 2006, having concentrated in both International Business and Finance. He received a BSc (Honours Physics) in 1986 from St. Francis Xavier University. His work experience is in MIS and management consulting. Stephen ran a consulting firm in Regina for several years, growing the company to 27 employees. Over nearly 20 years, he has worked for or consulted in a variety of sectors including agriculture, oil and gas, chemicals, mining, insurance, NGOs and government.

CHAPTER 1

INTRODUCTION – OBJECTIVES OF THE EXERCISE

Short sea shipping is a declared priority of the Federal Government, and it has confirmed the considerable importance of the analysis and promotion of this quite innovative form of transportation by its agreement to a trilateral NAFTA Memorandum of Cooperation, signed in 2003.[1]

The aim of this study, therefore, is to advance the Federal Government's appreciation of the potential for short sea shipping activities on the East Coast of Canada and the US. More particularly the goal is to develop insights into current and projected freight flows along the Atlantic border, and the mode, or combination of modes, by which those goods are currently being transported. It is also directed at assisting government and industry interests (principally shippers, ports, ship operators and trucking operators) by bringing some specificity to the challenges that modally integrated East Coast short sea shipping operations will need to address in order to compete effectively with all-truck routes. Finally, as an ancillary objective, it is aimed at shedding some light on the degree to which government policies and regulations either facilitate or frustrate the resolution of these challenges and thus impact the potential for such services.

As a starting point, it is first useful to reiterate, in the context of this study, which transportation activities we are regarding as included in the range of transportation options that we term "short sea shipping." While there is no generally accepted definition of this concept, it may in its broadest sense be considered to embrace all movements by water of passengers and/or cargo that do not include a trans-oceanic voyage. Transport Canada includes some additional qualifiers (e.g., the use of the phrase "relatively short distances"), by defining short sea shipping as follows:

> *Short sea shipping involves the movement of cargo or passengers by water over relatively short distances. It can occur within lakes and river systems and along coast lines. It consists of mainly domestic shipping but can also include cross-border traffic (Canada–US–Mexico). It does not consist of shipping across the world's major oceans.*

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1 Memorandum of Cooperation on Sharing Short Sea Shipping Information and Experience between the Transportation Authorities of Canada, Mexico and the United States of America, signed 6 November 2003.

While the label short sea shipping inevitably focuses attention on the marine element, and its technological and commercial performance, it is important to keep in mind that the service under consideration also depends upon the provision of efficient land-mode movements at both ends, and streamlined intermodal interfaces, all integrated into a seamless single movement. This is therefore not just a simple marine transfer but a sophisticated intermodal operation with a myriad of complex dimensions, each of which needs examination and resolution in order to render the service viable.

There is an additional important consideration that serves to narrow the definition of short sea shipping for the purposes of this study. Because the primary rationale for stimulating enhanced short sea shipping activity is the reduction in congestion and associated environmental degradation in land modes, particularly road transport, the primary market targets for a modally integrated service are those cargoes (and, to a more limited extent, passengers) that are currently being carried by land mode. Thus the dimension of short sea shipping that is of primary interest in this project is general cargo, usually containerized or in trailers, and moving principally by road. While it is not the intent to ignore passenger transportation, it is not regarded as a major focus of this analysis. Finally it is assumed that if a modally integrated transportation alternative can be made more efficient and the cost made lower than the present all-truck option, then it may well stimulate expanded business activity for those located in proximity to the routes chosen for new service options, while providing a downward pressure on future traffic growth on highways.

It is also important to appreciate what is not included, at least not in this study. While the scope of the project under consideration involves both domestic (cabotage) and international movements of goods (excepting transoceanic movements), it excludes detailed research into feeder movements of containers transported in the international ocean liner trades. While this exclusion is directed more at containing the scope of the study, it needs to be recognized that the success of any short sea shipping venture on the East Coast will almost certainly depend on a melding of international feeder activity and North American origin/destination traffic in order to be viable.

Again, because of the expectation of continuing inflexibility in relation to any possible relaxation of US cabotage restrictions, any detailed examination of the potential commercial benefits to a coastal short sea shipping service arising from access to US domestic movements of cargo is also excluded. The study also excludes bulk movements of cargo, unless there is at least some potential to move such cargoes by land mode. With respect to container movements, while the focus is directed principally at lift-on/lift-off movements, it is noted that inclusion of roll-on/roll-off (piggy-back and drop trailer services) could have an important influence on the commercial viability of the service.

Canada's interest in short sea shipping has in large measure been stimulated by earlier interest generated elsewhere in this new concept. It has been a priority in Europe since the early 1990s, and has received significant policy attention and active promotion, most recently through its Marco Polo and Marco Polo II programs. The US has also been quite active in examining the concept, with MARAD taking a lead role in evaluating its potential, particularly through its Short Sea Shipping Cooperative Program (SCOOP). Thus an important stimulus for the examination of short sea shipping potential in Canada has been equivalent motivations in the US.

The present level of short sea shipping activity on the Canadian East Coast may be viewed as comparatively modest. Ironically, however, largely due to geography, it may be the most dynamic short sea sector in North America. The dispersed domestic population base of 2.4 million in Atlantic Canada, spread out over a territory the size of Britain and France and largely surrounded by water, suggests that there could well be opportunities for enhanced short sea shipping under the right circumstances. This possibility is supported by the fact that there are several interesting and innovative shipping operations in and around Atlantic Canada, and a variety of modern technology has recently been mobilized. This includes an Incat 098 fast ferry operating between Bar Harbor, ME, and Yarmouth, NS, and a modern feeder service that operates between Halifax and the New England ports of Portland, ME and Boston, MA. A 1004 TEU feeder ship, the *Oceanex Avalon*, with moveable cell guides capable of handling 53' containers, has commenced operations between Montreal and St. John's, Newfoundland and Labrador.

However, these encouraging initiatives have been counterbalanced by certain setbacks. For example, attempts to introduce new short sea services between New Brunswick and Newfoundland have encountered difficulties, as have similar efforts between Shelburne, Nova Scotia, and Gloucester, MA; Halifax, NS–Portsmouth, NH; Halifax–Great Lakes and between PEI and the northeast US. The high profile failure of the Toronto, ON–Rochester, NY, fast ferry passenger service is another indicator of the tenuous nature of the concept.

Halifax is Canada's pre-eminent East Coast port, and it is therefore reasonable to assume that it will be an important player in any substantive network of short sea shipping activities on the Atlantic seaboard. In particular, the stature and importance of Halifax as the principal container port in Atlantic Canada offers the potential for it to become a gateway hub for international container movements, with associated feeder services.

There are other important circumstances that support the potential for Halifax to become a key player in regular transhipment services to the US eastern seaboard. The continuing strong focus on security issues serves to enhance opportunities for the Port to

act as a safe port of entry for cargo transhipped to markets in New England. There may also be some scope for the development of additional short sea services to New England and Philadelphia, as well as non-NAFTA States such as Bermuda and the Bahamas. This development could serve to further enhance Halifax's role as a secure North American gateway.

The formula for success in short sea shipping is complex. However two essential requirements must clearly be met. First, recognizing that shipping is a derived demand, there must be enough cargo moving (preferably in both directions) on routes sufficiently close to the eastern seaboard that a modally integrated short sea shipping service could offer, in theory at least, an alternative, so long as commercial and other conditions were right. Second, the actual performance of a competing modally integrated service involving a short sea shipping service leg must be made sufficiently attractive to the shippers of this cargo to stimulate both substantive cargo diversion from all-truck routes (thus achieving reduction in congestion and environmental degradation), and new market development. This study seeks to address these requirements.

With regard to the first, Chapter 2 examines the range of Atlantic Canadian goods (including, to the degree possible, respective volumes [tonnage] and values as identified in available Canadian and US databases) that are currently being transported along the eastern seaboard of the US and to other destinations such as Bermuda or Freeport in the Bahamas. The chapter also examines the types and values of goods moving to Atlantic Canada that originate in the US or Caribbean, so as to establish a sense of the degree of cargo imbalance, and its implications for the viability of short sea shipping services.

More particularly the chapter evaluates the markets in the proximity of the following ports:

US Ports	**Non-US**
Gloucester, MA	Hamilton, Bermuda
Bridgeport, CT	Freeport, Bahamas
Camden, NJ	
Philadelphia, PA	
Wilmington, NC	
Savannah, GA	

With regard to the second requirement, namely that of ensuring that shippers find the short sea service sufficiently attractive to warrant diversion from all truck, efforts are directed in Chapter 3 at identifying the criteria, conditions, circumstances etc., that are critical to the viability of the all-land movements to and from USEC destinations including insights into costs to shippers, and the importance of the speed, frequency and reliability (predictability) of the service and of just-in-time (JIT) delivery. A critical

element from the point of view of Canada's NAFTA partners and those interested in sustainable transportation on the eastern seaboard is potential avoidance of the severe congestion on the I-95 and the resultant air pollution from trucking, problems that are also driving US interest in short sea shipping. Chapter 3 explores shippers' perspectives in this regard, and focuses, in particular, on the trade-offs that users of the service would likely make, be it in favour of an all-road or a modally integrated short-sea shipping operation.

In Chapter 4 the study examines the full range of challenges facing a potential provider of short sea shipping services. With respect to cost, the project endeavours to identify realistic figures for the full costs of a modally integrated short sea shipping option, including the two land legs, the water leg and the intermodal transfers. It also includes a global identification of the broad range of acquisition costs (including capital financing) and operational costs (including fuel, crew, maintenance costs, port costs etc.) for a range of vessel concepts. While we initially intended to examine a traditional container feeder service against a high-speed freighter, the chapter examines five vessel options since none is ideal. Based on this work, efforts are directed at identifying the circumstances most likely to ensure the success of a modally integrated alternative, including the minimum and maximum distances over which short sea shipping might be expected to be competitive. It broadly examines the full spectrum of commercial and other challenges to see whether the associated costs or service constraints could be managed so as to allow such a service to be viable. As part of this assessment of viability, the study also looks at the potential use of eight ports, and explores the needs and perspectives of selected truckers who have a high potential to make use of such a service. Finally, by building a case on commercial grounds, the environmental case can be made as well. Thus the research builds on the assumption that if the business case can be made, regulators will address any regulatory or other impediments as a result of pressure from potential business interests or environmental groups.

Ultimately the product of this exercise is intended not only to enable potential operators to do more detailed studies in support of their own business case, but also to illustrate for government(s) the merit of examining the need for adjustments to the existing policy and/or regulatory environment.

In this respect, Chapter 5 broadly identifies (but does not intensively examine) those government policies, subsidies, fees, rules or regulations that either facilitate or frustrate the quality and cost of the services provided either by the all-land mode or by the intermodal option. It sets the scene for Chapter 6, which draws conclusions as to the overall potential for short sea shipping on the East Coast, and the conditions that would likely need to prevail in order for that potential to be realized.

In summary, the aim of this study is to inform. Presently, a major impediment to the encouragement and stimulation of short sea shipping initiatives is the lack of available information and data on existing and potential markets and associated cargo movements sufficient to enable a disciplined analysis of the opportunities and risks associated with investments in this complex sector. Also lacking is any extensive information on the operational, technological and commercial factors relating to the provision of a modally integrated alternative to the all-land route. Finally, there is little in the way of insight and advice as to the attitudes and concerns of those currently involved in transportation activities on the eastern seaboard of North America, and their willingness to change the way they do business.

Thus the principal contribution of the study is, hopefully, the provision of a solid information base that can not only provide a sound foundation for informed policymaking by government, but can also act as a stimulus to the transportation industry, and in particular the marine and trucking modes. We hope that the industry will use the information to develop novel and creative proposals that will in turn lead to the realization of modally integrated short sea alternatives that can relieve some of the congestion and environmental degradation of the all-land routes.

CHAPTER 2

THE POTENTIAL DEMAND FOR SHORT SEA SHIPPING

INTRODUCTION

The first objective of the project focused on highlighting current and projected freight flows along the Atlantic border, moving between origins and destinations in Canada and the United States (US) on or near the eastern seaboard. The second objective of the research was to note the mode, or combination of modes, by which those commodities are being transported. This chapter focuses on these two objectives. In order to determine the state of knowledge about demand, existing and potential, along the eastern seaboard, the chapter summarizes the research conducted at Dalhousie University over the summer and fall of 2005.

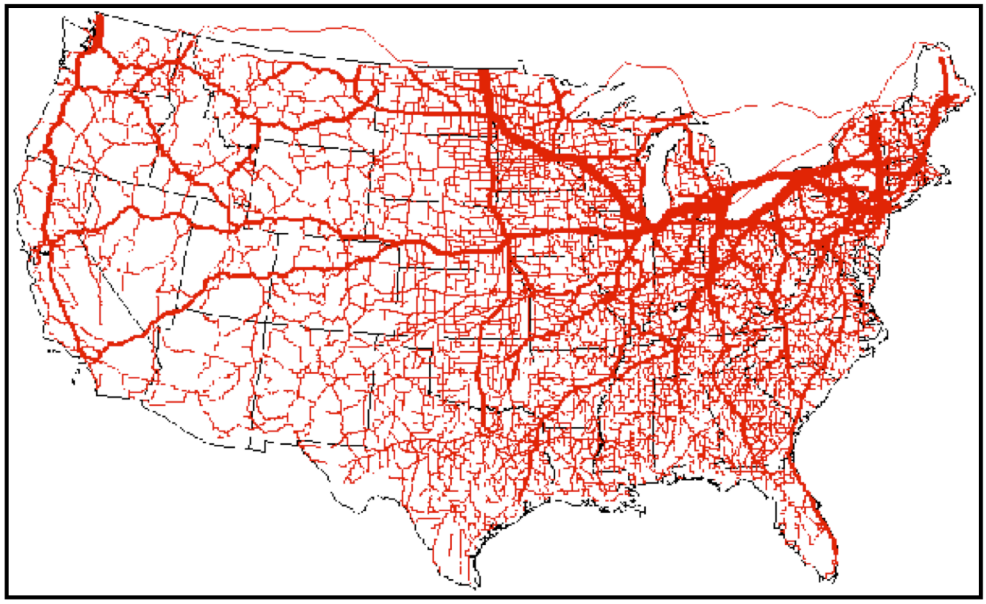
Before we discuss the key findings, there are two caveats to the research data that must be discussed. Export data for goods destined to the US eastern seaboard is reported only at the state and provincial levels; thus it was not possible to restrict the assessment to a radius of 250 km of key ports or metropolitan census areas as we had originally hoped. In addition, weight data were only available in one direction, southbound. Appendix 1 provides detailed data assessment of the trade lanes to/from each of the four Atlantic Provinces by commodity, and each state by mode, for those seeking to assess the trade lane in more detail.

KEY FINDINGS

There were a number of secondary data sources used in the conduct of this baseline trade research. Industry Canada's Strategis (*Trade Data Online*), in particular the 2002 statistics, served as the primary source of data for the preliminary analysis on the critical commodity moves. This was supplemented by the US Bureau of Transportation Statistics (BTS) 2004 US Import and Export data. The BTS data southbound is a richer data source as it also contains the weight as well as the value for each commodity. (There are no weight data northbound in this data set.) Finally, we commissioned Logistics & Marketing Services Inc. of Saskatoon to supplement these by illustrating the weight data flows for us and adding its assessment of distribution centres along the I-95 corridor (data it had from a previous study).

The US Federal Highway Administration (FHWA) Freight Analysis Framework is a visual tool to assess trade flows to US states (Figure 2.1). A quick examination of all Canadian truck flows to the US in 2001 illustrates the importance of the eastern seaboard markets to Canadian exporters by truck.

FIGURE 2.1: CANADIAN TRUCK TRAFFIC TO US, 2001



Source: FWHA Freight Analysis Framework

In assessing the secondary data found in Appendix 1, it quickly became apparent that there is a significant imbalance of north-south trade between the Canadian Atlantic provinces and the US east coast states, with substantially more commodities **by value** flowing southwards. Tables 1 to 4 of the Appendix 1 have been consolidated to illustrate the **value by mode** from Atlantic Canada in 2002 (Table 2.1). From this, it appears that the overall critical markets for Atlantic Canada are Massachusetts, Maine, New Jersey, Connecticut, Pennsylvania and South Carolina. Neither Bermuda nor the Bahamas is a substantial market for Atlantic Canadian companies and further consideration does not seem to be warranted.

TABLE 2.1: ATLANTIC CANADA DOMESTIC EXPORTS, 2002 BY MODE OF EXPORT (000 CAD)

Destination	Road	Rail	Water	Air	Other	Total	% of Trade
Massachusetts	1,528,021	72,957	1,144,905	2,486	742,815	3,491,190	27.60
Maine	908,958	224,415	1,101,685	1,489	328,944	2,565,497	20.28
New Jersey	200,515	19,696	1,556,476	3,411	0	1,780,104	14.07
Connecticut	201,268	253,382	310,180	839	0	765,674	6.05
Pennsylvania	276,112	69,975	313,947	2,600	0	662,641	5.24
South Carolina	623,820	27,479	8,777	1,197	0	661,277	5.23
Virginia	83,584	27,813	511,212	4,776	0	627,392	4.96
New York	396,349	89,693	83,176	3,077	0	572,301	4.52
Florida	151,170	24,045	249,469	9,245	0	433,931	3.43
New Hampshire	224,735	5,968	162,663	1,272	7	394,651	3.12
Maryland	113,063	37,483	44,365	1,866	0	196,783	1.56
Georgia	94,175	50,898	1,124	2,188	0	148,392	1.17
Rhode Island	107,004	99	29,530	2,013	0	138,650	1.10
North Carolina	71,249	31,098	20,809	811	0	121,972	0.96
Vermont	24,344	2,018	0	304	0	26,668	0.21
West Virginia	12,891	495	12,708	408	0	26,504	0.21
Delaware	9,881	1,248	11,416	117	0	22,666	0.18
District of Columbia	2,298	0	0	296	0	2,596	0.02
Bermuda	1,619	253	3,523	1,214	0	6,614	0.05
Bahamas	1,053	1,315	1,386	1,466	0	5,222	0.04
Total	$5,032,109	$940,330	$5,567,351	$41,075	$1,071,766	$12,650,725	
% of Trade	39.8%	7.4%	44.0%	0.3%	8.5%		100.00

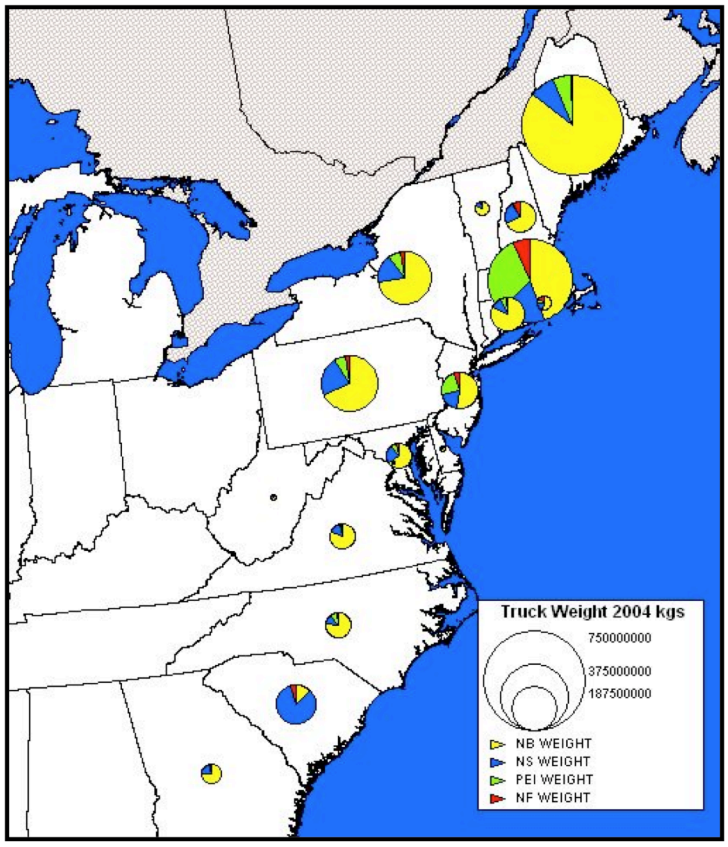
Note: Ordered in terms of total value followed by Bermuda and the Bahamas.
Source: Statistics Canada (2002), *Exports Merchandise Trade*.

However, when individual province exports are examined in detail in Appendix 1, quite a different picture emerges. The majority of Newfoundland trade is already carried by water, and appears to offer little potential for further development of a short sea service. On the other hand, road is the primary mode (96.6 percent) for PEI's exports (primarily to Massachusetts, Maine and New Jersey) but the total exported values are considerably smaller than those of New Brunswick or Nova Scotia. PEI import values from the eastern seaboard also appear to be quite small. Key southbound markets for New Brunswick are Maine, Massachusetts and New Jersey (after traffic by "other

modes" [e.g., pipeline] is extracted) and there are considerable imports by value from the US. For Nova Scotia, key southbound markets are Massachusetts, South Carolina and Connecticut (again after traffic by "other modes" is extracted) but northbound values appear to be quite small. However, value does not paint a true picture of transport demand; for that we need another measure (e.g., weight, truckloads, containers).

In terms of weight, only southbound data are available from the US Department of Transportation Bureau of Transportation Statistics (BTS). If we take the weight data in Table 2.2 and evaluate them on the basis of province of origin, it does appear from the table and Figure 2.2 that there are four major markets of significant volume: Maine, Massachusetts, the cluster of New York/New Jersey/Pennsylvania/Maryland and South Carolina. It also becomes quite clear that a large part of the Maine traffic comes from New Brunswick and, given our earlier assessment, is low-value high-density product. While such product characteristics make for a good traditional short sea client, this cargo is unlikely to divert to a short sea operation as the distance is too short to make the routing viable if there is any inland distance at either end of the sea leg.

FIGURE 2.2:
2004 ATLANTIC TRUCK TRAFFIC BY PROVINCE TO US, KILOGRAMS



Note: Illustration by Logistics & Marketing Services Inc.

Source: Compiled by study team using US Bureau of Transportation Statistics data.

TABLE 2.2: ATLANTIC CANADA TRUCK TRAFFIC TO US STATES, 2004

STATE	TOTAL WEIGHT (KG)
Maine	737,845,941
New Hampshire	100,594,494
Vermont	29,208,923
Massachusetts	556,354,906
Connecticut	112,652,478
Rhode Island	23,930,714
New York	239,072,711
New Jersey	129,871,032
Pennsylvania	273,718,400
Delaware	7,317,654
District of Columbia	2,206,814
Maryland	62,655,575
West Virginia	6,379,970
Virginia	63,915,520
North Carolina	64,724,816
South Carolina	153,856,315
Georgia	49,875,024
Florida	37,974,271
Total	2,652,155,558

Source: Compiled by study team using Bureau of Transportation Statistics data.

The purpose of the evaluation here, building on Appendix 1, was focused on two activities: (1) identifying the existing transportation demand along the eastern seaboard, and (2) identifying commodities that were critical, in order to identify key shippers of those commodities in preparation for a survey of those shippers, reported in the next chapter. The analysis in Appendix 1 revealed key commodities and key trade lanes for further investigation, including identifying shippers for participation in the research survey. The analysis made apparent that trade between Nova Scotia and Massachusetts and South Carolina deserves further assessment. Similarly, trade between New Brunswick and Massachusetts, Pennsylvania and New York should also be further investigated with respect to establishing and/or enhancing short sea shipping routes.

In conclusion, while there appears to be a market opportunity in four clusters along the eastern seaboard based on the existing traffic patterns, only three are relevant for further consideration: Massachusetts, the cluster of New York/New Jersey/ Pennsylvania/Maryland, and South Carolina. We conclude that the distance to Maine is too short to make short sea competitive against truck if there is any inland distance at

either end of the sea leg.[2] Appendix 1 further indicates that the potential demand for the last of these three is not entirely clear, as there is the possibility that the Nova Scotia–South Carolina trade lane is already served by sea (given the modal data provided) and that further investigation is required to assess the relevance of the noted discrepancy between the data sources.

Moreover, the data analysis presented in Appendix 1 indicates that the trade is unbalanced and, in our assessment, without the opportunity to engage in cabotage on the return leg, the technical analysis undertaken in Chapter 4 will have to examine whether there is sufficient volume in one direction (southbound) to offset the likely poor capacity utilization northbound.

POTENTIAL OPPORTUNITIES

Given the increasing congestion in the Port of New York New Jersey and the dramatic growth of Asian trade, other ports along the eastern seaboard have seen an opportunity to attract a significant share of global container trade, particularly Savannah and Norfolk. As part of our consideration of other potential opportunities, we asked Logistics & Marketing Services (LMS) to examine the role of the I-95 corridor in US logistics development. In its analysis of distribution centres (DCs) along the I-95 corridor, LMS evaluated the pattern of DC development along the corridor and identified DCs by functional activities, including 3PL terminals, manufacturing, food distribution, wholesale and retail operations. LMS then captured visually (in the slides in Appendix 2) the largest DCs, finding that many provided, for their global supply chain clients, deconsolidation services, some warehousing and outbound distribution to retail. Figure 2.3 indicates the relative importance of transportation and warehousing employment to the states along the corridor, and in particular the importance of Pennsylvania to the DC business.

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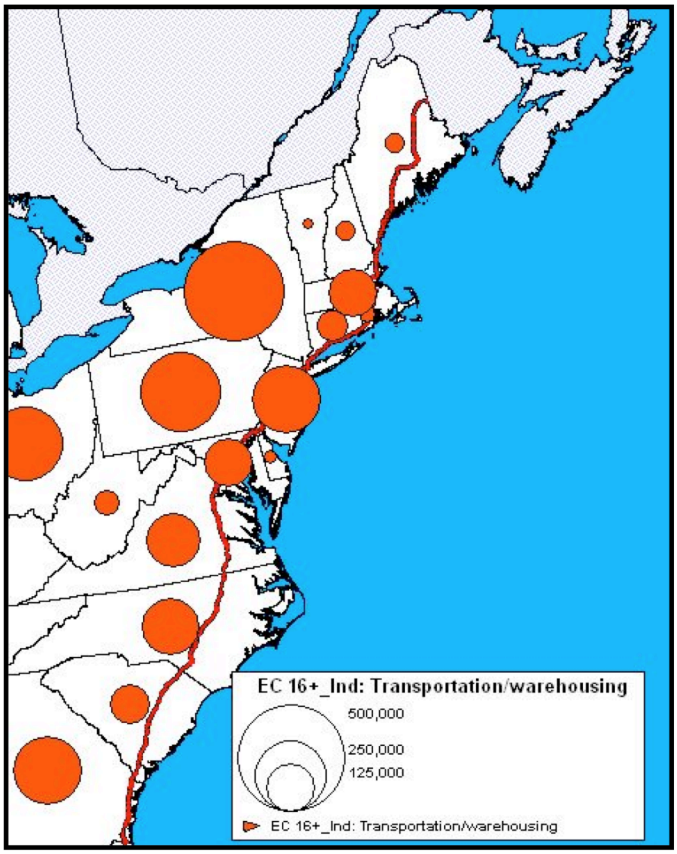
2 There is a considerable volume of business between northern New Brunswick and Maine that would not divert to a longer water route.

FIGURE 2.3:
EMPLOYMENT 2001
TRANSPORTATION &
WAREHOUSING

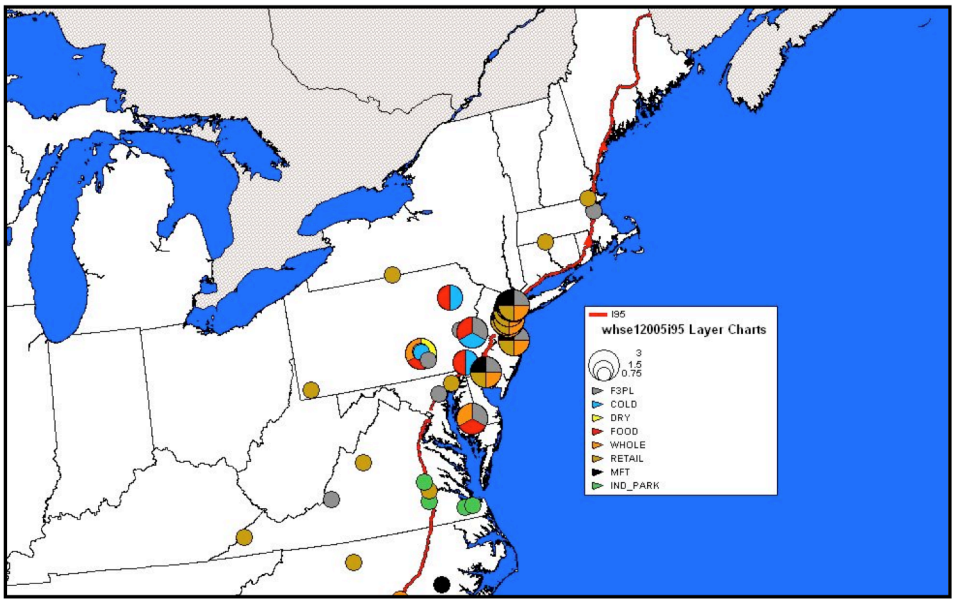


Source: Logistics & Marketing Services Inc.

The relative importance of Pennsylvania and New York over Massachusetts (in the northern part of the I-95) is further supported in Figure 2.4. The growth of Harrisburg, PA (at the intersection of the I-81 and the I-78) and Allentown, PA (on I-78) have happened as urban land costs in the more populated cities on the I-95 corridor rose in the last decade, and DCs relocated (and are continuing to relocate) to less expensive areas. Large food manufacturers such as Hershey and Nestlé have located in this area. In addition, there are smaller warehouses situated in southern New Jersey outside Camden. Should a short sea operator from Atlantic Canada wish to target transhipped feeder traffic into these DCs, a port in Pennsylvania would be a suitable choice.

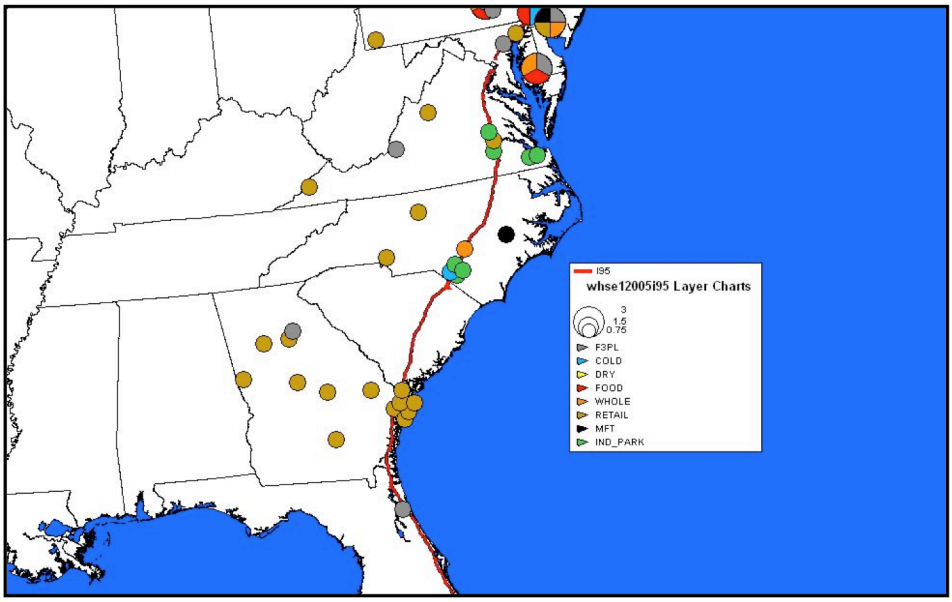
As an extension of this thinking, in the southern part of the I-95, LMS has identified DCs in the Richmond–Petersburg (VA) cluster and near Savannah; both Wilmington, NC, and Savannah, GA, hold promise for this traffic, as illustrated in Figure 2.5. Wilmington, NC, would be competing head-on with the terminals operated under the umbrella of the Virginia Ports Authority, the second largest port cluster on the eastern seaboard.

FIGURE 2.4: I-95 NORTH DISTRIBUTION CENTRE ACTIVITY



Source: Illustration by Logistics & Marketing Services Inc.

FIGURE 2.5: I-95 SOUTH DISTRIBUTION CENTRE ACTIVITY



Source: Illustration by Logistics & Marketing Services Inc.

Our conclusion is that a potential short sea operator would do well to consider two further paths for due diligence work prior to beginning to contemplate operating a short sea service based on this demand picture. One would be to examine the possibility of a feeder operation, partnering with one of the large container shipping operators currently servicing the global DCs in Pennsylvania. This additional business might support an otherwise unprofitable service. Second, one area we did not investigate is the potential for US northbound domestic short sea as this currently is unavailable to other than US flag operators. If changes were made to allow access to the cabotage market over the longer term, it might provide additional backhaul for the light-load leg.

ACKNOWLEDGEMENT

The research assistance of Scott Garinther (Dalhousie MBA Class of 2005) and Stephen Kymlicka (Dalhousie MBA Class of 2006) in undertaking the background research for this chapter (as captured in Appendix 1) is much appreciated. Preliminary research in advance of the contract by Jeff Livingston (Dalhousie MBA Class of 2005) provided a valuable base on which this work was built. The research support (presented in Appendix 2) provided by LMS and Dave Spearin is also appreciated.

CHAPTER 3

ASSESSING THE SHIPPER REQUIREMENTS

INTRODUCTION

The project aims to understand the challenges that a modally integrated East Coast short sea shipping operation would need to address in order to compete effectively with all-truck routes. This chapter examines the choice criteria of shippers as well as the degree to which shippers understand, and are concerned about, congestion on the highways and the associated environmental degradation.

While the formula for success in short sea shipping is complex, the actual performance of an alternative modally integrated service involving a short sea shipping service leg must be made sufficiently attractive to the shippers to stimulate substantive cargo diversion from all-truck routes. We are trying to gain insight into the costs to shippers, and the importance of the speed, frequency and reliability (predictability) of the service and of just-in-time delivery to market, whether it be by an all-road service or a modally integrated short sea shipping operation.

METHODOLOGY

The Halifax Port Authority's *Shippers' Profile Directory of Atlantic Canada Importers & Exporters 2004* was used to identify the most appropriate exporters and importers to survey in each of the four Atlantic Provinces. It was determined during the design of the study that a "key informants" approach would be a most cost effective approach to understanding the critical features in shipper decision-making. To identify the key informants to be surveyed, the query variables used were the shipping route (Canada/US), the type of packaging, state/province of origin/destination, and mode of transport, specifically truck. The type of packaging was limited to roll-on/roll-off (Ro-Ro), dry van, reefer container and flat, all of which represent containerized forms of transport (the short sea study's initial parameter was to examine the opportunity to move goods off the road into a short sea container service). As a result of these query parameters, several significant shippers were not selected for inclusion in the Task 2

survey as their commodities are packaged as breakbulk or bulk, the goods are not destined for East Coast markets,[3] or the commodities are currently transported by sea. The directory contained 604 shippers of whom 68 were deemed to be the most important to contact (based on the above criteria plus relative proximity to Halifax and commodities noted as critical in the trade lane analysis). These shippers were approached by e-mail and telephone to determine their interest in participating in the study. We were interested in those using for-hire trucking (eliminating those who engage in private carriage as unlikely to switch to short sea). Of these, 36 agreed to participate when initially contacted (and provided specific states to which they currently ship). Of this group, 24 **completed** the telephone and Internet survey to assist us with the assessment of key features in modal choice in the corridor.[4]

Each of the companies willing to participate was contacted by a subcontracted professional market research firm (Focal Research Consultants Ltd.), and Focal answered any questions, prompted follow-up and generally walked the exporters through the survey instrument designed by the research team for use in the study. Focal then tabulated the results and provided them (and the raw data) to the research team. Their report to the study team appears in Appendix 3.

The Internet survey instrument was in three parts. Part 1 tested the trade-offs made in decisions where short sea options were evaluated against truck options. We particularly wanted to capture any bias against short sea that might exist (whether real or perceived) as a potential operator will have to address in planning the operation. Part 2 tested the trade-offs made in decisions where two short sea options were competing against each other with the purpose of understanding service design requirements. Part 3 asked supplemental questions to evaluate the other factors of influence on the decision, including assessment of road congestion and environmental degradation.

The instrument was tested with one of Atlantic Canada's largest shippers to the US and adjustments made before it was used by Focal Research. The data collection phase closed later than anticipated because summer holidays for key informants made participation a lower priority.

As can be seen from Table 3.1, there is a question of whether the key informants reflected the sample from which they were drawn. The response from the Fish and Seafood industry was much higher than from the other groups; it is speculation only to discuss why.

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3 These were defined as those goods traveling to Maine, Vermont, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, District of Columbia, Virginia, North Carolina, South Carolina, Georgia and Florida.

4 Those who began the survey but failed to complete it were deemed non-respondents. The survey took an average of 15 minutes to complete.

TABLE 3.1: RESPONDENT PROFILE

	Frequency	
Commodities	**Sample**	**Respondents**
Agriculture	10	2
Fabricated Products	12	5
Fish & Seafood	29	13
Forestry Products	10	3
Machinery & Parts	3	1
Other	4	0
Total	68	24

SHIPPER CRITICAL ISSUES

The actual performance of a competing modally integrated service involving a short sea shipping service leg must be made sufficiently attractive to the shippers of this cargo to stimulate substantive cargo diversion from all-truck routes and to help shippers build new markets for economic return. This section identifies the service levels and the broad level of freight rates that an illustrative competing, modally integrated, short sea shipping service would need to achieve in order to be attractive to shippers. In particular, we focus on the trade-offs that customers would face with respect to transit time, price and reliability of the service, be it all-road or a modally integrated short-sea shipping operation. Shippers were asked to choose from various sets of service options, always presented in pairs, with the ability to indicate if neither service package would meet their needs. This allowed us to determine broad preferences for individual variables within option sets. The following discussion is based on an assessment of the Focal Research report (Appendix 3) along with a review of the raw data.

To develop these choice sets, we first determined the variables (see Table 3.2) we would bundle into choice sets. The variables are defined during the discussion of the findings.

As some of these variables are associated only with one mode, the choice sets were developed as a two-stage process. The first six decision sets always matched a trucking option against a short sea option. The next four decision sets matched one short sea option against another. That way, we could first determine preferences that varied between the two modes before determining what is needed in a new service. It would also allow us to identify the firms for which no short sea option would work.

TABLE 3.2: SHIPPER CRITICAL SHORT SEA VARIABLES

Decision Factors	Variants Proposed
Service options to be tested	Long-distance truck Short sea shipping integrated with truck
Transit time	Current time to market (1) 25% faster than current transit time (2) 25% slower than current transit time (2)
Cost of service (per kilo delivered)	Current price you pay (1) 10% lower than current price paid 20% lower than current price paid 10% higher than current price paid (2)
Documentation	Through bill of lading or waybill door-to-door Truck bill plus an ocean bill (2)
Frequency of service/ Availability of service	Fully flexible departure time (as needed) (1) Once a week fixed-day departure (2) Fixed-day departure every two weeks (2)
Reliability	Delivery within 12 hours of promised delivery time Delivery within 24 hours of promised delivery time

Notes: (1) only associated with long distance truck option.
(2) only associated with short sea option.

Conjoint analysis (often called trade-off analysis) requires that the buying group be homogeneous[5] and these shippers are not. To make a statistically correct, quantitative conclusion using this method of comparison, we would have required hundreds of shippers making decisions on many more service packages than would fit into the busy schedules of today's shippers. In other words, we would have had to conduct a census of the shippers in the directory. Therefore, we opted to use a key informant approach. Using an Internet survey in conjunction with a professional personal interviewing firm meant that respondents could complete answers on their computer screens in their own time or while on the phone with the research firm. However, the small sample size of key informants means that the conclusions below are qualitative only and open to interpretation.

5 Conjoint analysis is frequently used to determine buying factors, and an ideal use would be to determine what students might use to decide which of three apartments to rent, for example. Students are a relatively homogeneous group in terms of demographics and product requirements. Shippers are not homogeneous but quite segmentable; some are price-focused while others have specific delivery requirements. The sample size and data collected were not extensive enough to allow segmentation. Extension of the research would require a much larger group of shippers to be approached for segmentation to take place.

Transit Time and Delivery Time (Reliability)

While these two concepts are distinctly different, they are related and so are treated together. Transit time is a "time to market" question, and was operationalized in the choice sets as current time to market (associated with current trucking arrangements), 25 percent faster than current transit time (associated with a higher speed short sea service), and 25 percent slower than current transit time (associated with a traditional short sea service). Bracketing the trade-offs in this way, rather than in precise hours, allowed us to accommodate a wide range of routing arrangements and gain insight into time-related decisions.

Reliability is a moving target; what is viewed as reliable by one exporter is not by another. Reliability is always defined in terms of expectations; therefore, we were most concerned with tolerance of delay (as relative to delivery time). Two variables were established to determine the notion of reliability and were not mode-specific; they were delivery within 12 hours or within 24 hours of the promised delivery time.

Delivery time is also a question of windows.[6] Many shipments can be designated as JIT, with a window set for delivery, which, if missed, means that there has been a service failure in the transport arrangements. For this reason, delivery time may be critical for some shippers and not for others.[7] For this reason, shippers were asked a supplementary question: "Are you required by your customers to provide just-in-time service?" For those with JIT shipments, there was a supplementary option question on volume: "For what percent of your shipments?" As delivery windows may vary considerably, we also wanted to know about this business practice.

What Table 3.3 tells us is that the majority of shippers are looking for at least the current time to market if not something faster, but a small number are prepared to accept a slower time to market if the rest of the service package is acceptable. If we look in particular at the decisions made in Choice 2, twice as many companies chose service package 3 over service package 4 because the 25 percent boost in transit time (from a faster trucking service) was seen as better than a 10 percent reduction in the cost of the service (from a short sea option). When presented with short sea options only, those concerned with time to market split into two relatively even groups, one where speed was a critical factor and one where it was not.

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6 A window is a defined delivery time with an allowed deviation. For example, the shipment must arrive at its destination on Tuesday between 8 AM and 5 PM. Some delivery windows are set in minutes in the JIT environment.

7 Delivery time was only tested in the first six choice sets to keep the service package descriptions to a manageable size.

TABLE 3.3: SUMMARY OF TIME REQUIREMENTS (TRUCK VERSUS SHORT SEA)

Option Characteristics	Presented (1)	Selected	Total
Time			
Current Time to Market	96	58	60%
25% Slower than Current Time	96	21	22%
25% Faster than Current Time	96	47	49%
Package did not Meet Needs	144	26	18%
Delivery			
Within 24 hours of Promised Delivery Time	144	47	33%
Within 12 hours of Promised Delivery Time	144	71	49%
Package did not Meet Needs	144	26	18%

Note: (1) The option is presented to 24 respondents 4 times for total occurrence of 96 or 6 times for a total occurrence of 144 in the choice sets.

As for delivery time, what this and a detailed review of the raw data tell us is that the majority of shippers are looking for a tighter fence around the delivery time but that reliability of delivery time does not influence the mode choice. Reliability is not a differentiating factor between those choosing trucking options and those choosing short sea options. All expect a tighter time frame regardless of the option chosen. This implies that short sea is not accompanied by a negative perception in its ability to deliver to expectations if it is a modally integrated one. As one shipper noted:

> *As long as its known soon enough, usually delays can be overcome with phone calls ... Again as long as it's known ... After all we aren't shipping live hearts for transplant.*

There is a clear preference in both of the truck versus short sea choices and the choices between two short sea options for meeting delivery requirements within 12 hours of promised. The key phrase is "promised." For many companies, the promise of a particular delivery time is relevant. Of the 24, 16 had fixed delivery windows. Only three of the 24 companies noted that none of their shipments was a JIT shipment; eight had all shipments as JIT. The remainder were mixed and many chose not to indicate the percentage of JIT shipments. Clearly, meeting delivery windows will be an issue for any service package development.

Documentation

From research into short sea shipping currently underway in the US, we realized that documentation could be a key motivator in choosing a modal option. US shippers were quite concerned about purchasing a service requiring multiple carrier contracts, given the

liability and convenience impacts of a choice that is not modally integrated. Therefore we chose to examine the shippers' preferences for single contracts of carriage as opposed to multiple contracts. This element was tied to the short sea service only, as carriers in the trucking industry currently operate on a single waybill, whereas a short sea service, if integrated and wholesaled by one link in the chain, might have a single multimodal waybill, while a non-integrated service might require multiple contracts.[8]

More than twice as many companies preferred a single carriage document to multiple contracts, leading us to believe that a single contract arrangement has a greater chance of succeeding, all else equal. This encourages us to identify the interest of trucking companies and potential short sea operators in a retailing of an integrated package over one that is not integrated.

Cost of Service (per kilo delivered)

In Europe in the mid-1990s, transit time experienced by shippers was so long that European shippers expected rates to be discounted at least 35 percent to offset increased inventory costs.[9] To sum up this study and that by Paixão and Marlow (2002), the shorter the distance, the less likely that short sea shipping is competitive against the truck mode on cost.[10] The longer the distance, the less likely short sea shipping will be truck-competitive on transit time. In short, short sea shipping in Europe has difficulty meeting the service and price requirements of shippers and yet, in the mid-2000s, it is very truck competitive in Europe. We were, therefore, particularly interested in the needs of Atlantic Canadian exporters on this dimension.

One of the variables in the trade-off options was current price you pay (associated with current trucking arrangements), 10 percent lower than current price (associated with all arrangements), 20 percent lower than current price (associated with current all arrangements) and 10 percent higher than current price (associated with a premium short sea service). Bracketing the trade-offs in this way, rather than using precise dollar amounts, allowed us to accommodate a wide range of origins and destinations and get to the essence of cost-related decisions from the point of view of the shipper. (Price would be the same but from the carrier view.)

As can be seen from the Focal Research report, in the trucking versus short sea choice set, options (the first six decisions) that included either the current price or 20

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8 The documentation variants were not presented in the first six choice sets in order to keep the service package descriptions to a manageable size. The delivery time issue was presented there.

9 European Commission Transport Research APAS (1996). *Short Sea Shipping*, Luxembourg: Office for Official Publications of the European Communities.

10 Paixão, A.C. & P.B. Marlow (2002). The Strengths and Weaknesses of Short Sea Shipping, *Marine Policy*, 26, 167-178.

percent less were strongly favoured over those with 10 percent less or 10 percent higher. The options with 20 percent higher were almost never chosen. In other words, a 10 percent discount is insufficient to trigger switching behaviour to short sea but a 20 percent discount is. Likewise, a 10 percent premium was not a deterrent to the choice of short sea shipping, but a 20 percent premium in either trucking or short sea would induce a re-evaluation of transport options. We can speculate that if short sea services cost 10 percent more, it might be chosen over the road option if (a) the balance of the service package was acceptable or superior to the road option, or (b) the exporter wanted to exert a modal splitting package for other reasons not studied here or (c) the shipper viewed other short sea attributes as desirable.[11] Of particular interest is the finding that if the service is the same or faster in time to market, some of the respondents are prepared to pay more.

However, when exporters were presented with short sea options only, there was a clearer expectation of a price discount with short sea and 10 percent less was most often selected. The problem with the analysis of the four short sea only choice sets is that fixed-day departure every two weeks is not acceptable to a majority of exporters, and raises questions about its influence on the short sea options.

Frequency of Service/Availability of Service

Departure arrangements are important for many shipments. Research work by Brooks in the late 1980s[12] indicated that a minimum requirement of container shippers was weekly fixed-day departure, although on thin routes shippers may be prepared to accept fortnightly or biweekly services. As most short sea services are found on thin routes, research is needed to determine the frequency requirements of shippers in the market. The biggest advantage of the truck mode over short sea services is its fully flexible departure time (it is available when the shipper wants) and so this variable is only associated with trucking. The research question was: Will shippers accept a biweekly service in a new short sea operation or must it be weekly, if not even more frequent?

Therefore the three variables were fully flexible departure (trucking only), once a week fixed-day departure and fixed-day departure every two weeks (both associated with short sea arrangements). The first, while not explicit, is implicit in a choice of

11 Other motivators in transport choice behaviour have been examined by Brooks in other research and include the desire to split the business over alternate routes to mitigate route risk (port closures, perceived weather risk, etc) and supplier risk (splitting the business over more than one carrier maintains market competition and diminishes the risk associated with potential carrier bankruptcy). Few exporters align all their business with one transport operator.

12 Brooks, Mary R. (1990). Ocean Carrier Selection Criteria in a New Environment, *Logistics and Transportation Review*, 26, 4, 339-355.

trucking over short sea. This may have been the unstated reason why the majority of shippers preferred trucking to short sea in the analysis of the first six choice sets, and 25 percent of the shippers are unlikely to switch to short sea shipping unless trucking service deteriorates drastically (see the mode choice discussion later). When it comes to weekly or biweekly service, 40 percent of shippers did not choose an option (the two service offerings were not acceptable) and a further 40 percent preferred weekly over the 20 percent choosing biweekly service. This tells us that only a small percentage of the market is interested in a short sea option with biweekly service, likely for the reasons that something in the rest of the package is desired; the services where biweekly departures were accepted were those with the 20 percent price discount or the 25 percent faster transit time. As a high-speed short sea service is unlikely to be offered biweekly for operational reasons addressed in Chapter 4, we can assume that a small part of the market has flexibility in its contracts with customers to set delivery times suitable to it (as opposed to its customers).

Mode Preference

Of the 24 responding companies, four never chose short sea shipping. In other words, they always chose the trucking option in stage 1 of the survey and always indicated that neither short sea option was suitable in the second stage of the survey. Another two chose none of the short sea options in stage 2, but had selected the short sea option in stage 1 over trucking options when time to market for the trucking option was 25 percent slower and it was equal to or faster than current time to market (an option reflecting greater road congestion). Several of these six were in the seafood and agricultural products market and the primary feedback was that they needed greater flexibility than fixed-day departure offered. Two more companies did not choose short sea at all if a trucking option was available but indicated they might choose one if that was all that was available (e.g., no trucking option). One of these said that the product could not be containerized (indicating that a drop-trailer service might be favourably received if the service packages used a Ro-Ro feeder rather than container ship). These eight companies could be considered unlikely candidates for a short sea service as switching would be highly unlikely unless current trucking services deteriorate significantly in future.

It is clear that switching may not be induced for some of the key informants, and may be induced if transit times are equal to or better than existing, or price is equal to or less than existing. As noted previously, a 10 percent discount is insufficient to trigger switching behaviour to short sea but a 20 percent discount is. Likewise, a 10 percent premium is not a deterrent to the choice of short sea shipping, but a 20 percent premium in either trucking or short sea would induce a re-evaluation of transport options. Many

exporters require higher frequency services on these routes, so weekly or more frequent sailings would be desirable. A short sea operator could not expect exporters to switch all business to a short sea package because of the frequency requirements of part of the market, and because of shipper interest in diversifying the route and supplier risk. Incentive pricing for an equivalent short sea service could induce trial, and premium pricing for a better transit time service could also be effective in attracting customers.

KEY MARKETS IDENTIFIED FOR SERVICE

We wanted to understand the relative importance of the various destinations. The trade lane analysis indicates that some states are more critical (in terms of value or weight) for Atlantic Canadian companies than others. (These are indicated in column 2 of Table 3.4.) The key informants that showed interest in using short sea options are currently exhibiting the market pattern indicated in column 4 of Table 3.4. Of those interested in short sea shipping and supplying market served data (14 companies), two companies sold in all 17 states, and four sold in three or less; the average number of markets served was seven. Because so many of these companies are selling their products in multiple states, the answers do not reflect the impact of service packages by state. For this reason, the ports chosen to service cannot be determined in this way.

OTHER ISSUES FOR SHIPPERS

Environmental Damage

Shippers were asked to assess the impact of trucking and short sea shipping on the environment. The results in Appendix 3 indicate to us that many shippers are not well-informed about the environmental issues associated with each mode of transport. While both modes rated similarly (on a scale of 1 to 5, with 1 being *seriously damages the environment* and 5 being *not harmful*) in the middle of the scale,[13] the telling fact is that more companies felt confident about evaluating the perceived impact of trucking while fewer were able to judge the impact of short sea shipping. One respondent indicated that more education on the environmental impact of short sea shipping would be appreciated and hoped that available studies would be provided directly by the researchers. This indicates a role for government in informing the users about what is known of environmental impacts of transportation beyond the current efforts in the area of automobile emissions with consumers.

13 The means were not statistically different.

TABLE 3.4: KEY MARKETS

State (1)	Greater Value (2)	Key Informants Exporting to This State (n=20) (3)	Interested in Short Sea Shipping (n=14) (3)
Maine	***	11	9
Vermont	*	10	8
New Hampshire	**	9	7
Massachusetts	***	20	13
Rhode Island	*	7	5
Connecticut	**	11	8
New York	***	12	8
New Jersey	**	7	5
Pennsylvania	***	6	4
Delaware	*	5	3
Maryland	**	5	3
District of Columbia	*	4	3
Virginia	**	6	4
North Carolina	**	6	4
South Carolina	***	6	4
Georgia	**	5	3
Florida	*	9	5

Notes: (1) These appear in geographical order.
(2) As identified by the trade lane analysis in Chapter 2 and Appendix 1. They are rated as one star (low volume by tonnage), two stars (medium volume by tonnage) and three stars (high volume by tonnage).
(3) Four of the 24 key informants would not indicate current markets; 2 of 16 potential short sea customers would not indicate markets.

Road Congestion

Here there are two issues—the incidence of road congestion and its severity.

If the incidence of road congestion is high, whether it is at the border or in the US (along the I-95), it becomes an issue for companies in their transportation planning. Of the 24 companies asked about the issue,[14] 15 believed it to be an issue for the company, with a further two indicating it is at times, depending on destination and the security level in play at the border.

Severity of road congestion should be considered serious if it becomes a motivator. Seven of the 24 companies thought it serious enough to encourage them to

14 Question: Is road congestion currently an issue in serving your US east coast markets?

consider switching to short sea shipping.[15] As road congestion worsens along the eastern seaboard, this number will likely grow.

For 63 percent of the responding shippers, US east coast road congestion is an issue in serving the market. Of these, half indicated the problem was serious enough to encourage them to switch to a short sea service. One company, however, noted that such switching would require a fast transit time, an equal or lower price, and removal of customs clearance problems. This company perceived that customs clearance was more difficult for marine shipping than for trucking.

US Harbor Maintenance Tax (HMT)

The US HMT is an issue that has been cited by shippers in the Transport Canada cross-country workshops as a disincentive to the development of short sea shipping transport alternatives between Canada and the US. The HMT (0.125percent of cargo value on US freight imports) is charged on each call (goods transhipped are billed twice). Brooks and Frost (2004) noted that it

> *has contributed to new ventures focusing on passenger rather than freight potential, or on the narrow opportunity to move 'in transit' freight exempt from the fee. In particular, it has acted as a deterrent to the development of cross border marine services in the heavily congested Ontario–Michigan trade, and is believed to be a factor in the decision to abandon plans to carry a few trucks on the Rochester–Toronto passenger ferry scheduled to start in 2004.*[16]

The Brooks and Frost conclusion was based on the anecdotal evidence supplied by the Workshops and the Detroit–Windsor Ferry operations. The research question is whether or not this concern is replicated for Atlantic Canadian companies.[17]

Seven of the companies believed that the HMT would raise their transport cost to market by more than 5 percent; of these, two thought more than 10 percent. Nine did not know the impact or left the question blank, leaving eight to indicate an impact of less than 5 percent. These eight indicated that the imposition of HMT would have no or

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15 Question: Is congestion a motivator to encourage you to consider switching to short sea shipping if a new service were available?

16 Brooks, Mary R. and James D. Frost (2004), Short Sea Shipping: A Canadian Perspective, *Maritime Policy and Management*, 31, 4, 393-407 at p. 402.

17 After the application of HMT was explained, two questions were asked: one on how much it would increase transport costs and an open-ended question regarding its influence on the decision to use short sea shipping. These questions were positioned after the choices were made, as the impact of HMT is considered a cost by the shipper, yet not part of the price quoted.

minimal impact on their choice of short sea shipping or trucking. One of the companies that did not know the impact indicated that flexibility and reliability would determine the modal choice and that HMT was a less important consideration. The other comments reflected more a concern about the total cost of getting the product to market and indicated that HMT was only one variable in the calculation of cost, and that the cost may tilt the decision in favour of trucking.

Other Factors

The responses to the final question (about other factors) provide some additional insights.[18] In particular, three issues are restated here: the need for fast transit time by the seafood industry, the importance of service reliability, and the fact that ocean containers hold less product than truck trailers do. One shipper was quite clear that security, product safety, dependability and reliability of whatever service is supplied, and the reputation of the supplier, would factor in a short sea shipping choice.

CONCLUSIONS

A number of general conclusions can be drawn from the shipper survey results, although the survey did not have enough respondents to ensure statistical validity. The shippers of Atlantic Canada fall into two very distinct groups: those for whom time to market is critical (e.g., seafood shippers) and those for whom a slower service (short sea or truck) is still acceptable. Short sea was not perceived to be less reliable, but a majority of shippers have a tight delivery window.

Documentation options other than a single door-to-door contract were not well received. More than twice as many companies preferred a single carriage document to multiple contracts. Therefore, a single contract arrangement has a greater chance of succeeding, all else equal. This encouraged us, as part of the research, to identify the interest of trucking companies and potential short sea operators in a retailing of an integrated transport package over one that is not integrated. (See Chapter 4 for this discussion.)

Service every two weeks is unacceptable. More frequent departures are critical to the development of a market-acceptable service. Scheduling requirements indicate that 25 percent of the shippers are unlikely to switch to short sea shipping unless trucking service deteriorates drastically; it is instructive to note that a majority of companies reported road congestion, with about one-half of those indicating it to be serious enough to encourage them to consider switching to short sea shipping. Customs clearance was

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18 Question: Are there any other factors you consider important to your decision to use short sea shipping (or not) that have not been reflected above? The replies are presented in Appendix 3.

perceived to be more difficult for marine shipping than for trucking and this perception may be more of a barrier than expected.

Pricing issues were of particular interest. While there is heavy discounting in Europe for slower transit time services, levels of discounting do not seem to need to be so large. While a 10 percent discount is insufficient to trigger switching behaviour to short sea, a 20 percent discount might. On the other hand, a 10 percent premium was not a deterrent to the choice of short sea shipping, but a 20 percent premium in either trucking or short sea would induce a re-evaluation of transport options. It appears that 20 percent attracts the attention of the shipper as would a faster, frequent service. If the service is the same or faster in time (to market), some companies are prepared to pay more for other reasons (e.g., route diversification, carrier diversification, risk mitigation). Incentive pricing for an equivalent (to trucking) short sea service could induce trial, and premium pricing for a better transit time service could also be effective in attracting customers. The existence of HMT is clearly a factor mitigating against the use of short sea for some companies, and the opportunity to argue for its removal for NAFTA partners is a policy position that could be developed.

Shippers are not well informed about the environmental issues associated with each mode of transport, which leaves us unable to evaluate environmental issues. It is clear, however, that there is a role for government to educate industry on the environmental impacts of their freight mode choices.

ACKNOWLEDGEMENT

The research support of Focal Research Halifax, and in particular Tracey Schrans, is much appreciated.

CHAPTER 4

DESIGNING THE SERVICE: TECHNICAL CONSIDERATIONS

INTRODUCTION

This chapter examines the technical aspects of short sea shipping between Halifax and ports along the US east coast and offshore. Three vessel types—container, roll-on, roll-off and high speed—are analyzed and both purchase and time charter options are considered. Basic operating costs and port charges are assessed and compared with the cost of trucking 50, 100 and 150 miles from each port pair. In addition, overall transit times for shipping versus trucking are compared.

As above, the study will examine several vessel options and the cost of operating these vessels. In the contract we committed to looking at two options, the 396 TEU *Shamrock* and a high speed vessel, the Incat *Evolution 112*, but upon further analysis and given that there were suitable data available, we decided to examine four additional ships, the Damen 800, the *Oceanex Avalon* and two roll on, roll off vessels, *Stena Foreteller* and *Altinia*. We looked at both purchase and time charter options for *Shamrock* and just a time charter option for *Altinia*; therefore, our analysis looks at vessel costs for seven options. It also provides some insight into whether a would-be operator should purchase or charter a vessel, as well as recent and future market trends for the feeder and Ro-Ro sectors.

This chapter also looks at port selection. We originally committed to examine six US east coast options, including Fall River, MA, Bridgeport, CT, Camden, NJ, Philadelphia, PA, Wilmington, NC, Savannah, GA, as well as two offshore ports, Hamilton, Bermuda, and Freeport, Bahamas. Because of the difficulty in obtaining cost information from several of these ports, and the fact that Fall River does not have suitable secure facilities in place for short sea shipping, we added Gloucester, MA, to the list of ports examined.

Owners or charterers will seek to keep their assets in use 100 percent of the time. In the real world, this is not realistic, but some compromise between vessel speed, fuel consumption and schedule integrity is usually possible. The ship operator, however, will attempt to avoid a situation where, for example, the vessel is operating five days a week and idle the other two. It will, however, wish to build in sufficient buffer time to allow

for inclement weather and other such delays, as it is very difficult to "catch up" with a small vessel. The operator will also want to avoid sailing the vessel at full speed in order to conserve fuel. Excessive buffer time, on the other hand, is simply poor asset management.

The short sea operator will want to avoid working overtime and will therefore sail the vessel between ports on weekends, if feasible. If there is time-of-day pricing or unfavourable union arrangements, the vessel should be worked between 0800 and 1700 hours in both ports, if possible. The schedule will also need to address supply chain issues, such as Friday sailing from Halifax with a Monday delivery in the US, with return on Friday. Equipment utilization will be discussed, as many of the trucking companies that carry freight into the US "triangulate" their units, such that they return to the Maritimes via Toronto or Montreal, thereby making it difficult for a short sea operator to realize full loads in each direction.

The chapter also looks at port selection. We originally committed to examine six US east coast options, including Fall River, MA, Bridgeport, CT, Camden, NJ, Philadelphia, PA, Wilmington, NC, Savannah, GA, as well as two offshore ports, Hamilton, Bermuda, and Freeport, Bahamas. Because of the difficulty in obtaining cost information from several of these ports, and the fact that Fall River does not have suitable secure facilities in place for short sea shipping, we added Gloucester, MA, to the list of ports examined.

VESSELS

Initially, the study team considered just two vessels, the 396 TEU *Shamrock*, which had been operating between Halifax and St. Pierre et Miquelon and the US ports of Boston, MA, and Portland, ME. The operation of this vessel was going to be contrasted with a high-speed vessel design that is being marketed by the Australian builder and designer, Incat. Because part of the proposed target market for the service is domestic shippers who might switch from road, it was determined that the vessel options should include at least one that could accommodate either 53' trailers or 53' "domestic" containers, like those moving in domestic intermodal rail service and between the Canadian mainland and Newfoundland. Therefore, four additional ship options were considered.

Overall, the cost to charter vessels of this type has doubled since 2003. Clarkson's Research, a division of a UK-based ship broker, reports time charter rates on a 725 TEU geared feeder ship averaged USD6,650 in 2003 and USD12,973 in 2005.[19]

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19 The conversion rate for USD as of 31 January 2006 was 1USD = 1.1443CAD, and the conversion rate for EUR as of 31 January 2006, was 1EUR = 1.3836CAD according to mid-market rates in Toronto at noon, 30 January 2006. Prepared by BMO Nesbitt Burns, Capital Markets.

For smaller 350 TEU geared vessels, average rates were USD4,463 in 2003 and USD8,568 in 2005.[20] Moreover, instead of being able to charter a vessel for six months and then upgrade or renew, owners are asking for commitments of 24 months. It is a classic "owner's market," although the most recent price trend is down 2.8 percent on 725 TEU vessels and 2.6 percent for 350 TEU ships. Recent fixtures as represented in Table 4.1 include the following vessels:

TABLE 4.1: CONTAINERSHIP CHARTER RATES, DECEMBER 2005–JANUARY 2006

Vessel	TEUs	Type	Daily Rate USD
Shamrock	396	Geared	$7,900
City of Manchester	300	Geared	$5,500
Express Phoenix	367	Geared	$9,000
Regina Eberhardt	755	Geared	$9,125
Knock	518	Geared	$9,750
Reggeborg	558	Gearless	$10,250
Maike D.	660	Gearless	$9,000
Oued Ziz	501	Gearless	$8,750
Inka Dede	658	Gearless	$8,100
Pan Tau	601	Gearless	$8,100
Anna Gabriele	450	Gearless	$7,900
Norrland	508	Gearless	€7,200
Lappland	658	Gearless	€6,800

Source: Clarkson's Research Services, Container Intelligence Monthly, December 2005; S. Danoff USA, shipbrokers, 16 January 2006.

Secondhand prices have also risen. Clarkson's reports a five-year old geared feeder ship price averaged USD8.6 million in 2005, compared with USD5.9 million in 2003. Likewise, a similar-aged 725 TEU vessel has risen from USD9.5 million to USD13.5 million. Recent secondhand sales for geared vessels are included in Table 4.2.

20 Note: This index data are only available for geared vessels. **Actual** time charter rates are available for gearless **and** geared.

TABLE 4.2: SECONDHAND CONTAINERSHIP PRICES, DECEMBER 2005

Name	TEUs	Built	Price USD
Ossian	518	1999	$12.75M
Leguan	518	1999	$10.5M
Gemartrans Pioneer	534	1996	$12.1M
Hyundai Eagle	533	1986	$17.0M
Blue Link	818	1994	$19.5M
Platinum Pearl	860	1997	$18.25M
Middeldiep	323	1997	$19.0M

Source: Clarkson's Research Services, December 2005.

For a 725 TEU geared vessel, newbuilding prices have also increased from USD13.0 million in 2002 to USD19.5 million in 2004, and USD20.5 million in November 2005. We also obtained sales data for two gearless vessels, as illustrated in Table 4.3.

TABLE 4.3: GEARLESS CONTAINERSHIP NEWBUILD PRICES, LATE 2005

Name	TEUs	Built	Price USD
Serenada	344	1999	$6.0M
Inke Dede	510	2005	$9.7M

Source: Clarkson's Research Services, December 2005, January 2006.

As of January 2006, there are a number of gearless vessels on the market, at the asking prices shown in Table 4.4.

TABLE 4.4: GEARLESS CONTAINERSHIP AVAILABILITY, JANUARY 2006

Name	TEUs	Built	Price USD
OSG Bosstec	698	2006	$21.0M
Yong Yue no. 6	631	1979	$3.0M
BEI Jiang	554	2005	$10.0M
Great Samite	478	1992	$8.0M
Peace Lake	420	1995	$6.9M

Source: S. Danoff USA, shipbrokers, 16 January 2006.

Because of the cost of container equipment and other factors, including the potential market the service would likely attract (e.g., domestic trailers), we decided to

examine the potential for using a pure Ro-Ro vessel.[21] Average prices for five-year-old 1,250 lanemetre (75 trailers) Ro-Ro vessels increased from EUR10.6 million in 2002 to EUR17.2 million in 2004. Larger 2,500 lanemetre (150 trailers) vessels increased from EUR20.1 million to EUR29.9 million over the same period. Newbuilding prices for 1,200–1,300 lanemetre vessels increased from EUR18.2 million to EUR24.7 million while the prices of larger 2,300–2,700 lanemetre vessels have risen from EUR30.4 million to EUR34.4 million (Clarksons Research, 12/05).

We also obtained recent charter rates for Ro-Ro vessels, as shown in Table 4.5.

TABLE 4.5: RO-RO CHARTER RATES, JANUARY 2006

Name	Year	Lanemetres/trailers	Charter cost
CETAM Victoria	1977	1,290 / 105	USD9,330
Garden	1977	1,445 / 105	USD9,330
Hansaland	1983	1,225 / 94	USD10,179
Altinia	1992	1,150 / 91	USD7,271
Trans Carrier	1993	1,068 / 86	USD8,482
Maria G	1977	1,268 / 85	USD7,876

Source: S. Danoff USA Ltd., shipbrokers, 16 January 2006.

Ro-Ro secondhand sales data are more limited, but several indicative prices are as shown in Table 4.6.

TABLE 4.6: RO-RO SECONDHAND SALES, JANUARY 2006

Name	Built	Lanemetres/trailers	Price
Maltese Falcon	1979	1,699 / 136	USD5.25M
Greifswald	1988	1,570	USD13.33M
Rolon Alcudia	1979	1,107 / 90	USD2.1M

Source: S. Danoff USA Ltd., shipbrokers, 16 January 2006.

One issue that a would-be operator would need to come to grips with is whether to purchase a new (or secondhand) vessel or whether to charter it on the open market. For a start-up operation, purchasing a new or secondhand vessel is very risky, unless there are contracts in place guaranteeing sufficient volume to justify the initial investment. Usually, a new operation will charter a vessel initially and wait until volumes find their "natural" level before purchasing. There are advantages and

21 As most of this type of Ro-Ro vessel are used in Europe, time charter and newbuilding costs are supplied in euros. As of 1 February 2006, the exchange rate between euros and USD is 1.1879.

disadvantages to both approaches. When the market is saturated with vessels, charter rates tend to be below the cost of operating new vessels. When vessels are in high demand (as at present), charter rates will tend to be higher than the cost of owning. Since 2003, because of a surge in worldwide container shipping (the so-called China Effect), charter rates on feeder-type vessels have almost doubled. At the same time, very few of these vessels are being built, compared with larger Panamax and post-Panamax ships. Feeder vessels are in especially high demand in the Far East, Indian sub-continent, Mediterranean, north Europe and Caribbean, where large transhipment hubs are located and where short sea feeder services are quite prevalent. As few of these vessels are being built, rates tend to be a factor of simple economics—supply and demand. If worldwide shipping demand eases, then rates on feeder vessels will tend to ease or soften.

The overall container market is expected to grow 10.1 percent in 2006 and 9.8 percent in 2007, which suggests that demand for such vessels (and hence rates) will remain high for some time. The demand for feeder vessels could change if mainline carriers reduce the number of ports that are "feedered" and increase the number of ports that large ships call directly. This could happen as more than 250 post-Panamax vessels are expected to be delivered by 2008. However, many would-be direct call ports are not equipped to handle large vessels.

There would also appear to be an opportunity for shipowners and investors to build new feeder vessels. Ocean Shipping Consultants has stated that "the current fleet is characterized by a high proportion of obsolete vessels; around 40 percent are at least 15 years old and can be expected to be removed from the market around 2010" (*Germanischer Lloyd*, June 2005). Transhipment volumes at major hub ports have risen at a faster rate than direct gateway cargo throughput in recent years and the demand for feedering has risen commensurately.

Time chartering (as opposed to bareboat chartering) also eliminates the need for a ship management structure, or for ship managers to be hired, as all issues relating to crewing, maintenance and stores are handled either by the owners or their ship management companies. Likewise, charter rates on Ro-Ro vessels have been very good for owners due to a surge in demand for short sea services between the Baltic countries and both the UK and Europe.

The specifications data for the new vessels were obtained through shipping data sources (Fairplay Vessel Data Reports), press reports and corporate web sites (Oceanex, Stena), the shipyard that built them (Damen), or the company that designed the vessel (Incat).

MV *Shamrock*

Until early 2005, the MV *Shamrock* operated between the ports of St. Pierre et Miquelon, Halifax, Portland and Boston. It was built in Romania in 2000 at a reported cost of USD22 million. After its original owners experienced some financial difficulties in 2004, the vessel was sold at auction for USD11.05 million. The new owner is Clarke Inc., a Halifax-based transportation company, with interests in trucking and container terminals. The ship is managed by Thien & Heyenga of Germany. Since early 2005, the vessel has been under charter to Tropical Shipping of West Palm Beach, Florida, at a reported daily charter rate of USD7,900. *Shamrock*'s basic specifications are as shown in Table 4.7.

TABLE 4.7: *SHAMROCK* VESSEL SPECIFICATIONS

Length	119.99 m
Beam	18 m
Draft	5.40 m
Deadweight	4,850 dwt
Cargo capacity (TEU)	396 TEU
Cranes	2 x 40 t
Speed	16 kn
Fuel consumption	26.7 tonnes IFO 180 per day

The most noteworthy feature of this vessel is probably its speed, which is 2-3 knots faster than most vessels of this type. This is critical to the classic "feeder" market, as it allows the vessel to be able to keep a schedule and meet the "mother" ship. It also has ships' gear, which could be important in smaller ports such as Gloucester or Bridgeport. In terms of this study, the particular market to be served would require it to be capable of carrying heavy containers of 15 tonnes or more, which would limit it to carrying approximately 200 40-foot containers or FEUs. The vessel also has a small Ro-Ro ramp, but it was intended for carrying small French autos to St. Pierre and not large trailers. The vessel also has cell guides that were designed to accommodate standard 20' and 40' containers in the hold. Oversize containers would need to be carried on deck and it is not clear how this would affect vessel stability, etc. A short sea operation utilizing this vessel would also require the purchase or lease of approximately 600 containers to carry cargo, if it did not carry "feeder" or transhipment cargo.

If the service were predicated on carrying overseas transhipment cargo and *some* short sea cargo, it would be ideal. At the present time, its charter cost is at the top of the cycle, but to purchase the vessel at the price it was auctioned at would makes less sense

(even if it were available). The current owners are in a good position to venture into short sea shipping given their other interests and given a sound business case.

Incat Evolution 112

The original proposal stated that we would compare the operation of a conventional feeder like MV *Shamrock* with a high-speed alternative built by either Incat or Austal Ships, both of which have US affiliates. An Incat passenger/car ferry operates between Yarmouth, NS, and Bar Harbor, ME, and an Austal Ships vessel was operating across Lake Ontario between Toronto, ON, and Rochester, NY, but service has stopped for the second time. Both of these vessels were built in Australia. Of the two designs, there are more Incats operating worldwide than there are Austal vessels. This type of high-speed vessel technology is now more than 10 years old, having been pioneered by Sea Containers' subsidiary, HoverSpeed, on the English Channel.

Incat provided the study team with vessel costs and operating data, so that is the vessel analyzed for this application. The vessel's designer targets short sea applications that cater to the market that exists between air cargo and conventional freight-carrying vessels. Examples of suitable freight can include seafood, fresh produce, cut flowers, JIT manufacturing inputs, courier packages and possibly mail. The builder also anticipates there will be some military applications as fast response units. Salient data for the Incat Evolution 112 are summarized in Table 4.8.

TABLE 4.8: INCAT EVOLUTION 112 SPECIFICATIONS

Cost	USD66M
Length	112.63 m
Beam	30.20 m
Draft	3.30 m
Deadweight	1,000 dwt
Cargo capacity (trailers)	32 high speed / 47 slow speed
Speed	36 kn high speed / 23 slow speed
Fuel consumption	5.9 t MGO per hour / 2.6 t per hour

This vessel has limitations in its operating range and cargo-carrying capacity. The normal operating range with full cargo complement and maximum speed is 300 nautical miles (nm), which is a shorter distance than Halifax to any of the proposed ports. Therefore, to extend the range means carrying more fuel and less cargo, which increases unit costs. We decided, therefore, to limit discussion to the northern portion of the market, i.e., ports such as Gloucester, MA, and Bridgeport, CT, the latter being over

500 nm from Halifax. A critical cost factor is the type of fuel used, fuel consumption and cost of fuel, which is extraordinary high.

This vessel may appeal to seafood shippers southbound and produce shippers northbound, as well as companies shipping emergency oilfield supplies. It is able to offer frequency and speed. At full speed, transit time to Gloucester is slightly less than 10 hours, not including local delivery times. To Bridgeport, the transit time is slightly more than 15 hours, not including local delivery. The over-the-road distance to Gloucester is 695 miles, which would take 14 hours at a constant 50 miles per hour, which is illegal under current regulations. To Bridgeport, it is 845 miles, which would take 17 hours at a constant 50 miles per hour. Both options are therefore competitive in terms of overall elapsed time, and in fact may be better because of truck hours-of-service regulations. The service could probably be offered 4-5 times per week to Gloucester and 3 times per week to Bridgeport. (Whether it is cost competitive with trucking will be determined in the next section.)

Damen 800

Two vessels of this type were delivered to a Dutch short sea operator, Geest North Sea Line, in 2005 at a reported cost of USD18 million each. A further 14 sister ships have been ordered. They are unique in that they were built with moveable cell guides that allow the vessels to carry 20', 40' and 45' containers. Their relevant specifications are shown in Table 4.9.

TABLE 4.9: DAMEN 800 VESSEL SPECIFICATIONS

Cost	USD18M
Length	140.56m
Beam	21.80m
Draft	7.33m
Deadweight tonnage	9,322 dwt
Cargo capacity (TEUs)	804 TEUs
Speed	17 kn
Fuel consumption	29.4 tonnes per day

Because the study was focused on cargo moving between Canada and the US, it was therefore deemed desirable to be able to carry containers of varying lengths, especially 45', 48' and 53' units, since they would be the most homogeneous relative to truck trailers. The vessel's builder indicated that

> *All container positions can be used for 45' containers (in the hold and on deck). The holds are equipped with movable cell guides, which can be positioned for 40' and 45' containers. Longer containers cannot be placed in the hold, because the hold dimensions are based on two times 45', so 90'. On deck there is more space available, but one loses then some positions. On deck, all positions can be used for 8' 6" (2,60 m) wide containers. In the hold, with cell guides, only the outside positions in hold 2 and 3 can accommodate these containers. If the cell guides are removed, then all positions can be used for 8' 6" wide.*

What this means is that this vessel, as presently designed and as flexible as it is, cannot accommodate 53' containers, which would be most suitable for transporting truck trailers moving between Canada and the US. This vessel would be more appropriate in a European trade or feeder service with a high preponderance of 40' and 45' equipment.

MV *Oceanex Avalon*

In 2005, Canada's pre-eminent short sea operator, Oceanex, took delivery of a new vessel, *Oceanex Avalon*, that was built in Germany at a cost of EUR28 million, or USD34.5 million. There are very few details available for this vessel, but its general specifications are listed in Table 4.10.

TABLE 4.10: MV *OCEANEX AVALON* VESSEL SPECIFICATIONS

Cost	EUR28M / USD34.5M
Length	148.90 m
Beam	25.90 m
Draft	9.61 m
Deadweight tonnage	14,747 dwt
Cargo capacity (TEUs)	1,004 TEUs
Speed	20 kn
Fuel consumption	Approx. 40 tonnes per day

Oceanex operates short sea services between the Canadian mainland ports of Montreal and Halifax to St. John's and Corner Brook, Newfoundland and Labrador. The *Oceanex Avalon* has entered service between Montreal and St. John's. The most noteworthy feature of the vessel is its capability of carrying 53' domestic containers, which are the same size as highway trailers.

Oceanex's strategy for building this vessel seems quite clear. The company has long been a proponent of roll-on, roll-off technology; before the purchase of the *Avalon*,

its fleet consisted of three Ro-Ro vessels with some container-carrying capacity. In recent years, many of its largest customers, including trucking firms such as Armour Transportation Group, Clarke Transport and Maritime-Ontario, have purchased domestic 53' containers, which are the same size as standard truck trailers. Oceanex also carries similar-sized containers for Canadian Tire and CN Rail. Oceanex itself ordered 300 53' containers at a cost of CAD4.0 million for its own use. Containers provide more flexibility than trailers and can be carried onboard a vessel, on intermodal rail cars and by trucks. A container vessel of this size can carry 1,004 TEUs, or about 500 FEUs, depending on their weight.

If there were sufficient cargo available, a vessel of this design would be ideal for the service contemplated, because it can carry a wide mix of container sizes. Whether a smaller version with the same flexibility has been designed has not been determined. This point is worthy of further examination. Such a large vessel might also have difficulty using some of the smaller ports envisioned, so it may be restricted to ports such as Boston and Philadelphia, thus increasing lift costs. Productivity would be compromised at smaller ports, although there is time in the cycle and container gantry cranes are not used in St. John's, where the *Avalon* presently calls. An operation using such a vessel would also need to purchase a sufficient complement of containers to have one in each port and one on the water for each slot on the vessel, or perhaps as many as 1,500. This would involve additional capital investment of approximately CAD20 million or USD17.5 million, based on the cost of Oceanex's recent purchase of 300 such containers. A pure Ro-Ro operator, however, would not need to make this investment, as it would be carrying highway trailers owned by its customers (the truckers).

MV *Stena Foreteller*

Stena's *Foreteller* class of vessels, which were built in China in 2002, 2003 and 2004, fit the general description in Table 4.11.

TABLE 4.11: MV *STENA FORETELLER* VESSEL SPECIFICATIONS

Cost	USD33.0M
Length	195.30 m
Beam	26.80 m
Draft	7.30 m
Deadweight tonnage	12,300 dwt
Cargo capacity (TEUs)	3,000 lm or 185 x 16 m trailers
Ramp width	10.61 m
Speed	22.5 kn
Fuel consumption	79 t HFO per day

A unique feature of these vessels is their very wide cargo door, which allows trailers to be loaded and discharged two at a time, provided there is a suitable shoreside facility available. The *Stena Forecaster* is on long-term charter to the Finnish carrier Transfennica, and in 2005 was named that carrier's "Ship of the Year." Two sister ships are also in service with Transfennica.

A container vessel can carry much more cargo per deadweight tonne at a cheaper cost than a comparable Ro-Ro vessel, but container vessels take longer to load and unload. Recent research conducted for Transport Canada regarding so-called drop trailers carried on the Marine Atlantic ferry service between Nova Scotia and Newfoundland suggests that Ro-Ro productivity as practiced in Canada, at least, is not high.[22] At North Sydney, productivity is 16-21 moves per hour, while at Halifax it is 18-20 moves per hour. This compares with at least 22 lifts per hour for container operations. (On feeder operations, productivity is frequently much higher.)

A number of US studies have suggested that larger ports are not interested nor do they have the capacity to serve small container vessels operating in short sea markets because they are too congested with deepsea cargo.[23] In addition, it has been suggested that the rates that would have to be charged would be too high to sustain short sea operations. A study in Bridgeport, CT, suggested that small Ro-Ro vessels might be more appropriate to domestic short sea operations because of the possibility of (a) quick turnaround times and (b) the ability to enter smaller harbours.[24] It therefore seemed to make sense to analyze the potential for a Ro-Ro operation.

The Stena vessel is probably too large; however, it was built at a very low cost. Similar-sized or larger vessels are currently on order for upwards of USD66 million. However, Transfennica/Spleitoff has six vessels of 2,800–3,000 lanemetres and 660 TEU capacity on order for USD40 million each. Most new Ro-Ro vessels and those on order are tending to be this size or larger, to accommodate the north European demand for short sea services. An exception is Seatruck Ferries, that operates from Ireland to the UK, and which is building two 1,830 lanemetre capacity vessels for USD30 million. Large Ro-Ro vessels are particularly prevalent operating in the Baltic from Finland to continental Europe and Britain. Their main advantage in the context of this study is that they could accommodate trailers without the vessel operator having to purchase a fleet of

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22 MariNova Consulting Ltd. and Geoplan Opus, *Social and Economic Impact of Marine Atlantic Drop Trailer Service*, Transport Canada, November 2005.

23 MariNova Consulting Ltd., *Short Sea Shipping Market Study*, Appendix A, Literature Review, Transportation Development Centre of Transport Canada, 2005.

24 Developing a Short Sea Container Shipping Facility and Service: Bridgeport's Experience, Greater Bridgeport Regional Planning Agency, 15 May 2003.

53' containers. However, not all of the ports examined have Ro-Ro facilities of the type that are need to effect quick turnaround times.

MV *Altinia*

It also made sense to analyze a smaller chartered Ro-Ro vessel, so we chose a relatively new and recently chartered one, MV *Altinia*. This vessel fits the parameters in Table 4.12.

TABLE 4.12: MV *ALTINIA* VESSEL SPECIFICATIONS

Built	1992
Daily Charter Cost	USD7,271
Length	150 m
Beam	21.6 m
Draft	5.9 m
Deadweight tonnage	8,924 dwt
Cargo capacity (trailers / lm)	91 / 1,150
Ramp width	n/a
Speed	14 kn
Fuel consumption	20 t IFO 180

Vessel Summary

For the new vessels, which we have evaluated by their purchase cost, we have assumed the criteria in Table 4.13.

TABLE 4.13: NEW VESSEL FINANCING

Mortgage interest rate	8%
Required ROI on equity	15%
Mortgage (years)	10
Payments/year	12
% down payment	20%

We obtained vessel daily operating costs from *Ship Operating Costs: Annual Review and Forecast* by Drewry Shipping Consultants. It suggests current rates listed in Table 4.14.

TABLE 4.14: SHIP OPERATING COSTS

Crewing	Europeans $2,842	Filipinos $1,307
Insurance	Container $939	Ro-Ro $770
Maintenance (0-5 years – scheduled)	$2,191	
Stores	$250	

Because the operation would not be subject to US cabotage, or Jones Act restrictions, we have assumed that all vessels would operate under a flag of convenience and with foreign crew, at the least cost possible. Thus, the service would not be able to carry cargo between US ports. The only Jones Act vessels that could possibly be considered for such a service are tug and barge operations, similar to those used by Columbia Coastal and Osprey Line. There are very large tug and barge combinations operating between the US mainland and Puerto Rico, but these are not appropriate for this type of service or the sea conditions experienced between Halifax and the US east coast, particularly across the Bay of Fundy.

Except for the Incat high-speed vessel, the cost range is remarkably consistent. Estimated daily operating costs (USD) are summarized in Table 4.15.

TABLE 4.15: ESTIMATED DAILY OPERATING COSTS PER FEU (USD)

Vessel	Time charter or ownership	Crew	Main-tenance	Insur-ance	Stores	Fuel	Total	Per TEU
Shamrock (time charter)	$7,900					$8,624	$16,524	$83
Damen	$8,579	$1,850	$2,169	$939	$250	$9,496	$23,283	$57
Avalon	$19,672	$1,850	$2,169	$939	$250	$11,305	$36,185	$72
Incat (high speed)	$27,998	$1,676	$4446	$770	$250	$84,960	$120,100	$3,753
Incat (slow speed)	$27,998	$1,676	$4,446	$770	$250	$37,440	$72,580	$1,544
Stena Forteller	$13,919	$1,850	$2,169	$770	$250	$25,517	$44,475	$240
Altinia (time charter)	$7,271					$6,460	$13,731	$150

None of the new vessels is ideal, particularly if the service is to be predicated on domestic truck traffic between Canada and the US. The would-be operator should make a choice as to whether to serve the domestic trailer market, carrying trailers rather than

containers, or the overseas transhipment market, in which case it could also incorporate some domestic cargo. If a pure container ship were chosen, the operator would need to provide a fleet of containers, whereas a Ro-Ro vessel could carry trailers owned by the trucking firms themselves. To our knowledge, only one vessel capable of carrying 53' oversize containers has yet been built (for Oceanex in 2005).

A time-chartered Ro-Ro vessel is probably more suitable to the domestic market and a geared container vessel is more appropriate to the feeder market, depending upon the port choice. As to whether the operator builds the service around domestic or overseas business will obviously depend on market response.

PORTS

The proposal stipulated that we would examine a number of US and foreign port options, including the following:

US port	**Foreign port**
Fall River, MA	Hamilton, Bermuda
Bridgeport, CT	Freeport, Bahamas
Camden, NJ	
Philadelphia, PA	
Wilmington, NC	
Savannah, GA	

Because of the lack of response from some ports and the lack or suitable facilities in others (e.g., Fall River), as well as the potential operating range of the Incat Evolution 112, we also included an additional port: Gloucester, MA. More detailed profiles appear in Appendix 4.

Gloucester, MA

Gloucester is an intriguing possibility for a short sea service from Halifax. It is located 15 miles from downtown Boston, but a few hours closer steaming from Halifax than Boston. It is also located at the eastern end of Route 128 and in close proximity to most of New England. Gloucester is also the location of one of the biggest seafood markets in New England, the others being located in Portland, ME, and south Boston.

Facilities have been improved in recent years, but the port caters mainly to fishing vessels. It has aspirations to accommodate small cruise vessels. In the past, the port and its main stevedoring and shipping agency have expressed a great deal of interest

in short sea or feeder services to Canada, but efforts to discuss its potential for this study were not responded to with enthusiasm.

One problematic issue in the past was unionization of the labour force and the potential reaction of Boston's ILA if "their" cargo was handled at Gloucester. Boston currently has international feeder services from both Halifax and New York. The Halifax service also carries cargo northbound to Halifax for China Ocean Shipping Company (COSCO), which calls Boston on a direct call basis. This would not be an issue if the short sea service operating from Halifax were purely a domestic short sea service with no overseas transhipment cargo.

Fall River, MA

Fall River is located on Naragansett Bay, 21 nm from Providence and 490 nm from Halifax. Port officials there have long desired to have a feeder operate to Canada and have more recently been promoting it for US domestic short sea shipping. The port has direct, on-dock rail connections with three rail spurs. It is also close to Route 24 and I-95.

In terms of a short sea service connecting to Halifax, there is a 20-mile deviation up Naragansett Bay and there are other ports nearby that offer better access to markets in New England. It might be problematic for the Incat vessel because of wake wash issues, although fast passenger ferries owned by New England Fast Ferries operate from New Bedford to Nantucket and Martha's Vineyard. We failed to make contact with the operators of the port in Fall River.

An alternative to Fall River might be New London, CT, located south of the entrance to Naragansett Bay, 504 nm from Halifax. It has a modern terminal, which was upgraded in the past 5-10 years and is operated by the Canadian stevedoring firm Logistec. The terminal is less than 3 miles from I-95, 125 miles north of New York City and 106 miles south of Boston. It is also connected to Montreal via Rail America's Connecticut Southern Railway, formerly Central Vermont Railway. New London presently handles general cargo, forest products and metals. The port is very interested in short sea services.

Bridgeport, CT

Bridgeport is located in southern Connecticut, on Long Island Sound, about 60 miles north of New York City. It has been the focus of the Port Authority of New York New Jersey's Port Inland Distribution Network (PIDN) strategy, which could see a tug and barge feeder operate from container terminals in Port Elizabeth, NJ, similar to a service that was inaugurated between Port Elizabeth and Albany. There is also at least one group examining the potential to operate domestic US short sea services from Bridgeport. For

this reason, and its close proximity to the New York region, it seems to make sense to examine it for a Halifax-based short sea operation. However, we did not succeed in discussing this potential with Bridgeport officials, despite many attempts to do so.

Camden, NJ

Camden, NJ, is located across the Delaware River from Philadelphia. The port has committed $135 million for a 24-36 month project to open a new terminal in Paulsboro.

> *From an operations standpoint, the marine terminal will consist of a modern wharf and fender system that ranges from a phase one development of approximately 1,500 linear feet to a potential full-build length of approximately 3,500 linear feet. As currently proposed, the full build-out of the 190 acre Port Paulsboro will comprise berths for six ships including roll-on and roll-off and lift-on and lift-off capabilities for more efficient cargo handling and at least one container crane. The port will seek permitting for all six berths but will only initially build two berths and then add the additional berths as business grows.*[25]

It was selected as a candidate port because it was anticipated that costs would be lower there than at Philadelphia.

Philadelphia, PA

The port of Philadelphia is located 743 nm from Halifax. In 2004, it handled 178,000 TEUs of containers, up from 148,000 the year before. The port specializes in southern hemispheric trades (South America and Australia/New Zealand) and shipments of meat and produce. It is located in a highly populated region with good access to highways and other regional markets such as Baltimore and Washington.

The downside of Philadelphia is its high port costs and the long traverse up the Delaware River. Port officials are ambivalent about a feeder service because they want to attract mainline business, but are more interested in a short sea service. There is some interest in a feeder service to Philadelphia on the part of at least one of Halifax's mainline carriers, which indicated it could ship 800 FEUs per annum via Halifax.

Wilmington, NC

Wilmington is located 1,007 nm south of Halifax and 529 nm beyond Philadelphia. It is a fast-growing port with seven major shipping lines serving it. These lines include a Zim/Lloyd Triestino service from Northern China and Gearbulk, a breakbulk specialist.

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25 http://www.southjerseyport.com

In 2004, it handled 104,122 TEUs, up from 96,453 the year previous. The state of North Carolina recently announced it is seeking investors to build a major new container terminal complex in Southport, NC, that will be capable of handling 2 million TEUs a year. The port of Wilmington presently has a USD130 million terminal expansion underway, which will double the port's existing capacity to 530,000 TEUs. The investment includes the acquisition of four new post-Panamax container gantry cranes.

Wilmington boasts easy vehicular access with US 17, 74, 76 and 421 and Interstates 95 and 40 close by. Inland rail service is provided by both CSX Intermodal and Norfolk Southern, with CSX offering twice-daily service. There is a connecting rail line, owned and operated by Wilmington Terminal Railroad, which interchanges cars between the port and the CSX system. There is sufficient equipment for handling all rail traffic, including double-stack trains, and the port is located in a Free Trade Zone.

Savannah, GA

Savannah is located 1,156 nm from Halifax and 223 nm beyond Wilmington. In 2004, Savannah handled 1.6 million TEUs, up from 1.5 million the year before. It has been able to attract a substantial number of all-water services from the Far East because over 15 major distribution centres are located in Savannah. These companies are listed in Table 4.16.

TABLE 4.16: SAVANNAH DISTRIBUTION CENTRES

Company	Size of Facility (sq ft)
Home Depot	2,000,000
Wal-Mart	1,300,000
Dollar Tree	800,000
Pier 1	800,000
Lowe's	750,000
Best Buy	700,000
Fred's	600,000
Michael's	400,000
Bombay Company	250,000
California Cottage	191,216
Hugo Boss	165,000

Source: MariNova Consulting Ltd., "Greater Halifax Distribution Study," 2004; *Georgia AnchorAge*, Georgia Port Authority, various issues.

The philosophy of the Port of Savannah is that if carriers wish to handle a given retailer's cargo, then it must incorporate a Savannah port call. Target Stores recently

announced it would build a 2 million sq ft distribution centre in Savannah and expected it would result in 60,000 TEUs of cargo for the port. In late 2005, IKEA announced it would build a 1.3 million sq ft facility that would handle at least 15,000 TEUs per annum. A short sea service from Halifax could conceivably deliver cargo destined to these distribution facilities. Garden City Terminal is within 6.3 miles (10 km) of Interstate 16 (East/West) and 5.6 miles (9 km) of Interstate 95 (North/South) with access to more than 100 trucking companies. CSX Transportation and Norfolk Southern Railroad provide Class I rail service. The port is interested in developing short sea links.

Hamilton, Bermuda

Hamilton, Bermuda, is the only cargo port in Bermuda, although there is a former naval base in St. George's that was mooted for a port development about 10 years ago. Hamilton is located 757 nm from Halifax.

Bermuda is served by three shipping lines: Bermuda Container Line (BCL), which operates a 360 TEU vessel from Port Elizabeth, NJ, directly to Hamilton. Bermuda International Shipping Line operates from Salem, NJ, to Hamilton. Somers Isle Shipping Line is affiliated with BCL and operates from Fernandina Beach, Florida. BCL is represented in Canada by Montship, but its cargo moves from Atlantic Canada on a transhipment basis by Atlantic Container Line. BISL is represented in Canada by Seabridge International and its cargo moves from Atlantic Canada by rail to Montreal and then by truck to Salem.

If there were sufficient volume of cargo, it could be shipped directly from Halifax without taking the "scenic" route. A service could also potentially carry transhipment cargo loaded at Halifax at a cheaper cost than New York. A Bermuda port call might work in conjunction with one of the other ports that are being studied.

Freeport, Bahamas

In 1995, Freeport handled 39,466 TEUs. Since then, the port has been completely rebuilt and is now a major transhipment terminal operated by Hutchison Port Holdings, the world's largest container terminal operator. In 2004, it handled almost 1.2 million TEUs. It is used primarily by three major shipping lines—Maersk Line, Mediterranean Shipping Company and CMA—as a pivot point for their north-south and east-west services. Other customers include Tropical Shipping and Cagema, which both have extensive services throughout the Caribbean.

Its inclusion in this study was premised on the idea that a feeder or short sea service could operate from Halifax to Freeport and have access to the whole Caribbean basin as well as South and Central America. It has been determined, however, that none of the vessels studied would have the capability of providing a weekly service because

of the distance involved, which is 1,359 nm from Halifax and 884 nm from Bermuda. The new service, which Maersk Line will bring to Halifax in April 2006, may be able to link up with these services, depending on what other ports it calls along the US east coast. Likewise, Tropical Shipping calls directly at Saint John, New Brunswick, so a Halifax-based feeder would have to compete with it.

Summary

Based on this evaluation and the data uncovered in Chapter 2, it would appear that there is some potential to operate a short sea service between Halifax and the Philadelphia/Camden region. Philadelphia expressed the most interest in such a service; Camden was preoccupied with port expansion work. Another port in this region, Salem, NJ, also handles Bermuda International Shipping Line, with which there could be some synergies and so this port could be assessed by a potential operator.

While we were unsuccessful in discussing the project with port officials in Bridgeport, CT, this option should not be abandoned, particularly if that port is successful in attracting a New York–Bridgeport short sea service. A Wilmington service would also appear to have some potential, although it does not have the volume of Atlantic region cargo that a Philadelphia service could attract. There are significant port expansion plans underway in North Carolina and port officials that were contacted are very keen on short sea shipping. Likewise, Savannah expressed a great deal of interest, but cargo volumes do not appear to justify further investigation.

It would be possible to do a multi-port itinerary in a weekly cycle (e.g. Halifax–Gloucester–Bridgeport), but we believe that success would be limited given the restrictions of the US cabotage legislation. In Europe, most such short sea services operate on multi-port itineraries.

SUMMARY OF DOOR-DOOR COSTS

We obtained truck rates ranging from CAD2.00–CAD2.40 per mile for dry cargo, with a 25 percent fuel surcharge usually added to this. We therefore based our trucking costs on CAD2.25 per mile, and converted to USD at 0.85.

We were provided with local delivery rates in both the US and Canada, as shown in Table 4.17. These rates are for a return move, whether there is one or not. We also assumed that most cargo would move beyond the port area, and therefore estimated the direct trucking costs to and from Nova Scotia to destinations 50, 100 and 150 miles from each of the ports studied.

TABLE 4.17: LOCAL TRUCKING COSTS, NOVA SCOTIA AND US

Distance (miles)	Nova Scotia (USD)	US (USD)
50	$340	$450
100	$425	$550
150	$510	$650

Based on the trade flows, it is likely that trucks will move full southbound and empty northbound. Many (but not all) truckers triangulate between the Maritimes, US east coast, central Canada and back to the Maritimes. What is not yet clear is if all three legs are revenue legs. In at least one case, we were told that trailers move empty from the US to Montreal or Toronto, where they are filled with cargo to the Maritimes.

It is assumed that a would-be operator would need to provide door-door service, or the short sea service will be competing with trucking from door-door. Except for the Incat options, the door-door costs of shipping to all ports are remarkably similar. Based on local delivery at both ends of 50 miles, with trucking costs of USD340 in Canada and USD450 in the US and 60 percent vessel utilization, the spread between the lowest cost shipping options (not including the two Incat options) and trucking for a one-way move is illustrated in Table 4.18.

TABLE 4.18: DOOR-DOOR COSTS, 50 MILES FROM EACH PORT

Port	High	Low	Low cost % difference vs truck	Truck USD (one way)
Gloucester		$1,432	-6%	$1,520
Bridgeport	$1,694	$1,353	-33%	$1,807
Camden	$2,082	$1,454	-31%	$1,912
Philadelphia	$2,102	$1,474	-28%	$1,912
Wilmington	$2,152	$1,393	-109%	$2,920
Savannah	$2,228	$1,487	-121%	$3,289

Note: Highest cost option is *Altinia* Ro-Ro vessel; lowest cost option except for Gloucester is *Stena Foreteller* Ro-Ro vessel. Gloucester is *Shamrock* charter option.

The short sea options are therefore very competitive within 50 miles of each port, especially the southern destinations. Note that Wilmington is less expensive than Philadelphia because of much cheaper stevedoring costs. A very tightly run service to each port could actually be slightly cheaper since a good operator will balance truck moves to and from the port with full loads each way.

At origin and destination 100 miles from each port, the situation is shown in Table 4.19.

TABLE 4.19: DOOR-DOOR COSTS, 100 MILES FROM EACH PORT

Port	High	Low	Low cost % difference vs truck	Truck USD (one way)
Gloucester		$1,583	-8%	$1,711
Bridgeport	$1,845	$1,504	-32%	$1,998
Camden	$2,233	$1,605	-19%	$1,912
Philadelphia	$2,253	$1,625	-18%	$1,912
Wilmington	$2,303	$1,543	-89%	$2,920
Savannah	$2,379	$1,638	-100%	$3,289

At origin 150 miles from each port, the spread is as shown in Table 4.20.

TABLE 4.20: DOOR-DOOR COSTS, 150 MILES FROM EACH PORT

Port	High	Low	Low cost % difference vs truck	Truck USD (one way)
Gloucester		$1,734	-9%	$1,902
Bridgeport	$1,996	$1,655	-32%	$2,189
Camden	$2,384	$1,756	-41%	$2,486
Philadelphia	$2,404	$1,776	-39%	$2,486
Wilmington	$2,454	$1,694	-106%	$3,494
Savannah	$2,530	$1,789	-116%	$3,863

By contrast, Incat rates (fast and slow), for 50 miles from port, are listed in Table 4.21.

TABLE 4.21: SLOW SPEED INCAT DOOR-DOOR COSTS, 50 MILES FROM EACH PORT

Port	Fast	Slow	% differential vs truck	Truck (one way)	Reefer trucks	Differential vs reefer truck
Gloucester	$3,479	$1,975	+13%	$1,711	$2,138	-8%
Bridgeport	$4,246	$2,311	+13%	$1,998	$2,497	-7%
Camden	$5,461	$2,854	+33%	$1,912	$2,390	+16%
Philadelphia	$5,457	$2,868	+33%	$1,912	$2,390	+17%
Wilmington	$7,222	$3,403	+14%	$2,920	$3,650	-7%
Savannah	$8,184	$3,614	+9%	$3,289	$4,111	-12%

Surprisingly, the Incat vessel, sailing in slow mode, is most competitive both closest to and the furthest away from Halifax. Refrigerated trucking costs about 25 percent more than dry vans, so this would lower the differential for seafood and other commodities. If carrying seafood, however, the impact of the US HMT would likely be quite severe because seafood is a relatively high-value commodity.

Atlantic Container Line offers short sea (or intercoastal) service to three ports on the US east coast: New York, Baltimore and Portsmouth, VA (Norfolk). It is able to do so because its vessels "double call" on its North Atlantic service. That is, they call Halifax first port inbound from Europe and last port outbound to Europe. They effectively have up to one-third of the vessel available for intercoastal or short sea moves. It has also offered interline service for carriers with Atlantic region cargo which did not have port calls at either Halifax or Saint John. Equipment availability has militated against greater development of the service. It has also carried cargo for some local shippers in Nova Scotia, but changes in its supply chain priorities moved the cargo from sea to rail and some trucking. ACL offers one-way "intercoastal" port-port rates as described in Table 4.22 (in USD).

TABLE 4.22: ATLANTIC CONTAINER LINE "INTERCOASTAL" RATES, PORT-PORT

Port	20' dry	40' dry	20' reefer	40' reefer
New York	$615	$765	$755	$915
Baltimore	$810	$960	$1,100	$1,250
Portsmouth, VA	$760	$910	$1,100	$1,250

TRANSIT TIME COMPARISONS

Using the MV *Stena Foreteller* we can draw the following comparison between a ship sailing at 20 knots versus a truck moving from Halifax to each port at 50 miles per hour. Table 4.23 illustrates that shipping is very competitive with trucking to all port destinations.

TABLE 4.23: COMPARISON OF DOOR-DOOR SHIPPING COSTS VS TRUCKING RATES

Port	Shipping (hrs)	Shipping with pick up & delivery 50 miles each end + discharge time (1)	Trucking (hrs)	Effective trucking time w. delays, rest etc. (2)
Gloucester	20	30	12.0	12.0
Bridgeport	31	41	17.0	32.5
Camden	42	52	20.0	34.0
Philadelphia	42	52	20.0	34.0
Wilmington	56	66	30.5	56.0
Savannah	65	75	35.0	61.5

Notes: (1) Assume 1.5 hours driving each end, 1 hour gate time at each terminal and 5 hours discharge time

(2) See below. However, according to the online transit time tool of Midland Transport, all shipments to the first four destinations would arrive on the fourth morning after departure i.e., depart Tuesday, arrive Friday morning.

Based on discharging 150 trailers at 20 per hour, they could be available to the local trucker within 7.5 hours. It would take one hour to process the vehicle through the gate and another 1.5 hours to drive to or from the shipper or consignee.

The Incat vessel at slow speed is even more competitive, as shown in Table 4.24.

TABLE 4.24: COMPARISON OF SLOW SPEED INCAT DOOR-DOOR VS TRUCKING RATES

Port	Shipping (hrs) (1)	Shipping with pick up & delivery	Trucking (hrs)	Effective trucking hours
Gloucester	15	23	14	29.5
Bridgeport	24	32	17	32.5
Camden	33	41	20	34
Philadelphia	32	40	20	34
Wilmington	44	54	30.5	56
Savannah	51	59	35	61.5

Note: (1) Assume discharge in 3 hours

As the analysis below illustrates, however, there are complications, including limitations on hours of work involved in truck moves, which must be factored into any discussion. In the US, truckers may drive a maximum of 11 hours after 10 consecutive hours off duty. Overall elapsed time for truck moves will be much longer in all cases than those illustrated above.

Philadelphia Example[26]

A student group at Dalhousie used the www.mapquest.com website to estimate the travel time from Halterm in Halifax to the Packer Avenue Terminal in Philadelphia to be approximately 18 hours and 20 minutes, without delays. This estimate almost certainly underestimates the transit time, as it does not consider likely events that will cause delays including traffic congestion and delays at the border.

A more advanced trip calculator program is required in order to refine the settings to account for maximum highway speed limits, customs and immigration/border crossing time delays, maximum drive time as well as mandatory idle and break time for the drivers. The study team attempted to take these considerations into account, as shown in Tables 4.25 and 4.26, which summarize a normal schedule for a trucking company operating between Halifax and Philadelphia.

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26 Charlton, A., S. Garinther, A. Payn & N. Horne (2005), *Short Sea Shipping: Halifax to Philadelphia*, presented to the International Business Student Research Symposium, Halifax, 11 February.

TABLE 4.25: HALIFAX–PHILADELPHIA TRIP CALCULATOR

Event	Time (in hours)
Load Time at Consignee	2
Normal Drive to Philadelphia	18.5
Time to clear Customs & Immigration.	1.5
Border Delays	2
Congestion	1
Total Transit Time	**25**

Source: Charlton et al. (2005, p. 10).

As previously noted, constraints are placed on the trucking company by government policy, limiting not only the amount of time a driver can spend on the road, but idle time as well (refuelling, border inspection etc.). These events are estimated and summarized below.

TABLE 4.26: DRIVING "EVENTS" HALIFAX–PHILADELPHIA

Event	Time (in hours)
Maximum Driving	10
Border delay	2
Mandatory Idle Time	3
Mandatory Break	10

Source: Charlton et al. (2005, p. 10).

When government regulation and trucking inefficiencies such as road congestion and border delays are considered, the transit time increases significantly, and thus decreases the effectiveness of transport by truck. For example, a one-way leg to Philadelphia was previously estimated to take roughly 18 hours with no delays; however, Table 4.27 shows the effect of the above noted events.

TABLE 4.27: REAL TIME TRIP CALCULATOR HALIFAX–PHILADELPHIA

Event	Time (in hours)
Load time at consignee	2
Hours driving no delays	10
Time to clear customs & immigration	1.5
Mandatory rest period	10
Resume driving no delays	8.5
Unload at destination	2
Total trip time	**34**

Source: Charlton et al. (2005, p. 11).

Congestion, particularly on the I-95, can significantly increase this transit time from the above overall estimate of approximately 34 hours.

Midland Transport's online transit time calculator (www.midlandtransport.com) was used to estimate the transit time from site predefined origination and destinations Halifax, NS (postal code B3H 1A1) to Philadelphia Naval Shipyard in Pennsylvania (zip code 19112). The results calculated an approximate four-day transit (pick up on Monday, with delivery on Thursday).

As an alternative, the study team estimated that the sea route would take approximately 49.5 hours, based on a cruising speed of 15 knots. A one-way transit time estimate is broken out in Table 4.28.

TABLE 4.28: REAL TIME ELAPSED TIME VIA VESSEL, HALIFAX–PHILADELPHIA

Event	Time (in hours)
Load cargo	10 to 12
Pilotage (Halifax)	2
At sea	49.5
Pilotage (up the Delaware River)	7
Unload	10 to 12
Total Transit Time	**78.5 to 82.5 (conservative estimate)**

Therefore, a complete circuit would be between 137 and 141 hours (the above estimate plus an additional at sea event and two additional pilotage events). The BP Distance Calculator was used to confirm the team's estimate. Using a more conservative speed of 13.5 knots, the transit time from Halifax to Philadelphia was calculated to be approximately 55 hours or 2 days and 7 hours.

The above calculations form the foundation for further discussion. Direct comparison of these two modes must be made on a unit level or per TEU as the *Shamrock*'s load/unload time, which was the vessel used in the Halifax–Philadelphia study, has a capacity for 350/430 TEUs vs only 1 or 2 TEU(s) in the trucking analysis. Furthermore, the shipping transit time analysis does not account for transit of a container from the point of origination to the port in Halifax or for the container to move from the Philadelphia port to the final destination.

Service Consideration

The input we received from the trucking sector suggested that short sea shipping would work for markets south of Philadelphia and for non-time-sensitive cargoes such as beer and peat moss. It may also be able to compete with rail movements into these markets. Ports within a 12-hour drive, such as Gloucester, are probably best served by road and Philadelphia/Camden are worthy of further study.

The service would have to be at least weekly, with a Friday departure from Halifax and Monday delivery in the US port. About 75 percent of Maritimes-based trucking to the US is triangulated back to the Maritimes via Ontario and Quebec and this could be problematic for the short sea operator. However, this could be mitigated by the rate structure. There should be a return rate based on full southbound and empty northbound, with a small premium charged for full trailers northbound. The rate should also be 15-30 percent below trucking costs and the savings passed on to both shipper and carrier. The shipper research will need to be replicated to determine more precisely which rate structure will work.

Overall, if the short sea service offers a time saving, and a cost saving for both the carrier and the customer, it will be well received.

CONCLUSIONS

Based on this discussion and the detailed analyses in Appendix 5, there are a number of conclusions that can be drawn from our analysis. Most short sea options studied are competitive with trucking, based on current costs plus fuel surcharges.

The best vessel option would appear to be a relatively new, time-chartered container ship, or a large Ro-Ro such as *Altinia*, which is capable of carrying highway trailers and is less complicated from a logistical standpoint. Most US studies have suggested that short sea services will migrate to smaller ports and that Ro-Ro is most suitable.

Remarkably, the slow-speed Incat option seems viable for a market relatively close to Halifax, such as Gloucester and transit time–wise, with Wilmington and

Savannah. It would appear to be well suited to seafood shippers. A similar service catering to seafood shippers, using a BGV C180 operating at speeds up to 60 kn is planned between Drammen, Norway, and Boulogne, France—a distance of 1,200 miles. However, most of the Nova Scotia seafood shippers are located in southwestern Nova Scotia and trucking to Halifax to put the trailer on a ship would take time and be quite costly. It would probably make more sense to look at a port closer to the source of cargo, such as Shelburne or Yarmouth.

In terms of cost, short sea shipping, including a truck move 50, 100 and 150 miles inland, is quite competitive with trucking. Transit times are slower than "effective" trucking times, but faster than the advertised times of at least one trucking firm.

Another intriguing aspect of our findings is the apparent competitiveness of services further south than New England, especially Philadelphia/Wilmington. However, if the larger shipping lines decided to chase the cargo that a short sea operator carried, as demonstrated by ACL's rates, they could jeopardize the existence of the service. Most of the deepsea carriers that call at Halifax also call at ports such as Norfolk, Charleston and Savannah, but have not seriously pursued short sea or intercoastal cargoes to date. There appears to be some potential to serve areas such as Bridgeport and Philadelphia/Camden, although the response we received from our port enquiries was not encouraging, except perhaps in the case of Philadelphia.

The response received from the truckers we attempted to interview was also very disappointing, although there is some interest in a service to southern destinations, particularly if it offers a cost saving and competitive transit times. We should not rush to conclude that they are completely uninterested. It is our conclusion that, given the documentation and insurance requirements noted in Chapter 3, it will be necessary for any short sea operator to have a trucking partner willing to retail the operation for it to succeed and that the trucking partner will have to develop a documentation and insurance package to suit the shippers, along with a competitive retail price.

CHAPTER 5

POLICY ISSUES

THE RATIONALE FOR CANADIAN GOVERNMENT INTEREST IN SHORT SEA SHIPPING

It is interesting to note that as recently as the 2003 release of *Straight Ahead,*[27] the previous government's "blueprint document" setting out its vision for the future of transportation in Canada, there is little profile given to short sea shipping as an integral part of Canada's transport policy. Indeed the only reference to short sea shipping is to be found buried deep in Chapter 4 – Infrastructure, where, on page 54 (in a section on "Strategic Investments") short sea shipping is offered as an example of where long lead times and collaborative approaches are considered necessary.

While short sea shipping is offered as an example of strategic collaboration, it was apparently not viewed as being of sufficient importance to merit a substantive recommendation. However, the strategic long-term context of this concept is significant, and will be discussed later.

A key subsequent development was Canada's 2003 conclusion of a *Memorandum of Cooperation* with the US, which was subsequently extended, in November of that year, to include Mexico.[28] While the scope of this agreement was quite modest, limiting itself to the sharing of information and experience, and a commitment to mutual support in the promotion of short sea shipping, nevertheless it signaled an enhanced interest in pursuing the potential of this comparatively new concept.

Currently, Transport Canada's website indicates that its objective in promoting short sea shipping opportunities is to

> *help alleviate congestion, strengthen intermodalism, improve utilization of waterway capacity, facilitate trade, and reduce greenhouse gas emissions.*

The website goes on to say,

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27 Transport Canada document TP 14504, *Straight Ahead – A Vision for Transportation in Canada,* released 25 February 2003.

28 Memorandum of Cooperation on sharing Short Sea Shipping Information and Experience between the Transportation Authorities of Canada Mexico and the United States of America, signed 6 November 2003.

> *The objectives of short sea shipping include increasing the efficiency of the overall transportation system. As international and internal trade volumes increase, and as the population expands, the challenges of meeting the transportation demands of the marketplace become more acute. It is believed the marine mode has the capability and flexibility to contribute to achieving this objective by accommodating future traffic growth, easing congestion and assisting in alleviating air pollution by moving additional freight and passengers by water.*

In this second extract there is again reference to a new, more strategic dimension, namely the idea that short sea shipping has the potential to make a contribution to future transportation development.

Transport Canada's hopes and expectations with regard to short sea shipping have continued to be consolidated, as set out in recent conference proceedings (for example that given by the DG Marine Policy in New York in October 2004).[29] From these various more recent pronouncements, six broad objectives may be identified for Canadian short sea shipping as follows (not in any particular order):

1. Strengthening intermodal linkages
2. Improving utilization of waterway capacity
3. Mitigating congestion
4. Reducing greenhouse gas emissions
5. Meeting future demands from economic expansion, increased trade, population growth and urbanization
6. Facilitating cross-border trade

With regard to the first two of these six objectives, it is important to note that strengthening of intermodal linkages and utilization of waterway capacity are more means to an end than ends in themselves. Indeed, the success of short sea shipping clearly depends on the achievement of these goals rather than the other way round.

Furthermore, it needs to be appreciated that, in the context of the East Coast of North America, each objective takes on particular regional characteristics that differentiates it from equivalent objectives in other marine transportation sectors in Canada, most notably the Great Lakes St. Lawrence System.

For example, "utilization of waterway capacity" on the East Coast has a different meaning than, for example, that in relation to the Great Lakes St. Lawrence Seaway system, where there is not only significant investment in waterway infrastructure but

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29 MARAD Third Annual Short Sea Shipping Conference, New York, 13-15 October 2004.

also, ultimately, limitations on capacity, at least along the Seaway, although those limits are in no way threatened at present. The East Coast waterway offers near limitless capacity, which is readily available to be utilized. However, such utilization will only occur where there is a reasonable degree of coincidence between the configuration of the marine leg and the origins and destinations of the cargo (or passengers) that might potentially move by ship. It is, of course, an important objective of this project to examine whether this coincidence exists, at least with respect to cargo.

With regard to congestion, the principal focus of difficulty on the East Coast is south of the border on the I-95. Thus, from a narrow East Coast perspective, which may differ from other north/south traffic flows elsewhere in Canada, the principal objective in offering an alternative service is less to **relieve** congestion (which is ultimately for the US to resolve) and more to provide Canadian shippers with options to **avoid** the congestion on US highways. This clearly hinges on demonstrating to potential users that the short sea shipping option offers commercial advantages over the land-based option, either directly or through some form of government support designed to achieve certain social objectives.

Again with regard to reducing greenhouse gas emissions, while the benefits offered by the marine mode are, of course, worth pursuing at any time, they are particularly to be sought in situations where serious congestion is occurring. In this respect it may be argued that the focus of concern with regard to greenhouse gas emissions, at least on the East Coast, is again principally south of the border where the major congestion problems are occurring (particularly in the New York, New Jersey area). In any event, until or unless the Canadian government is prepared to introduce real, tangible incentives to encourage reductions in greenhouse gases, there is little from an environmental perspective that is likely to persuade shippers to switch to the marine mode, beyond the modest motivation to be viewed as good corporate citizens.

The next goal, that of meeting future demands from economic expansion, increased trade, population growth and urbanization, is unquestionably a laudable government objective, but not one that shippers have the luxury of supporting unless introduction of a short sea shipping service provides immediate cost savings, efficiency gains or reliability advantages. Thus there is a timing dichotomy between the government's future aspirations, and the present-day commercial needs of the users and providers of transportation services. In light of this dichotomy it would seem evident that some mechanism, namely some form of assistance measure, will be required to stimulate a shift in interest to the marine mode. It is worthy of note that this is the policy approach that has been adopted in Europe through its Marco Polo programs (see below). If such a stimulus is considered necessary in Europe, it seems probable that an equivalent program of support will be required in North America.

The final goal, namely that of facilitating cross-border trade, is therefore probably the key objective here. Clearly the achievement of this goal, in the absence of any substantive government stimulus, depends upon whether circumstances exist such that a short sea shipping alternative is able to facilitate cross-border trade by offering service attributes that make it more attractive than land route alternatives. It is a principal aim of this study to examine whether this is the case.

POTENTIAL DRAWBACKS

Having explored the Canadian government's rationale for supporting short sea shipping initiatives, it is now perhaps useful to examine whether there are any substantive drawbacks for Canada in relation to any initiative to stimulate increased short sea shipping activity. Such drawbacks would obviously detract from the policy appeal of this initiative.

First, it needs to be recognized that the marine leg offers very little in the way of opportunities for Canadian flag ship operators, since there are few East Coast prospects for Canadian cabotage movements, beyond those that are already occurring. Opportunities are limited to cabotage movements because, without the protection afforded by the *Coasting Trade Act*, *1992 c.31* there are no other East Coast marine transportation routes where Canadian flag shipping could reasonably hope to compete with any expectation of success. Recognizing that the prospects for short sea shipping on this coast almost certainly hinge on the commercial viability of the international movements, Canadian flag participation in any expanded short sea shipping activity is most unlikely.

It may therefore be reasonably assumed that all international short sea shipping movements would be carried by foreign (possibly including US, see below) flag shipping, not only because de facto Canadian shipping policy renders Canadian flag shipping uncompetitive on the international legs, but also because the freight rates necessary to attract cargo away from land routes would almost certainly not be achievable under the higher costs needed to meet Canadian registration and crewing requirements.

There is, of course, the potential for some form of Canadian-owned, foreign flag vessel, operated as an international shipping company (ISC) as provided for in the *Income Tax Act*. Such a vessel would be manned by a foreign crew, thus reducing costs, but also employment opportunities for Canadians. The concept requires that the company be incorporated abroad with only its "mind and management" located in Canada, and as such it would not pay Canadian corporate income tax. It could, however, provide modest employment opportunities for a limited number of shore-based Canadians. An important impediment is that, having gained access to international traffic, it is then excluded from domestic traffic!

We thus have a situation where, under current national shipping policy regime, the commercial benefits flowing from the provision of short sea service, beyond those accruing to the shippers and ports, would only likely be of modest benefit to Canada. At the same time, the shift of cargo off the land routes would presumably negatively impact land-based Canadian transportation service providers, be they truckers or rail services. Thus, unless there is some change in Canadian shipping policy, a successful transition to a short sea shipping service, for a given level of cargo transportation demand, is likely to result in a net loss of business to Canadian transportation service providers.

Of course, with the current shortage of truck drivers, the trucking industry could well be interested in collaborating on a multimodal transportation initiative where it would withdraw from the provision of the entire trip, and focus instead on providing land transportation services at one or other end of the marine leg. While it would appear that there is some interest among trucking companies in offering a comprehensive short sea shipping service, the benefits of increased transport choice would likely accrue principally to the shipper through improved market opportunity and access, plus the potential downward pressure that increased competition might have on rates. Thus the motivation among truckers for increased involvement in short sea shipping would appear quite modest.

Another dimension of this debate merits mention. Under the present regulatory regimes governing cabotage in Canada and the US, American flag vessels have a distinct advantage over their Canadian counterparts, since they are not only able to carry all US origin/destination East Coast domestic traffic under the protection of the *Merchant Shipping Act of 1920* (the Jones Act), but at the same time have the option to add a single international leg to, say, Halifax, if, as and when circumstances make it attractive. It could well be that the benefits of reserved access to US domestic cargoes could make it possible for US flag vessels to compete with foreign flag vessels whose access to cargoes is much reduced. Thus the pattern of cargo movements, with a single Canadian port at the end of the route, lends itself much more to the provision of a coastal service provided by US flag vessels than by Canadian flag vessels. That said, a recent study by the I-95 Corridor Coalition[30] reports that many of those consulted in the US on the potential expanded use of short sea shipping operations in the region cited the Jones Act as a key obstacle.

To summarize this section, there is clearly a need for greater specificity in defining the government's objectives in relation to East Coast short sea shipping. What

30 I-95 Corridor Coalition Study *Short-Sea and Coastal Shipping Options Study,* prepared by Cambridge Systematics, Inc., November 2005, p. 3-7.

exactly is the aim? What are the desired outcomes? How much is it worth to achieve these outcomes?

In particular, recognizing that the necessary stimulus for short sea shipping might well only be provided through government intervention in the form of assistance measures or policy adjustment, it is particularly important that the benefits to Canada of pursuing short sea shipping success on the East Coast be clearly and specifically articulated.

WHAT ARE THE CHALLENGES? HOW SHOULD THEY BE ADDRESSED?

Having examined the rationale behind Canadian interest in short sea shipping, it is now appropriate to consider the various challenges that need to be addressed in order to make this service a success. These challenges will be considered under the following broad headings:

- Challenges arising in relation to differentials in modal treatment
- Image and promotion challenges
- Technological challenges
- Port and infrastructure efficiency challenges
- Regulatory and administrative challenges
- Customs challenges
- Challenges related to the availability of information, data, statistics, etc.
- Challenges related to risk, insurance and liability

Challenges Arising in Relation to Differentials in Modal Treatment

Clearly, for potential users of short sea shipping services, the choice to activate such use depends very largely on the appeal of the service in relation to alternative choices. This is, of course, as it should be so long as the relative appeal of alternative choices, for users of the service, truly reflects the preferences and values of the public at large. In other words, when a shipper of goods down (or up) the East Coast of North America is faced with deciding whether to use a land-mode route or a short sea shipping alternative, the respective considerations of price, and its trade offs with respect to frequency, reliability, time to market, risk, etc. must be such that the choice made coincides with the best interests of the Canadian (and other North American) public.

As set out above, there are considerations that make it appealing from a policy perspective for at least some of the potential East Coast cargo to move via an intermodal route involving a marine leg. The objective should therefore clearly be to construct a

commercial environment where the natural choice for certain shippers is to use a short sea shipping option. At issue is how this can be made to happen.

There are two principal dimensions to this objective. The first dimension relates to ensuring that the short sea shipping option is not rendered less attractive by costs and/or other service-related circumstances that are not equally applied to other modes. Obviously, such a situation would unfairly render the choice to use short sea shipping less attractive. Such possibilities might include non-uniformity of charges and fees as between modes (some of these are discussed later), infrastructure-related subsidies to land-mode operators (e.g., through the provision of "way" facilities [i.e., roads and railways] the cost of which is not fully recovered from users of that infrastructure).

Inconsistencies in the application of rules and procedures (particularly in relation to customs – see below) are another consideration. Differentials in the timeliness or availability of services or differences in cargo inspection procedures (that delay loading or unloading of cargo or passengers) can obviously negatively impact the choice of short sea shipping.

Environmental costing is another important dimension. While there is both a desire to reduce greenhouse gases and recognition that the marine mode generates less pollution in this respect, little progress has been made in tensioning the choice of shippers to use the most environmentally friendly mode, through the use of environmentally leveraged charging for services.

Finally, recognizing that coastal competition constitutes only a small percentage of the business of land-mode operators, there is a risk of non-compensatory pricing on those routes that compete with short sea shipping so as to discourage diversion. If such pricing were to result in the non-optimal choice of transportation modes, then it would clearly not be in the public interest.

The second of the two dimensions mentioned above extends beyond the removal of features that disadvantage short sea shipping in relation to other modal choices to that of providing active encouragement to shippers to shift to a transportation mode that, at least in the context of future transportation objectives, is seen as more attractive from a public interest perspective, in other words to provide some form of direct support or subsidy, albeit perhaps on an interim basis, in order to actually stimulate a shift to a new and as yet unproven transportation alternative.

More specifically, it was recognized earlier that perhaps the most persuasive attribute offered by short sea shipping is the contribution that it can make to the pattern of transportation in the future. On the other hand, it was stressed that shippers are obliged to make decisions based on conditions prevailing in the present. The policy challenge for government, therefore, is to bridge the gap between present circumstances and future aspirations.

This has, of course, been the rationale behind the important initiative of the European Union, namely the Marco Polo program, which involved an injection of some EUR100 million, and its successor Marco Polo II, which boosted this amount to EUR740 million. These programs have recognized that:

> *Intermodal transport is a complex transport option, involving various actors with various business models, in a fragmented and small-scale environment, often separated by modal cultures and along national lines. The Commission recognizes that it is in the first place the task of market operators to improve intermodal transport within markets, whose access is free and where the rules of free competition and supply and demand prevail. However, in order to unleash the potential of intermodal transport, the willingness to take risks inherent in switching from road to alternative modes needs to be stimulated.*[31]

The European perspective on this issue is clear. You cannot persuade market operators to switch from a familiar and proven choice of mode to an unfamiliar and more complex (therefore inherently more risky) alternative without some form of substantive encouragement.

This consideration is also recognized in the recent I-95 Corridor Coalition Study,[32] where a central message from potential users was that "incentives such as tax breaks, breaks on handling fees, and others will be necessary for shippers to begin to use short-sea shipping operations." Canada faces exactly the same challenge, and can of course solve it by adopting a similar approach should it choose to do so.

As with the Marco Polo program, such time-limited support would need to apply to all the intermodal segments of the short sea shipping option. It would (like Marco Polo I) need to set out clear, quantifiable and verifiable modal shift objectives and give clear policy direction to industry as to what was expected of it in such broad areas as modal shift, catalyst actions, common learning actions, etc. It would also (like Marco Polo II) need to promote the concept of viewing coastal waterways as "Motorways of the Sea" (not unlike the Seaway's Highway H2O initiative) and support that concept through the provision of development aid for infrastructure, facilities and logistic management systems. It would also need to encourage traffic congestion avoidance measures, to be achieved through diversion to the multimodal option rather than contraction in transportation demand through reductions in production or employment.

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31 EU Commission proposal COM (2004) 478 final. Brussels 14.7.2004, p. 3

32 Corridor Coalition Study, *Short-Sea and Coastal Shipping Options Study,* prepared by Cambridge Systematics, Inc., November 2005, p. 3-10.

Image and Promotion Challenges

Experience in Europe has served to confirm that while the concept of short sea shipping is intended to make life easier for shippers, many do not perceive it as offering an efficient and cost effective way of moving cargo, and instead tend to view it as old-fashioned, slow and complex. In particular, in Europe, there is reported to be a quite widespread view that short sea shipping performs poorly when it comes to transit times, flexibility and frequency.[33] There is perceived to be a concern that, unlike trucking, the service is not truly door-to-door. While this view may also prevail to a degree in Canada, it is perhaps worth noting that the shipper survey reported in Chapter 3 did not identify quite the same intensity of concern, at least not among the largest of shippers.

Similarly (again as confirmed in this study's survey of shippers in Chapter 3) environmental benefits are not well understood, or seen as offering much appeal to shippers in persuading them to shift to intermodal alternatives, unless those benefits are translated into tangible gains in cost reduction or efficiency. While Chapter 3 confirms that congestion is viewed as serious by some shippers, the level of collective concern has not yet reached a level sufficient to stimulate a serious interest in an intermodal option.

Clearly, if there is to be a meaningful shift to short sea shipping, efforts must be made to adjust any negative image and perception. Ways have to be found to improve the performance of the various service parameters, and in particular to offer an integrated service. All the various players in the intermodal mix have to be involved in an active search for solutions. As well as government, these players include shipowners, transport and logistics companies, ports, shippers, forwarders and transport agencies.

In Europe efforts have been made to set up Short Sea Promotion Centres as one-stop administrative "shops" providing advice and encouragement to potential users. They are now established in at least 15 countries with steps being taken to expand into others. More specifically, the role of these centres is to provide information about the features and advantages of short sea shipping so as to combat the current negative image. For consideration is whether something similar could be established within NAFTA, although there is little sign that the level of international collaboration required to pursue such an initiative could presently be mobilized.

Consultation with existing shippers on this route, as set out in Chapter 3 indicates that transit time and frequency of service are key factors in any decision to switch to short sea shipping. In Europe, these parameters are also perceived to be particularly sensitive issues for would-be users of short sea shipping. More particularly, the prevailing view appears to be that (unless congestion becomes a serious and continuing

33 Fiches on *Image of Short Sea Shipping.* Submitted by DG TREN (1999, updated 2005).

cause of delay) trucks can be tailored to deliver cargoes with relative precision. It is not surprising that comparatively slow ship speed (see the next section addressing technology considerations), coupled with port handling times and road delivery requirements at either end of the marine leg, generates considerable concern among would-be users regarding transit time and frequency.

Recognizing that the route under examination in this study is primarily international in nature, there also has to be much clearer evidence of collaboration between international partners if interested parties are to be persuaded that participating governments are serious about striving for maximum efficiency and minimum cost. Agreement in a Memorandum of Cooperation to exchange information is just not going to provide the necessary degree of persuasion! This degree will only be achieved through much more substantive collaborative efforts, extending to active programs of cooperation on the full range of technical, operational and commercial aspects. Unless the collective political will, and commitment is there, and is seen to be there both north and south of the border, this initiative just "ain't gonna fly"!

Technological Challenges

It is important to recognize, and accommodate in any analysis, a number of technological realities associated with short sea shipping. The very nature of the marine transportation mode, usually involving the movement of comparatively large quantities of comparatively low value cargo at relatively slow speeds (until or unless commercially competitive high speed—i.e., 25-30 knot—vessels can be developed) presents challenges in any initiative where the aim is to make the marine mode attractive for the movement of comparatively small quantities of comparatively high value cargo, the dominant, although not exclusive, characteristic of cargo moving by truck.

First, it is worth reiterating the point made in Chapter 3 that short sea shipping is not (despite its name!) normally attractive from a cost perspective over short distances, where land-mode alternatives exist, since the ratio of terminal costs to total costs tend to be too high, to the point where intermodal options are rendered non-competitive.

Second, and particularly in the context of this study, any possibility of commercial viability almost certainly hinges on a service that combines feeder operations with door-to-door (domestic or cross-border) service, so as to achieve a sufficient volume to allow sailings at a regularity sufficient to meet the expectations of shippers of higher value, more time-sensitive cargoes. However, feeder service obligations are likely to tie any such short sea operation to the schedules of deepsea carriers. It may, therefore, only be quite providential that such departure times, or indeed frequencies (as confirmed in Chapter 3), meet the needs of door-door shippers.

Third, the complex and demanding nature of the logistics exercise almost certainly requires a quite sophisticated ship with efficient cargo handling facilities. However, the challenges of entry into competition with established land-mode operators, coupled with uncertainties in relation to other partners in the intermodal endeavour, would almost certainly inhibit investment on this scale. This problem is compounded by the dynamic nature of the endeavour in the start-up phase where, should the service prove successful, the size of ship that might be used at the outset would likely need to be replaced by a larger ship, with all the technological and capital investment complexities that such a situation would create.

It also needs to be borne in mind that each short sea shipping opportunity is comparatively unique in terms of the geography of the service, and the nature and economics of the cargoes to be transported. This uniqueness gives rise to the need for a vessel whose characteristics are specifically tailored to the characteristics of the service under consideration. This, in turn, introduces difficulties in acquiring a vessel that is ideally suited to the service for which it is to be used, particularly in the current market where smaller feeder vessels are in short supply. Thus, as is evident from the analysis in Chapter 4, the acquisition of a used vessel, which is ideally suited to any specific short sea shipping application, is likely to be problematic.

Clearly, if it is to stimulate maximum shipper demand, an efficient short sea ship needs to have the flexibility to accommodate a variety of shapes and sizes of cargo loading units, be they containers of various sizes and construction, or other forms of cargo stowage. In this respect, intermodal options that depend for their commercial success upon attracting comparatively large quantities of cargo must deal with the additional complexity associated with the present variations in containment sizes and structural qualities. While this problem is not as significant in North America as it is in Europe, the variations in cargo containment constitute an important cargo handling challenge for short sea shipping. Again as discussed in Chapter 4, while feeder services almost certainly need Lo-Lo cargo handling capabilities, it may well be that the most efficient method of cargo handling for domestic and cross-border traffic is through the use of Ro-Ro technology.

In light of all of the above, there is a compelling need for a focused program of research and development in order to address some of these important technological challenges. More specifically there needs to be a particular focus on the intermodal interface, which is clearly dependent on innovative cargo handling concepts and technologies in order to integrate the marine mode into the logistic chain.

In conclusion, therefore, the quite sophisticated technological needs of the service also argue for advances in ship and cargo handling technology so as to ensure that vessels are ideally tailored to the needs of short sea shipping, and that the maximum

benefits are being realized from advances in logistic concepts and systems, including Intelligent Transportation Systems (ITS). Efforts are also needed to ensure that the service affords a high level of safety, efficient traffic management systems, competent and knowledgeable personnel and environmentally responsive operations.

Port and Infrastructure Efficiency Challenges

Short sea shipping normally involves at least two intermodal transfers. There is therefore a need for a better understanding as to how ports fit into the total logistics chain.

First, it is important to appreciate that port authorities, particularly those operating under the "landlord" model of governance, do not have total control over all activities taking place within the port. Again, terminal-operating efficiency is often beyond the terminal operators' direct control, for example in circumstances where customs or other regulatory procedures must be fulfilled. In this respect, achieving quick, efficient and seamless cargo transfers and turnaround times involves administrative complexity in that it relies on the effective interaction of a number of parties, not all of which may be fully motivated to support the commercial success of the short sea shipping venture.

Another problem identified in Europe and more recently in the US is lack of the necessary short sea shipping tailored infrastructure, namely that which responds efficiently to the special needs of a service made up of a combination of feeder operations and door-door transport requirements. Problems identified[34] include a risk of inflexibility in the services provided, restrictive labour practices and a lack of transparency in the construction of port charges resulting in disproportionally high rates. It has also been pointed out that this risk is sometimes exacerbated by the monopolistic circumstances often enjoyed by terminal operators. Both Europe and the US have recognized that these considerations can result in slow turnaround times, inefficient hinterland connections and a perception that ports are not "short sea shipping friendly." These issues need to be examined in Canada to ensure that they do not inhibit the success of any short sea shipping venture.

Challenges Related to Regulatory and Administrative Impediments

There are a number of significant regulatory impediments that affect the competitiveness of services. Detailed analysis of several of these is outside the ambit of this study, but should be mentioned for completeness.

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34 For example, the *Short-Sea and Coastal Shipping Operations Study,* I-95 Corridor Coalition, November 2005, p. 2-8.

Principal among these impediments is the issue of cabotage. This has been touched upon earlier in the context of an examination of the rationale for the government to pursue short sea shipping as an attractive transportation alternative. It is noteworthy that a key ingredient in Europe's success in advancing use of short sea shipping options has been the removal of cabotage restrictions for virtually all EU flag shipping. Thus European registered shipping can transport cargoes virtually without restriction anywhere within the Union. Until or unless substantive efforts are made by NAFTA members to provide for a similar cabotage-free environment in North America, the credibility of any pronounced commitment to, and promotion of, short sea shipping will be seriously undermined. It simply does not make sense for governments to pronounce their interest in facilitating cheaper, more efficient, more environmentally friendly coastal transportation within the free trade area, while resisting all efforts to open any debate on the cabotage issue.

Another imposition on an East Coast short sea shipping service is that of the US Harbor Maintenance Tax (HMT). While, as made clear in Chapter 3, the impact of this tax is not well understood by potential users of East Coast services, it was recognized as one more variable in the calculation of cost that would tend to discourage a switch to an intermodal service, unless the all-land service had deteriorated significantly because of congestion or had become more expensive.

This charge was introduced by the US government in 1986, as a "user fee" directed at recovering the government costs associated principally with dredging of some (but not all) East Coast ports. It was initially set at a comparatively painless payment level of 0.04 percent ad valorem tax on all exports, imports and domestic cargoes (where cargoes included certain passengers carried for hire, but excluding ferries). This was however tripled in 1990 to a level of 0.125 percent. In 1998, following a challenge that the HMT was in breach of the US Constitution, the US Supreme Court concluded that the HMT was not a user fee but constituted a tax, and was therefore unconstitutional if applied to exports. However, the tax was maintained on imports and domestic cargoes.

In certain respects, the tax may be viewed as working, at least theoretically, in Canada's favour since, by unloading US-bound cargo in Canadian ports and moving it overland, the tax is avoided, thus making Canadian ports attractive in relation to their US counterparts. Certainly this concern has been voiced by US ports opposed to the tax.[35]However, it serves to stimulate rather than discourage a shift to the use of land modes, and therefore works at variance with the thrust of the arguments for encouraging short sea shipping. Of course, to the degree that it imposes an additional cost on

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35 See American Association of Port Authorities website: http://www.aapa-ports.org/govrelations/hmt_repeal_paper.htm

Canadian goods moving to the US, which is not imposed on land routes, the marine route may be viewed as disadvantaged. In particular it could be argued that while the apparent intent is to impose a user fee for harbour maintenance, principally dredging, there are many US ports that do not require dredging. Furthermore, to the degree that a short sea service may make use of such ports (since such services tend to be shallower draft vessels in any case), it does not receive any service for the payment being made. This consideration is thus a further example of inequalities in modal treatment.

In addition, there is evidence that HMT funds have been used to pay down the US deficit. In this respect it may be argued that there is little relation between the charge and the services received, and raises doubts as to whether the tax is legitimate under NAFTA rules. Efforts therefore need to be made to persuade the US to remove this charge, at least for NAFTA members. In any event, it is understood that the matter is again under review by Congress for domestic shipments, and pressure could be brought to bear to broaden the extent of any relief gained.

Of course there are other "way" charges (e.g., pilotage) that contribute to the cost of the marine mode. This is not to argue for the discontinuance of pilotage or similar services, but rather to ensure that a ship only has imposed upon it essential regulations and requirements and is supported by efficient services provided at a cost that is fair and reasonable.

From an administrative perspective, a major impediment is the lack of NAFTA-wide documentary conformity and standardization. Clearly, the service would benefit from more harmonized documentary procedures (including, of course, the use of a single waybill, as confirmed in the research undertaken in Chapter 3). Europe is currently moving to adopt the IMO FAL forms, and NAFTA should give serious consideration to doing the same. Not only would uniform documentation be highly beneficial, but also the expanded use of electronic processing would further enhance that utility. Without progress in this matter, the service will continue to have difficulty in projecting a truly door-door image.

Customs Challenges

While customs might well be considered to be just another regulatory or administrative challenge, it is of sufficient import to justify a separate section.

A first issue is the non-uniformity of service standards that exist between land and sea customs procedures. It is, of course, true that the mix of feeder (extra-NAFTA origin/destination) and door-door North American (intra-NAFTA origin/destination) movements gives rise to cargoes that vary widely in the customs treatment they require. That said, ways need to be found to treat intra-NAFTA cargo movements by short sea shipping as no more than a virtual "bridge," in the same way as truck cargo may cross a

"bridge" in the movement of cargo between Canada and the US. Anything that constitutes more demanding or lower quality customs treatment in comparison with that applied to land alternatives disadvantages marine movements in relation to an all-land route. The European Union addresses this need by the provision of an "Authorized Regular Shipping Service," which dispenses with the requirement to prove the customs status of Community goods.[36]

Another impediment identified in Europe has been the existence of a number of constraints on the commencement of discharging cargo until all clearances have been received. This problem is exacerbated by the non-availability to marine movements of customs services on a 24/7 basis, while such services are available for most land-mode border crossings. Clearly this issue needs to be examined in Canada to ensure that short sea shipping services receive customs services at least equivalent to those provided to land modes.

Technology must be mobilized to support such customs operations along the lines of the European Union's new Computerized Transit System. Ways must be found to enable electronic reporting and processing.

A final consideration, which is linked to inequality of treatment between modes, relates to the payment of duty on the acquisition of foreign capital equipment. In this respect, the 25 percent duty paid by ship operators to import a ship is significantly in excess of that paid by operators in competing modes who choose to import capital equipment. Despite the simplicity and clarity of this consideration, and the fact that it obviously works at variance with the short sea shipping objectives discussed earlier, there is little sign of a willingness to rectify this anomaly any time soon. While this situation continues, the credibility of the government's commitment to the support of short sea shipping will remain open to question.

This brief summary of customs challenges does not do justice to this quite complicated field, and considerably more effort will need to be devoted to understanding current customs requirements and seeking ways to streamline customs administration and procedures.

Challenges Related to the Availability of Information

As indicated earlier, a central message emerging from this study is the inadequacy of meaningful statistics, data and information. The necessary statistical foundation for meaningful analysis of present and potential cargoes is just not available in the form required to confidently assess opportunities. It is apparent that the figures for cargo

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36 EU Document SEC (2002) 632, *Guide to Customs Procedures for Short Sea Shipping*, Brussels 29 May 2002.

movements are at the state or provincial level, as opposed to cities of origin or destination of the cargo. This handicaps the analysis of short sea shipping potential, since that potential varies with distance from the eastern seaboard. Similarly, it is difficult to obtain cost data for all the various elements that constitute the intermodal movement.

In order to ensure that the scope for diversion to an intermodal route is thoroughly and accurately examined, it is vitally important that both tonnage and value statistics be available, broken out on a major commercial centre, as opposed to state/provincial, basis, as well as other cargo characteristics such as containment arrangements or hazard potential. Thus, in order to gain insights into future modal choices, arrangements need to be put in place now for the reporting and consolidation of cargo and transportation data in a manner that renders it amenable to meaningful analysis of alternative routes. Only in this way will it be possible to assemble a sufficiently accurate appreciation of cargo patterns to allow for sound strategic policy-making.

Risk, Insurance and Liability Challenges

A final complex but important consideration is the issue of risk, insurance and liability. This is additionally important because the risk of loss or damage is enhanced by the inclusion of additional handling points. Most international conventions addressing liability have a strong modal orientation. For example, we see that the Hague/Hamburg Rules cover marine transportation, while the Warsaw Convention (1955) addresses air transportation. Other international conventions, with a signatory focus principally in Europe, govern road (International Carriage of Goods by Road (CMR Convention 1961), rail (the COTIF/CIM Convention) and inland waterways (the CMNI Convention). The absence of multi-modal liability regime again, potentially at least, presents difficulties for the short sea shipping concept in assuring would-be users that their liability concerns are fully accommodated.

In summary, there are a number of considerations that reside within the ambit of responsibility of governments to address and rectify. Recognizing the tenuous nature of the commercial viability of the service under study emerging from Chapter 4, and the challenges associated with persuading shippers, in sufficient numbers, to switch from an all-land route, it would be of the utmost importance that these considerations receive attention.

CHAPTER 6

CONCLUSIONS

INTRODUCTION

The aim of this study has been to advance the Federal Government's appreciation of the potential for short sea shipping activities on the East Coast of Canada and the US. We believe that we have done this and more. The issues are complex and the potential for a service is somewhat marginal. Much depends on further investigation of the demand, the ability of a carrier to induce switching, and the willingness of the Federal Government to address the regulatory and commercial impediments to the launching of a successful service.

We approached the mandate we had with doggedness. At first, the available statistics were insufficient to make good commercial decisions but we continued to ask questions, to tease out new information and to revise our thinking. This report is not a definitive one. It indicates areas where a potential operator needs to contemplate further due diligence. It also delves more deeply than originally anticipated into the challenge of finding a business opportunity with potential. In addition, it identifies those impediments within the purview of Government to repair. We hope it informs, stimulates further thought, and generates debate. It is but part of the journey, not the destination.

THE DEMAND FOR THE SERVICE

While the data analysis conducted in association with our examination of market demand appears to indicate a market opportunity in four clusters along the eastern seaboard, based on the existing traffic patterns, we concluded that the distance to Maine is too short to make short sea competitive against truck. Only three others were deemed to be relevant for further consideration: Massachusetts, the cluster of New York/New Jersey/Pennsylvania/ Maryland, and South Carolina. The last of these featured data discrepancies between the sources that indicated further investigation is required. We also concluded that the trade is unbalanced and, without the opportunity to engage in cabotage on the return leg, it is highly likely there will be poor capacity utilization northbound.

While the pattern of existing over-the-road traffic may not support a service, the pattern of distribution centre development along the corridor indicated the relative growth of this type of business in the I-95 corridor, and in particular the importance of Pennsylvania to the new logistics business. Should a short sea operator from Atlantic Canada wish to target transhipped feeder traffic into these distribution centres, we concluded that a port in Pennsylvania would be a suitable choice and help complement the existing demand.

Our conclusion, in the absence of adequate data, is that a potential short sea operator would do well to consider two further paths for due diligence work prior to developing the business case for its bankers. The first of these would be to examine the possibility of a feeder operation, partnering with one of the large container shipping operators currently servicing the global distribution centres in Pennsylvania. This additional business might support an otherwise unprofitable service. Second, one area we did not investigate is the potential for US northbound domestic short sea as this currently is unavailable to other than US flag operators. Access to the marine cabotage market over the longer term would provide incremental cargo for the backhaul leg. As neither US nor Canadian vessels will be cost competitive, the cargo imbalance would likely deter a new foreign flag short sea operator from entering the trade.

WHAT SHIPPERS WANT AND NEED

The shippers of Atlantic Canada fall into two very distinct groups: those for whom time to market is critical (e.g., seafood shippers) and those for whom a slower service (short sea or truck) is still acceptable. Surprisingly, short sea was not perceived to be less reliable, but a majority of shippers have a tight delivery window.

Documentation options other than a single door-door contract were not well received. This encouraged us, as part of the research, to identify the interest of trucking companies and potential short sea operators in a retailing of an integrated transport package over one that is not integrated. Likewise, the discovery that service every two weeks is unacceptable forced us to focus on evaluating weekly sailings, or twice weekly sailings in the case of a Gloucester port call. Scheduling requirements indicate that 25 percent of the shippers are unlikely to switch to short sea shipping unless trucking service deteriorates drastically; it is instructive to note that a majority of companies reported road congestion, with about one-half of those indicating it to be serious enough to encourage them to consider switching to short sea shipping. Customs clearance was perceived to be more difficult for shipping than for trucking and this perception may be more of a barrier than expected.

Pricing issues were of particular interest and we found that levels of discounting did not need to be as large as in Europe. While a 10 percent discount is insufficient to trigger switching behaviour to short sea, a 20 percent discount might. On the other hand, a 10 percent premium was not a deterrent to the choice of short sea shipping, but a 20 percent premium in either trucking or short sea would induce a re-evaluation of transport options. It appears that 20 percent attracts the attention of the shipper as would a faster, frequent service. We believe that incentive pricing for an equivalent (to trucking) short sea service could induce trial, and premium pricing for a better transit time service could also be effective in attracting customers.

The existence of HMT is clearly a factor militating against the use of short sea for some companies, and the opportunity to argue for its removal for NAFTA partners is a policy position that could be developed (see below).

TECHNICAL CONSIDERATIONS

As we observed in Chapter 4, most short sea options studied are competitive with trucking, based on current costs plus fuel surcharges.

The best vessel option would appear to be a relatively new, time chartered Ro-Ro vessel such as *Stena Foreteller*, which is capable of carrying highway trailers and is a less complicated from a logistical standpoint. Most US studies have suggested that short sea services will migrate to smaller ports and that Ro-Ro is most suitable. However, given the decline of piggyback in rail intermodal, any potential operator needs to consider that a similar evolution may occur in short sea shipping.

Remarkably, the slow-speed Incat option seems viable for a market relatively close to Halifax, such as Gloucester and, transit time–wise, with Wilmington and Savannah. It would appear to be well suited to seafood shippers. However, most of these shippers are located in southwestern Nova Scotia and trucking to Halifax to put the trailer on a ship would take time and be quite costly. It might make more sense to look at a port closer to the source of cargo, such as Shelburne or Yarmouth.

In terms of cost, short sea shipping, including a truck move 50, 100 and 150 miles inland is quite competitive with trucking. Transit times are slower than “effective” trucking times, but faster than the advertised times of at least one trucking firm.

Another intriguing aspect of our findings is the apparent competitiveness of services further south than New England, especially Philadelphia/Wilmington. There appears to be some potential to serve areas such as Bridgeport and Philadelphia/Camden.

The input we received from the trucking sector suggested that short sea shipping would work for markets Philadelphia and south, and for cargoes that are not time-sensitive, such as beer and peat moss. Philadelphia and Camden warrant further study. A

major issue to overcome is that approximately 75 percent of Maritimes-based trucking to the US is triangulated back to the Maritimes via Ontario and Quebec. This could be mitigated by a discounted rate structure, with the savings distributed so as to encourage modal switching. Maritime-based trucking companies would also need to either partner with a local US drayage firm or set up their own US operations, the former option being preferable for a host of reasons.

POLICY CONSIDERATIONS

With regard to conclusions flowing from the review of policy issues, we believe that five principal messages emerge from the analysis.

First, the East Coast reflects characteristics that differentiate it from other regions in Canada in relation to short sea shipping. There would therefore appear to be merit in examining in more detail the exact manner in which the six broad objectives identified by Transport Canada for short sea shipping (as set out in the previous chapter) apply to the East Coast of North America. More particularly, these objectives may need to be defined and articulated more specifically, in order to respond to the special character of the coast, and the associated actual and potential cargoes moving up or down it. Particular characteristics include the international nature of the majority of potential routes and the implications that this has for such aspects as ship registry, cabotage considerations, customs procedures etc. These features argue for a careful examination as to the exact nature of Canada's objectives, and how they might best be realized.

This examination has an important additional dimension, namely the relationship between the commercial realities of today, and the achievement of objectives that may only be relevant sometime in the future. For example, while there are certainly emerging issues with regard to congestion, at least south of the border, the scale of this problem may only be sufficient today to stimulate diversion of a limited amount of cargo, an amount likely below that needed to support the viability of a new short sea shipping service. On the other hand, if the solution is only initiated when congestion has become severe, it may well then be too late to introduce and develop an efficient short sea shipping service.

Thus there is a timing disconnect between the need to initiate diversion to short sea shipping (now) and the evolution of sufficiently problematic commercial circumstances to stimulate such diversion (later). Government needs to address this timing disconnect. More particularly, it needs to examine how it might implement a package of incentives that encourage shippers to divert now in order to achieve objectives that may only become important at a later date. This would argue in favour of

some program of support that parallels initiatives in Europe such as those embodied in Marco Polo and Marco Polo II.

However, this in turn presents difficulties, since such a support program would raise issues in relation to Canada's broader transportation policy that calls for equality of treatment between the modes. There is also difficulty in providing funding support to those entities such as Canada Port Authorities that come under the scope of the *Canada Marine Act*. Thus these constraints on the provision of support to achieve certain goals also need to be addressed.

With respect to environmental degradation, it is unrealistic for government to expect shippers to move to a more environmentally friendly, modally integrated transport choice if, in so doing, it results in additional costs and reduced competitiveness for them. Thus not only must the options (all-land or integrated short sea) be appropriately "tensioned" through full environmental pricing, but also a further stimulus may be required to overcome shipper misgivings regarding use of a conceptually complex and as yet unproven alternative. The shipper survey found that shippers are not well informed about the environmental issues, further supporting our conclusion that there is a role for government to educate industry on the environmental impacts of their freight mode choices. Again, some additional support may well be needed in line with that currently being provided in Europe.

A second broad message is that the government faces an important credibility challenge. It is fine to espouse the merits of short sea shipping as a means of relieving congestion and/or environmental degradation; however, the government is unlikely to appear convincing until it is clearly seen to be acting firmly and openly on the removal of major regulatory and other obstacles, at both the national and international level.

In Canada, such obstacles include the 25 percent duty on imported ships. Canada must also be seen to take up debate with the US to remove trade impediments within the NAFTA region in the same way that barriers to trade in transport services have been effectively reduced or removed in Europe. This debate must address such aspects as the application of Harbor Maintenance Tax to Canadian goods moving to the US by sea (while not applicable to goods moving by land) and, yes, even the issue of cabotage, which becomes more and more anachronistic over time. As noted in Technical Considerations, while multi-porting is possible to do in a weekly service in New England, cabotage rules prevent optimal asset utilization, thus raising the cost of offering such a service.

A third message is that government needs to bring some real "teeth" to its promotion activities. The era of conferences and workshops to inform and educate is just about over, and their incremental utility is fast diminishing. If it makes sense to promote short sea shipping, then substantive promotion initiatives need to be taken, for example,

with the establishment of promotion centres that offer expert advice and assistance, again in line with similar successful initiatives in Europe.

A fourth message is the need to recognize that there are commercial impediments that need resolution if the competitiveness of short sea shipping is to be enhanced. Commercial impediments include insurance and liability complexities, the use of through transport documents in a marine move, the streamlining of customs procedures and cost-effective stevedoring services. The most crucial of these is a matter of political will, the removal of customs cost recovery charges on new services while retaining grandfathered exceptions on existing congested routes. This does not require legislation. A second impediment is more difficult to resolve. Efforts must be undertaken to convince the Department of Homeland Security to reduce the advance notification requirements on NAFTA-originating shipments to terms more suitable to their geographic proximity. This has happened for US-to-Canada shipments, but not in the other direction. Without this, marine-based transportation will never succeed in securing cargo from the road mode.

A final message is the need to recognize, and then act to rectify, the present serious shortcomings in the availability of meaningful data and information. Until or unless accurate data on cargo types, origins and destinations, etc. is readily available, would-be operators of short sea shipping services are going to be exposed to higher risk and uncertainty in planning a new operation, which in turn will lead to a diminished likelihood of taking on the introduction of such services. As was quite evident in our quest for useful transportation planning information, the trade data just did not meet the minimum acceptable. There is a solution to this as well. In the era of modern technology and data gathering for security purposes, such data is now collected. The development of the Automated Commercial Environment will go some distance towards resolving this problem, but by then the window of interest in short sea may have closed. Perhaps this is a new program of research that can be undertaken by the three governments under the umbrella of the *Memorandum of Cooperation*.