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Evaluation of International Dredging Financing Practices

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EVALUATION OF INTERNATIONAL DREDGING FINANCING PRACTICES

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Views, opinions, and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy, or decision unless so designated by other official documentation.

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Executive Summary

This study examined how dredging projects in foreign ports are typically funded and identified who is responsible for dredging operations, whenever possible. Data for this study was collected and gathered from questionnaires and secondary sources. The study examined the dredging financing policies in nineteen countries, including nations in Western, Central and Eastern Europe, Southeast Asia, Australia, and Latin America (see Table ES -1 for a complete listing). These countries were selected because of their significance in world trade, their port infrastructure policies, and availability of the data. Cumulatively, these nations represent approximately 50 percent of world seaborne metric tonnage.

Investigation of port and harbor fees and dredging financing around the world demonstrated the wide variety of approaches used in other countries. The use and structure of port and harbor fees are fundamentally dependent on each nation's own political structure and each country's perception of the importance and role of ports to their national economy. Although no dredging financing models were identified that track exactly with the approach currently used in the U.S., or identical to the proposed harbor service fee concept, many countries fund port dredging activities from their national or state budgets, financed either partially or wholly by port-assessed charges.

Key findings include:

- All ports collect some menu of user fees from vessel operators, which are often composites of wharfage, docking, pilot services, etc. These fees are usually referred to as “port charges”, “channel fees”, “harbor fees” or are sometimes integrated into “wharfage charges” or other fees. Collections from such fees are often used to finance operations, maintenance, and improvements to the port infrastructure, which almost always includes dredging. Table ES-1 provides a summary of the dredging financing mechanisms used in the countries surveyed.
- User fees are collected from the vessel operators for what is essentially viewed as the “marine-side” or “waterside” of port operations, that is, relating to vessels moving from international waters into port navigation channels leading to access for terminal quays. In most nations, responsibilities for berth or quayside dredging shifts to the terminal operator, as does virtually all landside and cargo handling operations. This division of responsibilities is consistent with the convention applied in U.S. ports.
- Fees are predominantly based on vessel size (NT or GT) and sometimes defined by vessel type. There are also examples of charges being based on operational factors, such as a charge on vessel draft (Argentina).

- Administration of the fee collection systems around the world vary considerably from nation to nation, with the models ranging from the collection agent being an agency or ministry of a federal government, a port authority, or a private sector concessionaire (Argentina).
- In most of the countries where user fees are collected and the port is not privatized, the fees are deposited into the national treasury for distribution. In most cases it is not clear whether such deposits are into a nation's "general treasury" or into an identifiable "trust fund" dedicated to port or dredging activities. Usually the fees are subsequently redistributed back to the ports in the form of "general revenues", based on government policy and the port's budgetary needs.
- In many cases the complex structure of port charges and the variety of budgetary practices preclude a direct linkage between the user fees collected and the financing of dredging activities. However, three specific cases (Argentina, Australia, and Canada's St Lawrence Seaway) were identified. Where a direct linkage could not be identified, there is generally a strong indirect link between the collection of port user fees and dredging costs incurred at a nation's ports for maintaining and improving waterside infrastructure.
- An examination of international terminal handling charges (THCs) did not reveal any apparent portion of these fees allocated to specific dredging activities.
- To the extent that a port project may require a capital expenditure that exceeds the available funds, then other sources of revenue (other tax revenue or loans) are used in some countries to meet the funding requirement (Latvia, Lithuania, Tunisia and Nicaragua). These sources of revenue are provided by multilateral institutions such as The World Bank, the Inter-American Development Bank, and the European Bank for Reconstruction and Development.

The table below (ES-1) represents a summation of the key findings of the study laid out by key categories for 19 countries. Wherever definitive information was available this has been so identified, but when there was either uncertainty or a lack of definitive information, it is reported as an "N/A". There were also some cases identified of multiple organizations responsible; this has been highlighted.

Table ES -1

Country	Dredging Responsibility	Collection of Fees ¹	Fee Basis	Distribution of Fee	Financial Mechanism
France	National Government	National Government	N/A	National Government	National Government
Germany	Port Authority	Port Authority	GT/ vessel type	State Government	State/National Government
United Kingdom	Port Owner (e.g. ABP)	Port Owner	GT	Port Owner	Port Owner/ National Government
Canada (St. Lawrence Seaway)	Canadian Coast Guard	National Government	GT	National Government	National Government
Latvia	Port Authority	Port Authority	N/A	Port Authority	EBRD, National Government
Lithuania	Port Authority	N/A	N/A	N/A	World Bank, EBRD, Japan, Netherlands, National Government
Russia	N/A	Ministry of Transport	Per cubic meter	Ministry of Transport	National Government
Australia	State/Private	Port Authority	GT	State/Port Authority	N/A
China	Regional Engineering Bureaus/Ministry of Communications	N/A	N/A	N/A	National Government
Japan	Ministry of Transport	Port Authority	GT	National Govt./Port:50/50	National Government
Hong Kong	Marine Bureau/National Government	Private Operators	N/A	N/A	N/A
Malaysia	National Government	Port Authority	LOA meter length	National Government	National Government
Singapore	National Government	National Government	N/A	National Government	National Government
Thailand	Ministry of Communications/Port Authority of Thailand	Port Authority of Thailand	NT	National Government	National Government
Argentina	Private	Port Authority	NT	Port Authority	Fees and subsidy split
Colombia	Ministry of Transport	Port Authority	N/A	Ministry of Transport	National Government
Mexico	Terminal Operators	Port Authority (APIs)	N/A	APIs & Central Ministry of Transport	N/A
Panama	Terminal Operators	Private Operators	GT	Private Operators	Fees
Lebanon	Port Authority	Port Authority	LOA	Port Authority	Port Budget
Tunisia	Port Authority	Port Authority	Per cubic meter	Port Authority	Port Authority, World Bank, Netherlands

¹¹ These fees may or may not include specific harbor maintenance components. Generally they include wharfage, pilotage, general access fees, among others.

Table of Contents

ACKNOWLEDGEMENTS	iii
EXECUTIVE SUMMARY	v
CHAPTER 1.....	1
1. INTRODUCTION	1
1.1 <i>Background</i>	1
1.2 <i>Purpose and Use of This Research</i>	2
1.3 <i>Organization of Report</i>	2
1.4 <i>Research Approach</i>	3
CHAPTER 2.....	5
2. OVERVIEW OF PORT INFRASTRUCTURE FINANCING	5
CHAPTER 3.....	7
3. CASE STUDIES OF INTERNATIONAL PORT HARBOR FEES AND CHARGES	7
3.1 <i>Approaches Currently in Use</i>	7
3.2 <i>Canada</i>	9
3.3 <i>Western Europe</i>	9
France	9
Germany	9
United Kingdom	11
3.4 <i>Eastern and Central Europe</i>	12
Latvia.....	12
Lithuania.....	13
Russia	13
3.5 <i>Asia/Australia</i>	13
Australia.....	14
China	14
Japan.....	14
Hong Kong	15
Malaysia.....	16
Singapore.....	16
Thailand.....	17
3.6 <i>Latin America</i>	17
Argentina.....	17
Colombia	21
Jamaica	21
Mexico.....	21
Panama	22
3.7 <i>Other Countries</i>	22
Lebanon	22
South Africa.....	23
Tunisia.....	23
3.8 <i>Comparison of International Terminal Handling Charges (THCs) for Container Operations</i> . 23	23
Port Dues	25
3.9 <i>International Waterways</i>	26
SUMMARY AND CONCLUSIONS	29
APPENDICES.....	31
5.1 <i>Appendix A - St. Lawrence Seaway Regulations</i>	31
5.2 <i>Appendix B - The Suez Canal</i>	41
5.3 <i>Appendix C - Panama Canal</i>	45
5.4 <i>Appendix D - Questionnaire</i>	53

CHAPTER 1

1. Introduction

- This report presents the results of research into harbor and deep draft navigation channel funding practices around the world.

1.1 Background

The March 31, 1998 decision by the United States Supreme Court on *U.S. Shoe v. The United States* found the Harbor Maintenance Tax (HMT) unconstitutional as applied to exports. Collection of the *ad valorem*¹ tax on exports was halted on April 25, 1998. The Court's decision also has international trade implications. The U.S. is currently engaged in consultations through the World Trade Organization (WTO) regarding a claim by the European Union that the HMT violates the *General Agreement on Tariffs and Trade* (GATT).

The purpose of the fee was to provide Operations and Maintenance (O&M) funding for the dredging of federal navigation channels constructed and maintained by the U.S. Army Corps of Engineers (USACE). To operate and maintain channels in Fiscal Year 1999, some \$500 million is being allocated by the USACE from the Harbor Maintenance Trust Fund, which is the depository for the receipts.

The Supreme Court ruling leaves the existing Harbor Maintenance Tax on domestic and import shipments and passengers in place for the time being. Additionally, the Court's ruling did not preclude a true harbor maintenance fee on exports. In fact, the Court appeared to invite Congress to revisit the maintenance fee funding mechanism within the framework of user charges that would fairly match the exporters' demand for harbor services and facilities.

Congress originally created the Harbor Maintenance Tax in 1986 in response to growing public demands for reduced direct federal subsidies for water resource projects. The *ad valorem* tax (assessed by value of the goods) was imposed and then increased in 1990. Conceptually, it was intended that the tax should not influence shippers or carrier's choices of one port versus another.

To meet the Supreme Court's requirements for constitutionality, any new fee or charging mechanism must be related to the value of service provided. The Court noted that the extent and manner of port use depends on factors such as the size and tonnage of a vessel, the length of time it spends in port, and the services it requires, for instance, harbor dredging (114F. 3d, at 1572).

1.2 Purpose and Use of This Research

The USACE commissioned this research into the deep draft navigation infrastructure practices of other World Trade Organization (WTO) countries with major seaports and a strong maritime industry. This report discusses the results of the research identifying and evaluating international port and harbor funding and revenue collection policies in other countries.

The following factors have been researched:

- The entities responsible for dredging
- Dredging funding mechanisms
- Legislative or constitutional constraints on funding mechanisms
- The entities responsible for levying fees
- The levels of port fees and charges levied
- The mechanisms for how port charges levied
- Who pays for port charges
- Determination of whether separate elements of charges collected, specifically fees for dredging navigation channels and berth access channels, can be identified.

The mechanism for how port charges *are* levied have been examined for operations and maintenance dredging as well as new project construction.

This report can serve as an introduction to policy makers in the United States on how dredging is funded and how navigation channels are maintained abroad. Because of the well established role of Congress and USACE in navigation and water resources policy making, discussions regarding U.S. dredging policy options have rarely considered the alternative practices and policies used overseas. The invalidation of the Harbor Maintenance Tax presents policy makers with an opportunity to develop an innovative navigation funding mechanism that is both legal and equitable to the users of the navigation system. This review of the funding policies of other governments confirms that the United States is not developing policy in a vacuum. An understanding of practices in other countries will also assist policy makers in addressing potential concerns of ship operators, importers and exporters, and their representatives, especially foreign ones.

1.3 Organization of Report

The report is organized as follows: An executive summary, the report itself and appendices. The main report has four sections. Following this introductory section one, section two contains an overview of world port infrastructure financing and mechanisms. Section three presents the international country case studies. The international country port fees and charges case studies are organized by world region as follows: Western Europe, Eastern and Central Europe, Asia/Australia, Latin America and other. For clarity, the situations at selected individual ports are presented in the context of the

country organization of the material. Section three also contains a comparison of international container port terminal handling charges. Finally, section four presents the summary and conclusions. Appendices A, B and C detail charges for the St. Lawrence Seaway, the Suez Canal, and the Panama Canal, respectively. Appendix D contains a copy of the port questionnaire used in the research for the study.

1.4 Research Approach

Research was conducted by means of fax questionnaires and telephone discussions with individual port authorities, local and national governments and associations in the relevant countries in this initial analysis. Since the number of recipients of any individual questionnaire were quite few, questionnaires did not require Office of Management and Budget (OMB) review. Where possible, local expertise was used to augment the contractor's research efforts from the U.S.

Three completed questionnaires were returned. A number of others were passed to different institutions. For example, in the Netherlands, the contact at ECT passed the document to the Rotterdam Port Authority. A number of other questionnaires have been promised, but at the time of writing have not yet been returned.

Numerous follow ups by fax and direct telephone contacts were made. It is felt that a direct meeting with the port authorities would have yielded better results. To achieve more comprehensive results, it is recommend that a series of direct face-to-face meetings, particularly in Northern Europe, be carried out.

Given the incomplete return of the questionnaires, the information search was extended to cover additional countries beyond that which was envisaged in the Scope of Work.

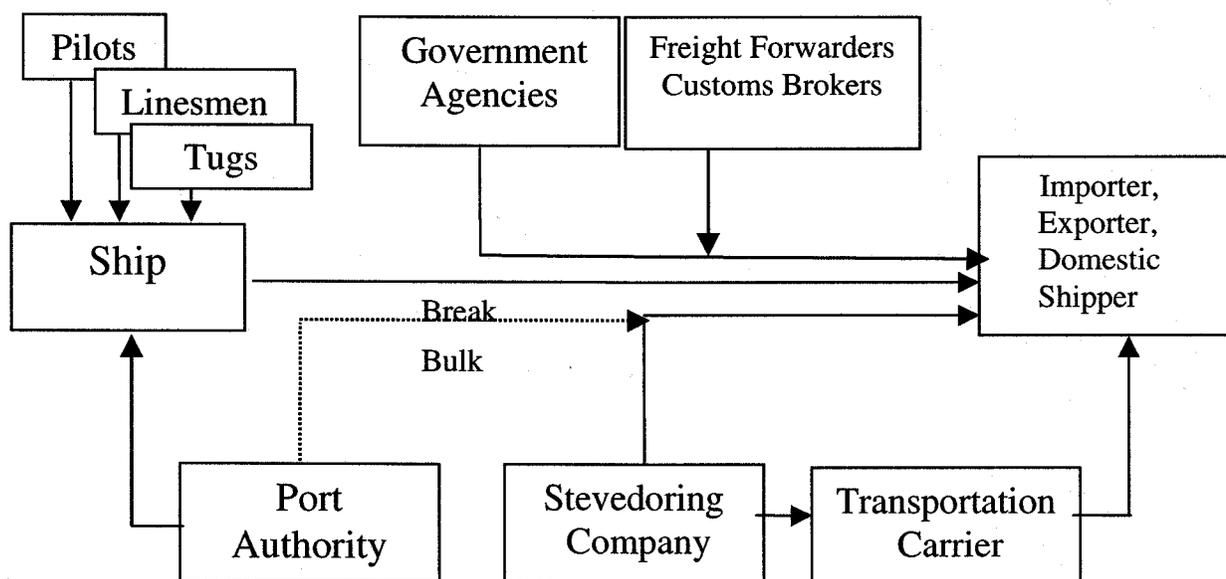
CHAPTER 2

2. Overview of Port Infrastructure Financing

Port infrastructure is financed using a variety of mechanisms throughout the world with the most common being direct funding from the national government. However, in some countries such as Australia and Argentina, port charges are now used to collect funds for port infrastructure. In the countries where the national governments no longer fund port infrastructure the ultimate port infrastructure funding source is the purchaser of the imported goods. Regardless of how port infrastructure is funded, there are already established practices of assessing charges for port activity. Payments occurring within ports range from wages or transaction fees for vessel and cargo handling to lease payments for long term use of facilities or equipment. There are also licenses, permits, registration and a variety of other fees assessed against port users.

The mechanisms used to collect charges in a port vary, but the common element for international goods trade is the assessment of charges flowing toward the shipper, whether importer, exporter, or domestic shipper. The exhibit below demonstrates an example of assessment flows in a port, regardless of purpose or use of the funds. Each of the arrows represent a potential assessment of charges and, therefore, a potential point for infrastructure funding collection. These flows are not comprehensive with government revenue collection represented by tariff assessments on importers or fees charged to exporters. Obviously there are other government fees and taxes assessed to the other entities in the port system not represented in this flow chart.

Example Flows of Port Charge Assessments



CHAPTER 3

3. Case Studies of International Port Harbor Fees and Charges

In this section, the port control, revenue collection and dredging finance situation is reviewed in a sample of countries throughout the world. These countries were selected for their significance to world trade, their port infrastructure policies, and availability of information. The countries are organized alphabetically within each region: Western Europe, Central and Eastern Europe, Asia, Latin America, and Other countries. Critical information relating to user fees with dredging responsibilities is highlighted with bold face in the text.

3.1 Approaches Currently in Use

Investigation of port harbor fee and dredging financing around the world has demonstrated the wide variety of approaches in use in other countries. Not surprisingly, the differences in port and harbor fee policy mirror the differences in political and economic structures across countries. The differences in policy and governmental organization and the complexity of the various fee structures, and difficulty in tracing the linkages to the intended funding uses, present some difficulties in making direct comparisons of water resources and navigation financing policy, and in explaining differences in port charges and harbor fees. Furthermore, the global spread of market based economic policies, including extensive port privatization, has resulted in changes to the traditional port funding policies for many ports. In some countries, changes in ownership, operation and funding for ports have had the side effect of changing the process for port improvements. In many countries these policies are still in a state of flux.

Historically, the purpose of port fees and harbor charges was fundamentally dependent on each country's perception of the role of ports in their economies. One common approach to the role of ports holds ports to be an important part of the social infrastructure, serving the economy with jobs and as a facilitator of trade development. This has been a common view throughout the European countries and in much of Asia. In these countries, it has been government policy to accept the possibilities that some ports would operate at a loss and be subsidized by government from general revenues. This view is still held by many countries today, despite the significant worldwide trend toward privatization and market-based performance standards for government entities. It has been common for capital works such as dredging and other port infrastructure development to be considered public goods for which the government has responsibility. As a result, the funding mechanism has primarily been either direct government expenditure or indirect financial support to regional or local government or port agencies through favorable below-market or very long-term government loans. The most common practice in the countries examined is for the national government to pay for harbor infrastructure operations, maintenance, and expansion out of general government

revenues. Fees are typically collected by state port authorities but are not generally earmarked for harbor maintenance.

The new trend towards market-based performance standards for government enterprises considers ports to be industry infrastructure that performs best when subject to the discipline of the market. Under this view, port infrastructure would pay for itself through benefits returned to the economy implicitly by generating a positive financial rate of return and optimally at market rates. Government can still be the owners of the infrastructure from this perspective, but the financial performance of the infrastructure itself must justify its existence. This need for financial justification has led to the “user fee” concept in which port users pay their proportional share of the costs of maintaining the infrastructure. Specifically for harbor and channel maintenance and development, the cost of the navigation channels should be borne by those that use them in proportion to their use.

In the extreme, the market approach to port and harbor infrastructure policy permits the complete privatization of ports, harbors, and channels. This action allows and encourages private sector entities to make the decisions regarding operations, maintenance, and development of the port infrastructure. The tradeoff is that the potential financial rewards to the private entities taking ownership and control are intended to compensate for the risks in investment and operations inherent in the decision making of the firms. In the cases of privatized ports and harbors, the contribution of infrastructure to the economy can be more explicitly measured through taxes, license and purchase fees paid to the government seller and dividends and earnings for the private owners and operators. Australia has already adopted this model, leaving the consequential control and financial responsibility for dredging entirely in private hands.

Direct comparisons of fees collected on harbor and port use have proved difficult, as the structure of port charges and the different operating environments around the world make definitions of the intended use of fees collected difficult to identify. The differing approaches to port subsidies, as well as port payments for capital spending, operations and non-seaport functions, all affect the level and use of port and harbor charges. This adds a further degree of complexity to harbor funding comparisons. It must also be recognized that the analysis is based on extensive but still incomplete information. This research has considered only fees and charges levied on the final users (e.g. ship or cargo owners, importers, and exporters) and not the indirect charges levied on port service providers or embedded in facility and ancillary charges.

Another dilemma affecting fee comparisons across countries is the difference in terminology of fees and charges. The differences transcend language translation issues to the intent of the governing law and the classifications and measurements used to calculate required payments. Even within countries, differences appear port – to – port. The names and definitions of charges and fees are often evolved from local custom or practice that has long lost its meaning except for its adoption as an expected and common practice at a specific port.

3.2 Canada

The study addressed only the St. Lawrence Seaway.

The Canadian Coast Guard (CCG) announced that there was going to be an interim St. Lawrence Ship Channel Maintenance Dredging Services Fee (MDSF) effective September 1, 1997. The proposal to implement this new charge emanated from the Canadian Government as a means of addressing the maintenance dredging contracts and contract management costs until a long term management mechanism is implemented. The fee structure was legislated as a temporary measure for up to two years.

As part of the overall policy on National Marine Strategy, a decision was made to withdraw the CCG from funding dredging across all of Canada. The responsibility of dredging is to be transferred to beneficiaries.

For 1997/98 the MDSF intended to generate about \$C3.02 million on a full year basis to be allocated \$C2.9M for the dredging contract and \$C120K for Contract Management.

3.3 Western Europe

France

Port infrastructure and channel construction has long been the responsibility of the national government in France. The assumption has been that the high cost and long operating life of water infrastructure projects were beyond the long-term financing capacity of financial markets. **With national government funding available, the practice of making users pay for waterside port infrastructure has been rare in France.** The national budget pays for infrastructure from general revenues, not any specific fee collected from the maritime industry. Private operators pay only for landside development.

Germany

In Germany, there are no general provisions under the law, treaty or within the Constitution that constrain how revenues related to ports are to be collected. Ports do not make a distinction among port fees paid by local, regional or national entities. Therefore there are no statistics available as to the allocation of revenues on this basis. Two examples follow of dredging financing practices in Germany at the country's largest ports, Hamburg and Bremerhaven.

The port of Hamburg is operated by the Free and Hanseatic City of Hamburg, which is a federal state of the Federal Republic of Germany. The Ministry of Economics within Hamburg, is responsible for infrastructure maintenance and development, which includes

such items as quaywalls, water depth, roads, bridges and rail facilities within the port boundaries.

The state Ministry of Economics of the City-State of Hamburg manages the Department of Hydraulic and Port Construction. An annual budget is allocated to the Department, which is part of the overall budget of the Free and Hanseatic City of Hamburg.

The Port of Hamburg is run as a landlord port² where the port activities such as cargo handling, storage, distribution, etc., rests entirely with the private sector. This is also true for additional services like tug towage, mooring, ship dispatch, delivery of equipment, maintenance and repair of vessels. Pricing is market driven without recourse to the state.

The Hamburg port administration is involved in three areas:

1. It sets the rents for areas and quaywalls.
2. **It fixes the Harbor dues which are levied on every sea going vessel, depending on vessel's gross tons (GT) and the period of stay.**
3. It fixes the dues for the port pilot.

The harbor dues are different for liner and tramp shipping. Terminal handling charges are negotiated between the shipping lines and the terminal operators. In all cases, the vessel operator is responsible for the payment of harbor dues and terminal charges.

For a representative container vessel (52,191 GT), the harbor dues would be DM18,583.20 (\$11,061) and for a bulker (37,323 GT), the dues are DM25,140.20 (\$14,964).

The port of Bremerhaven comes under the jurisdiction of the Free and Hanseatic City of Bremen, which is a federal State within the Federal Republic of Germany. The City/State of Bremen administers the ports via the Ministry of Ports.

The port dues are made up of:

- Tonnage dues for the berth
- Port fee for the harbor pilot
- Fee for waste disposal
- Quay dues for loading/discharging of cargo.

The fee structure is embodied within the tariff rules of the "Hafengebueerenordnung" HgebV-12/2/76. **Fees are levied on the basis of gross tons (GT) based on the International Tonnage Certificate (69), or the weight (tons) of loaded/discharged goods. Vessels are distinguished by type of ship (RoRo, Container, bulk, reefer, etc.) which applies only in the case of tonnage dues. All revenue is returned to the City of Bremen, Ministry of Ports, which subsequently reimburses the service fees, (e.g. fee levied on pilots and waste disposal).**

² Landlord ports own the land but lease facilities for others to operate.

In all cases, the ship operator/owner is responsible for the payment of the fees, usually via their port agent. The breakdowns of the fees, based on the representative ship types are:

Container Vessel:

- Tonnage dues (\$20,538) DM 34,504.00 (max. stay allowed 1 days)
- Pilot using without locks (\$1,094) DM 1,838.00
- Pilot using locks (\$1,560) DM 2,620.00
- Waste disposal (\$118) DM 198.90 per 48 hours
- Quay dues, per container/ton (\$4.64) DM 7.80 per ton (highest fee)

Bulk Vessel:

- Tonnage dues (\$14,676) DM 24,655.00 (max. stay 14 days)
- Pilot using without locks (\$830) DM 1,394.00
- Pilot using locks (\$1,189) DM 1,998.00
- Waste disposal (\$118) DM 198.90 per 48 hours
- Quay dues, charged per ton (\$4.64) DM 7.80 per ton (highest fee)

United Kingdom

In the United Kingdom, privatization has been adopted as national policy, broadly and specifically, for the ports industry. The current law governing British port industry is established in two pieces of legislation, the Harbors Act from 1964, and the Ports Act, adopted in 1991.

Harbors Act. As of 1964, the English Harbors Act established a National Ports Council that provided control of harbor development and financial assistance for the improvement of harbors, as well as maintenance, related charges and management of harbors. The National Ports Council was funded by charges levied on the various harbor authorities.

The United Kingdom Government (Ministry of Transport) however, is the final arbiter of construction/reconstruction work as well as improvement or repair of a harbor, in all cases where the expenditure appears to be one of a capital nature. Within this same framework, the UK Government can decide to fund part or all of the expenses incurred as a result of capital construction or maintenance.

Notwithstanding it has remained the responsibility of the individual port authorities to ensure the safe and uninterrupted movement of ships in the harbor and the approaches thereto. This has included the designation of ship channels and vessel routing within the area under the port authority's responsibility.

It is the responsibility of the Port Authority to levy harbor dues, however the Government has the right to revise these charges subject to a proper review procedure. In the case of the privatized ports the new landlord is responsible for funding the dredging of channels. **Both Felixstowe Port, operated by Hutchison Port Holdings, and Southampton,**

operated by Associated British Ports, carry out channel dredging. The cost of this is passed on as part of their annual lease agreement with the terminal operators and can be assumed to be passed back to the users.

Ports Act. In 1991 the Government of the United Kingdom enacted the Ports Act to provide for the transfer to the private sector of certain statutory port undertakings, securities, land, properties and liabilities, in other words the privatization of the ports. As part of this statute, a separate Port Authority would continue to administer those functions that the new port companies did not have transferred to them. This effectively left the non-terminal capital construction and maintenance (including dredging) under the control and responsibility of the slimmed down port authority.

3.4 Eastern and Central Europe

Since the demise of the Soviet Union, substantial investments in cargo port infrastructure have been made throughout the newly independent countries of eastern and central Europe. Significant privatization has occurred for individual terminal facilities and port services, such as stevedoring. However, the underlying port and harbor infrastructure remains in state hands. Development of the ports has required improvements to navigation channels and berths, usually integrated into other port expansion projects. Given the poor macroeconomic situation in these countries, the capital for such projects is not generally available internally, so most of the development has involved funding from international agencies or developed countries. This international funding is just a part of the long-term economic development strategy of these countries, which is intended to generate growth through increased trade. The lending authorities are operating under the assumption that lower transportation costs and more reliable services for the importing and exporting of goods will promote development of other industries, thereby increasing the general welfare in these economies.

Latvia

Since independence, Latvia has reestablished its port of Riga to its former role as serving as a gateway for large cargo volumes to and from Russia. Since 1994, the port has been owned by the Riga Port Authority, which is controlled, in equal amounts by the national government and the Riga municipal government. The port acts as a landlord to privatized terminal operators, but retains responsibility for operations, maintenance and development of the port infrastructure. The port of Riga has been successful in attracting additional cargo and is recapturing Russian trade, which was lost immediately after independence. **The Port Authority has set competitive rates for port charges, and has attracted international funding to support port reconstruction,** (mostly to serve transshipment cargo, which makes up over 80 per cent of cargo tonnage through the port).

In addition to Russia, other countries in the former Soviet Union such as Uzbekistan and Kazakstan use Riga as their principal shipping port. As most of this trade is bulk or general cargo, and not lighter weight container or RO/RO traffic, the navigation channel

depths recently have been improved to accommodate deeper draft vessels. **The cost of deepening the main channel and related harbor berths to 11.5 meters has been funded out of the Port Authority Capital budget, with support from international agencies and the Latvian central government**

Lithuania

Lithuania, like the other Baltic nations, has laws and regulations that are relatively new following independence from the Soviet Union. The major seaport in Lithuania is Klaipeda, which is now undergoing substantial infrastructure improvements. Following independence, responsibility for the port's infrastructure was given to the Klaipeda State Seaport Authority. The terminals and stevedoring operations at the port were privatized but **the port authority is still responsible for the operations and maintenance of port infrastructure, including dredging the harbor entrance, navigation channels, and berths.**

Investment in the port's infrastructure is funded through user charges and multilateral loans. Navigation channel and berth deepening as well as rehabilitation of the harbor entrance are being undertaken with financial support from the World Bank, the Netherlands, Japan and the European Investment Bank.

With international agency support, the charges and fees on vessel calls and cargo have been "increased" or "levied" to fund specific harbor improvement projects but are still kept at levels that are very competitive with other European sea ports.

Russia

In Russia, the national Russian Ministry of Transport oversees a national budget for the ports, with limited local port control or responsibility for infrastructure. The port authority levies a port tariff on vessels which is used by the State for infrastructure improvements. The port tariffs charged at competing Latvian and Estonian ports are lower than at Russian ports such as St. Petersburg which results in Russian trade going through those Baltic ports.

3.5 Asia/Australia

Asia presents the extremes in the world regarding approaches to port funding, control and responsibility. From the tax-paying completely private ports of Australia to the central government control of China, the variety of policy approaches are clearly evident. The only channel dredging policy model missing is that which has developed in the United States, with a mix of local port authority and national funding and control, paid for by the users through a specific harbor maintenance fee. As many of the economies of Asia (e.g. Singapore and Hong Kong) have been built on the activity and development of their seaports, the government harbor policy making has evolved with a much greater level of public interest and attention than is found in most other countries. The peculiar Asian

capitalist economic business cultures have also strongly influenced harbor policy in these countries. We examine a variety of these economies from the perspective of their recent harbor policy and dredging finance.

Australia

In the last ten years the Australian port system has undergone as much radical restructuring and change as in any country in the world. Australia has pursued port privatization aggressively and has introduced a variety of fee structures and revenue raising mechanisms around the country.

For example, **the ports of Fremantle and Melbourne have access charges that are based on vessel tonnage and are intended to cover dredging costs.** The port of Sydney levies a “navigational service charge” on tonnage that is similar to port dues and goes into the budget that covers dredging the port. The state and Northern Territory governments oversee the port authorities but the responsibility for channels lies with the port authorities or their privatized contract operators. **Revenues to Australian port authorities include pilotage dues, tonnage dues, the harbor maintenance levy, leases and wharfage charges.** Also, port authorities in Australia pay a sales tax equivalent on revenue to the state government. Under Australian law, waterside authority extends, on a port basis, to ten nautical miles from harbor entrances. In Australia, sea dumping is allowed for maintenance dredging, but sediment sampling and environmental permitting is required. Many Australian ports have adopted innovative dynamic under keel clearance systems to estimate swell, tide, and vessel squat in order to maximize tidal windows for sailing and minimize required dredging.

These systems have been developed by engineers and naval architects for the vessel fleets calling Australian ports. The systems are sophisticated computer models customized for each port.

China

The government of China has rapidly expanded its maritime cargo ports to handle the surging international trade volumes it has experienced over the last two decades. In other segments of the China economy, the central government’s revenues and budget control the port industry, including the funding for expansion and channel dredging. Regional Engineering Bureaus under the Chinese Ministry of Communications are responsible for dredging but the funding and budget approval are made at the national level. **There is no Chinese harbor or water resources maintenance fee but there are port charges assessed to vessels calling Chinese ports.**

Japan

Under Japanese law, the state and each local port management body are responsible for splitting the costs of harbor improvements 50-50. There is an extremely important exception, however. The Japanese government has designated many of their largest ports

as “especially important ports for the promotion of foreign trade” in which case the national government may pay 100% of the costs for maritime infrastructure and 75% of the cost of mooring facilities. Operations, maintenance and port expansion projects are funded from general government revenues and are appropriated in the National Diet Budget. The Japanese Ministry of Transport, through their Ports and Harbors Bureau, approves all dredging and oversees port development at the national level. Unlike the US system, the Japanese central government’s port development responsibility and control extends not only to main harbor channels but also to individual berths and landside terminals and facilities. Local Port Bureaus do have significant influence on the central government’s port planning, and in the smaller ports without the special national treatment, their responsibility for funding is also significant and more comparable to US Port Authorities.

In Japan, there are no specific harbor maintenance charges although the wharfage fees collected at ports contribute to each local port’s contributions (if any) to waterside infrastructure construction. Japanese port charges are relatively consistent around the country. In 1997, the Japanese ports of Tokyo, Yokohama, Kawasaki, Nagoya, Osaka, Kobe, Kitakyushu, Shimonoseki, Shimizu and Hakata **all adopted wharfage rates based on the gross tonnage of each vessel calling the ports.** Fees are now calculated on a 12-hour basis. Prior to 1997, fees were assessed for each 24-hour period using the same vessel gross tonnage as the base.

As an example of charges on vessels calling ports, the wharfage fees at Yokohama are calculated as 10.05 yen (\$0.074) per gross ton for 12 hours with an additional charge of 6.7 (\$0.05) yen imposed every 12 hours thereafter. The ports also charge a mooring buoyage fee that is charged (for ships of 15,000 gross tons or more) at 36,350 yen (\$269) for 12 hours, with an additional fee of 24,240 yen (\$180) levied every 12 hours thereafter.

Another example is Kobe, where existing port fees for using quays equipped with cargo handling terminals have recently been restructured to separate the mooring and cargo handling fees. The fees had been applied to the integrated and preferential use of quays and container yards or gantry cranes. As elsewhere in Japan, the mooring fee policy is now assessed based on the gross tonnage of ships. Example fees are 26,460 yen (\$196) for containerships of less than 5,000 gross tons; 39,690 yen (\$294) for vessels less than 8,000 gross tons; 52,920 yen (\$392) for ships less than 10,000 gross tons; and 79,380 yen (\$588) for vessels over 10,000 gross tons.

Vessels calling Japanese ports must also pay pilotage fees, crane fees, and other terminal handling charges that are tied to actual use of those resources in the port on each vessel call.

Hong Kong

As the busiest port in the world, Hong Kong has had an intense interest in port capacity and expansion for much of the last fifty years. Under British rule, Hong Kong’s port was overseen by the Government Marine Department, an Executive arm of the government.

The Marine Department had responsibility for channels and navigation in the harbor but little direct role in decision making regarding port operations, funding or development. Then and now, private companies, including Hong Kong International Terminals (HIT) control and manage the terminals. From an international perspective, the private companies have had an unusually strong role in the evolution and development of the port of Hong Kong. The private companies in the port set the charges and fees for their own facilities, separate from the government. **There are no channel fees assessed in Hong Kong but there are port fees assessed based on gross tons.** Since Hong Kong has reverted to a province of China, the funding for channel and navigation projects is officially controlled by the Chinese national government, though it is expected that the future port development will continue to be based on the general port revenues collected in Hong Kong itself.

Malaysia

The majority of Malaysian seaborne trade moves through its own ports but a very significant amount, about 40% of the country's trade, still goes over the causeway to the port of Singapore. The Malaysian port of Kelang, which serves the capital, Kuala Lumpur, is a large container port by world standards but is dwarfed by its neighbor Singapore, the second largest container port in the world. As with other near-neighbor port situations, competition between the ports is strong. To compete with the services and deals offered at the Port of Singapore, the port costs at the Malaysian port of Kelang, are kept to an average of less than one-half of those at Singapore. Even with the cost advantage, the perceived superior service offered by Singapore continues to draw Malaysian trade through Singapore. The much greater frequency and number of carriers and the reputation of Singapore for efficient, reliable service contributes to this perception and its affect on port choice.

During the last two decades of rapid growth, Malaysia had invested billions developing its cargo port infrastructure at Port Kelang. The port terminals are mostly private but the Malaysian government is responsible for operations, maintenance and development of the navigation channels. **Dredging is funded from the government's general revenues as part of complete port budgets. In their role as port landlord, the revenues collected by the Port Authority represent mostly rents and lease payments. The port collects fees on vessel calls and for cargo handling but none are tied to dredging the port or channels.**

Singapore

Singapore, as the world's second largest container port, and as a tiny nation built on maritime trade, has an extreme dependence on international trade and their port facilities. The culture of the country has led to great success in commerce, **but also a complex and secretive system of real port infrastructure spending and charges. Though there are official rates and fees for using the port, Singapore is noted for its willingness to make special deals with specific operators or others that can bring cargo business to their port.** Government practices involve incentives for lines to call or hub their services

at the port. There are port dues and fee offsets and rebates used to attract and keep cargo business. There is no requirement that any of these agreements be made public, and the Singapore port authorities maintain a policy of not commenting.

Thailand

As in neighboring Southeast Asian countries, Thailand's port authority is a national government agency. The Thai Ministry of Communications is the central government agency whose budget and control includes the Port Authority of Thailand (PAT). Port operations, maintenance and development are funded from port revenues and the national budget. **The PAT collects ship fees, cargo handling charges, and port dues that are used to fund the channel and the port. The measure used for the assessment of fees to be charged by the PAT is the net registered tonnage of each vessel calling in Thailand.** Revenue that is collected goes into general revenue accounts from which port dredging is covered as an operating expense or included in the project budget for port improvement projects.

3.6 Latin America

The ports and harbor activities in Latin America present an interesting case for comparison with events in the United States. Virtually the whole of Latin America, from Mexico to Chile, has accepted the principle of privatization and concessioning of state-owned facilities to the private sector. Certainly ports have been at the forefront of this process. The case of Argentina is of particular interest as it is one of the very few exceptions globally for assessing fees on vessels use of channels in order to contribute toward maintenance dredging costs.

Argentina

At the beginning of the nineties, the Latin American continent needed to implement drastic solutions in order to recover from the economic recession that occurred during the previous decade.

Up to that moment the transport system including ports and harbors was run by the public sector and had degenerated to a precariously low level, mainly due to poor management and a lack of funds. The Argentine Government started a privatization process, which included the Port of Buenos Aires and the maintenance dredging of its main waterway, the River Plate and the Parana River.

For the first time in its history, the Argentine government contracted the maintenance dredging of a vital waterway to a private enterprise in the form of a concession, handing over the administration of the waterway to a private company, enabling it to collect tolls from the users of the waterway.

The case study of the Argentine experience demonstrates the application of a new concept, which is now open to other port authorities. This new approach uses the

expertise of a private enterprise as an alternative way to raise funds needed for the maintenance dredging required for ports and harbors.

The nineties will be considered as a landmark for economic reform in the Latin American continent. A key element in this economic reform is the privatization process that is ongoing in most of the Latin American countries. Public industries and services are, to a large extent, being transferred to private enterprises. In order to cope with the economic growth and infrastructure in general, the ports, in particular, have to be reorganized, modernized and improved. It is generally reckoned that in terms of ports and shipping, Argentina has "traveled further along the road" toward liberalization than any other country in Latin America.

The first important step was taken in 1993 when the government of President Menem decided to privatize the so-called Puerto Nuevo of Buenos Aires. After fierce bidding, six terminals were transferred into private hands. These privatized terminals have been operational since the autumn of 1994. Since then, handling and stevedoring costs in the harbor have been reduced significantly, in some cases up to one third of the cost as compared with when the port operation was still in public hands.

However, the success of the privatized port could not have occurred without a drastic improvement in the maintenance of Argentine's principal waterway, the River Plate. Indeed, Argentina depends on the waterway, consisting of the River Plate and the Parana River, for 70% of the exportation of its products, particularly grain and cereals. It extends from Punta Indio (km 205.3) on the River Plate up to Santa Fe (km 589) on the Parana River, over a distance of almost 440 miles. This waterway, however, has a continuous need for dredging over a majority of its length. Before its privatization in 1995, the Parana and River Plate waterway presented two basic problems: a lack of depth and poorly maintained and barely existing navigational aids, both equally disastrous for safe navigation.

In the last years before privatization, the depth of the waterway had gradually decreased from 32 feet to 24 feet. Navigation by night had become virtually impossible along certain stretches of the river.

The Argentine Government was faced with a situation of increasing costs to bring the river back to being fully navigable, a situation which effectively caused it to weigh the benefits of continued state support vs. partial or full handover to the private sector.

Because of the lack of depth, large vessels had to "top up" their cargoes in other ports such as Bahia Blanca, in the South of Argentina or even in neighboring countries such as Brazil. Consequently, freight costs rose sharply. Moreover, the frequent grounding of ships resulted in an increased insurance premiums for the ship operators.

In 1993, the Argentine Ministry of Economy and Public Works issued a tender for the concession of the dredging and signaling of the waterway between Punta Indio on the River Plate and Santa Fe on the Parana River. The concept of this tender was totally new

in the dredging industry: a vital waterway had to be constructed and maintained by a private company. However, instead of paying the contractor for the works executed, the completed waterway would be operated by the successful bidder in the form of a concession for a period of ten years. In fact the waterway, once constructed, would function as a toll highway - ships sailing along the waterway would pay a toll to the concession company. In order to render the project economically feasible and to reduce the risk to the concessionaire, the Argentine government has agreed to pay a subsidy of \$30 million per annum during the concession period.

Indeed, pre-tender studies showed that a concession based exclusively on payment of toll by its users was unviable, since the toll to be charged was higher than the potential economic benefit for each separate user. The macro-economic benefit for the country however, highly justifies the quarterly subsidy by the national government.

The terms of reference of the tender were quite simple:

- to dredge and maintain a 100 m wide waterway over a length of approximately 700 km , and,
- to refurbish the navigational aids over the entire distance according to the international lighthouse standards.

Works had to be carried out in three construction phases:

- During phase one, the waterway had to be dredged to a depth of 28ft over a period of 9 months which included the time for mobilization.
- During phase two, the waterway had to be deepened to 32 ft. The maximum execution period for this phase being 24 months.
- During phase three, the waterway had to be maintained at a depth of 32 ft. until the end of the ten-year concession period.

The tender procedure itself consisted of a technical and a financial proposal. The technical proposal included among other things

- the redesign of the waterway, including a complete signaling system according to international standards,
- a geotechnical investigation of the materials to be dredged and the corresponding output calculations of the different dredges to be used during the project,
- hydrographic surveys and an interpretation of the historical hydrological data on water levels and frequencies,
- volume calculations during the construction stage, including sedimentation at 28 and 32 ft depths, and a forecast of the future sedimentation during the maintenance period, and
- a traffic study, divided over the consecutive sections of the waterway, in order to establish the level of income to be expected from the toll.

The financial proposal was designed to rely on a single figure, namely the amount of the toll to be applied per net registered tonnage of a vessel using the waterway.

In total the Argentine Ministry of Economy and Public Works received six proposals. After a technical evaluation, three offers were retained and their corresponding financial bids were opened. The group of Jan De Nul was the lowest bidder, and was consequently awarded the contract. The total estimated contract value is US\$650 million with approximately one third of this amount coming from the collection of the toll.

The key item of the project is the toll system. A reduced toll was applied to the entire waterway after the completion of phase one; thereafter, the full toll applied once phase two was completed. **The toll is calculated as a function of the vessel's Net Registered Tonnage (NRT), its maximum draught and the actual depth of the channel (28 or 32 ft). The whole channel is divided into sections and subsections. Ships are charged tolls according to the sections and subsections of the waterway that they actually use. The total toll consists of two tariffs, one taking into account the dredging work and the other the navigational signaling.** In order to implement a correct toll system, a constant monitoring of the channel traffic is imperative and requires close cooperation with the maritime authorities.

In this latter respect, an agreement was signed between the Prefectura Naval, the Naval Authority and the concessionaire in order to guarantee a constant monitoring of all ship movements that includes satellite communications. The concessionaire is responsible for collecting the toll, while the Naval Prefecture has the authority to check upon payment by the ship's agent prior to issuing any port clearance to the vessel.

The response of the shipping industry to the changes has been quite positive. After an initial reluctance to pay tolls for maintenance dredging and signaling, ship owners and terminals appear to be prepared to pay for the benefits of the system.

Before the start of the concession, the transport cost of one ton of cereal from Argentina to Europe was around US\$27/ton compared with US\$16/ton today. In 1992, a total of 200 ships with a length of around 150 m were loaded at the private terminals of Rosario. Only 17 could sail with full holds, representing an average cargo of only 12,000 tons. In 1995, 260 ships of the same size were loaded, with 120 of them fully loaded with a cargo of between 24,000 and 26,000 tons each.

More important than the impact on the direct transport cost is the guarantee the ship operator will be able to sail the vessel with the planned draught. This represents a vast improvement over the past, when vessels arriving with a certain draught had to be lightened because water levels on the waterway were lower than expected due to inadequate maintenance.

In conclusion, it should be mentioned that by privatizing the maintenance of their principal waterway, the Argentine government has been able to overcome a very serious deficiency in their export process. The government lacked the funds and the equipment

necessary to reestablish the depths and safe navigation of a vital waterway. By privatizing the maintenance dredging and implementing an innovative toll system the Argentine government has assured itself of the services and efficiency of a specialist private contractor, at the same time seemingly assuring itself of competitive exports in the years to come.

Colombia

In Colombia, the Port Authority is a national body with local offices (Superintendencia de Portuaria). The Port Authority reports to the Ministry of Transportation. Therefore, issues related to capital development and maintenance dredging are ultimately controlled at the national level. Decisions regarding capital expenditure for dredging typically require a feasibility study funded by FONADE, a government financing institution. In most ports, additional work to carry out infrastructure development also needs the agreement of the Colombian Navy. **Channel deepening projects are funded directly by the Government out of general revenues.**

The port terminals are increasingly being concessioned to private operators. This has been the case in Cartagena. The terminal operator is responsible for fixing cargo charges and other land side related fees.

Jamaica

As in many other developing countries, the funding of the new container port expansion at Kingston, Jamaica has been made possible in large part through international lending. The European Bank for Reconstruction and Development has provided the funding necessary for the Jamaican government to pay for deepening the Kingston navigation channel to a depth of 42 feet. **There are no specific harbor maintenance fees collected or planned for Jamaica.**

Mexico

Before the recent spate of infrastructure privatization in Mexico, the federal government had responsibility for all harbor channel development and construction. With the concessioning of the major Mexican cargo ports, the private operators had to assume the responsibility for dredging as part of complete operational responsibility and control at each port. **The fees charged by private Mexican port operators are not specific to dredging, but are considered part of total operating revenues from which operating and infrastructure development budgets must be financed.**

The former "Puertos Mexicanos" in Mexico City, which used to have complete operating authority over the country's 52 ports is now a skeletal organization since the operational aspects of port management have been moved locally to each port in the form of new independent port authorities called Administracion Portuaria Integral (API). **Each API operates its port, collects fees and distributes fees for the maintenance of existing**

infrastructure including dredging, while new major projects must be approved centrally through Puertos Mexicanos. The idea is to provide a perspective on port development from the national capital and to prevent the expansion of ports into areas that are not competitive or that are not in the interest of the nation.

Panama

In Panama, the **Panama Canal Commission takes responsibility for the dredging of all Canal Waters**, which effectively constitutes the approach channels to the Canal entrance. (See Appendix C). Separately, the main cargo ports have been concessioned, or are operating privately such as Manzanillo International Terminal (MIT), Balboa, and Cristobal. The terminal operators are responsible for dredging the quays and the approaches from the navigation channel to the terminals. In the case of MIT, the Operator, Stevedoring Services of America (SSA) opted not to use Canal Waters and dredged their own approach channel directly from the Caribbean to the terminal.

A separate Port Authority Autoridad Portuaria Nacional (APN) remains in existence and is responsible for buoys and port activities that are not within the responsibility of the terminal operators.

3.7 Other Countries

Lebanon

The principal cargo port in Lebanon, Beirut, is run by a port authority, Gestion et Exploitation du Port de Beyrouth (GEPB). GEPB sets the fees and is responsible for the budget expenditures for the cargo port. **Navigation infrastructure improvements are planned and funded out of the port authority budget, either operating or capital budgets, depending on the nature of the expenditure. There is no separate revenue or expenditure stream for dredging.**

Port Authority revenue is raised through fees paid by vessels using the port. Through 1997, the fees were a daily fixed port fee plus an ad valorem charge of 2.5% on the value of the cargo, for handling and transit. The ad valorem charge was the responsibility of the consignee. There also was and continues to be a per container fee for each box handled. **Under a new fee structure introduced by the GEPB 1998, fees are to be assessed based on vessel size.** Meanwhile the ad valorem charges on cargo has been eliminated. The new vessel fee system is **based on vessel length**, with a rate of \$4 per meter for each 24 hour period, for foreign flagships, and \$2 per meter per 24 hour period for Lebanese flag vessels. For vessels in port longer than four days, the daily charge increases to \$6 per meter. Container handling charges are lowered but are still charged separately. The charge per TEU has been reduced 24 %, from \$50 to \$38. The per FEU charge has been reduced 10 % from \$70 to \$63.

Instead of the previous ad valorem charges, the new proposed tariff for containerized cargo is quite simplified. There are only three rate levels under the new system: low value

goods will be charged \$200 per box; general cargo will be charged \$300 per box, and high value goods such as alcohol and cigarettes will be charged \$700 per box. Breakbulk cargoes will now be charged on a weight basis, using tons as the measure for the fee.

In an effort to promote the ports' transshipment business for the region, the new Lebanese fee structure has a separate provision for transshipment goods. The inclusive transshipment container handling charge (including up to 15 days storage in port) is now \$78 per container. For more than 15 days, an additional \$75 charge per container will be levied, which is intended to penalize operators that are not truly transshipping containers.

These changes are intended to encourage growth in high value containerized and roll-on/roll-off cargo, and to reduce time in port for the average vessel call. Removal of the ad valorem cargo charges, are intended to reduce the need for customs to be involved in revenue collection and therefore to reduce overhead costs associated with each shipment.

South Africa

In South African ports, there are no direct channel or harbor maintenance fees. Vessels are assessed port dues that are **based on the cubic capacity of ships.** The cubic capacity is measured in cubic meters and is calculated by the port from **Gross Registered Tons**, if no cubic capacity measurement is separately available.

Tunisia

Tunisian ports remain firmly under the control of the national port authority, OPNT, which in turn reports to the Ministry of Transportation. The OPNT takes responsibility for all vessel operations, as well as terminal operations. Each of the ports operate under its own management, but cannot take independent action on pricing or infrastructure development.

Dredging is therefore the responsibility of OPNT and is funded as part of the national budget and is part of the FiveYear Development Plan in terms of forward planning. As with many developing countries, Tunisia has recently received a significant World Bank loan to develop its infrastructure. Part of these World Bank funds have been earmarked for port development, including dredging activities. The authors are also aware that the Netherlands Government had provided funds for dredging as part of a purchase arrangement for dredging vessels to be purchased from the Netherlands.

3.8 Comparison of International Terminal Handling Charges (THCs) for Container Operations

As part of the evaluation of international port charges and dredging funding, two studies published by an Italian consulting company, Marconsult were also referenced. These were published in 1991 and updated in 1994. Although somewhat dated, the work is interesting in that it is one of the sources available that has consistently benchmarked container handling port services across a broad range of ports around the globe in a

uniform manner. Since the 1994 update, a number of terminals in the survey have been privatized and there will most likely have been price changes as a result of this.

Based on work that The Columbus Group has carried out in Central and South America, the estimated cost to the terminal operator of a container move is around \$40 per container. In cases where the volume of moves is particularly high, such as in Freeport, Bahamas and MIT, Panama, one could expect the cost to be marginally lower, whereas in the United States, the cost is probably higher.

A key issue that presented itself both in the benchmarking of port charges as well as in assessing THCs, is that there is a decided lack of conformity and homogeneity in the structure of charges. This clearly has a distorting effect, which must be kept in mind. This is in part caused by changes in responsibility of port operations, as port authorities and terminal operators are increasingly autonomous organizations, as well as by technological and intermodal changes in the handling of cargo and the interface with the landside operations.

In the case of the Marconsult study, operations were standardized as much as possible in order to provide an “average” figure, which was translated into a basic operation. This included 1) ship to stack, and 2) stack to gate. This represents the pricing structure to the cargo owner ultimately. However, the ship operator will also face charges, which may or may not be passed on to the cargo owner. These charges relate to:

- Hatch opening and closing
- Overtime
- Vessel stand-by
- Lashing/unlashing
- Extra yard moves in the stack and on the ship
- Weighing
- Special container handling
- Lay days

The figures presented in Table 3.7A below indicate that the **majority of terminal handling charges fall within the \$100-\$140 range for 20ft loaded containers. Empty moves generally receive a discount, but not in all cases. Some ports do not differentiate between container sizes for either full or empty moves. This is probably reflective of the cost structure, which also does not differentiate by size or weight.**

In cases where terminal operators are independent bodies separate from the Port Authority, they have contractual arrangements ranging from landlord/tenant status to concession operator and to private owner. Within this broad mix of arrangements various forms of fees are levied. These range from annual concession fees, direct taxation per container move, leasehold charges and lump sum charges for a fixed number of years. Whatever the arrangements might be, **it is not apparent that any identifiable portion of the fees are allocated to specific items such as dredging for maintenance or capital development.**

Table 3.7A
Basic Operation Costs: Vessel to gate or gate to vessel for import/export containers
 (Based on Exchange rate valid at time of Marconsult Study)

Port/Terminal (in US\$)	20ft. container		40ft. container	
	Loaded	Empty	Loaded	Empty
Hamburg	161	136	161	136
Bremerhaven	188	156	188	156
Rotterdam	139	139	139	139
Antwerpen	104	104	104	104
Zeebrugge	85	85	85	85
Felixstowe	128	92	128	92
Algeciras	114	100	152	147
Valencia	106	99	141	129
Marseille-Fos	145	145	145	145
Genoa	138	88	138	88
La Spezia	144	113	144	113
Piraeus	109	74	183	122
Hong Kong	194	194	298	298
Kaohsiung	130	130	180	180
Kobe	267	239	407	360
New York	190	190	190	190
Oakland	146	146	146	146

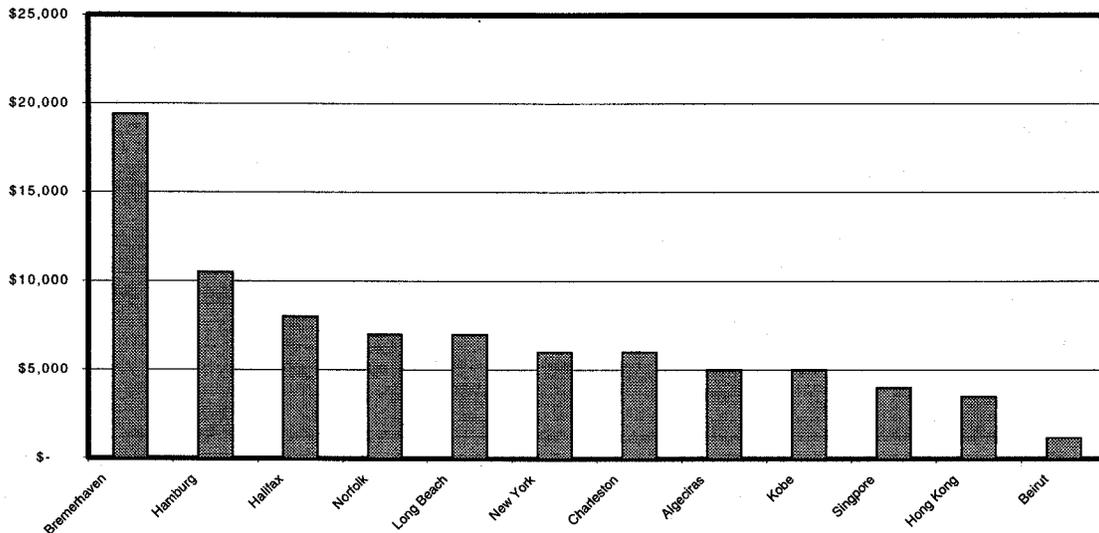
Port Dues

During this research another source of information was identified. A study carried out by a UK firm identified the proportion of costs associated with the marine, i.e. non-terminal, sector of the vessel charges in port. No breakout was provided as to the make up of the charges, nor the size of the ships, and the results are an average figure. This information is somewhat problematic from a comparison point of view; nevertheless, due to the slow rate of response from the ports, which were sent questionnaires, it was decided to exhibit this data together with other data that was collected in order to provide an indicative set of figures. Table 3.7B below summarizes the findings for container vessels. It must be assumed that the results pertain, on average, to smaller vessels.

Table 3.7B
Vessel Port Charges
Marine Sector Only

Port (* = TCG Survey)	Fees
Hamburg *	\$10,500
Bremerhaven *	\$19,400
Halifax	\$8,000
New York	\$6,000
Norfolk	\$7,000
Charleston	\$6,000
Algeciras	\$5,000
Beirut *	\$1,176
Singapore	\$4,000
Hong Kong	\$3,500
Kobe	\$5,000
Long Beach	\$7,000

Container Vessel Fees at Key Ports



3.9 International Waterways

This study includes appendices on three international waterways that collect fees based on vessel transits whose intent is to cover the operational costs of keeping the waterways operational. In the case of the Suez Canal, revenues are cost plus and are a major contributor to the national budget. In Panama, the Canal is operated as a non-profit service. **The tolls that are levied on vessels transiting the Panama Canal are intended to cover the operations and maintenance of the waterway, including capital improvement**

programs for the infrastructure. Since 1979 an additional \$100 million of the revenue is passed on to the Government of Panama following the 1979 Treaty which will transfer the Canal to Panama on December 31, 1999.

The fees charged by the Canadian Coast Guard on vessels using Canadian facilities are intended to cover the costs of operating, maintaining and administering of the St. Lawrence Seaway Development Corporation.

The very nature of these toll structures is directly comparable to the principle of levying a fee or charge to provide for the operations and maintenance of navigation channels in the ports and harbors of the United States.

Summary and Conclusions

At the outset of this study, it was hoped that the major port authorities around the world would respond to a short questionnaire. It was agreed to restrict the list to 10 ports. The response has not been as good as had been hoped.

The international evaluation of dredging practices has highlighted the wide variety of approaches in other countries. However, in most cases a single theme runs through the policy. That is, that the national governments, via their ministries of transport, maritime affairs or commerce generally take responsibility for dredging of ports. The dredging activity is regarded as an investment in the national infrastructure.

Port dues or fees are collected on ships for what is essentially the "marine side" of port operations, that is, relating to vessels moving from international waters into navigation channels to near the terminal quays. The responsibilities for berth or quayside dredging shifts to the terminal operator (in many cases the same as the port authority) and all landside and cargo operations are the responsibility of the terminal operator.

Generally the port dues are collected by the ports and distributed to the State or National Government, which in turn provide the port authority with annual budgets for expenditure, including dredging. There appears to be no direct link between the dues and the budget funds. In many of the developing countries, the dredging requirements, as well as the expansion needs of ports under state control, is partly (or wholly) funded by Multilateral Institutions such as the World Bank and the Inter American Development Bank. Individual countries also make other soft loans available as part of their foreign aid or for political purposes. Tunisia for example, has recently been awarded significant funds from the World Bank while Nicaragua has received a soft loan of \$17 million from Taiwan for the dredging needs of the Port of Corinto. The trend toward privatization and concessioning of ports has created some new practices, particularly in Australia, United Kingdom and Panama.

In two cases, this study identified a direct linkage between navigation channel dredging and a fee structure on vessels. One is in Argentina, where a concession has been granted to Jan de Nul from Belgium to carry out dredging, half of which is paid out of Government funds and loans and the remainder through fees collected by the concessionaire. The other is in Canada, where the Canadian Coast Guard charges fees for the use of the St. Lawrence Seaway for vessels visiting Canadian ports. In Australia, it appears that the two privatized ports of Freemantle and Melbourne have a fee that has a direct contribution to dredging costs. Similarly, the port of Sydney levies a charge that goes into a fund that also covers dredging. Additionally, the St. Lawrence Seaway toll structure on the Canadian side is a direct dredging related fee, whilst both the Panama and Suez Canals can be considered to be charging for the direct usage of their facilities.

It can be concluded that the majority of international dredging is probably subsidized by most of the national or state governments. However there appears to be no direct link between the collection of port dues and the funding of dredging. This makes the United

States situation somewhat different from the rest of the maritime nations, in that there is a national fund that is related to expenditure on dredging on a national scale rather than at the local port or navigable channel level.

Appendices

5.1 Appendix A - St. Lawrence Seaway Regulations

REVISED
AS OF 1996
CODE OF FEDERAL REGULATIONS
TITLE 33 - NAVIGATION AND NAVIGABLE WATERS
CHAPTER IV - Saint Lawrence Seaway Development Corporation

PART 402 - Tariff of Tolls

§402.1 Purpose.

This regulation prescribes the charges to be assessed for the full or partial transit of the St. Lawrence Seaway between Montreal, Quebec, and Lake Erie.

§402.2 Title.

This tariff may be cited as the St. Lawrence Seaway Tariff of Tolls.

§402.3 Interpretation.

In this tariff,

- (a) "Authority" means the St. Lawrence Authority;
- (b) "Bulk cargo" means such goods as are loose or in mass and generally must be shoveled, pumped, blown, scooped or forked in the handling and shall be deemed to include:
 - (1) Cement, loose or in sacks;
 - (2) Coke and petroleum coke, loose or in sacks;
 - (3) Domestic cargo;
 - (4) Liquids carried in ships' tanks;
 - (5) Ores and minerals (crude, screened, sized or concentrated, but not otherwise processed) loose or in sacks, including alumina, bauxite, coal, gravel, phosphate rock, sand, stone and sulfur, but excluding coal;
 - (6) Pig iron, scrap metals;
 - (7) Lumber, Pulpwood, poles and logs, loose or bundled;
 - (8) Raw sugar, flour, loose or in sacks;
 - (9) Woodpulp, loose or in bales;

(10) Material for recycling, scrap material, refuse and waste.

(c) "Cargo" means all goods aboard a vessel whether carried as revenue or non-revenue freight, or carried for the vessel owner, except: empty containers and the tare weight of loaded containers, all such containers having a capacity of 18 cubic meters (635.665 cubic feet) or more; ships' fuel, ballast or stores, or crew or passengers' personal effects, and in transit cargo that is carried both upbound and downbound in the course of the same voyage which shall be reported in the Seaway Transit Declaration Form but is deemed to be ballast and not subject to toll assessment;

(d) "Containerized cargo" means any general cargo shipped in an enclosed, permanent, reusable, nondisposable, weathertight, shipping conveyance having a capacity of 18 cubic meters (635.665 cubic feet) or more and fitted with a minimum of one hinged door:/P

(e) "Corporation" means the Saint Lawrence Seaway Development Corporation;

(f) "Domestic cargo" means cargo, the shipment of which originates at one Canadian point and terminates at another Canadian point, or which originates at one United States point and terminates at another United States point, but shall not include any import or export cargo designated at the point of origin for trans-shipment by water at a point in Canada or in the United States;

(g) "Feed grains," means barley, corn, oats, flaxseed, rapeseed, soybeans, field crop seeds, grain screenings, and meal from these grains for animal consumption;

(h) "Food grains," means buckwheat, dried beans, dried peas, rye, and wheat;

(i) "General cargo" means all goods not included in the definitions under paragraphs (b), (g), (h) and (j), but excluding steel slab;

(j) "Government aid cargo" means processed food products which have been donated by or the purchase of which has been financed on concessional terms by the Federal government of either the United States or Canada for the purposes of nutrition, economic development, emergency, or disaster relief programs and any food cargo that is owned or financed by a nonprofit organization or cooperative and that is certified by the Customs Service of the United States or Canada as intended for use in humanitarian or development assistance overseas.

(k) "Metric ton" means, unless otherwise stated, a metric unit of weight of 1,000 kilograms (2204.62 pounds);

(l) "Passenger" means any person being transported through the Seaway who has paid a fare for passage;

(m) "Pleasure craft" means a vessel, however propelled, that is used exclusively for pleasure and does not carry passengers;

(n) "St. Lawrence Seaway" includes all facilities and services authorized under the St. Lawrence Seaway Authority Act, Chapter 242, Revised Statutes of Canada, 1952, as amended and under Public Law 358, 83rd Congress, May 13, 1954, enacted by the Congress of the United States, as amended, and including the Welland Canal, which facilities are under the control and administration or immediate financial responsibility of either the Authority or the Corporation;

(o) "Seaway" means the St. Lawrence Seaway;

(p) "Tolls" means the total assessment levied against a vessel, its cargo and passengers for complete or partial transit of the Seaway covering a single trip in one direction;

(q) "Vessel" means every type of craft used as a means of transportation on water, except a vessel of or employed by the Authority or the Corporation.

§402.4 Tolls.

(a) The tolls shall be set forth in the schedule hereto.

(b) The tolls under this Tariff are due from the representatives of each vessel as soon as they are incurred and payment shall be made within thirty (30) days of the vessel's entry into the Seaway.

(c) The tolls for the section between Montreal and Lake Ontario shall be paid 75 per cent in Canadian dollars and 25 per cent in United States dollars. Payments for transit through locks in Canada only shall be in Canadian dollars, and payments for transit through locks in the United States only shall be in United States dollars.

(d) The tolls for transit of the Welland Canal shall be paid in Canadian dollars and shall accrue to the Authority.

§402.5 Security for payment.

A representative of each vessel shall provide the Authority or the Corporation with security, satisfactory to the Authority or the Corporation, for payment of tolls.

§402.6 Description and weight of cargo.

(a) A cord of pulpwood shall be deemed to weigh 1,450 kilograms (3,196.70 pounds).

(b)

(1) 1,000 f.b.m. of sawn softwood lumber with less than 15 percent moisture content shall be deemed to weigh 770 kilograms (1,697.56 pounds).

(2) 1,000 f.b.m. of sawn softwood lumber with 15 percent moisture content or over shall be deemed to weigh 950 kilograms (2,094.39 pounds).

(3) 1,000 f.b.m. of sawn hardwood lumber with less than 15 percent moisture content shall be deemed to weigh 1,135 kilograms (2,502.24 pounds).

(4) 1,000 f.b.m. of sawn hardwood lumber with 15 percent moisture content or over shall be deemed to weigh 1,405 kilograms (3,097.49).

(c) The tonnage used in the assessment of tolls shall be calculated to the nearest 1,000 kilograms (2,204.62 pounds).

§402.7 Post-clearance date operational surcharges.

(a) If the Authority and the Corporation so determine, they may establish a clearance date for the transit of the Montreal-Lake Ontario section. Each vessel which does not comply with the conditions announced by the Authority and the Corporation in establishing the clearance date may be required to pay in dollars an amount not exceeding the operational surcharge set forth below:

(1) Vessels reporting during the 24 hour period immediately following the clearance date: 20,000.00

(2) Vessels reporting more than 24 hours late, but less than 48 hours after the clearance date: 40,000.00

(3) Vessels reporting more than 48 hours late, but less than 72 hours after the clearance date: 60,000.00

(4) Vessels reporting more than 72 hours late, but less than 96 hours after the clearance date: 80,000.00

(b) The operational surcharge assessed vessels already at a port, dock or wharf within the St. Lambert- Iroquois Lock segment of the Montreal-Lake Ontario section at the clearance date shall be \$20,000 less than the amount otherwise applicable.

(c) Each vessel which reports more than 96 hours after the clearance date may transit only if a prior written agreement authorizing such transit has been entered into among the owner or agent of the vessel and the Authority and the Corporation. Such agreement may provide for additional operational surcharges.

(d) Assessed operational surcharges will be prorated on a per lock basis. Surcharges representing transit through United States locks will be for the account of the Corporation and payable in United States funds and surcharges representing transit through Canadian locks will be for the account of the Authority and payable in Canadian funds.

§402.8 Schedule of tolls.

1998 Seaway Toll Schedule

(Cargo Tolls Per Metric Ton in C\$)

Effectively Canadian charges only as U.S. tolls are no longer collected effective 10.1.94

St. Lawrence Seaway Tariff of Tolls Effective June 1, 1998
(All Tolls are Canadian and payable in Canadian dollars)

MONTREAL/LAKE ONTARIO SECTION

BULK	\$0.8466
COAL	\$0.4998
CONTAINERIZED CARGO	\$0.8466
GRAIN	\$0.5202
STEEL SLABS	\$1.8462
GENERAL	\$2.0400
VESSEL GRT	\$0.0816

WELLAND CANAL SECTION

BULK	\$0.5610
COAL	\$0.5610
CONTAINERIZED CARGO	\$0.5610
GRAIN	\$0.5610
STEEL SLABS	\$0.6426
GENERAL	\$0.8976
VESSEL GRT	\$0.1326
VESSEL LOCKAGE	
Loaded for 8 locks	\$ 3,584.00
Ballast for 8 locks	\$ 2,648.00

BOTH SECTIONS COMBINED

BULK	\$ 1.4076
COAL	\$ 1.0608
CONTAINERIZED CARGO	\$ 1.4076
GRAIN	\$ 1.0812
STEEL SLABS	\$ 2.4888
GENERAL	\$ 2.9376
VESSEL GRT	\$ 0.2142
VESSEL LOCKAGE	
Loaded for 8 locks	\$ 3,584.00
Ballast for 8 locks	\$ 2,648.00

- Tolls are assessed: per metric weight ton of cargo, per vessel gross registered ton, and per lock transit for the Welland Canal.
- No tolls on government aid cargoes;
- Tolls frozen at 1993 levels through May 31, 1998;
- Welland Canal lockage fee is for a full one way transit of 8 locks;
- Due to computer rounding, actual toll invoices may differ from above.

RATES OF CHARGES OR TOLLS

Sec. 12. (a) (§988) The Corporation is further authorized and directed to negotiate with the Saint Lawrence Seaway Authority of Canada, or such other agency as may be designated by the Government of Canada, an agreement as to the rules for the measurement of vessels and cargoes and the rates of charges or tolls to be levied for the use of the Saint Lawrence Seaway, and for an equitable division of the revenues of the seaway between the Corporation and the Saint Lawrence Seaway Authority of Canada. Any formula for a division of revenue which takes into consideration annual debt charges shall include the total cost, including both interest and debt principal incurred by the United States in financing activities authorized by this Act, whether or not reimbursable by the Corporation. Such rules for the measurement of vessels and cargoes and rates of charges or tolls shall, to the extent practicable, be established or changed only after giving due notice and holding a public hearing. In the event such negotiations shall not result in agreement, the Corporation is authorized and directed to establish unilaterally such rules of measurement and rates of charges or tolls for the use of the works under its administration: PROVIDED, HOWEVER, That the Corporation shall give three months' notice, by publication in the Federal Register of any proposals to establish or change unilaterally the rates of charges or tolls, during which period a public hearing shall be conducted. Any such establishment of or changes in basic rules of measurement or rates of charges or tolls shall be subject to and shall take effect thirty days following the date of approval thereof by the President, and shall be final and conclusive, subject to review as hereinafter provided. Any person aggrieved by an order of the Corporation establishing or changing such rules or rates may, within such thirty-day period, apply to the Corporation for a rehearing of the matter upon the basis of which the order was entered. The Corporation shall have power to grant or deny the application for rehearing and upon such rehearing or without further hearing to abrogate or modify its order. The action of the Corporation in denying an application for rehearing or in abrogating or modifying its order shall be final and conclusive thirty days after its approval by the President unless within such thirty-day period a petition for review is filed by a person aggrieved by such action in the United States Court of Appeals for the circuit in which the works to which the order applies are located or in the United States Court of Appeals for the District of Columbia. The court in which such petition is filed shall have the same jurisdiction and powers as in the case of petitions to review orders of the Federal Energy Regulatory Commission filed under section 8251 of Title 16. The judgement of the court shall be final subject to review by the Supreme Court upon certiorari or certification as provided in sections 1254(1) and 1254(2) of Title 28. The filing of an application for rehearing shall not, unless specifically ordered by the court, operate as a stay of the Corporation's order.

(b) In the course of its negotiations, or in the establishment, unilaterally, of the rates of charges or tolls as provided in subsection (a) of this section, the Corporation shall be guided by the following principles:

1. That the rates shall be fair and equitable and shall give due consideration to encouragement of increased utilization of the navigation facilities, and to the special character of bulk agricultural, mineral, and other raw materials.

2. That rates shall vary according to the character of cargo with the view that each classification of cargo shall so far as practicable derive relative benefits from the use of these facilities.
3. That the rates on vessels in ballast with passengers or cargo may be less than the rates for vessels with passengers or cargo.
4. That the rates prescribed shall be calculated to cover as nearly as practicable, all costs operating and maintaining the works under the administration of the Corporation, including depreciation, and payments in lieu of taxes.
5. {Repealed}

WAIVER OF COLLECTION OF CHARGES OR TOLLS

Sec.13.(a) (§988a.) Notwithstanding section 12 of this Act or any other provision of law, the Corporation shall not collect any charge or toll established pursuant to section 12 of this Act with respect to a commercial vessel (as defined in section 4462(a) (4) of the Internal Revenue Code of 1986).

(b) The Corporation will maintain a record of the annual amount of each charge or toll that would have been collected with respect to each such commercial vessel is it were not for paragraph (a) of this section.

CHANGES TO SEAWAY TOLLS PROPOSED

The St. Lawrence Seaway Authority announced in the Canada Gazette, Part I, its intention to establish, upon repeal of the existing directives given by Governor in Council to The Authority in 1959, a Seaway Tariff of Tolls, with a 2 percent cargo toll and vessel charge increase, to become effective on June 1, 1998. The proposed 2 percent increase for both the Montreal/Lake Ontario and the Welland Canal sections of the St. Lawrence Seaway would be the first increase in tolls since 1993.

The repeal of the 1959 bilateral agreement was required to allow the Canadian Government to unilaterally raise the tolls for the 13 (out of 15) locks that it operates. The reason given for the toll increase was to provide funds for the upkeep and maintenance of the locks and to allow the commercialization of the overall operation. The toll revenue projection for the year was reported as \$350 million. The U.S. has been funding its operation from the Harbor Maintenance Tax since 1986 when it also repealed the domestic regulation relating to the Seaway.

DREDGING SERVICES TONNAGE FEE

The Canadian Coast Guard (CCG) announced that there was going to be an interim St. Lawrence Ship Channel Maintenance Dredging Services Fee (MDSF) effective September 1, 1997. The proposal to implement this new charge emanated from the Canadian Government as a means of addressing the maintenance dredging contracts and contract management costs until a long term management mechanism is implemented. The fee structure was intended for up to two years.

As part of the overall policy on National Marine Strategy, a decision was made to withdraw the CCG from funding dredging across all of Canada. The responsibility of dredging is to be transferred to beneficiaries.

For 1997/98 the MDSF intended to generate about \$C3.02 million on a full year basis to be allocated \$C2.9M for the dredging contract and \$C120K for Contract Management.

The fees were established under the authority of section 47 of the *Oceans Act*. After consultation with users, the fee structure is based on Gross Registered Tonnage (GRT) of ships transiting the St. Lawrence Ship Channel. The GRT fee is \$C0.033 per GRT, applying to:

- All commercial ships (domestic or foreign) originating from, or stopping at, any Canadian port and transiting a portion of the St. Lawrence Ship Channel.
- Ships with a static draught of 5.0m or more during each transit.
- Each upstream voyage that uses the St. Lawrence Ship Channel regardless of the number of Canadian Ports of call during the voyage.
- Each downstream voyage that uses the St. Lawrence Ship Channel regardless of the number of Canadian Ports of call during the voyage.

All non-commercial vessels are exempt.

The fee will not apply to:

- Ships with a static draught less than 5.0m, during each transit.
- Ships in transit not originating from, or not stopping at a Canadian port.
- Those ships transiting between the Great Lakes-St. Lawrence Seaway System and the Port of Montreal (excluding the Contrecoeur terminal) that do not proceed eastward from the Port of Montreal because they do not use the dredged portion.
- Ships moving within the confines of a port boundary (in the case of Montreal excluding the Contrecoeur terminal).

A separate fee will be charge for each upstream and downstream transit of the St. Lawrence Ship Channel. The CCG will provide an invoice for each transit of a foreign flagship, and will capture the applicable transit data for all domestic ships for preparation of a monthly invoice.

5.2 Appendix B - The Suez Canal

The Suez Canal is the first man-made canal dug for commercial shipping. It is a sea level canal with mooring bollards every 125 meters on both sides of the Canal. The navigable channel is bordered by light and reflecting buoys as navigational aid to night traffic. There are 11 signal stations along the western bank of the Canal, each of which is about 10 km. apart from the other.

The Canal is run in a convoy system to transit at a fixed speed and a fixed separation distance between every two passing ships. Three convoys pass through the Canal every day; two southbound and one northbound.

The Suez Canal has been expanded in four parts since 1955 to facilitate the transit of ships in both directions, thereby expanding capacity. Transit time is 12 to 16 hours, and the capacity is about 76 ships per day.

The Suez Canal Authority regulates and manages the operations of the Canal. During 1996/97 the SCA undertook development work to continue to deepen draft to 59ft. from 58 ft. as well as contracting to build a special suction dredger. The SCA has stated that in order to maintain its competitive advantage, it is focusing on deepening the draft to 68 feet, to allow the passage of tankers with loads up to 300,000 tons, or a net tonnage of more than 500,000 tons. The targets of the Fourth 5-year Plan are to reach a draft depth of 92 feet. This would appear to be overly optimistic and beyond international traffic requirements however.

During 1997, 14,430 ships made full transits through the Suez Canal in both directions, a drop of 2% compared with 1996. The daily average was 39.5 ships. The transiting net tonnage however registered an increase from 355 million tons in 1996 to 368.7 million tons in 1997. The majority of the cargo tonnage is made up of non-oil cargoes.

RATES OF CHARGES OR TOLLS

The SCA operates a flexible tariff policy to attract international trade movement through the Canal.

New rates of the Suez Canal tolls effective January 1, 1998 are as per the attached tables. In addition, the SCA Chairman announced the following:

1. Crude oil tankers will continue to get-
 - A discount of 5% on Suez Canal dues in case of transporting crude oil quantities exceeding one million metric tons and up to two million metric tons.
 - A discount of 10% on Suez Canal dues in case of transporting quantities between two and three million metric tons.
 - A discount of 30% on Suez Canal dues in case of transporting crude oil quantities in excess of 3 million metric tons.

These discounts are granted to the round trip (laden or in ballast) of the same tanker and if crude oil quantities are transported by one individual client within one year beginning with his contract with the SCA.

The maximum payment for the round trip of any crude oil tanker shall not exceed SDR (Special Drawing Rights) 330,000 regardless of the tankers SCNT.

2. LNG carriers – ballast and loaded LNG carriers shall be granted a discount of 35% on the Suez Canal dues regardless of destination.
3. Container ships, General cargo ships and Lash Ships - The 6% surcharged levied on ballast ships carrying empty containers on in the cargo holds are cancelled.
4. Dry bulk ships – Owners of dry bulk cargo ships that operate between Australia and North West Europe or between South Africa and the Mediterranean may get in touch with the SCA Planning, Research and Studies Dept., the Economic Unit, which can decide on the “proper” dues in advance. During the first half of 1998, discounts on bulk cargo shipments have ranged between 22% (iron ore shipment to Japan) and 82% (also iron ore).

**SUEZ CANAL DUES RATES TO BE APPLIED AS FROM
FIRST OF JANUARY 1998 IN ACCORDING WITH CIRCULAR NO. 3/97**

TYPE OF VESSEL	SUEZ CANAL NET TONNAGE											
	FIRST 5,000 T.		NEXT 5,000 T.		NEXT 10,000 T.		NEXT 20,000 T.		NEXT 30,000 T.		REST OF TONNAGE	
	Laden	Ballast	Laden	Ballast	Laden	Ballast	Laden	Ballast	Laden	Ballast	Laden	Ballast
(1) Crude Oil Tankers	6.49	5.52	3.62	3.08	3.25	2.77	1.40	1.19	1.40	1.19	1.21	1.03
(2) Tankers of Petroleum products	6.75	5.52	3.77	3.08	3.43	2.77	1.93	1.19	1.93	1.19	1.93	1.03
(3) LPG Carriers	6.75	5.75	3.77	3.21	3.43	2.92	2.42	2.06	2.42	2.06	2.42	2.06
(4) Chemicals, Bulk liquid & LNG Carriers ⁽¹⁾	7.50	6.38	4.18	3.56	4.81	3.24	2.68	2.28	2.68	2.28	2.68	2.28
(5) Dry Bulk Carriers	7.21	6.13	4.14	3.52	2.97	2.53	1.05	0.90	1.00	0.85	1.00	0.85
(6) Combined Carriers:												
a) If carrying Crude Oil only	6.49	-	3.62	-	3.25	-	1.40	-	1.40	-	1.21	-
b) If carrying Petroleum Products only	6.75	-	3.77	-	3.43	-	1.93	-	1.93	-	1.93	-
c) If carrying more than one kind of cargo	6.75	-	3.77	-	3.43	-	1.93	-	1.93	-	1.93	-
d) If carrying Dry Bulk Cargo only	7.21	-	4.14	-	2.97	-	1.05	-	1.00	-	1.00	-
e) If carrying other bulk liquid	7.50	-	4.18	-	3.81	-	2.68	-	2.68	-	2.68	-
f) In ballast	-	6.13	-	3.52	-	2.53	-	0.90	-	0.85	-	0.85
(7) Containers vessels and Vehicle Carriers	7.21	6.13	4.10	3.49	3.37	2.87	2.42	2.06	2.42	2.06	1.83	1.56
(8) Other Vessels ⁽²⁾	7.21	6.13	4.14	3.52	3.77	3.21	2.63	2.24	2.63	2.24	2.63	2.24

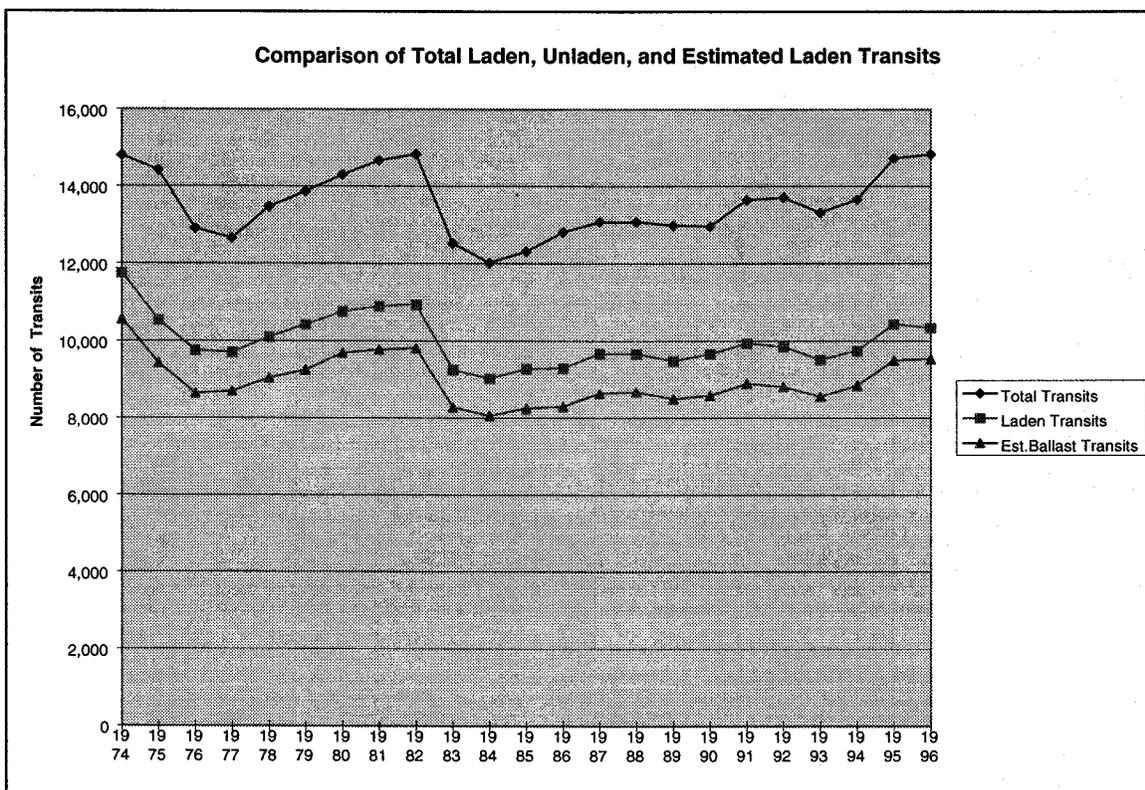
- (1) If in ballast, chemical/oil tankers are to be charged at the same rate of oil tankers.
(2) Other than special floating units mentioned in the Explanatory Note.

5.3 Appendix C - Panama Canal

The Panama Canal has been operating at a historically high rate of utilization in terms of total transits through the Canal for the last several years. This surge in transits – reaching 13,631 commercial ocean-going transits in 1995 and nearly 14,000 in 1996 and 1997- has placed operational stresses on the Canal. This corresponded to 216.7 million PC/UMS net tons in 1995 and an estimated 229 million in 1997.

There has been no period since 1974 when the total transits exceeded 15,000 laden and ballast voyages. The ratio of laden to ballast transits is close to 3 to 2; therefore, 40% of the transits are in vessels, which do not carry cargo. The transit forecast developed in this section is for ocean-going commercial cargo vessels. The additional transits from non-commercial vessels must still be factored in when considering the total potential traffic.

Comparison of Total, Ballast, and Estimated Laden Transits



The current capacity of the Panama Canal is approximately 15,000 transits, including those made by non-commercial ocean-going vessels. This equates to approximately 42 maximum sustainable transits per day. The quality of service provided by the Canal is directly related to the capacity for meeting transit demand. As such, the ideal number of transits at the moment is closer to 38-39 transits per day. As the number goes above this

operational problems begin to surface including an increase in Canal Waters Time (CWT) which is measured by the period a ship is at the waterway once ready for transit. The Canal policy is to strive to a maximum of 24 hours, yet in 1995 the CWT rose to 28.2 hours, during 1996 to over 32 hours and during 1997 times averaging 36 hours were reported.

According to the Panama Canal Commission, unless major improvements to increase the Canal capacity are completed, CWT cannot be meaningfully improved as Canal traffic continues to grow and strain the existing operating capacity.

To meet this challenge, the Panama Canal Commission has approved measures to increase and accelerate the program to provide increased capacity. This includes acceleration of the widening of the Gaillard Cut, augmentation of the tugboat fleet, design and procurement of additional locomotives, modernization of the vessel traffic management system, hydraulic conversion of miter gates and rising stem valves moving machinery and automation of locks machinery controls. This program will cost approximately \$1 billion to execute. It is intended to complete everything by the end of 2002. Funding for all these improvements is from direct toll revenue as the Panama Canal operates as a non-profit making facility. It is totally debt free.

As a result of this major capital program, the capacity of the Canal will rise to a maximum sustainable level of about 48-50 transits per day, with an operating capacity, for CWT around 24 hours, of approximately 43-44 transits per day, that is closer to an annual level of 17,000.

Ship Size and Utilization

The changing ship size and growth in ship utilization of the larger ships has been analyzed, as shown below. The shifts from smaller vessels to larger occur and smaller ships may be eliminated in the competitive environment. The ship averages reflect weighted averages from the PCC ship files.

Ship Utilization and DWT – Historical Period Only

Utilization									
Ship Type	1976	1980	1985	1990	1995	%75-80	%80-85	%85-90	%90-95
Bulk	0.75	0.75	0.75	0.81	0.82	0.0%	0.0%	8.0%	1.2%
Container	0.41	0.45	0.47	0.50	0.52	9.8%	4.4%	6.4%	4.0%
General Cargo	0.55	0.50	0.50	0.51	0.55	-9.1%	0.0%	2.0%	7.8%
Tanker	0.82	0.84	0.79	0.80	0.78	2.4%	-6.0%	1.3%	-2.5%
RoRo	0.18	0.32	0.48	0.42	0.49	77.8%	50.0%	-12.5%	16.7%
Reefer	0.38	0.36	0.29	0.30	0.33	-5.3%	-19.4%	3.4%	10.0%
Vehicle	0.21	0.26	0.23	0.26	0.25	23.8%	-11.5%	13.0%	-3.8%
Average DWT									
Ship Type	1976	1980	1985	1990	1995	%75-80	%80-85	%85-90	%90-95
Bulk	31,750	33,737	36,220	37,852	40,421	6.3%	7.4%	4.5%	6.8%
Container	25,136	21,995	27,684	32,827	31,865	-12.5%	25.9%	18.6%	-2.9%
General Cargo	11,133	10,635	11,095	12,402	12,645	-4.5%	4.3%	11.8%	2.0%
Tanker	23,315	36,626	32,162	31,351	32,496	57.1%	-12.2%	-2.5%	3.7%
RoRo	2,780	14,116	16,952	16,370	17,692	407.8%	20.1%	-3.4%	8.1%
Reefer	6,223	6,426	6,784	7,628	8,484	3.3%	5.6%	12.4%	11.2%
Vehicle	11,653	14,468	14,155	14,270	14,837	24.2%	-2.2%	0.8%	4.0%

Recent studies of the expected growth in world trade and the Canal's role in that growth have generated concerns that the capacity of the Canal may place a limit on its ability to provide safe and reliable transit by the year 2010 for ships up to Panamax size. In order to partially meet this impending capacity shortfall, the Panama Canal Commission has undertaken a major investment project to increase the capacity of the canal. Included in this is the widening of the Gaillard Cut and additional dredging to widen channels to allow vessels to pass each other. During FY1996 the following quantities, in cubic yards, were removed:

	Earth	Rock	Total
Pacific District (Maintenance)	1,790,194	N/A	1,790,194
Central District (Widening)	N/A	319,450	319,450
Atlantic District (Widening)	1,454,606	N/A	1,454,606
Total	3,244,800	319,450	3,564,250

Panama Canal Toll Structure

In the past eight decades in the waterway's history, tolls rates for the Canal have increased just eight times, with increasing frequency since 1974. Toll increases have been required due to cost inflation related to the operation and maintenance of the Panama Canal.

In 1992 the unit of measurement for ships was altered when the Panama Canal Commission approved the introduction of the **Panama Canal Universal Measurement System (PC/UMS)**. The PC/UMS system was implemented in 1994.

History of Panama Canal Toll Increases

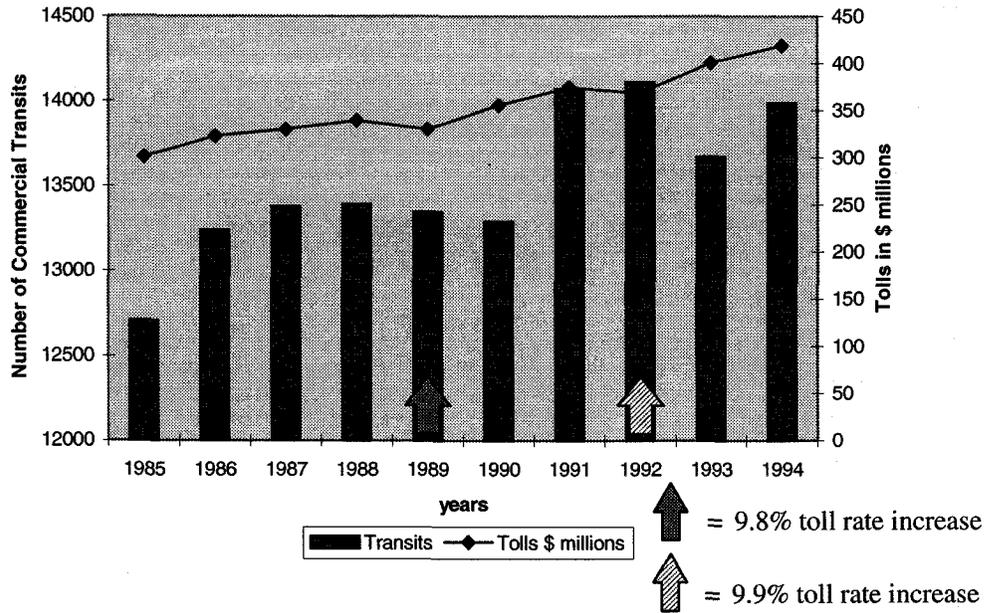
<i>Year</i>	<i>Toll for Laden Voyage</i>	<i>Toll for Laden Voyage</i>	<i>Percent Increase</i>
1915-1938	\$1.20	\$0.72	
1938	\$0.90	\$0.72	-25% on laden only
1974	\$1.08	\$0.86	19.7
1976	\$1.29	\$1.03	19.5
1979	\$1.67	\$1.33	29.3
1983	\$1.83	\$1.46	9.8
1989	\$2.01	\$1.60	9.8
1992	\$2.21	\$1.76	9.9
1997	\$2.39	\$1.90	8.2
1998	\$2.57	\$2.04	7.5

Thus, over the 18-year time period (1974-1992), the average annual increase was 4.4%, with the most recent average annual increase nearer 3%.

The Panama Canal also provides a system for vessels to book a guaranteed passage slot. This is the "booking" fee (35 CFR 104.6(b)). The fee is \$0.26 per PC/UMS Net ton, with a minimum fee of \$1,500. During periods of congestion when the authorities believe there to be at least 90 vessels for two consecutive days, a Premium-booking fee of \$0.69 per PC/UMS Net Ton is applied. The minimum Premium-booking fee is \$4,000.

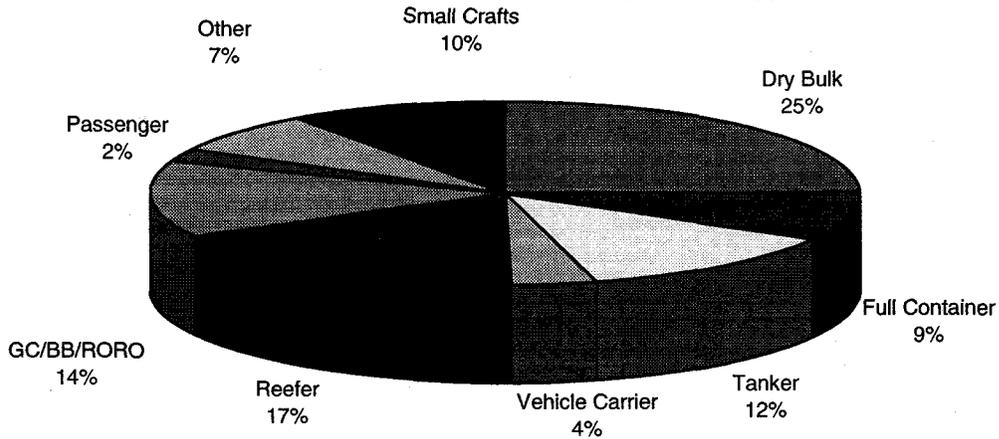
When annual transits and their corresponding toll revenues are compared with each toll increase, a direct relationship may be derived. The chart below shows the number of commercial vessel transits and toll revenues from 1985 to 1994. The arrows in 1989 and 1992 denote the recent toll increases. Toll receipts are seen to increase after the 1989 change. After the 1992 toll change, tolls fall but quickly rebound in the following years.

Comparison of number of Commercial Transits and Tolls Collected per Year (1985-1994)



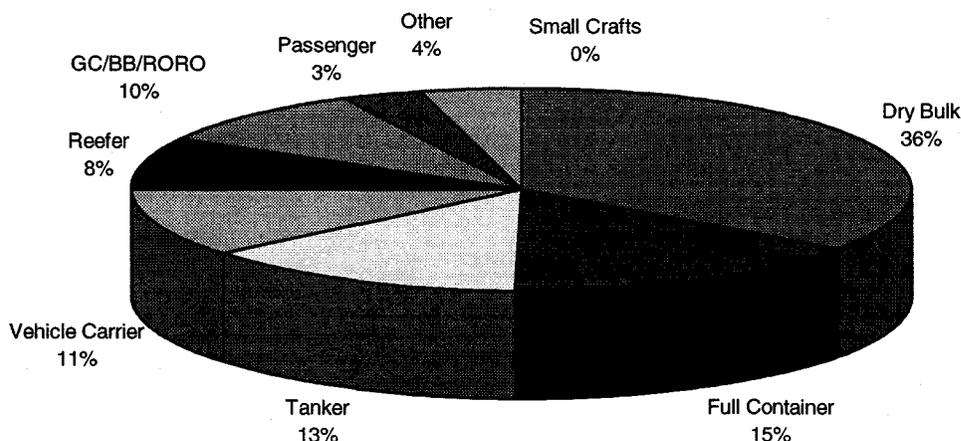
The graphs below summarize the distribution of traffic across the most important market segments, in terms of both number of transits and toll revenue. The largest market segment is dry bulk, accounting for 25% of transits and 35% of tolls revenue. Other important segments are full container ships and tankers, especially when considered in terms of tolls revenue. It is interesting to note that the combination of dry bulk, containerships, tankers and vehicle carriers account for 75% of tolls revenues versus only 50% of transits. This reflects the larger carrying capacity of these vessel types. Reefers, general cargo vessels, break bulk and other smaller cargo vessels represent 33% of transits and just 22% of revenues.

Distribution of Vessel Transits by Vessel Type



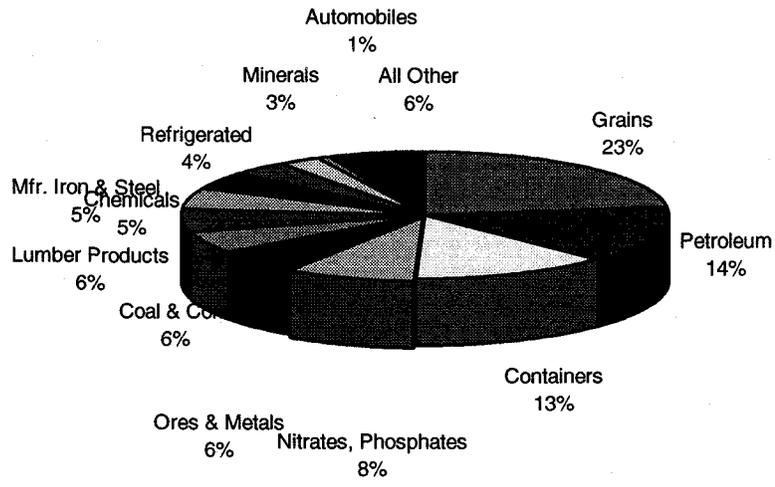
A strong pattern can be observed with respect to the distribution of traffic by trade route as observed in the graphics below. Five major trade routes, or origin-destination pairs, account for 76% of cargo tonnage, with just one, between East Coast North America and Asia, making up 44% of cargo tonnage. The other major routes link the East Coast of North America with other Pacific locations and Europe with the West Coast of the Americas. The Canal is particularly important to trade in the hemisphere. About 64% of Canal business originates or is bound for the US and about 14% of total US trade makes use of the Canal. The Canal is the major trade route also for some countries in Latin America.

Distribution of Toll Revenues by Vessel Type



Segmented by commodity type, cargo is similarly concentrated in a few major classes, with grains making up 23% of total cargo, followed closely by petroleum products including crude oil at 14% and containers at 13%. The majority of the cargoes are low-value bulk commodities which typically are influenced more by low transport cost than time and reliability of service. Nevertheless, some important segments such as containers and other fast-growing high-value cargo segments (edible oils, perishable food products, automobiles, etc.) place a premium on transit time and reliability as the time value of the cargo and the cost of delays are often far greater than the direct cost of additional transport time.

Cargo Tonnage by Commodity Type



5.4 Appendix D - Questionnaire

June 30, 1998

Dear:

The Columbus Group, a maritime consulting company, is requesting your help in a study of funding of dredging of commercial ports. We are asking for you to complete the short port questionnaire that follows and return it by fax. Our fax number is +01 (703) 351-6634.

In gratitude for your assistance, we will provide those responding with the results of our comparison of international port dredging financing. Our research has been commissioned by the Corps of Engineers in the United States; the US government agency responsible for dredging US ports and harbors.

If you have any questions regarding this survey or research please contact Mr. Paul Bingham or me at the address below.

Sincerely,

Ben Hackett, Senior Vice President
Director, Maritime Consulting
The Columbus Group
2111 Wilson Boulevard, Suite 1200
Arlington, VA 22201-3001
USA

+01 (703) 351-6620 x312
+01 (703) 351-6634 (fax)
bhackett@thecolumbusgroup.com

Port Dredging Finance Questionnaire

Please fax to +01 (703) 351-6634, no page cover needed

The following questionnaire should less than five minutes to complete. Please complete as much of the information as possible. If you do not know an answer or some questions do not apply, please complete the remaining questions. For all questions, answer from the perspective of the primary commercial port. Thank you for your participation in this research.

1. What organization has responsibility for dredging navigation channel(s)?
 - 1a. Is this organization under national, state, port authority or private control?
2. How does this organization pay for dredging? (e.g. line item in general maintenance expense budget or a separate dredging project budget)
3. Where does the organization get the money to fund the dredging expense? (e.g. part of port dues or port fees, general government taxes, or a separate dredging fee)
4. If dredging is not funded from general government tax revenues, what organization levies the fees?
5. To your knowledge, are there provisions under the law, treaty, or the country's constitution that constrain how revenues may be collected in this country?

Questions 6 through 8 refer to port charges, fees, and port dues for commercial ports in the country.

6. What is the structure of port fees and charges levied? What are the port fees, dues, or charges?
 - 6a. On what basis are vessel charges, if any, assessed? (E.g. GRT, NRT, LOA, Type of ship)
7. What is the allocation, if any, of the port fee or port charge revenue between local/regional/national entities?

8. Who pays the port fees or charges, either directly or indirectly? (e.g. ship operator, cargo shipper)
9. What would be the fees/charges for the following two example vessels:
 - a. Cellular vessel of 60639 DWT, 52191 GT, 25487 NT, Beam 32.3 Meters, LOA 294.1 Meters
 - b. Bulker of 62180 DWT, 37323 GT, 18583 NT, Beam 32.21 Meters, LOA 228.0 Meters

Name/Title _____ Telephone _____

Organization _____ Fax _____

Address _____ E-Mail _____

EVALUATION OF INTERNATIONAL DREDGING FINANCING PRACTICES

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December 1998

IWR Report 98-R-7

Views, opinions, and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy, or decision unless so designated by other official documentation.

Acknowledgements

This study was conducted for the U.S. Army Corps of Engineers, Institute for Water Resources, Navigation Analysis Division (IWR-N). Mr. Ben Hackett of The Columbus Group of Arlington, VA., was the principal investigator and Mr. Jack Keifer of Planning and Management Consultants, Ltd. of Carbondale, IL, provided contract management and oversight. Over all project direction was provided by Mr. Phillip J. Thorpe of IWR-N. Review and comments were provided by Ms. Mona J. King, Ms. Christine M. Brayman and Mr. Robert A. Pietrowsky of IWR-N. Study oversight was provided by Mr. Raleigh H. Leef of the U.S. Army Corps of Engineers Headquarters, Policy Review and Analysis Division within the Directorate of Civil Works.

Executive Summary

This study examined how dredging projects in foreign ports are typically funded and identified who is responsible for dredging operations, whenever possible. Data for this study was collected and gathered from questionnaires and secondary sources. The study examined the dredging financing policies in nineteen countries, including nations in Western, Central and Eastern Europe, Southeast Asia, Australia, and Latin America (see Table ES -1 for a complete listing). These countries were selected because of their significance in world trade, their port infrastructure policies, and availability of the data. Cumulatively, these nations represent approximately 50 percent of world seaborne metric tonnage.

Investigation of port and harbor fees and dredging financing around the world demonstrated the wide variety of approaches used in other countries. The use and structure of port and harbor fees are fundamentally dependent on each nation's own political structure and each country's perception of the importance and role of ports to their national economy. Although no dredging financing models were identified that track exactly with the approach currently used in the U.S., or identical to the proposed harbor service fee concept, many countries fund port dredging activities from their national or state budgets, financed either partially or wholly by port-assessed charges.

Key findings include:

- All ports collect some menu of user fees from vessel operators, which are often composites of wharfage, docking, pilot services, etc. These fees are usually referred to as "port charges", "channel fees", "harbor fees" or are sometimes integrated into "wharfage charges" or other fees. Collections from such fees are often used to finance operations, maintenance, and improvements to the port infrastructure, which almost always includes dredging. Table ES-1 provides a summary of the dredging financing mechanisms used in the countries surveyed.
- User fees are collected from the vessel operators for what is essentially viewed as the "marine-side" or "waterside" of port operations, that is, relating to vessels moving from international waters into port navigation channels leading to access for terminal quays. In most nations, responsibilities for berth or quayside dredging shifts to the terminal operator, as does virtually all landside and cargo handling operations. This division of responsibilities is consistent with the convention applied in U.S. ports.
- Fees are predominantly based on vessel size (NT or GT) and sometimes defined by vessel type. There are also examples of charges being based on operational factors, such as a charge on vessel draft (Argentina).

- Administration of the fee collection systems around the world vary considerably from nation to nation, with the models ranging from the collection agent being an agency or ministry of a federal government, a port authority, or a private sector concessionaire (Argentina).
- In most of the countries where user fees are collected and the port is not privatized, the fees are deposited into the national treasury for distribution. In most cases it is not clear whether such deposits are into a nation's "general treasury" or into an identifiable "trust fund" dedicated to port or dredging activities. Usually the fees are subsequently redistributed back to the ports in the form of "general revenues", based on government policy and the port's budgetary needs.
- In many cases the complex structure of port charges and the variety of budgetary practices preclude a direct linkage between the user fees collected and the financing of dredging activities. However, three specific cases (Argentina, Australia, and Canada's St Lawrence Seaway) were identified. Where a direct linkage could not be identified, there is generally a strong indirect link between the collection of port user fees and dredging costs incurred at a nation's ports for maintaining and improving waterside infrastructure.
- An examination of international terminal handling charges (THCs) did not reveal any apparent portion of these fees allocated to specific dredging activities.
- To the extent that a port project may require a capital expenditure that exceeds the available funds, then other sources of revenue (other tax revenue or loans) are used in some countries to meet the funding requirement (Latvia, Lithuania, Tunisia and Nicaragua). These sources of revenue are provided by multilateral institutions such as The World Bank, the Inter-American Development Bank, and the European Bank for Reconstruction and Development.

The table below (ES-1) represents a summation of the key findings of the study laid out by key categories for 19 countries. Wherever definitive information was available this has been so identified, but when there was either uncertainty or a lack of definitive information, it is reported as an "N/A". There were also some cases identified of multiple organizations responsible; this has been highlighted.

Table ES -1

Country	Dredging Responsibility	Collection of Fees ¹	Fee Basis	Distribution of Fee	Financial Mechanism
France	National Government	National Government	N/A	National Government	National Government
Germany	Port Authority	Port Authority	GT/ vessel type	State Government	State/National Government
United Kingdom	Port Owner (e.g. ABP)	Port Owner	GT	Port Owner	Port Owner/ National Government
Canada (St. Lawrence Seaway)	Canadian Coast Guard	National Government	GT	National Government	National Government
Latvia	Port Authority	Port Authority	N/A	Port Authority	EBRD, National Government
Lithuania	Port Authority	N/A	N/A	N/A	World Bank, EBRD, Japan, Netherlands, National Government
Russia	N/A	Ministry of Transport	Per cubic meter	Ministry of Transport	National Government
Australia	State/Private	Port Authority	GT	State/Port Authority	N/A
China	Regional Engineering Bureaus/Ministry of Communications	N/A	N/A	N/A	National Government
Japan	Ministry of Transport	Port Authority	GT	National Govt./Port:50/50	National Government
Hong Kong	Marine Bureau/National Government	Private Operators	N/A	N/A	N/A
Malaysia	National Government	Port Authority	LOA meter length	National Government	National Government
Singapore	National Government	National Government	N/A	National Government	National Government
Thailand	Ministry of Communications/Port Authority of Thailand	Port Authority of Thailand	NT	National Government	National Government
Argentina	Private	Port Authority	NT	Port Authority	Fees and subsidy split
Colombia	Ministry of Transport	Port Authority	N/A	Ministry of Transport	National Government
Mexico	Terminal Operators	Port Authority (APIs)	N/A	APIs & Central Ministry of Transport	N/A
Panama	Terminal Operators	Private Operators	GT	Private Operators	Fees
Lebanon	Port Authority	Port Authority	LOA	Port Authority	Port Budget
Tunisia	Port Authority	Port Authority	Per cubic meter	Port Authority	Port Authority, World Bank, Netherlands

¹¹ These fees may or may not include specific harbor maintenance components. Generally they include wharfage, pilotage, general access fees, among others.

Table of Contents

ACKNOWLEDGEMENTS	iii
EXECUTIVE SUMMARY	v
CHAPTER 1.....	1
1. INTRODUCTION	1
1.1 <i>Background</i>	1
1.2 <i>Purpose and Use of This Research</i>	2
1.3 <i>Organization of Report</i>	2
1.4 <i>Research Approach</i>	3
CHAPTER 2.....	5
2. OVERVIEW OF PORT INFRASTRUCTURE FINANCING	5
CHAPTER 3.....	7
3. CASE STUDIES OF INTERNATIONAL PORT HARBOR FEES AND CHARGES	7
3.1 <i>Approaches Currently in Use</i>	7
3.2 <i>Canada</i>	9
3.3 <i>Western Europe</i>	9
France	9
Germany	9
United Kingdom	11
3.4 <i>Eastern and Central Europe</i>	12
Latvia.....	12
Lithuania.....	13
Russia	13
3.5 <i>Asia/Australia</i>	13
Australia.....	14
China	14
Japan.....	14
Hong Kong	15
Malaysia.....	16
Singapore.....	16
Thailand.....	17
3.6 <i>Latin America</i>	17
Argentina	17
Colombia	21
Jamaica	21
Mexico.....	21
Panama	22
3.7 <i>Other Countries</i>	22
Lebanon	22
South Africa.....	23
Tunisia	23
3.8 <i>Comparison of International Terminal Handling Charges (THCs) for Container Operations</i>	23
Port Dues	25
3.9 <i>International Waterways</i>	26
SUMMARY AND CONCLUSIONS	29
APPENDICES.....	31
5.1 <i>Appendix A - St. Lawrence Seaway Regulations</i>	31
5.2 <i>Appendix B - The Suez Canal</i>	41
5.3 <i>Appendix C - Panama Canal</i>	45
5.4 <i>Appendix D - Questionnaire</i>	53

CHAPTER 1

1. Introduction

This report presents the results of research into harbor and deep draft navigation channel funding practices around the world.

1.1 Background

The March 31, 1998 decision by the United States Supreme Court on *U.S. Shoe v. The United States* found the Harbor Maintenance Tax (HMT) unconstitutional as applied to exports. Collection of the *ad valorem*¹ tax on exports was halted on April 25, 1998. The Court's decision also has international trade implications. The U.S. is currently engaged in consultations through the World Trade Organization (WTO) regarding a claim by the European Union that the HMT violates the *General Agreement on Tariffs and Trade* (GATT).

The purpose of the fee was to provide Operations and Maintenance (O&M) funding for the dredging of federal navigation channels constructed and maintained by the U.S. Army Corps of Engineers (USACE). To operate and maintain channels in Fiscal Year 1999, some \$500 million is being allocated by the USACE from the Harbor Maintenance Trust Fund, which is the depository for the receipts.

The Supreme Court ruling leaves the existing Harbor Maintenance Tax on domestic and import shipments and passengers in place for the time being. Additionally, the Court's ruling did not preclude a true harbor maintenance fee on exports. In fact, the Court appeared to invite Congress to revisit the maintenance fee funding mechanism within the framework of user charges that would fairly match the exporters' demand for harbor services and facilities.

Congress originally created the Harbor Maintenance Tax in 1986 in response to growing public demands for reduced direct federal subsidies for water resource projects. The *ad valorem* tax (assessed by value of the goods) was imposed and then increased in 1990. Conceptually, it was intended that the tax should not influence shippers or carrier's choices of one port versus another.

To meet the Supreme Court's requirements for constitutionality, any new fee or charging mechanism must be related to the value of service provided. The Court noted that the extent and manner of port use depends on factors such as the size and tonnage of a vessel, the length of time it spends in port, and the services it requires, for instance, harbor dredging (114F. 3d, at 1572).

1.2 Purpose and Use of This Research

The USACE commissioned this research into the deep draft navigation infrastructure practices of other World Trade Organization (WTO) countries with major seaports and a strong maritime industry. This report discusses the results of the research identifying and evaluating international port and harbor funding and revenue collection policies in other countries.

The following factors have been researched:

- The entities responsible for dredging
- Dredging funding mechanisms
- Legislative or constitutional constraints on funding mechanisms
- The entities responsible for levying fees
- The levels of port fees and charges levied
- The mechanisms for how port charges levied
- Who pays for port charges
- Determination of whether separate elements of charges collected, specifically fees for dredging navigation channels and berth access channels, can be identified.

The mechanism for how port charges *are* levied have been examined for operations and maintenance dredging as well as new project construction.

This report can serve as an introduction to policy makers in the United States on how dredging is funded and how navigation channels are maintained abroad. Because of the well established role of Congress and USACE in navigation and water resources policy making, discussions regarding U.S. dredging policy options have rarely considered the alternative practices and policies used overseas. The invalidation of the Harbor Maintenance Tax presents policy makers with an opportunity to develop an innovative navigation funding mechanism that is both legal and equitable to the users of the navigation system. This review of the funding policies of other governments confirms that the United States is not developing policy in a vacuum. An understanding of practices in other countries will also assist policy makers in addressing potential concerns of ship operators, importers and exporters, and their representatives, especially foreign ones.

1.3 Organization of Report

The report is organized as follows: An executive summary, the report itself and appendices. The main report has four sections. Following this introductory section one, section two contains an overview of world port infrastructure financing and mechanisms. Section three presents the international country case studies. The international country port fees and charges case studies are organized by world region as follows: Western Europe, Eastern and Central Europe, Asia/Australia, Latin America and other. For clarity, the situations at selected individual ports are presented in the context of the

country organization of the material. Section three also contains a comparison of international container port terminal handling charges. Finally, section four presents the summary and conclusions. Appendices A, B and C detail charges for the St. Lawrence Seaway, the Suez Canal, and the Panama Canal, respectively. Appendix D contains a copy of the port questionnaire used in the research for the study.

1.4 Research Approach

Research was conducted by means of fax questionnaires and telephone discussions with individual port authorities, local and national governments and associations in the relevant countries in this initial analysis. Since the number of recipients of any individual questionnaire were quite few, questionnaires did not require Office of Management and Budget (OMB) review. Where possible, local expertise was used to augment the contractor's research efforts from the U.S.

Three completed questionnaires were returned. A number of others were passed to different institutions. For example, in the Netherlands, the contact at ECT passed the document to the Rotterdam Port Authority. A number of other questionnaires have been promised, but at the time of writing have not yet been returned.

Numerous follow ups by fax and direct telephone contacts were made. It is felt that a direct meeting with the port authorities would have yielded better results. To achieve more comprehensive results, it is recommend that a series of direct face-to-face meetings, particularly in Northern Europe, be carried out.

Given the incomplete return of the questionnaires, the information search was extended to cover additional countries beyond that which was envisaged in the Scope of Work.

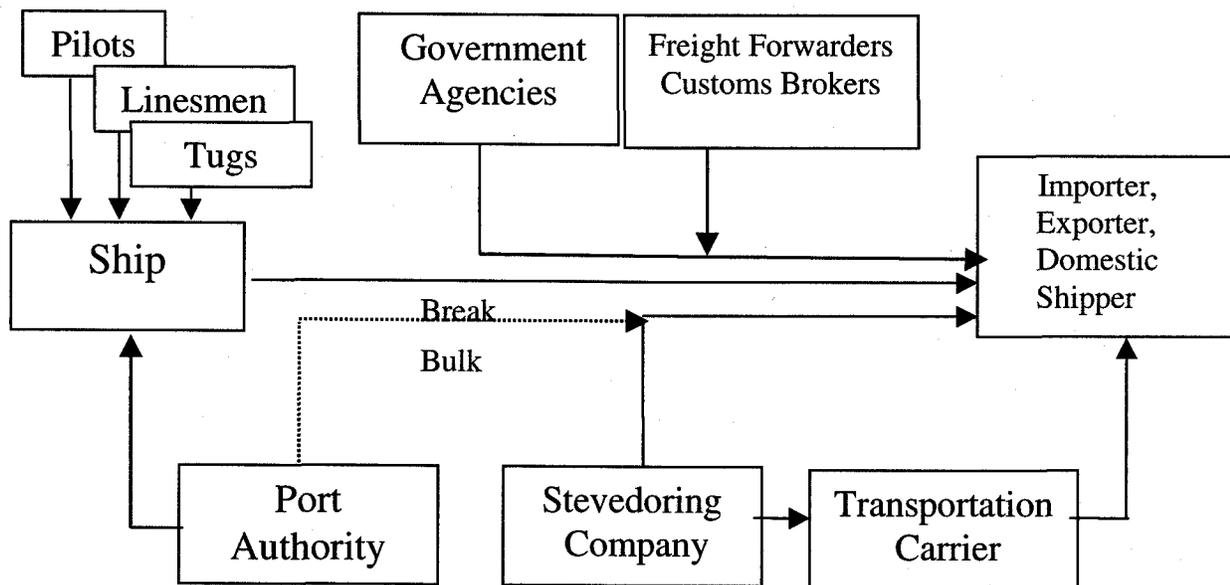
CHAPTER 2

2. Overview of Port Infrastructure Financing

Port infrastructure is financed using a variety of mechanisms throughout the world with the most common being direct funding from the national government. However, in some countries such as Australia and Argentina, port charges are now used to collect funds for port infrastructure. In the countries where the national governments no longer fund port infrastructure the ultimate port infrastructure funding source is the purchaser of the imported goods. Regardless of how port infrastructure is funded, there are already established practices of assessing charges for port activity. Payments occurring within ports range from wages or transaction fees for vessel and cargo handling to lease payments for long term use of facilities or equipment. There are also licenses, permits, registration and a variety of other fees assessed against port users.

The mechanisms used to collect charges in a port vary, but the common element for international goods trade is the assessment of charges flowing toward the shipper, whether importer, exporter, or domestic shipper. The exhibit below demonstrates an example of assessment flows in a port, regardless of purpose or use of the funds. Each of the arrows represent a potential assessment of charges and, therefore, a potential point for infrastructure funding collection. These flows are not comprehensive with government revenue collection represented by tariff assessments on importers or fees charged to exporters. Obviously there are other government fees and taxes assessed to the other entities in the port system not represented in this flow chart.

Example Flows of Port Charge Assessments



CHAPTER 3

3. Case Studies of International Port Harbor Fees and Charges

In this section, the port control, revenue collection and dredging finance situation is reviewed in a sample of countries throughout the world. These countries were selected for their significance to world trade, their port infrastructure policies, and availability of information. The countries are organized alphabetically within each region: Western Europe, Central and Eastern Europe, Asia, Latin America, and Other countries. Critical information relating to user fees with dredging responsibilities is highlighted with bold face in the text.

3.1 Approaches Currently in Use

Investigation of port harbor fee and dredging financing around the world has demonstrated the wide variety of approaches in use in other countries. Not surprisingly, the differences in port and harbor fee policy mirror the differences in political and economic structures across countries. The differences in policy and governmental organization and the complexity of the various fee structures, and difficulty in tracing the linkages to the intended funding uses, present some difficulties in making direct comparisons of water resources and navigation financing policy, and in explaining differences in port charges and harbor fees. Furthermore, the global spread of market based economic policies, including extensive port privatization, has resulted in changes to the traditional port funding policies for many ports. In some countries, changes in ownership, operation and funding for ports have had the side effect of changing the process for port improvements. In many countries these policies are still in a state of flux.

Historically, the purpose of port fees and harbor charges was fundamentally dependent on each country's perception of the role of ports in their economies. One common approach to the role of ports holds ports to be an important part of the social infrastructure, serving the economy with jobs and as a facilitator of trade development. This has been a common view throughout the European countries and in much of Asia. In these countries, it has been government policy to accept the possibilities that some ports would operate at a loss and be subsidized by government from general revenues. This view is still held by many countries today, despite the significant worldwide trend toward privatization and market-based performance standards for government entities. It has been common for capital works such as dredging and other port infrastructure development to be considered public goods for which the government has responsibility. As a result, the funding mechanism has primarily been either direct government expenditure or indirect financial support to regional or local government or port agencies through favorable below-market or very long-term government loans. The most common practice in the countries examined is for the national government to pay for harbor infrastructure operations, maintenance, and expansion out of general government

revenues. Fees are typically collected by state port authorities but are not generally earmarked for harbor maintenance.

The new trend towards market-based performance standards for government enterprises considers ports to be industry infrastructure that performs best when subject to the discipline of the market. Under this view, port infrastructure would pay for itself through benefits returned to the economy implicitly by generating a positive financial rate of return and optimally at market rates. Government can still be the owners of the infrastructure from this perspective, but the financial performance of the infrastructure itself must justify its existence. This need for financial justification has led to the “user fee” concept in which port users pay their proportional share of the costs of maintaining the infrastructure. Specifically for harbor and channel maintenance and development, the cost of the navigation channels should be borne by those that use them in proportion to their use.

In the extreme, the market approach to port and harbor infrastructure policy permits the complete privatization of ports, harbors, and channels. This action allows and encourages private sector entities to make the decisions regarding operations, maintenance, and development of the port infrastructure. The tradeoff is that the potential financial rewards to the private entities taking ownership and control are intended to compensate for the risks in investment and operations inherent in the decision making of the firms. In the cases of privatized ports and harbors, the contribution of infrastructure to the economy can be more explicitly measured through taxes, license and purchase fees paid to the government seller and dividends and earnings for the private owners and operators. Australia has already adopted this model, leaving the consequential control and financial responsibility for dredging entirely in private hands.

Direct comparisons of fees collected on harbor and port use have proved difficult, as the structure of port charges and the different operating environments around the world make definitions of the intended use of fees collected difficult to identify. The differing approaches to port subsidies, as well as port payments for capital spending, operations and non-seaport functions, all affect the level and use of port and harbor charges. This adds a further degree of complexity to harbor funding comparisons. It must also be recognized that the analysis is based on extensive but still incomplete information. This research has considered only fees and charges levied on the final users (e.g. ship or cargo owners, importers, and exporters) and not the indirect charges levied on port service providers or embedded in facility and ancillary charges.

Another dilemma affecting fee comparisons across countries is the difference in terminology of fees and charges. The differences transcend language translation issues to the intent of the governing law and the classifications and measurements used to calculate required payments. Even within countries, differences appear port – to – port. The names and definitions of charges and fees are often evolved from local custom or practice that has long lost its meaning except for its adoption as an expected and common practice at a specific port.

3.2 Canada

The study addressed only the St. Lawrence Seaway.

The Canadian Coast Guard (CCG) announced that there was going to be an interim St. Lawrence Ship Channel Maintenance Dredging Services Fee (MDSF) effective September 1, 1997. The proposal to implement this new charge emanated from the Canadian Government as a means of addressing the maintenance dredging contracts and contract management costs until a long term management mechanism is implemented. The fee structure was legislated as a temporary measure for up to two years.

As part of the overall policy on National Marine Strategy, a decision was made to withdraw the CCG from funding dredging across all of Canada. The responsibility of dredging is to be transferred to beneficiaries.

For 1997/98 the MDSF intended to generate about \$C3.02 million on a full year basis to be allocated \$C2.9M for the dredging contract and \$C120K for Contract Management.

3.3 Western Europe

France

Port infrastructure and channel construction has long been the responsibility of the national government in France. The assumption has been that the high cost and long operating life of water infrastructure projects were beyond the long-term financing capacity of financial markets. **With national government funding available, the practice of making users pay for waterside port infrastructure has been rare in France.** The national budget pays for infrastructure from general revenues, not any specific fee collected from the maritime industry. Private operators pay only for landside development.

Germany

In Germany, there are no general provisions under the law, treaty or within the Constitution that constrain how revenues related to ports are to be collected. Ports do not make a distinction among port fees paid by local, regional or national entities. Therefore there are no statistics available as to the allocation of revenues on this basis. Two examples follow of dredging financing practices in Germany at the country's largest ports, Hamburg and Bremerhaven.

The port of Hamburg is operated by the Free and Hanseatic City of Hamburg, which is a federal state of the Federal Republic of Germany. The Ministry of Economics within Hamburg, is responsible for infrastructure maintenance and development, which includes

such items as quaywalls, water depth, roads, bridges and rail facilities within the port boundaries.

The state Ministry of Economics of the City-State of Hamburg manages the Department of Hydraulic and Port Construction. An annual budget is allocated to the Department, which is part of the overall budget of the Free and Hanseatic City of Hamburg.

The Port of Hamburg is run as a landlord port² where the port activities such as cargo handling, storage, distribution, etc., rests entirely with the private sector. This is also true for additional services like tug towage, mooring, ship dispatch, delivery of equipment, maintenance and repair of vessels. Pricing is market driven without recourse to the state.

The Hamburg port administration is involved in three areas:

1. It sets the rents for areas and quaywalls.
2. **It fixes the Harbor dues which are levied on every sea going vessel, depending on vessel's gross tons (GT) and the period of stay.**
3. It fixes the dues for the port pilot.

The harbor dues are different for liner and tramp shipping. Terminal handling charges are negotiated between the shipping lines and the terminal operators. In all cases, the vessel operator is responsible for the payment of harbor dues and terminal charges.

For a representative container vessel (52,191 GT), the harbor dues would be DM18,583.20 (\$11,061) and for a bulker (37,323 GT), the dues are DM25,140.20 (\$14,964).

The port of Bremerhaven comes under the jurisdiction of the Free and Hanseatic City of Bremen, which is a federal State within the Federal Republic of Germany. The City/State of Bremen administers the ports via the Ministry of Ports.

The port dues are made up of:

- Tonnage dues for the berth
- Port fee for the harbor pilot
- Fee for waste disposal
- Quay dues for loading/discharging of cargo.

The fee structure is embodied within the tariff rules of the "Hafengebuerenordnung" HgebV-12/2/76. **Fees are levied on the basis of gross tons (GT) based on the International Tonnage Certificate (69), or the weight (tons) of loaded/discharged goods. Vessels are distinguished by type of ship (RoRo, Container, bulk, reefer, etc.) which applies only in the case of tonnage dues. All revenue is returned to the City of Bremen, Ministry of Ports, which subsequently reimburses the service fees, (e.g. fee levied on pilots and waste disposal).**

² Landlord ports own the land but lease facilities for others to operate.

In all cases, the ship operator/owner is responsible for the payment of the fees, usually via their port agent. The breakdowns of the fees, based on the representative ship types are:

Container Vessel:

- Tonnage dues (\$20,538) DM 34,504.00 (max. stay allowed 1 days)
- Pilot using without locks (\$1,094) DM 1,838.00
- Pilot using locks (\$1,560) DM 2,620.00
- Waste disposal (\$118) DM 198.90 per 48 hours
- Quay dues, per container/ton (\$4.64) DM 7.80 per ton (highest fee)

Bulk Vessel:

- Tonnage dues (\$14,676) DM 24,655.00 (max. stay 14 days)
- Pilot using without locks (\$830) DM 1,394.00
- Pilot using locks (\$1,189) DM 1,998.00
- Waste disposal (\$118) DM 198.90 per 48 hours
- Quay dues, charged per ton (\$4.64) DM 7.80 per ton (highest fee)

United Kingdom

In the United Kingdom, privatization has been adopted as national policy, broadly and specifically, for the ports industry. The current law governing British port industry is established in two pieces of legislation, the Harbors Act from 1964, and the Ports Act, adopted in 1991.

Harbors Act. As of 1964, the English Harbors Act established a National Ports Council that provided control of harbor development and financial assistance for the improvement of harbors, as well as maintenance, related charges and management of harbors. The National Ports Council was funded by charges levied on the various harbor authorities.

The United Kingdom Government (Ministry of Transport) however, is the final arbiter of construction/reconstruction work as well as improvement or repair of a harbor, in all cases where the expenditure appears to be one of a capital nature. Within this same framework, the UK Government can decide to fund part or all of the expenses incurred as a result of capital construction or maintenance.

Notwithstanding it has remained the responsibility of the individual port authorities to ensure the safe and uninterrupted movement of ships in the harbor and the approaches thereto. This has included the designation of ship channels and vessel routing within the area under the port authority's responsibility.

It is the responsibility of the Port Authority to levy harbor dues, however the Government has the right to revise these charges subject to a proper review procedure. In the case of the privatized ports the new landlord is responsible for funding the dredging of channels. **Both Felixstowe Port, operated by Hutchison Port Holdings, and Southampton,**

operated by Associated British Ports, carry out channel dredging. The cost of this is passed on as part of their annual lease agreement with the terminal operators and can be assumed to be passed back to the users.

Ports Act. In 1991 the Government of the United Kingdom enacted the Ports Act to provide for the transfer to the private sector of certain statutory port undertakings, securities, land, properties and liabilities, in other words the privatization of the ports. As part of this statute, a separate Port Authority would continue to administer those functions that the new port companies did not have transferred to them. This effectively left the non-terminal capital construction and maintenance (including dredging) under the control and responsibility of the slimmed down port authority.

3.4 Eastern and Central Europe

Since the demise of the Soviet Union, substantial investments in cargo port infrastructure have been made throughout the newly independent countries of eastern and central Europe. Significant privatization has occurred for individual terminal facilities and port services, such as stevedoring. However, the underlying port and harbor infrastructure remains in state hands. Development of the ports has required improvements to navigation channels and berths, usually integrated into other port expansion projects. Given the poor macroeconomic situation in these countries, the capital for such projects is not generally available internally, so most of the development has involved funding from international agencies or developed countries. This international funding is just a part of the long-term economic development strategy of these countries, which is intended to generate growth through increased trade. The lending authorities are operating under the assumption that lower transportation costs and more reliable services for the importing and exporting of goods will promote development of other industries, thereby increasing the general welfare in these economies.

Latvia

Since independence, Latvia has reestablished its port of Riga to its former role as serving as a gateway for large cargo volumes to and from Russia. Since 1994, the port has been owned by the Riga Port Authority, which is controlled, in equal amounts by the national government and the Riga municipal government. The port acts as a landlord to privatized terminal operators, but retains responsibility for operations, maintenance and development of the port infrastructure. The port of Riga has been successful in attracting additional cargo and is recapturing Russian trade, which was lost immediately after independence. **The Port Authority has set competitive rates for port charges, and has attracted international funding to support port reconstruction,** (mostly to serve transshipment cargo, which makes up over 80 per cent of cargo tonnage through the port).

In addition to Russia, other countries in the former Soviet Union such as Uzbekistan and Kazakhstan use Riga as their principal shipping port. As most of this trade is bulk or general cargo, and not lighter weight container or RO/RO traffic, the navigation channel

depths recently have been improved to accommodate deeper draft vessels. **The cost of deepening the main channel and related harbor berths to 11.5 meters has been funded out of the Port Authority Capital budget, with support from international agencies and the Latvian central government**

Lithuania

Lithuania, like the other Baltic nations, has laws and regulations that are relatively new following independence from the Soviet Union. The major seaport in Lithuania is Klaipeda, which is now undergoing substantial infrastructure improvements. Following independence, responsibility for the port's infrastructure was given to the Klaipeda State Seaport Authority. The terminals and stevedoring operations at the port were privatized but **the port authority is still responsible for the operations and maintenance of port infrastructure, including dredging the harbor entrance, navigation channels, and berths.**

Investment in the port's infrastructure is funded through user charges and multilateral loans. Navigation channel and berth deepening as well as rehabilitation of the harbor entrance are being undertaken with financial support from the World Bank, the Netherlands, Japan and the European Investment Bank.

With international agency support, the charges and fees on vessel calls and cargo have been "increased" or "levied" to fund specific harbor improvement projects but are still kept at levels that are very competitive with other European sea ports.

Russia

In Russia, the national Russian Ministry of Transport oversees a national budget for the ports, with limited local port control or responsibility for infrastructure. The port authority levies a port tariff on vessels which is used by the State for infrastructure improvements. The port tariffs charged at competing Latvian and Estonian ports are lower than at Russian ports such as St. Petersburg which results in Russian trade going through those Baltic ports.

3.5 Asia/Australia

Asia presents the extremes in the world regarding approaches to port funding, control and responsibility. From the tax-paying completely private ports of Australia to the central government control of China, the variety of policy approaches are clearly evident. The only channel dredging policy model missing is that which has developed in the United States, with a mix of local port authority and national funding and control, paid for by the users through a specific harbor maintenance fee. As many of the economies of Asia (e.g. Singapore and Hong Kong) have been built on the activity and development of their seaports, the government harbor policy making has evolved with a much greater level of public interest and attention than is found in most other countries. The peculiar Asian

capitalist economic business cultures have also strongly influenced harbor policy in these countries. We examine a variety of these economies from the perspective of their recent harbor policy and dredging finance.

Australia

In the last ten years the Australian port system has undergone as much radical restructuring and change as in any country in the world. Australia has pursued port privatization aggressively and has introduced a variety of fee structures and revenue raising mechanisms around the country.

For example, **the ports of Fremantle and Melbourne have access charges that are based on vessel tonnage and are intended to cover dredging costs.** The port of Sydney levies a “navigational service charge” on tonnage that is similar to port dues and goes into the budget that covers dredging the port. The state and Northern Territory governments oversee the port authorities but the responsibility for channels lies with the port authorities or their privatized contract operators. **Revenues to Australian port authorities include pilotage dues, tonnage dues, the harbor maintenance levy, leases and wharfage charges.** Also, port authorities in Australia pay a sales tax equivalent on revenue to the state government. Under Australian law, waterside authority extends, on a port basis, to ten nautical miles from harbor entrances. In Australia, sea dumping is allowed for maintenance dredging, but sediment sampling and environmental permitting is required. Many Australian ports have adopted innovative dynamic under keel clearance systems to estimate swell, tide, and vessel squat in order to maximize tidal windows for sailing and minimize required dredging.

These systems have been developed by engineers and naval architects for the vessel fleets calling Australian ports. The systems are sophisticated computer models customized for each port.

China

The government of China has rapidly expanded its maritime cargo ports to handle the surging international trade volumes it has experienced over the last two decades. In other segments of the China economy, the central government’s revenues and budget control the port industry, including the funding for expansion and channel dredging. Regional Engineering Bureaus under the Chinese Ministry of Communications are responsible for dredging but the funding and budget approval are made at the national level. **There is no Chinese harbor or water resources maintenance fee but there are port charges assessed to vessels calling Chinese ports.**

Japan

Under Japanese law, the state and each local port management body are responsible for splitting the costs of harbor improvements 50-50. There is an extremely important exception, however. The Japanese government has designated many of their largest ports

as “especially important ports for the promotion of foreign trade” in which case the national government may pay 100% of the costs for maritime infrastructure and 75% of the cost of mooring facilities. Operations, maintenance and port expansion projects are funded from general government revenues and are appropriated in the National Diet Budget. The Japanese Ministry of Transport, through their Ports and Harbors Bureau, approves all dredging and oversees port development at the national level. Unlike the US system, the Japanese central government’s port development responsibility and control extends not only to main harbor channels but also to individual berths and landside terminals and facilities. Local Port Bureaus do have significant influence on the central government’s port planning, and in the smaller ports without the special national treatment, their responsibility for funding is also significant and more comparable to US Port Authorities.

In Japan, there are no specific harbor maintenance charges although the wharfage fees collected at ports contribute to each local port’s contributions (if any) to waterside infrastructure construction. Japanese port charges are relatively consistent around the country. In 1997, the Japanese ports of Tokyo, Yokohama, Kawasaki, Nagoya, Osaka, Kobe, Kitakyushu, Shimonoseki, Shimizu and Hakata **all adopted wharfage rates based on the gross tonnage of each vessel calling the ports.** Fees are now calculated on a 12-hour basis. Prior to 1997, fees were assessed for each 24-hour period using the same vessel gross tonnage as the base.

As an example of charges on vessels calling ports, the wharfage fees at Yokohama are calculated as 10.05 yen (\$0.074) per gross ton for 12 hours with an additional charge of 6.7 (\$0.05) yen imposed every 12 hours thereafter. The ports also charge a mooring buoyage fee that is charged (for ships of 15,000 gross tons or more) at 36,350 yen (\$269) for 12 hours, with an additional fee of 24,240 yen (\$180) levied every 12 hours thereafter.

Another example is Kobe, where existing port fees for using quays equipped with cargo handling terminals have recently been restructured to separate the mooring and cargo handling fees. The fees had been applied to the integrated and preferential use of quays and container yards or gantry cranes. As elsewhere in Japan, the mooring fee policy is now assessed based on the gross tonnage of ships. Example fees are 26,460 yen (\$196) for containerhips of less than 5,000 gross tons; 39,690 yen (\$294) for vessels less than 8,000 gross tons; 52,920 yen (\$392) for ships less than 10,000 gross tons; and 79,380 yen (\$588) for vessels over 10,000 gross tons.

Vessels calling Japanese ports must also pay pilotage fees, crane fees, and other terminal handling charges that are tied to actual use of those resources in the port on each vessel call.

Hong Kong

As the busiest port in the world, Hong Kong has had an intense interest in port capacity and expansion for much of the last fifty years. Under British rule, Hong Kong’s port was overseen by the Government Marine Department, an Executive arm of the government.

The Marine Department had responsibility for channels and navigation in the harbor but little direct role in decision making regarding port operations, funding or development. Then and now, private companies, including Hong Kong International Terminals (HIT) control and manage the terminals. From an international perspective, the private companies have had an unusually strong role in the evolution and development of the port of Hong Kong. The private companies in the port set the charges and fees for their own facilities, separate from the government. **There are no channel fees assessed in Hong Kong but there are port fees assessed based on gross tons.** Since Hong Kong has reverted to a province of China, the funding for channel and navigation projects is officially controlled by the Chinese national government, though it is expected that the future port development will continue to be based on the general port revenues collected in Hong Kong itself.

Malaysia

The majority of Malaysian seaborne trade moves through its own ports but a very significant amount, about 40% of the country's trade, still goes over the causeway to the port of Singapore. The Malaysian port of Kelang, which serves the capital, Kuala Lumpur, is a large container port by world standards but is dwarfed by its neighbor Singapore, the second largest container port in the world. As with other near-neighbor port situations, competition between the ports is strong. To compete with the services and deals offered at the Port of Singapore, the port costs at the Malaysian port of Kelang, are kept to an average of less than one-half of those at Singapore. Even with the cost advantage, the perceived superior service offered by Singapore continues to draw Malaysian trade through Singapore. The much greater frequency and number of carriers and the reputation of Singapore for efficient, reliable service contributes to this perception and its affect on port choice.

During the last two decades of rapid growth, Malaysia had invested billions developing its cargo port infrastructure at Port Kelang. The port terminals are mostly private but the Malaysian government is responsible for operations, maintenance and development of the navigation channels. **Dredging is funded from the government's general revenues as part of complete port budgets. In their role as port landlord, the revenues collected by the Port Authority represent mostly rents and lease payments. The port collects fees on vessel calls and for cargo handling but none are tied to dredging the port or channels.**

Singapore

Singapore, as the world's second largest container port, and as a tiny nation built on maritime trade, has an extreme dependence on international trade and their port facilities. The culture of the country has led to great success in commerce, **but also a complex and secretive system of real port infrastructure spending and charges. Though there are official rates and fees for using the port, Singapore is noted for its willingness to make special deals with specific operators or others that can bring cargo business to their port.** Government practices involve incentives for lines to call or hub their services

at the port. There are port dues and fee offsets and rebates used to attract and keep cargo business. There is no requirement that any of these agreements be made public, and the Singapore port authorities maintain a policy of not commenting.

Thailand

As in neighboring Southeast Asian countries, Thailand's port authority is a national government agency. The Thai Ministry of Communications is the central government agency whose budget and control includes the Port Authority of Thailand (PAT). Port operations, maintenance and development are funded from port revenues and the national budget. **The PAT collects ship fees, cargo handling charges, and port dues that are used to fund the channel and the port. The measure used for the assessment of fees to be charged by the PAT is the net registered tonnage of each vessel calling in Thailand.** Revenue that is collected goes into general revenue accounts from which port dredging is covered as an operating expense or included in the project budget for port improvement projects.

3.6 Latin America

The ports and harbor activities in Latin America present an interesting case for comparison with events in the United States. Virtually the whole of Latin America, from Mexico to Chile, has accepted the principle of privatization and concessioning of state-owned facilities to the private sector. Certainly ports have been at the forefront of this process. The case of Argentina is of particular interest as it is one of the very few exceptions globally for assessing fees on vessels use of channels in order to contribute toward maintenance dredging costs.

Argentina

At the beginning of the nineties, the Latin American continent needed to implement drastic solutions in order to recover from the economic recession that occurred during the previous decade.

Up to that moment the transport system including ports and harbors was run by the public sector and had degenerated to a precariously low level, mainly due to poor management and a lack of funds. The Argentine Government started a privatization process, which included the Port of Buenos Aires and the maintenance dredging of its main waterway, the River Plate and the Parana River.

For the first time in its history, the Argentine government contracted the maintenance dredging of a vital waterway to a private enterprise in the form of a concession, handing over the administration of the waterway to a private company, enabling it to collect tolls from the users of the waterway.

The case study of the Argentine experience demonstrates the application of a new concept, which is now open to other port authorities. This new approach uses the

expertise of a private enterprise as an alternative way to raise funds needed for the maintenance dredging required for ports and harbors.

The nineties will be considered as a landmark for economic reform in the Latin American continent. A key element in this economic reform is the privatization process that is ongoing in most of the Latin American countries. Public industries and services are, to a large extent, being transferred to private enterprises. In order to cope with the economic growth and infrastructure in general, the ports, in particular, have to be reorganized, modernized and improved. It is generally reckoned that in terms of ports and shipping, Argentina has "traveled further along the road" toward liberalization than any other country in Latin America.

The first important step was taken in 1993 when the government of President Menem decided to privatize the so-called Puerto Nuevo of Buenos Aires. After fierce bidding, six terminals were transferred into private hands. These privatized terminals have been operational since the autumn of 1994. Since then, handling and stevedoring costs in the harbor have been reduced significantly, in some cases up to one third of the cost as compared with when the port operation was still in public hands.

However, the success of the privatized port could not have occurred without a drastic improvement in the maintenance of Argentine's principal waterway, the River Plate. Indeed, Argentina depends on the waterway, consisting of the River Plate and the Parana River, for 70% of the exportation of its products, particularly grain and cereals. It extends from Punta Indio (km 205.3) on the River Plate up to Santa Fe (km 589) on the Parana River, over a distance of almost 440 miles. This waterway, however, has a continuous need for dredging over a majority of its length. Before its privatization in 1995, the Parana and River Plate waterway presented two basic problems: a lack of depth and poorly maintained and barely existing navigational aids, both equally disastrous for safe navigation.

In the last years before privatization, the depth of the waterway had gradually decreased from 32 feet to 24 feet. Navigation by night had become virtually impossible along certain stretches of the river.

The Argentine Government was faced with a situation of increasing costs to bring the river back to being fully navigable, a situation which effectively caused it to weigh the benefits of continued state support vs. partial or full handover to the private sector.

Because of the lack of depth, large vessels had to "top up" their cargoes in other ports such as Bahia Blanca, in the South of Argentina or even in neighboring countries such as Brazil. Consequently, freight costs rose sharply. Moreover, the frequent grounding of ships resulted in a increased insurance premiums for the ship operators.

In 1993, the Argentine Ministry of Economy and Public Works issued a tender for the concession of the dredging and signaling of the waterway between Punta Indio on the River Plate and Santa Fe on the Parana River. The concept of this tender was totally new

in the dredging industry: a vital waterway had to be constructed and maintained by a private company. However, instead of paying the contractor for the works executed, the completed waterway would be operated by the successful bidder in the form of a concession for a period of ten years. In fact the waterway, once constructed, would function as a toll highway - ships sailing along the waterway would pay a toll to the concession company. In order to render the project economically feasible and to reduce the risk to the concessionaire, the Argentine government has agreed to pay a subsidy of \$30 million per annum during the concession period.

Indeed, pre-tender studies showed that a concession based exclusively on payment of toll by its users was unviable, since the toll to be charged was higher than the potential economic benefit for each separate user. The macro-economic benefit for the country however, highly justifies the quarterly subsidy by the national government.

The terms of reference of the tender were quite simple:

- to dredge and maintain a 100 m wide waterway over a length of approximately 700 km , and,
- to refurbish the navigational aids over the entire distance according to the international lighthouse standards.

Works had to be carried out in three construction phases:

- During phase one, the waterway had to be dredged to a depth of 28ft over a period of 9 months which included the time for mobilization.
- During phase two, the waterway had to be deepened to 32 ft. The maximum execution period for this phase being 24 months.
- During phase three, the waterway had to be maintained at a depth of 32 ft. until the end of the ten-year concession period.

The tender procedure itself consisted of a technical and a financial proposal. The technical proposal included among other things

- the redesign of the waterway, including a complete signaling system according to international standards,
- a geotechnical investigation of the materials to be dredged and the corresponding output calculations of the different dredges to be used during the project,
- hydrographic surveys and an interpretation of the historical hydrological data on water levels and frequencies,
- volume calculations during the construction stage, including sedimentation at 28 and 32 ft depths, and a forecast of the future sedimentation during the maintenance period, and
- a traffic study, divided over the consecutive sections of the waterway, in order to establish the level of income to be expected from the toll.

The financial proposal was designed to rely on a single figure, namely the amount of the toll to be applied per net registered tonnage of a vessel using the waterway.

In total the Argentine Ministry of Economy and Public Works received six proposals. After a technical evaluation, three offers were retained and their corresponding financial bids were opened. The group of Jan De Nul was the lowest bidder, and was consequently awarded the contract. The total estimated contract value is US\$650 million with approximately one third of this amount coming from the collection of the toll.

The key item of the project is the toll system. A reduced toll was applied to the entire waterway after the completion of phase one; thereafter, the full toll applied once phase two was completed. **The toll is calculated as a function of the vessel's Net Registered Tonnage (NRT), its maximum draught and the actual depth of the channel (28 or 32 ft). The whole channel is divided into sections and subsections. Ships are charged tolls according to the sections and subsections of the waterway that they actually use. The total toll consists of two tariffs, one taking into account the dredging work and the other the navigational signaling.** In order to implement a correct toll system, a constant monitoring of the channel traffic is imperative and requires close cooperation with the maritime authorities.

In this latter respect, an agreement was signed between the Prefectura Naval, the Naval Authority and the concessionaire in order to guarantee a constant monitoring of all ship movements that includes satellite communications. The concessionaire is responsible for collecting the toll, while the Naval Prefecture has the authority to check upon payment by the ship's agent prior to issuing any port clearance to the vessel.

The response of the shipping industry to the changes has been quite positive. After an initial reluctance to pay tolls for maintenance dredging and signaling, ship owners and terminals appear to be prepared to pay for the benefits of the system.

Before the start of the concession, the transport cost of one ton of cereal from Argentina to Europe was around US\$27/ton compared with US\$16/ton today. In 1992, a total of 200 ships with a length of around 150 m were loaded at the private terminals of Rosario. Only 17 could sail with full holds, representing an average cargo of only 12,000 tons. In 1995, 260 ships of the same size were loaded, with 120 of them fully loaded with a cargo of between 24,000 and 26,000 tons each.

More important than the impact on the direct transport cost is the guarantee the ship operator will be able to sail the vessel with the planned draught. This represents a vast improvement over the past, when vessels arriving with a certain draught had to be lightened because water levels on the waterway were lower than expected due to inadequate maintenance.

In conclusion, it should be mentioned that by privatizing the maintenance of their principal waterway, the Argentine government has been able to overcome a very serious deficiency in their export process. The government lacked the funds and the equipment

necessary to reestablish the depths and safe navigation of a vital waterway. By privatizing the maintenance dredging and implementing an innovative toll system the Argentine government has assured itself of the services and efficiency of a specialist private contractor, at the same time seemingly assuring itself of competitive exports in the years to come.

Colombia

In Colombia, the Port Authority is a national body with local offices (Superintendencia de Portuaria). The Port Authority reports to the Ministry of Transportation. Therefore, issues related to capital development and maintenance dredging are ultimately controlled at the national level. Decisions regarding capital expenditure for dredging typically require a feasibility study funded by FONADE, a government financing institution. In most ports, additional work to carry out infrastructure development also needs the agreement of the Colombian Navy. **Channel deepening projects are funded directly by the Government out of general revenues.**

The port terminals are increasingly being concessioned to private operators. This has been the case in Cartagena. The terminal operator is responsible for fixing cargo charges and other land side related fees.

Jamaica

As in many other developing countries, the funding of the new container port expansion at Kingston, Jamaica has been made possible in large part through international lending. The European Bank for Reconstruction and Development has provided the funding necessary for the Jamaican government to pay for deepening the Kingston navigation channel to a depth of 42 feet. **There are no specific harbor maintenance fees collected or planned for Jamaica.**

Mexico

Before the recent spate of infrastructure privatization in Mexico, the federal government had responsibility for all harbor channel development and construction. With the concessioning of the major Mexican cargo ports, the private operators had to assume the responsibility for dredging as part of complete operational responsibility and control at each port. **The fees charged by private Mexican port operators are not specific to dredging, but are considered part of total operating revenues from which operating and infrastructure development budgets must be financed.**

The former "Puertos Mexicanos" in Mexico City, which used to have complete operating authority over the country's 52 ports is now a skeletal organization since the operational aspects of port management have been moved locally to each port in the form of new independent port authorities called Administracion Portuaria Integral (API). **Each API operates its port, collects fees and distributes fees for the maintenance of existing**

infrastructure including dredging, while new major projects must be approved centrally through Puertos Mexicanos. The idea is to provide a perspective on port development from the national capital and to prevent the expansion of ports into areas that are not competitive or that are not in the interest of the nation.

Panama

In Panama, the **Panama Canal Commission takes responsibility for the dredging of all Canal Waters**, which effectively constitutes the approach channels to the Canal entrance. (See Appendix C). Separately, the main cargo ports have been concessioned, or are operating privately such as Manzanillo International Terminal (MIT), Balboa, and Cristobal. The terminal operators are responsible for dredging the quays and the approaches from the navigation channel to the terminals. In the case of MIT, the Operator, Stevedoring Services of America (SSA) opted not to use Canal Waters and dredged their own approach channel directly from the Caribbean to the terminal.

A separate Port Authority Autoridad Portuaria Nacional (APN) remains in existence and is responsible for buoys and port activities that are not within the responsibility of the terminal operators.

3.7 Other Countries

Lebanon

The principal cargo port in Lebanon, Beirut, is run by a port authority, Gestion et Exploitation du Port de Beyrouth (GEPB). GEPB sets the fees and is responsible for the budget expenditures for the cargo port. **Navigation infrastructure improvements are planned and funded out of the port authority budget, either operating or capital budgets, depending on the nature of the expenditure. There is no separate revenue or expenditure stream for dredging.**

Port Authority revenue is raised through fees paid by vessels using the port. Through 1997, the fees were a daily fixed port fee plus an ad valorem charge of 2.5% on the value of the cargo, for handling and transit. The ad valorem charge was the responsibility of the consignee. There also was and continues to be a per container fee for each box handled. **Under a new fee structure introduced by the GEPB 1998, fees are to be assessed based on vessel size.** Meanwhile the ad valorem charges on cargo has been eliminated. The new vessel fee system is **based on vessel length**, with a rate of \$4 per meter for each 24 hour period, for foreign flagships, and \$2 per meter per 24 hour period for Lebanese flag vessels. For vessels in port longer than four days, the daily charge increases to \$6 per meter. Container handling charges are lowered but are still charged separately. The charge per TEU has been reduced 24 %, from \$50 to \$38. The per FEU charge has been reduced 10 % from \$70 to \$63.

Instead of the previous ad valorem charges, the new proposed tariff for containerized cargo is quite simplified. There are only three rate levels under the new system: low value

goods will be charged \$200 per box; general cargo will be charged \$300 per box, and high value goods such as alcohol and cigarettes will be charged \$700 per box. Breakbulk cargoes will now be charged on a weight basis, using tons as the measure for the fee.

In an effort to promote the ports' transshipment business for the region, the new Lebanese fee structure has a separate provision for transshipment goods. The inclusive transshipment container handling charge (including up to 15 days storage in port) is now \$78 per container. For more than 15 days, an additional \$75 charge per container will be levied, which is intended to penalize operators that are not truly transshipping containers.

These changes are intended to encourage growth in high value containerized and roll-on/roll-off cargo, and to reduce time in port for the average vessel call. Removal of the ad valorem cargo charges, are intended to reduce the need for customs to be involved in revenue collection and therefore to reduce overhead costs associated with each shipment.

South Africa

In South African ports, there are no direct channel or harbor maintenance fees. Vessels are assessed port dues that are **based on the cubic capacity of ships.** The cubic capacity is measured in cubic meters and is calculated by the port from **Gross Registered Tons**, if no cubic capacity measurement is separately available.

Tunisia

Tunisian ports remain firmly under the control of the national port authority, OPNT, which in turn reports to the Ministry of Transportation. The OPNT takes responsibility for all vessel operations, as well as terminal operations. Each of the ports operate under its own management, but cannot take independent action on pricing or infrastructure development.

Dredging is therefore the responsibility of OPNT and is funded as part of the national budget and is part of the FiveYear Development Plan in terms of forward planning. As with many developing countries, Tunisia has recently received a significant World Bank loan to develop its infrastructure. Part of these World Bank funds have been earmarked for port development, including dredging activities. The authors are also aware that the Netherlands Government had provided funds for dredging as part of a purchase arrangement for dredging vessels to be purchased from the Netherlands.

3.8 Comparison of International Terminal Handling Charges (THCs) for Container Operations

As part of the evaluation of international port charges and dredging funding, two studies published by an Italian consulting company, Marconsult were also referenced. These were published in 1991 and updated in 1994. Although somewhat dated, the work is interesting in that it is one of the sources available that has consistently benchmarked container handling port services across a broad range of ports around the globe in a

uniform manner. Since the 1994 update, a number of terminals in the survey have been privatized and there will most likely have been price changes as a result of this.

Based on work that The Columbus Group has carried out in Central and South America, the estimated cost to the terminal operator of a container move is around \$40 per container. In cases where the volume of moves is particularly high, such as in Freeport, Bahamas and MIT, Panama, one could expect the cost to be marginally lower, whereas in the United States, the cost is probably higher.

A key issue that presented itself both in the benchmarking of port charges as well as in assessing THCs, is that there is a decided lack of conformity and homogeneity in the structure of charges. This clearly has a distorting effect, which must be kept in mind. This is in part caused by changes in responsibility of port operations, as port authorities and terminal operators are increasingly autonomous organizations, as well as by technological and intermodal changes in the handling of cargo and the interface with the landside operations.

In the case of the Marconsult study, operations were standardized as much as possible in order to provide an "average" figure, which was translated into a basic operation. This included 1) ship to stack, and 2) stack to gate. This represents the pricing structure to the cargo owner ultimately. However, the ship operator will also face charges, which may or may not be passed on to the cargo owner. These charges relate to:

- Hatch opening and closing
- Overtime
- Vessel stand-by
- Lashing/unlashing
- Extra yard moves in the stack and on the ship
- Weighing
- Special container handling
- Lay days

The figures presented in Table 3.7A below indicate that the **majority of terminal handling charges fall within the \$100-\$140 range for 20ft loaded containers. Empty moves generally receive a discount, but not in all cases. Some ports do not differentiate between container sizes for either full or empty moves. This is probably reflective of the cost structure, which also does not differentiate by size or weight.**

In cases where terminal operators are independent bodies separate from the Port Authority, they have contractual arrangements ranging from landlord/tenant status to concession operator and to private owner. Within this broad mix of arrangements various forms of fees are levied. These range from annual concession fees, direct taxation per container move, leasehold charges and lump sum charges for a fixed number of years. Whatever the arrangements might be, **it is not apparent that any identifiable portion of the fees are allocated to specific items such as dredging for maintenance or capital development.**

Table 3.7A
Basic Operation Costs: Vessel to gate or gate to vessel for import/export containers
 (Based on Exchange rate valid at time of Marconsult Study)

Port/Terminal (in US\$)	20ft. container	20ft. container	40ft. container	40 ft. container
	Loaded	Empty	Loaded	Empty
Hamburg	161	136	161	136
Bremerhaven	188	156	188	156
Rotterdam	139	139	139	139
Antwerpen	104	104	104	104
Zeebrugge	85	85	85	85
Felixstowe	128	92	128	92
Algeciras	114	100	152	147
Valencia	106	99	141	129
Marseille-Fos	145	145	145	145
Genoa	138	88	138	88
La Spezia	144	113	144	113
Piraeus	109	74	183	122
Hong Kong	194	194	298	298
Kaohsiung	130	130	180	180
Kobe	267	239	407	360
New York	190	190	190	190
Oakland	146	146	146	146

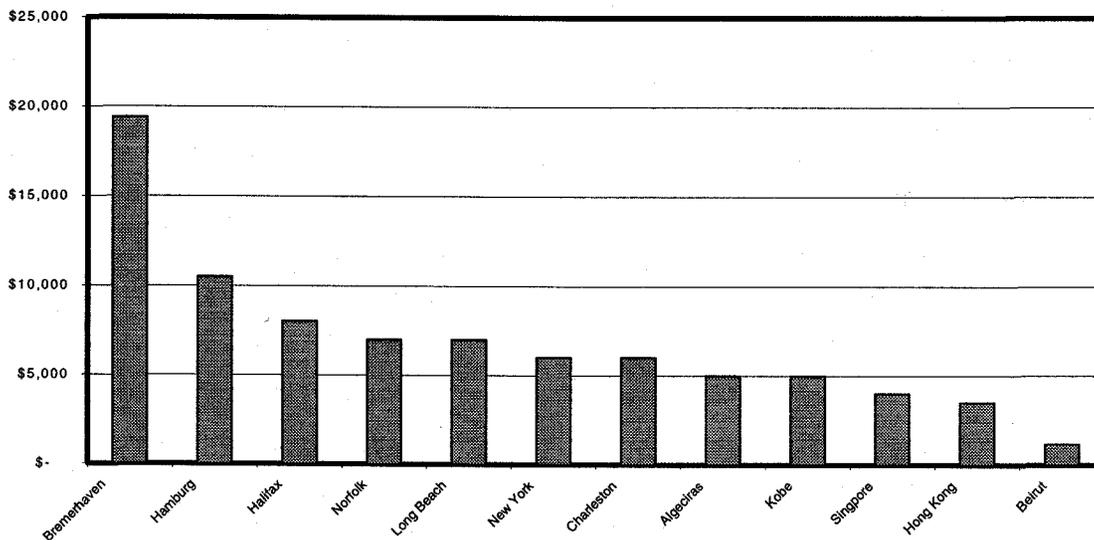
Port Dues

During this research another source of information was identified. A study carried out by a UK firm identified the proportion of costs associated with the marine, i.e. non-terminal, sector of the vessel charges in port. No breakout was provided as to the make up of the charges, nor the size of the ships, and the results are an average figure. This information is somewhat problematic from a comparison point of view; nevertheless, due to the slow rate of response from the ports, which were sent questionnaires, it was decided to exhibit this data together with other data that was collected in order to provide an indicative set of figures. Table 3.7B below summarizes the findings for container vessels. It must be assumed that the results pertain, on average, to smaller vessels.

Table 3.7B
Vessel Port Charges
Marine Sector Only

Port (* = TCG Survey)	Fees
Hamburg *	\$10,500
Bremerhaven *	\$19,400
Halifax	\$8,000
New York	\$6,000
Norfolk	\$7,000
Charleston	\$6,000
Algeciras	\$5,000
Beirut *	\$1,176
Singapore	\$4,000
Hong Kong	\$3,500
Kobe	\$5,000
Long Beach	\$7,000

Container Vessel Fees at Key Ports



3.9 International Waterways

This study includes appendices on three international waterways that collect fees based on vessel transits whose intent is to cover the operational costs of keeping the waterways operational. In the case of the Suez Canal, revenues are cost plus and are a major contributor to the national budget. In Panama, the Canal is operated as a non-profit service. **The tolls that are levied on vessels transiting the Panama Canal are intended to cover the operations and maintenance of the waterway, including capital improvement**

programs for the infrastructure. Since 1979 an additional \$100 million of the revenue is passed on to the Government of Panama following the 1979 Treaty which will transfer the Canal to Panama on December 31, 1999.

The fees charged by the Canadian Coast Guard on vessels using Canadian facilities are intended to cover the costs of operating, maintaining and administering of the St. Lawrence Seaway Development Corporation.

The very nature of these toll structures is directly comparable to the principle of levying a fee or charge to provide for the operations and maintenance of navigation channels in the ports and harbors of the United States.

Summary and Conclusions

At the outset of this study, it was hoped that the major port authorities around the world would respond to a short questionnaire. It was agreed to restrict the list to 10 ports. The response has not been as good as had been hoped.

The international evaluation of dredging practices has highlighted the wide variety of approaches in other countries. However, in most cases a single theme runs through the policy. That is, that the national governments, via their ministries of transport, maritime affairs or commerce generally take responsibility for dredging of ports. The dredging activity is regarded as an investment in the national infrastructure.

Port dues or fees are collected on ships for what is essentially the "marine side" of port operations, that is, relating to vessels moving from international waters into navigation channels to near the terminal quays. The responsibilities for berth or quayside dredging shifts to the terminal operator (in many cases the same as the port authority) and all landside and cargo operations are the responsibility of the terminal operator.

Generally the port dues are collected by the ports and distributed to the State or National Government, which in turn provide the port authority with annual budgets for expenditure, including dredging. There appears to be no direct link between the dues and the budget funds. In many of the developing countries, the dredging requirements, as well as the expansion needs of ports under state control, is partly (or wholly) funded by Multilateral Institutions such as the World Bank and the Inter American Development Bank. Individual countries also make other soft loans available as part of their foreign aid or for political purposes. Tunisia for example, has recently been awarded significant funds from the World Bank while Nicaragua has received a soft loan of \$17 million from Taiwan for the dredging needs of the Port of Corinto. The trend toward privatization and concessioning of ports has created some new practices, particularly in Australia, United Kingdom and Panama.

In two cases, this study identified a direct linkage between navigation channel dredging and a fee structure on vessels. One is in Argentina, where a concession has been granted to Jan de Nul from Belgium to carry out dredging, half of which is paid out of Government funds and loans and the remainder through fees collected by the concessionaire. The other is in Canada, where the Canadian Coast Guard charges fees for the use of the St. Lawrence Seaway for vessels visiting Canadian ports. In Australia, it appears that the two privatized ports of Freemantle and Melbourne have a fee that has a direct contribution to dredging costs. Similarly, the port of Sydney levies a charge that goes into a fund that also covers dredging. Additionally, the St. Lawrence Seaway toll structure on the Canadian side is a direct dredging related fee, whilst both the Panama and Suez Canals can be considered to be charging for the direct usage of their facilities.

It can be concluded that the majority of international dredging is probably subsidized by most of the national or state governments. However there appears to be no direct link between the collection of port dues and the funding of dredging. This makes the United

States situation somewhat different from the rest of the maritime nations, in that there is a national fund that is related to expenditure on dredging on a national scale rather than at the local port or navigable channel level.

Appendices

5.1 Appendix A - St. Lawrence Seaway Regulations

REVISED
AS OF 1996
CODE OF FEDERAL REGULATIONS
TITLE 33 - NAVIGATION AND NAVIGABLE WATERS
CHAPTER IV - Saint Lawrence Seaway Development Corporation

PART 402 - Tariff of Tolls

§402.1 Purpose.

This regulation prescribes the charges to be assessed for the full or partial transit of the St. Lawrence Seaway between Montreal, Quebec, and Lake Erie.

§402.2 Title.

This tariff may be cited as the St. Lawrence Seaway Tariff of Tolls.

§402.3 Interpretation.

In this tariff,

- (a) "Authority" means the St. Lawrence Authority;
- (b) "Bulk cargo" means such goods as are loose or in mass and generally must be shoveled, pumped, blown, scooped or forked in the handling and shall be deemed to include:
 - (1) Cement, loose or in sacks;
 - (2) Coke and petroleum coke, loose or in sacks;
 - (3) Domestic cargo;
 - (4) Liquids carried in ships' tanks;
 - (5) Ores and minerals (crude, screened, sized or concentrated, but not otherwise processed) loose or in sacks, including alumina, bauxite, coal, gravel, phosphate rock, sand, stone and sulfur, but excluding coal;
 - (6) Pig iron, scrap metals;
 - (7) Lumber, Pulpwood, poles and logs, loose or bundled;
 - (8) Raw sugar, flour, loose or in sacks;
 - (9) Woodpulp, loose or in bales;

(10) Material for recycling, scrap material, refuse and waste.

(c) "Cargo" means all goods aboard a vessel whether carried as revenue or non-revenue freight, or carried for the vessel owner, except: empty containers and the tare weight of loaded containers, all such containers having a capacity of 18 cubic meters (635.665 cubic feet) or more; ships' fuel, ballast or stores, or crew or passengers' personal effects, and in transit cargo that is carried both upbound and downbound in the course of the same voyage which shall be reported in the Seaway Transit Declaration Form but is deemed to be ballast and not subject to toll assessment;

(d) "Containerized cargo" means any general cargo shipped in an enclosed, permanent, reusable, nondisposable, weathertight, shipping conveyance having a capacity of 18 cubic meters (635.665 cubic feet) or more and fitted with a minimum of one hinged door:/P

(e) "Corporation" means the Saint Lawrence Seaway Development Corporation;

(f) "Domestic cargo" means cargo, the shipment of which originates at one Canadian point and terminates at another Canadian point, or which originates at one United States point and terminates at another United States point, but shall not include any import or export cargo designated at the point of origin for transshipment by water at a point in Canada or in the United States;

(g) "Feed grains," means barley, corn, oats, flaxseed, rapeseed, soybeans, field crop seeds, grain screenings, and meal from these grains for animal consumption;

(h) "Food grains," means buckwheat, dried beans, dried peas, rye, and wheat;

(i) "General cargo" means all goods not included in the definitions under paragraphs (b), (g), (h) and (j), but excluding steel slab;

(j) "Government aid cargo" means processed food products which have been donated by or the purchase of which has been financed on concessional terms by the Federal government of either the United States or Canada for the purposes of nutrition, economic development, emergency, or disaster relief programs and any food cargo that is owned or financed by a nonprofit organization or cooperative and that is certified by the Customs Service of the United States or Canada as intended for use in humanitarian or development assistance overseas.

(k) "Metric ton" means, unless otherwise stated, a metric unit of weight of 1,000 kilograms (2204.62 pounds);

(l) "Passenger" means any person being transported through the Seaway who has paid a fare for passage;

(m) "Pleasure craft" means a vessel, however propelled, that is used exclusively for pleasure and does not carry passengers;

(n) "St. Lawrence Seaway" includes all facilities and services authorized under the St. Lawrence Seaway Authority Act, Chapter 242, Revised Statutes of Canada, 1952, as amended and under Public Law 358, 83rd Congress, May 13, 1954, enacted by the Congress of the United States, as amended, and including the Welland Canal, which facilities are under the control and administration or immediate financial responsibility of either the Authority or the Corporation;

(o) "Seaway" means the St. Lawrence Seaway;

(p) "Tolls" means the total assessment levied against a vessel, its cargo and passengers for complete or partial transit of the Seaway covering a single trip in one direction;

(q) "Vessel" means every type of craft used as a means of transportation on water, except a vessel of or employed by the Authority or the Corporation.

§402.4 Tolls.

(a) The tolls shall be set forth in the schedule hereto.

(b) The tolls under this Tariff are due from the representatives of each vessel as soon as they are incurred and payment shall be made within thirty (30) days of the vessel's entry into the Seaway.

(c) The tolls for the section between Montreal and Lake Ontario shall be paid 75 per cent in Canadian dollars and 25 per cent in United States dollars. Payments for transit through locks in Canada only shall be in Canadian dollars, and payments for transit through locks in the United States only shall be in United States dollars.

(d) The tolls for transit of the Welland Canal shall be paid in Canadian dollars and shall accrue to the Authority.

§402.5 Security for payment.

A representative of each vessel shall provide the Authority or the Corporation with security, satisfactory to the Authority or the Corporation, for payment of tolls.

§402.6 Description and weight of cargo.

(a) A cord of pulpwood shall be deemed to weigh 1,450 kilograms (3,196.70 pounds).

(b)

(1) 1,000 f.b.m. of sawn softwood lumber with less than 15 percent moisture content shall be deemed to weigh 770 kilograms (1,697.56 pounds).

(2) 1,000 f.b.m. of sawn softwood lumber with 15 percent moisture content or over shall be deemed to weigh 950 kilograms (2,094.39 pounds).

(3) 1,000 f.b.m. of sawn hardwood lumber with less than 15 percent moisture content shall be deemed to weigh 1,135 kilograms (2,502.24 pounds).

(4) 1,000 f.b.m. of sawn hardwood lumber with 15 percent moisture content or over shall be deemed to weigh 1,405 kilograms (3,097.49).

(c) The tonnage used in the assessment of tolls shall be calculated to the nearest 1,000 kilograms (2,204.62 pounds).

§402.7 Post-clearance date operational surcharges.

(a) If the Authority and the Corporation so determine, they may establish a clearance date for the transit of the Montreal-Lake Ontario section. Each vessel which does not comply with the conditions announced by the Authority and the Corporation in establishing the clearance date may be required to pay in dollars an amount not exceeding the operational surcharge set forth below:

(1) Vessels reporting during the 24 hour period immediately following the clearance date: 20,000.00

(2) Vessels reporting more than 24 hours late, but less than 48 hours after the clearance date: 40,000.00

(3) Vessels reporting more than 48 hours late, but less than 72 hours after the clearance date: 60,000.00

(4) Vessels reporting more than 72 hours late, but less than 96 hours after the clearance date: 80,000.00

(b) The operational surcharge assessed vessels already at a port, dock or wharf within the St. Lambert- Iroquois Lock segment of the Montreal-Lake Ontario section at the clearance date shall be \$20,000 less than the amount otherwise applicable.

(c) Each vessel which reports more than 96 hours after the clearance date may transit only if a prior written agreement authorizing such transit has been entered into among the owner or agent of the vessel and the Authority and the Corporation. Such agreement may provide for additional operational surcharges.

(d) Assessed operational surcharges will be prorated on a per lock basis. Surcharges representing transit through United States locks will be for the account of the Corporation and payable in United States funds and surcharges representing transit through Canadian locks will be for the account of the Authority and payable in Canadian funds.

§402.8 Schedule of tolls.

1998 Seaway Toll Schedule

(Cargo Tolls Per Metric Ton in C\$)

Effectively Canadian charges only as U.S. tolls are no longer collected effective 10.1.94

St. Lawrence Seaway Tariff of Tolls Effective June 1, 1998
(All Tolls are Canadian and payable in Canadian dollars)

MONTREAL/LAKE ONTARIO SECTION

BULK	\$0.8466
COAL	\$0.4998
CONTAINERIZED CARGO	\$0.8466
GRAIN	\$0.5202
STEEL SLABS	\$1.8462
GENERAL	\$2.0400
VESSEL GRT	\$0.0816

WELLAND CANAL SECTION

BULK	\$0.5610
COAL	\$0.5610
CONTAINERIZED CARGO	\$0.5610
GRAIN	\$0.5610
STEEL SLABS	\$0.6426
GENERAL	\$0.8976
VESSEL GRT	\$0.1326
VESSEL LOCKAGE	
Loaded for 8 locks	\$ 3,584.00
Ballast for 8 locks	\$ 2,648.00

BOTH SECTIONS COMBINED

BULK	\$ 1.4076
COAL	\$ 1.0608
CONTAINERIZED CARGO	\$ 1.4076
GRAIN	\$ 1.0812
STEEL SLABS	\$ 2.4888
GENERAL	\$ 2.9376
VESSEL GRT	\$ 0.2142
VESSEL LOCKAGE	
Loaded for 8 locks	\$ 3,584.00
Ballast for 8 locks	\$ 2,648.00

- Tolls are assessed: per metric weight ton of cargo, per vessel gross registered ton, and per lock transit for the Welland Canal.
- No tolls on government aid cargoes;
- Tolls frozen at 1993 levels through May 31, 1998;
- Welland Canal lockage fee is for a full one way transit of 8 locks;
- Due to computer rounding, actual toll invoices may differ from above.

RATES OF CHARGES OR TOLLS

Sec. 12. (a) (§988) The Corporation is further authorized and directed to negotiate with the Saint Lawrence Seaway Authority of Canada, or such other agency as may be designated by the Government of Canada, an agreement as to the rules for the measurement of vessels and cargoes and the rates of charges or tolls to be levied for the use of the Saint Lawrence Seaway, and for an equitable division of the revenues of the seaway between the Corporation and the Saint Lawrence Seaway Authority of Canada. Any formula for a division of revenue which takes into consideration annual debt charges shall include the total cost, including both interest and debt principal incurred by the United States in financing activities authorized by this Act, whether or not reimbursable by the Corporation. Such rules for the measurement of vessels and cargoes and rates of charges or tolls shall, to the extent practicable, be established or changed only after giving due notice and holding a public hearing. In the event such negotiations shall not result in agreement, the Corporation is authorized and directed to establish unilaterally such rules of measurement and rates of charges or tolls for the use of the works under its administration: PROVIDED, HOWEVER, That the Corporation shall give three months' notice, by publication in the Federal Register of any proposals to establish or change unilaterally the rates of charges or tolls, during which period a public hearing shall be conducted. Any such establishment of or changes in basic rules of measurement or rates of charges or tolls shall be subject to and shall take effect thirty days following the date of approval thereof by the President, and shall be final and conclusive, subject to review as hereinafter provided. Any person aggrieved by an order of the Corporation establishing or changing such rules or rates may, within such thirty-day period, apply to the Corporation for a rehearing of the matter upon the basis of which the order was entered. The Corporation shall have power to grant or deny the application for rehearing and upon such rehearing or without further hearing to abrogate or modify its order. The action of the Corporation in denying an application for rehearing or in abrogating or modifying its order shall be final and conclusive thirty days after its approval by the President unless within such thirty-day period a petition for review is filed by a person aggrieved by such action in the United States Court of Appeals for the circuit in which the works to which the order applies are located or in the United States Court of Appeals for the District of Columbia. The court in which such petition is filed shall have the same jurisdiction and powers as in the case of petitions to review orders of the Federal Energy Regulatory Commission filed under section 8251 of Title 16. The judgement of the court shall be final subject to review by the Supreme Court upon certiorari or certification as provided in sections 1254(1) and 1254(2) of Title 28. The filing of an application for rehearing shall not, unless specifically ordered by the court, operate as a stay of the Corporation's order.

(b) In the course of its negotiations, or in the establishment, unilaterally, of the rates of charges or tolls as provided in subsection (a) of this section, the Corporation shall be guided by the following principles:

1. That the rates shall be fair and equitable and shall give due consideration to encouragement of increased utilization of the navigation facilities, and to the special character of bulk agricultural, mineral, and other raw materials.

2. That rates shall vary according to the character of cargo with the view that each classification of cargo shall so far as practicable derive relative benefits from the use of these facilities.
3. That the rates on vessels in ballast with passengers or cargo may be less than the rates for vessels with passengers or cargo.
4. That the rates prescribed shall be calculated to cover as nearly as practicable, all costs operating and maintaining the works under the administration of the Corporation, including depreciation, and payments in lieu of taxes.
5. {Repealed}

WAIVER OF COLLECTION OF CHARGES OR TOLLS

Sec.13.(a) (§988a.) Notwithstanding section 12 of this Act or any other provision of law, the Corporation shall not collect any charge or toll established pursuant to section 12 of this Act with respect to a commercial vessel (as defined in section 4462(a) (4) of the Internal Revenue Code of 1986).

(b) The Corporation will maintain a record of the annual amount of each charge or toll that would have been collected with respect to each such commercial vessel is it were not for paragraph (a) of this section.

CHANGES TO SEAWAY TOLLS PROPOSED

The St. Lawrence Seaway Authority announced in the Canada Gazette, Part I, its intention to establish, upon repeal of the existing directives given by Governor in Council to The Authority in 1959, a Seaway Tariff of Tolls, with a 2 percent cargo toll and vessel charge increase, to become effective on June 1, 1998. The proposed 2 percent increase for both the Montreal/Lake Ontario and the Welland Canal sections of the St. Lawrence Seaway would be the first increase in tolls since 1993.

The repeal of the 1959 bilateral agreement was required to allow the Canadian Government to unilaterally raise the tolls for the 13 (out of 15) locks that it operates. The reason given for the toll increase was to provide funds for the upkeep and maintenance of the locks and to allow the commercialization of the overall operation. The toll revenue projection for the year was reported as \$350 million. The U.S. has been funding its operation from the Harbor Maintenance Tax since 1986 when it also repealed the domestic regulation relating to the Seaway.

DREDGING SERVICES TONNAGE FEE

The Canadian Coast Guard (CCG) announced that there was going to be an interim St. Lawrence Ship Channel Maintenance Dredging Services Fee (MDSF) effective September 1, 1997. The proposal to implement this new charge emanated from the Canadian Government as a means of addressing the maintenance dredging contracts and contract management costs until a long term management mechanism is implemented. The fee structure was intended for up to two years.

As part of the overall policy on National Marine Strategy, a decision was made to withdraw the CCG from funding dredging across all of Canada. The responsibility of dredging is to be transferred to beneficiaries.

For 1997/98 the MDSF intended to generate about \$C3.02 million on a full year basis to be allocated \$C2.9M for the dredging contract and \$C120K for Contract Management.

The fees were established under the authority of section 47 of the *Oceans Act*. After consultation with users, the fee structure is based on Gross Registered Tonnage (GRT) of ships transiting the St. Lawrence Ship Channel. The GRT fee is \$C0.033 per GRT, applying to:

- All commercial ships (domestic or foreign) originating from, or stopping at, any Canadian port and transiting a portion of the St. Lawrence Ship Channel.
- Ships with a static draught of 5.0m or more during each transit.
- Each upstream voyage that uses the St. Lawrence Ship Channel regardless of the number of Canadian Ports of call during the voyage.
- Each downstream voyage that uses the St. Lawrence Ship Channel regardless of the number of Canadian Ports of call during the voyage.

All non-commercial vessels are exempt.

The fee will not apply to:

- Ships with a static draught less than 5.0m, during each transit.
- Ships in transit not originating from, or not stopping at a Canadian port.
- Those ships transiting between the Great Lakes-St. Lawrence Seaway System and the Port of Montreal (excluding the Contrecoeur terminal) that do not proceed eastward from the Port of Montreal because they do not use the dredged portion.
- Ships moving within the confines of a port boundary (in the case of Montreal excluding the Contrecoeur terminal).

A separate fee will be charge for each upstream and downstream transit of the St. Lawrence Ship Channel. The CCG will provide an invoice for each transit of a foreign flagship, and will capture the applicable transit data for all domestic ships for preparation of a monthly invoice.

5.2 Appendix B - The Suez Canal

The Suez Canal is the first man-made canal dug for commercial shipping. It is a sea level canal with mooring bollards every 125 meters on both sides of the Canal. The navigable channel is bordered by light and reflecting buoys as navigational aid to night traffic. There are 11 signal stations along the western bank of the Canal, each of which is about 10 km. apart from the other.

The Canal is run in a convoy system to transit at a fixed speed and a fixed separation distance between every two passing ships. Three convoys pass through the Canal every day; two southbound and one northbound.

The Suez Canal has been expanded in four parts since 1955 to facilitate the transit of ships in both directions, thereby expanding capacity. Transit time is 12 to 16 hours, and the capacity is about 76 ships per day.

The Suez Canal Authority regulates and manages the operations of the Canal. During 1996/97 the SCA undertook development work to continue to deepen draft to 59ft. from 58 ft. as well as contracting to build a special suction dredger. The SCA has stated that in order to maintain its competitive advantage, it is focusing on deepening the draft to 68 feet, to allow the passage of tankers with loads up to 300,000 tons, or a net tonnage of more than 500,000 tons. The targets of the Fourth 5-year Plan are to reach a draft depth of 92 feet. This would appear to be overly optimistic and beyond international traffic requirements however.

During 1997, 14,430 ships made full transits through the Suez Canal in both directions, a drop of 2% compared with 1996. The daily average was 39.5 ships. The transiting net tonnage however registered an increase from 355 million tons in 1996 to 368.7 million tons in 1997. The majority of the cargo tonnage is made up of non-oil cargoes.

RATES OF CHARGES OR TOLLS

The SCA operates a flexible tariff policy to attract international trade movement through the Canal.

New rates of the Suez Canal tolls effective January 1, 1998 are as per the attached tables. In addition, the SCA Chairman announced the following:

1. Crude oil tankers will continue to get-
 - A discount of 5% on Suez Canal dues in case of transporting crude oil quantities exceeding one million metric tons and up to two million metric tons.
 - A discount of 10% on Suez Canal dues in case of transporting quantities between two and three million metric tons.
 - A discount of 30% on Suez Canal dues in case of transporting crude oil quantities in excess of 3 million metric tons.

These discounts are granted to the round trip (laden or in ballast) of the same tanker and if crude oil quantities are transported by one individual client within one year beginning with his contract with the SCA.

The maximum payment for the round trip of any crude oil tanker shall not exceed SDR (Special Drawing Rights) 330,000 regardless of the tankers SCNT.

2. LNG carriers – ballast and loaded LNG carriers shall be granted a discount of 35% on the Suez Canal dues regardless of destination.
3. Container ships, General cargo ships and Lash Ships - The 6% surcharged levied on ballast ships carrying empty containers on in the cargo holds are cancelled.
4. Dry bulk ships – Owners of dry bulk cargo ships that operate between Australia and North West Europe or between South Africa and the Mediterranean may get in touch with the SCA Planning, Research and Studies Dept., the Economic Unit, which can decide on the “proper” dues in advance. During the first half of 1998, discounts on bulk cargo shipments have ranged between 22% (iron ore shipment to Japan) and 82% (also iron ore).

**SUEZ CANAL DUES RATES TO BE APPLIED AS FROM
FIRST OF JANUARY 1998 IN ACCORDING WITH CIRCULAR NO. 3/97**

TYPE OF VESSEL	SUEZ CANAL NET TONNAGE											
	FIRST 5,000 T.		NEXT 5,000 T.		NEXT 10,000 T.		NEXT 20,000 T.		NEXT 30,000 T.		REST OF TONNAGE	
	Laden	Ballast	Laden	Ballast	Laden	Ballast	Laden	Ballast	Laden	Ballast	Laden	Ballast
(1) Crude Oil Tankers	6.49	5.52	3.62	3.08	3.25	2.77	1.40	1.19	1.40	1.19	1.21	1.03
(2) Tankers of Petroleum products	6.75	5.52	3.77	3.08	3.43	2.77	1.93	1.19	1.93	1.19	1.93	1.03
(3) LPG Carriers	6.75	5.75	3.77	3.21	3.43	2.92	2.42	2.06	2.42	2.06	2.42	2.06
(4) Chemicals, Bulk liquid & LNG Carriers ⁽¹⁾	7.50	6.38	4.18	3.56	4.81	3.24	2.68	2.28	2.68	2.28	2.68	2.28
(5) Dry Bulk Carriers	7.21	6.13	4.14	3.52	2.97	2.53	1.05	0.90	1.00	0.85	1.00	0.85
(6) Combined Carriers:												
a) If carrying Crude Oil only	6.49	-	3.62	-	3.25	-	1.40	-	1.40	-	1.21	-
b) If carrying Petroleum Products only	6.75	-	3.77	-	3.43	-	1.93	-	1.93	-	1.93	-
c) If carrying more than one kind of cargo	6.75	-	3.77	-	3.43	-	1.93	-	1.93	-	1.93	-
d) If carrying Dry Bulk Cargo only	7.21	-	4.14	-	2.97	-	1.05	-	1.00	-	1.00	-
e) If carrying other bulk liquid	7.50	-	4.18	-	3.81	-	2.68	-	2.68	-	2.68	-
f) In ballast	-	6.13	-	3.52	-	2.53	-	0.90	-	0.85	-	0.85
(7) Containers vessels and Vehicle Carriers	7.21	6.13	4.10	3.49	3.37	2.87	2.42	2.06	2.42	2.06	1.83	1.56
(8) Other Vessels ⁽²⁾	7.21	6.13	4.14	3.52	3.77	3.21	2.63	2.24	2.63	2.24	2.63	2.24

- (1) If in ballast, chemical/oil tankers are to be charged at the same rate of oil tankers.
(2) Other than special floating units mentioned in the Explanatory Note.

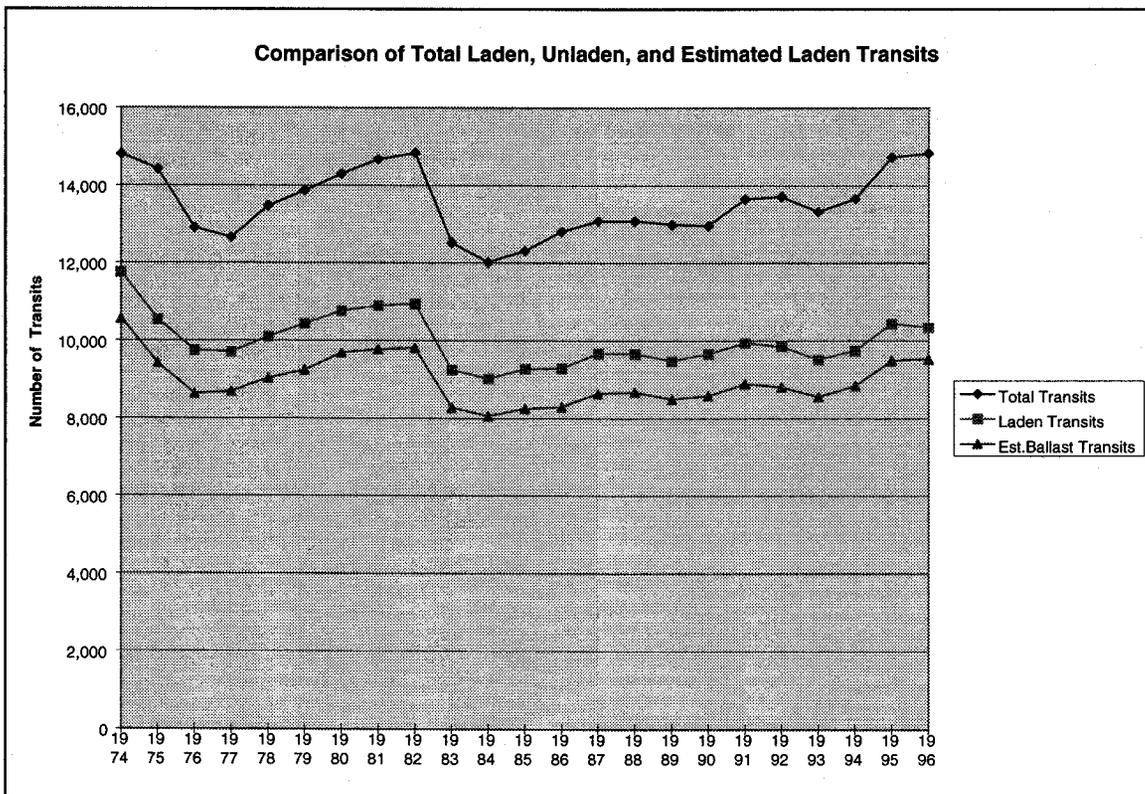
Note: The numbers contained within this Table are International Monetary Fund (IMF) Special Drawing Rights (SDR).

5.3 Appendix C - Panama Canal

The Panama Canal has been operating at a historically high rate of utilization in terms of total transits through the Canal for the last several years. This surge in transits – reaching 13,631 commercial ocean-going transits in 1995 and nearly 14,000 in 1996 and 1997- has placed operational stresses on the Canal. This corresponded to 216.7 million PC/UMS net tons in 1995 and an estimated 229 million in 1997.

There has been no period since 1974 when the total transits exceeded 15,000 laden and ballast voyages. The ratio of laden to ballast transits is close to 3 to 2; therefore, 40% of the transits are in vessels, which do not carry cargo. The transit forecast developed in this section is for ocean-going commercial cargo vessels. The additional transits from non-commercial vessels must still be factored in when considering the total potential traffic.

Comparison of Total, Ballast, and Estimated Laden Transits



The current capacity of the Panama Canal is approximately 15,000 transits, including those made by non-commercial ocean-going vessels. This equates to approximately 42 maximum sustainable transits per day. The quality of service provided by the Canal is directly related to the capacity for meeting transit demand. As such, the ideal number of transits at the moment is closer to 38-39 transits per day. As the number goes above this

operational problems begin to surface including an increase in Canal Waters Time (CWT) which is measured by the period a ship is at the waterway once ready for transit. The Canal policy is to strive to a maximum of 24 hours, yet in 1995 the CWT rose to 28.2 hours, during 1996 to over 32 hours and during 1997 times averaging 36 hours were reported.

According to the Panama Canal Commission, unless major improvements to increase the Canal capacity are completed, CWT cannot be meaningfully improved as Canal traffic continues to grow and strain the existing operating capacity.

To meet this challenge, the Panama Canal Commission has approved measures to increase and accelerate the program to provide increased capacity. This includes acceleration of the widening of the Gaillard Cut, augmentation of the tugboat fleet, design and procurement of additional locomotives, modernization of the vessel traffic management system, hydraulic conversion of miter gates and rising stem valves moving machinery and automation of locks machinery controls. This program will cost approximately \$1 billion to execute. It is intended to complete everything by the end of 2002. Funding for all these improvements is from direct toll revenue as the Panama Canal operates as a non-profit making facility. It is totally debt free.

As a result of this major capital program, the capacity of the Canal will rise to a maximum sustainable level of about 48-50 transits per day, with an operating capacity, for CWT around 24 hours, of approximately 43-44 transits per day, that is closer to an annual level of 17,000.

Ship Size and Utilization

The changing ship size and growth in ship utilization of the larger ships has been analyzed, as shown below. The shifts from smaller vessels to larger occur and smaller ships may be eliminated in the competitive environment. The ship averages reflect weighted averages from the PCC ship files.

Ship Utilization and DWT – Historical Period Only

Utilization									
Ship Type	1976	1980	1985	1990	1995	%75-80	%80-85	%85-90	%90-95
Bulk	0.75	0.75	0.75	0.81	0.82	0.0%	0.0%	8.0%	1.2%
Container	0.41	0.45	0.47	0.50	0.52	9.8%	4.4%	6.4%	4.0%
General Cargo	0.55	0.50	0.50	0.51	0.55	-9.1%	0.0%	2.0%	7.8%
Tanker	0.82	0.84	0.79	0.80	0.78	2.4%	-6.0%	1.3%	-2.5%
RoRo	0.18	0.32	0.48	0.42	0.49	77.8%	50.0%	-12.5%	16.7%
Reefer	0.38	0.36	0.29	0.30	0.33	-5.3%	-19.4%	3.4%	10.0%
Vehicle	0.21	0.26	0.23	0.26	0.25	23.8%	-11.5%	13.0%	-3.8%
Average DWT									
Ship Type	1976	1980	1985	1990	1995	%75-80	%80-85	%85-90	%90-95
Bulk	31,750	33,737	36,220	37,852	40,421	6.3%	7.4%	4.5%	6.8%
Container	25,136	21,995	27,684	32,827	31,865	-12.5%	25.9%	18.6%	-2.9%
General Cargo	11,133	10,635	11,095	12,402	12,645	-4.5%	4.3%	11.8%	2.0%
Tanker	23,315	36,626	32,162	31,351	32,496	57.1%	-12.2%	-2.5%	3.7%
RoRo	2,780	14,116	16,952	16,370	17,692	407.8%	20.1%	-3.4%	8.1%
Reefer	6,223	6,426	6,784	7,628	8,484	3.3%	5.6%	12.4%	11.2%
Vehicle	11,653	14,468	14,155	14,270	14,837	24.2%	-2.2%	0.8%	4.0%

Recent studies of the expected growth in world trade and the Canal's role in that growth have generated concerns that the capacity of the Canal may place a limit on its ability to provide safe and reliable transit by the year 2010 for ships up to Panamax size. In order to partially meet this impending capacity shortfall, the Panama Canal Commission has undertaken a major investment project to increase the capacity of the canal. Included in this is the widening of the Gaillard Cut and additional dredging to widen channels to allow vessels to pass each other. During FY1996 the following quantities, in cubic yards, were removed:

	Earth	Rock	Total
Pacific District (Maintenance)	1,790,194	N/A	1,790,194
Central District (Widening)	N/A	319,450	319,450
Atlantic District (Widening)	1,454,606	N/A	1,454,606
Total	3,244,800	319,450	3,564,250

Panama Canal Toll Structure

In the past eight decades in the waterway's history, tolls rates for the Canal have increased just eight times, with increasing frequency since 1974. Toll increases have been required due to cost inflation related to the operation and maintenance of the Panama Canal.

In 1992 the unit of measurement for ships was altered when the Panama Canal Commission approved the introduction of **the Panama Canal Universal Measurement System (PC/UMS)**. The PC/UMS system was implemented in 1994.

History of Panama Canal Toll Increases

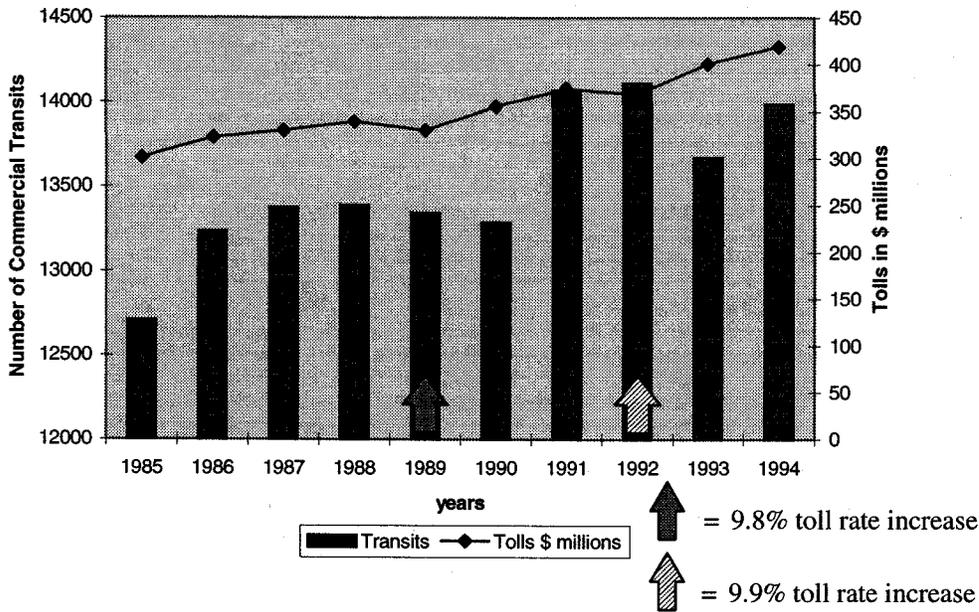
<i>Year</i>	<i>Toll for Laden Voyage</i>	<i>Toll for Laden Voyage</i>	<i>Percent Increase</i>
1915-1938	\$1.20	\$0.72	
1938	\$0.90	\$0.72	-25% on laden only
1974	\$1.08	\$0.86	19.7
1976	\$1.29	\$1.03	19.5
1979	\$1.67	\$1.33	29.3
1983	\$1.83	\$1.46	9.8
1989	\$2.01	\$1.60	9.8
1992	\$2.21	\$1.76	9.9
1997	\$2.39	\$1.90	8.2
1998	\$2.57	\$2.04	7.5

Thus, over the 18-year time period (1974-1992), the average annual increase was 4.4%, with the most recent average annual increase nearer 3%.

The Panama Canal also provides a system for vessels to book a guaranteed passage slot. This is the "booking" fee (35 CFR 104.6(b)). The fee is \$0.26 per PC/UMS Net ton, with a minimum fee of \$1,500. During periods of congestion when the authorities believe there to be at least 90 vessels for two consecutive days, a Premium-booking fee of \$0.69 per PC/UMS Net Ton is applied. The minimum Premium-booking fee is \$4,000.

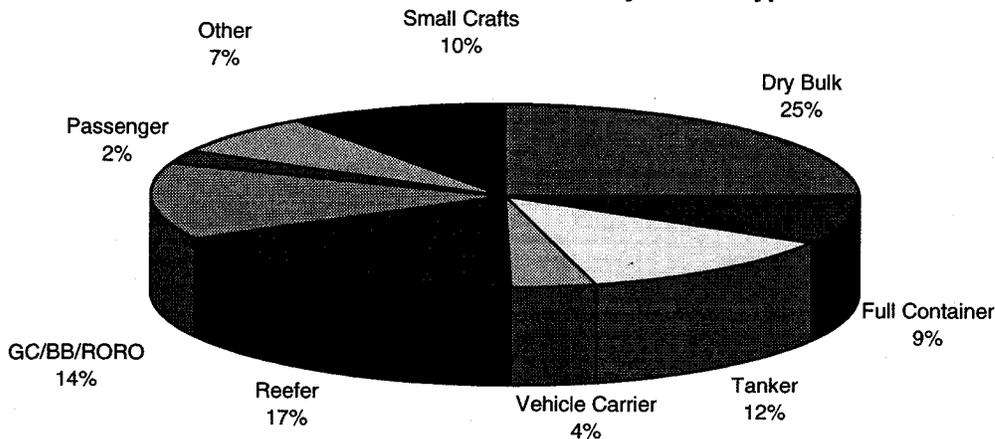
When annual transits and their corresponding toll revenues are compared with each toll increase, a direct relationship may be derived. The chart below shows the number of commercial vessel transits and toll revenues from 1985 to 1994. The arrows in 1989 and 1992 denote the recent toll increases. Toll receipts are seen to increase after the 1989 change. After the 1992 toll change, tolls fall but quickly rebound in the following years.

**Comparison of number of Commercial Transits and Tolls Collected per Year
(1985-1994)**



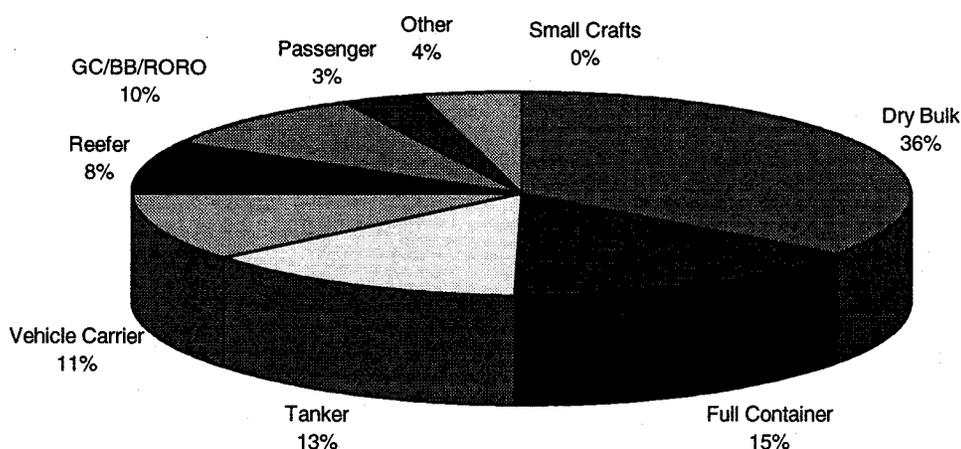
The graphs below summarize the distribution of traffic across the most important market segments, in terms of both number of transits and toll revenue. The largest market segment is dry bulk, accounting for 25% of transits and 35% of tolls revenue. Other important segments are full container ships and tankers, especially when considered in terms of tolls revenue. It is interesting to note that the combination of dry bulk, containerships, tankers and vehicle carriers account for 75% of tolls revenues versus only 50% of transits. This reflects the larger carrying capacity of these vessel types. Reefers, general cargo vessels, break bulk and other smaller cargo vessels represent 33% of transits and just 22% of revenues.

Distribution of Vessel Transits by Vessel Type



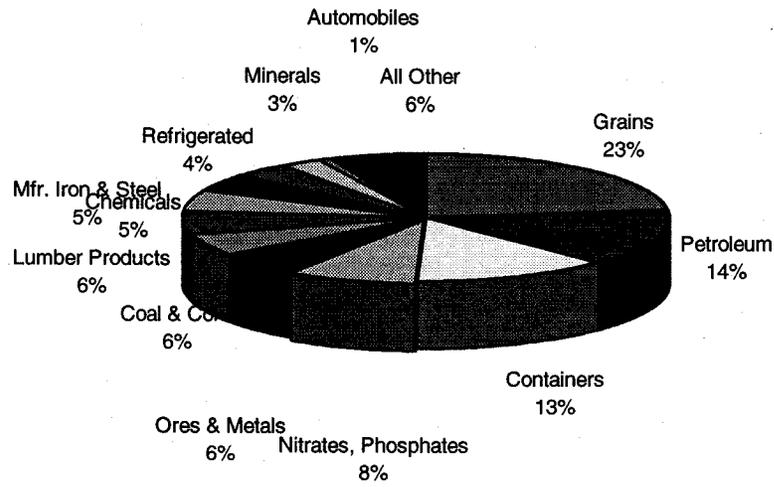
A strong pattern can be observed with respect to the distribution of traffic by trade route as observed in the graphics below. Five major trade routes, or origin-destination pairs, account for 76% of cargo tonnage, with just one, between East Coast North America and Asia, making up 44% of cargo tonnage. The other major routes link the East Coast of North America with other Pacific locations and Europe with the West Coast of the Americas. The Canal is particularly important to trade in the hemisphere. About 64% of Canal business originates or is bound for the US and about 14% of total US trade makes use of the Canal. The Canal is the major trade route also for some countries in Latin America.

Distribution of Toll Revenues by Vessel Type



Segmented by commodity type, cargo is similarly concentrated in a few major classes, with grains making up 23% of total cargo, followed closely by petroleum products including crude oil at 14% and containers at 13%. The majority of the cargoes are low-value bulk commodities which typically are influenced more by low transport cost than time and reliability of service. Nevertheless, some important segments such as containers and other fast-growing high-value cargo segments (edible oils, perishable food products, automobiles, etc.) place a premium on transit time and reliability as the time value of the cargo and the cost of delays are often far greater than the direct cost of additional transport time.

Cargo Tonnage by Commodity Type



5.4 Appendix D - Questionnaire

June 30, 1998

Dear:

The Columbus Group, a maritime consulting company, is requesting your help in a study of funding of dredging of commercial ports. We are asking for you to complete the short port questionnaire that follows and return it by fax. Our fax number is +01 (703) 351-6634.

In gratitude for your assistance, we will provide those responding with the results of our comparison of international port dredging financing. Our research has been commissioned by the Corps of Engineers in the United States; the US government agency responsible for dredging US ports and harbors.

If you have any questions regarding this survey or research please contact Mr. Paul Bingham or me at the address below.

Sincerely,

Ben Hackett, Senior Vice President
Director, Maritime Consulting
The Columbus Group
2111 Wilson Boulevard, Suite 1200
Arlington, VA 22201-3001
USA

+01 (703) 351-6620 x312
+01 (703) 351-6634 (fax)
bhackett@thecolumbusgroup.com

Port Dredging Finance Questionnaire

Please fax to +01 (703) 351-6634, no page cover needed

The following questionnaire should less than five minutes to complete. Please complete as much of the information as possible. If you do not know an answer or some questions do not apply, please complete the remaining questions. For all questions, answer from the perspective of the primary commercial port. Thank you for your participation in this research.

1. What organization has responsibility for dredging navigation channel(s)?
 - 1a. Is this organization under national, state, port authority or private control?
2. How does this organization pay for dredging? (e.g. line item in general maintenance expense budget or a separate dredging project budget)
3. Where does the organization get the money to fund the dredging expense? (e.g. part of port dues or port fees, general government taxes, or a separate dredging fee)
4. If dredging is not funded from general government tax revenues, what organization levies the fees?
5. To your knowledge, are there provisions under the law, treaty, or the country's constitution that constrain how revenues may be collected in this country?

Questions 6 through 8 refer to port charges, fees, and port dues for commercial ports in the country.

6. What is the structure of port fees and charges levied? What are the port fees, dues, or charges?
 - 6a. On what basis are vessel charges, if any, assessed? (E.g. GRT, NRT, LOA, Type of ship)
7. What is the allocation, if any, of the port fee or port charge revenue between local/regional/national entities?

8. Who pays the port fees or charges, either directly or indirectly? (e.g. ship operator, cargo shipper)
9. What would be the fees/charges for the following two example vessels:
 - a. Cellular vessel of 60639 DWT, 52191 GT, 25487 NT, Beam 32.3 Meters, LOA 294.1 Meters
 - b. Bulker of 62180 DWT, 37323 GT, 18583 NT, Beam 32.21 Meters, LOA 228.0 Meters

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