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Towards a port marketing plan for Kingston Terminal Operators Limited

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WORLD MARITIME UNIVERSITY

Malmö, Sweden

TOWARDS A PORT MARKETING PLAN
FOR
KINGSTON TERMINAL OPERATORS LIMITED

by

CLAUDIA K. GORDON

JAMAICA

A dissertation submitted to the World Maritime
University in partial fulfilment of the requirements
for the award of the:

Degree of Master of Science
in
Ports and Shipping Administration

Year of Graduation

1991

I certify that all material in this dissertation which is not my own work has been identified and that no material is included for which a degree has been previously conferred upon me.

The contents of this dissertation reflect my personal views and are not necessarily endorsed by the University.

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ABSTRACT

The objectives of this dissertation are two-fold. Firstly, it attempts to demonstrate the relevance of a comprehensive marketing approach to the improvement of the performance of Kingston Terminal Operators Ltd (KTO), and secondly to present guidelines for the development of a marketing plan for the Terminal. For analytical purposes, the paper is divided into seven chapters.

Chapters 1 to 3 attempt to set the scene. The first two are concerned with evaluating the impact of containerization on the shipping and port sectors. While chapter 3, reviews the current trends in both the macro environment and the shipping industry, and their implications for ports.

Chapters 4 and 5 present a basic introduction to KTO and appraise its performance to date. This serves to evaluate the current problems being faced by the Terminal, and presents the framework for subsequent proposals.

Chapter 6 addresses the question of the relevance of port marketing in improving the performance of ports. Some general marketing concepts are first presented, followed by discussions of their application in ports. Where possible, examples from other ports are furnished to demonstrate applicability. Although the emphasis here is on container facilities, it is intended that the general principles outlined can be applied, in varying degrees, to other types of ports.

The final section of the paper, chapter 7, takes the form of an illustrated manual outlining the steps to be taken in developing a marketing plan for KTO. It incorporates all the analyses of the previous chapters to develop the methodology required in the actual preparation of the Marketing Plan.

TABLE OF CONTENTS

CHAPTER	PAGE
1. CONTAINERIZATION & SHIPPING	1
1.1 Port Consolidation	
1.2 Amalgamation of Services & Routes	
1.3 Mergers, Joint Ventures & Other Agreements	
2. CONTAINERIZATION AND PORTS	11
2.1 The Transshipment Decision: Port Perspective	
3. CURRENT TRENDS IN CONTAINER SHIPPING AND IMPACT ON PORTS.	27
3.1 The Environment	
3.2 The Shipping Industry	
3.3 Implications For Ports	
4. INTRODUCTION TO THE KINGSTON CONTAINER TERMINAL	38
4.1 Brief History	
4.2 The Operating Agreement	
4.3 The Kingston Industrial Freezone (IFZ)	
4.4 The Kingston Container Terminal	
5. ANALYSIS OF KTO'S PERFORMANCE	59
5.1 Throughput & Service Performance	
5.2 Productivity	
5.3 Impact of Costs on Tariffs & Profitability	

6. THE ROLE OF PORT MARKETING

85

- 6.1 A definition of Marketing and General Marketing Concepts.
- 6.2 The Role of Marketing in Ports.
- 6.3 Developing The Marketing Strategy
- 6.4 Role of the Marketing Mix in Achieving Port Objectives
- 6.5 Controlling the Marketing Strategy

7. TOWARDS A MARKETING PLAN FOR KTO

121

- 7.1 Recommendations of a Marketing Department For KTO.
- 7.2 Towards a Marketing Strategy for KTO.

BIBLIOGRAPHY

APPENDICES

CHAPTER 1

CONTAINERIZATION AND SHIPPING

INTRODUCTION

Since their inception in the 1950s containers have experienced widespread use and afforded vast economies to the shipping industry. The first and most noticeable benefit was the reduction in time vessels spent at ports - from weeks to hours. In the face of increased trade flows following the second world war, the labour intensive nature of port operations represented a significant bottleneck in the through carriage of cargo. It was thus economically impractical for vessel operators to invest in larger tonnage since this would almost have certainly meant at least a proportionate increase in port time. Containerization, with its speedy and efficient operations, meant that larger ships could be employed and economies of scale achieved.

In contrast to conventional break-bulk operations, containership operations meant substantial investment on the part of both port and ship operators. Formerly, the level of port investment ran merely to the provision of a safe berth/pier, with cargo movements from ship to shore and vice versa, being provided largely by the ship's gear. Movement from quayside to transit area was very labour intensive, employing about 25 men per gang to unload a 15000 deadweight vessel. The level of port mechanization required to handle unitized operation therefore meant vast and unprecedented outlay of capital. This represented one of the reasons for the initial slow development of container port facilities as in many cases the level of available traffic did not justify the investment. As a means to supplement domestic traffic and therefore make investment more feasible, ports have had to cast their nets wider than the domestic market to encompass those of other countries and regions - thus acting out a

transshipment role.

While the possibilities for transshipment cargo made investment worthwhile, port operators soon realized that it also represented a stiffly competitive arena, with hardly any guarantee of continued viability. In fact ship operators given the new ability to funnel cargo to selective ports, have tended to trade ports off against each other, thus intensifying the competition.

In a similar situation of heavy investment, ship operators, in order to ensure the levels of loading which would afford the desired cost savings through economies of scale, have found the answer in cargo and port consolidation. Two things became clear:

(i) It was quite uneconomic for large vessels to make direct calls to outlying ports with small cargo volumes. Such practice would in fact totally erode any benefits to be accrued from large scale operation.

(ii) It is far cheaper to gather cargo from the outlying ports and absorb the inland transport cost rather than make direct calls.

Shippers were therefore quoted freight rates covering the entire movement and relieved of the responsibility of transporting cargo to the port. The total transport concept as provided by shipping companies, gave them control over ports from which cargo is shipped, thereby removing the long established revenue base of most ports - their captive cargo. Thus the concepts of door-to-door service, intermodalism and through transport gained widespread application.

The fact that the idea of transshipping was not novel, meant of course that the actors in the industry were aware of its potential and even those who were initially slow to react soon came aboard. The result was fierce competition leading to over tonnage in the case of the shipping sector and

excess capacity or underutilization in ports - a new problem had emerged.

To effectively compete and cope with the deflationary impact of excess tonnage in the market on freight rates, shipping lines have had to devise new and innovative strategies, which enabled them to retain their market share (or improve it) through continued frequency of service as well as maintain financial viability. Broadly speaking, operating strategies employed were:

- a) Port Consolidation
- b) Amalgamation of services and routes
- c) Mergers, Joint Ventures and other Agreements

1.1 PORT CONSOLIDATION

The vast investment in larger and faster ships for the container trade, required for a reasonable return on investment, a high degree of cargo density and minimum number of calls. As a means of achieving this, one option is to reduce the frequency of calls so as to gain fuller cargo loads. However, this has its problems in shipper dissatisfaction and loss of market to competitors.

Another alternative was to reduce the number of ports on the itinerary, primarily those with light traffic flows. Again, the obvious disadvantage with this strategy is that it could leave the door wide open for other carriers to enter the market, taking up the slack at the 'unselected' ports. A more viable solution was found by funneling (by sea or otherwise) cargo from the ports not on the itinerary, to selected ports which became the hub of their activities.

1.1.2 PORT SELECTION

The decision as to which port to consolidate activities, will depend on a trade-off between the various factors which

affect the economics of the port call. The relevant literature highlights the following as being paramount in the shaping of route itineraries ¹:

- i) Liner Pricing Policy
- ii) The relative cost of sea transport
- iii) Transport convexity ratio
- iv) Consignment and ship size
- v) Port Pricing
- vi) The quality of port services

i) **Liner Pricing Policy** : In liner shipping, the practice of equalization pricing is employed wherein the freight charged for shipping a given cargo from a port at one end of the route to any of the range of base ports at the opposite end, was the same. As mentioned previously, it was the shipper's responsibility and cost to get the cargo to a port frequented by the Line. This meant that in order to minimize their costs the port closest to the cargo source would often be selected. This also meant that to secure this cargo ships had to call at the ports. The elimination of traditional ports of call would therefore lead to increased transportation cost to shippers not sited near the hub port.

In order to implement a selective port call system without incurring a loss of customers, a form of absorption pricing was used: The inland transport cost was subsidized by the sea freight or the resultant savings gained on the long haul leg was used to subsidize feeder costs.

ii) **Relative cost of Sea transport:** The decision whether to transport cargo overland or make an additional port call will depend on the cost and time trade-off of the different modes of transport. In general, the cost of transport by sea tends to be 10 to 50 times cheaper than land based modes. The cost of sea transport is also affected by

¹ World Deepsea Container Shipping by Roy Pearson & J. Fossey. Gower Publishing Co. 1983. Page 132.

ship size, speed and age.

iii) **Transport convexity ratios:** As an input into the decision process the convexity ratio measures the relationship between marine distances saved or incurred as a result of making or not making a call. This is particularly useful where one port serves as a minor cargo area. In general an additional call is feasible if the distance the ship has to divert to make the call is less than that of feeding over land.² Of course, if maritime transport is decided best, based on this criterion, the question of whether to use a mainline or feeder vessel is relevant.

iv) **Consignment and average ship size:** For each port call, the entire ship and her attendant costs are involved. Therefore the greater the cargo available and or the smaller the ship size the more economical it becomes to make a diversion to include a port in the itinerary. Thus a multiport itinerary tends to be more feasible for smaller ships than mainliners. The average distance the cargo is to be shipped will also affect the decision of ship size.

Port pricing and quality of port services will be dealt with later on in this paper.

From the above it will be seen that each of these criteria of themselves will not be sufficient to create an optimal solution but rather a simultaneous optimizing of each variable. Obviously, an additional port call should not only enhance the line's revenue inflow, but impact positively on its profit position as well. Therefore, the decision to extend an itinerary involves a constant balancing of to be incurred and potential revenues to be gained. That is, the impact of the additional call on the entire system.

1.2 AMALGAMATION OF SERVICES AND ROUTES

² Ibid. 1. Page 136

The effect of containerization on ship size has already been highlighted: Container ships had far more carrying capacity and operate at higher speeds than the conventional general cargo ships, spent less time in port and were therefore more productive. In order to maintain the desired service frequency and fill these substantially larger vessels, changes had to be made to some of the former operating practices. One such change involved the amalgamation of routes and services. A brief look at the impact of containerization on the route itineraries and services offered by shipowners is relevant.

The effect of selective port calling on shipping itineraries and operations can be readily seen: Instead of multi-port calling, it became economical to call at a few ports located strategically along the route, where cargo was concentrated and fed to various other ports. The most far reaching change in ship itineraries since containerization has been the introduction of the global strategy originally by two operators: Evergreen and US Lines. Far reaching, since at the time of its introduction in 1984/85 the container routes were already experiencing massive over tonnage, and based on the logistics of such a global service, some 34 new ships of larger than average capacity appeared on the market for the new Round-the-World (RTW) service.

The increase in tonnage in a market already over supplied and experiencing fierce competition for the available cargo seemed foolhardy. However, in a market so fiercely competitive and where the strategy for survival (at least in the short term) largely involves rate undercuts to lure business away from competitors, operators must ensure that vessels are operated in such a way that capacity utilization and thus slot earning capability is improved beyond that of rivals and that operational costs are also lower. Thus the deployment of newer, larger, faster and more fuel efficient vessels by the RTW operators impacted favourably on their operating costs, thus providing the competitive edge. However, the main benefit from the adoption of RTW itinerary

is the possibility to cross subsidize different trade routes thereby ensuring not only stimulation of trade but high vessel utilization. ³ In fact, this is the crucial element in any RTW strategy and the US Lines failed largely because by adopting a unidirectional service route compared with Evergreen's east and west-about, they were unable to fill their substantially larger vessels. ⁴

A concomitant of the move to load centering is the development of door-to-door services by ship operators so that shippers not located close to the selected port will not be disadvantaged. Thus a through rate is quoted covering the movement of cargo from consignor to consignee regardless of the various modes of transport used to achieve this. This gave rise to the concepts of intermodalism/multimodalism and large investment by some of the larger operators in road and rail networks (and even recently into air transport) to facilitate inland on-carriage. Thus the use of double stacked train in the carriage of containerized cargo between the US East and West coasts became a feature of APL, and piggyback operators are a regular feature of the roads.

The development of a reliable information network through EDI allowed for smoother transportation logistics and more recently the Just In Time (JIT) concept. What JIT affords is the ready availability of goods to various manufacturers and retailers, where needed and when needed, thus keeping inventory costs down.

The ship operator providing these services can be seen as a transport specialist who will employ any mode of transport (and not necessarily including sea transport) to get cargo to the client on time. The role and responsibility of the ship

³ Traffic & Competition on Round-The-World Container Routes'. Page 61-62. Drewry Shipping Consultants. January, 1986.

⁴ Round-The-World Services: Its All Square. Containerization International. November, 1982. Page 65.

operator has significantly changed from the days where it began and end at the ship's rail and included just voyage from A to B and possibly loading and discharge of cargo. This change of responsibility is amply reflected in the IMO Convention on Multimodalism. Today, the total transport concept is more active since the ship owner has integrated both backwards and forwards, the services it supplies to its clients.

1.3 MERGERS, JOINT VENTURES AND OTHER AGREEMENTS

At this juncture, it is necessary to look at the impact of containerization on the liner shipping conferences as this will place in perspective the new forms of cooperation and organizational designs which emerged.

Conferences have existed in the deep sea liner trade since the 1870s when the Calcutta - UK conference was established.⁵ The primary aim of such an organization is to stabilize the market served (in terms of shipping tonnage and thus freight rates) and guarantee revenue to its members. The need for a stabilized market is a result of the inherent problems faced by companies offering liner service, that is, frequency of sailing at fixed tariffs (in the short run).

Fixed schedules imply a commitment to sail at a particular time and this is true whether a full ship load is received or not. The load factor is again dependent on frequency of sailing of not just a particular line, but also its competitors. Hence a situation of over tonnaging can occur on a route where there is no regulation of tonnage as exemplified by the open conference system in US trade.

The formation of a cooperative organization by shipowners

⁵ Conferences operating out of the European Community by B. Allen. Paper presented at World Maritime University in 1991.

regulating the availability of supply of shipping services and guaranteeing revenue to each member (through a cargo sharing formula) was a means of ensuring the desired stability (both from shipowner and shipper's viewpoint), by placing a limit on the competition between member lines.

Of course, the objective of tonnage regulation meant that not all lines desirous of joining the conference were accepted. This ability to dispense or refuse membership and therefore to some extent determine the financial viability of new lines was a powerful tool and often used. This was a prime reason for the UNCTAD international code of conduct, dictating mandatory admission of national shipping lines to conferences serving their country's trade.

Conferences not only regulated tonnage but tariffs, frequency, fleet size and ports of call. Tariffs were established on a commodity basis with the higher value cargo attracting a higher rate and therefore subsidizing the lower valued ones. Schedules and frequencies are organized to prevent intra-conference competition (eg. two conference ships should not call at the same port at the same time). Market share of liner cargo is allotted to each member and if exceeded the revenue has to be handed over to the conference for redistribution to members.

Conferences therefore developed into a powerful force within a trade and under the conventional liner system it was rare that 'outsiders' could survive. As a new line in a trade, there was the choice of trying to develop a market by securing a port and shippers which could take a long time (depending on the strength of the existing conference) and outsiders largely went bankrupt. Another option was to seek to join the conference and be given a share of the conference trade and have a more or less secure revenue base.

The advent of containerization has seen a considerable weakening in the power of conferences and the growth of outsiders. Whereas in the 1950s conferences controlled over

70% of trade on most routes, today its between 40 and 60%. "Competition with the conference in the days of conventional vessels required the acquisition of substantial expertise on shore and at sea for the handling and stowage of cargo".⁴ With containerization, the emphasis is on marketing, the efficiency and flexibility of service now rest with the ports.

Other factors that have limited the power of conferences are the emergence of shipper's councils with negotiating powers regarding freight rates, and service quality; governmental intervention primarily through the UNCTAD Code of Conduct and cargo reservation practices; different ship sizes, designs and cost structures. The latter is important. For a conference to exist or work at all, its members should have similar cost curves and hence no incentive to compete on price.

It is within this scenario of weakening conference powers and loss of control on capacity, that shipping companies have sought new and innovative methods of survival. With the massive capital investment required to operate a container fleet, the stability of revenue became even more vital. But the power of the conference is so weakened that vicious competition from both within and from outsiders, resulted in loss of conference market share, excess tonnage (further exacerbated by the mandatory admittance of national lines to conferences under the Liner Code) that operators had to resort to other means of cooperation. Such cooperation may be found in the establishment of shipping pools, joint ventures and consortia, joint service, slot chartering and other operating agreements.

⁴ Conferences operating out of the European Community
by B. L. Allen. Page 12

CHAPTER 2

CONTAINERIZATION AND PORTS

Before discussing the impact of containerization on ports it is important to review the general functions of ports as a link in the transportation chain. This will serve to better illustrate whether, and to what extent the basic functions of ports have altered.

The transport chain can be viewed as a system with three major subsystems:

- a) the **nodes**, which consist of interfaces between different modes or link of the chain
- b) the **links** which consists of railroads, highways, air routes, inland waterways, marine routes, and
- c) the **flows** which involves the movement of the different means of transport along these routes with cargo and people.

The marine port represents a very important node in the total transport system as it is the interface between the sea link and the land link. It is here that the largest possibilities for inefficiencies exist, since large amounts of cargo (or people) are transferred from one means of transport, processed/stored and passed on in smaller quantities to another mode of transport. This implies that to prevent bottlenecks, congestion, and increased costs, adequate facilities will need to be made available.

This does not mean the provision of port facilities

should be of the order to cover any conceivable volume of traffic. Rather, such a strategy would certainly result in very high port costs and therefore the aim of minimizing cost in the total transport system would still be frustrated. Instead, it becomes necessary for a trade-off to be made between the cost of providing a given level of port facilities as against the cost of not doing so. For example, the cost of a ship waiting for a berth (and the probability of loss of business to the port) against the cost of provision of an additional berth. This will depend on the port's objectives. If the aim is to attract transshipment traffic, then this becomes more important.

The foregoing has two implications: Firstly, the port authority must view the port as a part of the entire transportation system in order to properly evaluate exactly where additional investment in the expansion of facilities is required. Another example will serve to illustrate: It must be carefully investigated whether the long lines of lorries awaiting receipt or delivery of cargo is a result of too small a gate complex to accommodate the peaks, or whether it is the congestion on roadways which have caused a 'lumping' of arrivals. While the former reason would necessitate an expansion/reorganization of the gate complex the latter would suggest that improvements need to be made to the road infrastructure. In such a case the upgrading of the port facility would actually result in a worsening of the situation.

Secondly, the trade off situation implies that sub-optimality will necessarily have to occur in the different subsystems in order to minimize the cost of the whole. And conversely, that optimality in the parts will not necessarily constitute minimization of the whole.

Besides facilitating the change between different modes

of transport, the following may also be said of ports:

(i) They are the point where change of economic and commercial systems occur such as customs formalities, payment of duties and taxes, change of ownership, quality control inspection and so on.

(ii) They generate economic activity within a country and facilitate trade. In addition to its facilitation role, port activities themselves tend to generate the development of commercial activities relating to the various support services required by shipping. Such as ship chandlery, warehousing, bunkering, agencies and forwarders, banking and insurance, drydocking and so on.

With the post war trade boom, the advent of containerization and the possibility to use larger ships and high technology cargo handling equipment to achieve improved productivity, the volume of cargo passing through ports have experienced quantum increases: between 1970 and 1984 world container fleet increased at an annual rate of 18% with capacity moving from 195,000 TEUs to 2 million, and containerized cargo from 47 million tonnes to over 225 million - an annual growth rate of 12%. ¹ Since these containers will have to be handled at ports, at least a similar growth rate in throughput can be concluded:

This rapid and rather widespread growth in container traffic is placing considerable pressures on port authorities and port operators. Not only in terms of providing new facilities, adapting old ones or expanding present facilities, but also in terms of operational organization, as the increased volume of cargo now being handled means that the

¹ Improving Port Performance: Container Terminal Development. A project of UNCTAD & SIDA. Page 3.

possibilities for congestion is now magnified.

Under the conventional system where ship size was constrained, the depth alongside required was relatively shallow, and ships were often equipped with their own cargo handling gear, the port's role was limited primarily to the provision of stevedores, forklifts and warehouses for cargo. Indeed the geography of ports in this era was characterized by massive shed structures, some owned by consignees, from which cargo was sold. Thus the level of investment in port facilities was moderate and extended primarily to land and buildings.

Container operations on the other hand, are highly dependent on high capacity specialized equipment and therefore high investment cost to port developers. This is not merely a function of initial capital outlay but operating and maintenance costs as well (eg. approximately \$6 - 9 million a year for equipment costing say \$30 million). ²

Further, the features of conventional berths with their narrow aprons have disappeared and are replaced by the vast expanse of land required for stacking containers. The fact that ports lie in cities with vibrant commercial activities means that the cost of such prime and often scarce land for port expansion is quite considerable. This has frequently meant large investments in land reclamation.

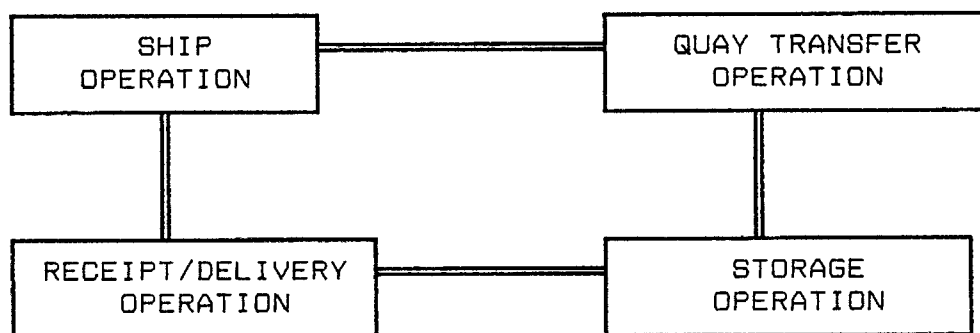
Also serving to increase the cost of container operations relative to conventional, is the increase in ship's draft. The newest container vessels have draft exceeding 12m and in many cases this has meant extensive and expensive dredging

² Operating Maintenance Features of Container Handling Systems. Researched by B. J. Thomas & D. Keith Roach for UNCTAD. Page 3.

tidal ports, maintenance dredging is also considerable.

These factors have led to the emergence of new concepts in the management and operation of ports:

(i) **The Terminal as a system.** Here the concept of the port as a subsystem of the total transport system needed to be developed further to embrace the new operational requirements dictated by containers. In order for the container port to carry out its function effectively the entire operation within the terminal needed of itself to be viewed as that of a system with its own subsystem, complementary and interdependent. This relationship is depicted below.



The type of quay transfer system used will determine the quantity of storage space required, which in turn will impact on the efficiency of the loading and discharging operation and in turn be determined by the rate at which cargoes clear the port. The output of the whole system is therefore constrained by the capacity of its weakest link.

(ii) **The Terminal Operator:** Cargo passing through a conventional general cargo port was handled and facilitated by several organizations, such as the stevedoring company for shipboard activities, a cargo handling company for quay transfer, port authority for transit shed and so on. Each

with its own objectives, management structures and administrative procedures. Coordination of activities was therefore poor and duplication often occurred. In order to obtain the economies afforded by containerization and dictated by the scale of investments, it became essential that the integrated nature of the various activities be recognized and a coordinated approach adopted - that is unity of command should prevail in the management of port facilities.

The high level of investment in both infra and superstructure in most countries, and especially in the case of the developing world, meant that this responsibility has fallen to the government. Thus government (central or local) became owners of the port and can choose to operate the facility. This was however not often the case. Operation of the conventional facilities were often carried out by private companies and thus the necessary expertise in port operations resided with private operators. Therefore, they were often contracted by governments to operate the container facility. Thus the concept of the Terminal operator emerged where port facilities were either leased out by the port authority on a long term basis to terminal operators or an operating company is established jointly between the port authority and stevedoring companies.

Containerization necessitated changes not only in port operational and management practices but had far reaching effect on the requirement for and the level of port labour employed. The conventional system of employment of often casual labour was well suited to an industry of largely unpredictable activities (due to unpredictable vessel arrivals) fluctuations in trade, the relatively unskilled nature of tasks and the general availability of labour in excess of demand. Liner services afforded some level of predictability in traffic and thus labour requirements could be calculated. So dock workers were registered, rostered and

experienced some stability of tenure and earnings. Later, in order to ensure an economic level of earnings (especially in some countries where registered dock workers numbered tens of thousand) manning levels in excess of the actual required was often laid down by unions.

The combined unitization of cargo and special cargo handling equipment served not only to increase productivity per gang but reduce the number of men required per gang from roughly 26 to something within the range of 12 to 14. Additionally, the introduction of the through transport system has meant that much of the traditional dock work is devolved to consignees/consignors, ICD's and other off-dock cargo processing facilities.

The social, economic and political consequences are enormous, and with the displacement of labour which ensued, labour discontent in the form of strikes and go slows can ruin a port if proper management techniques are not applied to manage this change. The level of skill required of today's dock worker is now of a high level and preferably multi-faceted. This new breed of dock worker is remunerated handsomely and it is frequently found that crane drivers are among the most highly paid port employees.

2.1 THE TRANSHIPMENT DECISION: PORT PERSPECTIVE

From the discussion in chapter 1, it was seen that the decision to tranship was that of the carrier as a part of his operating strategy. The primary benefit to him being the ability to serve a wider market, parts of which would not have been economical to service via direct calls with mainline vessels. The decision to tranship was based on economic factors such as load level, diversion distances and so on, as well as characteristics of the various ports to be served. In

the discussion of the impact of containerization on ports, the vast capital investment required to develop a container terminal was mentioned and that in many developing countries the only entity that can obtain finance on such a scale is the government.

Containerized cargo is primarily manufactured cargo, and the production centre for these is usually located in the developed market economies and more recently in Asia's Newly Industrialized Countries (NIC). Exports of the developing countries tend on the other hand, to be mostly of primary products such as ores and agricultural produce (most of which does lend themselves to containerization) although some limited amount of manufacturing exports does take place. Thus in many cases the actual or potential level of container cargo may not be sufficient to justify the level of investment required in even a single container terminal facility.

Port planners are therefore faced with the decision: should the country construct a container terminal and try to attract transshipment traffic in order to make it economically viable and therefore justify its existence, or should they allow their trade to be transhipped via another country/port and feedered to them thus requiring relatively minimal investment. Obviously the decision will be based on a complex mix of political and socio-economic cost benefit considerations.

2.1.1 RISKS AND BENEFITS OF TRANSHIPMENT

Based on a UNCTAD report on transshipment ports,³ the risks and benefits of a transshipment port may be said to affect primarily shippers, shipping lines and in addition to these, the national economy. The benefits attributed to the

³ Development & Improvement of ports: Transshipment ports TD/B/C.4/293. 1985

shippers are:

- a) reduction in maritime transport cost will result in cheaper services. Here it is assumed that economy of scale achieved by carriers will be passed on to the shipper in the form of reduced rates and this of course depends on the contestability of the market.
- b) greater sailing frequencies
- c) connections with a wider range of foreign ports and thus
- d) the possibility of new trade markets.

The primary disadvantages is that those on the feeder end of the service may have longer transit times, increased probability of cargo loss or damage due to multiple handling and ports and that disruption at the transshipment port imperils the security of supply. These constituted the primary grounds for shippers resistance in the beginning, to having their cargoes transhipped.

The major disadvantage to national shipping lines is the possible inability to compete with the larger carriers calling at the port, in terms of securing long haul cargoes. In such a case national lines may find their role relegated to the feeder option not in terms of increased market opportunity but for survival.

Local shipping lines can however, also derive some benefits from transshipment activities of a port. The improved efficiency afforded by modern cargo handling facilities and dictated by the fast turnaround time and increased productivity for vessels necessary at a transshipment port, will also accrue to national lines and serve to strengthen

their competitive position. Transhipment also offers new markets for local lines through the possibility to set up feeder operations if the mainline carriers do not have their own feeder networks.

The foregoing merits and demerits of the transhipment option will likewise impact on the national economy in varying degrees. Additionally, the existence of a transhipment facility generating increased port activity and traffic growth and establishing wide trade links, will serve to encourage the development of industrial services within the port estate, such as export processing zones, which in turn increases port activity.

A transhipment port is also a very lucrative means of earning foreign exchange and this is very important in the developing world where this is often a scarce commodity.

Finally, the use of feeder vessels allows access to smaller ports thereby affording the option (as far as the load centre country is concerned) of wider distribution of cargo by the cheaper water means and relieving the pressure on inland transport. For countries on both end of the feeder services, it also affords greater spread in the development of the country and serves to promote intra regional trade.

2.1.2 MINIMUM REQUIREMENTS FOR A TRANSHIPMENT PORT

The previous discussion concentrated on the various factors which influence the selection of ports on the itineraries of shipowners. From a port standpoint, it is essential to be aware of, and understand the interrelationship between these factors so as to be better able to predict the response of ship operators to a given change in any of these parameters. With these in mind, if a port's decision is to

try and attract transshipment traffic, the following criteria are also relevant, more so because the majority of these are largely within the ability of the port to furnish or influence:

- a) The level of national trade
- b) Potentially available traffic volume
- c) Physical location
- d) Port facilities
- e) Efficiency and Organization of port operations
- f) Competitive arena (national and regional)
- g) Pricing
- h) Existence of Free Zone/Port, storage and assembly processing of cargo
- i) Range of container and other shipping services available
- j) Availability of feeder services to and from relevant feeder port; level of hinterland development and inland transportation.
- k) Customs procedures (fast and efficient)
- l) Freedom of trade and the existence of market/preferential trade agreements with other countries.
- m) Government regulations.

These requirements are largely self explanatory. However the following points need to be made. While a high level of domestic traffic is not a prerequisite for being selected as a transshipment port, it has already been shown that the cargo uplift factor is considered by ship operators. Therefore a good cargo base relative to neighbouring countries enhances the potential of being selected.

What is most important however, is the future traffic potential. Here the analysis is not limited to that of the country/port hinterland under consideration, but the entire region. It is regional trade which creates transshipment opportunities for ports and not necessarily domestic trade. This point is repeatedly demonstrated in ports such as Singapore and Colombo whose actual trade relative to other countries for which they serve as transshipment points (India, Thailand etc) is quite small, yet today they are flourishing regional transshipment ports.

Of course this brings heavily into play the factor of government regulations which might adversely affect the ports possibilities for developing the transshipment trade. For example, one of the reasons for Colombo being used as a transshipment port for cargo destined for India is because of Indian Government regulations re transshipment.

In an effort to minimize voyage costs, the port that will be of interest to ship operators will tend to be that which offers the minimum deviation from the major trade routes. Thus port planners, especially in countries with large land mass should also bear this in mind when deciding where to establish a port.

Port facilities should be well maintained and of sufficient capacity to accommodate the expected vessel sizes. This means that tugs, where needed should be available; handling equipment, storage facilities, cranes and berths. In the transshipment business where the whole aim of the exercise is cost reduction, this assumes even greater importance to the success of the port.

This brings us to the requirement for a high level of efficiency and organisation. Port management must employ a commercial approach to the running of ports. There needs to be proper selection and training of employees and most

importantly, a degree of freedom and flexibility in decision making. For example, the level of authority accorded to management must not merely extend to the repetition of goals, objectives and rates. Instead especially in the case of the latter, they must be in a position to use discretion in negotiating these rates in accordance with prevailing market situation (charging what the market can bear). Of course to implement such decisions without it being disastrous to the company, the decision maker must be aware of all the elements which enter into play, namely the cost structure of the ports and the basis of the established tariffs.

2.1.3 UNDERUTILIZATION IN CONTAINER PORTS

Notwithstanding the vast investment required to set up container facilities and the general shortage of capital in developing countries the number of world container ports have increased rapidly since the 1970s. This is because following on the rationale of cost justification in the face of low domestic volume, many countries/ports have decided to bid for the available transshipment traffic. Obviously if several ports within a region develop transshipment facilities then there is that much less traffic available to each. Thus the situation of overcapacity and underutilization (different sides of the same coin) is evident in far too many ports.

A large part of the reason for overcapacity rests with port planners and decision makers. In order to justify the cost level very optimistic forecasts are sometimes used, or competition understated, if mentioned at all. Also the lure of scarce foreign exchange inflows expected from such a service is enough to make the need for in depth analysis of the market secondary.

In developing terminal facilities, the level of increase

in regional and national trade expected over the planning horizon will greatly determine the terminal capacity required. However, whilst trade projections may or may not materialize, the facility, once constructed can rarely be altered. A fourth reason is the influence of shipowners. In deciding whether or not a market will exist for its proposed transshipment facility, port planners often rely on the feedback it receives from the prospective users - the ship operators. The fact that it is in the interest of the shipowners to have a wide choice of ports at which to call will generally mean that the response received by the port planners is very positive. In fact it is in their interest not to discourage ports which are willing to provide transshipment facilities. The tendency is to encourage as many ports as are willing to make the investment and need not choose from among them before they have all made the necessary investment, and even the favoured one will find that the decision, of necessity, is not permanent, so the inter-port competition can be exploited in the future.⁴ While the creation of such a cut throat atmosphere may impact favourably on the efficiency of the competing ports, the same cannot however be said for the financial performance of the unselected ports.

2.1.4 ROLE OF AGREEMENTS

The only means of protecting port investment is to have a guaranteed traffic volume or a guaranteed level of facility usage. This may be possible through agreements between:

a) The port and the ship operator: This normally involves joint development of port facilities and therefore spreads the investment risk and assures the port of a level of

⁴ Development & Improvement of Ports: Transshipment ports. UNCTAD TD/B/C.4/293

usage. While contracts/agreements of this nature are widespread in the developed world, it is a rare occurrence in developing countries (Singapore the major exception) and may only occur if the port is in such a dominant position and expected to generate much traffic. In which case one may argue that the port would not necessarily need the contract and should probably go for a common user approach. From a carrier's point of view such contracts restrict flexibility and endanger the competition between ports on which they rely for improved port efficiency.

b) **Agreements between ports.** Ports compete not only on efficiency but on pricing. Thus published tariffs and actual charge will tend to differ from customer to customer. While this flexible approach is in accordance with that advocated earlier, it is often found that the size of the variation is dependent on how desperate the port management is to secure a particular line and not necessarily because this is what the market will bear.

There is scope therefore for ports to restrict competition among themselves through the charging of not dissimilar prices. In effect the formation of a cartel similar to conferences. This approach has several drawbacks. The effective functioning of any cartel assumes a similar cost structure for its members so that there is little incentive to reduce prices to lure cargo.

Unlike shipping lines, ports are disparate entities with different management structures and policies which greatly affect cost levels. For example, a Terminal which does not employ its stevedores directly but subcontracts this function as, and when needed, will have a lower level of fixed costs than that port which employs them directly. With a lower cost base he can reduce prices and still make a profit, to the detriment of the next port.

It can be argued that such an environment will force other ports to seek economies through cost reductions. However the structure of port relationships is often dictated by government and can take decades to change (as exemplified by the registered dock worker scheme in the UK). Of course, assuming similar cost structures and a willingness to cooperate, the problem of policing the actual rates charged would also emerge.

Another alternative arrangement that can be made between ports is the possibility for joint investment in return for a share in both the control of operation and profit. This is probably a more feasible alternative to that presented earlier, since it would avoid, in the initial stages, unnecessary waste of capital while accruing the benefits of transshipment. This would however (like the price fixing agreement) work best between ports of the same country in terms of operational logistics. It must be stated that while the proposed agreements between ports has obvious advantages, hardly any inclination at cooperation between ports along these lines has been shown to date.

c) Agreements between Governments. Agreements could be made between governments to either invest jointly in port facilities or share different aspects of the transshipment services between countries. For example, one provides the port facilities and the other the feeder service.

CHAPTER 3

CURRENT, TRENDS IN CONTAINER SHIPPING AND IMPACT ON PORTS

The two previous chapters were concerned with presenting a picture of the impact of containerisation on the evolution of ports. In particular, it was shown that historically the port's role in the change process has been typified by reactionary measures. They were not innovators but facilitators. This behaviour may be seen as very much in line with the generic function of ports, that is, as facilitators of trade and the interface between maritime and other transport modes. Thus the impetus for change - technological and operational - resided with the carriers, and the survival of the ports depended on their ability to anticipate, and respond effectively to this challenge, in order to prevent being marginalised and indeed survival was often at stake.

However, the all-powerful role of carriers in trade/transport has been significantly diluted over the years due particularly to the decline in conference power and the rise to power of shippers' organizations. While the ports themselves have not really gained power, it may be said that they are nevertheless in a stronger position by virtue of the carriers being in a less dominant one. However, they are still a long way off from, and may never be in the position of calling the shots.

In this chapter, based on recent trends, an attempt will be made to forecast the general environment in which ports will have to operate in the future and where appropriate, the response of some ports to the challenge.

3.1 THE ENVIRONMENT

The demand for shipping and port services is derived based on the need and ability of geographically disparate nations to trade, and in turn is affected by fluctuations in trade. Trade, on the other hand, is affected by a host of factors encompassing the more obvious economic and

political, technological ones as well as the unpredictable, such as natural disasters. Thus an analysis of the more predictable of these 'leading indicators' can offer invaluable insight to industry management by not only indicating what future demand for port services will be, but by offering hints as to where the markets are and how they may tailor the port's services to respond to these changes.

By and large, it is agreed that the prospects for future trade is one of sustained healthy growth in the 90s. It is expected that world economic growth will average 3.2 to 3.5 percent per annum ¹. While this remains in keeping with the general growth of the '80s, the pattern of trade is expected to change mainly due to:

1. THE STATE OF THE US ECONOMY

The growth of the '80s was led by US imports - largely from the Asian economies. However, with the yawning trade deficit and softening of the Dollar, as well as the strengthening of the Asian currencies, there is in progress a realignment of trade on a more balanced level. That is, US imports are expected to decline while their exports increase.

2. REGIONALISATION OF TRADE

The impending economic integration of Western Europe will make it into the single largest trading group in which there will be free movement of persons, goods, services and capital, which is in turn expected to fuel economic growth of the region. The removal of all tariff barriers between the community members will mean that trade between them is more competitive relative to non-members. This in itself constitute a barrier to trade as far as non-members are concerned. It has also resulted in what is increasingly referred to as the globalisation of production, which has the irresistible benefits of increasing investment inflows to the region, thereby stimulating both production and employment.

¹World trade to the year 2000. Implications for shipping: Asian Shipbuilding in the 1990s Conference. By Ben Hackett & Doug Beck. Page 2.

The indirect disbenefit may well be that unless the trade off between technological efficiency in production (thus reduced costs) and the relatively higher cost of European labour (especially in the more northerly states) is positive, the European consumer may be faced with higher costs for locally produced commodities. This will of course render imports more competitive, given a constant level of tariff on imports. In this regard one can expect the 'industrial banana' (great producing areas of Europe) to shift to the south where labour is cheaper.

Not only has the EC been a catalyst to the decentralisation of production, but the potential benefits of such integration has not entirely escaped the notice of other regions. There has been an increase in the number of agreements - bilateral and multilateral - aimed at accruing these same benefits. Witness for example the USA - Canada Free Trade Agreement and the proposed America's Initiative. For economic unions that already existed, new purpose has been added, thus the resurgence of activity in say CARICOM (Caribbean Common Market).

Other factors besides collective political action are at work to undermine international trade in favour of regional trade: Namely, the unequal development of the different countries within a region. In almost every region with maybe the exception of Africa, there exists a marked distinction in the economic development of the countries. For example Northern Europe versus Southern Europe, West more developed than East; USA and Canada more developed than Central, South America and the Caribbean; In Asia, Japan and increasingly South Korea are ahead (in terms of economic development) of say China, ASEAN, India and so on. Granted, this position has always existed, but its importance is now underlined in this movement towards regional trade which it facilitates, by virtue of the presenting the possibility for investors to exploit the various comparative advantages of the different countries (sub region). Thus 'the fastest interregional trade growth should occur between Japan and the Asian NICs, as the Asian NICs will increasingly become a feeder of the fast growing Japanese appetite for imported products, and Japanese direct investment in

that region and generate company trade' ² The magnitude and importance of intra-regional trade in the future is tabulated below:

TABLE 3.1
LONG TERM OUTLOOK FOR INTERREGIONAL TRADE
(\$billion, both ways)

	1988	1995	growth
EC4 - US	117.4	239.0	10.7% pa
EC4 - JAPAN	51.2	114.9	12.2
EC4 - ASIAN4	50.6	117.5	12.8
US - JAPAN	125.7	263.7	11.2
US - ASIAN4	97.7	230.4	13.0
JAPAN - ASIAN4	71.0	181.0	14.0
TOTAL	513.6	1,146.5	12.2
WORLD TRADE	5,613.0	11,734.8	11.0

Source: Extracted from 'Overview of the world economy & trade
By S. Masuyama. Havencongress, charts 8 and 10.

While the above table doesn't prove conclusively the argument, the fact that the incidence of intra-regional trade (Japan-Asian4) is expected to grow at a faster rate than both interregional and global trade nevertheless underlines the point. If the other regions chose to facilitate intra regional trade based on the model of the Asian NICs and Japan, namely by pumping investment in the less developed countries to take advantage of reduced inputs costs, then this will have the positive effect of raising the general level of economic development regionally. This will however, also reduce the demand for sea transport.

3. EAST - WEST DETENTE

The end of the cold war which had created a bi-polarisation in the world economy in former years should serve to boost world economic growth and a further restructuring of trade.

Firstly, the COMECON barter trade has collapsed under the new free

²Overview of the world economy & trade, HavenCongress. By
'S: Masuyama, page 5, para. 4

market system, as the countries try to secure hard currency necessary to survive and develop. This offers vast potential for trade in the short to medium term, since their exports tend to be primarily of heavy industry and natural resources while import demand is for manufactured goods and services. Potential trade will be limited, in the short run to their ability to pay.

The reduced level of military spending now possible through the warmer East-West relations has also the effect, if channeled into productive processes, to impact positively on world economic growth. The other side of this is that, the Developing countries will face stiff competition from these emerging free market economies for the available investments, aids and loans. This coupled with the debt problems will result in further weakening of their economies.

In general therefore, while the world economy and trade is expected to record healthy growth in the future (3.5 and 11% p.a. respectively) the demand for shipping services, by virtue of being dependent not only on quantity but also on the distance shipped, is expected to record less growth due to the above mentioned factors.

TABLE 3.2

GROWTH IN VOLUME OF COMMODITIES SHIPPED
(Average Annual growth rate)

	1985-89	1989-95	1995-2000
CRUDE & PETROLEUM PROD.	5.8%	2.1%	1.5%
IRON ORE	2.7	-0.3	0.6
COAL	3.8	2.3	2.7
GRAIN	1.8	1.9	1.7
BAUXITE & ALUMINA	4.7		0.5
PHOSPHATE ORE	1.1		1.0

Source: Extracted from JAMRI report on Medium to Longterm Analysis of the Shipping Market (1990-2005)

The general trend of expected decline observed in the table above is explained by Dr. Joon-Soo Jon as being attributable to '...the decline of

heavy industry in the developed countries, the localisation of natural resources and the industrialisation of developing countries' ³. The outlook for growth in the general cargo sector and in particular, the liner trade seems brighter, although still not up to the level of world trade. Viz: Increased demand for manufactured and semi manufactured goods is rapidly increasing, facilitated by increased containerisation. One forecast speculates that growth in the liner trade should average around 5.1% per annum, reflecting strong growth in consumer demand and globalisation of world production.⁴

3.2 THE SHIPPING INDUSTRY

For the shipping industry the implications of the above discussion can be translated as slower growth in the major arterial routes, but expansion in intra-regional activity:

TABLE 3.3
EXPECTED ANNUAL GROWTH IN CONTAINER TRADE

ROUTE	1984-89	1989-94
North America-Asia	8.4%	5.1%
" " -Europe	3.4	2.6
Europe-Asia	9.0	7.7
Intra-Asian	10.6	9.9
" Europe	4.6	4.9

Source: Extracted from Containerisation International 1990. Based on TBS/DRI forecasts.

Other factors which will impact on the industry include:

1. The trend towards increasing ship sizes. As of May 1989 around 38% of the capacity on order was for ships of 3000 TEU and more, many of

³Changes in Shipping Environment & Counter Strategies of Korea Towards year 2000. Page 151, para. 3

⁴World trade to year 2000: Implications for shipping. Presented to Asian Shipbuilding Conference, Busan, Korea in 1990, by B. Hecket & Doug Beck.

which were to be delivered in the 1990s ⁵. This trend towards larger mainline vessels has also influenced (for operational reasons) required size of feeder ships. Coupled with the existing overtonnage, then it can be expected that the downward pressure on liner rates will continue in the foreseeable future as carriers scramble for the available cargo to ensure economic load factors.

2. Adoption of differentiated marketing strategies by carriers.

Through the 80s the industry has seen the emergence of two distinct marketing strategies by carriers. On the one hand there are those who position themselves as global carriers offering customers not only door to door transport but also more sophisticated logistics, thereby becoming an almost indispensable part of the client's JIT distribution system. In contrast, other carriers adopted the approach of not vying for this global integrated service, but have positioned themselves as niche operators, specialising in a particular region or aspect of the total service package. This has resulted, in both cases, in increased investment in EDI - a necessity for logistics service - to provide shippers with accurate and timely information.

3. The increasing trend towards customer-oriented services. This is set to continue as shippers continue to demand better and more sophisticated services and carriers are forced for competitive reasons to comply. The rise of shippers power and outsiders have seen a weakening of conferences which is expected to continue in the future. This is a result of the conference's increasing inability to control tonnage and enforce rate levels - the purpose for which they were created.

4. The changing pattern of carrier cooperation. The emergence of market strategies based on service differentiation led to, and increased the importance of brand supremacy. Under this scenario, the inappropriateness of consortia, has therefore led to its decline in favour of operating agreements. The latter, while ensuring economies of scale, does not involve the loss of or a merger of carriers' identity in the

⁵ Top 20 Carriers Consolidate. Containerization International. June, 1990. Pages 46-50.

market place. It therefore offers the possibility to engender the much sought after customer loyalty.

5. The increased usage of non-ISO standard boxes. The philosophy behind containerisation was to enable the packaging and transport of cargo from origin to destination with minimal handling to the cargo itself, while in transit. It means that the form used to unitize the cargo must be interchangeable between different transport modes and can be handled by standard equipment. A standard for containers was therefore essential.

The creation of specific box sizes by the International Standard Organization (ISO) has largely governed the container sizes in use today. However, an increasing trend towards introducing different container sizes is much in evidence. This will have serious implications for the ability of existing port equipment to handle these new containers.

3.3 IMPLICATIONS FOR PORTS

Given that cargo handled in ports tend to grow at a higher rate than trade (due primarily to double handling), it can be inferred that cargo handled at ports in the coming decade or so will experience an average annual increase in excess of 5.1%. This in turn implies an increase in the demand for cargo handling services. On the other hand, falling liner rates means that carriers are more sensitive to costs and therefore that ports, in order to win the patronage of carriers will need to play their role in reducing carrier costs. While the response is normally that of tariff rebates, by far the largest contribution ports can make in the reduction of the transport cost is through short vessel stay in port. A survey to identify what is most important to the ship operators from a port standpoint reveals that port cost was by no means the top priority, but rather fast and efficient service.

The trend of increased ship size holds several implications for ports and their developmental plans. Obviously there will be the need to increase the depth of channels and berths, and to accommodate the higher

throughput per vessel per berth, there will be a need for more stacking areas to be made available for each ship's interchange and a given trade volume. The requirement for fast turnaround will be stronger than ever thus also implying necessary increases in number of cranes per ship, their speed and outreach. In general, increased efficiency is required in container cranes in order to enable reductions in ship's capital costs, operating costs and inventory costs of loaded cargoes, by shortening the turnaround time in port and total time cargoes are in transit.⁶

The degree of flexibility with which the port responds to the challenges of change can be the decisive factor to its survival. Thus, ports in responding to changes must select the appropriate strategy which will satisfy customers while maximizing its returns on investment. Dr. H. Beth ⁷ highlights two broad responses. Namely,

- 1) Capital widening, which involves the quantitative improvement of facilities, and,
- 2) Capital deepening, which depicts a qualitative response where strategies for the better utilization of current resources are employed such as rationalisation and increased productivity of existing facilities.

In practice it may well be that the optimum strategy comprises a combination of the two. For example, a port responding to the challenge of bigger ships will almost certainly need to deepen access channels and so on. They will also need to invest in new cranes (post panamax). But there may not exist the need to build additional berths since as was already stated, there will be fewer ships, *ceteris paribus*. What may be necessary is reallocation of berth lengths in keeping with the prevailing vessel lengths.

⁶Changes in world shipping & counter strategies of Korea towards the year 2000. By Dr. Joon-Soo Jon

⁷ Developments in World Shipping - Effect on ports. page 2. Presented at a Lecture to the World Maritime University in June, 1991.

Also the need to provide additional transit area may be avoided by the employment of policies which engender more efficient utilization of the existing areas, such as shortening of storage periods and strong penalties for tardy removal of cargo, divestiture of CFS functions to other warehouses and the increased use of ICD's (inland container depots).

In the era of containers computerisation of the port operations and planning is vital to improved operational efficiency, and in order to find the most feasible and cost effective solution to the issues of port development, finance and management. The leading ports of the world have sought and found the competitive edge in the various services they afford clients through a comprehensive computer system, involving in some cases linkages with ports at the other end of the trade route. Although this is admittedly a very advanced and complex undertaking, the logic is however clear: By direct communication with the other end of the trade route they are able to know, as soon as the vessel sails, all the various details of the cargoes destined for their port. Thus they are able to plan well in advance for its arrival.

The rise of individual marketing strategies through service differentiation aimed at customer loyalty, and the decline of consortia in favour of operating agreements, poses both opportunities and threats for ports. One possible disadvantage is the need to widen the marketing effort. For example, ports in their marketing activities could target three or so lines through a consortia, since the decision as to ports of call was collective. Similarly, with the breakaway, ports which had secured these lines may find they run the serious risk of losing a substantial portion of business.

On the positive side, this resurgence of independent carriers has opened up the market of potential customers as far as ports are concerned. Thus given equivalent efficiency in various ports and no great geographical/trade disadvantages, there should be a trend towards a more even distribution of carriers among ports. Ports can also seek to exploit the increased powers of shippers to influence carriers, to their advantage. This may be done by appealing directly to shippers who can use

their clout to decide on the ports from which their cargo should be shipped.

Thus, in the future, ports will undoubtedly need to concentrate on development of services both qualitatively and quantitatively but on an efficient and cost effective basis since it is unlikely that they will be able to pass on all their increased costs to carriers/shippers and remain competitive. It will also mean that ports will need to be innovative in both the provision of services and more active in influencing the ports through which cargoes are shipped.

In addition, in the planning of equipment purchase, management has to be cognizant of current trends which may render equipment prematurely obsolete. One significant example is the increased popularity of non-standard ISO boxes by shippers in order to secure cost benefits. A proposal was placed before ISO by ANSI (American National Standards Institute) to legitimize such sizes as 48 feet boxes although the payload is to remain the same as that of the 40 feet[®]. This has implications for the size of crane and yard equipment spreaders, the size of the slot per box allocated in the transit areas, and, in the case of the former, management will want to build in an option for adjustment/extension when purchasing equipment. The proposal of increased size while maintaining current allowable weight, raises the issue of control to ensure that overweight boxes do not damage costly equipment.

From the foregoing it would seem quite clear that ports need to register a voice in the organizations that take decisions which impact on their activities. For this there will be the need for unity. This will undoubtedly be the determinant of how successfully ports will perform in the future.

[®] USA proposal for ISO series 2 High Cube container size. ISO/TC 104 WG.4 no. 28. Prepared September 23, 1988

CHAPTER 4

INTRODUCTION TO THE KINGSTON CONTAINER TERMINAL

In 1975 Jamaica and in particular the Port of Kingston joined the ranks of countries vying for the container transshipment business. The decision was taken by the Port Authority to construct a container terminal to facilitate the growing containerised trade of the country and at the same time capitalise on the lack of such facilities in the region as a whole, by offering transshipment for the region and for certain other trades. This was seen as being possible due to the strategic location of the island, representing minimal deviation from the trade routes utilizing the Panama Canal.

The existing port estate was extended by land reclamation and a four berth terminal was developed and started operation in 1975. The strategy to vie for transshipment traffic has been largely successful as TEUs handled at the Terminal rose steadily during the first 12 years of operations, to peak at over 253,000 in 1987. Estimates by the Ocean Shipping Consultants projected that the port of Kingston would have been handling over 265,000 TEUs by 1990.¹

However, several events have since occurred to dramatically alter this picture. Namely, the destabilization of the Panamanian economy and the resultant impact on its freezone activities; the increasing use of the US land-bridge for cargo movements between its East and West coasts; and the stigma of illicit drug trafficking from the port which was largely responsible for the withdrawal of a major transshipment line at the end of 1987. Today, traffic at the Terminal

¹ World Container Ports to 2000. Ocean Shipping Consultants, 1986. Page 166

averages about 90,000 moves or just over 100,000 TEUs.

The Terminal is therefore facing a crisis. In the face of downward spiralling of traffic, the increased port costs with its impact on profitability, and the more recent industrial relations problem, the Terminal faces the very real danger of losing her present, if somewhat tarnished status as one of the premier container facility in the region. And with the increasing competition now faced from ports such as Cristobal, San Juan and Santo Domingo, any further loss of business could affect its survival.

In this chapter, a brief history of the development of the port is given, the general operational structure of the Terminal and in chapter 5 a situation analysis detailing performance to date and problems faced by the Terminal. It is hoped that this will present the background for the subsequent chapters in which it is suggested that the port may be able to resolve some of its more crippling problems and improve its declining transshipment market by adopting a comprehensive marketing plan.

4.1 BRIEF HISTORY

Since the early 17th Century during the English occupation of Jamaica, the Kingston harbour has been the centre of the Island's shipping and commercial activities. With over 8 square miles of navigable water and depth of over 90 feet, large ships could berth safely alongside the shore, discharge cargo and sail again quickly - a necessity during the period when Port Royal (the most easterly end of the harbour) served as a base for the activities of the reknowned English pirate, Sir Henry Morgan. The ensuing years saw activities of the port being relocated from Port Royal (after it was destroyed by earthquake in 1692) westerly, to what is

today known as Newport West.

As the rapid increase in the demand for sugar and other agricultural produce increased profits and gave wealth to the city, Kingston grew in size and importance to the Island. The development of port structures within the harbour was hard put to keep pace with that of the Island's commerce. The proliferation of finger piers to handle the rising tide of goods flowing through the port, concentrated a large number of ships on a relatively small area of coastline. This resulted in acute congestion in the port, as the road infrastructure of the city was not designed to take that level of traffic.

By the mid 1950s private developers began dredging and reclamation operations on the shoreline west of the city, resulting in the replacement of the pier structures with modern lateral quays. This was part of an integrated plan to link the development of the port with the general plan for that of the city and outlying areas.

The operation of the Newport West facilities (then berths 1 - 9) was to be entrusted to two of the old wharf companies, viz: Kingston Wharves and Western Terminals.

4.1.1 THE PORT AUTHORITY OF JAMAICA

Established in 1966 as a statutory body, it is directly responsible to the Ministry of Public Utilities and Transport for matters pertaining to the Island's ports and is thus entrusted with their overall supervision, and in general the various shipping related facilities found on the port estate. "As such it was empowered to:

- a) Fix and review wharfage rates for all public wharves in the Island

- b) Regulate the use of port facilities
- c) Provide and operate port facilities and related services
- d) Operate and lease such facilities as may be vested in [it]
- e) Maintain and improve port facilities
- f) Regulate and control navigation within the limits of the ports of the Island
- g) Provide for pilotage services in all ports of the Island" ²

In 1972 the Government assumed responsibility for all future port development. The decision was taken to build a modern transshipment container terminal and free port facilities. "This was conceived as a part of a coordinated policy for:

- i) developing the Port of Kingston to meet the future shift to container and transshipment traffic
- ii) attracting foreign investment; and
- iii) expanding exports" ³

thereby contributing to Jamaica's economic growth. The idea behind the double development of both the Terminal and Freezone complex is that both should work in tandem. The responsibility for policy implementation was also divested to the Port Authority. Given this responsibility, the Port Authority of Jamaica (PAJ), a relative newcomer to the port business, recognised its lack of expertise in the area of port operations. So in order to secure the loan necessary to build the facilities, entered into operating agreements with the two

²KTO 10th Anniversary Booklet, page 7

³Report to the Port Authority by Public Relations Associates

existing wharf companies, whereby it provides capital and the private sector the expertise.

Between 1975-1979 the container terminal was operated by Kingston Wharves and Western Terminals (KW & WT) on a joint venture basis. The container Terminal was subsequently made autonomous with these two companies becoming equal shareholders in the new company - Kingston Terminal Operators Limited (KTO). "KTO is a limited liability company with staff taken originally from the joint venture partners. This new company was given responsibility for the total operations of the Terminal, and for advising the PAJ, the owners of the facility, on the purchase of equipment." ⁴

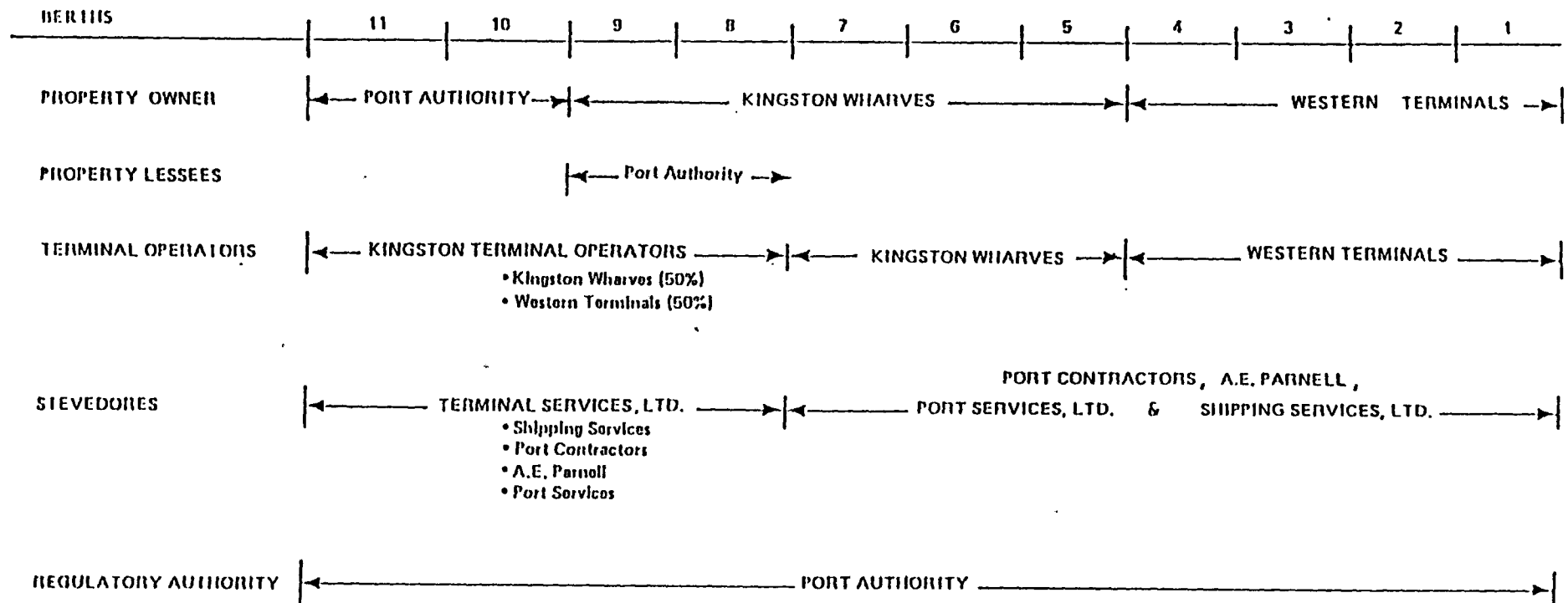
Here it should be noted that the container terminal comprises berths 8 - 11, but the PAJ owns only berths 10 and 11. It will be recalled that berths 8 and 9 are the property of KW. However, a special arrangement with the PAJ was concluded whereby these berths are operated in conjunction with berths 10 and 11 as the container facility at no charge to the PAJ (this arrangement is claused in the Terminal Operators Agreement, Appendix 4.1).

Such agreements characterise the relationship between the PAJ and the private sector, resulting in a conflicting and overlapping structure regarding the ownership and operations of the public wharves (see figure 4.1). One obvious area of conflict is the fact that private interests who own and operate a portion of the port's facilities are being regulated by the PAJ who not only set the wharfage rates but also own and operate competing facilities. This situation is further worsened by the fact that these private concerns have seen a portion of their traffic diverted to the container facility,

⁴KTO's 10th Anniversary Handbook, page 7.

FIGURE 4.1

FACILITIES -- OWNERSHIP AND OPERATION



Source: Kingston Port Development Study. Page XI-5.

under the direction of the PAJ, in order to increase the utilisation of the Terminal. As a means of compensation however, a further agreement was entered into between the parties, whereby "...wharfage on those containers directed away (domestic cargo) from their facilities is remitted to them in its entirety".⁵

4.2 THE OPERATING AGREEMENT

Although the appended Operating Agreement is not current (having expired in 1987), it is not substantially different from the current one and thus is adequate for purpose of illustrating the impact of certain clauses on the Terminal's operations.

Responsibility for equipment and plant maintenance under clause 7 falls to the Terminal Operators. However, clause 8 gives the PAJ responsibility for the provision of spare parts. The obvious advantage of this arrangement is that the PAJ, being a governmental institution has more ready access to lines of credit and is therefore in a position to garner the necessary scarce foreign exchange for the purchase of the spare parts. Although there exists an efficient means of communication between the Terminal and the Authority regarding spares needed, the fact that the purchasing entity is physically divorced from that doing the actual using, has resulted in certain inefficiencies and time lag in ordering. The problem of late arrival is often experienced and in some instances it was found that the parts actually received were of an incorrect specification - an expensive mistake.

For the above reasons it was often found that while there existed shortage of some spare parts, very high inventory

⁵Kingston Port Development Study, Page X1-6. Also Clause 19 of Terminal Operating Agreement, Appendix 4.1

levels existed for others. To this end the Terminal management recently devised an inventory system to calculate the Economic Order Quantity (EOQ) for some of the more crucial parts. The success of this system will of course depend on an accurate assessment of the lag time between ordering with the PAJ and receiving.

Another crucial if obvious factor will be actual usage rate versus predicted. With the increasing breakdown of ship-to-shore cranes being experienced, and thus the need for constant repair, forecasting usage rate is not at all easy. It is worthwhile to mention this experience of crane breakdowns is a result of the continual postponement of a long overdue refurbishing of these equipment. Such capital expenditure is the preserve of the PAJ and since the refurbishing exercise will require outlay of foreign exchange for both parts and overseas experts, it is delayed until the PAJ is prepared to spend the money. This is one of the inherent disadvantages in the present arrangement, since the PAJ is responsible for several port facilities and at any one time, the Container Terminal may not be number one on its priority list regarding the allocation of foreign exchange.

Clause 11 stipulates that the Operator (KTO) is to "provide adequate security for the container terminal and all the plant and equipment thereon...". At the same time it is the regulated responsibility of the Shipping Association of Jamaica (SAJ) to provide security for the entire port estate. As such, operating within the Terminal are at least two different security organisations. The security provided by KTO has largely been with regards to cargo security in the container yard and freight stations, while that provided by the SAJ covered the entire perimeter of the Terminal including access and exits, security aboard vessels and container security. In the mid '80s the Terminal experienced serious security problems which threatened its existence and has

resulted in a wider involvement by the PAJ in Terminal security matters. This involvement has also seen the introduction of another security organisation on the Terminal.

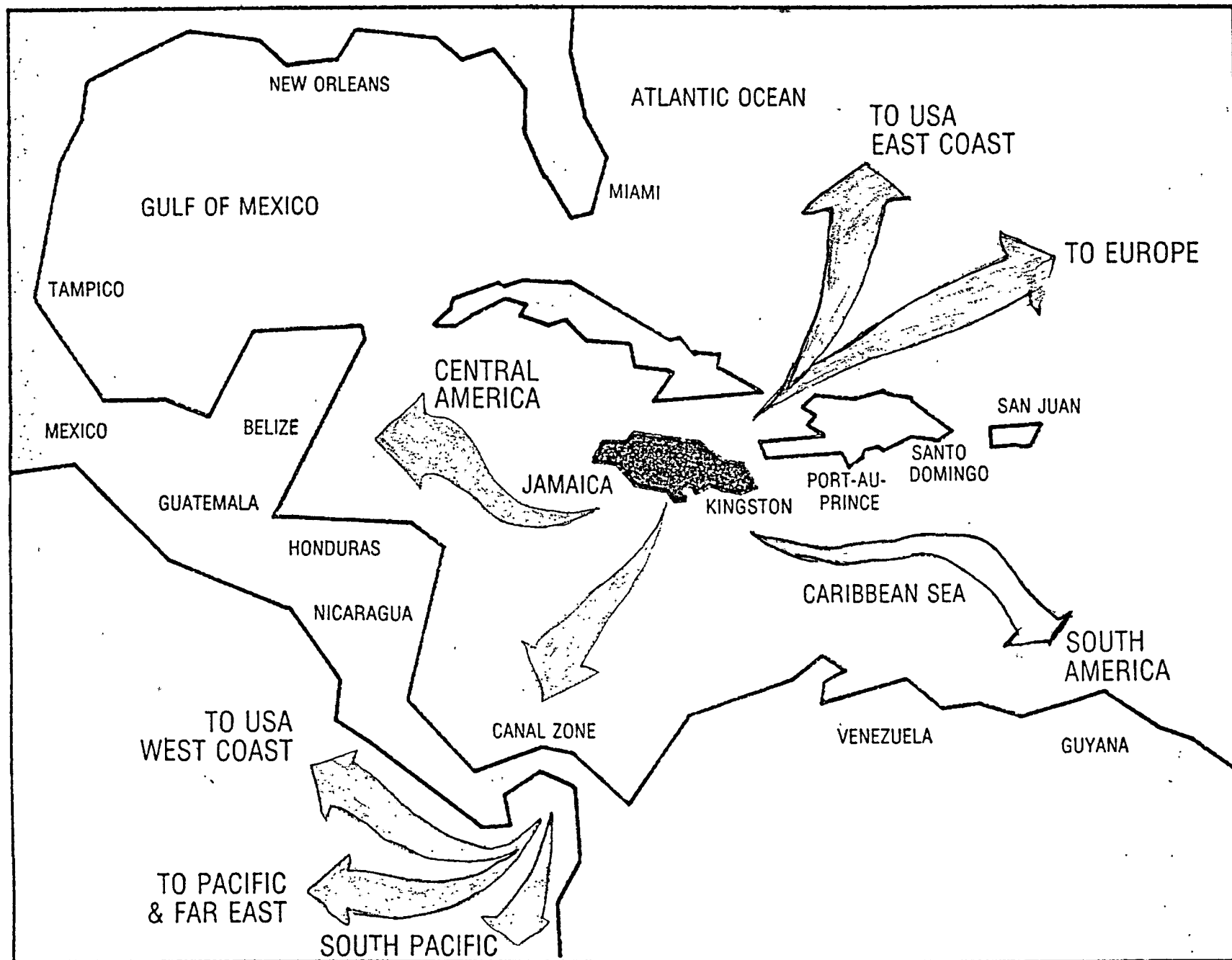
Regarding the marketing of the Terminal, clause 22 establishes joint responsibility between the parties for this function. However, in reality port marketing is spearheaded by the PAJ and constitutes primarily promotional tours with some members of the Terminal's management team being included in the delegation. To some extent the logic of such an arrangement is overwhelming: since the PAJ is responsible for other port facilities such as the freezone, it can best launch an integrated promotional campaign. The great disadvantage to the Terminal of not having its own in-house marketing department is that Terminal marketing activities is seen as a once-off activity, carried out a few times per year to try and drum up business, instead of an ongoing activity involving constant service improvement, market evaluation and forward planning.

4.3 THE KINGSTON INDUSTRIAL FREEZONE (IFZ)

Although this paper's major concern is with the transshipment terminal, it is felt that in as far as the freezone constituted a part of the plan for overall port development, a brief analysis of its success in terms of its goals could serve to place in context any evaluation of the transshipment port's own performance. The proposed twin development of a freezone complex and a transshipment terminal was viewed by the Government as being vital to economic development of the country.

The primary goal of the IFZ was to foster trade expansion and increased employment from the expected investment inflows,

FIGURE 4.2



while transshipment would increase foreign exchange earnings. A sort of symbiotic relationship was envisioned between the port and the IFZ wherein the former, by providing modern port facilities would attract regular scheduled service to the port, thereby enabling efficient transportation of the Island's trade and make Kingston more attractive for Freezone Investments. The IFZ on the other hand, would serve not only to feed cargo to the port, but by the very fact that its operation represents expanded trade for the Island, attract more lines to the port.

One of the essential criterion for the successful operation of a freezone and indeed a transshipment port is location. Here Jamaica has the benefit of being ideally located (see figure 4.2), viz:

- i) Jamaica is strategically located between Europe and South America and is directly on the route via the Panama Canal from the Far East to Europe and to the East Coast of North America.
- ii) The Island is centrally located relative to the rest of the Caribbean, Central America, South America and the Gulf area of the USA.

It was therefore felt that with this natural advantage the Island could become the hub for cargo destined not only for the region but also Europe and the Far East (this, as will be seen later, materialised to some extent when the port was chosen by Evergreen as a hub in its round-the-world service). In fact, it was a widely held belief that if this natural resource was properly exploited, the Island had the potential to become to these various regions "what Singapore was to the

Far East" ⁶, and indeed at the time there was no reason not to believe this.

Basic Criteria For Successful Operation of a Freezone

To successfully compete for freezone investment on the international market, a wide range of incentives and facilities need to be provided by the host country. Using Eric Pollock's ⁷ classification, these need to be both physical, and non-physical as set out below:

PHYSICAL

- a) geographical location
- b) availability of appropriate port facilities
- c) adequate land area (100 acres minimum)
- d) availability of labour
- e) " of cheap power and water
- f) availability of buildings

NON PHYSICAL

- g) favourable investment conditions and general financial and economic stability
- h) tax concessions
- i) reasonable rentals for facilities
- j) minimum fuss and bureaucracy.

The Kingston Freezone Company Ltd. is a joint holding of the Port Authority and the Government of Jamaica, established in 1976. Over 150 acres of land is dedicated to its development with just over a third being already developed into standard factory warehouse modules. The area is well

⁶Paper based on speech by Hon. Eric Bell (then Minister of Public Utility & transport) at the Opening of the Port Authority Seminar. 27/3/74.

⁷Free Ports, Free Trade Zones, Export Processing Zones & Economic Development, page 15

served by electricity and water as well as the major motorways of the Bustamante Industrial Estate on which it is located. With well over a fifth of the Island's labour force being unemployed, investors in the Kingston Freezone have the benefit of not only a vast pool of semi and unskilled labour but also at a cheap cost, as these employees were normally paid at the national minimum wage of US\$18.00 per week for a 40 hour week. Jamaica's favourable geographical location has already been mentioned and it may be readily seen that with the freezone being located adjacent to the modern container facility the second criterion was also met, thus completing the physical requirements.

A wide range of financial and operational incentives were put in place, viz:

- "TAX EXEMPTIONS - 100% tax holiday on profits

- CUSTOMS PROCEDURES - waiving of import licencing requirements minimal customs formalities

- DUTY EXEMPTION - no duty is levied on capital goods, consumer goods, raw material or imports for construction, extension or repair of Freezone premises - including office equipment

- PROFIT REPATRIATION - there are no restrictions on the repatriation of profits by companies operating in the Zone client companies are permitted to operate foreign currency accounts in accordance with the Exchange Control regulations of

the Bank of Jamaica.

WORK PERMITS - work permit applications are exempt from normal taxation".⁸

In the marketing of the complex, a further selling point was the benefits exporters of Jamaican made products would receive from the various international Agreements that the Island was a Signatory to. Such as the Caribbean Basin Initiative, Lome Convention, GATT, Caribbean and Caricom.

The Freezone targeted the full scale light manufacturing industry, thereby attracting activities in assembly of machinery, production of packaging material, printing and garment manufacturing. Over 90% of the labour employed on the Zone are engaged in the latter activity. Table I gives performance data on the Zone for the periods 1982-1989.

TABLE 4.1

YEAR	EMPLOYMENT	FOREIGN EXCHANGE EARNINGS (US\$)	CONTAINERS	
			IN	OUT
1982	875	1,100,000	407	163
1983	960	1,700,000	331	167
1984	3,134	2,400,000	456	205
1985	5,085	7,000,000	542	381
1986	7,781	10,800,000	727	596
1987	11,049	30,500,000	945	914
1988	6,559	28,700,000	750	879
1989	7,441	27,700,000	684	650

SOURCE: Statistics Dept. at the Kingston Freezone

Employment rose impressively from the 1982 level of 875, peaking at 11,049 in 1987. A similar trend will be observed in the performance of the container port but it is reasonable to conclude that there exists no significance to this

⁸ Kingston Export Freezone. Produced by Communications Consultant Ltd., 1987. For the PAJ.

correlation. As to the reason for the dramatic reduction in freezone employment following on 1987, it can only be speculated that this may have been a result of the widespread industrial action by the Freezone employees in demand of better pay and working conditions which led to some companies pulling out, while others cut staff. Unfortunately further interviews with the Freezone Statistician was not possible, and so it can only be assumed that this was the case.

Studies done on the implementation and benefits of the Freezone, where any attempt was made to actually quantify the expected benefits, were also unobtainable. This renders the task of concluding the extent to which its objectives were achieved, difficult. What is obvious however, is that in more than any other area the Freezone has been successful in tapping a respectable portion of Island's unemployed labour force. Also in the light of the volume of containers entering the country because of the existence of the zone, it may be deduced that with the maximum of 1859 achieved in 1987 being just over 1% of the containers passing through the Terminal for the same period, the Freezone has largely not achieved the goal of feeding cargo to the Terminal.

4.4 THE KINGSTON CONTAINER TERMINAL

Having briefly reviewed the performance of the Freezone primarily in order to assess impact on the Container Terminal, the objective now is to present a brief outline of the facilities of the Terminal itself, the operational structure and the current labour arrangement thereon. It is hoped that by so doing, a framework will be presented which will enable a better understanding of the Terminal and possible reasons for the level of performance discussed in the next chapter.

It will be recalled that responsibility for the operation of the Island's only specialised container facility was entrusted to an operating company - Kingston Terminal Operators Limited (KTO). For the purposes of this paper, the Kingston Container Terminal and KTO will be regarded as one and the same, since for all practical purposes this body is responsible for the operation of the Terminal on a profitable and efficient basis. Although as have been shown, the ability to do so effectively is constrained by the reliance on the PAJ for certain crucial decisions such as investment.

4.4.1 FACILITIES

The Kingston transshipment container terminal (also referred to as KTO) began operations in 1975 with 2 Paceco gantry portainer cranes for its shipside operations along 2,100 ft of berthing space. These were complemented by a tractor-trailer system for the quay transfer operation along with medium span transtainers for stacking. Shore-side operations, namely receivals, deliveries and transfers to the Container Freight Stations (CFS) were achieved through the use of straddle carriers, tractors and forklifts.

By 1991 the equipment inventory of the Terminal included:

- 5 gantry cranes
 - * 2 Paceco Vickers installed 1972
 - * 2 " Dominion Bridge 1982
 - * 1 Post Panamax 1991
- 1 140ton mobile crane
- 12 medium span rubber tyred gantries
- 18 Valmet straddle carriers
- 16 Tractor heads
- 54 chassis
- 1 30 ton Kalmar Forklift and an assortment of smaller forklifts

- 72 receptacles for integral reefer units
- 16 reefer towers (accommodate 64 containers)
- 30 clip on units.

It is important to note the ages of the gantry cranes. The two Vickers which were installed in 1972 are now over 18 years old and as far as shipping technology is concerned, their inability to efficiently service the present generation of vessels calling at the Terminal have rendered them more or less obsolete. Thus as will be later discussed, the problem of frequent breakdown and thus replacement options are presently being considered by the Terminal's management. Recently, there has been a move to phase out the Tractor-trailer relay system in favour of the straddle carrier direct system to take advantage of a more speedier quay transfer possibilities and less space requirements afforded by the latter system. However, some problems are being experienced since the question of the age of the gantries and thus 'air height' and clearance needed to ensure a safe operation. Consideration is being given to the installation of sensors on the cranes.

Constrained by depth of the channel leading to the harbour, the maximum allowed draft is 39'. Total Terminal area is approximately 37 hectares, of which there is over 6,500 TEU used for container stacking.

Other facilities provided directly by the Terminal include transshipment cargo reconsolidation utilizing its two Container Freight Stations (CFS). Vessel storage planning using the Terminal Information Control System (TICS) which is an online system providing up-to-the minute information on container movements in and out of the Terminal. This facility is provided to the shipping lines as part of the general service and as such attracts no direct cost to the users. Indirect port facilities (ancilliary) include a network of

Agents along the entire water front, bunkering facilities, cold storage, hauglage companies, brokers, container repair facilities, warehousing and various banking institutions.

4.4.2 LABOUR

KTO currently employs about 180 workers allocated with varying densities among the departments. The operations, CFS and maintenance departments will on average be accountable for about 80% of the total staff. None of the Terminal's employees are engaged in stevedoring activities. Instead, this function is subcontracted to a stevedoring company - Terminal Services Limited (TSL) - which in turn furnishes them from a 'Port Worker' labour pool maintained by the SAJ, while itself supplying the supervisory personnel. KTO's staff are used as far as direct ship operations are concerned, in longshore activities, that is, the location and carriage of containers to and from stacking area to quay apron.

Thus, working a vessel will essentially involve labour from three separate organisations: KTO, TSL and SAJ. Set out below is the typical gang strength required to work a Lift-On Lift-Off (LO-LO) vessel:

TSL:	1 Supercargo	- assigned to ship
	1 Time keeper	- " " "
	1 Dispatcher	
	1 Foreman	
SAJ:	2 Operators (crane)	
	2 Signalmen	
	13 Lashers	
	1 Gearsman	- assigned to ship
	1 Waterman	- " " "
	4 Gangwaymen	

--

24

The above mentioned are in turn supervised by a KTO team comprising:

1 Asst. Operations Manager	-	assigned to Terminal
1 Stowage coordinator	-	" " Ship
2 Stack clerks	-	" " Ship
2 Tally clerks		
2 Karrilift Operators		

The orders for gangs are placed by KTO's operations department which is in direct contact with the Shipping Agents. A typical gang strength (excluding supervisors and those assigned to the vessel or Terminal) constitutes 27 men. This is considered large and seem to suggest that the Terminal is not accruing the benefits of reduced demand for labour afforded by mechanization.

A very important point which emerges is that KTO is not directly responsible for the recruitment and training of those persons who directly affect its ability to perform as crucial a service as vessel operations efficiently, and therefore respond to the needs of carriers for fast turnaround of vessels. Thus even with the most meticulous planning and terminal arrangement, the desired increase in productivity is not always attainable. As will be discussed in more detail later on, the Terminal is plagued with low productivity and more recently, increasing labour unrest which is seriously affecting its credibility as a reliable and efficient port in the shipping community.

4.4.3 OPERATIONAL STRUCTURE

To carry out its function KTO is divided into six (6) departments. Viz: Administration, Accounts, Operation/Planning, Maintenance, CFS and Data departments.

ADMINISTRATION: It may be said that the this department carries out all the non-technical functions of the Terminal. Based on these activities it can be further divided into the 'Executive' Admininstration and Personnel. The former is headed by the Managing Director with whom the major policy decisions rest. Under his office and in association with the General Manager and Deputy General Manager, the public relations function of the Terminal is carried out. These three also comprise the major link between the PAJ and KTD and usually participate in port promotional tours. The Personnel Department is run by a Personnel Manager and carries out a wide range of functions traditional to personnel departments, ranging from manpower recruitment to administration of the employee health scheme.

ACCOUNTS: Headed by the Accountant/Office Manager/Financial Controller, this department has a wide range of functions. As such, certain functional sub-departments headed by their respective supervisors are evident. Namely, Accounts Receivable, Accounts Payable, Administration, Payroll, Statistics, Inventory and Dispatch. The Acccounts department's function is vital to the organization as it is from the comprehensive records kept that information is available for revenue collection and management control. It was not surprising therefore that not only did the Terminal computerisation process begin in this department but it was responsible for the actual spearheading of the port computerisation process. The Administrative section of this department is responsible for, among other things, the generation of the monthly accounts of the Terminal and accompanying reports, cash flow management, budget preparation and Tariff review computations. The Accounts department, because of its various functions therefore represents the nucleus of the Terminal's information system.

OPERATIONS/PLANNING: The activities of the operations

department may broadly be divided into two areas: those activities related to ship operations and those to the receiving and delivering functions. On this basis, the operations department, headed by 2 Operations managers, is divided into sub departments under the direct control of individual Assistant Operations Managers (ADMs).

Ship Operations: This involves vessel preplanning, ordering of stevedores, and during the actual vessel working, the location and carriage of containers to and from ship's side.

Receiving & Delivering: The two sub departments concerned are responsible for the receipt and delivery of FCL containers from and to consignees. It is the function of the Equipment Control department to verify the necessary documentation prior to releasing or accepting the containers. The deliveries department is responsible for the mounting and grounding of containers leaving or entering the Terminal and which are not to remain on chasses. Of course this is normally done on the advice of Shipping Agents.

The foregoing activities are carried out with some degree of efficiency by the use of computerised container tracking system and 2-way UHF radios and more recently portable terminal, enabling efficient communication and the rapid storage and retrieval of containers as well as vessel storage planning.

DATA PROCESSING DEPARTMENT: The Data Department is responsible for the computerisation of port functions. It grew out of the Accounts Department where the computerisation process was started and received departmental status in 1988/89. To date it has achieved a high degree of computerisation in all aspects of port activities with the priority areas of accounts and Operations being fully

computerised.

It employs the strategy of developing inhouse programmers and utilizes two computer systems which operate in parallel. The first and oldest is the IBM System 38 which is housed in the central port computer facility for the entire port of Kingston (Port Computer Services Ltd). On this system resides the TICS system developed by HTDATA, Gothenburg, Sweden, and modified by local programmers to fit the Terminal's needs. Software for the payroll department and in general the Terminal's accounting system is also housed on the IBM 38.

As just mentioned this system belongs to PCS, and the Terminal (along with all other port users) is charged for the use of the service on a real time basis, and where applicable, for programming services. This arrangement was made at the beginning of the computerisation process (early 80's) when neither the volume of traffic nor the inhouse expertise was available at the Terminal to justify the investment in its own computer facility on an economical basis. However, today, the Terminal could justify having its own system and as will be discussed later there may exist a case for the Terminal management to actually opt for this.

Whilst the first system is a portwide network system and thus affords the interchange of information /data between the port and agents, the second system - Xenix 386 - is an inhouse network system which contains spreadsheets and various other management information softwares.

CFS AND MAINTENANCE DEPARTMENTS: The CFS department carries out those functions typical of container freight stations. That is, the consolidation and deconsolidation of cargo into/out of containers. Although this function is performed primarily on domestic cargo, it is also carried out on transshipment cargo. The Maintenance department in addition

to being responsible for the maintenance of the Terminal's equipment, for which purpose it is staffed with engineers, electricians, mechanics and so on, is the depository for the Terminal's spare parts inventory, which as mentioned above, is administered by the Accounts Department.

CHAPTER 5

ANALYSIS OF KTO'S PERFORMANCE

The UNCTAD publication on Port Performance Indicators ¹ highlights two broad categories of performance indicators; those which answer the question of revenue versus cost performance (Financial Indicators) and those which measure output and productivity at the Terminal, (Operational Indicators). In this chapter, an analysis of KTO's performance to date is undertaken based on available statistics and an attempt will be made to highlight the problems faced. However, recommendations for possible solutions will be deferred to the final chapter in this dissertation, since from the view point of the Author, solutions require an integrated approach encompassing all the various terminal subsystems and not a piecemeal approach.

Applying the important measures of cargo handling performance postulated by G. De Monie ², the framework of this chapter will look at the Terminal's performance in terms of:

- a) Output
- b) Service
- c) Utilization
- d) Productivity

and to complete the picture, the trend in Terminal tariffs will be briefly analysed, the intention being to highlight the possible impact of all the above on the level of tariffs. It

¹ TD/B/C.4/131/Supp.1/Rev.1

² Basic Principles of Berth Operations (Ship-to-Shore system). Iper, Le Havre. Page 8.

will be readily appreciated that the four indicators listed above are necessarily inter-related and the arguments for one or the other will tend to overlap.

An evaluation of OUTPUT entails not only the quantity of work done in a particular period of time (throughput), but also embraces an analysis of the quality of cargo handling operation as manifested by such measures as moves per ship working hour at berth and in port, and gang or crane output per hour. SERVICE quality tends also to be measured by ship's time in port (turnaround) and moves per gang hour. Therefore, to prevent repetition, these two will be dealt with together. PRODUCTIVITY will be analyzed separately, while the degree of UTILIZATION will be mentioned where appropriate.

5.1 OUTPUT & SERVICE PERFORMANCE

5.1.1 THROUGHPUT

In accordance with the country's advantageous geographical location relative to the trunk line shipping routes, and her proximity to the Panama Canal mentioned in the previous chapter, KTO targeted, as potential users of its transshipment facility, the following services: ³

1. Far East to US Gulf & East Coasts
2. US West Coast to Europe
3. US East & Gulf Coasts to Oceania
4. Europe to West Coast South America
5. Europe to East & Gulf Coast of North America
6. Europe to Central America and Caribbean
7. US to Caribbean & Central America

³Kingston Port Development Study, 1985. Pages V-1 to V-18.

Obviously, the potential traffic from each service is related to the degree of economic activity of the regions concerned. Thus given the burgeoning economic activity in Asia and the resultant increase in trade between her and both the developing and developed world, trade with the Far East and between the US Gulf and East Coasts presented by far the largest transshipment possibilities for Kingston.

The Terminal's marketing efforts were therefore directed primarily at the operators of these services. This strategy was largely successful as the Terminal managed at a relatively early stage to secure some of the largest operators on the route such as ZIM and Evergreen Lines, which used Kingston as their only direct mainline port of call in the Caribbean; Zim on its service between the Far East and Europe/Mediterranean and Evergreen in its Round-The-World(RTW) service. SeaLand, another major operator used Kingston as a distribution hub for regional cargo.

Appendix 5.1, shows throughput at the Terminal for 11 years (1980-1990). As depicted in figure 5.1 below, container throughput experienced moderate fluctuations for the period 1980-1984 (average 5%) but enjoyed explosive growth for the ensuing three years (rates of up to 54%) before suffering a rather rapid decline (average 14%) to the 1990 recording of 88,113 - below the 1980 level of 95,273 !

It will also be observed that domestic throughput over the period remained relatively stable, recording no dramatic increases, except between 1987 and 1989 before declining in the final year. This is basically a reflection of the state of the Jamaican economy for which very limited growth rates (average 2%) were recorded. The 'boom' in 1988 can be attributed to the influx of relief and reconstruction cargoes following the 1988 hurricane. Thus the norm in terms of

FIGURE 5.1

Container traffic at K.T.O

(1980 -1990)

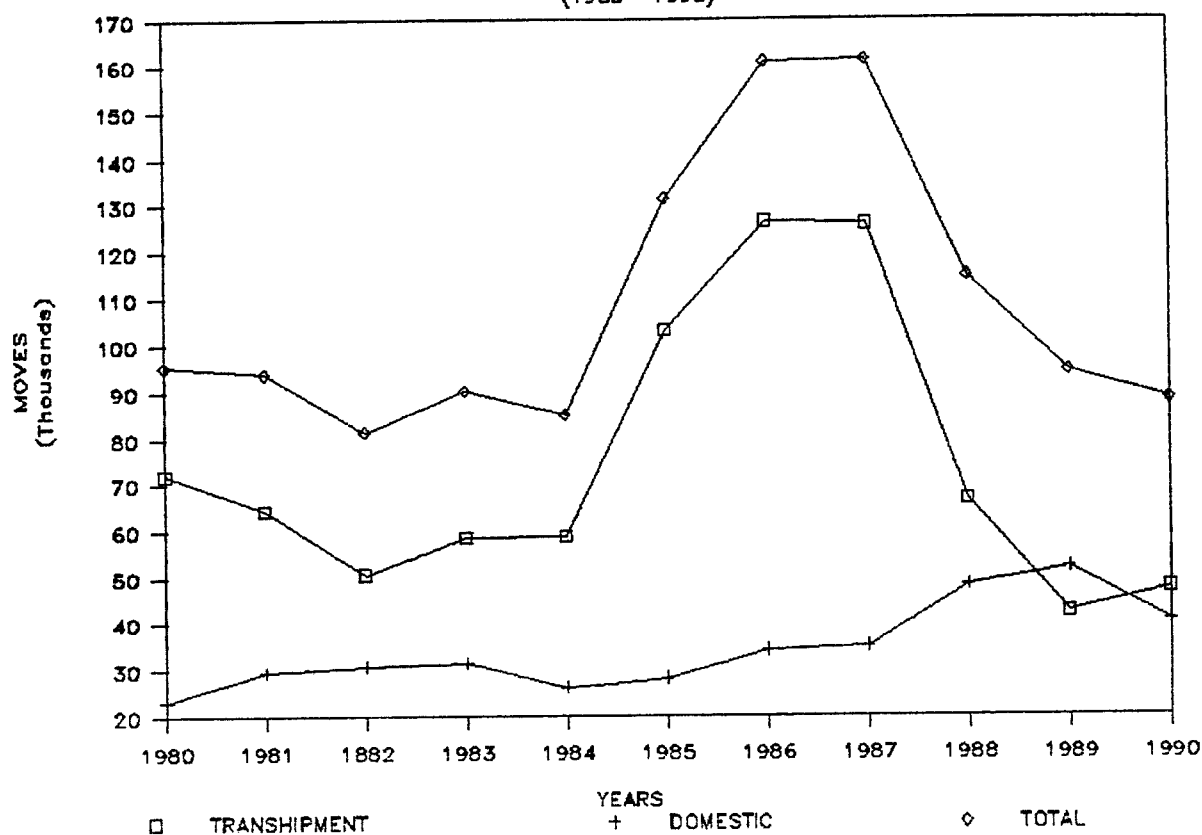
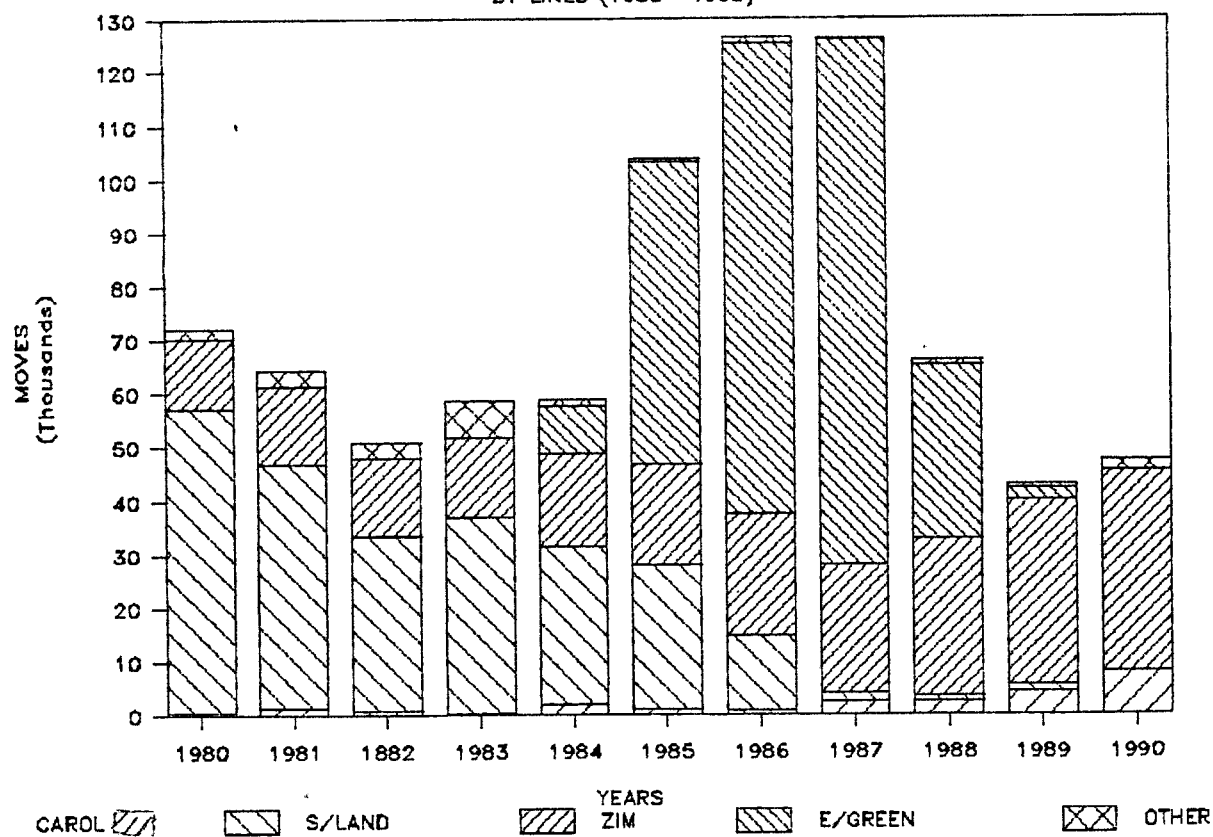


FIGURE 5.2

DISTRIBUTION OF TRANSHIPMENT CONTAINERS

BY LINES (1980 -1990)



Note: Transshipment figures include restows.

Source: KTO Statistics.

domestic traffic is relative stability.

A look at figure 5.2 detailing the distribution of transshipment containers on a per line basis offers some answers to the overall erratic performance observed. In 1980 SeaLand accounted for over 78% of the transshipment traffic handled at the Terminal. It was already mentioned that Kingston was of value to SeaLand as a distribution centre for regional cargo. However, in the mid 80s the line transferred its Caribbean distribution hub from Kingston to San Juan, Puerto Rico (where it has leased its own Terminal) as the latter was regarded as being more strategically located geographically to merge the Line's several services within the Caribbean Basin ⁴. Thus by 1987 there was no transshipment activity from this line.

The Terminal however, managed to stem the tide of decreasing transshipment traffic by securing Evergreen's use of its facilities in its RTW service. Thus the remarkable levels of growth experienced. Again it will be noted that three years after calling at the Terminal, Evergreen was responsible for roughly 78% of total transshipment activity. Whether it was the nuisance of having its ships seized and fined (later mitigated) by the US Customs for illicit narcotics or the inefficiency of Terminal operations that led to the line withdrawing its transshipment business at the port (the line still calls for domestic traffic), the effect is the downward trend in container throughput observed. The point here is that KTO has successively found itself in a position wherein it relies on a single carrier (or a limited number) for the bulk of its business and thus the loss of their patronage tend to have a disproportionate impact on the Terminal's traffic, revenue and ultimately its profitability.

⁴Kingston Port Development Study, 1985. Page IV-12

The only stabilizing presence (in terms of volume handled) has been the ZIM Israeli Line which while exhibiting comparatively modest growth (average 11%) has nevertheless done so on a sustained level and is now, by virtue of default, the port's major carrier.

The question arises as to why Kingston has found herself in a position of relying heavily on a limited number of carriers which subject to their whims and fancies, results in unstable throughput performance, and conversely, why hasn't KTO sought to widen its base of users and so prevent such a situation? The rather obvious answer is that it has become increasingly difficult for the port to attract new/major operators due to:

1. The impact of the US landbridge
2. Increased inter-port competition, and,
3. Inadequate port facility - or rather poor timing of investment .

Impact of the US landbridge

Initiated by American President Lines (APL), the use of rail to transport containerised cargo between the Pacific and Atlantic Oceans has gained popularity among other vessel operators. This is because sending the cargo by rail between the US East and West Coasts saves upwards of 7 days² and thus reduce costs and required fleet size, in comparison with the all-water route via the Panama Canal. This increased usage of landbridge is highlighted by the fact that of the top 20 carriers in terms of TEU capacity (shown in the table 5.1) only five (25%) do not employ the use of the US land bridges in their services. If the fact that two of these 'non-users'

² Structural Changes in Ocean Liner Transport: Prospects & Implications for Policy Formulation. UN Economic Commission For Latin America & the Caribbean, 1987. Page 16.

(Scandutch and SNCDV) have no service which would necessitate the use of either the landbridge or the Panama Canal is considered, then the percentage of these mega carriers which have so far opted for the use of the bridge service jumps to over 80%.

TABLE 5.1
Top 20 Carriers in terms of TEU capacity as at March 25, 1990.

	No. of Ships	CAPACITY (TEU)	PANAMA CANAL	US LANDBRIDGE
EVERGREEN	67	130,916	X	X
SEALAND	63	115,367	-	X
MAERSK	53	94,703	-	X
NYK	56	78,148	-	X
MOL	55	70,334	-	X
APL	35	66,380	-	X
OOCL	30	58,117	-	X
K-LINE	35	55,462	-	X
COSCO SHANG	55	54,505	-	X
HAPAG-LLOYD	32	53,178	-	X
HANJIN	25	49,621	-	X
P&O CONTS.	26	49,368	-	X
YANGMING	20	46,817	-	X
ZIM	46	44,817	X	-
NEDLLOYD	42	40,335	-	X
BSC	59	36,760	-	-
NOL	18	35,294	-	X
SCANDUTCH	20	32,948	-	-
SNCDV	40	31,204	-	-
CGM	27	29,040	X	-

SOURCES: 1. Containerisation International, June, 1990
Top 20 Carriers Consolidate, pages 46-50
2. Containerisation International Year book 1991

Another consequence of the increased landbridge usage is the removal of restriction re vessel size which was formerly dictated by the limits of the Panama Canal. Thus ships with capacity in excess of 3,000 TEU are gaining in popularity and it is significant that over 96% of such existing vessels belong to these operators ^a and this could further explain

^a Containerisation International. June, 1990.

the preference for landbridge usage. What this means as far as KTO is concerned however, is that a new approach to the marketing of the Terminal will be required, since the available business based on the port's proximity to the Canal is no longer a decisive advantage and there are precious few mega carriers still utilizing the Canal service to get from the one ocean to the next.

Increased Port Competition

Although the unit of measure in table 5.2 below is not uniform among the ports being reviewed, the trend is nevertheless obvious. While port activity at the Terminal has suffered a decline over the 1988/89 period (and up to the present) the trend among her major competitors has been that of steadily increased traffic - with the exception of Cristobal which dipped from 128,000 TEU in 1987 to 82,000 TEUs in 1988 (most likely due to the political crisis at the time), but has managed to stage a recovery in 1989.

TABLE 5.2
Containers handled at selected ports

PORT	1985	1986	1987	1988	1989
KINGSTON	128,816	157,613	159,223	111,699	91,578
CRISTOBAL*	77,301	102,751	128,582	82,44	102,702
SAN JUAN*	940,404	972,766	1,107,770	1,289,001	1,334,083
LIMON-MON	53,088	60,683	67,175	87,278	N/A
MIAMI*	229,614	219,524	223,696	273,077	337,961

* Reported in TEUs not containers.

Source: Extracted from Bremen Institute of Statistics 1990

It may be said that each of these ports, to varying degrees, are also well located to carry out a transshipment function. The argument also exists that Kingston has lost her competitive edge due to the proliferation of ports in the Caribbean now equipped to accommodate larger vessels, whereas

as recent as 1985 Kingston was the only port with sufficient draft to accommodate the larger mainline vessels. However, there is strong evidence pointing to the fact that competition is now, and will continue in the future to be, not so much from other Caribbean and Gulf ports but from an entirely new range of ports, that is those on the West Coast of North America.

This is particularly evident when it is borne in mind that Kingston's major transshipment business stemmed from cargo which originated in the Far East and destined for the Caribbean ⁷ and this, based on the discussion above, has largely been siphoned off by the rail services operating between both coasts of North America.

Port facility and timing of investment

As hinted at earlier, the loss of Evergreen's 80,000 transshipment moves per annum was purportedly a result of the rather costly inconvenience of having the Line's ships seized and fined by the US Customs, following the discovery of illicit drugs in containers originating from Kingston. However, based on discussions with a former associate of that company ⁸, it would seem that the finding of drugs onboard the vessel was merely the proverbial 'last straw' - a culmination of the general dissatisfaction with the level of service and perceived commitment of the Terminal's management as manifested by the slow development of facilities.

This dissatisfaction may have had its origins not only in

⁷Kingston Port Development Study, 1985. Table IV-5, page IV-21.

⁸ Prof. E. Frankel was responsible for designing Evergreen's feeder network in the Caribbean and had occasion to visit Kingston. The Author held discussions with him when he came to WMU in May, 1991 as a visiting professor.

the relatively low productivity levels (to be discussed later on) but in the severe congestion experienced at the Terminal during the 1986/87 period when Evergreen's activities were at a peak. The situation occurred where containers were being stacked on every available pocket of space, which obviously played havoc with their effecient retrieval and thus impacted negatively on vessel productivity, translating into high operating costs to the carrier. On a RTW service, a delay by a vessel resulting in missed Canal appointment, is even more costly than for other services, since each ship and leg is dependent on the other to ensure a high degree of cargo and route linkages.

The rapid throughput growth experienced at the Terminal no doubt would present difficulties for management to remedy in terms of stacking space in the short term. However, the fact that space for redevelopment was earmarked in the Terminal's longterm development plan meant that it should have been far easier for the Terminal to respond to this increased demand. This was however not the case. After innumerable petitions by the Terminal's management to the PAJ (who it will be recalled from chapter 4 has sole rights and responsibilty for Terminal development) work was finally started on a new area and completed in 1989. By this time however, Evergreen had already withdrawn its transshipment business from Kingston, not favouring any other Caribbean ports, but instead using the land bridge service for its eastbound service, using Kingston as a feeder port though making direct mainline calls on its westbound service before proceeding through the Panama Canal.

Thus with the now completed transit area the Terminal has found itself swinging form a position of congestion to one of underutilization.

5.1.2 SERVICE

According to the UNCTAD Monograph on Port Management ⁷, port performance should best be assessed for each area of activity. The major ones being:

- (i) ship operations
- (ii) cargo operations, and
- (iii) inland transport.

Since the interest of this paper concerns the transshipment activities of the Terminal and Jamaica is an island, no assessment of the performance of the Terminal re its inland transport (receiving and delivery) function will be made.

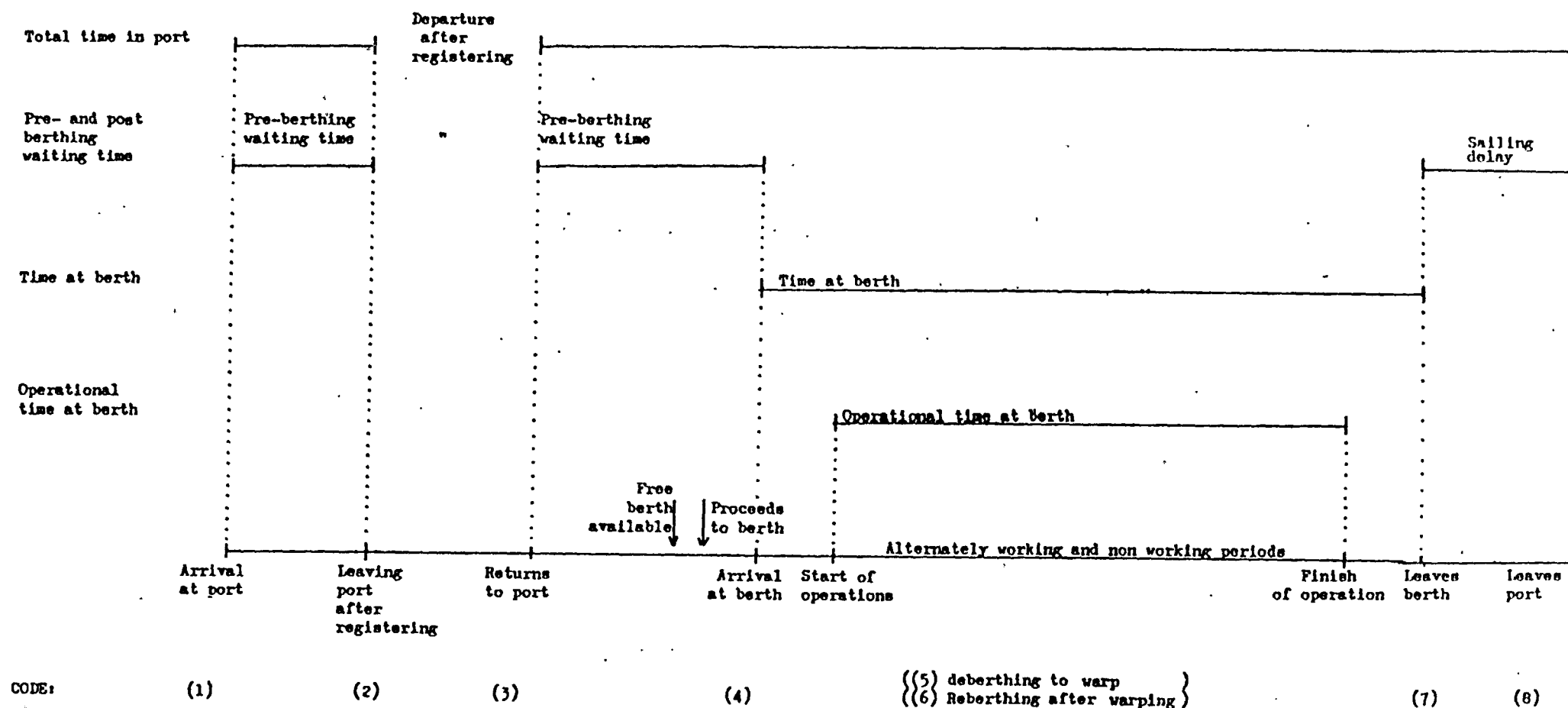
The most important indicator of the quality of ship's operations in port, is the duration of their stay (Turnaround time). It was mentioned in chapter 4 that the PAJ retains the responsibility for such services as pilotage and towage. Thus it has direct control over the time it takes the ship to reach berth following its arrival at the pilotage station. That is, phases 1-4 and 7-8 of the diagram displayed in figure 5.3. KTO's control is therefore at the point when the ship is at berth. An analysis of the number of hours ships spent alongside for the period 1988-1990 are presented in Appendix 5.2. This can, in the absence of further data, effectively be regarded as the vessel service time of the Terminal, even though it is more probable that service was completed before this time, but ship was awaiting outbound pilotage. Thus each vessel spends on average, roughly 9.8 to 11.8 hours alongside.

Based on PAJ statistics, for the final quarter in 1989 (see Appendix 5.3) vessel turnaround time averaged .56 of a day or nearly 14 hours. Assuming their definition of turnaround time takes into consideration both waiting and

⁷ Measuring & Evaluating Port Performance & Productivity, by G. De Monie. UNCTAD/SHIP/494(6), 1987. Para. 5.

FIGURE 5.3

BREAK-DOWN OF SHIP'S TIME IN PORT



Source: Principles of Berth Operations: Ship to Shore. by G. DeMonie

service time, then estimated waiting time for the vessel is about 3.7 hours or 38% of service time. Given that the optimal berth occupancy is one that gives a waiting to service time ratio of between 20-30% ¹⁰, then the estimated waiting time for vessels would seem to indicate some degree of congestion. However, based again on PAJ statistics for the same period, we are given a berth occupancy averaging 28.16% which, for a 4 berth system entails (assuming random arrival) an almost zero waiting time. It is therefore logical to conclude, based on these figures, that the waiting experienced by ships in receiving a berth is not a result of berth unavailability but rather delays in the provision of the other port services such as pilotage or towage, which are compulsory. Although the figures are not available to enable an analysis of the waiting time for say pilots, suffice it to say that if the prime concern of the Terminal's management is to reduce port cost to its carriers, implying primarily reduced turnaround time, then it must seek to influence the various organizations in the port which affect the ship's time in port.

The most popular and controversial measure of the level of service to port users, is the moves per gang or crane hours. This is because it indicates the performance of labour/equipment which has a direct bearing on the total vessel service time. A look at KTD's productivity report for the period 1.01.90 to 28.02.91 for its major transshipment carrier reveals that gross moves per crane hour (or gang hour) averages just around 13 moves (see Appendix 5.4), or more importantly, in only 69.5% of the time can Zim expect a performance rate in excess of 13 moves per hour of operation, and only 2% of the time can the Terminal expect to achieve its standard performance level of 20 moves per hour, depicted in figure 5.4. Therefore, if as the statistics indicate, there

¹⁰ Port Development: A Handbook for planners in developing countries.

FREQUENCY DISTRIBUTION

MOVES/GROSS HR: ZIM (1.1.90-28.2.91)

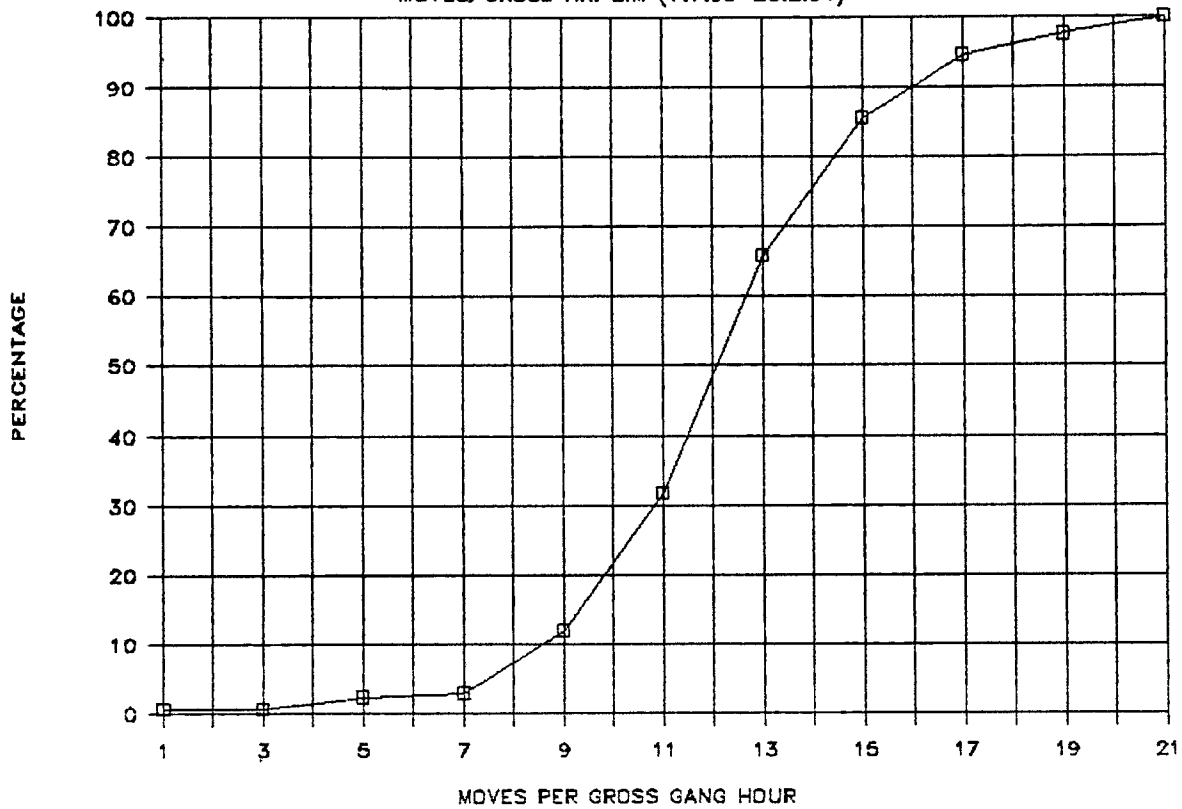
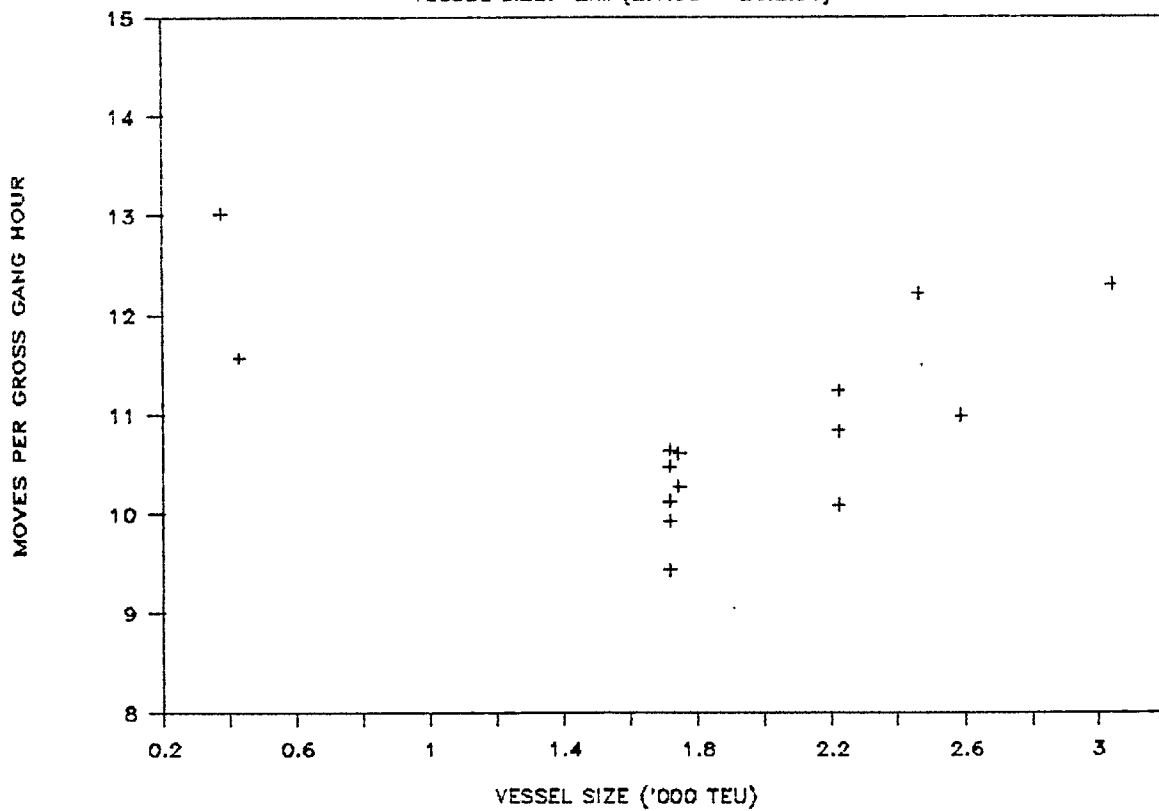


FIGURE 5.5

SCATTER PLOT OF PRODUCTIVITY

VESSEL SIZE: ZIM (2.1.90 - 26.2.91)



Source: KTO Productivity Report for period 1.1.90 to 28.2.91

is only a success rate of 2%, then an analysis of the reasons for the divergence between targeted and achieved performance levels is essential.

In evaluating a port's performance it is important to look at the various factors which may have contributed to the observed level of productivity. The relevant literature¹¹ suggests the following:

- (i) Ship size & type
- (ii) Total containers discharged/loaded per vessel call
- (iii) Weather conditions
- (iv) Port of call sequence in a given range
- (v) Balance or lack of balance between the various terminal subsystems
- (vi) Motivation & quality of container Terminal personnel
- (vii) Number, type & capacity of cranes employed on a vessel
- (viii) Stowage position in, & distribution over the bays of the vessel
- (ix) Number of outsized containers
- (x) Lashing systems utilized for on-deck containers
- (xi) proportion of import/export/transshipment/transit containers.

The factors which influence productivity of the ship operations are therefore primarily (a) ship related and (b) port related.

Ship related factors

Further analysis of the productivity levels for the various vessels of call for Zim Line are as presented below:

¹¹ UNCTAD Monographs on Port Management 6 - "Measuring & Evaluating Port Performance"

TABLE 5.3

VESSEL NAME	SIZE (TEU)	YEAR BUILT	ROUTE DEPLOYED	AV GROSS PROD./HR
ZIM Haifa	1,721	1972	MED/EC-WCNA/FE	9.4
Caribe II	377	1983	Carib. Feeder	13.0
Montreal	1,746	1973	Med/EC-WCNA/FE	10.6
KingstonII	431	1979	Carib Feeder	11.6
Genoa	1,721	1972	Med/EC-WCNA/FE	10.1
Keelung	2,224	1981	" " "	10.8
Savannah	2,224	1981	" " "	10.1
Hong Kong	1,746	1973	" " "	10.3
New York	1,721	1972	" " "	10.6
Iberia	2,224	1982	" " "	11.2
Tokyo	1,721	1972	" " "	10.5
Pusan	2,462	1981	" " "	12.2
California	1,721	1971	" " "	9.9
Livorno	2,588	1976JB1	" " "	11.0
America				8.7
Kingston3				14.3
Canada	3,039	1990		12.3

Sources: 1) KTD's Productivity Report 1.01.90 - 28.02.91
 2) Containerisation International Year book 1990.

All the above listed vessels are of the Fully Cellular type except the Zim Caribe II which is Semi Cellular. From the Scatter Plot diagram in figure 5.5, it will be observed that vessels of similar sizes tend to record similar productivity levels. It will also be seen that productivity for smaller vessels such as the CaribeII are higher than that for the mainliners. This may be explained by the fact that as far as the smaller feeder vessels are concerned Kingston is the first or last port of call in their itinerary, thus facilitating easier and quicker loading/discharging operations, while as far as the mainline vessels are concerned, the Port represents the middle port in the range (say the 10th) from the Mediterranean/East Coast/West Coast North America/Far East. Thus, high levels of restows are evident regarding the mainline vessels with the complete absence of any for the feeders.

The average of 10 to 11 gross moves per hour on mainline

vessels is quite below average and considering that these are the more expensive ships (on a daily running cost basis), it is important to look at the possible factors which affect their level of productivity.

It becomes apparent that these are primarily old ships (first and second generation) with over 50% of them having been built in the 1970s. The result is a poorer level of functional performance on areas such as hatch coamings and lashing gears. Thus a significant percentage of the delays recorded are attributable to the ship. The definition of ship's delay embraces dead gang hours (idle labour awaiting vessel's arrival) as well as delays caused during the opening of bays, lashing etc. Popular figures for these ship related delays run between 8-12 hours. While this is in no way conclusive evidence since it would be necessary to know exactly how many of the hours stated are attributable to defects in the vessel's gears, the argument is however strengthened when the following is considered: The feeder ship Zim Kingston II was built in 1979 and averaged 11.6 moves /hour as against the other feeder CaribeII built in 1983 which returns 13 moves/hour. In 1991 the Kingston II was replaced by the Kingston III, a newer ship and immediately productivity jumps to 14.3 moves per hour.

While the argument for the correlation between productivity levels and age of vessels is no doubt valid, it is somewhat complicated by a look at productivity figures for Evergreen (E/G) line (over the same period) which has substantially modern vessels, reveals a very low average of just over 11 moves with the modal being roughly 12-13 moves. Here again, it must be pointed out that the report being analysed indicates that of the 339 total hours delays incurred in E/G's 45 vessel calls, over 62% was attributable to the ship. In order then to have an unbiased view of the Terminal's productivity levels, it is essential to take out

the impact of ship's delay, the new level would then reflect the actual terminal performance.

Ideally, it would have been more profitable to be able to deduct only the hours lost awaiting a vessel's arrival, since delays caused in unlashing and so on, while not being under the strict domain of the Terminal, are indeed operational delays and should be reflected in the productivity figures.

Further, information on the time the vessel spends awaiting pilots, tugs etc should be added to the dead gang hours since such delays are the fault of the port if not exactly that of the Terminal. However, although these refinements are not available in the data at hand, a clearer picture of the Terminal's performance is possible, by deducting the delay figures given as being attributable to the ship. The probability distribution depicted in figure 5.6, shows that nearly 90% of the time E/G can expect a handling rate of 20 moves/hour with the average being about 16 moves - certainly an improved picture if not exactly the level required.

Terminal related factors

Regarding the factors pinpointed above as having a possible impact on productivity, the Terminal has little or no control. What the Terminal can and does have control over is the performance level of its equipment, the balance between the various Terminal subsystems and can certainly influence labour productivity.

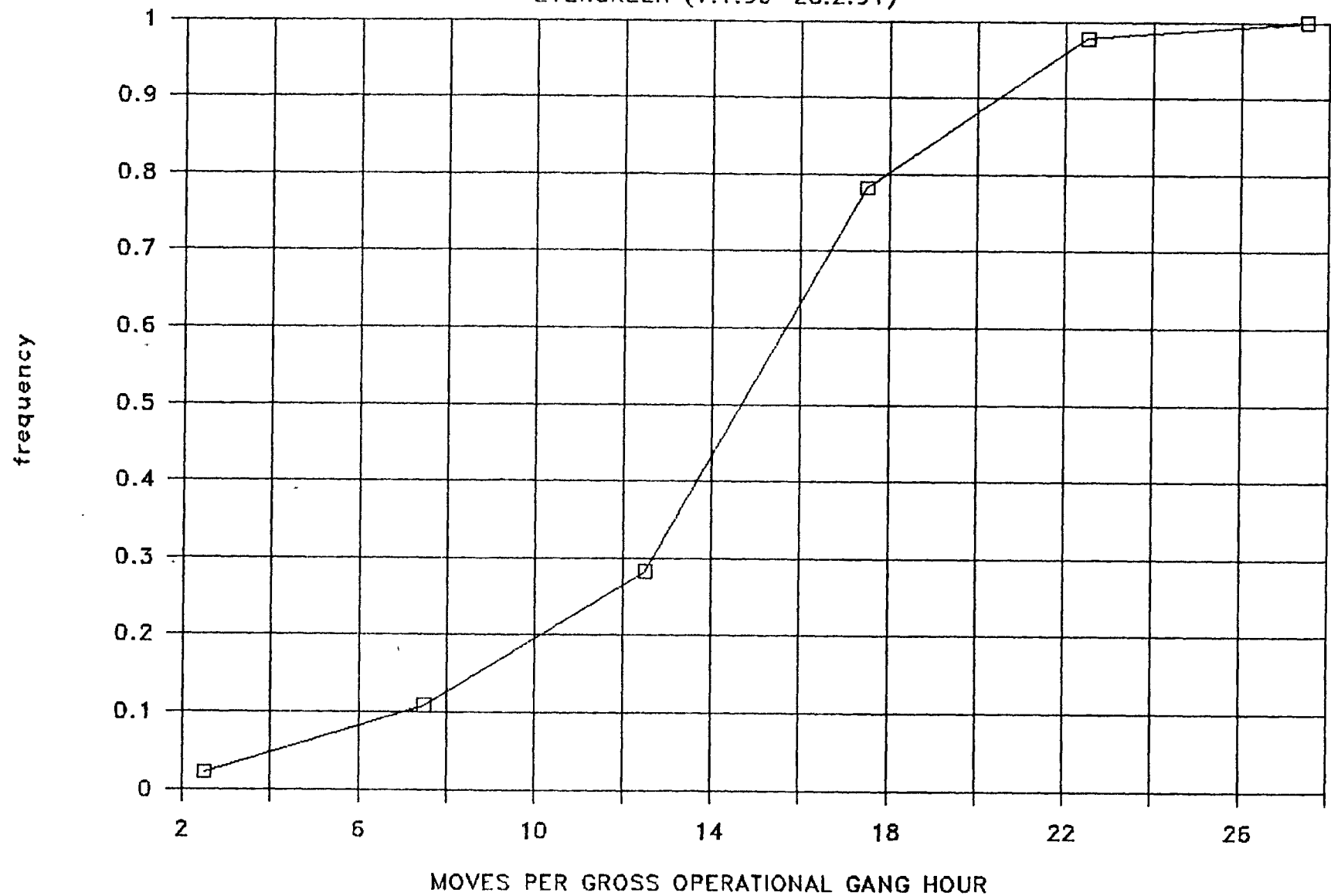
Equipment Performance

A high degree of equipment performance assumes minimal

FIGURE 5.6

FREQUENCY DISTRIBUTION

EVERGREEN (1.1.90-28.2.91)



Source: KTO Productivity Report for period 1.1.90 to 28.2.91

downtime during operations and this in turn implies certain preconditions, such as an effective preventative maintenance programme, skilled engineering staff and availability of spare parts on a timely basis. The Terminal retains a highly skilled and knowledgeable maintenance staff and a team of these engineers are at the Terminal on a round the clock basis. There is also a preventive maintenance programme in place.

It is found however, that the degree of success attainable by this team is very much dependent on, or affected by (a) the lack of spare parts and (b) the age of the ship to shore gantries. By the latter it is meant that the maintenance of these cranes, due to their limited number, tends to be carried out when they are free rather than when it is scheduled. This is of course understandable, but added to the fact that the machines are, as far as the ships calling at the port are concerned, technologically obsolete (inability to handle safely vessels with 5 high containers on deck), their substantial ages and thus the performance condition, dictates that a higher degree of maintenance is necessary to retain historic performance. During the 13 months examined, 26% of the delays reported on the productivity report were attributable to Gantry failure. The fact that these cranes experienced reduced utilization (a result of reduced terminal throughput) and thus should have more time for maintenance, would seem to indicate that it is becoming increasingly difficult for the repair team to keep them in operational condition.

In contrast to the performance of cranes, less than 8% of the operational delays were caused by breakdown of yard equipment such as straddle carriers. This is because these are not only largely new, but are available in enough quantities to enable rapid substitution in the event of a breakdown. This brings home the importance of the existence

of some degree of excess capacity or slack in the system. To be more explicit, the Terminal's fleet of gantries falls way behind the recommended minimum. Given that 2 gantries are needed for a single berth or on average 1.5 cranes per berth for multi-berth terminals ¹², it means for KTD's four berths the recommended fleet size is a minimum of 6 cranes. KTD up until 1991 had only 4 cranes, averaging 1 per berth. What this means is that at no time can the berths be fully occupied with any ship working more than one gang per ship. Given that its a transshipment terminal, we should not only expect vessels of a relatively large size, but in addition ensure them the rapid turnaround they need to remain competitive. This implies the availability of at least 2 cranes per ship.

The Terminal is considering extending its berthing facilities by an extra berth but has recently only acquired a single new crane, bringing the fleet up to 5. But 5 berths will dictate at least some 7 cranes. It is very important that the Terminal plans its development, not on an ad hoc basis but taking into consideration the various elements which make up the system - that is develop a model of the optimum number/capacity required for each subsystem to reduce bottlenecks and improve turnaround time.

Other factors affecting the ability of the Terminal to produce a high level of service includes the layout of the stacking area and the degree of illumination of the Terminal at nights. In the case of the former, a few years previously this was not carried out as would have been desired by the operations team due to shortage of stacking areas coinciding with surge in terminal traffic, and, as already been stated severe congestion ensued which rendered any attempt at an organized yard layout futile. This problem has largely been solved by the reduction in traffic, but more importantly by

¹² Improving Port Performance - Container Terminal Development. UNCTAD & SIDA Project.

the paving of additional area to bring the total stacking area to 6500 TEU.

The problem of poor lighting has been one plaguing the Terminal for several years. A useful exercise would be to plot the varying levels of productivity against the shifts so as to see precisely, the impact of illumination on productivity. Although one would normally expect lower levels for the night shift as against day even with perfect lighting, the factor of poor lighting, in KTD's case would undoubtedly reflect itself in the observations of low productivity (below 13 moves) being recorded for the night shifts. Unfortunately, the relevant data are not readily available, but suffice to say that the Terminal's management have long realised the possible impact of inadequate lighting on the Terminal's performance and has been agitating for its upgrade. This area of investment comes under the responsibility of the PAJ. Work on this started in 1990 and it is hoped will be completed in 1991.

Another nagging problem suffered by the Terminal is that of its surface condition. There seem to be the constant need for repaving and remarking of the box slots. This undoubtedly has its effect on costs, service quality and the necessary maintenance level required for the yard equipment.

5.2 PRODUCTIVITY

The basic concept of productivity seeks to establish a relationship between quantity and quality of goods or services produced against the quantity of resources used in their production. The main indicator of improving productivity being a decreasing ratio of input to output at constant

quality ¹³. As a continuation in the analysis of KTO's performance, this section will be concerned, firstly, with the trend in Terminal costs and the various factors impacting to produce the observed levels, and secondly, productivity of both labour and equipment and the impact of these on Terminal costs. It is expected that from these analyses and suggested reasons, a clear picture will emerge which will indicate the measures which need to be taken to reduce costs and improve productivity.

If figure 5.1 showing trend in container throughput at the Terminal is taken in conjunction with figure 5.7 showing trend in total cost, it is immediately evident that while throughput experienced differing degrees of fluctuation, costs were for the main, constantly rising. Also, the period of most intensive cost increases (1984-1987) coincided with that of increased traffic, which on a global scale tends to imply a high degree of variable costs. However, the fact that plummeting traffic levels following the 1987 period recorded only a slight decrease in total costs before it reverted to the previous level, seems to suggest the opposite. It should be noted that for the peak year 1987 really represented 15 months spending pro rated and presented for 12 months for comparative reasons.¹⁴ It is therefore conceivable that 1987's 12 month approximation could be more within the range of say \$55M and thus we would be faced with a constantly rising cost curve, further solidifying the impression of primarily fixed costs.

The breakdown of costs as displayed in figure 5.8 reveals that of the five elements comprising the total cost the one exhibiting the widest variation and one which is consistent

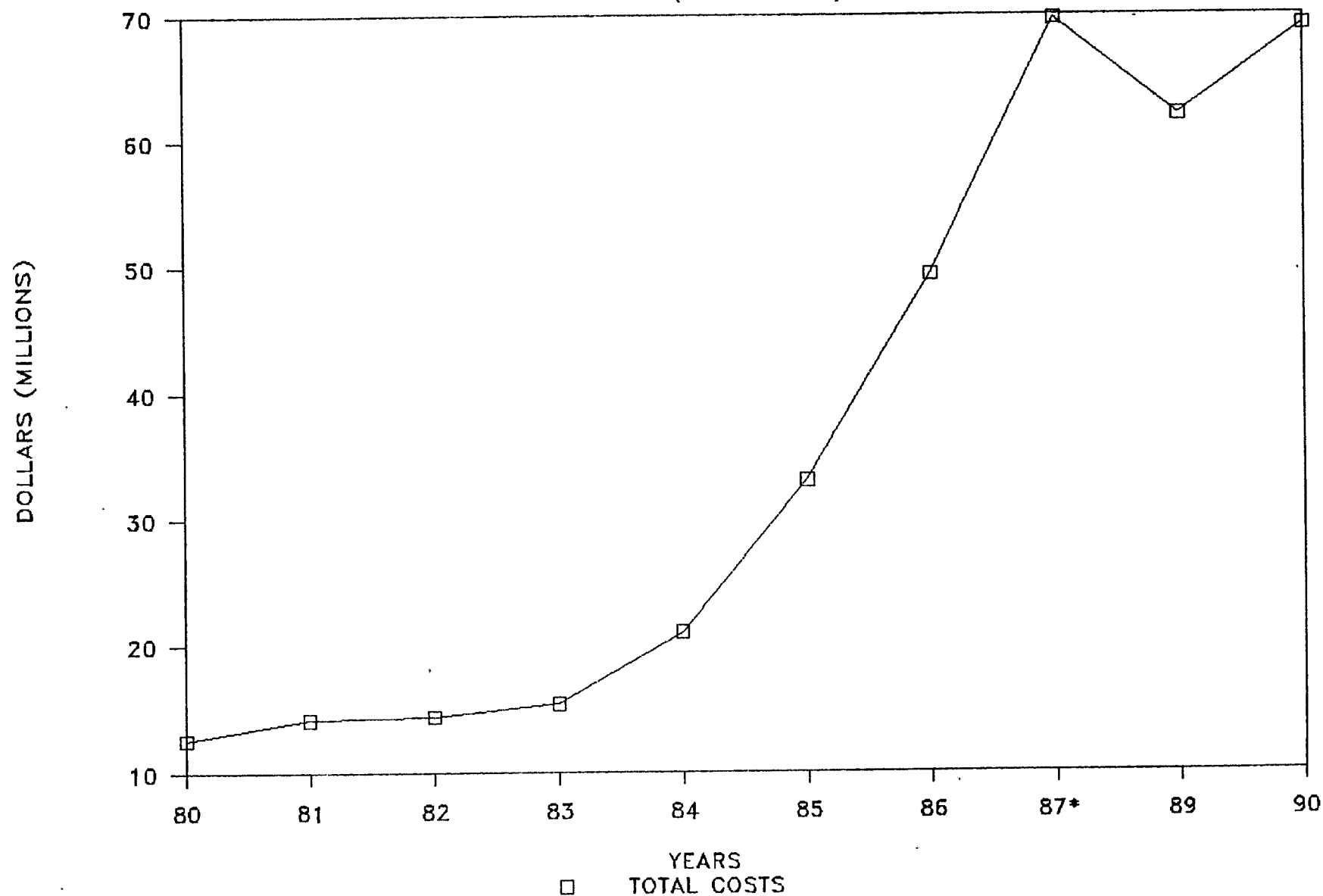
¹³ Productivity Management - A Practical Handbook by Joseph Prokopenko. ILO, 1987. Page 5.

¹⁴ KTO changed its financial year from Jan - Dec to Apr-Mar in 1987. Thus the Audit covered 15 months.

FIGURE 5.7

TREND IN TOTAL COSTS

BY LINES (1980 -1990)

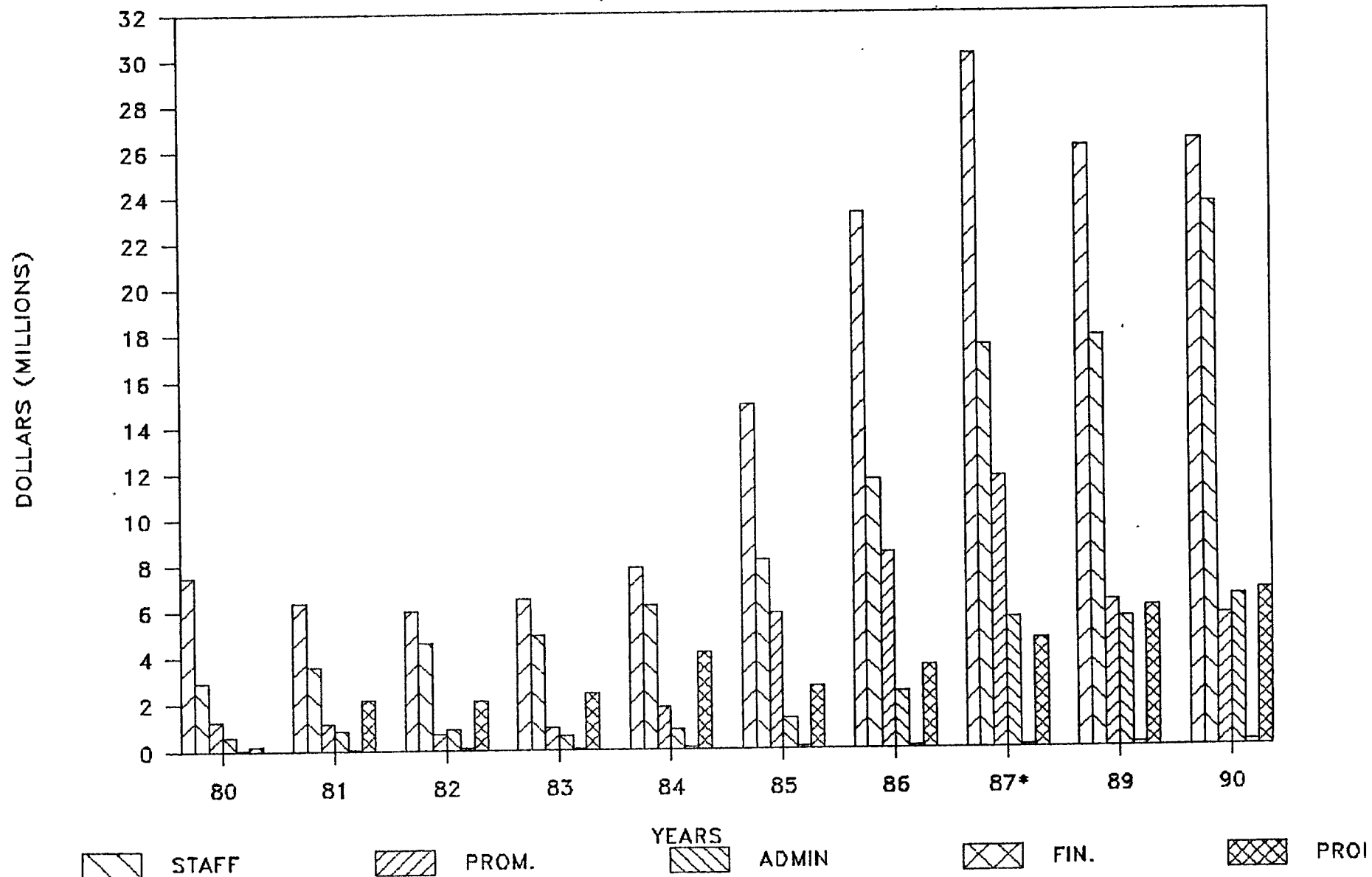


Source: KTO's Audited Accounts.

FIGURE 5.8

DISTRIBUTION OF COSTS

(1980 -1990)



NOTE: Promotional costs include rebates.

Source: KTO's Audited Accounts.

exhibiting the widest variation and one which is consistent with the behaviour observed in total costs is the Direct Expense category. It represented the largest area of Terminal expenditure, standing at over J\$23M in 1986 or 47% of total cost.

The Direct Operating cost, as the term implies, represents all those costs incurred by the port in the provision of its service to users and which would not have been incurred if there was no traffic at the Terminal, that is, container handling costs. It therefore encompasses costs such as stevedoring, stripping & stuffing of containers, mounting and grounding and repair and maintenance costs among others. As such this essentially represents variable costs and by definition should vary with the level of Terminal activity. Variable costs (vc) seem only to be flexible upwards and recorded only a marginal decrease despite a substantial one in throughput. Thus the VC component of the Terminal's costs may be said to have evolved overtime into fixed costs. The reasons for this are manyfold, and can be partly attributed to constantly rising labour and equipment costs fuelled by high inflation and the basis of the stevedoring arrangement in effect with TSL.

In chapter 4 it was mentioned that stevedoring operations at the Terminal are carried out on a subcontract basis by TSL. It was also mentioned that the straddle carrier relay system was employed by the Terminal in the quay transfer operation. What was however not stated was that the leg of the quay transfer involving movement from the apron to the stacking area was also carried out by TSL with KTO's personnel being utilized in the actual stacking. It is not clear whether this arrangement is union dictated. However, what is clear is that KTO paid nearly J\$7M in 1990 to TSL for this service.

This underlines the fact that substantial savings may be

carrier direct system for its quay transfer operations, as this would eliminate the need to employ TSL labour and trucks. Again, it is not quite clear what the prevailing arrangements are for work allocation on the Terminal as there exists some complex associations. For example, several of the aforementioned trucks used by TSL are actually owned by the PAJ and bought for use on the Terminal. One would therefore expect that these would represent equipment at the disposal of KTO in much the same way as the straddle carriers and cranes. KTO is however billed for their usage by TSL.

Before proceeding further, a brief description of the basis of stevedoring charges will be instructive. To repeat, TSL is contracted by the Terminal's management to provide stevedoring labour which it in turn recruits (on a need basis) from a central labour pool run by the SAJ. The labour engaged by TSL from the SAJ are paid at the union negotiated rates. TSL itself provides the supervisory personnel for the stevedoring and switching operations. Therefore in the case of stevedoring, KTO's payment to TSL has to cover wages and fringe benefits of both these categories.

TSL bills KTO, based not on hourly basis, but at a fixed cost per box moved. In the case of stevedoring it is the cost per shift divided by the estimated number of moves per shift (20 per hour for Lo-Lo and 10 for Ro-Ro) ¹⁵. The cost of TSL supervisory personnel which represents a fixed annual cost is recouped by charging KTO a rate based on their total cost allocated over the estimated annual moves.

This charging practice is analogous to the Sliding-Scales method. ¹⁶ According to the theory, the main advantage of

¹⁵ Internal Report on cost of services provided by KTO

¹⁶ Port charging practices by B.J. Thomas, Maritime Policy & Management 1978, vol.5 page 124

this method is that "a productivity agreement is built into the contract based on the knowledge that as performance measured in [moves/gang/hour] increases, so average total costs fall".¹⁷ Thus the rationale is that since revenue received by the stevedoring company is based on box moves and not hours, while its costs (primarily labour) are incurred largely on a hourly basis, then by increasing the moves per hour (higher productivity), that much less stevedoring cost will be incurred by them for a given revenue.

However, the system breaks down simply because the interests of the stevedoring company and that of the stevedores themselves are diametrically opposed: It is in the interest of TSL to improve productivity but from a wage point of view not beneficial to the stevedores. This problem is a result of the fact that the labour institution and the stevedoring company per se are separate entities and that stevedores are wage earners and not salaried employees. This of course explains the relatively stagnant levels of productivity achieved by the Terminal to date - around 13 moves per gross gang hours.

The Terminal's management to some extent attempted to protect itself against this low productivity level by building in the calculation of the stevedoring rate, a higher level of performance (20 moves per hour) thereby penalising TSL for non performance, and the intention being to create an incentive for improved performance. However, the degree to which this is actually effective is questionable. It is conceivable, even logical, that TSL, faced with this situation and knowing quite well the more probable performance level of the stevedores, would make allowance for this in their presentation of the overheads used in the calculation.

¹⁷ Ibid. 16

presentation of the overheads used in the calculation.

The present stevedoring arrangement offers certain benefits for the Terminal. The primary being, it avoids the carrying of stevedoring costs as overheads. This was especially important during the formative years of the Terminal's life when keeping fixed costs to a minimum was important. Thus fluctuations in throughput would not result in surplus or shortage of labour nor in the Terminal incurring huge losses. Maintenance of stevedoring labour as a variable cost was therefore important. This strategy has backfired, in that stevedoring costs are variable upwards but highly inflexible downwards and KTO may have to revise this strategy.

In addressing the question of productivity, it is essential to look at the efficiency of resource use, where efficiency is from a port standpoint synonymous with cost effectiveness, usually measured as the cost per container handled. ¹⁰ For the years between 1985 and 1990 cost per container handled at the Terminal are as below:

TABLE 5.4

	1985	1986	1987/88	1988/89	1989/90
Direct	113.36	144.58	188.02	261.18	283.35
Staff	62.22	72.41	108.85	178.13	253.52
Promotion	44.52	52.54	73.34	62.86	61.14
Admin.	9.95	15.13	34.90	55.70	70.22
Finance	0.34	0.37	0.37	1.06	1.78
Property	20.44	22.10	29.16	60.35	72.63
Total (J\$)	250.83	307.13	434.13	619.28	742.64
Index	100	122	173	247	296

Source: KTO Audited Accounts for Years 1985-1990.

¹⁰ Basic Principles of Berth Operations, G. De Monie. Iper, Le Havre, 1985. Page 19.

From a cost standpoint it may be said that during this period the efficiency of the terminal in terms of cost effectiveness worsened dramatically with cost per box displaying steep increases, reflecting in 1990 an almost 300% increase over the base year 1985.

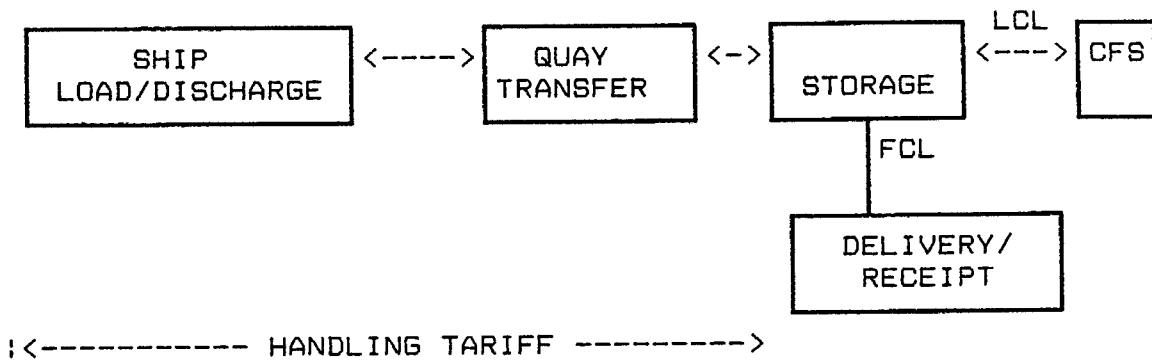
5.3 IMPACT OF COSTS ON TARIFFS AND PROFITABILITY

Before remarking on the impact of port performance on the level of tariff, a brief commentary on the structure and allocation of revenues is necessary. The allocation of the various port costs incurred by the Terminal's users is shown in Appendix 5.5. Except in the cases of wharfage (see discussion of the Agreement in chapter 4) and stripping and stuffing, KTD is not involved in the collection or billing for services which do not constitute a part of its revenue. Thus Harbour Fees, Pilotage, and Towage are contracted by carriers directly with the PAJ.

The general structure and content of the container tariffs is simple. Regarding the loading and discharging and quay transfer activity, a single rate is quoted for domestic and transshipment boxes respectively, regardless of box size. The rate for transshipment is a one way rate, that is, discharge is billed separately from loading. The loading/discharging rate per box covers all activities from ship's side to transit area. Thus there is no separate contract between the stevedoring company and the carriers.

The flow diagram below summarizes the container handling charges associated with various stages of the handling process.

FIGURE 5.9



The PAJ regulates all tariffs used in the common user ports of the Island. In the case of the Container Terminal, these rates are reviewed biennially, jointly between KTD and PAJ. The approach taken in deriving the tariff may best be viewed as cost based: The annual costs for the coming two years are estimated and then a form of sensitivity analysis is carried out, increasing the existing rates by various increments so as to ascertain the expected profit. Here due concern is given to continued competitiveness of the Terminal's pricing. As with all terminals competing for transshipment, the Terminal's tariff policy is one in which the domestic traffic subsidizes the transshipment. The degree of subsidy tends to hover around 65%.

According to the internal cost report carried out in 1990, the current cost of handling a box (including administrative overheads) exceeds the transshipment tariff. This is not surprising as, as can be seen in the appendix 5.6, while the biennial increment of container handling tariff is relatively modest (averaging 6 to 8 percent per review, or 3 to 4% per annum), increases in costs tend to be pretty dramatic. For instance, using 1985 as the base year, transshipment and domestic tariff recorded a 19% increase for the 1987-1989 period while total cost per box soared by 91% for the 1988/89 fiscal year. Naturally this has a deleterious effect on the Terminal's profit position and therefore investment returns. In the same appendix

a steady decline in unit profit is evident, almost without exception, for the years 1985-1990.

Given the need to remain competitive in the transshipment arena, the Terminal's first priority must be to restrain and reduce costs along with improving service quality. It may well be that both can be achieved through more efficient and productive use of resources.

CHAPTER 6

THE ROLE OF PORT MARKETING

The paper has, so far, progressed from a general discussion of the impact of the trends in container shipping on ports, to a more specific analysis of problems encountered by a container terminal, KTD. This chapter aims at presenting an approach that can be, and indeed has been adopted by many ports, in meeting the challenges of the dynamic container shipping environment - the marketing approach. The aim is not to present marketing as a panacea for all the port's problems. Instead, it is hoped that by presenting a systematic yet integrative plan of action, the marketing approach applied to ports, and indeed any organization, represent an invaluable tool for analyzing the market. It therefore places the port in a better position to respond to or initiate changes to its benefit.

After looking at a definition of marketing and some general marketing concepts, the focus of this chapter will be to highlight the need for a marketing approach in ports. By so doing, it is intended that the ground work will have been laid for the final chapter concerned with how to develop a marketing plan for KTD. Therefore, the current chapter will be dealing with the role and scope of port marketing while the final will concentrate on the 'how to' or 'doing' aspect.

6.1 A DEFINITION OF MARKETING AND GENERAL MARKETING CONCEPTS.

The term marketing usually conjures images of advertising and other promotional efforts. While this is undoubtedly a marketing activity, it is not itself marketing. Broadly speaking marketing may be defined as "...the part of [the]

business concerned with the way in which a product is sold..."

¹. This implies that there are two prerequisites in marketing the company's product or services, namely

- (1) a structure or marketing department with the responsibility for organizing, formulating, and executing the firm's marketing strategy, and
- (2) the method or strategy itself.

Modern marketing theory which traces the evolution of marketing from the periods of a role primarily restricted to selling and distribution, today would tend to disagree with this basic concept of marketing as "part of the business" activity and instead advocate that "marketing is so basic [to the firm] that it cannot be considered a separate function ... it is the whole business seen from the point of view of its final result, that is, from the customer's point of view".² The implications are that the organization of the various activities of the company should be centered around and be interrelated to the marketing department which then constitute the hub - a modern marketing company.

Similarly, there are distinct approaches to the arrangement or method of marketing. These concepts may be classified as

- a) the product concept
- b) the selling concept and,
- c) the marketing concept or more recently, the social marketing concept.

Under the product concept the firm concentrated its efforts on the creation of a good product under the

¹Collins Cobuild English Language Dictionary

²Marketing Management by Philip Kotler, page 3

assumptions that, given a good product, reasonably priced, little marketing effort is required to achieve desired sales and profit levels. The emphasis was therefore not so much on the utility of the product to the consumer as a marketing tool, but on quality/price trade-off.

This approach typified that taken by most port management wherein, having developed their facilities, they resolved to compete based on pricing and quality of service. This approach was and still is to a large extent valid. But gone are the days when the availability of well equipped and competitively priced port facilities were hard to come by, or conversely, when cargo belonging to the port's hinterland could be regarded as captive, and the demand for services seemingly endless. In addition to increased competition, this approach is rendered further incomplete by the fact that while cost/quality trade-off is still important, it now comprises only one of the many considerations in the port selection process.

With the manifest deficiencies of the product concept approach in meeting the firm's goals, another concept was developed, that is, the selling concept. Here in contradistinction to the product concept, the firm took the view that its products would not be sold unless it approached customers with a substantial selling and promotional effort.

Unfortunately, this approach normally meant a shift in focus, with the creation of a quality product becoming secondary. For this strategy to work it would mean that customers were not too concerned with quality and if dissatisfied would not communicate this to other potential users, and most importantly from a port stand point, that the company was not dependent on repeat business.

In the above two approaches to marketing, the

product/service was developed with little consideration as to the specific needs of customers, and the predominant factor was to achieve profit objectives. The marketing concept still maintains this profit objective, but sees it as being achievable not merely through the development of high quality reasonably priced products or through intensive selling and promotional efforts but instead the emphasis shifted from company-based to customer-oriented.

The key task of the organization was geared at the identification of customer needs, wants and values and to fulfilling these satisfactorily and more effectively and efficiently than competitors, on a profitable basis. Customer satisfaction was seen as the key to that of the organizational goals. Such an approach has several implications:

- i) the organization conceives of its mission in terms of satisfying a defined set of wants of a defined set of customers
- ii) active marketing research is undertaken to determine these wants
- iii) a recognition that all customer-impinging company activities must be placed under integrated marketing control, and
- iv) the company believes that doing a good job of satisfying customers, wins their loyalty, repeat business and favourable word of mouth promotion - all of which are crucial in satisfying the organization's goals.

The social marketing concept takes as an additional element, the consideration of general public welfare in responding to needs and wants of the market.

Having outlined the evolution of the various concepts under which firms carry out their marketing activities, it is now possible to move from a generic definition of marketing to a more specific and practical one. Marketing or more accurately marketing management, can be defined as the analysis, planning, implementation and control of programs designed to bring about desired changes with target markets for the purpose of achieving organization goals. Three elements emerge as being essential to successfully marketing a company:

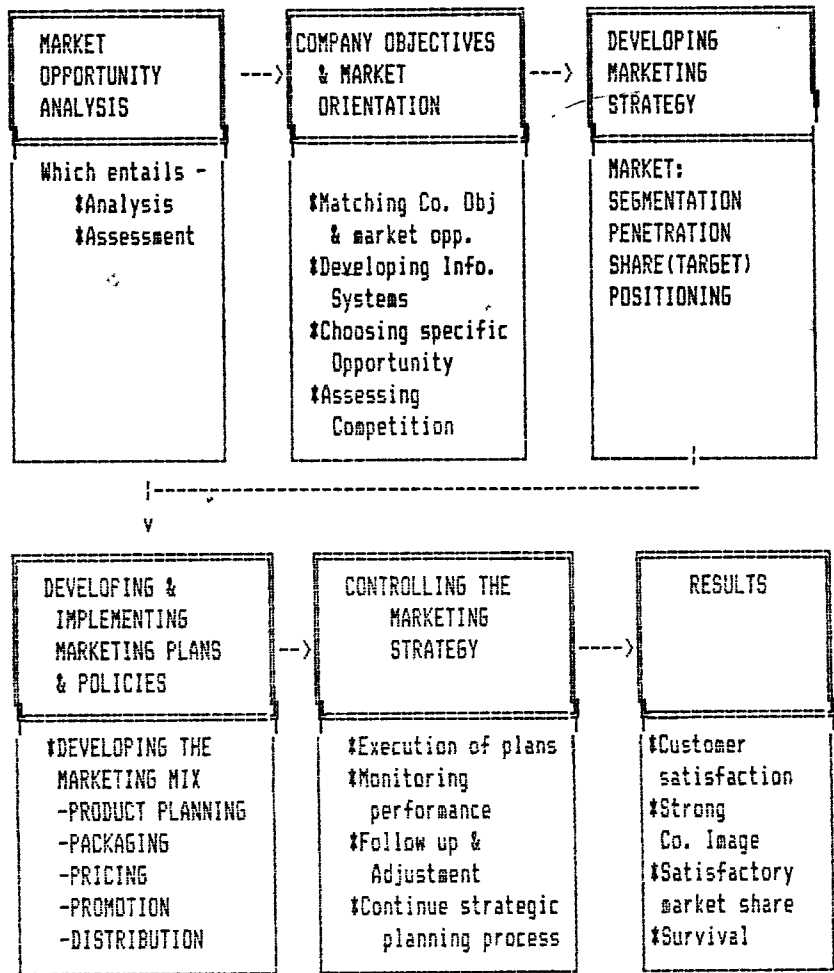
- i) a product oriented to the customer's needs and wants
- ii) a marketing organization or department, effective in bringing the product/service in contact with the potential customers, and,
- iii) a marketing plan, which identifies strategies and responsibilities for implementing action programs to achieve organizational objectives.

Marketing management thus presents a unified plan of action for the achievement of organizational goals. The major benefits to be gained from such a unified plan of action are threefold:

- i) It engenders coordination between the various activities within the organization and thus strengthens it.
- ii) It allows for the organization to specify expected development in the industry and thus use them to forecast and plan.
- iii) As a concomitant of i) & ii) strategic marketing planning eliminates surprises, and creates an effective climate for managing change.

The elements comprising, and process of strategic marketing planning is set out in flow diagram below:

FIGURE 6.1
ELEMENTS OF STRATEGIC MARKETING PLANNING.



Source: Marketing Strategy & Management by P. Kotler, page 69. Prentice Hall, 1976.

The essence or end product of the marketing planning process, is therefore to arrive at the optimal marketing mix (that combination of price, service range, distribution methods and promotional activities) with which to capture potential clients. It represents all the organization's plans and policies towards and through which it seeks to influence the market.

6.2 THE ROLE OF MARKETING IN PORTS

Changes in ship size, transport cost and the need for intermodal interchanges have significantly affected the port routing decisions of ship operators. The tendency is for a large percentage of a region or country's traffic to be concentrated at a few ports, especially in the deepsea trades, from which other locations are served. There exist mega ports where well in excess of 50% of the traffic handled are often not destined to or originating from their immediate hinterland or even country. Witness Colombo, where 70% of its containerized cargo is transshipment³.

The corollary is that there are ports which will experience under-utilization by virtue of their traffic being handled in another country's port. In the case of non-island states, the need for a port can all but disappear.

Based on the manufacturing concept of using marketing techniques to stimulate demand, port management often tends to view the role of marketing in ports as being limited to increasing the utilization of port facilities. While this is no doubt a very important function, it nevertheless represent a rather narrow perspective. A more liberal view may be to regard marketing in the light of improving the utilization of port facilities. The distinction is subtle, but nonetheless important. The former bears the connotation of increasing the throughput, while the latter places emphasis on the efficient utilization of port facilities, including

- a) more efficient allocation of resources
- b) attracting new traffic

³ Lecture on Port Marketing by E. Pollock. WMU, Malmö Sweden. August, 1991.

- c) reducing unit cost of operations and ultimately,
- d) improving the port's profit position.

An additional and important function of port marketing can also be identified. Viz:

- e) improving customer and worker relations.

It is within the context of these functions that the relevance of the planning process (or marketing scope) described earlier, will be discussed.

6.2.1 IMPORTANCE OF SETTING PORT OBJECTIVES

The existence of a port selection process (discussed in chapter 1) implies that the choice of ports of call is not fixed, but subject, in varying degrees, to external influences. This means there is scope for the port's management to influence the carriers and cargo interests' decision as to the ports to be used. The means by which it seeks to influence their action must however be based on the overall objectives of the port as derived based on a situation audit.

The need for clearly defined port goals and objectives is very basic to its long term existence, since it represents the company's mission translated into precise targets and thus serves as a powerful management tool. It provides (a) the people in the company with a specific sense of their role in the company's overall plan, (b) a basis for consistent coordinated decision making and planning among the various echelon of management and stimulate or motivate action for their achievement, and (c) a basis from which to measure actual performance and thus represents a vital control tool.

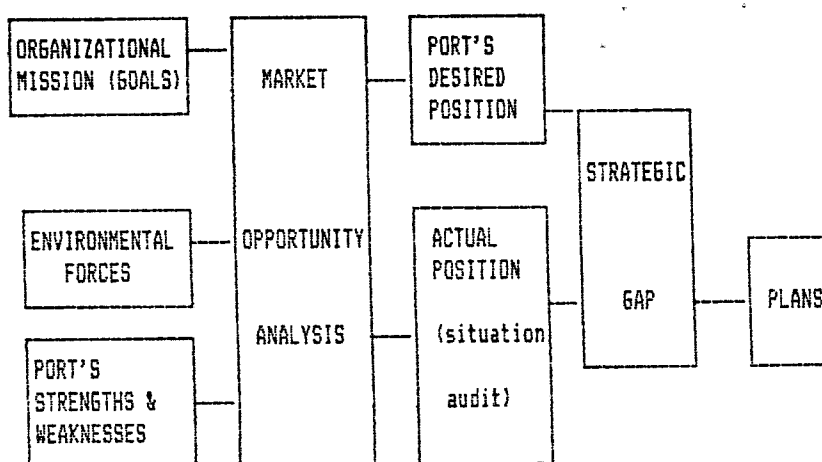
Given the port's mission, formulation of objectives (in

terms of what markets to target and with what services) should include :

- a) Environmental Analysis & Forecast
- b) Industry Analysis and competition
- c) Analysis of Organizational Strengths & Weaknesses
- d) Development of Market information system

The analytic process just described may be summarized in the diagram below:

FIGURE 6.2
PROCESS OF STRATEGIC PLANNING



Source: UNCTAD Seminar papers on Strategic Planning for Senior Shipping Managers

The mission of ports may often not be stated explicitly but may be deduced based on the policies or objectives adopted. R. O. Goss identifies three frequently stated objectives of seaports ⁴. Namely,

- i) to increase employment in the locality
- ii) to maximize profits, and,
- iii) to create added value through economic efficiency.

Moving from the broad policy objectives, ports need to

⁴Economic Policies & Seaports:1. Maritime Policy & Management 1990. vol. #17.

analyze the market in order to determine where the opportunities lie and how to respond to them. Based on the process outlined above, the first step is an analysis of the present environment and forecast of its future behavior.

6.2.1 ENVIRONMENTAL ANALYSIS & FORECAST

The demand for port services is derived based on the need to transport goods from one country to another or within a country through the use of maritime transport. Therefore key factors which influence the demand for port services are necessarily those that affect trade in general. Such as general state of the national regional and global economy, commodities traded, shifts in pattern of trade, political events, currency fluctuations and so on. These were discussed in chapter 3 and may be summarized as follows:

- World economic growth is expected to average around 3% annually to the year 2000.
- The trend to the organization of regional trade blocs.
- New trade opportunities in Eastern Europe.
- A shift in trade flow between USA and her trading partners in an effort to reduce the balance of trade deficit.
- Weakening of the US dollar.
- Trend in larger ship sizes, and non-standard ISO boxes.
- Liner trade is expected to average a rate of growth, half that of the 11% expected for trade in general (see chapter 3, page).

Another factor to be added is the short term impact of the increased oil prices as a result of the recent Middle East war, on the economies of oil dependent non-producing countries. It can be expected that this will impact

negatively on their economic growth and therefore trade.

The above macroeconomic environmental conditions hold several implications for ports, which was also underlined in chapter 3. The most significant however, is the fact that cost efficiency will in the future be emphasized as the decisive factor in port survival, especially in the face of declining freight rates and the regionalisation of trade which can render the use of larger ships not as cost effective from a carrier stand point, as originally anticipated. The port's management has to decide whether the objective should be towards say, providing the highest possible service, or the most economical - being a trade off between service and quality.

6.2.2 INDUSTRY ANALYSIS & COMPETITION

"The essence of formulating competitive [marketing] strategy is relating a company to its environment. ...the key aspect of the firm's environment is the industry or industries in which it competes." ⁵ An industry analysis includes therefore, a look at the company itself as well as the various actors in the industry which shapes its performance. These analyses will therefore look internally to pinpoint the organization's strengths and weaknesses, then externally to identify opportunities and threats in order to formulate the appropriate strategies so as to minimize the impact of threats and or maximize the opportunities.

The internal analysis includes:

- a) identification of the company's major activities and its customers

⁵Note on the Structural Analysis of Industries by Michael E. Porter Harvard Business School (376-054). 1975. Page 1.

- b) customers' requirements from the organization and the price they are willing to pay. From a carrier standpoint, the decision to transship is based on the trade-off between the cost of making additional call (with a larger more expensive vessel), loading and discharging relatively small volumes of cargo, and the cost of discharging a series of smaller consignments at one port and using smaller ships or inland transportation to convey them to final destination. Therefore as discussed in chapter 2, the choice of transshipment port must represent a combination of operational efficiency and low overall port costs. Indeed it is the former which by impacting on vessel turnaround time that is of great importance.

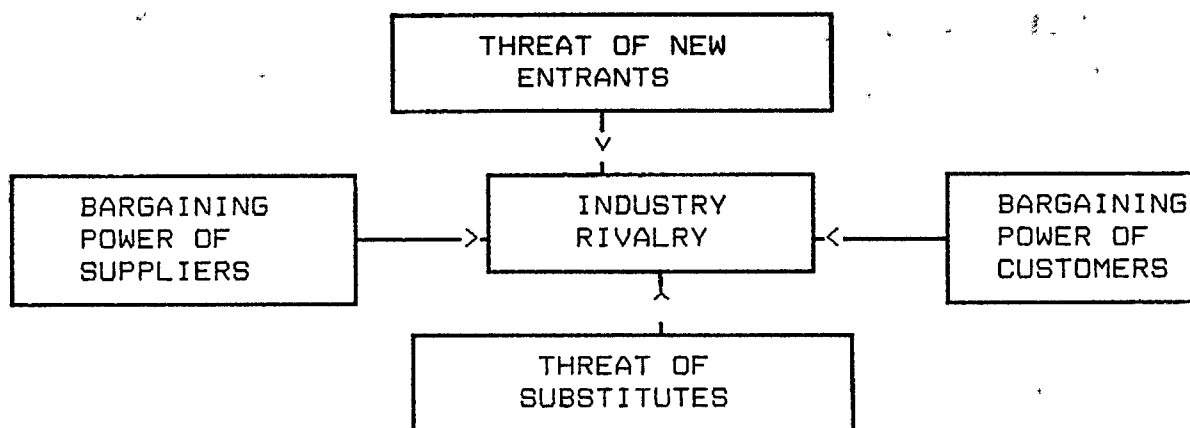
Cargo interests are concerned with speedy and safe transit of cargo through the port at minimum cost. Operational efficiency itself assumes the provision of adequate port facilities and a well trained and highly motivated labour force. Price of port services must be distinguished from and is secondary to port costs to the users. The latter by virtue of including ship's time, reflects to a great extent operational efficiency.

- c) the company's aspirations in the market place
- d) identification of the company's strengths and weaknesses in meeting customer needs relative to competitors
- e) Legal/political constraints which will affect future growth and development.

An assessment of the other actors in the market who

compete with the company present invaluable guidelines as to what approach, in terms of marketing strategy, is to be pursued. However, since the determinants of the firm's profitability are the various forces which drive the industry's competition it is important not to confine the analysis only to competitors, but all the forces which affect the port's ability to compete. Michael E. Porter identifies five major forces which drive industry competition, as diagrammed below: 6

FIGURE 6.3
COMPETITIVE FORCES OF AN INDUSTRY



Threat of Entry

New entrants to an industry adds new capacity and reallocate and or reduce market shares. The threat of entry depends on the barriers to entry. Six major barriers to entry:

- a) economies of scale
- b) product differentiation
- c) capital requirements
- d) access to distribution channels

6 Ibid 4. Page 2.

- e) other cost advantages
- f) Government policy.

Based on the six factors listed above, it may be concluded that there are no substantial barriers to entry in the Port Industry. In that, it is difficult to use a strategy based on differentiation and while capital requirements are substantial, governments and international lending agencies are willing to give 'soft loans' for port development. Government intervention through subsidies can also render a cost inefficient port, price competitive. Government policies regarding permission to develop port facilities, by virtue of limitation of jurisdiction, tend to deter new entrants only in the domestic arena.

The port industry is in a no win situation in this regard, since while there exists relatively low entry barriers, the market is still not contestable. This is so despite the fact that there exists possibilities to sell port equipment and reutilize port lands (often prime land), because governments usually prefer to continue subsidizing a port than have it closed. This attitude is often a function of the importance of the port and port related industries as employers of labour as well as the fear of depending on another country/port to handle its trade.

Competitive Rivalry

Rivalry occurs because one or more competitors either feels the pressure or sees the opportunity to improve position. It normally takes the form of price competition, advertising battles, product introductions and increased customer service." ⁷ The degree of competition in the industry is dependent on:

⁷Ibid 4. Page 8.

- a) number of competitors, their size and relative power
- b) rate of industry growth
- c) level of fixed costs
- d) degree to which product differentiation is possible
- e) high exit barriers
- f) capacity

The port industry is characterized by a proliferation of ports of varying sizes with the top 10 accounting for over 40% of total throughput in 1989 .⁸ The port recording the largest throughput (TEU) in 1988 was the port of Hong Kong with over 4 million TEUs representing a market share of 5.5%. KTO was itself ranked 42nd in the world container port traffic league, with over 180,000 TEUs representing a .25% market share. The big ports in the industry do not compete overtly on the basis of price, but rather on service innovations and performance standards. Relatively speaking, the dominance of a port is limited largely to the region it is in and the trade of that region.

After recording double digit rates of growth in the 1980s liner traffic growth is slowing considerably - a result of the declining possibilities for further containerisation of trade, especially in developed countries. This coupled with the larger number of container facilities in existence and those coming on stream, is a recipe for increased competition especially for transshipment traffic. The highly mechanized nature of container port operations dictates a high degree of fixed costs which in turn affect pricing strategies. Added to (d), (e) and (f), it is evident therefore that the port industry is a highly competitive one.

⁸Containerisation International Yearbook, 1991.

Substitutes

While there are no direct substitutes for port services, ports by virtue of being the interface between land and sea transport are nevertheless affected by factors which reduce the need for this interface. In the case of KTO, the use of the US Landbridge as against the Panama Canal has resulted in the restructuring of trade routes and decline in the demand for KTO's services.

Bargaining Power of Users

'Buyers or customers compete with the industry by forcing down prices, demanding higher quality or more services, and playing competitors off against each other - all at the expense of industry profitability' *. This quote aptly describes the position of ports today with respect to carriers. The fiercely competitive nature of the port industry gives port users and in particular carriers, enormous leverage in terms of dictating the service quality and significantly influencing the price the ports charge. That this erodes port profitability is evident. Huge investments are undertaken by ports to achieve or retain the competitive edge. At the same time the level of tariff cannot be significantly increased to provide a reasonable return on investment, relative to cost of capital. For example during a study tour to the port of Rotterdam, it was mentioned by a speaker from a stevedoring company that one of the biggest stevedoring companies on the port records a turnover of several billion US dollars, yet makes a profit of a couple million. This would seem to indicate the cut throat nature of the competition which forces such high cost levels, or a need for cost controls. Carriers are made even more powerful when their contribution to the port's traffic is a large proportion

* Note on Structural Analysis of Industries by Michael E. Porter. Havard Business School (376-054). 1975. Page 12.

of total Terminal traffic.

Bargaining Power of Suppliers

From a port stand point, the most important and powerful suppliers are the stevedoring company and labour unions. Terminal Operators rely on stevedoring companies to provide well trained and motivated labour force at an economic cost. Thus both its operational and cost efficiency relies heavily on the stevedoring companies. Also the power of unions cannot be overemphasized. Tightly unionized labour can bargain away the competitive position of ports as demonstrated by the UK experience under the Dock Labour Scheme. It was shown that with the present labour arrangement on the Terminal, KTO finds itself in a position of dwindling profits in the face of high labour costs, while increasing labour unrest is serving to undermine the credibility of the port and ultimately throughput.

By setting port objectives, it not only provides a plan of action and means of management control, but by virtue of dictating an analysis of the port's current position and the prevailing environment in which it operates, it forces management to make assumptions and forecasts of the future behavior of the market. They are therefore in a position to better seize any market opportunities that may arise or mitigate the impact of any threats. This assessment of the competitive position of the port is referred to as the SWOT (Strengths, Weaknesses, Opportunities and Threats) approach and is an essential step in formulating port objectives and therefore, marketing strategy.

6.2.2 MARKET OPPORTUNITY ANALYSIS IN A PORT CONTEXT

Market opportunity analysis aims at identifying scope for

future growth and development of the port, by examining trends in the market and evaluating whether opportunities exist which can be exploited on a profitable basis. Generally speaking, the opportunity for a port to grow will depend on the vibrancy of the national economy's trade and the existence of good port infrastructure at competing ports. It will also depend on the region's trade and the efficiency of the transport link between the various countries. It is the latter which will provide transshipment possibilities for ports.

In searching for transshipment opportunities the following considerations are applicable:

- i) what are the transshipment motives of carriers, and,
- ii) how the port can cater to these needs.

E. Pollock ¹⁰ highlights the following as being the major driving force behind a line's decision to transship:

- rationalization of services, reduction on costs and increasing operational flexibility
- logistical advantages such as the exchange of containers between different services operated by the same line or consortia. This also widens the market served, by increasing the number of destinations that can be reached from one port.
- sufficient reduction of ship's time so that fleet size can be reduced
- where the geography of certain countries, for example those with long coastlines and high inland

¹⁰ Based on a discussion with Prof. Pollock during the authors' visit to London, March, 1991.

transport cost, may necessitate calling at several ports, so fragmenting the cargo availability of each port

- when an existing service is operating with capacity for extra cargo
- when extra capacity is planned either in the form of larger vessels and or additional vessels, making possible increases in service frequency. Such situations increase the need for extra cargo, hence the search for additional markets
- possibilities also arise when lines are introducing new services, which may still be at a formative stage of development
- conditions at other ports which preclude or make direct calls less favourable as far as the line is concerned.

Additionally, the trend in shipping services offered by carriers to shippers can offer a port scope to carry out a transshipment role. More and more carriers are catering to the needs of shippers in other respects than mere transportation. Thus keeping abreast of the latest developments in this area, will also indicate the future role expected of ports.

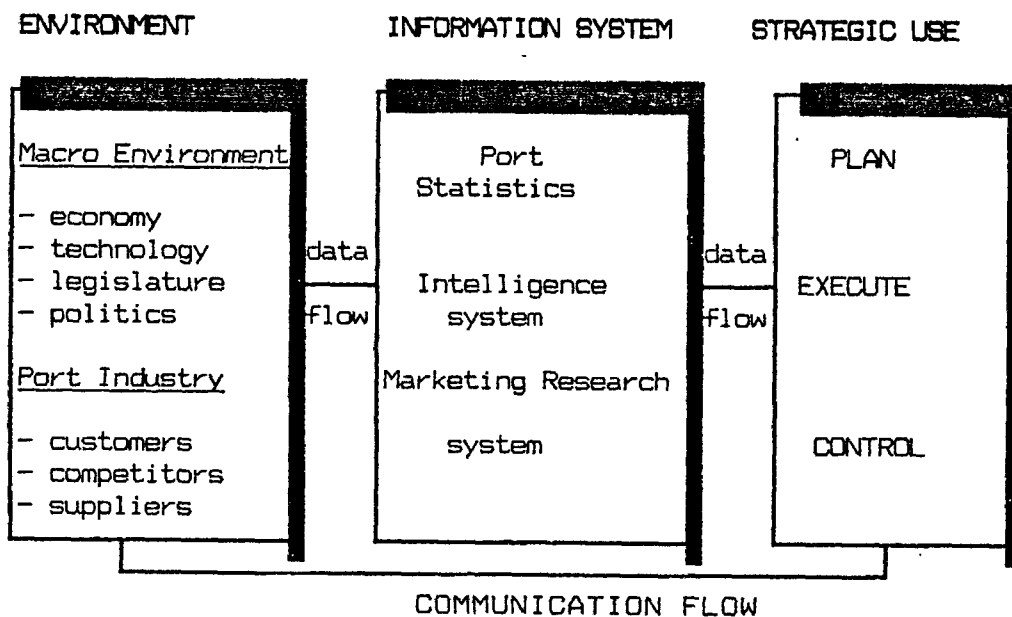
6.2.3 DEVELOPING A PORT MARKET INFORMATION SYSTEM

In order to carry out the foregoing analyses, an efficient and up to date market information system is essential. Decision makers must constantly be on the alert for leading indicators of business activity, signals and signs that will alert them to possible changes, new markets, changes in competitors' strategy, or general development in the

overall environment holding dangers or opportunities for the firm. Because marketing is the firm's response to external opportunities, marketing decision making is disastrous without accurate information to evaluate those opportunities.

Marketing research can be defined as the systematic gathering, recording and analyzing of data in order to assess problems and opportunities related to the marketing of the port's services. Diagrammed below are the components of a market information system.

FIGURE 6.4
PORT MARKET INFORMATION SYSTEM



Adapted from: Marketing Management by P. Kotler page 421

A good port data base will need to provide information to enable management to pinpoint:

- its major customers and traffics, in terms of both volume and profitability

- general financial performance of the port
- operational data regarding capacity and manpower
- activities or developments planned by competing ports which can affect demand for the port's services
- current and future changes in the pattern and volume of trade for particular countries and a regions
- operating strategies of major carriers, including present and targeted users of the port's facilities
- financial position and market share of current and potential customers
- governmental regulations that will impact on the port.

Some of these data are available from the port's accounting system, while others will dictate the need for external market research. Appendix 6.1 tables some important sources of shipping industry information, while Appendix 6.2 provides some considerations in carrying out a frequently used market research technique in the shipping industry - postal market surveys.

Having reached the point of identification of objectives in the context of market opportunities versus the port's present position, the next step is to devise the strategy (plans) to achieve the objectives.

6.3 DEVELOPING THE MARKETING STRATEGY

The development of a marketing strategy or plan of action involves two basic steps. The first is the selection of target markets and the second, the development of effective marketing programs to win these markets.

6.3.1 MARKET SEGMENTATION & TARGETING

Market segmentation is the process whereby management tries to identify different user groups who would probably be most receptive to using the port's facilities, and so target them for their marketing effort. By selecting target markets the port is able to utilize its resources more efficiently by focusing on a specific group's needs and wants. In the selection of market segments the following criteria must apply:

- i) measurable
- ii) accessible so that the firm can focus its efforts at it. Chances of success must take account of, and identify how satisfied the target is with their present port of call.
- iii) substantial enough to be exploited on a profitable basis. This is important since it would not be cost effective nor profitable to develop the service for a segment too small to offer favourable return on required investment.

Market segmentation also involves selecting target markets, since it is not possible to pursue all traffics due to resource limitations; there is little point in winning new business only to lose existing customers due to congestion or lack of capacity. In selecting target markets, due

consideration must be given to the existing (and planned increase in) capacity.

Bases of Port Market Segmentation and Targeting

Market segmentation for ports will firstly be geographic, based on trade patterns and the port's proximity to the various trade routes. This will then be narrowed according to the type and form of commodities being traded, and those the port is interested in pursuing.

Dividing the market on a commodity basis is especially useful in the port development phase, since the type and form of the commodities to be handled would largely determine the type of facilities required. Similarly, it provides a useful indication of the types and probable sizes of ships that can or are expected to use the port facilities. Commodity classifications which will affect and dictate terminal facilities and thus serves as a useful basis of segmentation are:

- i) dry bulk cargo
- ii) liquid bulk cargo
- iii) general cargo break bulk
- iv) containerized cargoes: dry and refrigerated; Ro-Ro and Lo-Lo.

Since the port cannot take its services to the lines, the factor of deviation distance (and therefore cost) to call at a port will influence the carriers decision and so must also be considered by port management. Another factor is the strategic location of the port to blend in with the carriers overall operational strategy -does the port afford smooth connections between the various inter-linking services of the carriers? Based on these, specific carriers and cargo

interests may be targeted.

It was previously mentioned that a market segment in order to facilitate successful targeting without wasting resources must be viable. This means that an evaluation of the various possibilities is essential. Estimates of potential traffic volume and income level, the port's cost of pursuing and servicing this market and ultimately, the expected contribution of this market segment to the port's overall profitability is essential.

6.3.2 CONSIDERATIONS IN THE DEVELOPMENT OF A PORT MARKETING MIX

The marketing mix represents the various media through which any organization seeks to secure the patronage of the target market. In general, these are identified as being the price, product/service, distribution channels and promotional efforts. In a port setting, these therefore comprise the combination of:

- i) service quality and range
- ii) tariff levels, and
- iii) selling and promotional activities.

Distribution refers to the various channels through which the product or service reaches the customer. The simultaneous production and consumption of port services necessarily means that the distribution is embedded in, and a part of the service. For this reason, considerations regarding the service, incorporates that of its delivery.

6.3.2.1 PLANNING PORT SERVICES

Planning the range and level of port services in the marketing mix entails ascertaining whether the present quality

level is as desired by customers. This fact would have emerged from the analytic process based on market research. It also involves setting targets for service quality, in terms of (a) productivity levels and (b) maximum vessel waiting time.

Since productivity levels are functions of the performance of labour and equipment, due consideration needs to be given to labor motivation, remuneration and training, and equipment supply and maintenance. Other factors which impact on productivity such as imbalance between the various subsystems of the port will need to be taken into account and plans made to address these.

It may be that changes will need to be made in the operational planning. Especially in the container shipping industry where the vessel's daily cost is high, rapid turnaround is vital. This is not only a function of productivity alongside berth, but of total time in port. It therefore becomes essential to also minimize the time spent in port before receiving a berth. Other services which impact on the ship's stay in port such as pilotage, towage and customs documentation may need to be considered for improvement.

Additionally, it may be that there exist inadequate berthing space, which may indicate the need for new investment. At this point the need for targets being set cannot be over emphasized. While the ideal situation from a carrier perspective is zero waiting time, which means the availability of a berth at all times, it is not feasible to provide the needed numbers due to investment cost to the port.

The port needs to establish the maximum time it can afford to have ships waiting, bearing in mind the need to satisfy customers so as to retain their business. Based on this, some notion of the required number of berths needed can be gained.

Improvement of service to users may also be looked at through more involvement of the port in the through transport process. It may be through providing information to users about alternative modes of transporting cargo to and from the port (feeder services, rail and road) and some indicative costs. It may be that there is a need to get involved in the actual arrangement of on-carriage either through contracts or direct investments.

The decision will need to be made as to whether the port should seek to increase customer satisfaction and entice new users by offering new services; such as EDP logistics and distribution services. Some ports have seen the benefits in terms of improved customer service and operational planning, of establishing links with ports on the opposite end of their trade. Ports such as Hamburg, Bremen and Rotterdam have set up EDP links with their opposite number in Asia and the United States (Singapore and the port of New York). This 'data bridge' gives instant information to customers on cargo flow, while by providing data on the number and type of containers to be shipped to the port, the identity of consignees and a breakdown of the status in terms of FCLs and LCLs, it affords the port a higher degree of operational pre planning.

The cost benefit trade off needs to be considered as well as whether the existing level of port competition requires it. Clearly, if the major competitors have gained an edge by offering this facility, it may be that it will constitute an important service improvement feature for the port, in order to avoid loss of business, and so the benefits will outweigh the cost. On the other hand, if it does not already form a part of the existing competitive arsenal, then the decision to pursue its development must rest on the financial costs to be incurred versus additional revenues to be gained.

6.3.2.2 PORT PRICING POLICIES

Port tariffs represent the remuneration to the port for its various services, and in the case of ports operated on a commercial basis, represents the means of achieving its financial objectives. While the prices of the various port services are usually stated in a published tariff (see appendix 6.3), in addition to planning the tariff level, consideration should be given to the need for a flexible pricing policy. This may be in the form of:

- (i) incentive rebates for large throughput customers;
- (ii) lower rates to encourage new traffic and
- (iii) incentives or penalties to encourage efficient utilization of port facilities.

A prerequisite to employing a flexible pricing policy is a knowledge of port costs. It is important to know how low charges can go if necessary, without being uneconomic. If it is desirable that each traffic/customer make a contribution to the overall profitability of the port, then this will dictate the minimum price be at least above direct costs.

A position on the desirability of special agreements with individual customers re tariffs will need to be taken: some customers may prefer the simplicity of a consolidated rate while others prefer detailed breakdown so that they have scope to arrange their operation in order to minimize outpayment. It is important for the port's management to have policies that respond to these needs, since it may affect the user's confidence in the port. Considerations as to special charges to encourage different traffic is also necessary. For example lower charges for transshipment versus domestic cargoes.

Due note must also be taken of the charges at competing ports (if available). This will indicate the scope for

further increases, especially regarding increased charges in light of additional investment in improved port facilities.

6.3.2.3 SELLING & PROMOTION OF PORTS

Before looking at the factors to be considered in the port selling and promotional effort, a distinction needs to be made between marketing and promotion. Marketing has been defined as the analysis, planning, implementation and control of plans aimed at satisfying port users. It involves devising that combination of service variety and quality, price and promotional activities, that will do so effectively. This means that promotion and selling is only one of the activities necessary in marketing the port.

Promotion and selling involves the overt efforts to increase customer and the public awareness in general, and usage of the port. Typically, a port will consist of several companies - competing and complementary. It is here that the distinction becomes important since it also dictates the division of the marketing effort. The role of promoting the entire port is normally the function of the Port Authority or an association of port companies (terminal operators, stevedoring companies, Agents, forwarders, truckers etc.). The task of promoting and securing business for a particular port company, say a terminal operator, must be the responsibility of the latter.

Port authorities and associations increase awareness of and generate interest in the port and can secure business for the port in general but should not allocate it to the port companies. For this, the individual companies should compete. While this arrangement does not preclude individual companies carrying out their own promotional activities to secure business, it does save costs and provide an integrated picture

of all the various port services to potential users. Such port bodies as the Port Authorities are therefore, allowed to solicit business but cannot conclude contracts or set rates though they may regulate it.

Whether promotion and selling efforts are being carried out at the port or company level, consideration has to be given as to whom the effort is to be directed at : shipowner, shipping agents, exporters, importers, forwarding agents, marketing boards and so on. This will depend on their perceived power (based on market research information) to influence or control port routing.

The effectiveness of the various media type for the different target audience is also important. This point cannot be over-emphasized, from both a cost and impact stand point. For example the use of television advertisements might be appropriate in a public relations effort but quite inappropriate compared to say trade journals, for reaching potential users.

6.4 ROLE OF THE MARKETING MIX IN ACHIEVING PORT OBJECTIVES

The next phase of the planning process is to develop the actual marketing strategy for the port. This involves the development of the marketing mix based on the objectives, and markets targeted. The final marketing plan must also consist of:

- a) targets and projections (in terms of TEU or tonnage) by traffic types
- b) a budget of both financial and human resources to be expended in the marketing effort, and

- c) a statement allocating the marketing activities among the various elements of the mix.

As can be seen, this represents the actual plan formulation phase, which, as stated earlier, is the concern of chapter 7. In this section, the role of the marketing mix in addressing some of the concerns of ports will be explored. Earlier, these concerns were identified as (a) more efficient utilization of facilities and (b) improvement of customer and worker relations.

6.4.1 The role of the marketing mix in improving efficient port utilization

Inefficient usage of facilities may occur as a result of excess capacity or too high a level of usage, which results in congestion or alternating situations of peaks and troughs in usage. In the case of the existence of excess capacity the aim will be to attract new, and of course, profitable cargoes.

In the case of the latter, the need may be to increment capacity. Judicious manipulation of the marketing mix can delay or reduce the need for new investments or attract new traffic to the port.

The fact that port services cannot be produced and stored ahead of demand, and that ship arrivals are not always predictable and will often tend to bunch, means that port facilities will experience periods of under-utilization and congestion. Seasonal demand for port services may be smoothed by pursuing a pricing policy wherein lower rates are charged for usage during the off-peak periods. This should serve to shift or spread some of the demand and so reduce congestion and the need to increase capacity.

Alternatively, it may be possible to encourage a faster turnaround of vessels:

- i) by calculating ship related charges based on time spent alongside. Increasingly, this is being used and is more effective the shorter the time frame for the charge. For example, charges based on hourly rates would be more effective than a daily charge.
- ii) higher tariffs may be levied on vessels lying alongside port facilities and not working cargo.
- iii) higher rates may also be levied for vessels working slower than average
- iv) incentives can also be given to encourage rapid despatch: For example, port Klang in Malaysia offers a reduction in wharfage charges for vessels of certain size which leave the port in under eight or six hours.¹¹ Another basis which might be more fruitful from a port management point of view, is to offer similar reductions to different categories of ships, but also based on the quantity of cargo worked per call, since the time spent alongside is also a function of the cargo volume to be handled. Another example, is the strategy used by Singapore and Kaoshung (Korea) wherein ships not leaving berth within say two hours after completing work, pay extra charges, which can amount to five times normal charges.¹² All these represent effective methods of persuading more efficient usage of berthing space.

¹¹ Lecture on Port Marketing by E. Pollock. WMU, August, 1991.

¹² Ibid. 11.

Similarly, more efficient usage of storage areas can be made by shortening the free periods and using an escalating rate for succeeding days above the free period.

Where situations of underutilization (not attributable to seasonal fluctuations) exist, the task is to use the marketing mix to attract new traffic. In this context it has already been shown how port marketing can serve to pinpoint new market opportunities. For a port pursuing new traffic, it is important that its tariffs be flexible in order to enable negotiations. Increasingly the trend is away from standard tariffs, in favour of individual contracts based on what the traffic will bear. This also means that there must exist proper knowledge of the carriers' revenue base.

6.4.2 The role of the marketing mix in improving customer and worker relations.

'Improving customer relations' is a somewhat nebulous objective, but a practical one nonetheless. The port's success in maintaining or improving these relations will depend on its awareness of what is desired by the users, which is in turn a function of good market research. However, broadly speaking, the port can increase its 'popularity' among its users by maintaining a high market profile and more importantly, by offering practical assistance when and where necessary, through:

- Keeping in touch. It is through constant dialogue with customers that port management can isolate problems in both its operation and that of the customers, and can make corrections or suggestions/accommodations. Customers' problems are often good sources of market opportunities.

- Providing facilities (where feasible) that are necessary to the customer's operations, but which it might not be economical for them to invest in. A good example of this is an electronic data processing service, especially with regards to vessel cargo planning and container tracking. These are now provided by many ports for a nominal fee. Another example is the provision of storage space and processing zones for manufacturing, along with computerized logistics system to effect the accurate and timely distribution of cargo. It caters to the manufacturers need to reduce inventory and transport cost while still being able to respond to the market.
- Market surveys carried out by ports can serve to indicate possible sources of cargo. Such information is invaluable to carriers, and with the prior approval of the companies surveyed can be copied to shipping lines.
- The port's promotional effort is also important. While the previous steps are well known by the recipients of the assistance, promotion through trade journals and trade fairs are useful in broadening the awareness among other sectors of the market. Increasingly, advertisements in trade journals are no longer limited to detailing port facilities and using catch phrases, but to explain how the port has solved a particular customer's problem - a testimonial form of advertising. Trade fairs are also invaluable sources of market contact, as well as well as advertising media, in order to increase port awareness.

The level of staff motivation correlates with that of productivity. It is therefore necessary for the port's management to seek means of improving the motivation of

workers. Methods such as incentive schemes and profit sharing schemes are in place in most ports. However, a significant influence to staff motivation and morale, is to receive public acknowledgement for good performance. The port of Singapore has found an effective (if not novel) means of doing this. That is, through its fortnightly port magazine, Port View. Here pictures of staff who achieved high productivity (often bannered as 'performance above par') on a vessel, are shown along with details of the vessel, the performance level, difficulties encountered and overcome during the task, and some group (eg. trophy) memento received for the performance. A port magazine can also serve to increase staff awareness and interest in the port's performance, competitors and the industry as a whole.

Thus it can be seen that the scope of the marketing mix to achieve port objectives are many and varied and limited only by management's ingenuity. It also demonstrates the need for a designated group of people to be responsible for the planning and coordination (a marketing department) of all these activities, since they impinge on all the aspects of the port.

6.5 CONTROLLING THE MARKETING STRATEGY

While planning is concerned with deciding what needs to be done, the emphasis of control is on the setting of standards, measurement of performance against these standards to evaluate achievement level and take corrective action. There are three levels of marketing control:

i) Strategic Control: This is the responsibility of top management and entails an evaluation of whether the company is pursuing the best markets, offering the right products and using the most effective means of communicating it. To determine this a marketing audit is carried out, the aim of

which is to examine the organization's marketing environment, internal marketing system and its marketing activities, to determine problem areas and recommend a corrective action plan to improve effectiveness.

ii) Annual Plan Control involves various levels of management in determining whether the company's annual objectives are being met, using various performance measurement tools such as

(a) revenue analysis, which tries to identify the various factors which contributed to the observed variance.

(b) market share analysis. Since the level of throughput does not itself indicate how well the port is performing relative to the industry, a market share analysis is often used. It suggests whether the changes in port performance were due to uncontrollable outside forces or whether there is a weakness in the current marketing program.

c) Expense-to-revenue ratio. This aims at keeping tabs on costs so as to ensure that the port is not overspending to achieve its objectives. Different ratios may be calculated for the various expense categories so as to detect which area of expenditure is causing the problem. Of necessity, some fluctuations will be random, so it is up to management to be able to distinguish these from 'real' fluctuations. Management needs to observe changes over several periods and plot these on a chart in order to detect the underlying trends.

d) Attitude tracking involves monitoring customers' attitudes to the port's services. If it is found that esteem for these services is falling, this can be a signal for management to take immediate action to restore

image or expect a downturn in its terminal usage in the future and ultimately in its profitability.

iii) Profitability and Control. It is not enough that the port is making a profit, management needs to know what specific areas of activity are making the profit, and how much. It is essential to gauge the profitability of each of the port's services. A good costing system and a sound basis for assigning common costs are prerequisites to useful profit centre analyses.

CHAPTER 7

TOWARDS A MARKETING PLAN FOR KTO

The objective of the previous chapter was to highlight the role and importance of marketing in the achievement of various port objectives. It concentrated mainly on outlining the marketing planning process and its relevance, or justification for its application to ports. Assuming that it was successful in establishing the desirability of the marketing approach, the natural progression is to move from the planning phase to the 'doing' phase. That is, how to actually prepare a marketing plan. Since the principal aim of this paper is to develop a marketing strategy for KTO, this seems the ideal point at which to merge the somewhat general discussions in chapter 6, with the company background and analysis of chapters four and five, and move towards a marketing strategy for KTO.

Three ingredients were mentioned in the previous chapter as being essential to any successful marketing endeavour: Namely, a service oriented to customer needs and wants; a marketing department with the responsibility for detecting these needs, developing the required services and devising effective means of establishing customer awareness for the port and its services; and finally, a marketing plan which identifies strategies and responsibilities for their implementation. The first requirement can be dealt within the actual marketing plan. Accordingly this chapter will consist of two broad sections. The first will be in the form of a recommended marketing department structure for KTO, while the second will detail the steps in the preparation of an actual marketing plan or strategy, using KTO where possible, as a case study.

7.1 RECOMMENDATIONS OF A MARKETING DEPARTMENT FOR KTO

It was shown in chapter 4 that KTO does not have a marketing department and that marketing, was carried out on its behalf by the Port Authority of Jamaica (PAJ). While this had certain

benefits (also mentioned), given the PAJ's involvement in and responsibility for all the Jamaican ports, it is inevitable that enough attention is not given to marketing of the Container Terminal. Thus such marketing activities as research and analysis are often carried out on a 'once off' and rush basis, immediately before a promotional tour. It has been demonstrated that marketing is a continuous process of monitoring and evaluation of market developments, so as to identify growth opportunities for the port and devise strategies for exploiting them successfully.

It is therefore vital that KTO establishes its own marketing department, with the requisite responsibility and authority to carry out these functions. A division will need to be made between the future marketing role of the PAJ and this new department. Since the container terminal operated by KTO is actually owned by the PAJ, the Terminal's management will need to convince the PAJ that such a change is not an attempt to shut them out, but is critical to the future success of the port. It may be that the PAJ will continue to carry out the promotion and public relations functions, but KTO the other marketing aspects.

Given the constraints on costs and the current low level of business at the Terminal, the proposed department should be as small as possible without impairing its functionality. The following functions are identifiable:

1. Market Analysis and Forecasting
2. Identification of new services and markets
3. Strategic Planning
4. Customer relations
5. Promotion and Public Relations

For this the minimum requirement in terms of personnel is five to seven, with responsibility for:

- i) Planning (the manager).
- ii) Information Gathering
- iii) Statistical analysis and forecasting
- iv) Customer relations
- v) Department administration (the secretary).

The above manpower program assumes that the PAJ in conjunction with KTO's executives, continue to carry out the actual promotion and public relations function of the Terminal.

Planning

The Marketing Manager should have at least a first degree in the social sciences (marketing, management or economics), plus experience and broad based knowledge of the shipping industry. He should report directly to the Managing Director. It is important that he be given the necessary level of autonomy and authority to plan and carry out the port's development. It is essential for him to have good communication skills, since there will be a need to liaise with and win the cooperation of the various departments. The support of top management also plays a vital role in his ability to solicit the degree of cooperation needed from other departments. Ideally, plans will need to be developed and approved on a team work basis, incorporating all the other members of the management team. The emphasis here is teamwork. Top management will also have to ensure his accountability in terms of plans as against achievements.

Information Gathering

Information gathering is indispensable to good analysis and planning. Relevant information will surface from any and varied sources. Therefore the person responsible for this task must be patient and thorough. Since it involves a great deal of reading, extraction and classification of data, the candidate for the job should possess a literary background. Perhaps a degree or diploma in the arts or social sciences.

Statistical Analysis and Forecasting

The job of statistical analyst involves evaluating the data gathered in order to identify possible threats and opportunities. The person employed will need to make assessments of the likely impact of economic and political policies on the port; to evaluate the environment, look at current trends in

cargo/commodity flows and services and forecast future ones. The Marketing Manager will need to rely heavily on his skills and ability in devising the actual marketing plan. For this task, a specialist in economic analysis is necessary - whether he has a port background or not. The possession of at least a first degree in economics or statistics is essential.

Customer Relations

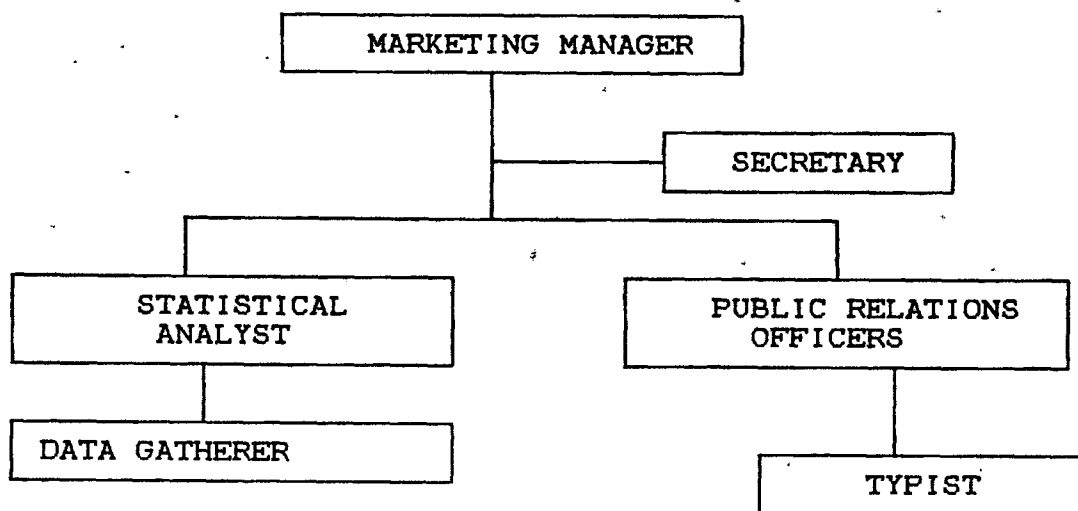
Customer relations involves maintaining contact with current customers so as to ascertain their problems and the degree of satisfaction with the service quality of the Terminal as well as contacting and monitoring potential customers. This is also a task for the Marketing Manager, that is keeping in contact with the customers. But in order to give more time to the planning function, he will need assistance in this respect. The person assigned this job must have excellent communication skills, as he will need not only to speak on the phone and through the mail, but also make and receive personal calls to and from customers. An important element in his ability to deal effectively with the customer will be his knowledge of their relative importance to the Terminal, in terms of traffic volume and profitability. In such a case, this individual will need to possess information on the status of the accounts of the different clients. In fact, he can be very useful in assisting the Accounts Receivable department in their collection efforts. This function may conceivably require more than one person, depending on the customer base and the level of attention required..

Department Administration

For the daily administration of the department, a secretary is essential. She will have the responsibility of the usual secretarial duties. At this point it must be stressed that the preferable combination is a typist and a secretary. The former would have the responsibility for preparing the various external and internal communications, manning of telephones and so on, for all members of the department. The secretary would be aligned primarily to the Manager and ensure the administrative functioning of the department in terms of meetings, appointments

and budget monitoring. She would report directly to the Manager. An experienced secretary is needed.

A diagram of the proposed functional relation for the marketing department is as below:



7.2 TOWARDS A MARKETING PLAN FOR KTO

The marketing plan is the actual written document which details specific marketing actions to be taken to achieve specific marketing objectives. It should pinpoint the strengths and weaknesses of the port in meeting market demands, while identifying future market potential, and thus facilitate an organized approach to their achievement. It is a plan of action. Preparation of the marketing plan is therefore a most important activity.

This section relies heavily on the work¹ of Robert K. Skacel for the methodology involved in preparing the plan. An attempt will be made to lend relevance to the methodology in a port

¹ The Marketing Plan: How to prepare it, what should be in it. Published by MPM Associates.

context by using KTO as a study. It is intended that by so doing, the initial step in devising a marketing plan for the improvement of KTO's performance will have been taken.

Six broad steps in the development of a Marketing Plan can be identified. Viz:

- 1) Preparation of the fact base
- 2) Identification of Strengths, Weaknesses, Opportunities and Threats (SWOT)
- 3) A statement of specific objectives
- 4) Development of the market strategy
- 5) Establishment of a marketing budget
- 6) Forecast of throughput and profit.

The first four will form the focus of the rest of this chapter, while the guidelines for the establishment of the marketing budget is presented in Appendix 7.5. Forecast of profit is a function of throughput, price and costs. The latter two are internally decided to a large extent, and are therefore more predictable. The real task is therefore to attempt a forecast of terminal throughput. A methodology for forecasting container traffic is presented in Appendix 7.6.

7.2.1 PREPARATION OF THE FACT BASE

The first step in developing the actual plan is to establish the basis for the plan. This is achieved by using the information gathered from the market information system discussed in the previous chapter. The fact base, so created, must give a thorough account of all the current conditions and situations in the marketing environment, pertinent to the current position of the Terminal, what is now being proposed as a solution and why. Since everything else flows from this fact base, it therefore represent a most crucial part of the entire plan.

Based on the analytic classification for the port fact base, presented in Appendix 7.1, the relevant fact base for KTO could be as below:

1FACT BASE FOR KTO

STATEMENT OF PURPOSE

The Kingston Container Terminal offers cargo handling services to port users.

1. THROUGHPUT

- For the years 1988-1990, a declining trend in throughput is observable. This is a result of a decline in KTO's share of the transshipment market. Recently, the domestic traffic also suffered decline due to worsening economic situation of the country.¹
- In the transshipment market KTO's customers consist entirely of the shipping lines, while for domestic cargo there is a combination of cargo interests and shipping lines. Their contribution to Terminal throughput is as below:

	DOMESTIC	TRANSHIPMENT
ZIM	26.6%	78.7%
SEALAND	27.0	-
EVERGREEN	14.0	-
CAROL	20.0	16.7
OTHERS	11.7	-

- Kingston serves a transshipment point via Zim for Miami, Houston, San Juan, Santo Domingo and Port-au-Prince. Domestic traffic flows are centred primarily around the USA, Far East and Europe and more recently the CARICOM countries.

2. MARKET

- Regional container throughput is increasing and therefore the potential market for transshipment is growing.²
- Liner trade is expected to increase by over 5.1% to the year 2000.³

2 FACT BASE FOR KTO (CONT'D)

- KTO's market share is falling.
 - The Terminal is losing ground in transshipment primarily because of:
 - a) low service quality in terms of productivity and unreliability due to stormy labour relations.
 - b) poor security image re contraband in containers
 - c) increasing use of the US Landbridge
 - d) increased port competition
 - The trend towards disintegration of consortia continues (Scandutch consortia will separate after January, 1991, for example). This has created new opportunities for ports, since these now independent lines are seeking hub ports for their operating networks.⁴
 - Increased landbridge usage can be expected to continue in the future.
 - Increased container penetration for tropical produce is expected to continue.⁵
 - The latest trend in port services, in addition to storage facilities, has been distribution logistics. Cargo information service using international EDP linkages has also been introduced by some of the leading ports in the industry.
 - The trend in larger ships sizes necessitating required depth alongside of over 13m compared with 11 or so metres, increased crane outreach (post panamax) and air height to serve 5 high containers on deck, is now established in the industry.
-

3FACT BASE FOR KTO (CONT'D)

- Productivity levels in ports are on the increase with market leaders such as Singapore recording average moves in excess of 40 per hour ⁶. Increased productivity is also a function of newer equipment technology.
- After relative stability during the 1987-1988 period, vessel operating costs have experienced steep increases exceeding an annual rate of 10%. ⁷ Shipowners will need to continue to exert tight control on costs in order to remain competitive.

3. THE MACRO ENVIRONMENT

- Expected change in the direction of trade due to:
 - * closing of gap in US balance of trade deficit and softening of the US dollar. Imports to US expected to decline while exports to increase.
 - * creation of economic intra-regional trading blocs. In particular the reduced preference status of countries signatory to such trade treaties as LOME etc., following the European Community integration in 1992. Therefore a reduction in exports to these countries, from the developing world can be expected.
 - * decentralisation of production
 - * new market horizons for trade in Eastern Europe
 - * scarcity of financial loans to developing countries expected in the future due to demand from Eastern Europe.
- World economic growth is expected to average between 3.2 to 3.5 percent. ⁸

4 FACT BASE FOR KTO (CONT'D)

4. KTO'S SERVICE

- Slow vessel turnaround time, averaging 14 hours per call.
- Poor operational performance of ship-to-shore cranes. Also a shortage of cranes to serve vessels adequately. Increased downtime attributable to age and unavailability of spare parts.
- Abundance of container storage areas. Over 6,500 TEUs now available.
- productivity averaging 13 moves per hour.
- increasing industrial unrest has marred the reliability of the Terminal's service. Especially following the protracted strike in September, 1990, during which the major transshipment carrier threatened to pull out.
- Offering storage and distribution service (under free port status) to cargo interest has the potential to increase the Terminal's transshipment performance.
- Involvement of the Terminal in through transport movement (on-carriage via feeder) can serve to enhance the port's attraction as a transshipment centre.

5. COMPETITION

- The major competing ports are on the one hand, those along the coasts of the United States. However, since the economics in favour of land bridge usage is quite overwhelming, KTO is not in a position to compete successfully for the cargoes so moved.

The second source of major competition is from those vying for cargo transported on the all-water route via the Panama Canal. These include San Juan, Cristobal, Limon-Moin and Santo Domingo.

5 KTO FACT BASE (CONT'D)

San Juan has the largest market share, but in general all competitors have been experiencing increased market share. The San Juan Terminal seems to be well developed. Cristobal's weakness is seen in terms of future scarcity of facilities relative to KTO:

	KTO	CRISTOBAL
Berths	4	2
length	640m	428m
depth	10.4 - 11.9m	10.7 - 12.2m
Cranes	5	2
Storage (TEU)	6,500	3,000
Reefer points	72 plus 64 con air	40

In 1989 Cristobal handled over 100,000 TEUs. This means that to avoid congestion, an average dwell time of 11 to 12 days per container is necessary. It is therefore evident that Cristobal might face capacity problems in the future, not only in terms of transit areas, but maybe also, berthing facilities. Two cranes serving two berths also imply slow vessel turnaround and probably high vessel waiting time.

Notes

1. See figure 5.1
2. Table 5.2 chapter 5.
3. Chapter 3, page 5.
4. During a field trip to Rotterdam, a visit was paid to Nedlloyds headquarters. The view of the Network Planning Manager was that, the next 5 to 10 years will determine the ports that will survive in the face of the reorganization of shipping networks, which, in his opinion, shipping companies will be making in the future.
5. Trade Horizons; Annual Issue, 1990. Published by Port Import & Export Reporting Service (PIERS). USA. Page 3 of the report states that in 1989 15,000 more northbound containers of bananas & coffee accounted for more than 50% of trade increase from Central America.
6. Port Views. February, 1990. Published by the Port of Singapore Authority.
7. Chapter 3, page 2.
8. Lloyds Shipping Economist, Sept. 1991. Pages 6 & 7.

7.2.2 SWOT ANALYSIS

The SWOT analysis utilizes the management's perceptions of the various market trends, competitor's weaknesses and the company's own strengths in order to identify opportunities which may be exploited profitably. The analysis flows naturally from the prepared fact base. Table 7.2 presents some guidelines in identifying problems and opportunities and these may be used to present a SWOT analysis for KTO as below:

6 SWOT ANALYSIS FOR KTO

STRENGTHS

1. Location of the port of Kingston relative to
 - a) the major trade routes utilizing the Panama Canal
 - b) the rest of the Caribbean, Central and South America (see appendix 7.1 for comparative distances from Kingston and Cristobal to Major ports in the region).
2. Adequate availability container stacking space.
3. Location of the Kingston Freezone adjacent to the port with adequate storage and factory space.
4. Adequate facilities for refrigerated cargoes.
5. Modern EDP system offering container tracking and cargo preplanning of vessels.
6. Proximity to the US Landbridge makes it ideal consolidation point for cargo between Far East and West Coast USA from the rest of the Caribbean, Central and South America.

WEAKNESSES

1. Poor labour relations and low level of motivation.
2. Slow vessel turnaround due to :
 - a) poor ancillary services such as pilotage and towage, and
 - b) an imbalance in the cranes to berth ratio

7 SWOT ANALYSIS (CONT'D)

3. High operational delays due to crane breakdown
4. High operational costs
5. Inability to respond to investment demands due to PAJ regulation
6. Poor Terminal surface conditions hampering operations and impacting on equipment performance
7. Dependent on a narrow base of customers for large portion of throughput
8. Poor image regarding container security against contraband
9. High labour cost due to high gang strength.

OPPORTUNITIES

Scope exists to strengthen KTO's transshipment position by:

1. Arranging feeder service for users interested in transshipping
2. Offering storage, distribution and processing service to cargo interests due to the existence of the IFZ and the abundance of stacking areas.
3. Actively vying for tropical produce from Central and South America to utilize the cold storage container facilities.
4. Using the existing EDP system to offer logistics services to customers for a nominal fee.
5. Further involvement in cargo consolidation for small shippers and so reduce the imbalance re empties and loaded containers.
6. The possibility to allocate some of the existing container stacking area to container leasing companies for repositioning of boxes.

THREATS

1. Increased usage of the US Land bridge
 2. Development of numerous container facilities in the region
 3. Possible reduction in regional trade following a reduction in the US export market and the European Community Integration in 1992.
-

7.2.3 STATEMENT OF SPECIFIC OBJECTIVES

Objectives represent desired solutions to existing problems or the exploitation of perceived opportunities and therefore represent a natural outgrowth of the SWOT analysis. Because all previous steps in the plan led to the formulation of the objectives and all subsequent steps are geared at achieving them, the objectives represent the core of the marketing plan. In as far as is possible, objectives should be specific and measurable, with a time frame for achievement. This allows for more efficient control. Objectives are not revenue and profit goals, but desired results which lead to their achievement.

Appendix 7.3 outlines some basic considerations in setting port objectives. Possible objectives for KTO:

8 KTO PORT OBJECTIVES

1. Improving the service quality of the vessel operations by reducing overall turnaround time through:
 - a) improved productivity to say 20 moves per hour, and,
 - b) reduced waiting time of vessels
 2. Increase customer base by
 - a) attracting new traffic
 - b) expanding the service range to include storage and distribution logistics
 - c) attracting smaller lines to enhance the port's on-carriage possibilities and therefore serve to attract larger lines
 3. Restrain/ reduce cost per container handled
 4. Improve the port's image in the market place.
-

7.2.4 MARKETING STRATEGY DEVELOPMENT

While objectives specify desired end results, strategy outlines specific marketing programs aimed at achieving them. As will be recalled from the previous chapter, a marketing strategy consists of two basic elements:

- 1) Market Targeting, and,
- 2) The Marketing Mix. The mix can be internally directed and or market directed. Internally directed strategies aim at service and tariff development, policy formulations and so on. While externally directed strategies are those presented to the customer in order to win his patronage.

Based on the guidelines for strategy development outlined in Appendix 7.4, KTO's strategy is presented below.

9 STRATEGY FOR KTO

MARKET TARGETS

With a view to broadening the Terminal's customer base,

- a) KTO should continue to target:
 - (i) container shipping lines using both the Panama Canal and the US Landbridge. Emphasis should be placed on attracting a broad range of carriers of different sizes.
 - (ii) regional shipping lines in order to facilitate on carriage to these countries.

Where formerly the great strength of KTO was its location relative to the Canal, and therefore ideally

placed to serve as a transshipment point for the Europe Far East, US Gulf and East Coasts to Far East and US West Coasts, this is no longer the case since these trades are now largely being landbridged. A review of the map presented in Figure 4.2 will show that KTO is also ideally placed to serve as a hub for Central and South America and the Caribbean. Further, in terms of marine distances saved KTO is better placed, relative to the major competitor, Cristobal, to act as a transshipment point for southbound cargo to the regions specified. This sub-region was originally assessed by KTO but not pursued.

It has also been noted that RTW operators still tend to use the route through the Panama Canal on at least one leg of their service. However, the preferred choice to act as hub has been Cristobal. For example the Tricon group comprising Senator Line, Cho Yang and DSR call at Cristobal on both their East and West bound service. Barber Blue Sea uses Cristobal as a hub for the Caribbean, Central and South American cargo. Evergreen, on its eastbound service now feeds Kingston's cargo over Charleston but on its westbound service, calls at both Kingston and Cristobal before continuing through the Canal.

This implies that there is still scope for KTO to attract business from some of the original routes targeted (Europe & US to Far East), but that this will involve a lot of marketing expenditure since they are already settled at Cristobal. And the degree of publicity with which Evergreen terminated its transshipment activities at Kingston has greatly tarnished the port's reputation and created some degree of skepticism among potential carriers. Since it is easier to try to keep customers than to regain them after they have left KTO may want to wait until it has secured a broader base of clientele and reduced the stigma currently attached to the port before pursuing this market.

11 KTO STRATEGY (CONT'D)

A more rewarding strategy may be to pursue the second segment of the market. That is to act as hub for southbound cargo destined for Central and South America and the Caribbean. In addition, KTO has the advantage of also being strategically located relative to the land bridges (primarily those to the Gulf Coasts) to act as a transshipment point for both imports and exports of these regions.

KTO will need to undertake market research to assess these possibilities and what strategies to pursue. Although these markets are smaller than those of the Far East trade now, if "a better economic climate among the West Coast South American nations is expected to boost container exports seven percent this year [1991] and a further 18% in 1992." ¹, then by getting involved in this market, KTO would have the possibility to grow as this market does. In total, exports to Central America are forecast to grow 20% per annum in the near term.

Whether KTO would need to target the smaller and or national lines for the northbound journey to Kingston and then the bigger lines for the trip from Kingston to say Charleston, would largely depend on the current operating pattern of both sets of lines and whether there is any advantage for them to make an intermediate stop at Kingston.

- b) Efforts should also be focussed at cargo interests. Namely,
 - (i) major exporters/importers of the region regarding using the port as a storage and distribution centre
 - (ii) the producers' association of regional farmers regarding the need for cargo consolidation and containerized cold storage facilities for agricultural produce.

1. 1990 Annual Issue of Trade Horizons. PIERS. page 9.

(iii) container leasing companies.

As shippers spell out the criteria for service and carriers try to respond, vast opportunities have opened up for ports whose management are willing to capitalize on them. The latest shipper's preoccupation has been with the need to reduce inventory costs while still preserving their ability to respond, with minimum delay, to market demand. This gave rise to the Just In Time (JIT) concept. As a research by Nedlloyds revealed, large producing companies have changed their approach to international trade. This is manifested in:

- a) a concentration primarily on production and sales
- b) production being organized internationally and on a decentralized basis, and,
- c) a reduction in the period between product manufacture and delivery.

This Nedlloyd interpreted to mean that these companies would need another company to handle logistics and distribution. Not only is there opportunity here for shipping lines to offer logistics services, but there exists a real market opportunity for ports to act as regional distribution centres.

KTO will need to target and actively canvass shippers, and not only the lines. The question of necessary space to be used for storage arise. In this regard, the use of the neighbouring freezone would be an advantage. In other words, part of the task of getting business for the Terminal, will involve that of securing business for the Freezone.

The likely shippers to be targeted are the ones who are still in the process of developing their trade and distribution channels. In this regard, the greatest potential rests with the ASEAN countries such as Thailand, Indonesia and Malaysia.

13 KTO STRATEGY (CONT'D)

The 1990 annual issue of the PIERS report on Trade Horizons, forecast the following growth in containerized trade to the US from these countries:

	THAILAND	INDONESIA	MALAYSIA
1991 (TEU)	158,456	65,121	56,720
GROWTH RATE	19.7%	16.5%	19.0%
1992 (TEU)	188,629	76,908	67,587
GROWTH RATE	19.0%	18.1%	19.2%

The major commodities and the dominant shipping lines engaged in this trade are as below:

IMPORTS TO US FROM SOUTH EAST ASIA (1990)

LINES	SHARE (TEU)	COMMODITIES	SHARE (TEU)
APL	65,028	FURNITURE	34,794
MAERSK	60,263	CANNED FOODS	29,774
EVERGREEN	51,797	APPAREL	21,804
SEALAND	42,099	ELEC. PROD.	15,451
OOCL	41,968	WOMEN'S &	
OTHERS	149,352	INFANT WEAR	14,782
		OTHERS	293,902

The degree to which KTO would be able to tap this market will largely depend on the lack of distribution facilities within the US, since the first port of call of the major carriers in this market is the US west coast ports, from which cargo is bridged to the East and Gulf ports. It would also be a function of savings in shipping costs as a result of bulk shipment, against the additional cost of shipping cargo to Kingston and storing it. Further market research will need to be carried out to determine which market segments to choose.

Further market development opportunities exist for the Terminal in the area of repositioning, storage and repair of leased containers. Nearly 45% of all containers in operation are leased. The major leasing companies are listed below along with their fleet size in 1990.

	FLEET(TEU)	HEAD OFFICE
GENSTAR/ITEL	920,000	SAN FRANCISCO
TIPHOOK GROUP	420,000	LONDON
TRANS AMERICA LEASING	290,000	NEW YORK
TRITON CONTAINER	200,000	SAN FRANCISCO
TRANS OCEAN LTD	130,000	SAN FRANCISCO
SEA CONTAINERS LTD	90,000	LONDON
INTERMODAL EQUIP. ASSOC	80,000	SAN FRANCISCO
TEXTAINER GROUP	75,000	TRIESTE/ITALY
INTERPOOL	70,000	NEW YORK
SCANDINAVIAN CARGO SYSTEMS	40,000	STOCKHOLM
MATSON LEASING	20,000	SAN FRANCISCO

Source: Containerization International Yearbook, 1991.

The port of Kingston already has a company (Equipment Care) which carries out container repairs. This experience is an added advantage if KTO chooses to target this market.

2. THE MARKETING MIX

The service: INTERNAL STRATEGIES

- (i) The objectives: To improve service quality especially re vessel operations, through improved productivity and reduced waiting time and to increase customer base. This requires:
 - (a) a solution to the problem of obsolete cranes and the increased operational breakdown being experienced, as well as a deficiency in the berths to cranes ratio.

Historically, the drawback to renewing or increasing port investment has been the reliability of KTO's management on the PAJ, resulting in considerable lag time between identification of the need and response. One solution may be for the Terminal's management to negotiate a new agreement with the PAJ, wherein a percentage of the operating surplus is not remitted to them, but retained by KTO to meet investment needs. The PAJ might wish to retain the right to approve the investment. But the fact that they are not required to fund it, should serve to speed up the process.

One basis for the percentage of earnings to be retained could be the annual depreciation cost, based on projected replacement value and port development need. A second solution is for KTO to look at the possibility to lease cranes. The European and Japanese markets might offer possibilities. The older cranes can be sold as there exists a market for these equipment.

- (b) Solution to the problem of other port services such as pilotage and towage will depend on Management's efforts to influence the performance of these entities. The system of payment for these services on a 'work done' basis should be implemented, with penalties (loss of revenue) for delays in performing the service.

16 KTO STRATEGY (CONT'D)

(c) Measures to improve the motivation and performance of stevedoring staff need to be taken. The primary reason for the poor productivity level on the Terminal was ascribed to:

- the fact that KTO had no direct control over the hiring, training, and therefore motivation of the stevedores
- the fact that stevedores, being paid hourly and not per box, had little incentive to increase productivity. Some incentive scheme was put in place, but the rate of incentive is not high enough to compensate for the wage loss by executing their job with dispatch.

One strategy is for KTO to adopt the approach most container terminals are today using. That is, employ crane operators directly on a salaried basis, and utilize the labour pool only for aboard ship activities, such as lashing. Unions need to be made to recognize that containerization has changed the definition of 'dock work'. Crane operators are no longer dock workers but highly paid and skilled technicians.

An alternative strategy is for stevedores to be paid on a box rate and not a hourly basis. This has the obvious advantage of giving workers a vested interest in the level of Terminal throughput as well as afford them the knowledge that it is no longer in their interest financially, to prolong the job, since their wages would be the same. This principle has been employed in several British Ports and has been successful in improving productivity.

17 KTO STRATEGY (CONT'D)

(ii)The objective: To restrain and or reduce cost per container handled.

An essential step to restraining and reducing Terminal costs is to accrue the benefits of mechanization in terms of labour reduction. The current level of 27 men per crane (excluding supervisory personnel), closely approximates to the situation that obtains for breakbulk terminals. A survey carried out by the author into this matter of gang strength, revealed that in the ports of Rotterdam, Colombo, New York, Malmo, Copenhagen and Los Angeles, the average gang strength ranges from 12 to 17 men. KTO cannot expect that investments in terminal equipment will have the desired cost savings if they are over manned.

Another factor of Terminal cost is that for tractors used to move containers between ship's side and the stacking area. One area of cost reduction could be to have a trailer to each tractor. That is, each tractor/driver crew would take two to three containers instead of one. This would not only serve to reduce labour cost, but enhance the vessel operations. The other solution proposed by the Terminal, of using the straddle carriers for this purpose, would also achieve the cost savings objective.

MARKET DIRECTED SERVICE STRATEGIES

The objective: To attract new traffic and broaden the customers base.

(i)Through Transport. The objective may be achieved by offering a wider range of services to new and existing users. Different customers require different services, therefore a customer needs-oriented approach will possibly entail the port positioning itself to handle everything between the production and selling of cargoes. It will necessarily involve the use of partners, such as forwarders, short sea vessel operators and so on. This will enable the port to offer through transport to clients.

On carriage arrangements will represent an essential part of KTO's service improvement strategy. The existence of a wide network of feeding possibilities can serve to attract larger lines, that would otherwise be unable to enter the relatively fragmented regional market.

(ii) Storage and Distribution services

The essence of the distribution logistics service is to meet the 'Just In Time' needs of cargo interests. On the one hand, efficient port services regarding feeding arrangements will ensure that importers receive cargo on time and on short notice, therefore reducing the need for stockpiling. While the manufacturers are able to produce on a short term basis to meet customer demand and also reduce cost of inventory build up.

Essential to this service is a reliable EDP system. In addition to facilitating easy storage and retrieval of information the EDP system will need to enhance the port's logistics function by providing information on different routing options and costs, in the distribution process. The essence of logistics is to optimize time and cost of distribution. This means that there will be the need for a data base on the various operators on the different routes, in order for KTO to select the best partners for each route.

The aim of the storage function is to meet the need of cargo interests to reduce transportation costs, by shipping in bulk, therefore achieving economies. The cargo can then be shipped to the various destinations as demand arises.

The Tariffs

INTERNAL STRATEGIES

This involves

- (a) establishing the cost base or minimum charge that can be levied for KTO's services, without accruing a loss,
- (b) comparison of the port's charges with those of competitors to ensure competitive a price level and,
- (c) policy decisions regarding the Tariff in general, such as flexibility of the published tariff, and so on.

These can be crucial in meeting the objective of attracting new customers, while retaining existing ones.

- (a) KTO has a high level of fixed costs, therefore in order to minimize unit cost and increase profitability, it needs to pursue a pricing strategy aimed at gaining high volume throughput. One basis for setting the price is to establish the different throughput and price levels at which the Terminal will break-even. The selection of one of these price levels as the minimum charge will depend on the probability of achieving these volumes. This provides minimum targeted throughput for the Terminal, above which, at a given charge it will make a profit.

This does not mean that this minimum charge will be that levied at customers, rather it establishes the degree of freedom management has in negotiating rates, by establishing the floor. The difficulty in using this approach is that it tends to establish a composite rate, not one for each service and would be more useful if the Terminal is pursuing a strategy of providing consolidated rates.

An alternative approach is to base the minimum rate on the direct cost of each service. The pricing policy will be to charge at a rate at least above the direct cost, so that each service will contribute towards fixed costs and profitability. Assuming the establishment and apportioning of the various costs to their costs centre, some degree of accuracy in calculating the direct cost can be achieved. However, while this approach is invaluable in underlining the minimum charge that management can levy for each service area, it does not take into consideration the overall profitability of the Terminal, as it neglects the consideration of the volume of traffic needed at particular rates, to cover fixed costs.

The ideal strategy is to combine both approaches. Thus, based on direct cost established for each service, a sensitivity analysis can be carried out by incrementing this direct cost and calculating the necessary volume to achieve break-even point. The choice of rate will therefore be based on that level of traffic which is most achievable. The price so determined is the minimum charge for the particular service.

- (b) In determining the final tariff level, consideration as to continued competitiveness has to be made. Many ports do not publish container handling tariffs, so it is difficult to acquire comparative data. However, a judgement can be made. For example, the comparatively low investment level at the port of Cristobal might mean that their fixed costs are not as high as KTO's and therefore charges might be lower. Consideration has also to be taken regarding vessel operators concern over escalating costs.

EXTERNAL PRICING STRATEGIES

- Instead of having a single published container handling tariff, KTO may conclude separate contracts with customers. The rate agreed on depending on the volume, size of ships, service required and the level of productivity desired. These charges should be founded upon an understanding of the carriers position in terms of revenue base.

This requires an approach of charging (within limits) what the traffic will bear. Thus for carriers with a market dominated by low valued cargo, the approach will be to generally be willing to charge a lower rate than for those which move say electronics. This means management will need to know the basis on which each carrier charges his freight. The approach proposed is applicable when freight is levied on a commodity basis. The objective of this approach is to encourage a variety of traffic so as to broaden the customer base, and reduce the Terminal's dependency on a narrow range of trades and customers.

- Lower rates might be levied to encourage vessels to call at off-peak periods or when there is not a heavy demand for cranes. For example, Appendix 7.8 shows that the demand for berth and crane usage at the Terminal is heaviest on Mondays, with Saturday being the lightest. By reducing the overtime charge on weekends it might be possible to spread the demand and therefore reduce the possibilities of congestion.
- In order to attract the business of storage for container leasing companies, it might be useful to offer free storage for a certain percentage of their containers. Thus storage charges can operate as a 'loss leader' the real objective being to gain substantial revenues from the container handling activities and not necessarily directly from storage.

- Increased vessel calls can be encouraged by giving a reduction in port dues, pilotage or towage charges, after a certain number of vessel calls per customer per year has been achieved. This should be directed at transshipment carriers. However, since these areas are not revenue sources for KTO, some arrangement will need to be made with the PAJ regarding compensation. The basis of the reduction must be in terms of additional calls (and traffic) expected as against revenue loss from the rate reduction.
- A most important price strategy in securing transshipment might be to offer a through (consolidated) tariff. This makes it easier for those cargo interests, wishing to tranship. The rate would need to cover all the various activities, including feedering. KTO would then pay the various partners accordingly.

The Promotion

The objective of the promotional strategy is to increase customer base and improve the image of the port.

In order to broaden the customer base, KTO needs to create awareness among current and potential users of its various services. It needs to have access to the right people and then communicate to them its services. KTO's current promotional strategies take the form of printed brochures, advertisements in trade journals and personal visits to customers or potential customers. In addition, access to cargo interests can be gained by visiting or participating in the various trade fairs (such as EXPO), forwarding and other industry conferences.

Initially, the stance might be for the Terminal to send one or two members of the marketing staff, to observe and recommend whether the port should take part the following year. Participation is normally in the form of booths displaying the Terminal's facilities, services and present customers. It is essential in promoting the Terminal's facilities that a distinction be made between planned and existing facilities. It was very surprising to this author to meet a top ranking official of CGM at the Port of Bremen, and be asked about our Freezone facilities. His understanding was that we have plans to build a facility, but he was quite unaware that the facility was in existence and operating for about a decade!

A crucial part of KTO's promotional strategy will be to repair its image in terms of container security and labour stability. To this end activities will have to be focused on detailing the various security measures which are now in place and highlighting their effectiveness by pointing to the fact that, since their implementation, no further drug finds were made by the US Customs. The effect of the degree of publicity with which Evergreen withdrew transshipment activities in Kingston, and the reason published (drug finds) must not be underestimated. It is much better for the marketing team to bring up the subject of Terminal security than to be asked about it. One strategy in promoting the security of the port might be to look at the possibility of having the US Customs come and appraise our security measures. An approval might be invaluable in eradicating the current stigma.

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APPENDIX 4.1

TERMINAL OPERATOR'S AGREEMENT

An Agreement made the 30th day of July, 1982
AMONG THE PORT AUTHORITY, a body corporate established and
existing under and by virtue of the Port Authority Act and
having its offices at 15-17 Duke Street in the parish of
Kingston (hereinafter referred to as "the Authority") of the
ONE PART and KINGSTON WHARVES LIMITED, a company
incorporated under the laws of Jamaica and having its
registered office at 64 Harbour Street in the parish of
Kingston of the SECOND PART and WESTERN TERMINALS LIMITED,
a company incorporated under the laws of Jamaica and having
its registered office at 64 Knutsford Boulevard, Kingston 5
in the parish of Saint Andrew of the THIRD PART and
KINGSTON TERMINAL OPERATORS LIMITED, a company incorporated
under the laws of Jamaica and having its registered office
at 64 Harbour Street in the parish of Kingston (hereinafter
referred to as "the Operator") of the FOURTH PART

W H E R E A S:

1. The Authority has the responsibility for regulating the use of all port facilities in the Port of Kingston including the Container Terminal at Newport West in the parish of Saint Andrew.
2. The Authority owns ^{part of} ~~part of~~ the Container Terminal including Berths 10 and 11 and is in the process of expanding the facilities of the Container Terminal.
3. Kingston Wharves Limited owns Berths 8 and 9 at Newport West and has agreed to make such portions of these as may be required and as may be capable of having the Paccco Portainer cranes operate thereon available for use as an integrated part of the Container Terminal.
4. The Operator is jointly owned by Kingston Wharves Limited and Western Terminals Limited who were parties to an agreement dated 23rd April, 1975 with the Authority for the operation of the Container Terminal. The Operator has been established by those two companies at the request of the Authority to enter into a new agreement with the Authority

to operate the Container Terminal upon the terms and conditions hereinafter mentioned, and with a view to avoiding the several deficiencies experienced in the operation of the said Container Terminal under the agreement dated 23rd April, 1975, particularly in the area of management and staffing.

NOW IT IS HEREBY AGREED:

1. This Agreement is for the management of the Container Terminal and any new berths as from time to time are available for operation as part of the Container Terminal and as are made available for that purpose.
2. This Agreement shall come into force on the 1st day of January, 1982 and shall, subject to the provisions of Clause 23, continue for a period of five (5) years.
3. The Operator during the continuance of this Agreement, shall manage and operate the Container Terminal and any expansion of the existing facilities as one operation.
4. Kingston Wharves Limited shall make available for use as an integrated part of the Container Terminal such portions of Berths 8 and 9 ^{as may be required} as may be required and as may be capable of having the Paccoc Portainer cranes operated thereon and save for any consideration as set out in this Agreement, ~~X~~ no charge shall be made to the Authority for such use of these Berths and facilities. Kingston Wharves Limited shall be responsible for maintaining at its own cost Berths 8 and 9 in a suitable condition for use as part of the Container Terminal aforesaid. X
X
X
5. The Operator shall in respect of the operation of the Container Terminal charge and collect for all services rendered thereat at the rates specified

by or agreed with the Authority and save as is otherwise specifically agreed, such sums charged shall be earnings of the operations of the Container Terminal. Any revenues derived from the throughput charges for fuel and water supplied from Berths 8, 9, 10 and 11 shall be divided equally between Kingston Wharves Limited and the Authority and shall not form part of the revenues of the operations of the Container Terminal.

6. The Operator shall not (save at its own risk) grant credit for the services rendered at the Container Terminal, except within the limits and in accordance with the terms approved by the Authority from time to time. X
X
X
X

7. The Operator shall undertake and be responsible for the maintenance and servicing of the Paceco ^{4 RAKAIA TRAIN CRANES} Portainer cranes, in accordance with the manufacturers specifications. It shall further undertake and be responsible for the maintenance and servicing of all plant and equipment made available by the Authority, with the agreement of the Operator, for use at the Container Terminal. The costs and expenses incurred by the Operator in the maintenance and servicing of all such plant and equipment shall be treated as part of the direct operating cost of the Container Terminal.

8. The Authority shall be responsible for the purchase of and will supply spare parts for the equipment made available by the Authority for use at the Container Terminal and although the Authority shall provide the necessary storage facilities the Operator shall be solely responsible for the safe custody of such spare parts when delivered by the Authority. The Operator shall pay the Authority for such spare

parts as and when used by the Operator and the cost of such spare parts and the personnel employed to ensure their safe custody shall be treated as part of the direct operating cost of the container Terminal. The Operator shall take stock of such spare parts not less than once in every three (3) months and the costs of any spare parts found missing shall be reimbursed to the Authority by the Operator. X

9. The Insurance premiums in respect of dock facilities, all plant and equipment, including spare parts owned by the Authority and made available to the Operator for use at the Container Terminal shall be paid by the Operator when due and shall be treated as part of the direct operating costs of the Container Terminal.

10. The Operator shall take out such policies of insurance in respect of such liabilities and upon such terms and conditions in the joint names of the Authority and the Operator as shall be agreed with the Authority as being necessary and adequate with such insurance company or companies as the Authority may in each case and from time to time direct or approve and the cost of such insurances shall be treated as part of the direct operating cost of the Container Terminal, it being understood and agreed that any insurance premiums payable in respect of Berths 8 and 9 shall not be treated as part of the direct operating cost of the Container Terminal. X

11. The Operator shall provide adequate security for the Container Terminal and all the plant and equipment thereon, and the costs and expenses of such security shall be treated as part of the direct operating cost of the container Terminal. X

12. The Operator shall maintain a separate bank account for the operation of the Container Terminal and all income and expenditure in relation thereto shall be passed through this account. The Operator shall prepare a monthly statement of accounts within thirty (30) days of the end of the month to which the statement relates and shall within sixty (60) days of the presentation of the relevant accounts, pay over to the Authority any surplus shown on that account. Any deficit shown by the accounts referred to herein shall be paid by the Authority into the abovementioned bank account within sixty (60) days of the presentation of the relevant accounts. As soon as possible after the expiration of each year, the Operator shall cause the accounts to be audited by a recognised firm of Accountants acceptable to the Authority. The audited accounts shall be presented to the Authority within Ninety (90) days after the end of the year to which the accounts relate or failing this as soon as possible thereafter. The cost of such audit shall be treated as a direct operating cost of the Container Terminal. Any adjustment necessitated by such audit shall be effected immediately. The Authority shall have the right at its own cost to have the accounts of the Operator audited from time to time and shall be entitled to conduct such investigations into the operations and management of the Container Terminal, as the Authority considers necessary from time to time.
13. The accounts referred to in the preceding clause shall be in such form and context as may be agreed from time to time by the Authority and the Operator.

14. The Operator shall confine its expenditure in relation to the management and operation of the Container Terminal within such limitations as may be agreed with the Authority or failing such agreement, then within such limitations as may be specified by the Authority provided however that it is clearly understood that any such specifications shall be geared towards a reasonable efficient operation.
15. The Operator shall maintain an efficient operation ~~as per the container terminal agreement~~ and shall satisfy the Authority that planning and management is adequate to ensure such operation and shall co-operate with the Authority to this end.
16. The Authority shall provide or arrange for the provision of all plant and equipment required for the operation of the Container Terminal after consultation and agreement with the Operator and shall take into account the availability of any equipment purchased by the Operator prior to this Agreement or with the knowledge and consent of the Authority for the operation of the facilities.
17. (a) Should the Operator not conclude with the Authority an Agreement to operate the Container Terminal after termination of this Agreement, the Authority shall immediately after such termination notify the Operator whether any equipment owned or controlled by the Operator is required and the Operator shall then make available to the Authority or to such other operator as the Authority may nominate, such equipment owned or controlled by the Operator at such rental charges as may be negotiated between the parties not being more than the current sums being paid for the use of such equipment by the user receiving most

favourable terms for their use, or within thirty (30) days of the commencement of such hireage the Authority may purchase such equipment at cost less depreciation at the rate or rates approved by the Authority, it being the intention of this Clause to ensure the ability of the Authority to secure the continued operation of the Container Terminal with as much equipment as was available for its operation during the period of this Agreement, and the Operator shall be obliged to deliver such equipment to the purchaser and the purchaser or the Authority shall make payment within thirty (30) days thereof.

17. (b) Should the Operator not conclude with the Authority an Agreement to operate the Container Terminal after termination of this Agreement the Authority shall indemnify and reimburse the Operator in respect of any amounts paid by the Operator under the provisions of The Employment (Termination and Redundancy Payments) Act or any Collective Labour Agreement in force at that time between the Operator and a Trade Union to its employees working at the Container Terminal at such date of termination of this Agreement with such indemnity however being limited to the period of employment with the Operator.
18. Where the Container Terminal is not sufficiently equipped to carry out any of the functions normally carried out at a container terminal and contemplated by this Agreement, the Operator may from time to time sub-contract such operations as may be necessary in the circumstances but only after consultation with the Authority on the need for and the terms of any such sub-contract as may be necessary in the circumstances. In exceptional

circumstances, where such consultation is not possible, a sub-contract for a specific purpose may be entered into by the Operator and notification thereof to the Authority, shall take place at the first possible opportunity. In any event, the conclusion of any such sub-contract must be notified promptly and in writing to the Authority.

19.

22/1/84

Kingston Wharves Limited and Western Terminals Limited in their respective capacities as wharf operators shall subject to the provisions of the Wharfage Act, collect and retain all wharfage payable (save as containerised transshipment cargo) for cargo passing over the Container Terminal on condition that all costs and expenses in connection therewith shall be borne by them and that none of such costs and expenses are charged to the operating cost of the Container Terminal. Should the Authority decide that wharfage or any part thereof on Containerised Transshipment Cargo is to be payable, then Kingston Wharves Limited and Western Terminals Limited shall collect same and the amount so collected less the direct expenses incurred in such collection shall form ³⁰ part of the earnings of the operations of the ³⁰ Container Terminal. *30*

20.

Kingston Wharves Limited and Western Terminals Limited each agree that it will pay to the Operator for the sole account of the Authority the sum of 10 cents per ton (tonnage assessed on the same basis as is used for the fixing of the tariff of wharfage rates) for every ton of cargo imported or exported in containers excluding all roll-on-roll-off cargo and containerised transshipment cargo which is handled by or over the

Container Terminal in respect of which wharfage is collectable pursuant to the tariff of wharfage rates. It being understood and agreed that such amounts paid by each of Kingston Wharves Limited and Western Terminals Limited shall not be taken into account by the Operator in determining either the Gross Revenue of the Container Terminal or the Net Revenue.

21. The Operator shall pay over to the Authority the residue of the total earnings from the operations of the Container Terminal after deducting from the total earnings during any accounting period the following expenses attributable to that accounting period:

- (a) all salaries, wages and other costs of personnel employed by the Operator;
- (b) maintenance costs;
- (c) costs, if any, of renting equipment used at the Container Terminal;
- (d) the cost of spare parts;
- (e) interest on working capital which may be borrowed for the operations of the Container Terminal;
- (f) insurance premiums for spare parts, the dock facilities and all plant and equipment as provided for in Clause 9 and insurance premiums payable in accordance with the provisions of Clause 10;
- (g) any other appropriate direct costs and should there be any dispute as to whether any cost is a direct cost, then normal accounting principles will apply in determining same;
- (h) capital charges, comprising interest payable by the Authority and depreciation on the plant, equipment and dock facilities owned by

the Authority at the rate or rates set out in letter of the same date as this agreement between the Authority and the Operator;

- (i) depreciation at the rate or rates set out in letter, ^{by the Authority: 1977} of the same date as this agreement between the Authority and the Operator on plant and equipment purchased and owned by the Operator and in respect of which no other charge by way of rental or hireage is being made as a charge to the Container Terminal. Where such equipment is used partly in respect of the Container Terminal and partly for other purposes, depreciation thereon shall be apportioned according to use;
- (j) a management fee calculated to reward the Operator for its efforts as operator of One and one-half per cent (1½%) of the Gross Revenue of the Container Terminal (less the 10¢ rental) plus twelve per cent (12%) of the Net Revenue. The terms "Gross Revenue" and "Net Revenue" shall be calculated on the basis agreed by letter of the same date as this agreement between the Authority and the Operator.

22. The Authority and the Operator shall work closely together for the promotion of the Container Terminal in order to aim at increasing the volume of containers now passing through the Container Terminal.

23. Without prejudice to any other rights of the parties, and notwithstanding the provisions of Clause 2, this Agreement may be terminated by either party at any time after the expiration of three (3) years from its commencement by six (6) months' previous notice in writing.

24. Should the Operator be desirous of continuing the management of the Container Terminal after the termination of this Agreement, the Operator shall not less than nine months before the expiration of this Agreement give to the Authority notice in writing of such desire, whereupon both parties shall forthwith enter into negotiations so as to determine the terms and conditions of the agreement for the continuing management of the Container Terminal by the Operator. In the event that such an agreement is not concluded three months before the expiration of the period of this Agreement then unless the Authority and the Operator shall otherwise agree this Agreement shall upon the expiration thereof be terminated.
25. The Authority may determine this Agreement forthwith by notice in writing to the Operator if the Operator shall go into liquidation (whether compulsory or voluntary not being merely a voluntary liquidation for the purposes of amalgamation or reconstruction) or shall become insolvent or enter into an agreement with its creditors generally or shall have a receiver appointed of its assets or undertaking or any part thereof.
26. any dispute arising under this Agreement shall be referred to a single arbitrator nominated by the President for the time being of the Public Accountancy Board of Jamaica in accordance with the provisions of the Arbitration Act or any statutory modifications or re-enactment thereof for the time being in force.
27. Nothing in this Agreement shall constitute a partnership between the parties hereto nor constitute any of them the agent of any other.

28. No variation waiver or modification of any of the terms of this Agreement shall be effective unless in writing and signed by or on behalf of the parties hereto.
29. Any notice required by this Agreement to be served on any party hereto shall be well and truly served if posted by prepaid registered post in any post office in Jamaica addressed to the party at the address hereinbefore appearing and any such notice shall be deemed to have been received within seventy-two (72) hours of the time of posting.

IN WITNESS WHEREOF the parties hereto have caused this Agreement to be executed as of the date hereinbefore written.

EXECUTED under the Common Seal)
of THE PORT AUTHORITY by)
Lucien M. Rattray, General)
Manager and H. St. John)
Woodham Secretary)
in the presence of:-)

[Signature]
[Signature]
Secretary

[Signature]

EXECUTED under the Common Seal)
of KINGSTON TERMINAL OPERATORS)
LIMITED in accordance with its)
Articles of Association in the)
presence of:-)

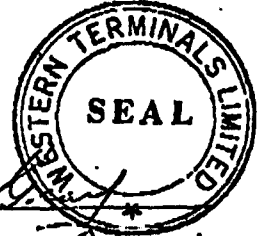
[Signature]
[Signature]
SEAL
KINGSTON TERMINAL OPERATORS LIMITED

[Signature]

EXECUTED under the Common Seal)
of KINGSTON WHARVES LIMITED in)
accordance with its Articles)
of Association in the presence)
of:-)

[Signature]
[Signature]

EXECUTED under the Common Seal)
of WESTERN TERMINALS LIMITED)
in accordance with its)
Articles of Association in the)
presence of:-)



[Signature]
[Signature]

[Signature]

APPENDIX 5.1

TRAFFIC AT TERMINAL (CONTAINERS & VESSELS) FOR 1980-1990

YEAR	TRANSHIPMENT	DOMESTIC	TOTAL	VESSEL CALLS
1980	72,029	23,244	95,273	507
1981	64,288	29,564	93,852	543
1982	50,570	30,777	81,347	506
1983	58,636	31,564	90,200	560
1984	58,888	26,133	85,021	515
1985	103,185	28,180	131,365	618
1986	126,489	34,241	160,730	548
1987	126,117	35,091	161,208	496
1988	66,578	48,195	114,773	530
1989	42,344	51,901	94,245	529
1990	47,512	40,601	88,113	412

Source: Kingston Terminal Operators Ltd

APPENDIX 5.2

KTO BERTH OCCUPANCY FOR PERIOD 1988-1990

MONTH	1990		1989		1988	
	NO. OF VESSELS	TOTAL HRS ALONGSIDE	NO. OF VESSELS	TOTAL HRS ALONGSIDE	NO. OF VESSELS	TOTAL HRS ALONGSIDE
JANUARY	37	321.5	41	430.1	40	696.2
FEBRUARY	34	371.9	38	301.7	37	402.6
MARCH	29	364.6	46	453.3	42	545.9
APRIL	31	380.2	41	412.6	46	475.4
MAY	32	380.3	48	511.3	38	413.5
JUNE	34	341	48	434.6	53	576.7
JULY	31	268.4	46	492	44	387.3
AUGUST	32	396.2	46	406	50	544
SEPTEMBER	28	423.2	39	405	41	400.4
OCTOBER	32	327.7	43	404.5	45	440.1
NOVEMBER	40	627.4	38	387.4	50	747.3
DECEMBER	41	540.9	38	385	41	528.8
TOTAL	401	4743.3	512	5023.5	527	6158.2
AVERAGE		11.83		9.81		11.69

Source: KTO Statistics

APPENDIX 5.3

KTO TURNAROUND TIME (DAYS) FOR OCTOBER - DECEMBER 1989

MONTH	NO. OF SHIPS	TIME
OCTOBER	43	0.53
NOVEMBER	38	0.57
DECEMBER	39	0.57
	120	0.56

SOURCE: TABLE 27, PORT STATISTICS
OF JAMAICA, OCT-DEC '89
PREPARED BY PAJ. JAN, 1990

APPENDIX 5.4

DISTRIBUTION OF MOVES PER GANG HOURS FOR ZIM VESSELS FOR PERIOD 1.01.90 TO 28.02.91

MV/GRS HR	MIDPOINT (X)	FREQ (F)	CUM. F	R. CUM.F%	XF
0 - 2	1	1	1	0.6	1
2 - 4	3	0	1	0.6	0
4 - 6	5	3	4	2.4	15
6 - 8	7	1	5	3.0	7
8 - 10	9	15	20	12.0	135
10 - 12	11	33	53	31.7	363
12 - 14	13	57	110	65.9	741
14 - 16	15	33	143	85.6	495
16 - 18	17	15	158	94.6	255
18 - 20	19	5	163	97.6	95
20 - 22	21	4	167	100.0	84
		167			2191
				AVERAGE	13.11976

Source: KTO productivity report

APPENDIX 5.5

TARIFF	RECIPIENTS OF REVENUE		
	KTO	PAJ	KW/WT
PILOTAGE	-	X	-
TOWAGE	-	X	-
WHARFAGE	-	-	X
CONTAINER HANDLING	X	-	-
RECEIPT & DELIVERY	X	-	-
STORAGE	X	-	-
STRIPPING & STUFFING	X	-	-
MOUNTING & GROUNDING	X	-	-

APPENDIX 5.6

INDICES OF REVENUE, COST & PROFIT PER CONTAINER
(1985 BASE YEAR)

	'85	'86	'87/88	'88/89	'89/90

REVENUE:					
DOMESTIC	100		111		119
TRANSHIPMENT	100		113		119

COST (J\$)	251	307	435	619	742
RATE OF EXCHANGE	4.25	5.5	5.5	5.5	6.5

COST (US\$)	59	56	79	113	114

INDEX	100	95	134	191	194

PROFIT	100	70	55	73	68
=====					

APPENDIX 6.1

COMPONENTS OF A PORT INFORMATION SYSTEM

REQUIRED DATA

DATA SOURCE

1. ENVIRONMENT

1.1 Macro Environment

a) **Economy:** Historical and forecast economic data on regional trading and partners focussing on:

- * GNP
- * Industrial production
- * Inflation
- * Investment & economic activity
- * Foreign trade (Imp & exp)
- * Balance of Payments and debt
- * Exchange rates
- * Political stability
- * International trade agreements

b) **Technology:** Developments which are likely to affect the in-

- * transport modes and ship sizes
- * Port & terminal cargo handling facilities

c) **Legislature:**

- * Government policy regarding imports and exports.
- * Imposition and removal of tariffs or export subsidies etc.

Data can be found in various publications: DRI, World Bank, IMF etc, However, the port can best keep abreast of the economic conditions of the various countries and regions through the local and international press as well as industry trade journals.

Industry journals such as Cargo ware, Containerisation International, Port Development International, etc.

Press and trade journals.

1.2 Port Industry

a) Customers

- | | |
|---|--|
| <ul style="list-style-type: none">* Trends in customer service requirements* Trading patterns and their trading partners over time.* Their share of the total* Level of freight rates for main commodities carried to and from the port on specific routes.* Concerns: costs, service speed and efficiency, etc.* Financial performance. | <p>In addition to sources previously quoted, such publications as PIERS, and Trade Horizons are useful. Also Market surveys.</p> |
|---|--|

b) Competitors: Information on existing and potentially competing ports:

- | | |
|--|--|
| <ul style="list-style-type: none">* Capacity : over or under utilization.* Service quality* Throughput performance and market share* Financial performance* Port development plans* Pricing* Main Customers* Labour relations | <p>See above sources.</p> <p>Containerisation
International Yearbook</p> |
|--|--|

2. PORT DATA.

The UNCTAD manual on Port Statistics outlines the needs and sources of port data and information. It tables each data item of information and this is attached for reference. The table tries to identify or classify information according to the degree of importance. It is recommended that a port setting up an information system, or improving an existing system, might find it useful to work out the essential data and then, as resources permit or needs demand, add first the important data and then the useful.

Classification of port data and information

Main categories of data	Recording			Nature	Frequency of collection
	Essential	Important	Useful		
Port organization	List of individual port operators Description of their functions			Information	Annual
Port facilities					
Berths	Classification by type Depth of water alongside berth Physical description			Information	Annual
Handling equipment	Classification by type Technical characteristics Capacity Age			Information	Annual
Storage equipment	Classification by type Physical description Storage capacity			Information	Annual
Transport equipment for use within the port area	Transport infrastructure (road- rail-inland water) Classification of vehicles by type Technical characteristics Capacity Age			Information	Annual
Navigational aids	Signalling system Pilotage Towage			Information	Annual
Servicing of ships	Facilities for : Bunker supplies Water supplies Repairs and maintenance			Information	Annual
Ship traffic					
Type of ship	Passenger ship Break-bulk general Cargo ships : Liners Tramps Specialized ship Mixed ship			Statistical	Continuous

Size of ship	GRT or NRT DWT Length	Draught	Beam	Statistical	Continuous or sam- pling
Type of operation	Loading Discharging Loading and discharging Bunkering Repairs, maintenance Other purposes			Statistical	Continuous
Origin and destination of ship		By country of origin and destination	By port of origin and destination	Statistical	Continuous or sam- pling
Flag of the ship			Flag	Statistical	Continuous
Port operations Turn-around time of ship	Times of : Arrival Berthing Departure			Statistical	Continuous
		Times of : Pilot on board Start handling Handling stoppage etc.		Statistical	Continuous or sam- pling
		Record of ship delay by main causes			
Services and facilities provided by the port	Successive berths allocated to each ship Handling and transport equip- ment for each working period Amount of cargo loaded and discharged during each work- ing period	Pilot and craft at each movement No. of tugs at each movement		Statistical	Continuous or sam- pling
Goods in storage		For each unit of storage : Goods received from ships Goods dispatched to hinterland Goods received from hinterlands Goods dispatched to ships		Statistical	Continuous or sam- pling
Supplies to ship		Types and tonnages of bunker Tonnages of water		Statistical	Continuous
Accidents		Accidents to ships Damage to cargoes		Information	Continuous

Classification of port data and information (continued)

<i>Main categories of data</i>	<i>Recording</i>			<i>Nature</i>	<i>Frequency of collection</i>
	<i>Essential</i>	<i>Important</i>	<i>Useful</i>		
<i>Port labour</i>	For the whole port : No. of supervisory staff No. of clerical staff No. of permanent dock-workers Average number of casual workers		Classification by age	Information	Weekly or monthly
	At each working period (normal-overtime-holidays) : Number of supervisory staff Number of clerical staff Number of permanent dock-workers Number of casual workers	The same breakdown by ship	Record of absences by cause	Statistical	Continuous
<i>Cargo flows</i>					
Type of traffic	Goods discharged Goods loaded Goods trans-shipped Types of traffic : Foreign Domestic Transit Entrepôt	Ocean traffic Near-sea traffic		Statistical	Continuous
Commodities	Amount of cargo in each class of the port commodity classification			Statistical	Continuous
Type of packaging	Amount of cargo in each type of packaging			Statistical	Continuous
Size of shipment		Number of individual shipments in each class size		Statistical	Sampling
Type of operation		Transfer from ships to inland transport and vice versa for inward and outward traffic Direct Through port storage Through lighter Through lighter and storage		Statistical	Continuous or sampling

APPENDIX 6.2

MARKET RESEARCH AS A TOOL IN PORT MARKETING

Having considered the general factors determining a port's traffic, there is a need to take steps to obtain relevant information about cargo movements to or from some particular region. In this respect market research will be geared at obtaining information from cargo interests.

Sometimes the necessary information can be obtained by INTERVIEWS, without a prior postal survey. However, this is only likely to be possible when relatively few companies are involved. Otherwise, there may be scope for a POSTAL QUESTIONNAIRE. Consideration will need to be given to the likelihood of a response. There will therefore be a need for follow-up calls and marketing meetings as relevant with appropriate companies/persons as identified by the postal survey.

USES OF MARKET RESEARCH

This research technique is useful in:

- a) Pinpointing potentially available traffics : moving in worthwhile volumes.
- b) Providing information for actual marketing meetings with potential port users (For example, about inland cargo origin and destination).
- c) The information so gathered is useful not only to ports but to the shipping lines. Therefore with the prior permission of the companies concerned, this information can be copied to a shipowner serving the port: enabling him to market his shipping service - and the use of the port - to cargo interests.

POSTAL SURVEYS - SOME PRACTICAL ASPECTS

1. Carefully identify information needed - keeping it to a minimum in terms of the work it imposes on the person completing the questionnaire.

2. Check the draft questionnaire questions on someone who knows about the trade. This prevents irrelevant and confusing questions.
3. Time allowing, do a small 'pilot' survey with the questionnaire before launching the full survey.
4. Length - not more than four sides. Ideally on a single sheet folded to give four sides.
5. Draft a very careful letter to explain why the information is desired. Also explain why it is in the interest of the company to reply (such as to enable the port to meet user needs as well as possible, etc). The confidentiality with which the information will be treated must also be stated.

If it is desired that a market survey should help a shipowner canvass traffic for his ships/your port, do mention that the information will be given to the shipowner as well. This will in fact give an excellent opportunity to use the letter - composed jointly with the shipowner - to give details of his service or proposed service.

6. It is important to write and thank all companies who completed the questionnaires, whether or not they show that they are involved in the market being surveyed. It might also be useful to produce and send them a copy of a simplified version of a report on the survey (excluding all commercial information) in appreciation for their help. This helps to provide marketing contact and can improve the response rate in future surveys.
7. On the questionnaire, ask the person completing it to
 - write in their
 - * Name
 - * Telephone number
 - * Function
 - indicate 'YES' or 'NO' - to whether they are involved in the market (commodity or trade) being surveyed, otherwise, companies not shipping will not

reply and there will not be any indication of how good the response rate is or to whom a reminder letter and or questionnaire should be sent.

8. After a few weeks, send a reminder letter/questionnaire to those who have not replied.

9. On the questionnaire, typical questions can include:

- Tonnages: specifying weight of cargo sent to whatever destinations the information is required on; by main commodities or specific commodities.

- Cargo origins

- Whether and how packaged: Container, pallets, break-bulk and so on.

- If any big changes are expected in future cargo volumes, origins and destinations or packaging. The latter may indicate need for additional port services such as cargo consolidation.

- Terms of shipment (fob or cif etc.)

- Who controls shipments and port routings. It may also be worthwhile asking a general question as to the broad reason for choice of port. This may be done by asking respondents to tick boxes on the questionnaire as to the most important reasons.

- A last question could be one asking for any comments the company may wish to make.

Source: Extracted from E. Pollock's Lecture on Port Marketing.
August, 1991.

APPENDIX 6.3

Common Tariff Categories

- Conservancy - A fixed fee for access to the port and use of the aids to navigation. This charge is based on the characteristics of the vessel. It is sometimes called Light Dues, Harbor Rates or Channel Dues.
- Port Dues - A fixed fee for general use of the port facilities. This charge is based on the characteristics of the vessel. It is sometimes referred to as a Harbor Dues.
- Pilotage - A unit, movement or time-related charge for piloting the vessel in and out of the port. This charge is based on the characteristics of the vessel.
- Tug Hire - A unit, movement or time-related charge for towing the ship to and from the berth as well as for moving the vessel within the port. This charge is based on the characteristics of the vessel or the tugboat. It is sometimes referred to as Towage or Tug Services.
- Mooring/ - A fixed fee for tying up and releasing vessels at anchorage or at the
Unmooring the wharf. This charge is sometimes based on the characteristics of the vessel. It may be referred to as Anchorage or Dolphin Rates if the vessels is at anchorage and as Berthing Fee or Line Handling if the vessel is at the wharf.
- Berth Hire - A time-related charge for staying alongside the berth. This charge is based on the characteristics of the vessel as well as the length of stay. It is sometime referred to Berthage, Berth Rent, Quay Dues, Dockage, Wharf Rates or Berth Occupancy.
- Stevedorage - A unit or time-related charge for transferring the cargo between the wharf and the vessel. This charge is based on the characteristics of the carg as well as the period of time the labor is employed. It is also referred to as Cargo Handling, Labor Hire, Discharging or Loading.
- Wharfage - A unit charge levied against all cargo moved across the wharf or handled in the port. This charge is based on the characteristics of the cargo. It is sometimes referred to as the General Charge or the Berth Fee.

Wharf - Handling	A unit charge for moving the cargo between wharf and storage. This charge is based on the characteristics of the cargo. It is sometimes referred to as Cargo Handling or Labor Hire.
Storage -	A time-related charge for storing the cargo in open, covered, or enclosed areas. This charge is based on the characteristics of the cargo and the type of storage.
Equipment - Hire	A time-related charge for the use of port equipment by the stevedoring companies or the consignee/shipper. This charge is based on the type of equipment used. Where cranes are used, this charge may be referred to as Cranage or crane hire. For other equipment terms such as Forklift Hire, Straddle Hire or Plant Hire may be used.
Packing/ - Unpacking	A unit charge for changing the form in which the cargo is being shipped. This charge depends on the type of cargo and the form in which it is to be changed. Depending on the form of the cargo, this charge may be referred to as a Depot, CFS, Consolidation/-Deconsolidation, or Stuffing/Stripping Charge.
Delivery/ - Receipt	A unit charge for moving the cargo between storage and land transport vehicles (road or rail) or directly between the vessel and land transport vehicles. This charge is based on the characteristics of the cargo and the mode of land transport.

Source : ESCAP and UNCTAD reports, individual port tariffs

APPENDIX 7.1

CLASSIFICATION FOR A PORT FACT BASE

1. THROUGHPUT

- TREND: - Statistical performance and rate of growth
- Breakdown by type and mix :
commodity; import and export; domestic and transshipment; FCL & LCL; empties and loaded
- MARKET: - Sources of transshipment and domestic traffic
CUSTOMERS- Shipping lines' throughput contribution and mix;
- Cargo interests' " "
- Throughput by sources/destinations
- Profit contribution in terms of : Customers; transshipment and domestic traffic.

2. MARKET

- State of the transshipment and domestic container market:
growth rates
total market size
KTO's share of the market
is KTO's share of the market increasing or decreasing
- Markets where KTO is losing ground and why
- where is the Terminal doing well and where is the performance poor
- trends in the market: productivity, port routing, services offered and technology

3. TRENDS IN- MACRO - ENVIRONMENT

- Trade patterns
- global, regional and national economic growth
government regulations
- trading agreements

4. SERVICE -

- All facts about the Terminal's services:
Productivity
Crane and Equipment performance
Labour performance

Quality and reliability assessment

Price of port services

Identification of additional services which will complement existing range and increase customer satisfaction.

5. COMPETITION- Identification of all major competitors
Strengths and weaknesses
Market share (trends)
Future plans
Pricing
Capacity

6. CUSTOMER - What do customers regard highly of KTO's
ATTITUDE services and what they do not.

APPENDIX 7.2

GUIDELINES IN IDENTIFYING PROBLEMS AND OPPORTUNITIES

PROBLEMS

1. Look for deviation from anticipated results:
 - less market share than anticipated
 - fewer customers or a narrow customer base
 - declining market share
 - loss of customers
 - lower throughput or profit versus increased costs.
2. Look for any deterrent to smooth Terminal operational performance such as:
 - lack of personnel
 - poor equipment performance
 - inadequate service facilities, such as: shortage of equipment and stacking area
 - unfavourable government regulations (customs or port investment)
3. Look at any obstacles standing in the way of achieving performance goals such as
 - shortage of spare parts
 - low service quality
 - pricing levels
 - labour relations
 - customer dissatisfaction
 - low awareness in market of port facilities.

OPPORTUNITIES

Opportunities are often presented disguised as problems, therefore a review of the statement of problems and the fact base can turn up opportunities associated with:

- geographical location
- service advantage
- emerging technology
- resource advantage
- changing customer needs
- improvement in service facilities.

It needs to be identified whether unfavourable trends are being experienced by the Terminal only, or is it part of a wider industry problem. Thus the reason for the observed trend is important. A distinction has also to be made between solvable and unsolvable problems. In the case of the former, if its profitable for the port to attempt a solution. Thus a statement of problems and opportunities must be compiled.

APPENDIX 7.3

GUIDELINES IN THE STATEMENT OF PORT OBJECTIVES

State where relevant, assumptions underpinning the objectives. These assumptions must describe management's estimate of important developments or environmental conditions beyond the port's control which cannot be accurately predicted, but which must be considered when carrying out the plan.

Assumptions in a port context could be related to:

- changes in the national, regional and global economic conditions
- inflation rate
- status of major competition
- availability of financing and rate of interest
- availability of spare parts
- currency fluctuation
- changes in patterns and direction of cargo flows
- industry over or under capacity
- economic well-being of major customers and trading partners
- impact of major innovations or expected developments
- anticipated industry growth pattern and rate
- company capabilities
- government regulations
- labour environment

It is useful to categorize these assumptions according to the areas described under competitive forces in chapter 6. Namely, Macro Economic, Industry and Company related assumptions.

APPENDIX 7.4

GUIDELINES IN STRATEGY DEVELOPMENT AND IMPLEMENTATION

1. Each action program outlined must start by first restating the specific objective it is aimed at achieving.
2. Strategy must assign for each specific area of activity:
 - responsibility
 - deadlines
 - priorities
 - resources
3. For effective implementation, strategies
 - need to be communicated to those involved in their achievement. For example, Operations and Maintenance departments.
 - require motivation to encourage follow through, both at the managerial and staff level.
 - need to be coordinated with other port functions and therefore must be compatible with and can be integrated into other functions. It is useful and desirable to summarize in the marketing plan, the major port activities which affect its achievement, even though the responsibility for so carrying out, is outside that of the marketing department.
 - must be based on the company's strengths, limitations and assumptions about the future, if they are to be viable action plans.

APPENDIX 7.5

CONSIDERATIONS IN DEVISING THE MARKETING BUDGET

While strategies propose the plan of attack, the marketing budget specifies how much the various activities will cost. The first step in formulating the budget is to isolate the marketing department's area of responsibility. This may be seen as the activities relevant to securing and maintaining patronage of the port. Thus the relevant cost areas will be:

- a) Customer relations
- b) Advertising, and,
- c) Promotion, including incentives and rebates

Budgetary cost estimates must be assigned to the individual marketing action plans. This implies good knowledge of the cost of the various activities. This costs includes not only data on the external activities themselves, but also on personnel costs. The marketing budget is therefore synonymous with marketing department budget.

Costs can be projected based on historical and current data from the accounting department, advertising agencies personnel department etc.

Each major budget figure must have a supporting statement to justify the allocation in terms of the goals of the activities and how necessary they are to the overall port performance.

ALTERNATIVE METHODS OF ESTABLISHING BUDGETS

There are essentially three methods of establishing budgets:

1. **Mechanical method:** This method is so called, because it involves no input from members of staff in its development, but is formulated by management and handed down. While it is simplest to establish, the fact that it is often created in isolation, means that the interests and concerns at the various levels might not have adequately been considered. This will lead to lack of identification with and understanding of the

budget, translating in reduced enthusiasm for its success.

2. The bottoms up method. This is more popular than the previous method, and is essentially a compilation of the master budget based on estimates and plans of various department managers. This ensures that the interests and concerns of the various organizational sub-units are considered. However, a possible problem is that plans of individual departments may be incompatible both with other departments and the organization as whole. Thus some coordinating force is necessary to prevent conflict.

3. The Cooperative method. This takes into consideration the shortcomings of the two previous approaches. It involves three phases:

a) Top management sends down a loose estimate (based on port objectives) as a planning guideline for allocation of marketing funds.

b) Marketing planners develop their strategies within those general guidelines, but with freedom to recommend exceptions, backed up by full details justifying all requests.

c) Top management fully reviews the marketing plans - which calls for a detailed marketing budget - and decide on a final approved figure.

While the merits of this method are obvious, the process is time consuming and implies a high level of communication. It can however be most effective.

APPENDIX 7.6

GUIDELINES IN FORECASTING PORT TRAFFIC

The final step in the preparation of the marketing plan is to project the traffic level, costs and profit that the marketing strategy is intended to achieve. Forecasts of traffic should be broken down into categories to enable review against actual performance so as to pinpoint problems or opportunities which may be causing the variance.

Useful classifications for the projection of port traffic could be: transshipment and domestic, by

- (i) commodity type
- (ii) geographic region
- (iii) carriers or
- (iv) services, such as storage and distribution.

These can also be used as profit centres and so establish the profitability of the different cargoes and services to the port. Here there will be the need for a sound basis of fixed cost assignment.

A forecast is rarely absolutely accurate, since it represents an attempt to estimate likely future events and thus involves uncertainty. It is usual therefore, to qualify forecasts. The finished forecast should be supported by a description of the underpinning assumptions and their effect. The method of preparing the forecast should also be described.

Forecasting methods can be divided into two major categories: Objective methods, comprising various statistical approaches, and subjective methods, based on surveys and opinions. The statistical approach includes methods such as moving averages, exponential smoothing and correlation, while subjective methods employ surveys of user and expert opinions. A more accurate forecast for ports might be obtained by using a combination of the two approaches.

METHODOLOGY FOR FORECASTING CONTAINER TRAFFIC FOR KINGSTON.

The methodology first utilizes forecasts of trends in world trade and expected changes in commodity flows through the Caribbean. These are determined by factors such as:

- economic activity in individual nations that gives rise to international trade.
- changing industrial base of many nations
- currency restrictions
- protectionism
- debt crisis.

Based on these, a forecast of cargo flows to and from specific areas which make up Kingston's transshipment market can be made. The procedures for carrying out the above analyses are outlined below.

Step 1

Utilizing both qualitative judgement and quantitative evaluations, a generic view of world trade patterns, shipping patterns, cargo types and vessel itineraries of the major carriers that ship through the Caribbean basin must be developed.

A decision as to the appropriate basis to be used to make the forecast must also be made. That is, commodities or trade routes? Here for transshipment at KTO, the appropriate basis would be general cargo. General cargo can be derived by taking all commodities traded (based on UN trade statistics) and deduct liquid and dry bulk and other non-containerisable cargoes. This gives the maximum cargo that can be containerized. The analysis should concentrate on trade (import & export) between specific regions in the world and countries in the region, rather than trade routes.

Step 2

To forecast import and export trade flows through the Caribbean Basin, there may be the need to divide the world into trading blocs. This division can be based on considerations such as historical trading relationships, participation of regions in international trade, distance from Kingston and types of products the region might trade. Consideration should also be given to the prospects of these countries shipping any significant volume of general cargo through the Caribbean.

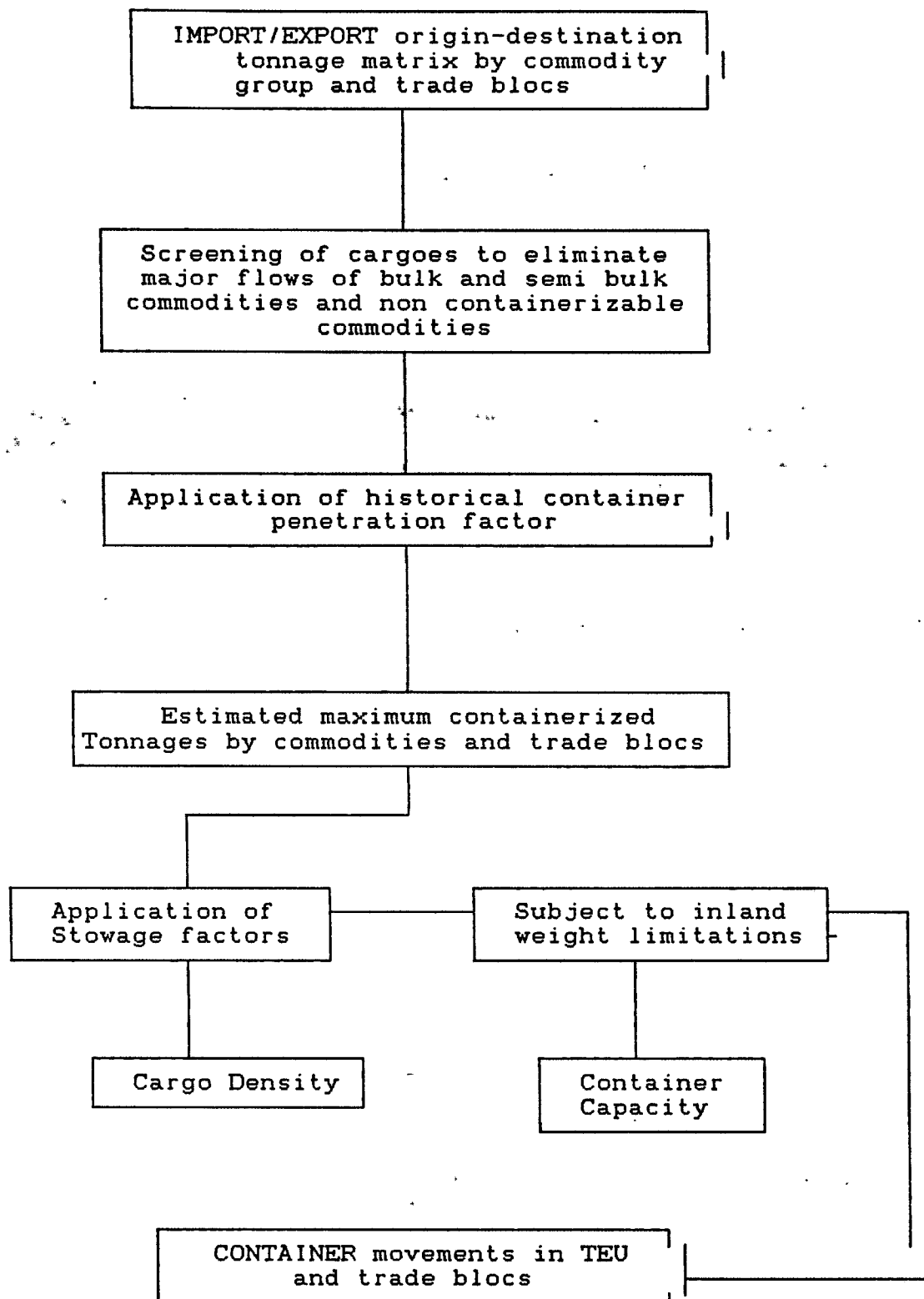
Step 3

The next step is to identify the countries that will most heavily influence future general cargo trade volumes for each region. These 'indicator nations' can then be used to forecast import and export for each of the regions, instead of it being derived based on a country by country forecast. The decision to use indicator nations will of course depend on the degree of accuracy required.

Step 4

The next task is to convert the projected trade flows to container flows. For this it is necessary to combine two data sources in order to gauge the degree of container penetration: General cargo trade based on the UN statistics with the container movements in the region provided from Containerisation International Yearbook. Based on the container flow as against the total general cargo trade for a specific period (historical), the present level of container penetration can be calculated. This rate can then be applied to the projected general cargo trade flows (on a commodity basis) to get future containerized trade flow.

To convert containerized trade flows to actual number of TEUs requires the application of the various cargo stowage factors, and where applicable, any existing regulations on container weight limits. The process just described is summarized in the flow diagram below:



Source: Adapted from

- (1) Container Ships & Shipping by Roy Pearson. Fairplay Publications Ltd, 1988. page 46.
- (2) Kingston Port Development Study, Chapter II

The attached table also gives typical cargo stowage factors.

Typical Cargo Stowage Factors

Commodity	Tonnes per cubic metre	Box length (ft)	20' container 18 tonnes 30 cbm	40' container 24 tonnes 66 cbm
Copper ingots	3.3	20	weight out space util. 18%	weight out space util. 11%
Zinc ingots	2.5	20	weight out space util. 24%	weight out space util. 15%
Pressed wool bales	2.0	20	weight out space util. 30%	weight out space util. 18%
Nuts and bolts	1.7	20	weight out space util. 35%	weight out space util. 21%
Molasses (in bulk)	1.4	20	weight out space util. 43%	weight out space util. 26%
Nails	1.4	20	weight out space util. 43%	weight out space util. 26%
Copper coils	1.1	20	weight out space util. 55%	weight out space util. 33%
Cement (bagged)	1.0	20	weight out space util. 60%	weight out space util. 36%
Cars (in KD form)	1.0	20	weight out space util. 60%	weight out space util. 36%
Plate glass	1.0	20	weight out space util. 60%	weight out space util. 36%
Salt (in bulk)	1.0	20	weight out space util. 60%	weight out space util. 36%
Iron & Steel scrap	1.0	20	weight out space util. 60%	weight out space util. 36%
Hardwoods	0.91	20	weight out space util. 66%	weight out space util. 40%
Timber	0.8	20	weight out space util. 75%	weight out space util. 45%
Coal (high grade)	0.71	20	weight out space util. 85%	weight out space util. 51%
Sugar	0.71	20	weight out space util. 85%	weight out space util. 51%
Cheese	0.71	20	weight out space util. 85%	weight out space util. 51%
Potatoes	0.63	20	weight out space util. 95%	weight out space util. 58%
Condensed Milk	0.59	20	weight out space util. 98%	weight out space util. 62%
Bacon	0.59	20	weight out space util. 98%	weight out space util. 62%
Woodpulp	0.59	20	weight out space util. 98%	weight out space util. 62%
Veg oil (in drums)	0.56	20	weight out space util. 93%	weight out space util. 65%
Coffee (bagged)	0.56	20	weight out space util. 93%	weight out space util. 65%
Rubber (bales)	0.53	20	weight out space util. 88%	weight out space util. 69%
Textile products	0.14	40	weight out space util. 23%	weight out space util. 39%
Furniture	0.14	40	weight out space util. 23%	weight out space util. 39%
Domestic elec gds	0.12	40	weight out space util. 20%	weight out space util. 33%
Fibreglass	0.03	40	weight out space util. 5%	weight out space util. 8%

APPENDIX 7.7
COMPARATIVE DISTANCES IN NAUTICAL MILES
FROM KINGSTON & CRISTOBAL TO SELECTED PORTS

COUNTRY/PORT	KINGSTON	CRISTOBAL
CENTRAL AMERICA		
Mexico: Tampico	1263	1473
Belize	696	798
Honduras: Puerto Cortes	671	714
Guatemala: Puerto Barrios	732	824
Costa Rica: Limon/Moin	616	279
Panama: Cristobal	555	
CARIBBEAN		
Curacao	586	766
Aruba	529	632
Cuba: Havana	743	990
Haiti: Port-au-Prince	278	863
Dom. Republic: Santo Domingo	428	891
Puerto Rico: Ponce	597	1080
San Juan	635	1082
Antigua: St. John	867	1390
Guadeloupe: Point-A-Pitre	912	1440
Dominica: Roseau	912	1145
Trinidad & Tobago: Port of Spain	999	1248
St. Lucia: Port of Castries	952	1320
Barbados: Bridgetown	1045	1440
SOUTH AMERICA		
Columbia: Cartagena	483	370
Barranquilla	444	340
Santa Marta	438	360
Venezuela: Puerto Cabello	690	788
Maracaibo	582	676
La Guaira	730	930
Brazil: Belem	2170	2316
Recife	3027	3173
Manaus	2836	2982
Fortaleza	2628	2775
Guyana: Georgetown	1326	1550
US EAST COAST		
Charleston	1060	1560
Jacksonville	1012	1505
Miami	747	1200
New York/New Jersey	1472	1972
Port Everglades	763	1217
New Orleans	1155	1403

Source: World Wide Distance Tables
BP Tanker Company Ltd., London, 1976. Vol 1

APPENDIX 7.8

DAILY DEMAND FOR KTO'S SERVICES Based on KTO's Productivity Report (Total Vessel Call Per Line) For period 1.1.90 - 31.12.90

LINES	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
COLUMBUS	1	3	2	1		4	1
CAROL	14	12	8	9	10	9	6
WISCO	2	1	1		1	1	
SEALAND	1	2	25	26	1	3	
ZIM	26	20	15	24	24	20	16
EVERGREEN	5	6	7	5	9	3	2
SCOTT	6		3	1	2		
CALYPSO	4	3	1	2			
LIBRA	1						1
NEDLLOYD	1						1
JAM. PRODUCERS	3	3	1		1		
BLUE CARIBE	1		1	1			
N. Amer. CARIB	5	6	3	1	4	5	3
GOMEZ SHIPPING	4	2	1	3	6	1	
CAVN LINE				1			
ARAWAK		6		1			
CARAT		1		1			
	74	65	68	76	58	46	30

MONTHLY DEMAND FOR KTO'S SERVICES Based on KTO's Productivity Report (Total Vessel Call Per Line) For period 1.1.90 - 31.12.90

LINES	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
COLUMBUS	1	1		1	1	1	1	1		2	1	1
CAROL	6	3	5	6	6	6	6	6	5	5	8	6
WISCO											3	3
SEALAND	8	7	4	4	5	4	4	5	3	6	4	4
ZIM	12	11	14	12	13	12	10	12	10	12	14	11
EVERGREEN	3	4	2	3	1	4	3	4	4	3	5	1
SCOTT	3	4	2									1
CALYPSO	3	2	1	2	1	1						
LIBRA		1										
NEDLLOYD	1					1						
JAM. PRODUCERS			1							1	2	4
BLUE CARIBE		1			1						1	
N. Amer. CARIB				3	4	4	4	3	4	2	3	
GOMEZ SHIPPING						1	2	1	2	3	5	3
CAVN LINE											1	
ARAWAK												1
CARAT												1
	37	34	29	31	32	34	30	32	28	34	47	36

Source: KTO Productivity Report for period 1.1.90 to 31.12.90