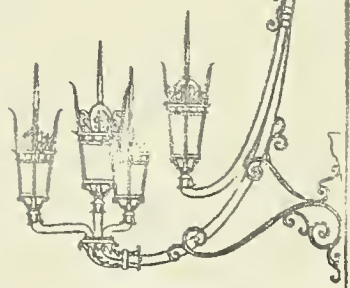


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THE PORT OF BOSTON: A MARITIME STRATEGY


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THE PORT OF BOSTON: A MARITIME STRATEGY

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Massachusetts Port Authority
99 High Street
Boston, Massachusetts 02110
(617) 482-2930

I. INTRODUCTION

Massport's Role

The Massachusetts Port Authority, a quasi-governmental Authority supported entirely by revenues from its own facilities, was created by act of the Massachusetts legislature in 1956. The mandate given at its creation was to modernize and revitalize two commercial transportation facilities critical to commerce in New England: Logan Airport and the public terminals of the Port of Boston. The Authority is responsible for the planning, development, operations, and maintenance of the original Port properties and additional properties acquired by lease or purchase since 1956.

In the twenty-five years since 1956 the maritime industry has undergone dramatic technological change in the handling of general cargo: from traditional labor intensive handling of break-bulk cargo at finger piers and waterfront cargo sheds to highly mechanized handling of containerized cargo across modern wharves supported by open storage yards.

This revolution in cargo handling has had enormous impact on the operations and facilities of all U.S. ports. Ports have been required to adjust labor arrangements, construct costly new container terminals and grapple with the redevelopment of finger piers physically unsuited for container cargo handling.

The industry changes resulted in shifts in Boston's maritime trade and changes in its waterfront development and usage patterns.

In 1960 the Port handled general cargo at seven breakbulk piers. In 1980, although tonnage through the Port has increased, only one of these piers continues as an active general cargo terminal. The remaining piers, technologically obsolete, have been replaced by modern port facilities at a cost of more than \$75 million to the Port Authority.

Since 1976 Massport has made development of its port properties a major priority. Recognizing the changing requirements of the maritime industry, Massport has developed a two-pronged strategy for its waterfront properties. This strategy can be briefly summarized as follows:

- 1) to promote commerce in the region by developing modern port facilities with capacity to meet the growing needs of the regional economy;
- 2) to return to economically productive uses those waterfront properties which have fallen into disuse and disrepair as a result of market and technology trends.

Goals and Objectives

Massport's maritime mission can be stated as follows:

1) To develop maritime related cargo facilities and to ensure that they are operated in a viable manner, ensuring the ability to handle the demands of export/import cargoes generated by the economies of the City of Boston, the Commonwealth of Massachusetts and the New England region.

2) To provide the marketing capability and expertise required to attract additional, regularly scheduled direct vessel calls to meet existing and future cargo demands on all major world maritime trading routes.

3) This mission must be constrained by the need to generate sufficient revenues from maritime activities to avoid operating deficits and to increase contribution to overhead costs. While the Authority is prepared to invest maintenance funds necessary to sustain operations, it will require market-based justification for major capital improvements.

As with all Massport facilities, terminals must be developed and operated so as to minimize adverse impacts on adjacent communities and the natural environment.

Five major policy objectives will guide port development decisions. They can be summarized by the following statements:

(1) Development: Development of container handling facilities will be given priority as necessary to meet the need of the New England economy for "load center" container terminal services and supporting port infrastructure. Expansion of container and other port facilities will be undertaken incrementally as justified by market demand from new (or expanding) carrier service. Construction design and environmental permitting will be undertaken in anticipation of demand to achieve a balance between time and cost in future port development.

(2) Management: Massport will redirect the focus of its maritime activities from terminal operation to facility development and targeted marketing.

(3) Financial: Massport's historic operating assumption of maritime facilities as "loss leaders" subsidizing the regional economy will be replaced by a requirement that terminal rates be set to recover operating and capital costs and to make increasing contributions to overhead. Future terminals will only be developed if the labor situation can be improved to allow competitive rates and a financially sound position for the Authority.

(4) Marketing: Massport will aggressively market the Port of Boston to carriers providing service on trade routes not now directly served from Boston. The new port terminals at Conley Terminal and the Naval Annex will be used to attract these new carriers to Boston as well as to strengthen important existing carriers.

(5) Waterfront Revitalization: Plans will be developed to return waterfront facilities, obsolete for cargo handling, to economically productive uses. In all cases the development will produce revenues sufficient to cover operating, capital, and overhead costs and to reduce the overhead borne by cargo handling facilities.

Based on these goals and objectives, the key questions addressed by the Maritime Strategy Project were:

- . Do New England shippers need additional port service and capacity and will they benefit from it?
- . Can Massport afford to meet the demand, or will increased cargo volume simply increase the port's deficit?
- . If expansion will result in increased deficits can these deficits be justified by the economic benefit to the city, state and region?

As a result of Booz Allen's analysis of the New England market, competitive ports, and the costs to carriers of serving Boston, the Authority is in a better position to answer these questions than a year ago. Booz Allen's market conclusions are, on balance, positive. Clear opportunities for growth have been identified. However obstacles to the port's growth exist, some beyond Boston's control.

Summary of Findings

- . Boston is New England's major port and the only port in the region providing a full range of container handling services.
- . In 1979 approximately 1.8 million tons of maritime general cargo was shipped in or out of New England. More than 90% of this cargo was containerized. The market is highly concentrated; 76% originates or terminates within 55 miles of Boston. (Report 1)
- . 43% of this tonnage was handled at the Port of Boston; 31% through New York and the remainder through west coast, Canadian or smaller New England ports. (Report 1)

- . Boston's location guarantees that the port will always face stiff competition for service and cargo from New York, west coast and Canadian ports. Within New England, Providence, Portland and Portsmouth are all planning to profit from Boston's operational and labor problems to capture a portion of the New England market. (Report 1)
- . New England's cargo is traded primarily with countries in North Europe (50%) and the Far East (23%). (Report 1)
- . In 1979 the operations of Boston's public terminals contributed more than \$425 million to the regional economy. Containerized cargo is the cargo resulting in the highest direct economic impact per acre utilized: \$1.6 million per acre.
- . The major beneficiaries of activity at the Port of Boston are the more than 3600 individuals and 170 firms which provide services at the Port. Their port related revenue is more than \$155 million a year. Public terminals account for 60% of these activities. Secondary benefits flow to Massachusetts and New England shippers and consignees. (Report 4)
- . Surveys of New England shippers, review of port tariffs and analysis of present shipping patterns indicate that New England shippers recognize more than \$22 million in annual savings by shipping through Boston and that the key to increased market share through Boston is increased direct carrier service. (Reports 3 & 7)
- . Low labor productivity, high labor costs and the ILA's general unwillingness to participate in port growth are the greatest barriers to increased carrier service. Boston's labor is 40% less productive and its labor-based terminal handling charge 25% higher than competitive ports. (Report 9)
- . The high costs and heavy use of Moran Terminal have made carriers reluctant to initiate new service through Boston despite their interest in carrying New England's high value cargo. (Report 5)
- . New England's general cargo is forecast to grow 5.5% annually in the next twenty years. Maintaining only its present market share, Boston's tonnage would exceed two million tons by the end of this century. (Report 2)

- . To meet this demand, Boston will be required to expand container handling capacity at Conley Terminal through the 1980's and build additional capacity at the Massport Marine Terminal in the 1990's. Increased market share may require accelerated investment.(Report 10)
- . The container capacity added by the new Berth at Conley provides an opportunity to attract new and expanded carrier service to Boston. Massport's primary marketing effort will therefore focus on the ocean carrier market. New service will attract increased cargo volumes and bring new jobs and revenues to the waterfront. (Report 5)
- . Analysis of other ports indicates a strong correlation between a port's financial performance and its distance from direct terminal operations, particularly labor negotiations. In the future Massport will enter into lease or terminal operating agreements with private operators wherever possible. (Report 11)
- . Booz Allen cautions that a leasing policy may be difficult to implement in Boston and suggests formation of a non-profit corporation to operate Boston's public terminals. (Report 11)
- . Port development in the 1980's will focus on incremental expansion of container handling capacity at Conley Terminal to meet market demand and development of the new Massport Marine Terminal Complex in South Boston for bulk and break-bulk cargo.
- . In the 1990's the 46 acre Massport Marine Terminal, now under development at the former South Boston Naval Annex, will be converted as required to meet market demand for container handling, doubling the container capacity of the Port of Boston.

A viable port requires cargo, facilities, and service. Boston has both the cargo potential and the facilities. Competitive rates and labor moderation are keys to attracting new and expanded service. The cooperation of the port, business, and residential communities is essential to attracting new service, recapturing Boston's market, and realizing the potential of the port's new and developing terminal facilities and their benefit to the city and region.

II. THE ROLE OF THE PORT AND BENEFITS TO THE REGION

The Port of Boston is New England's major seaport providing all the services shippers expect for fast and efficient cargo handling. A source of jobs and commerce for the entire region, more than 25 million tons of cargo, worth nearly \$7 billion, are handled annually in the Port.

In a national context Boston ranks twelfth in terms of containerized tonnage and 25th in terms of total foreign trade general cargo tonnage. (8-1 and 8-2)*

The Port of Boston, with its natural deep-water harbor, 40 foot deep channels, and modern terminal facilities, is able to accommodate the world's most modern shipping vessels. Boston is served by 24 steamship lines, providing frequent regularly scheduled service to 175 worldwide ports.

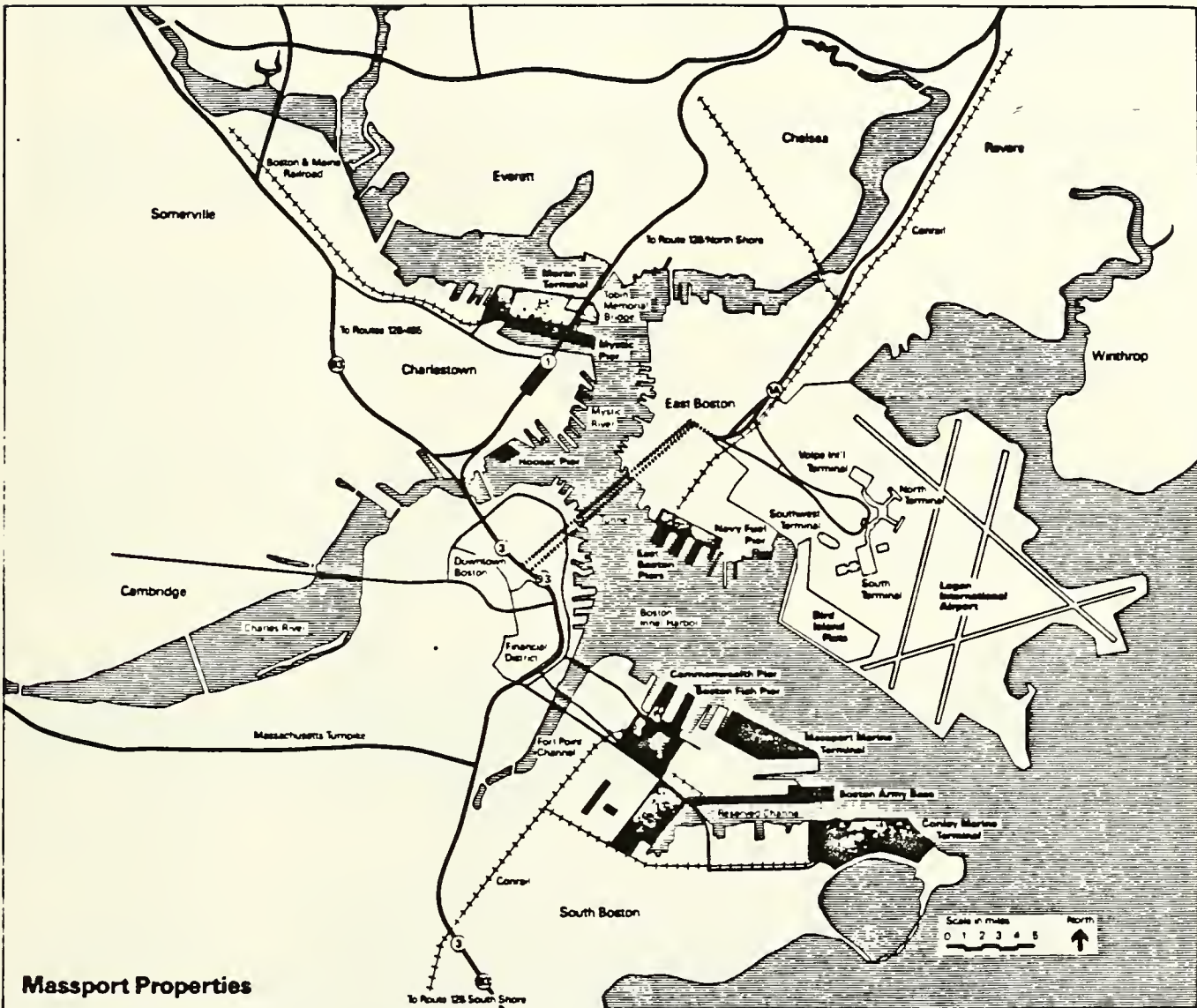
Two railroads - the Boston and Maine, and Conrail - and an easily reached interstate highway network link the seaport to all parts of New England as well as to the Mid-Atlantic, the Midwest, and eastern Canada.

Private facilities in the Port of Boston include a variety of terminals, piers, berths, and shipyards located in the city of Boston and in the neighboring communities of Chelsea, Everett, Quincy, Revere, and Winthrop. Bulk commodities including petroleum, scrap metal, sugar, and gypsum are handled by private terminal facilities.

The Port's major public general cargo terminals, Moran Terminal, Paul Conley Marine Terminal and the Massport Marine Terminal complex in South Boston, are owned and operated by the Massachusetts Port Authority (Massport). Massport's public terminals handle general cargos such as lumber, automobiles, and high value containerized goods including machinery, computer components, photographic equipment, paper products, and consumer goods.

Massport has focused on the development of container handling facilities for the past ten years because 90% of the general cargo moving through the Port of Boston is containerized. Only certain port properties are suitable for handling containerized cargo because of the need for marginal berthing, large dockside cranes, and large expanses of open area near the berth needed for storage of containers. The industry standard for container terminals recommends a facility of at least 50 open acres behind a 1000 foot marginal wharf served by two container cranes.

*Numbers in parentheses throughout this report refer to individual Booz Allen working papers completed as part of Massport's Maritime Strategy Project during 1980 and 1981.



Of the original Port Properties conveyed to Massport in 1956 --- Hoosac Pier, Mystic Pier, East Boston Piers 1-5, Commonwealth Pier and Conley Terminal --- only Conley Terminal meets these optimum criteria. Recognizing the physical limitations of the original Port properties, Massport has acquired property more suitable for container terminal development. Land in Charlestown was acquired for the development of Moran Terminal in the late 1960's and in 1979 the Authority signed a long term lease for development of a marine terminal at the former South Boston Naval Annex.

The role of Massport is to serve as a catalyst for economic growth for the region by providing modern port facilities for the intermodal transfer of New England export and import cargo between land and water carriers.

Economic Benefits of the Port's Public Terminals

In 1979 the operations of Boston's public port terminals contributed more than \$425 million to the regional economy. These economic benefits can be divided into three categories:

First, shipment of export and import cargo through Boston's port facilities directly creates jobs on the waterfront and generates revenues for local firms and individuals participating directly in the port's activities such as stevedores, longshoremen, ship repair firms, etc. These benefits can be measured in jobs created and revenues earned.

The direct economic benefit associated with public terminals in the Port of Boston was nearly \$100 million in 1979. This represents the annual revenues of the more than 170 firms employing over 2000 people who are directly involved in the general cargo activities of the port. The benefit associated with activities at Boston's public terminals represent approximately 60% of the impact attributable to the port as a whole. (4-3)

The second category of economic benefit resulting from availability of public port facilities in Boston is transportation savings to New England shippers. These are savings realized because shippers are able to use Boston rather than a more distant port. New England shippers surveyed indicated that they saved from \$10 to \$33 a ton by shipping through Boston. This results in over \$22 million annually in transportation savings. (4-3 and 4-5)

Of the public port's direct economic impact, 51% is related to the fixed operation of the port and does not vary with cargo volume. The remaining 49%, approximately \$49 million in 1979, is variable depending on cargo volumes and vessel calls. (Table 4-4)

Booz Allen reviewed the major cargo operations at the port's public terminals and analyzed the economic impact attributable to each. This analysis reveals that stacked container handling provides the highest economic impact per acre utilized, \$1.6 million, while automobiles result in the greatest benefit on a per ton basis, \$117.09. (4-8 and 4-9)

DIRECT ECONOMIC IMPACTS BY CARGO TYPE *

<u>IMPACTS</u>	<u>Moran Containers</u>	<u>Sea Land Containers</u>	<u>Castle Island Breakbulk</u>	<u>Mystic Pier</u>	<u>Lumber</u>	<u>Autos</u>
Direct Impact per ton	\$28.11	\$27.12	\$36.13	\$62.74	\$18.66	\$117.09
Transportation Savings per ton	<u>27.00</u>	<u>27.00</u>	<u>27.00</u>	<u>3.20</u>	<u>3.50</u>	<u>-</u>
Total Impact per ton	\$55.11	\$54.12	\$63.13	\$65.94	\$22.16	\$117.09
Total 1979 Tonnage (000's of tons)	580	125	56	51	35	46
Total Impact (000's of Dollars)	\$ 29,545	\$6,765	\$3,535	\$3,363	\$ 776	\$5,386
Storage Acres Utilized	22	10	10	5	14	30
Impact Per Acre (000's of Dollars)	\$1,628	\$677	\$354	\$673	\$ 55	\$180

* Based on vessel disbursement accounts. Summary of tables 4-3, 4-4, 4-5 and 4-6.

The third category of benefits are the indirect benefits to other businesses and to the general public as a result of the multiplier or "ripple" effect of the direct revenues. Booz Allen did not calculate the multiplier impact of port activities. However a multiplier of 2.5 is customarily used in assessing the economic impact of a port. This results in an additional annual impact of \$305 million.

Public Operations in the Port of Boston

Container Operations: The Port of Boston is one of the five major ports on the North Atlantic coast of the United States with terminal facilities for handling containerized ocean cargo.

In 1981 twenty-six international ocean carriers handle containers at the Port's terminals. Fourteen of these lines serve Boston directly. Three lines serve Boston with dedicated weekly feeder vessels, two via Halifax and one via New York. The remaining nine carriers serve Boston via the weekly McAllister Barge to New York.

Container volumes for the period 1976-1981 are shown in the table below:

<u>Fiscal Year</u> <u>(July - June)</u>	<u>Full</u> <u>Containers</u>	<u>Total</u> <u>Containers</u>	<u>Container</u> <u>Tonnage</u>
1976	35,390	47,808	495,969
1977 ¹	43,492	56,898	619,070
1978 ¹	42,918	57,330	619,855
1979	51,438	70,384	741,249
1980 ²	53,068	70,356	769,336
1981 ²	49,280	58,283	757,889

¹ - ILA strike - October and November 1977

² - ILA slowdown - November and December 1980 resulting in vessel diversions

Breakbulk and Neo-Bulk Operations: Breakbulk (non-containerized) general cargo and neo-bulk cargos such as automobiles and lumber are handled at Conley Terminal in South Boston. Breakbulk tonnage has declined in the past ten years with the increase of containerization. The level of automobile and lumber imports has historically been highly cyclical, depending upon such factors as the general health of the economy, the state of the building industry (particularly new home starts), and international agreements regarding import restrictions.

<u>Fiscal Year</u> <u>(July - June)</u>	<u>Auto</u> <u>Tonnage</u>	<u># of Autos</u>	<u>Lumber</u> <u>Tonnage</u>	<u>000's of</u> <u>Gross</u> <u>Board Feet</u> <u>of Lumber</u>	<u>Break</u> <u>bulk</u> <u>Tonnage</u>
1976	42,358	40,460	28,471	32,537	78,173
1977	44,286	42,006	49,134	56,150	55,172
1978	52,027	48,697	45,787	52,325	73,658
1979	50,819	47,011	39,355	44,977	65,914
1980	49,949	45,793	27,683	31,638	26,524
1981	69,570	61,053	27,711	31,672	14,684

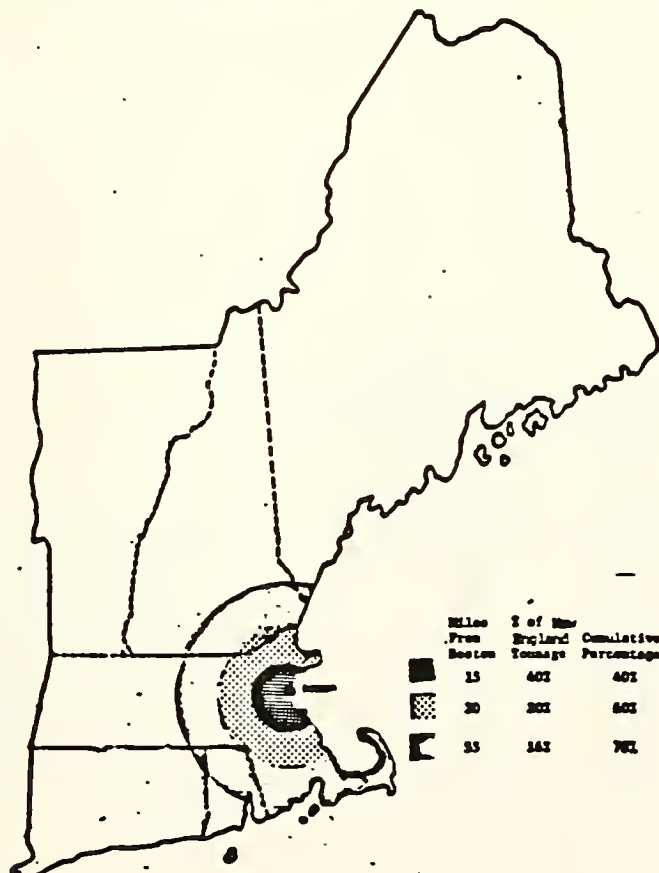
It is assumed that these commodities will continue to be handled through Boston at either the Conley Terminal or the Massport Marine Terminal and that the level of imports will continue to fluctuate cyclically.

III. BOSTON'S MARKET

The six New England states, excluding southwest Connecticut, are the Port of Boston's primary market. In 1979 this New England market generated more than five million tons of waterborne import and export cargo (excluding petroleum products). This included 1,800,000 tons of containerized and breakbulk general cargo, 700,000 tons of neo-bulk cargo and 2,800,000 tons of non-petroleum bulk cargo. These three cargo segments are described below. (1-2, 1-14 and 1-20)

A. General Cargo

Market area: New England general cargo shippers and consignees are highly concentrated around Boston. 76% of New England cargo originates or terminates within 55 miles of Boston. 72% of New England cargo has a Massachusetts origin or destination. Boston is the region's major port. (1-3)



Volume: In 1979 New England generated an estimated 1.8 million tons of general cargo. 60% of this cargo is imported and 40% exported. More than 90% is containerized. (1-2)

Commodities: New England's general cargo market is highly diversified and includes a range of high value commodities, reflecting New England's economic base and consumption patterns. (1-11)

Exports

Estimated New England Common Carrier Market
by Commodity With Boston's Market Share
(Thousands of Tons) (Table 1-11)

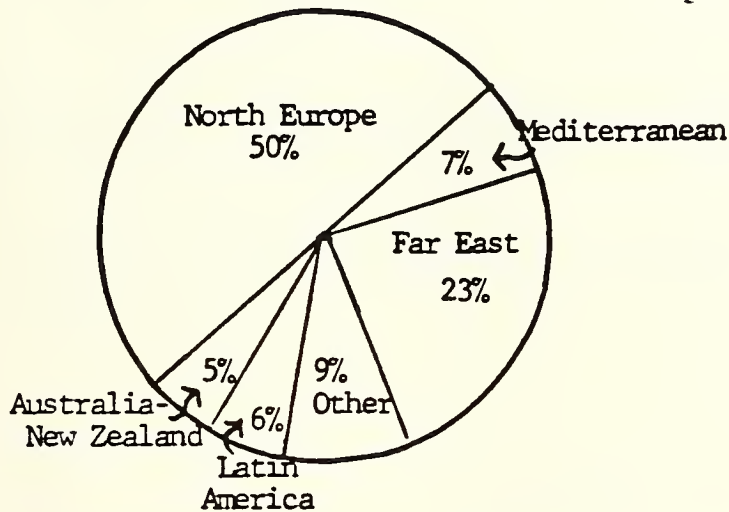
<u>Commodity Group</u>	<u>New England Tonnage</u>	<u>Boston's Tonnage</u>	<u>Boston's Share (%)</u>
Chemicals	142	64	45%
Metal manufactures	136	9	7
Forest & paper products	112	80	71
Manufactured goods	78	40	51
Crude, raw materials	57	30	54
Scrap	56	29	52
Machinery	46	14	30
Textile & textile products	39	18	46
Food & food products	25	12	48
Leather & hides	24	14	58
	<u>715</u>	<u>310</u>	<u>43</u>

Imports

Estimated New England Common Carrier
Market by Commodity With Boston's Market Share
(Thousands of Tons) (Table 1-12)

<u>Commodity Group</u>	<u>New England Tonnage</u>	<u>Boston Tonnage</u>	<u>Boston's Share (%)</u>
Consumer goods	436	162	37
Crude, raw materials	210	60	29
Food & food products	158	102	65
Iron & steel products	75	16	21
Machinery	60	36	60
Forest & wood products	56	40	71
Chemicals	40	25	63
Manufactured goods	40	20	50
Metal manufactures	20	14	70
	<u>1095</u>	<u>475</u>	<u>43</u>

Trading Partners: Countries of Europe and the Far East are New England's major trading partners, accounting for 80% of the total general cargo tonnage. (1-9)



1979 NEW ENGLAND GENERAL CARGO

Boston's Market Share: 43% of New England's general cargo is shipped through the Port of Boston. This is a lower market share than might be expected for a major port from its primary market area. Boston's share is even more concentrated than the overall New England market: 77% of Boston's market is within Route 495 and 92% is within 55 miles of the port. The export/import balance, commodity mix, and foreign origin/destination of Boston cargo reflect the composition of the New England market. (1-2 and 1-3)

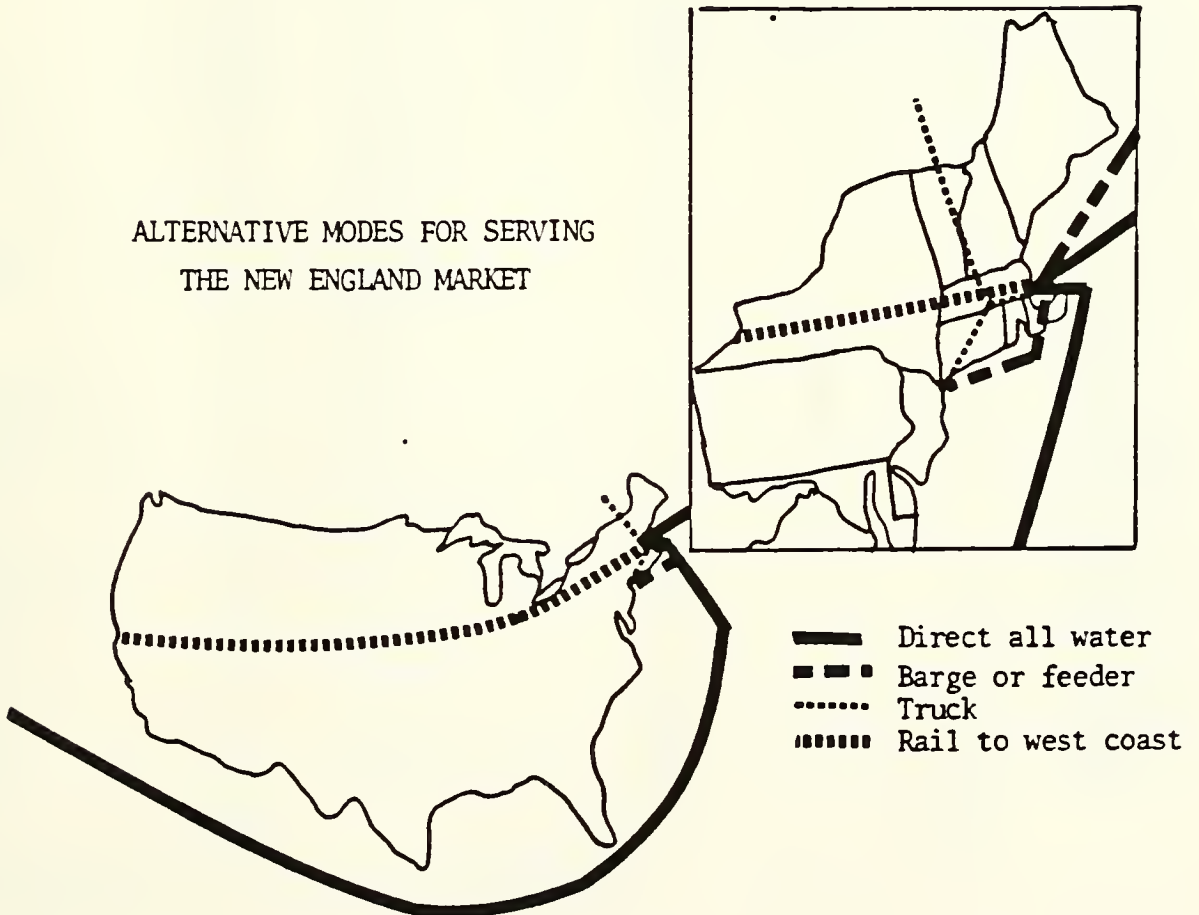
BOSTON'S SHARE OF THE NEW ENGLAND MARKET

<u>Metropolitan Area</u>	(Table 1-5) Estimated New England Tonnage(000's)	Percentage of Total	(Table 1-6) Estimated Boston Tonnage(000's)	(Table 1-7) Boston's Market Share
Inside Route 128	724	40%	377	52%
Rte 128 to Rte 495	362	20%	228	63%
Hartford	235	13%	24	10%
Providence	127	7%	24	19%
Worcester	72	4%	55	76%
Rutland VT	36	2%	-	-
Nashua NH	36	2%	24	67%
Chicopee	18	1%	8	44%
Springfield	18	1%	8	44%
Barre VT	18	1%	8	44%
Fall River	18	1%	8	44%
Webster	18	1%	8	44%
SUBTOTAL	1,682	93%	772	43%
Other Areas	128	7%	13	10%
TOTAL	1,810	100%	785	43%

Carriers serving the New England market have several choices for handling the region's cargo:

- (1) direct call at Boston
- (2) feeder or barge service from Boston or from a smaller New England port to New York or Halifax
- (3) truck to New York or Montreal
- (4) rail to west coast ports (minibridge service) (6-1, 6-2, and 6-3)

ALTERNATIVE MODES FOR SERVING
THE NEW ENGLAND MARKET



Boston is the port traditionally used by carriers to serve the New England market. Boston is served directly or by feeder by a cross section of the largest container operators in the world. In 1979 fourteen carriers called at the Port of Boston with direct service. Ten others served Boston in relayed service via common carrier barge or their own feeder vessels. (5-14)

The table below summarizes the major carriers handling New England cargo in 1979 and estimates their relative use of direct, feeder, and truck/rail service.

TOP 15 CARRIERS OF NEW ENGLAND CONTAINER CARGO - 1979 *

	Share of New England Market	Primary Trade Route	Direct From Boston	Feeder/ Barge from Boston	Truck or rail thru other Ports	% of Boston's Tonnage	Frequency and Type of Boston Service
Sea Land	15.8%	North Europe	-	75%	25%	18.5%	Weekly feeder via New York
U. S. Lines	6.7%	North Europe	75%	-	25%	11.8%	Weekly Direct
ACL	6.1%	North Europe	-	30%	70%	2.4%	Weekly barge via New York
Trans Freight Lines	6.0%	North Europe	90%	-	10%	24.5%	Weekly Direct
Farrell	4.6%	Australia/NZ Mediterranean	10%	25%	65%	3%	Weekly barge via New York
APL	4.0%	Far East	-	-	100%	-	No all water service
Barber Blue Sea	3.3%	Far East	50%	-	50%	2%	Twice a month direct
Japanese Consortium	2.9%	Far East	40%	25%	35%	11.1%	Monthly direct weekly barge
Columbus	2.4%	Australia/NZ	75%	-	25%	2.4%	Twice a month direct
Maersk	2.4%	Far East	-	-	100%	-	No all water service
Orient Overseas	2.3%	Far East	-	25%	75%	3.2%	Weekly barge via N.Y.
ACT/PACE	2.2%	Australia/NZ	75%	-	25%	2.9%	Twice a month direct
Hapag Lloyd	2.1%	North Europe	-	75%	25%	-	Weekly Feeder via Halifax
Dart	2.1%	North Europe	-	35%	65%	1.8%	Weekly barge via N.Y.
Italian	2.0%	Mediterranean	50%	25%	25%	4.4%	Twice a month direct
Other	35.1%					12%	
	100%					100%	

*Based on Tables 5-6, 5-7, 5-8, 5-9, 5-10, 5-11 and terminal records

Carriers were interviewed regarding their method of handling New England cargo, particularly whether or not to call directly in Boston. These interviews indicated that decisions about service are strongly influenced by carriers' perception of Boston's unstable labor situation and resulting high terminal costs. The advantages and disadvantages of serving Boston directly, as perceived by the carriers, are summarized below: (5-16)

<u>Advantages</u>	<u>Disadvantages</u>
<ul style="list-style-type: none"> . Only New England port capable of handling a large "direct" container service . One day closer to Europe than to other principal Atlantic ports . Inland freight savings accrue to the carriers customers on the order of <ul style="list-style-type: none"> - \$350 per container compared to New York - \$600 per container compared to Montreal . First port of discharge westbound 	<ul style="list-style-type: none"> . Unstable labor situation and resultant high costs . First port of loading east-bound . Rail rate levels unfavorable compared to New York and Baltimore for mid-west cargo and rail service to port area inadequate

The incremental cost of a direct Boston call for New England cargo vs. barge or truck to New York varies depending upon the type of vessel (its size and fuel consumption), its itinerary (added costs for a vessel enroute to Europe or Canada are less than for one terminating in New York), and the value and volume of cargo handled by the carrier. Baseline costs were estimated for each alternative. The sensitivity of each mode to rising fuel costs was also analyzed: (6-8)

	<u>Estimated 1980 Cost per Container</u>	<u>Fuel as % of Cost</u>
800 TEU Vessel Direct Call to Boston (Table 6-4)		
a. Bypass diversion	\$348	5%
b. Northern diversion	\$550	15%
Barge to New York (Table 6-5)	\$527	2.7%
Truck to New York (6-28)	\$1006	11%

Assuming these costs, the breakeven number of containers was calculated for a range of vessel sizes making direct calls vs. barge cost at \$527 a container:

	<u>Bypass Diversion of Vessel on N.Y. to Europe/Canada route</u>	<u>Northern Diversion Vessel with northern terminus in New York</u>
800 TEU Vessel (Table 6-6)	63	150
1200 TEU Vessel (Table 6-6)	78	196

These calculations do not address other components of a carrier's decision regarding a direct call, such as vessel scheduling and capacity, balance of equipment, or fixed costs in New York.

Booz Allen did not analyze the comparative cost to a carrier of all-water vs. minibridge service to the Far East or identify breakeven volumes and factors involved in this modal choice.

Competitive Ports: Boston's competition from other ports occurs in two areas: competition for New England cargo and competition for carrier service.

(1) Boston's major competition for New England's cargo comes from the ports of New York and Montreal and from minilandbridge service through west coast ports. Smaller New England ports such as Portland, Portsmouth, and Providence compete with Boston, to a limited extent, in their local market areas. (1-12)

Competitive Ports Market Share of New England
Liner Cargo (Table 1-13)

<u>Port</u>	<u>Estimated Share of New England Liner Cargo</u>
Boston	43%
New York	30-32%
Montreal	6- 8%
West Coast Ports via MLB	5-15%
others	4-18%
	<u>100</u>

New England shippers surveyed by Booz Allen indicated the following factors were most important in port selection: (1) frequent and reliable carrier service; (2) efficient terminal facilities and (3) competitive inland and ocean freight rates. Boston's performance relative to competitive ports varies considerably depending on market area and trade route. (7-2) Europe and the far East, New England's major trading partners, are discussed below.

Boston's primary competition for the European Trade is from the ports of New York and Montreal. Boston's good direct service, position as the first port of call westbound, and lower overall costs to New England shippers are strong selling points. New York offers greater frequency of service, while Montreal offers lower rates through its CAST line service. (7-3)

<u>European Service</u> (Tables 7-2, 7-3, and 7-4)	<u>Boston Direct</u>	<u>Boston Feeder</u>	<u>Truck to N.Y.</u>	<u>Truck to Montreal</u>
Shipper Costs 40' container from Boston (photo equipment)	\$ 2,879	\$ 3,698	\$ 3,780	\$ 2,700
Shipper Costs 20' container from Worcester (abrasives)	\$ 1,400	\$ 2,260	\$ 2,478	\$ 1,155
Number of carriers serving the port	2	6	14	7
Average Sailings per month	8	12	54	33
Average days between sailings	3.7	2.5	.6	.9
Average transit days				
- inbound	9.5	15.1	11.2	11
- outbound	14	16	11	10.9

Boston's competition in the Far East Trade comes from New York and West Coast ports via minibridge. Minibridge is the fastest service while Boston feeder is the least costly. (7-7)

<u>Far East Service</u> (Tables 7-5, 7-6 and 7-7)	<u>Boston Direct</u>	<u>Boston Feeder</u>	<u>Truck to N.Y.</u>	<u>Mini-Bridge</u>
Shipper costs 40' box from Boston (footwear)	\$ 2,238	\$ 1,983	\$ 2,405	\$ 2,320
Shipper costs 20' box from Springfield (bicycle parts)	\$ 2,532	\$ 1,587	\$ 2,713	\$ 2,601
Number of carriers serving port	1	2	13	7
Average sailings per month	2	4	66	27
Average days between sailings	15	7.5	.5	1.2
Average Transit Time				
Outbound (to Taiwan)	26	34	32	28
Inbound (from Yokohama)	30	38	30	24

New York is Boston's main competitor for cargo on other trade routes. In general, New York has more frequent service on all trade routes, while trucking rates are lower to the Port of Boston. (7-11)

(2) Ports competing with Boston for carrier services include the North Atlantic ports of New York, Philadelphia, Baltimore, and Hampton Roads. (7-15)

The table below compares carrier activities at these ports:

	<u>Number of Liner Carriers</u>
Boston	23
New York	97
Philadelphia	52
Baltimore	95
Hampton Roads	63

(Table 7-13)

Tariff charges (dockage, wharfage, and crane rental rates) for these five ports were analyzed for the period 1970-1981. This analysis indicated that while Boston's rates have historically been higher than the other North Atlantic ports they are now at a competitive level. However Boston's low labor productivity results in overall handling charges considerably higher than the North Atlantic average. (7-30)

Comparison of 1980 Cargo Handling Costs
At Boston With Other North Atlantic Ports
(in Dollars Per Container) (Table 9-2)

<u>PORT</u>	<u>CARRIER</u>			
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
Boston	\$ 326	\$ 216	\$ 184	\$ 122
New York	270	221	278	80
Baltimore	--	155	179	87
Philadelphia	189	214	--	--
Hampton Roads	<u>202</u>	<u>155</u>	<u>143</u>	<u>--</u>
Average	<u>247</u>	<u>192</u>	<u>196</u>	<u>96</u>
Boston as % of Average	132%	113%	94%	127%

B. Neo-Bulk Cargo

Neo-bulk cargo is general cargo which is shipped in volume usually in shipload movements of a single commodity by one shipper through a dedicated facility. Port selection criteria are different for neo-bulk than for containerized or break-bulk general cargo. Competitive rates, productive productive labor arrangements, and proximity to inland destination are more important factors in port selection for neo-bulk cargo than the services and infrastructure of a major port.

New England's neo-bulk was estimated at 700,000 tons in 1979 about one percent of the total U.S. neo-bulk market; it consists of a few major commodities and is primarily an import market. The major commodities handled as neo-bulk in New England are iron and steel lumber, and automobiles (1-15)

Boston handles 13% of New England's neo-bulk tonnage - primarily automobiles and lumber. Providence, Rhode Island handles a significant volume of neo-bulk cargo, particularly iron and steel lummer, and autos. (1-16) Bananas are imported to New England through specialized facilities at the Port of New York, United Brand's northeast distribution center. (1-19)

The table below provides a breakdown of New England's major neo-bulk commodities in 1979 and the percentage handled by each port: (Tables 1-15 and 1-16)

<u>EXPORTS</u>	ESTIMATED NEW ENGLAND TONNAGE (1979) MOVING IN NEO- BULK SHIPMENTS	BOSTON	PROVIDENCE	NEW YORK	SEASPORT	PORTLAND	NEW LONDON
Woodpulp	60,000						
Paperboard	20,000				100%	25%	75%
<u>IMPORTS</u>							
Autos	130,000	37%	56%	6%			
Lumber	150,000	24%	76%				
Iron & Steel	200,000	4%	96%				
Bananas	<u>100,000</u>			100%			

C. Bulk Cargo

New England's bulk cargo tonnage (excluding petroleum and other bulk fuels) was estimated at 2.8 million tons in 1979.

The relatively low level of bulk cargo tonnage flowing in and out of New England reflects the limited presence of heavy industry in the region. New England's major bulk exports are iron and steel scrap and tallow. Major bulk imports include sugar, gypsum, and road salt. (1-20)

Port choice by bulk cargo shippers is very strongly influenced by proximity to the inland origin or destination and by low labor and port costs. Boston handled 48% of this market in 1979. (1-21) Bulk commodities are shipped through privately operated terminals, sometime directly at the shipper's plant, such as the gypsum plant in Charlestown.

The table below summarizes New England's non-petroleum bulk market in 1979 and the percentage handled by each port. (tables 1-20 and 1-21)

	NEW ENGLAND ESTIMATED TONNAGE (1979)	BOSTON	PROVIDENCE	SEARSPORT	PORTSMOUTH	NEW BEDFORD	NEW LONDON
<u>EXPORTS</u>							
Iron & Steel Scrap	1,400,000	50%	43%		7%		
Pig Iron	20,000	100%					
Tallow	33,000	100%					
	<u>1,453,000</u>						
<u>IMPORTS</u>							
Sugar	400,000	90%					10%
Gypsum	350,000	45%		9%	46%		
Salt	550,000	20%	15%	29%	36%		
Iron Ore Conc.	70,000	100%					
Frozen Fish	50,000				3%	97%	
	<u>1,420,000</u>						

IV. THE EXTERNAL ENVIRONMENT: OPPORTUNITIES AND OBSTACLES TO FUTURE GROWTH

Cargo volumes through Boston will be affected by trends and developments in the maritime industry and in the external environment within which the port operates. Areas which were investigated by Booz Allen included: regional cargo forecasts, maritime industry trends, regulatory trends, service and development at competitive ports, and labor productivity in Boston. The highpoints of this analysis are summarized below.

A. Cargo Forecasts: Boston cargo volumes are likely to increase in two ways: growth in New England's total market and growth in Boston's market share.

(1) Growth based on New England Market Growth

General cargo tonnage shipped through Boston is projected to grow at an average annual rate of 5.5%, assuming that Boston maintains its present share of the New England market. (2-12)

At that rate general cargo tonnage through Boston will increase to 1.4 million tons in 1990 and will triple by the year 2000 to 2.6 million tons. This tonnage will continue to be primarily containerized.

These forecasts are based on econometric forecasts of regional economic activity and analysis of foreign trade activity for 47 major commodities representing more than 70% of New England tonnage. (2-1 through 2-5)

The resulting forecasts are consistent with long term trade forecasts prepared by the U.S. Maritime Administration and with other economic projections for the national and regional economy. (2-15 and 2-16)

(2) Growth Based on Increased Market Share

Market analysis suggests four areas for growth of Boston's market share of New England cargo:

Boston presently handles only 56% of the import cargo destined within Route 495, as compared to 88% of export cargo. Increasing Boston's share of imports to 75% would increase annual tonnage by 132,000 tons. (1-23)

The Hartford and Providence markets are secondary New England cargo areas. The Port of Boston captures only 10% and 19% of these markets respectively. This cargo is highly containerized and moves on trade routes where Boston provides excellent

service. Increase of Boston's share to 70% of this market would increase annual tonnage by 180,000 tons. (1-24 and 1-25)

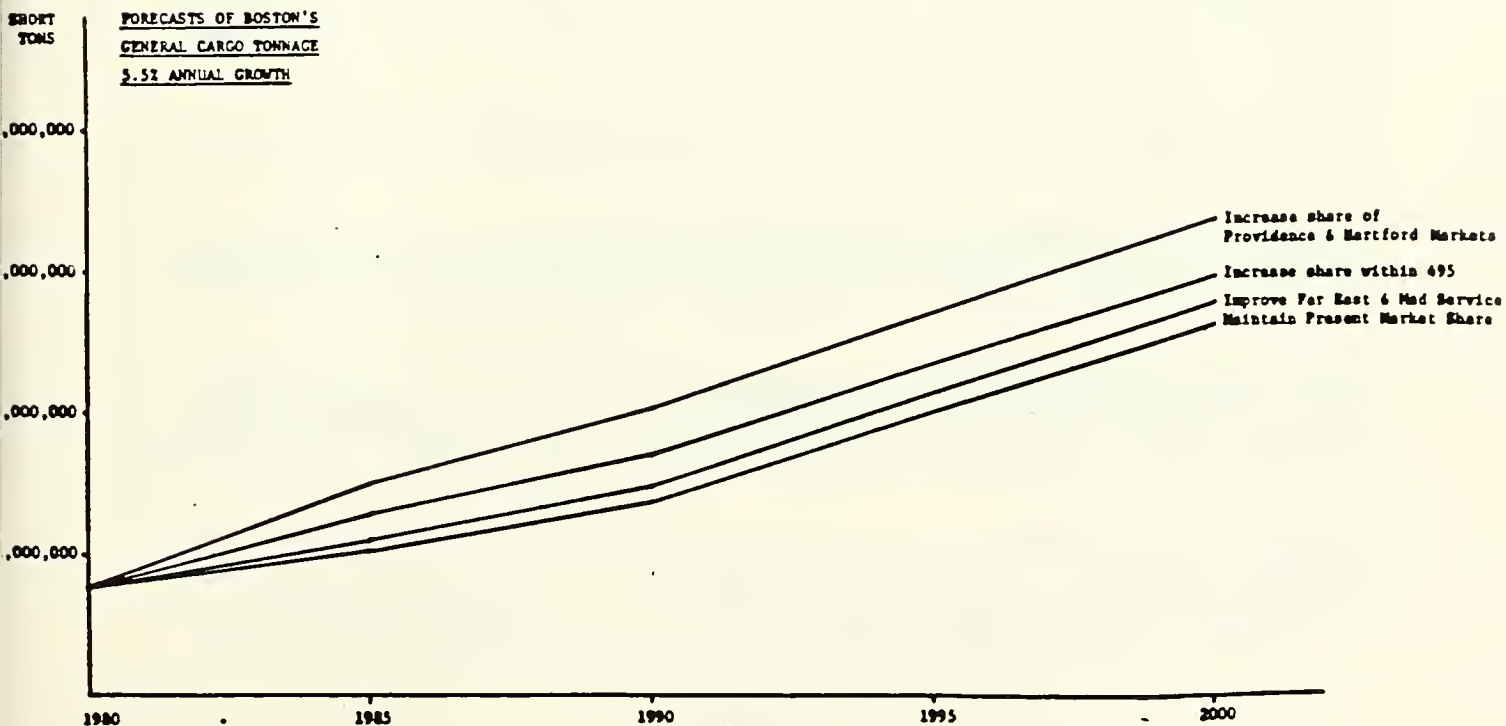
North Europe, the Far East, and the Mediterranean are the major trade routes for future Boston growth. (1-27)

Growth in these areas would result in the following general cargo volumes through the Port of Boston:

BOSTON GENERAL CARGO TONNAGE (000'S OF TONS)

	<u>1980</u>	<u>1985</u>	<u>1990</u>	<u>2000</u>
<u>(1) Growth in New England Market</u>				
Boston General Cargo based on Overall 5.5% Market Growth	790	1,020	1,367	2,612
<u>(2) Growth in Boston's Market Share</u>				
Improved Far East & Med Service		78	102	175
Increased Share of Imports Within 495		173	225	384
Increased Share of Providence & Hartford Tonnage		<u>235</u>	<u>307</u>	<u>402</u>
Total Potential				
General Cargo	790	1,506	2,001	3,393

(Tables 2-7, 1-23, 1-24 and 1-27)



B. Maritime Industry Trends: Excess capacity exists in containerized shipping engaged in U.S. trades. Rates have not increased sufficiently to cover costs which have more than doubled in the past five years. Energy costs are responsible for a very significant portion of this increase. Daily fuel costs for a 13,000 TEU vessel rose from \$6,000 in 1976 to \$22,000 in 1980. A number of U.S. flag carriers have reduced or ceased operations entirely as a result of poor profit performance. (5-5, 5-6 and 5-7)

The trend to larger, fully containerized vessels peaked in the late 1970's. The present trend is to smaller, more flexible vessels. Carriers are adopting slower speeds, converting vessels from steam to diesel power, decreasing operating costs and productivity of their ships and taking other measures to reduce costs.

C. Regulatory Trends: Recent legislative and regulatory trends were reviewed in light of their impact on secondary ports such as Boston. The major findings are summarized below:

- Truck deregulation will make it easier for carriers to move New England cargo over the road to other ports. A number of steamship carriers have also received approval to own and operate trucking operations to support their maritime activity. (8-4)
- Changes in ocean shipping regulatory laws may provide carriers with greater flexibility in port selection and pricing, altering traditional distribution and service patterns perhaps to the detriment of secondary ports such as Boston. Massport should increase its monitoring of proposed legislation and regulation in this area. (8-5)
- Resolution of the controversy surrounding the 50-mile rule will affect Massport's unprofitable business at Mystic Pier and may result in re-opening the current ILA contract. (8-7)
- Movement toward a uniform labor contract would eliminate a number of Boston's competitive advantages over New York. Boston should make every effort to preserve local control over local practices and fringe benefit programs. (8-8)
- Carriers, such as CAST, shipping through Canadian ports are increasing penetration of the New England and midwest markets. Massport should support proposed legislation addressing this issue. (8-9)
- The coal export boom has resulted in proposals to dredge several major ports to depths of 55 feet. Boston should monitor the impact of such projects on its competitive position in handling container and neo-bulk vessels. (8-10)

D. Development Plans at Competing Ports: During the next five years Boston can expect increased competition in all market segments as facility expansion occurs at competing ports. Booz Allen recommends countering this competition by targeting marketing efforts to emphasize Boston's strengths. For example, Boston's excellent inbound service from Europe should be stressed to high value importers while the cost advantages of Boston's all-water Far East service should be emphasized to cost-sensitive exporters. (7-38 and 7-39)

North Atlantic ports that compete with Boston plan to invest more than \$430 million in container handling facilities in the next five years. (7-18)

Ports that compete with Boston for New England's containerized cargo (New York, Montreal and smaller New England ports) have planned investments estimated at \$330 million, mostly in container facilities. (7-18) These are summarized in the table below:

PORT	ESTIMATED ANNUAL GENERAL CARGO TONNAGE (000 TONS)	CURRENT SHARE OF NEW ENGLAND MARKET	PLANNED PUBLIC INVESTMENT IN FACILITIES 1980-1985 (in \$ Millions)	COMMENTS
New York	15,000	30-32%	\$210	Will have excess capacity through 1980-1985 period.
Portsmouth, NH	100 est.	2- 4%	0	Could divert heavy lift business and small amount of container traffic.
Maine Ports	200	0-10%	20	Searsport to be developed for forest products and Portland for containers.
Providence	300	10-12%	10 ¹	Port specializes in specialty commodities. Private investment planned.
Halifax	3,300	2- 3%	23	Container Terminal II to open 1981 at cost of \$29.2 million.
St. John	3,000	2- 4%	24	Diversified forest products and container facilities. Competes for Maine forest products.
Montreal	10,000	6- 8%	39	Three berth - 29 acre Racine container terminal to be completed in 1981 at cost of \$20 million.

1. Estimated private sector investment.

Ports south of New York that compete with Boston for carrier service have planned investments in container facilities in excess of \$100 million. (7-27) Estimates of these investments are summarized below:

Planned Port Expenditures 1980-1985
(Millions of \$) (Tables 7-19 & 7-20)

	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>
Philadelphia	N/A	7.7	9.0	4.7	2.0	N/A
Baltimore	3	--	--	40	N/A	N/A
Hampton Roads	<u>6.5</u>	<u>4.8</u>	<u>4.4</u>	<u>8.25</u>	<u>7.0</u>	<u>7.0</u>
	9.5	12.5	13.4	52.95	9.90	7.0

E. Labor: Labor productivity and costs emerge as a critical factor in carriers' decisions to increase or decrease Boston service and in Massport's financial capacity to undertake further port development.

Analysis of Boston's labor situation and that of comparable terminals at other North Atlantic ports yielded the following conclusions:

- (1) Moran Terminal is 40% less productive and 25% more costly to carriers than comparable North Atlantic terminals. (9-1, 9-2 and 9-4)
- (2) The poor productivity and high costs are due in large measure to overstaffing. The number of fulltime ILA terminal staff at Moran is nearly twice that at comparable terminals as summarized below: (9-3)

this has been connected to a certain extent

Comparison of Labor Productivity at Five North Atlantic Container Terminals During 1979 (Table 9-1)

TERMINAL	TONNAGE HANDLED	LONGSHORE HOUR	TONS/HOUR
Moran Terminal	581,000	560,630	1.04
Philadelphia Terminal 1	556,000	308,000	1.81
Philadelphia Terminal 2	581,244	427,533	1.36
Hampton Roads Terminal 1	868,000	277,217	3.13
Hampton Roads Terminal 2	1,368,000	747,600	1.83
Average	790,849	464,196	1.70

Note: Includes hours expended in consolidation sheds.

The limited land area, poor layout, and heavy use of the terminal requiring excessive overtime work have also contributed to Moran's productivity and cost problems.

- (3) Significant cost reduction and productivity improvements are available at Moran. A 25% expense reduction was achieved at Mystic in the 1980-83 ILA contract. The potential exists to achieve an overall 28% cost reduction at Moran and Mystic. (9-9)
- (4) However, any substantial labor reduction at Moran will result in more men drawing Guaranteed Annual Income as provided in the ILA contract. Thus, Massport's cost reductions will be offset, to some extent, by increased demand on the Union's funds. This may in turn require an increased tonnage assessment to carriers. An increase in overall service and volume through the port would allow productivity gains without loss of ILA employment and the resulting burden on GAI funds. (9-10 and 9-11)

V. DESCRIPTIONS AND CAPACITY OF PORT TERMINALS

The Port of Boston's public cargo handling facilities are concentrated in Charlestown and South Boston at three major terminals. Development of these terminals has been an important priority for the Authority. Massport's development program and terminal facilities are described below.

A. Port Development Program: Since 1978, Massport has been engaged in a three-phase development program to return the Port's existing terminals to efficient operation and expand its facilities to meet future needs.

The first phase, which began in 1978, involved the rehabilitation of Moran Container Terminal and Conley Terminal. This program, at a cost of well over \$10 million, included the replacement and the addition of cargo handling equipment at Moran, rehabilitation of one of the container cranes at Moran, rehabilitation of storage and berthing areas at both Moran and Conley and the addition of land for storage of cargo at Moran. The majority of this work has been completed.

The second phase involved the construction of a new container area at Conley Terminal at a cost of \$18 million. This project includes a 1000-foot berth, two 40-ton container cranes, and initially, ten acres of land for container storage. Over twenty-five additional acres are available for immediate development and additional berth capacity and cranes are planned. The recently completed terminal allows a 20% increase in the number of containers which can be handled through public terminals in the Port of Boston.

The third phase involves creation of a new 47 acre marine terminal at the former South Boston Naval Annex which will be the heart of the new South Boston Marine Terminal complex. Used in conjunction with the port property at the Army base, Commonwealth Flats and the former Navy Recreation property, it will serve as a bulk and breakbulk facility during the next decade. Ultimately, it will be developed as a three berth container terminal which will double the Port's container capacity and offer shippers fast and efficient cargo handling into the twenty-first century. The first stage of development of this terminal is a \$23 million Massport investment to construct a dike and provide 36 acres of fill.

B. Port Terminal Capacity: The capacity of each of Massport's terminals has been estimated in terms of the amount of cargo which the terminal is able to handle in a year. Capacity is a function of both physical constraints and operating practices. It should be thought of as a range rather than an absolute limit. Within this range trade-offs may be made between operating costs and volume handled. (10-1 and 10-3)

Some of the elements which limit terminal capacity are a function of the physical layout of the terminal and may be corrected by physical improvements; examples are the number of berths and amount of warehouse space. Other constraints, such as the turnover rate of cargo, are a function of shipper behavior which may be influenced by actions such as an increase in demurrage rates. A number of factors beyond the control of the port also influence capacity, such as the size distribution of the ships calling at the port and the frequency of calls.

Terminal capacity estimates were developed by identifying potentially constraining activities at each terminal (berth, cranes, storage, gates, consolidation); analyzing theoretical capacity and then modifying it based on actual operating experience to include factors such as peaking, circulation equipment downtime, and cargo density. The activity with least capacity constrains capacity for the entire terminal.

The capacity estimates which follow were based on 1979 terminal operations and cargo mix. Any change in operations (e.g. from stacked to mounted containers) or cargo mix (e.g. ratio of empty to full containers) would impact the estimates. These estimates represent the point beyond which increased volume, although still feasible, will result in substantially increased costs and waiting time. (10-3)

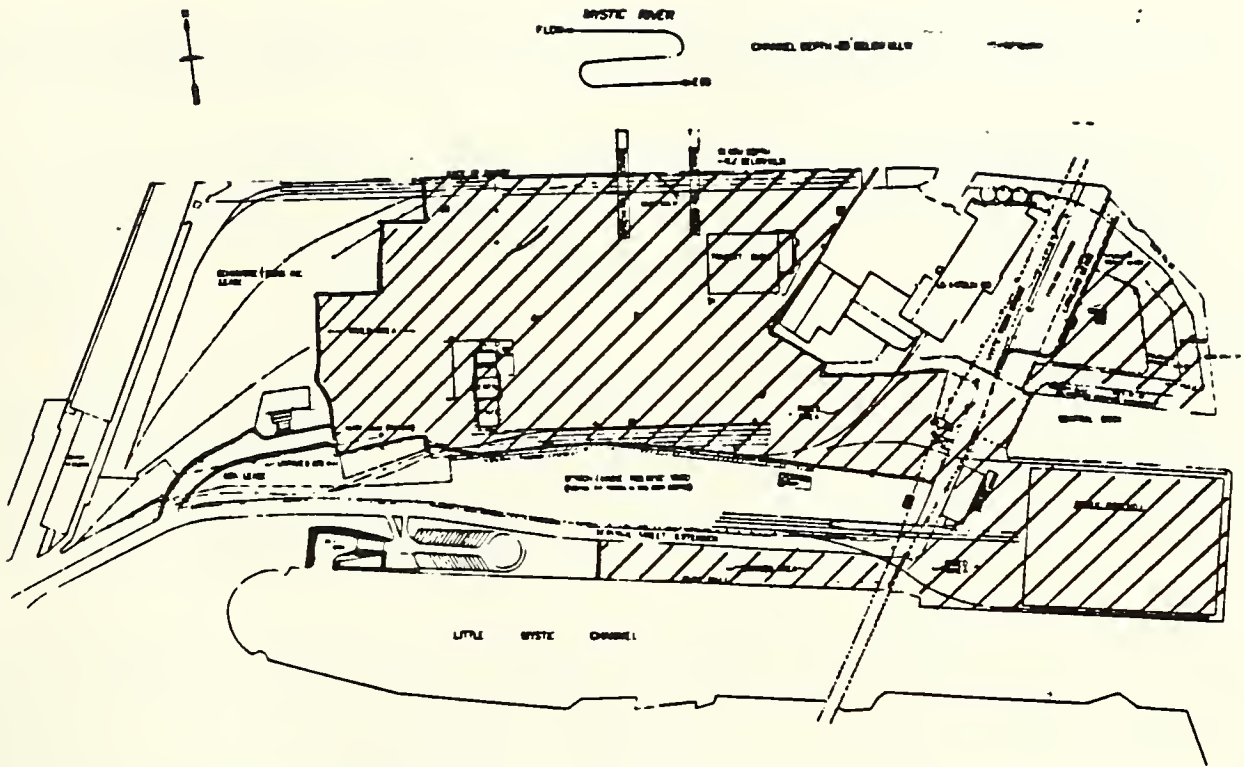
C. Moran Container Terminal in Charlestown is the largest container terminal in New England. The 1,100-foot berth, with two container gantry cranes and 22 acres of storage area, handles an average of 26 ships per month, making it one of the busiest terminals for its size in the world. In 1980, 540,922 tons of containerized cargo were handled at Moran.

Moran serves New England shippers and consumers by providing direct and feeder service from New England to all foreign ports. The availability of these port services in Boston saves New England shippers approximately \$27 per ton in transportation costs over alternative ports.

Moran Terminal was opened in 1971 as Boston's first public container terminal. It is operated in conjunction with a "stuffing and stripping" shed at Mystic Pier 1 where less than container load cargo is handled.

Based on 1979 operating practices, Booz Allen estimated that Moran has the capacity to handle 53,250 containers per year with one crane; with both cranes operating capacity increases to 82,500 containers. If containers were stored on chassis the terminal's capacity would be reduced to 54,050 containers per year. (10-4)

In 1979, Moran operated at 95% of theoretical capacity. It should be noted that during this period the terminal was operating with one crane at unusually high levels of berth utilization and labor overtime, resulting in uneconomic costs to both Massport and carriers using the terminal. (10-6)



MORAN CONTAINER TERMINAL - CHARLESTOWN

1100 foot berth
 2 cranes
 21.5 acre storage yard
 7.9 acres auxiliary storage
 250,000 sq. ft. stuffing and stripping shed
 Capacity: 53,250 containers (stacked) (one crane)
 82,500 containers (stacked) (two cranes)
 54,050 containers (on chassis)

<u>CARGO</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>
000's of tons	265	444	433	594	581	541
Containers	24,452	37,966	36,674	53,870	49,425	44,722

In the last three years Massport has undertaken a multimillion dollar investment program at Moran to improve services to shippers and shipping lines using the terminal.

Further expansion at Moran is constrained by limited acreage since the terminal is sited between a U.S. Gypsum factory and an iron scrap export terminal. As a result expanded container handling capacity in the Port of Boston will be provided by Massport's new terminals at Castle Island and the former Naval Annex.

D. Conley Terminal (formerly Castle Island) in South Boston is the major terminal in the Port of Boston for the discharge of lumber, automobiles, and breakbulk general cargo. Conley Terminal provides 4255 feet of marginal wharf, with water depths of 35 to 40 feet supported by 101 acres and a 220,000 square-foot shed for general cargo and less-than-containerload operations. The terminal handled 226,259 tons of cargo in 1980.

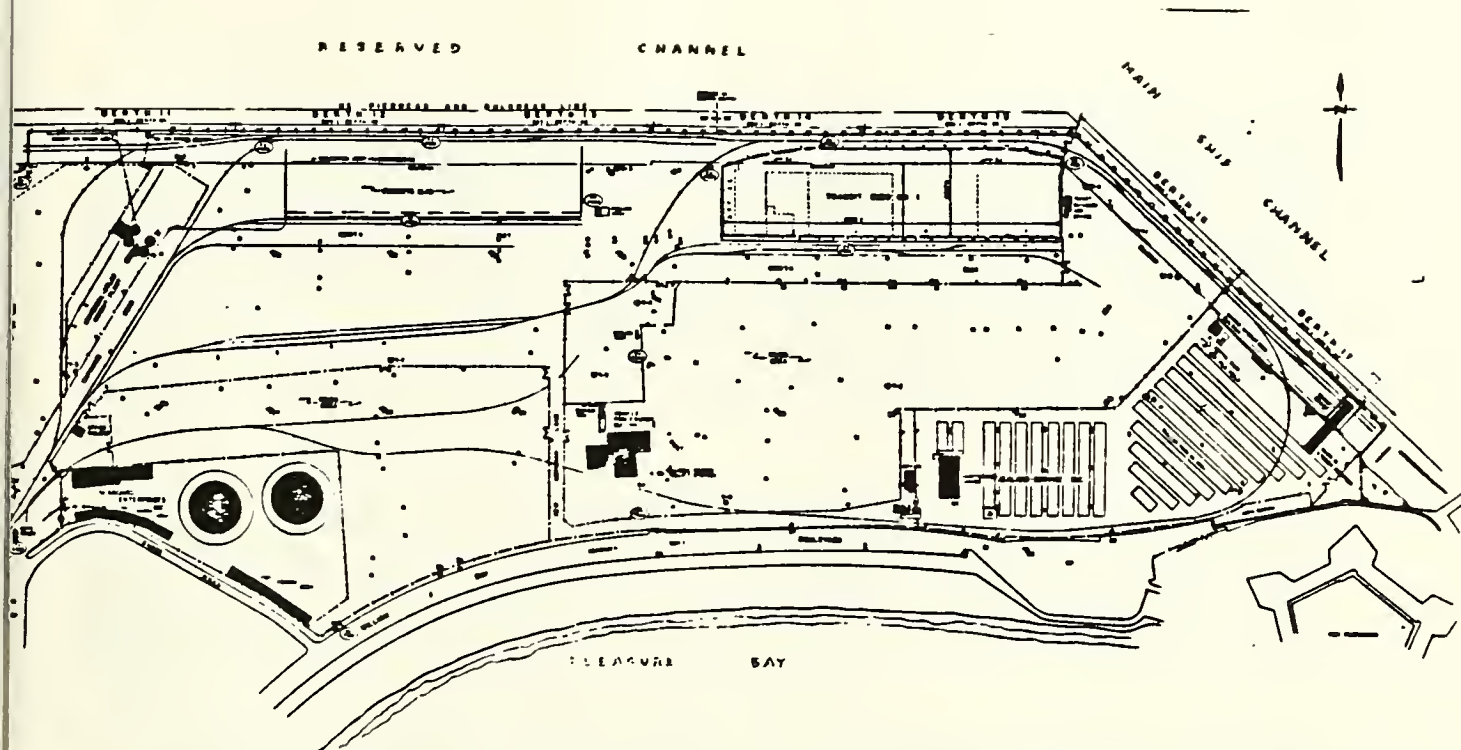
Berth #17, at the eastern end of Conley Terminal, is leased to Sea Land Services, Inc., which provides steamship services to some 50 world ports via weekly feeder to New York. It is Boston's original container facility. The Sea Land complex includes a 17.5-ton-capacity Paceco gantry crane and over 10 acres of paved area capable of storing more than 450 containers on chassis at one time.

Berth #16, adjacent to the Sea Land Terminal, is leased by Toyota which imported 29,115 automobiles in 1980. Other cargo handled at Conley Terminal in 1980 included 23,644 Subarus, more than 15 million gross board feet of lumber imported from British Columbia, fuel oil for storage at Texaco's adjacent terminal, as well as both containerized and breakbulk general cargo.

To accommodate increased container volume expected in the 1980's, Massport has invested \$18 million at the western end of Conley Terminal to convert Berth 11 into New England's newest container terminal. The new terminal is a two crane facility with 1,000 feet of marginal wharf and a storage yard of ten acres. The yard acreage will be increased as demand grows. As additional acreage is required for container handling, some of the neo-bulk cargos will be relocated to Massport's new Marine terminal complex at the former Navel Annex.

The new Berth 11 terminal, the first major seaport development in Boston since 1972, was completed the fall of 1981.

Based on 1979 tonnage, operations, and acreage allocations, Conley Terminal had the estimated capacity to handle 23,400 containers at Sealand's leased facility, 51,000 automobiles, 80 million gross board feet of lumber and 150,000 tons of break-bulk general cargo. (10-8 and 10-9) The acreage allocations at Conley can easily be adjusted to increase capacity to handle one commodity, while decreasing capacity for another.



CONLEY TERMINAL - 1979

<u>USES:</u>	Sealand (leased)	13 acres	General Cargo	13 acres
	Toyota (leased)	22.8 acres	New Terminal	13 acres
	Subaru	8 acres	(complete in late 1981)	
	Lumber	10 acres	MDC	2 acres
	Texaco	6.1 acres	Access and circulation	13 acres

FACILITIES (1979)

Container berth	595 feet
General berthing	3660 feet
Container cranes	One
Container storage	10 acres

CAPACITY (1979)

23,400 containers
50,610 autos
80 million GBF lumber

<u>CARGO</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>
Containers	14,632	16,920	14,128	17,255	19,039	20,209
Autos	33,274	41,414	42,244	53,857	42,418	52,759
Lumber (000's GBF)	20,465	53,347	43,348	52,908	40,237	17,597
Breakbulk (tons)	31,619	33,849	76,995	70,525	43,731	19,647

The twenty-five acre area allocated for storage of lumber and Subarus is presently used to capacity whenever discharge of the two cargos coincides requiring maximum storage for Subarus and lumber simultaneously. Lumber and Subaru vessels call once a month each, on the average. Cargo is stored on the terminal for up to two weeks. More frequent vessels calls and faster turnover would result in higher annual capacity at Conley for these commodities. Booz Allen estimated that Conley had the capacity to handle three times its 1979 level of autos and lumber. This type of capacity increase is beyond the direct control of the terminal operator.

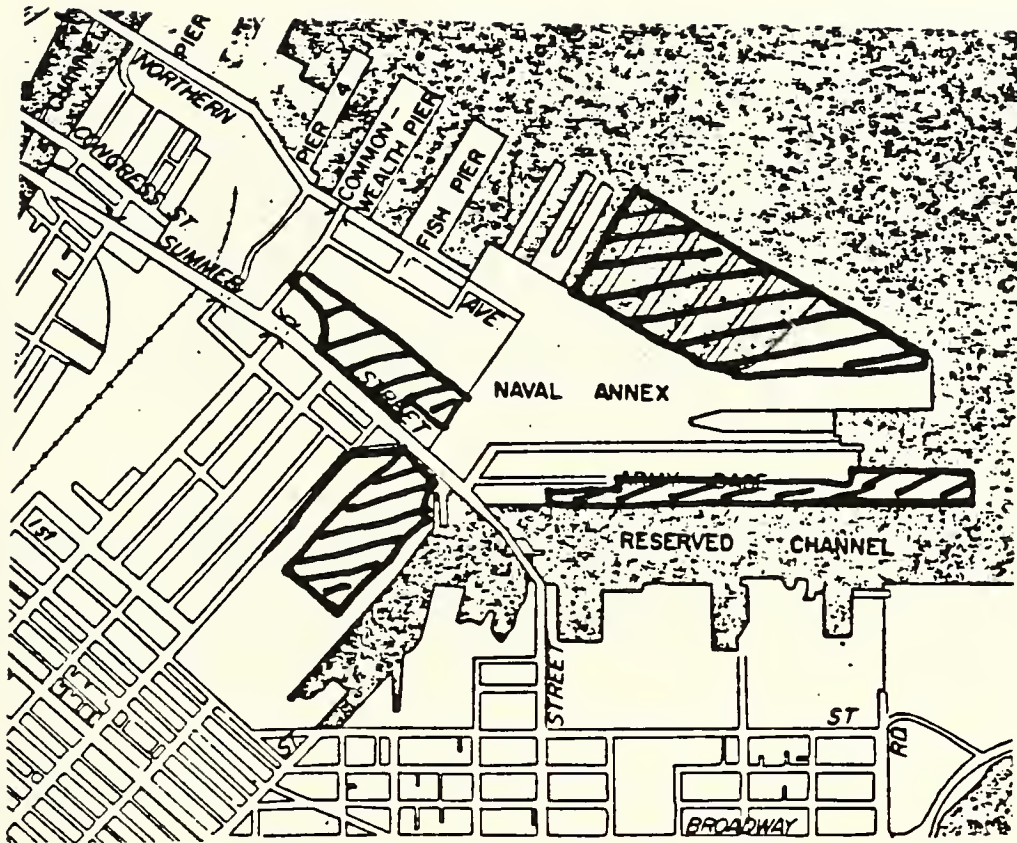
The new Berth 11 container facility will increase Boston's container capacity by 24,500 containers. Conversion of additional acreage to container storage will increase capacity by 2,450 containers per acre. Up to five acres can be made available with minor re-allocation of terminal activities. Beyond this, relocation of either lumber or auto imports to the Massport Marine Terminal will be required.

Maximum container development at Conley (3 berths and 75 acres) would yield capacity of 135,000 containers, assuming chassis storage.

E. The Massport Marine Terminal includes acreage at the former South Boston Naval Annex, the Navy Recreation property in South Boston, the Army Base, Commonwealth Flats, and Commonwealth Pier.

At the Naval Annex, Massport has undertaken a large-scale seaport construction project which will provide the Port of Boston with container handling facilities into the next century. The site, 11 acres of land and 36 acres of water, was leased by the Authority from the City of Boston in 1979 after several years of intense negotiations. When fully developed for container handling it will comprise a 3-berth, 4-crane, 47 acre terminal with 2700 feet of marginal wharf.

During the initial stage of construction, which began in 1980, the original finger piers were removed. Within the next three years the 11-acre north jetty will be rehabilitated and 36 acres of water area adjacent to the existing pier face will be filled in. Construction of a dike around the fill site has been completed. Fill operations, which began during the spring of 1981 will continue for several years. A portion of the 1.2 million cubic yards of material required to fill the 36 acres now under water will be purchased from the MBTA as it is excavated from the Southwest Corridor construction project.



MASSPORT MARINE TERMINAL COMPLEX - 1979

	<u>Berth</u>	<u>Acreage</u>	<u>Covered Storage</u>
Commonwealth Flats	-	10	-
Army Base	5465 ft.	-	865,000
Annex	-	-	-
	5465 ft.	10	865,000
Additional Capacity			
1980: Annex	1000 ft.	-	-
1981: Annex	-	10.72	-
Navy Rec.	-	15.8	-
1982: Annex	-	8	-
1983: Annex	-	16	-
1984: Annex	-	12	-
	6465 ft.	72.52 acres	865,000 sq.ft.
1985-90 Annex	2000 ft.		
	8465 ft.		

The terminal will be used for the open storage of bulk and neo-bulk cargo while the fill settles and compacts and until it is required for container handling. Open storage areas at the former Navy Recreation Property (15.8 acres) and Commonwealth Flats (10 acres) will be used to store cargo such as imported automobiles or salt which has been unloaded at the north jetty berth. The wharf shed and pier sheds at the Army Base are presently used for warehousing and it is anticipated that this use will continue. However these buildings and the Army Base berths could be returned to cargo handling if justified by cargo demand.

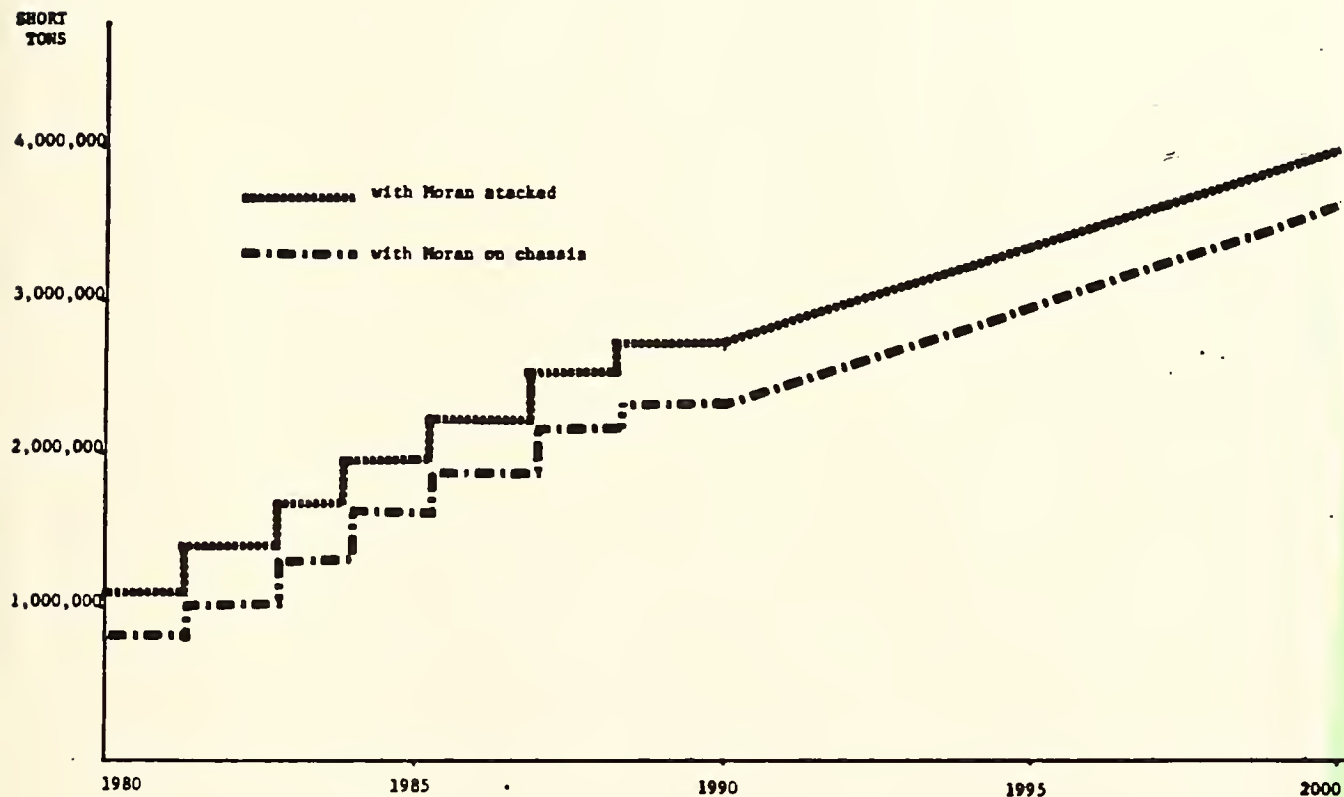
F. Future Terminal Demand: In 1979, Massport had 125 acres available or under use for cargo handling at Moran, Conley, and Commonwealth Flats, including 32 acres for container cargo, 54 acres for other general and neo-bulk cargos, 17 acres under development, and 20 acres leased for bulk cargo handling as summarized in the table below:

STORAGE ACREAGE AS OF 1979 *

	<u>MORAN</u>	<u>CONLEY</u>	<u>COM. FLATS</u>	<u>TOTAL</u>	<u>1979 TONNAGE</u>
<u>GENERAL CARGO</u>					
Containerized	22	10	-	32	736,008
Breakbulk	-	13	-	13	43,734
<u>NEO-BULK</u>					
Automobiles	-	31	-	31	46,008
Lumber	-	10	-	10	35,209
<u>BULK</u>					
Scrap (Schiaivone)	11.5	-	-	11.5	These bulk cargos are handled at leased facilities by private terminal operators
Salt (Cargill)	-	-	3	3	
Oil (Texaco)	-	6	-	6	
AVAILABLE STORAGE	-	-	7	7	
UNDER CONSTRUCTION	-	10	-	10	
	33.5 acres	80 acres	10 acres	123.5 acres	

* Does not include apron, covered storage, access or circulation areas. Also does not include the Naval Annex leased in late 1979 or the Navy Rec Property acquired in 1981.

By 1985, this acreage will have increased to 187 acres with the additions of the Annex and Navy-Rec properties and it is estimated that 62 acres will be used for container handling. Present container capacity and additional capacity resulting from the Authority's port development program are summarized in the table which follows:



	<u>1980</u> ²	<u>by 1985</u> ³	<u>by 1990</u> ⁴	<u>by 2000</u> ⁵
Container storage acres available	32	62	87	133
Container berth available	1700 ft	2700 ft	3700 ft	6400 ft
Total container capacity ¹ (000's)	106	151-179	212-241	327-356
Container tonnage capacity ¹ (000's)	1,128	1,646-1,968	2,346-2,668	3,662-3,984
Total acreage available for non-container cargo	91.5	124.5	99.5	52.5

¹ higher container capacity assumes stacked storage at Moran, lower capacity assumes chassis storage at all terminals

² See previous table for breakdown by terminal

³ 30 additional acres at Conley for containers; add 47 new acres at Annex and 16 new acres at Navy Rec.

⁴ 25 additional acres at Conley for containers;

⁵ 47 additional acres at Annex for containers

