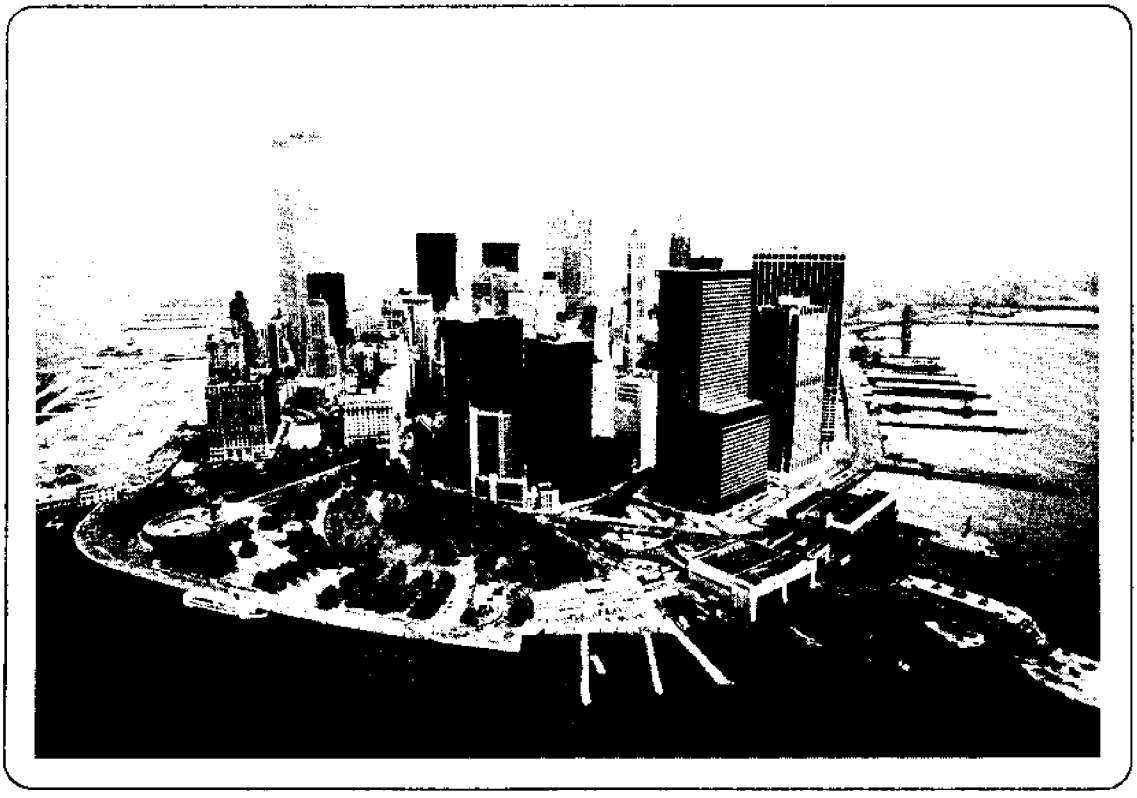
The New York City Waterfront:

An Analysis of Municipal Ownership and Leasing of Public Land



By Mitchell Moss
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ABSTRACT

This original compilation of location, size, use, and revenue of New York City's municipally-owned waterfront parcels offers a valuable management tool. Revenue from these properties is considerably less than their potential revenue and considerably less than the revenue of comparable private-owned properties. The city's lease price per square foot is about 39 percent lower than that charged for similar private parcels. This study highlights the need for a management information system to better use the municipally-owned shoreline. Moreover, it proposes a systematic policy of long-term leasing to encourage public and private cooperation in revitalizing the urban waterfront and to improve the life style of its people.

INTRODUCTION

This paper considers the management of municipally owned land within the City of New York. Up to this time, the management of publicly owned land has been a concern primarily of the federal government which has vast holdings used for a variety of purposes. To date, numerous studies have been made of federal government practices in managing public lands, yet considerably less attention has been given to the functions that local governments perform in this area.[1] The New York City waterfront is examined here as a case study in local land management through a description and an analysis of the use of the city's publicly owned shoreline.

The City of New York obtained title to much of the land within its boundaries in 1668 when Governor Dongan issued a city charter that granted "all the waste, vacant, unpatented, and unappropriated lands...within the ...city and on Manhattan's Island...extending and reaching to the low-water ...not heretofore given or granted."

During the initial period of ownership, the city followed a "mixed policy of selling and leasing."[2] The revenues from such activities provided funds for municipal services and improvements. In the mid-19th century when funds were needed to pay for such major municipal improvements as the Croton Aqueduct much of the municipally owned land was sold. However, the city retained the coastal property by leasing docks and piers to private firms and continues this policy to the present day.

The practice of leased public lands in cities has been employed for centuries. In contemporary urban communities, leasing is used for a variety of purposes including, most notably, port facilities. Public ownership and leasing also has been used in the development of major commercial and recreational facilities in the United States, such as Marina del Rey in Los Angeles and Mission Bay in San Diego, while in Europe, it has been used extensively as a planning and development tool in a number of cities.[3]

Changes on Urban Waterfronts

The issue of managing public leaseholds is especially important for urban waterfronts where changes in economic activity and marine transportation technology have substantially altered the pattern of port use. For example, containerization has replaced the cumbersome piecemeal method of moving cargo. This new shipping technology requires an amount of land that is rarely available or is too expensive at ports situated on or near the central business district. Thus, new port facilities to accommodate container ships have been developed at locations outside the central business district.

Changes in the pattern of passenger transportation also have influenced the level of activity at the urban port. Air transportation has replaced the ocean liner as the dominant mode of intercontinental transportation. As a result, the demand for passenger ship travel has declined.

The emergence of new modes of land transportation have further altered the character of waterfront use in urban areas. The interstate highway system and trucks have replaced the railroad as the predominant method of cargo movement to and from the ports. The increased role of trucking is due to the capacity of trucks to meet the needs of the increasingly dispersed population.

These changes in transportation technology have significantly decreased the level of port activity in many large American cities. The major users of port facilities--cargo and passenger shipping firms, railroads, warehouses, and port related industries--have adjusted their operations to meet the locational and spatial requirements brought about by modern transportation technologies. Such firms no longer make extensive use of the piers, terminals, and land areas next to the port. As a result, such facilities have been neglected, under maintained, and often abandoned.

The impact of these technological and economic processes can be seen on the Manhattan waterfront in New York City.[4] During the last 15 years, cargo shipping through the Port of New York and New Jersey has increased; however, Manhattan has not participated in the growth. In fact, with the development of modern container facilities on the New Jersey side of the port, activity has declined dramatically on the piers of Manhattan.

Currently much of the publicly owned waterfront is underused and inaccessible to citizens. This property is under the jurisdiction of the city's Department of Ports and Terminals which leases parcels and also grants permits for a variety of uses. The leasing of this land has been conducted in a series of individual decisions concerning particular parcels rather than in the context of an overall leasing policy for a valuable public resource.

In order to analyze in economic terms the city's performance in using its enormous holdings of urban waterfront land and to point to possible improvements in that use, it is first necessary to fully describe the city's holdings and their uses. It is sadly symptomatic of the city's management that no comprehensive picture of the waterfront holdings is available. The most laborious part of this study has been the piecing together from city records of the data necessary to develop a comprehensive picture of the waterfront resources.

In the section that follows, the public waterfront is fully described in terms of number of land parcels, their location, area, use, type of lessor, revenues generated, and prices per square foot. Waterfront property used for parks is excluded. The data on land area and revenues unfortunately are not complete for all parcels. Nonetheless, the scope of the description is sufficiently complete to allow a careful analysis of the city's performance in resource allocation within this paper. The CONCLUSION--A CHANGE IN MANAGEMENT section presents the conclusions and points to the likely fruitfulness of future comparative work, i.e., judging New York City's public waterfront use against the performance of other major cities with significant waterfront holdings.

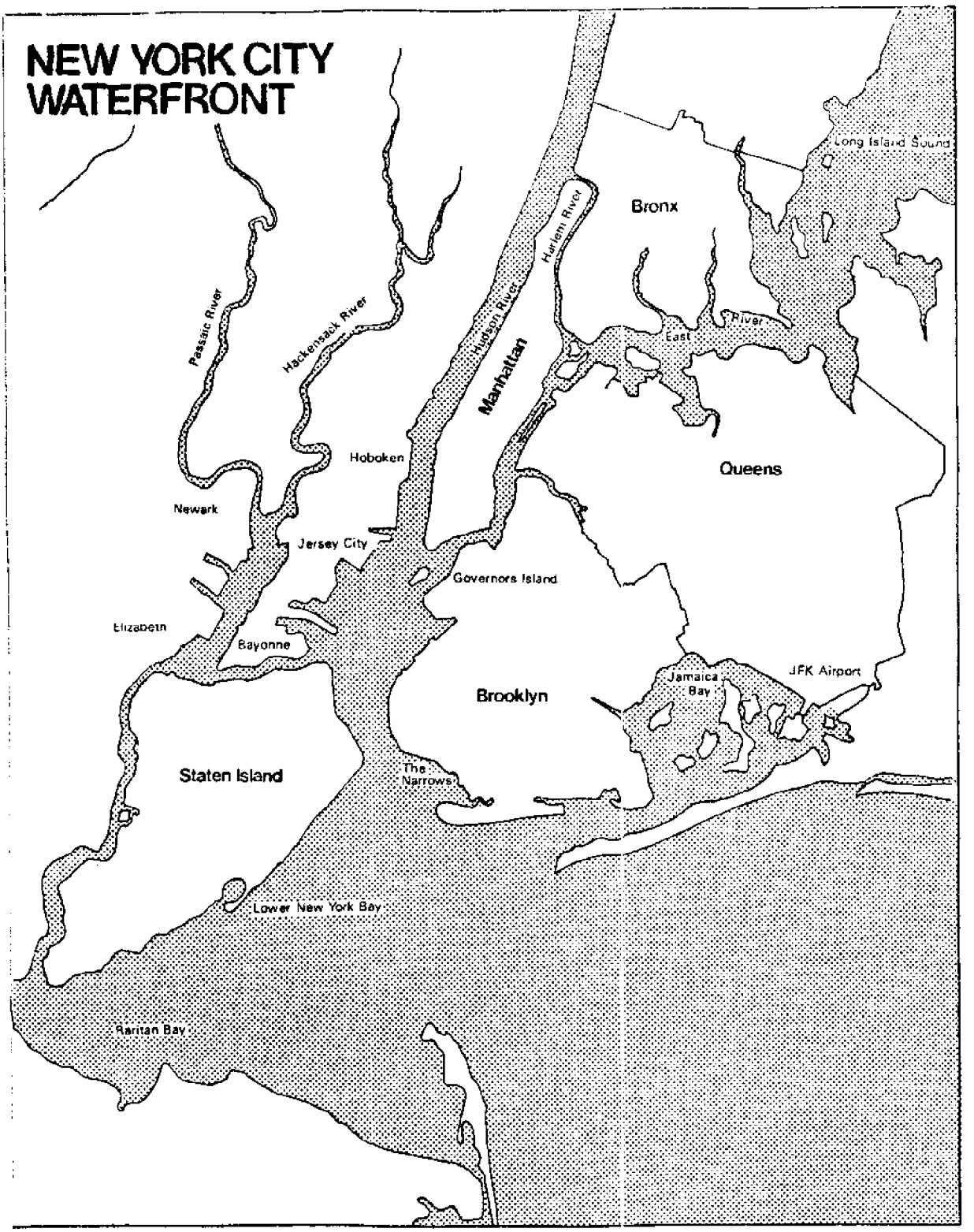
NEW YORK CITY
WATERFRONT
Long Island Sound
Bronx
Harlem River
Hudson River
Manhattan
East River
Queens
Passaic River
Hackensack River
Hoboken
Newark
Jersey City
Governors Island
Elizabeth
Bayonne
JFK Airport
Jamaica Bay
Brooklyn
Staten Island
The Narrows
Lower New York Bay
Raritan Bay

FIGURE 1

NEW YORK CITY'S WATERFRONT HOLDINGS

Waterfront Parcels

Figure 1 shows the area of New York City. Much of the description that follows relating to location of city parcels can be best understood by reference to this map. Examination of the map reveals that the city has an enormous coastline with much of that coastline owned by the city. As noted above, the description and analysis presented here excludes existing waterfront parks and a few large scale projects such as Battery Park City Landfill.

Table 1 presents borough location and acreage data of the waterfront parks. The figures present an estimate of total park, playground, and beach area located in the City of New York's coastal zone. An inventory of city recreational facilities including name, address, and acreage and a street map of New York City provided the sources of data of Table 1. Because it is frequently difficult to designate the boundaries of a coastal zone, the park acreage figures in this study are an estimate. The deciding factor in categorizing a waterfront park is whether a park area borders on the waterfront and/or obtains its character from its coastal location. The details for each borough (names and acreage of each waterfront park) are shown in the Appendix.

Over 10,000 acres of city coastal zone are used for parks. The Bronx (the only mainland borough) accounts for 3,514 of those acres. Pelham Bay Park in the Bronx represents the lion's share of Bronx waterfront park area (over 2,100 acres) as is clear from the map. The city's total acreage of waterfront park area is much greater than the area of Central Park (about 2,200 acres), the most widely known of America's urban parks.

The large scale projects on city owned waterfront, which are excluded from the analysis, are listed in Table 2. Exclusion is based on whether the land is already designated as a waterfront park and also on the size of a project.

TABLE 1

WATERFRONT PARKS IN NEW YORK CITY: BOROUGH AND AREA

Borough	Area (Acres)
Manhattan	1,332 (a)
Bronx	3,514
Queens	2,490 (b)
Brooklyn	1,989 (c)
Staten Island	1,318 (d)
Total	10,643

(a) Includes 404 acres in three island parks in the East River.

(b) Includes Breezy Point, 345 acres of land under water.

(c) Excludes 9,151.8-acre Jamaica Bay Reserve.

(d) Includes 14-acre Hoffman and Swinburne Islands.

TABLE 2

LARGE SCALE WATERFRONT PROJECTS NOT INCLUDED IN TABULATIONS

Borough and Project	Area (Acres)
Manhattan	
Battery Park City Landfill	100
Convention Center	40
Bronx	
Hunts Point Market	270
Brooklyn	
Military Ocean Terminal	105
Bush Terminal	N.A.
Staten Island	
Howland Hook	600
Gateway National Park	N.A.
Federal Military Installations	N.A.

Turning now to the main focus of this study, the city owned waterfront parcels, Table 3 presents the number of parcels by borough. (Hereafter, the descriptive phrase city owned will not be repeated unless required for clarity.) Of the 621 parcels listed, 508 are in two boroughs, Manhattan and Brooklyn. These two were settled and developed earlier than the others, and so New York City's early port facilities were concentrated there.

In Table 4 the 621 waterfront parcels are designated by the body of water in which they are located. There are three major concentrations of waterfront parcels; North River, East River, and Rockaway-Jamaica Bay parcels are in Manhattan and most of Rockaway-Jamaica Bay parcels are in Brooklyn. Of the 137 East River parcels, 71 are in Manhattan and the others are in Brooklyn and Queens.

The waterfront parcels are listed by use in Table 5. Because there are interesting differences in the use of Manhattan parcels compared with the other boroughs, the table shows Manhattan separately. The single most important use category city-wide is health, education, and recreation, accounting for 180 parcels. However, Manhattan is unusually low in that use with only 25 parcels. Another use which could be considered as recreation, namely marina-fishing, shows 96 parcels, none of which are in Manhattan. (There are in fact four marinas in Manhattan but because of use definitions and different department jurisdictions, they do not show up in the data of Table 5.) Industrial use accounts for 113 parcels about half of which are in Manhattan. The most predominant use in Manhattan is parking, accounting for the use of 97 of the borough's 239 waterfront parcels. In the other four boroughs only five parcels are used for parking. Residential use is trivial with only two parcels in the entire city.

The city's waterfront resources can be viewed in terms of two broad economic categories, production and consumption. Use for production presumably adds to employment and income in the city. Use for consumption adds to the amenities or the quality of life in the city. Of course it also adds to employment and income but that effect is not as important.

In Table 6, the uses listed in Table 5 are grouped by production, consumption, and all other uses. Viewed in this way it becomes clear that most of the parcels outside Manhattan fall under consumption use (252 out

TABLE 3

NUMBER OF CITY OWNED WATERFRONT PARCELS BY BOROUGH

Borough	Number of Parcels	Percent of Total
Manhattan	239	38.5%
Bronx	30	4.8
Queens	56	9.0
Brooklyn	269	43.3
Staten Island	27	4.3
Total*	621	100.0%

* Figures may not add due to rounding.

TABLE 4

NUMBER OF CITY OWNED WATERFRONT PARCELS BY BODY OF WATER

Body of Water	Number of Parcels	Percent of Total
North River (Hudson)	134	21.6%
East River	137	22.1
Harlem River	36	5.8
Long Island Sound	5	0.8
Upper N.Y. Bay Narrows	44	7.1
Rockaway-Jamaica Bay	259	41.7
Arthur Kill	4	0.6
Atlantic Ocean	2	0.3
Total	621	100.0%

TABLE 5

NUMBER OF CITY OWNED WATERFRONT PARCELS BY TYPE OF USE

Use	All Boroughs	Manhattan	Four Other Boroughs
Residential	2	1	1
Commercial	33	15	18
Parking	102	97	5
Industrial	113	55	58
Health, Education, and Recreation	180	25	155
Marina-Fishing	96	--	96
Utility Maintenance	48	17	31
Vacant	29	19	10
Other	18	10	8
Total	621	239	382

TABLE 6

PRODUCTION AND CONSUMPTION USES OF CITY OWNED WATERFRONT PARCELS

Use Category	All Boroughs	Manhattan	Four Other Boroughs
Production uses[(a)]	296	184	112
Consumption uses[(b)]	278	26	252
All other uses[(c)]	47	29	18
Total	621	239	382

(a) Commercial, parking, industrial, and utility maintenance.

(b) Residential, health, education, recreation, and marina-fishing.

(c) Vacant and other.

TABLE 7

EFFECTIVE TERM OF LEASE ON CITY OWNED WATERFRONT PARCELS

Term of Lease	All Boroughs	Manhattan	Four Other Boroughs
One Year or Less	123	72	51
Extension	498	167	331
Total	621	239	382

of 382, or 66 percent). On the other hand, most of the Manhattan parcels are allocated to production use (184 out of 239, or 77 percent).

Although data on the rate of turnover of lessees of waterfront parcels are not available, terms of lease data are presented in Table 7. Judging from the term of lease data, one might infer that there is less turnover of lessees in the Bronx, Queens, Brooklyn, and Staten Island, where only 51 parcels (13 percent) have leases of one year or less. In Manhattan 72 of the 239 parcels or 30 percent have leases of one year or less.

Table 8 shows the parcels by type of lessee. Type of lessee and use are, of course, different. According to Table 8 only 17 parcels in the city are leased by parking firms, but Table 5 shows that 102 parcels are used for parking. Thus there are 85 parcels used for parking which are not leased by parking firms. Many of those are government lessees, federal, state, municipal, or public authority. Most of the 72 parcels leased by government agencies are in Manhattan.

More than 90 percent of the parcels leased by marine related organizations are outside Manhattan. The non-marine related lessees have 198 parcels of which 116 or 59 percent are in Manhattan.

Area of Waterfront Parcels

The total area in the 621 waterfront parcels included in this study is not known exactly. In some cases the area is not included in the city's records. In others, only a measurement in linear feet is provided or the parcel is simply described as one berthing or two berthings , defined as a sufficient distance to maneuver a ship. The number of parcels for which area data are missing is summarized in Table 9. Most of the parcels for which area data are not available are outside Manhattan.

This should not hinder one of the purposes of this study which is to evaluate the efficiency of the city's leasing practices. Since efficiency in production is easier to evaluate than efficiency in consumption (e.g. the benefits derived from consumption use are not easily expressed in dollar terms), it is fortunate that the parcels with area measures are in Manhattan since uses for production are concentrated there (see Table 6).

TABLE 8

TYPE OF LESSEE OF CITY OWNED WATERFRONT PARCELS

Type of Lessee	All Boroughs	Manhattan	Four Other Boroughs
Government			
Federal agency	16	14	2
State agency	1	1	--
Municipal agency	39	32	7
Public authority	16	13	3
Total	72	60	12
Marine Related			
Passenger-tourist	23	6	17
Cargo	20	10	10
Marina	59	8	51
Individual	153	3	150
Fishing	36	--	36
Other	5	--	5
Total	296	27	269
Non-Marine Related			
Parking	17	17	--
Haulage-warehousing	24	21	3
Commercial firm	38	22	16
Industrial firm	55	20	35
Con Edison	38	20	18
Other utility	8	3	5
Penn Central	8	6	2
Dock railway	3	--	3
Other	7	7	--
Total	198	116	82
Institution	16	12	4
Vacant	39	24	15
Total All Lessees	621	239	382

TABLE 9

NUMBER OF CITY OWNED PARCELS BY AREA MEASUREMENT AVAILABILITY

Category	All Boroughs	Manhattan	Four Other Boroughs
Area Measure Available	387	198	189
Area Measure Not Available	234	41	193
Total	621	239	382

TABLE 10

AREA OF CITY OWNED PARCELS BY BOROUGH

Borough	Area of Parcels (thousands of square feet)	Percent of Total
Manhattan	8,167	40.3%
Bronx	291	1.4
Queens	396	2.0
Brooklyn	10,924	54.0
Staten Island	470	2.3
Total	20,248	100.0%

TABLE 11

AREA OF CITY OWNED PARCELS BY BODY OF WATER

Body of Water	Area of Parcels (Thousands of square feet)	Percent of Total
North River (Hudson)	6,064	29.9%
East River	2,795	13.8
Harlem River	470	2.3
Long Island Sound	2	-
Upper N.Y. Bay-Narrows	5,683	28.1
Rockaway-Jamaica Bay	5,218	25.8
Arthur Kill	3	-
Atlantic Ocean	13	0.1
Total	20,248	100.0%

A summary of the total area of the 387 parcels for which data are available is presented in Table 10 by borough. Manhattan and Brooklyn together account for 94.3 percent of the area of measured parcels in the city. That is in rough accordance with the data on number of parcels by borough which show that Manhattan and Brooklyn have about 82 percent of the waterfront parcels (see Table 3).

The total area of over 20 million square feet is equivalent to 465 acres, 197 acres of which are in Manhattan where the nation's highest land values are concentrated.

Table 11 shows the area of waterfront parcels located by proximity to a body of water. The North River parcels, all of which are in Manhattan, account for the largest single concentration of waterfront area (29.9 percent of the total). In close second place is the Upper New York Bay-Narrows waterfront with 28.1 percent followed by Rockaway-Jamaica Bay with 25.8 percent. Those three riverfront areas together account for 83.8 percent of the measured waterfront area in the city's possession. Comparing the area data with the number of parcels by body of water (Table 4), it becomes clear that the Upper New York Bay-Narrows parcels are unusually large. With only 44 parcels (7.1 percent of the total number of parcels), the Upper New York Bay-Narrows city waterfront represents 28.1 percent of the area. On the other hand, Rockaway-Jamaica Bay has the greatest number of parcels (259 or 41.7 percent of the total), but its measured area of 5,218,000 square feet is not as great as the Upper New York Bay-Narrows area (5,683,000 square feet). That is because the Rockaway-Jamaica Bay parcels are primarily used for docks for private pleasure craft.

Further explanations of use are shown in Table 12 which presents the area of waterfront parcels by type of use. Manhattan is listed separately from the other boroughs because of the already noted differences in use between it and the rest of the city. As seen in the table, Manhattan accounts for almost 8.2 million square feet or 40 percent of the city owned waterfront total of over 20.2 million. However, Manhattan waterfront only accounts for 13 percent of the total city waterfront area in commercial use and about 30 percent of the city waterfront area in industrial use. Although all the vacant waterfront area of almost 2 million square feet is in Manhattan, the figure simply denotes that area measures were not available

TABLE 12

AREA OF CITY OWNED PARCELS BY TYPE OF USE

Use	All Boroughs	Manhattan	Four Other Boroughs
Residential	261.4	261.4	-
Commercial	4,422.8	595.5	3,827.3
Parking	2,162.3	1,926.2	236.1
Industrial	9,021.7	2,689.3	6,332.4
Health, education, and recreation	491.9	354.1	137.8
Marina-fishing	1,537.1	-	1,537.1
Utility maintenance	22.7	13.0	9.7
Vacant	1,986.6	1,986.6	-
Other	342.4	341.1	1.3
Total	20,248.9	8,167.2	12,081.7

for vacant parcels outside Manhattan.

Table 13 looks at the use categories of Table 12 grouped according to production and consumption. Unlike the data on parcels by use, which show roughly half the parcels in production uses (see Table 6), the data by area indicate that a larger area of the waterfront is in production uses (77 percent). Only about 2.3 million measured square feet are in consumption uses (11 percent). Although Manhattan has far more parcels in production uses than the other four boroughs, Table 13 shows that in terms of area about two-thirds of the waterfront area in production uses (10.4 million square feet) is in the other four boroughs. The major share of that area is in Brooklyn as the other three boroughs have less developed and less city owned waterfront area (see Table 10).

The total measured area of waterfront parcels occupied by various types of lessees is presented in Table 14. In Manhattan, municipal agencies, public authorities, and parking firms use almost 4 million square feet of the borough's total measured waterfront area of nearly 8.2 million square feet. Outside Manhattan, haulage-warehousing operations and commercial firms lease 8.5 million square feet of the four-borough total of nearly 12.1 million square feet. The next most important type of lessee is marina operations with over 1.4 million square feet.

Rental Income

Data on the annual rental income which the city earns from its leased waterfront parcels are not complete. For some parcels, the official records do not show the rental income. In other cases, the rent is based upon a formula from which it is not possible to calculate the annual rent with data available. On some parcels, the rent has been waived by the city.

The description which follows excludes parcels without stated rents and parcels with formula rents (7 parcels in Manhattan, 24 in the other four boroughs). The rental data shown in the tables which follow represent the sum of annual rentals on parcels for which rent is not waived. However, the number of parcels shown includes parcels for which rent has been waived.

Total annual rental income generated by the city's leased waterfront parcels (excluding the 31 parcels with formula rents or parcels with missing

TABLE 13

AREA OF CITY OWNED WATERFRONT
PARCELS IN PRODUCTION AND CONSUMPTION USES
(thousands of square feet)

Use Category	All Boroughs	Manhattan	Four Other Boroughs
Production Uses[a]	15,629.5	5,224.0	10,405.5
Consumption Uses[b]	2,290.4	615.5	1,674.9
All Other Uses[c]	2,329.0	2,327.7	1.3
Total	20,248.9	8,167.2	12,081.7

(a) Commercial, parking, industrial, and utility maintenance.

(b) Residential, health, education, recreation, and marina-fishing.

(c) Vacant and other.

TABLE 14

AREA OF CITY OWNED WATERFRONT PARCELS BY TYPE OF LESSEE
(thousands of square feet)

Type of Lessee	All Boroughs	Manhattan	Four Other Boroughs
Federal agency	115.4	115.4	--
State agency	2.5	2.5	--
Municipal agency	2,532.7	2,497.9	34.8
Public authority	1,074.0	1,074.0	--
Passenger-tourist	140.0	137.2	2.8
Cargo	917.3	208.7	708.6
Marina	1,549.5	100.7	1,448.8
Individual	180.1	14.8	165.3
Fishing	270.3	--	270.3
Marine related	29.5	--	29.5
Parking	389.7	389.7	--
Haulage-warehousing	4,849.1	334.4	4,514.7
Commercial firm	4,230.0	214.3	4,015.7
Industrial firm	688.5	310.2	378.3
Con Edison	93.5	92.7	0.8
Other utility	2.0	2.0	--
Penn Central	34.6	27.2	7.4
Dock railway	483.2	--	483.2
Non-marine related	135.6	135.6	--
Institution	273.7	252.2	21.5
Vacant	2,257.7	2,257.7	--
Total	20,248.9	8,167.2	12,081.7

TABLE 15

RENTAL INCOME OF CITY OWNED PARCELS BY BOROUGH

Borough	Annual Rental Income		Number of Parcels*	
	Amount (Thou. $)	% of Total	Number	% of Total
Manhattan	$6,364.4	58.6%	232	39.3%
Bronx	20.9	0.2	30	5.1
Queens	37.4	0.3	55	9.3
Brooklyn	4,326.3	39.8	254	43.1
Staten Island	110.3	1.1	19	3.2
Total	$10,859.3	100.0%	590	100.0%

* Includes parcels for which city has waived rent.

data) is presented in Table 15 by borough. As with other measures presented (number of parcels, measured area), Manhattan and Brooklyn together account for almost all of the rental income (98.4 percent). Manhattan has the highest annual rental income, almost $6.4 million, which is about 50 percent larger than the rental income from the Brooklyn parcels.

More interesting than the distribution of total rent by borough, however, is the fact that the city's annual income from its leased waterfront parcels is slightly under $11 million. With over 20 million measured square feet of city owned waterfront parcels (see Table 10), that amounts roughly to an annual return of 50 cents per square foot of land. Although for agricultural uses that would be a fabulous rate of return, we shall show in the next section that, for urban real estate, it is less than optimum.

The rental income from waterfront parcels is broken down by body of water in Table 16. About $9.1 million of the total rental income of $10.9 million is derived from parcels on the North River (exclusively Manhattan) and on the East River (split about evenly between Manhattan and Brooklyn). Table 16 shows that the body of water with the greatest number of parcels, Rockaway-Jamaica Bay, only generated about 3 1/2 percent of the rental income. That is because most of those parcels are leased for private recreational use, specifically the docking of pleasure craft, and most of those parcels include submerged land.

Rental income by type of use is presented in Table 17. Of the total rental income of $10.9 million, almost $6.7 million is derived from parcels leased for industrial use. That is about 61 percent of the total. The only other uses which produce a significant amount of income are commercial and parking uses. Together, commercial, parking, and industrial uses account for about 10.3 million of the city's rental income, or 95 percent of the total. It is interesting to note that although most of the industrial use rental income comes from parcels outside Manhattan, little of the non-marine related commercial and parking rental income is generated outside Manhattan.

From Table 17 it is clear that Manhattan is the major source of rental income producing $6.4 million out of the $10.9 million total or around 60 percent. But Manhattan accounts for only 40 percent of the measured area of waterfront parcels (see Table 12). That suggests, of course, that the lease rates for Manhattan parcels tend to be higher. Certainly that

TABLE 16

RENTAL INCOME OF CITY OWNED
PARCELS BY BODY OF WATER

Body of Water	Annual Rental Income		Number of Parcels[a]	
	Amount (thou. of $)	% of Total	Number	% of Total
North River (Hudson)	$3,324.8	30.6%	130	22.0%
East River	5,795.9	53.4	130	22.0
Harlem River	127.6	1.2	36	6.1
Long Island Sound	1.3	-	5	0.9
Upper N.Y. Bay-Narrows	1,231.9	11.3	29	4.9
Rockaway-Jamaica Bay	373.0	3.4	254	43.1
Arthur Kill	3.4	-	4	0.7
Atlantic Ocean	1.4	-	2	0.3
Total[b]	$10,859.3	100.0%	590	100.0 %

(a) Includes parcels for which city has waived rent.

(b) Figures may not add due to rounding.

TABLE 17

RENTAL INCOME OF CITY OWNED WATERFRONT
PARCELS BY TYPE OF USE
(thousands of $)

Use	All Boroughs	Manhattan	Four Other Boroughs
Residential	$ 0.1	-	$ 0.1
Commercial	2,381.5	$2,257.5	124.0
Parking	1,247.4	1,166.8	80.6
Industrial	6,652.2	2,624.9	4,027.3
Health, Education, and Recreation	130.2	48.5	81.7
Marina-Fishing	145.2	-	145.2
Utility Maintenance	61.8	35.6	26.2
Vacant	-	-	-
Other	240.9	231.1	9.8
Total	$10,859.3	$6,364.4	$4,494.9

TABLE 18

RENTAL INCOME OF CITY OWNED
PARCELS IN PRODUCTION AND CONSUMPTION USES
(thousands of $)

Use Category	All Boroughs	Manhattan	Four Other Boroughs
Production Uses[a]	$10,342.9	$6,084.8	$4,258.1
Consumption Uses[b]	275.5	48.5	227.0
All Other Uses[c]	240.9	231.1	9.8
Total	$10,859.3	$6,364.4	$4,494.9

(a) Commercial, parking, industrial, and utility maintenance.

(b) Residential, health, education, recreation, and marina-fishing.

(c) Vacant and other.

general finding is in accord with what one would expect in a rational market given the unusually high real estate values in Manhattan. However, the land values are probably not so different as to account for the anomaly presented by commercial use income compared with commercial use measured area (Table 12) as summarized below.

Commercial Use	Manhattan	Four Other Boroughs
Percent of commercial income	94.8%	5.2%
Percent of commercial area	13.5%	86.5%

Although Manhattan has only 13.5 percent of the measured square feet leased for commercial use, it accounts for 94.8 percent of the income. This difference may perhaps be accounted for by extensive rent waivers on the commercial parcels in the other four boroughs. Nonetheless, a rough calculation of price per square foot per year of $4.00 in Manhattan vs. $0.04 in the other boroughs is certainly striking.

The rental income is aggregated by production and consumption uses in Table 18. Consumption uses account for less than 3 percent of rental income from waterfront parcels, and most of that is cutside Manhattan.

Rental income is broken down by type of lessee in Table 19. Industrial firms represent the largest single source of rental income--about $3.3 million or 30 percent of the total. Cargo type lessees are second with over $2.8 million followed by public authorities with $2.3 million. Municipal agencies which use 2.5 million square feet of waterfront parcels in Manhattan do not pay any rent.

Prices Per Square Foot

In order to calculate an annual lease price per square foot for each waterfront parcel, it is necessary to know:

(a) the annual lease rent for the parcel, and

(b) the area of the parcel in square feet.

As already noted for some parcels the annual rent is not given or it is based upon a formula. All of those parcels were excluded in calculating prices per square feet. Also excluded were parcels lacking an area measure.

TABLE 19

RENTAL INCOME OF CITY OWNED WATERFRONT
PARCELS BY TYPE OF LESSEE
(thousands of $)

Type of Lessee	All Boroughs	Manhattan	Four Other Boroughs
Federal agency	$ 58.9	$ 58.9	-
State agency	-	-	-
Municipal agency	-	-	-
Public authority	2,299.6	2,162.9	136.7
Passenger-tourist	296.1	267.2	28.9
Cargo	2,838.0	842.5	1,995.5
Marina	166.0	13.5	152.5
Individual	61.4	0.9	60.5
Fishing	69.1	-	69.1
Marine related	8.9	-	8.9
Parking	679.5	679.5	-
Haulage-warehousing	341.4	340.8	0.6
Commercial firm	456.9	318.0	138.9
Industrial firm	3,264.5	1,409.2	1,855.3
Con Edison	189.8	172.7	17.1
Other utility	24.9	13.7	11.2
Penn Central	30.8	28.8	2.0
Dock railway	11.7	-	11.7
Non-marine related	29.9	28.8	1.1
Institution	32.0	27.1	4.9
Vacant	-	-	-
Total	$10,859.4	$6,364.5	$4,494.9

For the remaining parcels, the annual lease price per square foot was calculated. Parcels with waived rentals were included, but of course, the price per square foot for each of those parcels is zero. In all of the tables which show mean prices per square foot for various categories of parcels, the means are unweighted.

In excluding parcels lacking the rent data or lacking the area measure, the number of parcels is reduced to 377 from 621.

Status	All Boroughs	Manhattan	Four Other Boroughs
Parcels with rent and sq. ft. data	377	193	184
Parcels lacking rent or sq. ft. data	244	46	198
Total	621	239	382

As can be seen, more than half the parcels in the boroughs other than Manhattan do not have rent or square feet data. That is because most of those parcels are land under water, and their use is primarily private recreation, i.e., the docking of pleasure craft.

The annual prices per square foot for the sample parcels included are presented by borough in Table 20. The city wide average for the 377 parcels is 42 cents per square foot. It is important to stress that the square feet used in the calculations is land area, not floor space. In the section which follows, these prices will be analyzed in terms of implied land values and comparisons will be made with privately owned land. But in this section the data will simply be presented.

As seen in Table 20, in Manhattan the average price of 70 cents per square foot is much higher than in any of the other boroughs. The lowest average price (7 cents per square foot) is for the 44 parcels in Queens. What is perhaps most surprising in Table 20 is that the average price in Brooklyn (14 cents per square foot) is lower than Manhattan's. That is surprising because Brooklyn parcels account for about 40 percent of the

TABLE 20

ANNUAL PRICES PER SQUARE FOOT FOR CITY OWNED WATERFRONT PARCELS BY BOROUGH

Borough	Average Price per Square Foot (a)	Number of Parcels in Sample	Coefficient of Variation (b)
Manhattan	$0.70	193	1.73
Bronx	$0.10	13	1.42
Queens	$0.07	44	0.97
Brooklyn	$0.14	115	1.78
Staten Island	$0.20	12	0.92
Total	NA	377	
Average	$0.42	NA	

(a) Unweighted mean.

(b) The coefficient of variation is a relative measure of the extent of variation in the prices per square foot. It is calculated by dividing the standard deviation by the mean. The larger the coefficient of variation, the greater the dispersion among the prices. A coefficient larger than one indicated substantial dispersion.

city's rental income from waterfront parcels (Table 15). The discrepancy apparently is in the large number of Brooklyn parcels for which measured area data are missing. There are 115 parcels in Brooklyn included in the price data sample, but 254 in the rental income data sample. For Manhattan, on the other hand, 193 parcels are included in the price data sample out of a total of 232.

Also shown in Table 20 is the coefficient of variation, a measure of the relative dispersion among prices (see footnote (b) to Table 20 for a fuller explanation). The greatest dispersion in prices occurs in Brooklyn and Manhattan, according to that measure.

The average prices per square foot by body of water are presented in Table 21. The highest average prices are for parcels in the North and East Rivers. Those are also the rivers which account for 84 percent of the city's rental income (see Table 16). The very high coefficient of variation for the East River parcels (1.95) reflects an average of over $1.00 on the Manhattan side and around 12 cents on the Brooklyn side. The third highest average price is only 23 cents per square foot per year (upper N.Y. Bay-Narrows). The others are so low that, if they are not trivial, they are certainly only nominal.

Average prices are shown by three categories of use (production, consumption, and other) in Table 23. The average prices in production uses are much higher than in other uses. Within production uses, however, Manhattan prices are almost four times larger than prices in the other four boroughs.

It is evident from the above that there are great differences in average prices between Manhattan and the rest of the city with Manhattan being much higher in all the uses which generate significant income. Because of these differences, the city wide average prices are not very meaningful or representative. Consequently, in the tables which follow, the averages for all boroughs are not shown.

There is a great deal of variation among average prices by type of lessee as shown in Table 24. In Manhattan, average prices per square foot range from a high of $1.65 for parking lessees to a low of 6 cents for marina and individual lessees (for parcels under water). As in the case of prices by use, the range outside Manhattan is not as wide. The highest average price is 44 cents per square foot to Con Edison while the lowest is 5 cents

TABLE 21

ANNUAL PRICES PER SQUARE FOOT FOR CITY OWNED WATERFRONT PARCELS BY BODY OF WATER

Body of Water	Average Price per Square Foot (a)	Number of Parcels in Sample	Coefficient of Variation
North River (Hudson)	$0.61	115	1.20
East River	$0.85	74	1.95
Harlem River	$0.18	25	1.05
Long Island Sound	$0.10	3	1.72
Upper N.Y. Bay-Narrows	$0.23	15	0.68
Rockaway-Jamaica Bay	$0.12	143	1.96
Arthur Kill	$0.02	1	--
Atlantic Ocean	(b)	1	--
Total	NA	377	
Average	$0.42	NA	

(a) Unweighted means

(b) Less than 1¢

TABLE 22

ANNUAL PRICES PER SQUARE FOOT FOR CITY OWNED
WATERFRONT PARCELS BY TYPE OF USE

Use	All Boroughs	Manhattan	Four Other Boroughs
Residential	--	--	--
Commercial	$0.75	$1.21	$0.32
Parking	$0.76	$0.78	$0.38
Industrial	$0.54	$0.77	$0.13
Health, Education and Recreation	$0.10	$0.10	$0.10
Marina-Fishing	$0.10	--	$0.10
Utility Maintenance	$1.75	$3.22	$0.28
Vacant	--	--	--
Other	$0.25	$0.28	--
Average	$0.42	$0.70	$0.13

TABLE 23

ANNUAL PRICES PER SQUARE FOOT FOR CITY OWNED
WATERFRONT PARCELS BY CATEGORY OF USE

Use Category	All Boroughs	Manhattan	Four Other Boroughs
Production Uses[a]	$0.73	$0.87	$0.23
Consumption Uses[b]	$0.10	$0.10	$0.10
All Other Uses[c]	$0.08	$0.08	--
Average	$0.42	$0.70	$0.13

(a) Commercial, parking, industrial, and utility maintenance.

(b) Residential, health, education, recreation, and marina-fishing.

(c) Vacant and other.

TABLE 24

ANNUAL PRICES PER SQUARE FOOT FOR CITY OWNED WATERFRONT PARCELS BY TYPE OF LESSEE

Type of Lessee	MANHATTAN		FOUR OTHER BOROUGHS	
	Avg. Price	No. of Parcels	Avg. Price	No. of Parcels
Federal agency	$0.36	11	--	--
State agency	--	1	--	--
Municipal agency	--	31	--	2
Public authority	$0.94	9	--	--
Passenger-tourist	$1.56	4	$0.40	1
Cargo	$1.51	7	$0.28	3
Marina	$0.06	7	$0.15	42
Individual	$0.06	3	$0.09	97
Fishing	--	--	$0.10	3
Marine related	--	--	$0.08	4
Parking	$1.65	17	--	--
Haulage-warehousing	$0.94	21	--	--
Commercial firm	$1.40	19	$0.24	9
Industrial firm	$0.76	18	$0.15	18
Con Edison	$1.20	6	$0.44	2
Other utility	$0.31	1	--	--
Penn Central	$0.86	2	$0.24	1
Dock Railway	--	--	--	--
Non-marine related	$0.67	7	--	--
Institution	$0.55	5	$0.05	2
Vacant	--	24	--	--
Total	NA	193	NA	184
Average	$0.70	NA	$0.13	NA

TABLE 25

ANNUAL PRICES EXCLUDING PARCELS WITH WAIVED RENT, BY BOROUGH

Borough	Number of Parcels with Rent and Square Feet Data			Average Price per Square Foot Based on Parcels Paying Rent	Coefficient of Variation
	Total	Rent Waived	Rent Paid		
Manhattan	193	64	129	$1.04	1.29
Bronx	13	2	11	$0.12	1.26
Queens	44	1	43	$0.07	0.95
Brooklyn	115	3	112	$0.15	1.76
Staten Island	12	2	10	$0.24	0.73
Total	377	72	305	NA	
Average	NA	NA	NA	$0.52	

per square foot to institutions.

As already noted, the calculations of average prices in the above tables include the many parcels for which the city has waived rent. The number of such waivers varies by borough, by use, and by lessee. Consequently, the data presented reflect average revenue per square foot to the city, but do not adequately reflect the average cost per square foot to the users who pay rent. Those prices (or costs) are shown in the tables which follow. They are necessarily higher than the prices shown before because parcels with waived rents are excluded from the calculation of the averages.

Table 25 presents average prices by borough per square foot, excluding parcels for which rent has been waived. It also shows how many parcels have waived rents. The striking point about the data shown is that the difference between the Manhattan average price and the other boroughs becomes greater by excluding the parcels with waived rents. That is because almost all the parcels with rent waived are located in Manhattan (64 out of 72). The Manhattan average price of $1.04 per square foot shown in Table 25 is 34 cents higher than the Manhattan average, <u>including</u> waived rent parcels (see Table 20). For the other boroughs, the averages go up very little by excluding waived rent parcels. The Staten Island average is 4 cents higher, Bronx 2 cents, Brooklyn 1 cent, and Queens shows no change.

Off hand, one would think that rent waivers would be most numerous in boroughs with lower prices per square foot. But that is not the case. Most rent waivers are in Manhattan where the city obtains the highest prices per square foot.

Average prices in Manhattan, based on parcels paying rent, are shown by use in Table 26. In Manhattan, the only use category without any rent waivers is utility maintenance. All the other categories have a relatively significant number of parcels with waived rents. All 19 of the vacant parcels have waived rents. It should be noted that "vacant" indicates that the parcel has no lessee, that the parcel is not being used, or that it has been abandoned by the previous lessee.

In the other four boroughs, rents for only 8 parcels (for which area in square feet is known) have been waived. Therefore, taking out the waivers has no significant effect upon the average prices originally shown in

TABLE 26

ANNUAL PRICES EXCLUDING PARCELS WITH WAIVED RENT, BY USE

Use	Number of Parcels with Rent and Square Feet Data			Average Price per Square Foot based on Parcels Paying Rent	Coefficient of Variation
	Total	Rent Waived	Rent Paid		
Residential	--	--	--	--	--
Commercial	12	3	9	$1.61	0.90
Parking	94	20	74	$0.99	0.66
Industrial	40	13	27	$1.13	1.22
Health, Education and Recreation	16	3	13	$0.12	1.87
Marina-Fishing	--	--	--	--	--
Utility Maintenance	4	--	4	$3.22	1.80
Vacant	19	19	--	--	--
Other	8	6	2	$1.11	0.72
Total	193	64	129	NA	
Average	NA	NA	NA	$1.04	

Table 22. The eight parcels with waived rents outside Manhattan are used as follows.

Commercial	1
Industrial	1
Health, Etc.	4
Utility Maintenance	1
Other	1
Total Waived	8

Average prices and number of parcels with waived rents are shown by type of lessee in Table 27 for Manhattan only. The average prices range from a high of $1.70 per square foot for public authorities to a low of 6 cents for marinas and individuals. There are no rent waivers for private firms but waivers affect public lessees. All 31 municipal agencies have rent waivers, while among public authorities, 4 out of 9 have rent waivers. Three out of 11 federal agencies, as well as the single state agency, have rent waivers.

TABLE 27

ANNUAL PRICES EXCLUDING PARCELS
WITH WAIVED RENT, BY LESSEE

Lessee	Number of Parcels With Rent and Square Feet Data			Average Price per Sq. Foot Based on Parcels Paying Rent
	Total	Rent Waived	Rent Paid	
Federal agency	11	3	8	$0.50
State agency	1	1	--	--
Municipal agency	31	31	--	--
Public authority	9	4	5	$1.70
Passenger-tourist	4	--	4	$1.56
Cargo	7	--	7	$1.51
Marina	7	--	7	$0.06
Individual	3	--	3	$0.06
Fishing	--	--	--	--
Marina related	--	--	--	--
Parking	17	--	17	$1.65
Haulage-warehousing	21	--	21	$0.94
Commercial firm	19	--	19	$1.40
Industrial firm	18	--	18	$0.76
Con Edison	6	--	6	$1.20
Other utility	1	--	1	$0.31
Penn Central	2	--	2	$0.86
Dock railway	--	--	--	--
Non-marina related	7	--	7	$0.67
Institution	5	1	4	$0.69
Vacant	24	24	--	--
Total	193	64	129	NA
Average	NA	NA	NA	$1.04

ANALYSIS OF NEW YORK'S WATERFRONT RESOURCES

Methodology

The purpose of the analysis in this section is to evaluate the performance of New York City in its allocation of a valuable resource--the urban waterfront holdings of the city. The chief criterion for this evaluation is the principle of opportunity cost. Namely, given present uses of the city's waterfront, are there other uses which would yield greater economic benefits? If so, then the present allocation is inefficient.

Because of the complexities involved in estimating net benefits in consumption uses, specifically the imputation of dollar values for aggregate utility or satisfaction, no attempt is made here to evaluate consumption uses. The analysis will focus on production type uses. In production uses the market provides unambiguous yardstick prices with which efficient use can be evaluated.

One difficulty in comparing alternative uses of urban land in terms of their net benefit or rate of return is the host of constraints upon land use. The spatial distribution of various economic activities within an urban area is anything but uniform. Land prices reflect that uneven distribution as do lease prices for the use of land. The land under Rockefeller Center or the Pan Am building is more valuable than any city owned waterfront parcel. In the short run the conditions which make that midtown land so valuable cannot be replicated along the city owned waterfront. Consequently, in comparing the city's rate of return from present uses to alternative uses, premium type uses will be excluded as not presently good alternatives. In considerations of long term development strategies for the city's Manhattan waterfront, however, the possibility of premium uses should not be excluded. After all, in the nation's second major office center (Chicago), waterfront land has commanded premium prices.

The specific output of this evaluation analysis is a set of comparisons between what the city is presently earning on its waterfront holdings (in production uses) with what it could be earning under different assumptions. One of the problems involved in making such comparisons is the form of the available data. As reported we have data on annual lease income and area

(in square feet) for much of the city's waterfront. Thus it has been possible to calculate the annual income per square foot for different uses and locations. From another large sample of real private property sales, we have data on the selling price (market value). From that sample (895 sales), it has been possible to estimate market values per square foot. In order to make comparisons between annual income per square foot (the city waterfront data) and market value per square foot (the private real property sales data), it is necessary to convert annual income into market value or vice versa. That requires application of the basic present value formula.

According to the economic theory of capital (and standard financial practice), the present market value of an asset that will generate a stream of net income over the future is the discounted value of that asset. The key variables required to estimate the present value of an asset are:

(1) the expected remaining life of the asset,

(2) the estimated net income generated in each future period of remaining life,

(3) the appropriate rate of discount (i.e. the interest rate).

In reality, none of those three variables is ever known for certain. Thus risk and uncertainty are central issues in valuing assets. Although the physical life of an asset may be known with some reasonable accuracy, technological change may reduce the effective life. Needless to say, the estimated net income generated in the future is subject to uncertainty. That is not unrelated to the appropriate rate of discount. The degree of risk and uncertainty which the market assigns to any asset in any period is reflected in the discount rate. That is, part of the discount rate reflects a risk premium. Even if there were an asset with absolutely no risk and a world with no inflation, the asset's future income would still have to be discounted by some rate of interest greater than zero because people have a preference for present income over future income. They demand a payment for waiting.

The present value formula is shown in equation (1).

$$(1) \qquad P.V. = \sum_{t=1}^{n} \frac{Y_t}{(1+r)^t}$$

P.V. = present value of an asset,

Y_t = net income produced by the asset in future year t,

r = discount rate,

n = number of years of remaining life of the asset.

If it is assumed that net income (Y) will be the same for all future years (i.e., from t=1 to n), then equation (1) is the sum of a geometric progression, which is:

$$(2) \qquad \sum_{t=1}^{n} \frac{Y_t}{(1+r)^t} = \frac{Y}{r} - \frac{Y}{r}\left(\frac{1}{1+r}\right)^n$$

It can be seen that as n approaches infinity, then equation (2) becomes simply:

$$(3) \qquad \frac{Y}{r}$$

It can be shown that for values of n greater than 40, the present value is very closely approximated by equation (3).

In this analysis, the asset under consideration is urban land. Because all land is assumed to have perpetual life, the present value formula applied is

$$(4) \qquad P.V. = \frac{Y}{r}$$

Of course using that formula requires the assumption that net income in all future periods is the same. In current dollars, that is an absurd assumption. However, having no information about the future, it is reasonable (and standard practice in applied economics) to assume that today's net income, in terms of today's purchasing power, is the best available estimate of net income in each future year, holding purchasing power constant at today's level.

For specific data of this analysis, the variables in equation (4) are:

$$\begin{pmatrix}\text{Market value per}\\ \text{square foot of}\\ \text{land}\end{pmatrix} = \begin{pmatrix}\text{Annual lease income}\\ \underline{\text{per square foot of land}}\\ \text{(Interest rate)}\end{pmatrix}$$

This formula can be applied to average annual lease income per square foot on the city's waterfront holdings to estimate their implied average market values per square foot. By rearranging the formula

$$\begin{pmatrix}\text{Market value per}\\ \text{square foot of}\\ \text{land}\end{pmatrix} \text{(Interest rate)} = \begin{pmatrix}\text{Annual lease}\\ \text{income per square}\\ \text{foot of land}\end{pmatrix},$$

the equation can be applied to our sample estimates on private real property to estimate their implied average annual lease incomes per square foot.

It is recognized that such a procedure lacks discrimination. If our interest were to estimate the market value of each one of a set of city waterfront parcels, using the average lease income would be unacceptable because land values vary greatly. But our interest is in making aggregate estimates and comparing those aggregates. Therefore the procedure is acceptable.

A 10 percent rate of interest is used for discounting in this analysis. There is no compelling reason to use 10 percent, but given the present structure of market interest rates and the consensus projection of long run inflation around 5 percent per year, a discount rate of 10 percent for urban land is not unreasonable.

Market Value of Private Real Property

From the real property sales records of the City of New York, we have obtained data on privately owned parcels that were sold in the 18-month period from mid-1974 to the end of 1975. The records exclude sales which are not considered bona fide, that is seller and buyer must be different parties (the transactions must be "arms length"). In order to develop a sample of private parcels roughly comparable to the city owned waterfront parcels, only those private parcels in Manhattan within three blocks of the waterfront were included. Thus the sample consists of 895 private parcels including the sales price (market value), assessed land value, location, and use. Although data on land area of each parcel were not available, it was

possible to develop plausible estimates of land area which were then used to calculate market values per square foot. The estimation procedure is described below.

The real property sales data include the assessed land values in addition to the assessed value of land plus improvements and the market value. The sample of 895 real property sales in Manhattan includes 119 walkup buildings in lower Manhattan. The residential walkup buildings were almost all built near the turn of the century and tend to be uniform in size and land area, on lots of about 2,500 square feet. The total land area of those 119 buildings was calculated (119 x 2,500 sq. ft.). Then the ratio r was calculated:

$$r = \frac{\text{Aggregate estimated land area of 119 walkup buildings}}{\text{Aggregate assessed land value of 119 walkup buildings}}$$

Assuming that assessors use a standard formula for assessing land, the ratio r (r= .10294) was used to estimate land area of the other property types as follows:

$$r \left[\begin{array}{c}\text{Aggregate assessed land value} \\ \text{of property type j}\end{array}\right] = \begin{array}{c}\text{Estimated aggregate land} \\ \text{area of property type j}\end{array}$$

The aggregate market values for each property type (commercial, parking, etc.) from the sample were divided by their respective estimated aggregate land areas to derive estimates of market value per square foot. These estimates include land value and improvements.

It would have been desirable for the sample of private parcels to be as similar as possible to the public waterfront parcels, but since data on annual lease charges per square foot are not available for all the city's waterfront parcels such correlation could not be achieved. Calculation of lease charges per square foot requires both an area measure for the parcel and an amount for annual lease payment. It is fortunate for comparison purposes that there are 198 city owned parcels with area measures (square feet) in Manhattan (see Table 9). Those parcels total more than 8 million square feet or 40 percent of the city's parcels with known area (see Table 10). Of those 198 Manhattan parcels, annual lease charges are known for 193 of them. Thus average prices per square foot can be calculated for 193 city owned parcels in Manhattan. Outside of Manhattan,

TABLE 28

AVERAGE PRICES PER SQUARE FOOT OF CITY OWNED PARCELS
INCLUDING AND EXCLUDING PARCELS WITH WAIVED RENTS, BY BOROUGH

Borough	Parcels with Rent and Square Feet Data		Excluding Parcels with Waived Rent	
	Number	Avg. Price	Number	Avg. Price
Manhattan	193	$0.70	129	$1.04
Bronx	13	0.10	11	0.12
Queens	44	0.07	43	0.07
Brooklyn	115	0.14	112	0.15
Staten Island	12	0.20	10	0.24

another 184 city owned parcels have both area and lease charge data available. The number of parcels and average prices per square foot, by borough, have been presented in Table 20. Those average prices per square foot for city owned waterfront parcels, by borough, are repeated in Table 28 which also shows the average prices excluding parcels with waived lease payments.

The first point extrapolated from Table 28 is that parcels with waived rents are concentrated in Manhattan. About one third (64 parcels) of the number in Manhattan pay no rent. Only eight parcels outside Manhattan have their rent waived. Consequently, the Manhattan average price excluding rent waivers is significantly higher than the average calculated with the waivers included ($1.04 per square foot versus $0.70). Outside Manhattan there is little difference in the average prices including or excluding waived rent.

The prices excluding waivers on Manhattan parcels can be validly compared with the implied prices from the sample of privately owned parcels. Limiting the comparison to parcels where rent is actually paid is dictated by the fact that there are two separate public policy questions involved.

1) Are the average prices charged by the city for production uses of its waterfront land efficient (i.e. do they represent the highest possible short run return on that land)?
2) Do waivers of rent for some users represent a rational resource management policy?

Another point brought out in Table 28 is that excluding parcels with waived rent, the Manhattan average price is several times higher than the average prices on other boroughs. It is about seven times more than the Brooklyn average of $0.15 per square foot. Thus if it can be shown that the city's return on its 129 rent paying Manhattan parcels is well below what the market would indicate, it could be reasonably implied that the return on the rent paying Brooklyn parcels is also too low. Together Manhattan and Brooklyn account for 98.4 percent of the city's $10.9 million annual rental income from its waterfront parcels (see Table 15).

The estimated market values per square foot of the private parcels within three blocks of the waterfront are presented in Table 29. Data for the 244 parcels shown are most comparable to the city waterfront parcels because they exclude private parcels in upper Manhattan. Very few of the city's

waterfront parcels that both pay an annual lease and have an available measure of area are in upper Manhattan. Consequently the 120 Manhattan parcels from which the city's average lease price is calculated (see Table 27) are virtually all in lower Manhattan (i.e. south of 72nd Street on the Hudson River and south of 42nd Street on the East River).

TABLE 29

MARKET VALUES OF PRIVATE PARCELS
NEAR LOWER MANHATTAN WATERFRONT

Type of Property	Total Market Value (thousand $)	Number of Parcels	Estimated Market Value per Square Foot
Walkup buildings	$9,756	119	$32.79
Commercial	12,668	41	19.95
Parking	3,795	29	19.36
Industrial	11,552	41	39.88
Vacant	1,638	14	33.50
Total	NA	244	NA
Average	$39,409	NA	$26.86

The market values shown include improvements, such as buildings. The estimated average of $26.86 per square foot suggests that the private parcels included are far from being premium Manhattan real estate. That average implies a market value per acre around $1.1 million. The fact that the values shown are by no means high is best seen by first converting them to an annual lease price basis using equation (3) and an interest rate of 10 percent.

TABLE 30

IMPLIED ANNUAL LEASE PRICES PER SQUARE FOOT BY PROPERTY TYPE

Type of Property	Implied Annual Lease Prices per Square Foot
Walkup buildings	$3.28
Commercial	2.00
Parking	1.94
Industrial	3.99
Vacant	3.35
Average	$2.69

The calculation implies that a square foot of land, including the improvements (structures of various kinds) upon it, yields an annual return of $2.69.

In sharp contrast to that return is the calculation of annual return per square foot of land upon which the improvement is an office building (Table 31). The calculation in Table 31 indicates that for a class B Manhattan office building with 30 floors of rentable office space at a secondary location the annual return per square foot of land is $14.40 per square foot. That is more than five times larger than the implied annual lease prices for our sample of private parcels.

From the striking comparison in Table 31 we infer two points. The first is that our private sample implies its lease prices are by no means high and thus serve as a conservative basis for comparison with the city's waterfront lease prices. The second point is that Manhattan's most highly valued private real estate, unlike other cities, is not to be found in the waterfront vicinity.

The implied average annual lease price for the private parcels in lower Manhattan has been estimated as $2.69 per square foot. The average annual lease price charged by the city for 129 Manhattan waterfront parcels is $1.04 per square foot (see Table 28). Thus the city's price is about 39

TABLE 31

ANNUAL RETURN PER SQUARE FOOT OF
MANHATTAN OFFICE BUILDING LAND
(based on 1976 rents)

	Premium Location Class A Building	Secondary Location Class B Building
Base rent per square foot of floor space (excludes pass-through cost increases)*	$12.00	$6.00
Assumed net income per square foot of floor space (10% return)	$1.20	$0.60
Assumed number of rentable stories (floors)	40	30
Estimated net income per square foot of land plus improvements (number of stories x net income per square foot of floor space)	$48.00	$18.00
Adjustment for assumed 20% open land on site	$38.40	$14.40

* Base rent data for 1976 provided by Landauer Associates.

percent of the implied market price on similarly located private parcels. Of course it would be even lower if the city's 64 parcels with waived rents were included.

It can be argued that the private parcel average is overstated since it includes improvements while the city's parcels have little in the way of improvements. However, the data of Table 29 indicate that vacant private parcels in the sample have an implied annual lease price of $3.35. Walkup buildings, which are notoriously poor investments, except for speculation, are valued slightly less than vacant land (an implied annual lease price of $3.28 per square foot). Thus the improvements on the sample of private parcels presumably are not highly valued. It is not unusual in Manhattan for vacant land to be more highly valued than land with improvements. If the improvements are obsolete in terms of present land uses, then the cost of development must include demolition. Consequently, land with no improvements, requiring no demolition, often will be more highly valued.

Estimation of Lost Income

In order to make conservative estimates, an annual lease price at the lower end of the private parcel property types will be used to estimate lost income on the city's Manhattan parcels. The rate selected is $1.96 per square foot, the midpoint between commercial and parking private property (see Table 29).

Table 32 presents reported lease income and hypothetical lease income on Manhattan's waterfront parcels under different assumptions. As shown, actual city income from production uses (about $6.1 million) plus other uses excluding consumption (about $0.2 million) totals about $6.3 million.

TABLE 32

LEASE INCOME ANALYSIS

		Thousands unless Otherwise Indicated
A.	Rental Income of City's Manhattan Parcels in Production Uses (from Table 18)	$6,084.8
B.	Area of City's Manhattan Parcels in Production Uses (from Table 13)	5,224.0
C.	Market Price from Private Parcel Sample	$1.96/sq. ft.
D.	Hypothetical Rental Income Using Market Price ($1.96 x 5,224.0, i.e. B x C)	$10,239.0
E.	Hypothetical Loss of Income on Parcels in Production Uses (A - D)	-$4,154.2
F.	Rental Income of City's Manhattan Parcels in Uses Other than Production or Consumption (from Table 18)	$231.1
G.	Area of City's Manhattan Parcels that Are Vacant or in Uses Other than Production or Consumption (from Table 13)	2,327.7
H.	Hypothetical Rental Income Using Market Prices ($1.96 x 2,327.7, i.e. G x C)	$4,562.3
I.	Hypothetical Loss of Income on Parcels in Other Uses or Vacant (F - H)	-$4,331.2
J.	Hypothetical Total Loss of Income (E + I)	-$8,485.4

The hypothetical income totals about $14.8 million (lines D + H). Therefore the hypothetical loss is about $8.5 million per year.

It must be stressed that the hypothetical loss applies only to Manhattan. It excludes an evaluation of consumption uses, and it is quite conservative because the hypothetical market price applied is only $1.96 per square foot. Roughly speaking, on a city wide basis the loss might be near $15 million.

For over 20.2 million square feet of city owned land area (a portion of which is land under water, especially outside Manhattan), the city earned only $10.9 million in 1975 (see Tables 13 and 15). Yet in the same year the city paid out $38.7 million for 8.4 million square feet of leased floor space in Manhattan (see Robert F. Wagner, Jr. City Leasing Practices. The Consequences of Mismanagement and a Blueprint for Reform, June 1976).

CONCLUSION--A CHANGE IN MANAGEMENT

The hypothetical income loss calculated in the previous section must be thought of as a short run loss because the market price used ($1.96 per square foot) reflects depressed values for private waterfront vicinity parcels. It is not unlikely that those depressed values are in large part a long run consequence of the city's non-policy regarding effective management of its waterfront resources.

Over the long run, a municipal waterfront policy should be developed which generated social and economic benefits. The physical environment and the economic base of New York City could be enhanced by a systematic program of long term leasing of the municipal waterfront. Such a leasing policy should be designed to provide a mix of uses in the waterfront, including recreational, residential, as well as commerical activities.

One type of development which would have important benefits for the eroding economic base of New York would be to build middle income condominium communities on tracts of city owned waterfront. Perhaps employers of large numbers of office workers in the city could be induced to finance condominiums in exchange for first claims in a number of the housing units for their middle-level employees. Property tax abatement would be desirable to keep the monthly charges low. One of the reasons often cited by employers for moving offices out of the city is the high cost of housing for employees. With appropriate long run policies, the city's waterfront could make positive contributions to the quality of life and work in New York and could strengthen the economic base of the city by preventing some out migration. At the same time, the waterfront could generate more annual revenues for the city than the present non-policy of individual short-term leases for non-intensive land uses.

A first step that the city could take toward improved use and management of its waterfront resource is to develop a data system for the vast holdings of parcels. To gather the information for this report required an enormous effort of collecting, classifying, and computerizing from the archaic record keeping sources of the Ports and Terminals Department. As a result, we have much more knowledge about the city's waterfront than anyone in city management. Effective management requires correct information and a comprehensive view. A management information system for the waterfront parcels is a necessary first step toward improved management.

The broad outline of the kind of data which should be developed, computerized, and maintained so that the data file is current are presented below.

Necessary Data

1. A separate record in the data system for each parcel, uniquely identified by code number.
2. Location of the parcel identified by tax lot and block, by waterfront (North River, etc.), by assessment district, by community planning district, by health area, by census tract, and by borough.
3. Use identification.
4. Lessee identification.
5. Term of lease information.
6. Area information.
7. Annual rental information.

One direction for further investigation is to explore the record of public development of waterfronts in other majcr cities. Proposed policies for New York's waterfront would be better informed if they were based upon the collective experience of waterfront development in other cities.

FOOTNOTES

1. Marion Clawson. "Historical Overview of Land Use Planning in the United States" in Environment: A New Focus for Land Use Planning, Donald M. McAllister, ed. Washington, DC: National Science Foundation, 1973.

2. John W. Reps. "Public Land, Urban Development Policy, and the American Planning Tradition", in Modernizing Urban Land Policy, Marion Clawson, ed. Baltimore, MD: The John Hopkins Press, 1973.

3. Mitchell L. Moss. "Marina del Ray A Prototype for Urban Development" in Financing State and Local Government: New Approaches to Old Problems, Mark Rosentraub, ed., Western Social Science Association, 1977.

4. Mitchell L. Moss. "The Urban Port: A Hidden Resource for the City and the Coastal Zone," Coastal Zone Management Journal, Vol. 2, No. 3, 1976.

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APPENDIX

Inventory of Waterfront Parks

The figures presented are an estimate of total park, playground, and beach areas located in New York City's coastal zone. We used primary documents from city government containing name, address, and acreage of recreational facilities, together with a street map of New York City, as sources for the following inventory. It is frequently difficult to designate the boundaries of a coastal zone; therefore, the park acreage figures in this study are estimates. The decision criteria employed in this study are if a park area borders on the waterfront and/or obtains its character from its coastal location, such as recreational area, it is categorized as a waterfront park.

APPENDIX

MANHATTAN	Acres
North River	
Battery Park	23.0
Fort Washington Park	145.8
Riverside Drive and Hudson River	
W 158th to Dyckman Sts.	
Riverside Park and Drive	293.1
W 72 to W 129 & W 135 to W 158 includes 79th St. Riverside Park Marina	
Total North River	461.9 acres
East River	
Jeanette Park	.73
Lillian Wald Playground	.7
Corlears Hook Park	4.4
Catherine Slip Malls	.1
Alfred E. Smith	2.8
Sarah Roosevelt	7.9
Hamilton Fish Park	4.3
East River Park	57.5
John J. Murphy	1.3
Public Bath and Playground	1.8
Esplanade	1.8
Playground	1.3
Peter Detmold Park	1.3
5 Parks	.8
Sutton Place	1.2
Playground	.6
John J. Park	3.3
Carl Schurz Park	14.9
Playground	.2
DeKovats Playground	1.3
Mill Rock	8.6

MANHATTAN (cont.)	Acres
Stanley Isaacs	1.2
Playground	1.1
School Playground	1.3
Pier E. 107	.4
T. Jefferson	15.5
Park	5.2
Triborough Bridge Park	2.3
Total East River	143.8 acres
Harlem River Drive Parks (series of strip parks)	9
Inwood Hill	196
High Bridge Park	119
Total Harlem River	324 acres
Island Parks in East River	
Mill Rock	8.7
Randall's Island	273.4
Ward's Island	122.4
Total Island Parks	404.5 acres
Total Manhattan	1,334.2 acres

BRONX WATERFRONT PARKS	Acres
Ft. Independence Park	3
Jerome Park Reservoir	
Bronx Park	721
Pugsley Creek Park	4.3
Washington Bridge Park	3.4
Sound View Park	149.5
Ferry Point Park	413.8
Riverdale Park	97.2
Pelham Bay Park	2117.8
Castle Hill Park	4.2
Total Bronx	3514.2 acres

QUEENS WATERFRONT PARKS	Acres
Astoria Park	61.2
Hermon Macneil Park	28.9
Clear View Park	103.9
Crocheron Park	45.8
Rainey Park Playground	8.1
Rockaway Park	31.5
Queensbridge Park	20.3
Francis Lewis Park	16.4
Rockaway Beach Boardwalk	179.1
Astoria Athlectic Field	3.6
Astoria Houses Playground	5.7
Jamaica Bay Park	144.8
Rockaway Community Park	253.7
JHS 180 Playground	1.1
PS 183 Playground	.9
Park	.8
Breezy Point Park (296 dry, 345.6 land under water)	641.6
Edgemere Park	253.7
Bayswater Park	25.0
Frank M. Charles	39.5
Alley Park	624.8
Total Queens	2,490.4 acres

BROOKLYN WATERFRONT PARKS	Acres
Canarsie Beach Park	132.2
Bensonhurst Park	19.8
Dyker Beach Park	216.6
Marine Park	798.0
Owls Head Park	27.1
Seaside Park and Aquarium	22.4
Ballfields	19.3
Drier-Offerman Park	73.1
Red Hook Recreation Area (upland park)	58.5
Leon Kaiser Playground	26.2
Playground	2.9
Spring Creek Park	46.9
Park	2.6
Playground	2.3
Coney Island Boat Basin	36.8
Joseph T. McGuire Park	77.2
Park	.5
Coney Island Beach and Boardwalk	106.1
Playground	1.2
Playground	2.2
Manhattan Beach Park	40.4
Playground	1.3
Playground	2.5
Park	1.0
Skating Rink	4.1
Park	26.2
Public Place	5.8
Jacob Riis State Park	236.4
Jamaica Bay	9,151.8
Total Brooklyn	11,141.4 acres

STATEN ISLAND WATERFRONT PARKS	Acres
Faber Park	4.3
FDR Boardwalk and Beach	638.5
Arthur Von Briesen Park	12.7
Richmond Terrace Esplanade	1.5
Sailor's Snug Harbor	75.8
Wolfe's Pond Park	317.4
Great Kills Park	253.3
Hoffman & Swinburne Is. Offshore	14.0
Lemon Creek	75.7
Total Staten Island	1,393.2 acres