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NEW YORK CITY

WHOLESALE FRESH FRUIT AND VEGETABLE MARKETS

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Issued June, 1960

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Summary

This report recommends new and efficient facilities at a new location for fresh fruit and vegetable wholesalers now operating from outmoded and inefficient facilities in the Lower Manhattan Market, the primary wholesale food marketing area in New York City.

New York City, the largest market for fresh fruits and vegetables in the country, serves millions of persons who live in the city's metropolitan area, many others who work in the city, shoppers, business visitors, and vacationers.

In 1956, the equivalent of 165,500 carlots of fresh fruits and vegetables, with a wholesale value of \$350 million, was handled. Of this amount 110,950 carlots were handled in the Lower Manhattan Market area. Secondary wholesale markets, food chains, and other facilities handled approximately 54,550 carlots. About 52 percent of the 165,500 carlots was received by rail, 44 percent by motortruck, and the remainder by boat and airplane.

The congestion, inefficiencies, and unsanitary conditions of the Lower Manhattan wholesale fruit and vegetable market have been known for many years and have prompted many efforts to improve them. Among the inadequacies of the present market are narrow streets; old, inefficient, and outmoded multistory buildings; lack of rail connections; unsanitary conditions and fire hazards—all of which have led to high costs of operation and made it difficult for many operators to remain in business.

Obviously, a new fruit and vegetable wholesale market for New York City is needed to correct these conditions. To accommodate the present requirements of 200 independent dealers and 2 fruit auction firms located in the Lower Manhattan area the following facilities would be needed: 12 buildings containing a total of 240 wholesale store units and 2 units for restaurants with public restrooms in the basements; house tracks (railroad tracks alongside a freight house or store for loading or unloading freight at the building) accommodating 240 rail cars for direct unloading at the stores; 80 offices for brokers and others on the second floor of a store building; auction facilities approximating 150,000 square feet on first floor and 50,000 square feet of office space and auction auditorium space on second floor; team tracks (tracks on which railroad cars are placed while freight is transferred between the cars and highway vehicles) for approximately 400 rail cars; paved streets not less than 150 feet wide (preferably wider), when store buildings face each other; and parking areas for at least 1,500 cars and motortrucks. The area should be large enough to permit expansion of stores, as needed.

These facilities, with space for future expansion, would require about 100 acres. Five possible sites have been considered, including a modernization and rebuilding of the present Lower Manhattan Market area. Advantages and disadvantages of each have been outlined. An effort was made to find some sites which could accommodate in the future the facilities of wholesalers of such other products as butter, eggs, cheese, and groceries, now located in the Lower Manhattan Market area. If the fruit and vegetable dealers are moved, it would be necessary to find a location for the other food dealers who would be dispossessed. Experience in other cities has shown that the benefits of a "one-stop" wholesale food distribution center at which several food commodities are sold are sufficient to justify such a center.

Cost of cartage, handling, waste and deterioration, rents, and delay to trucks, for moving the equivalent of 110,950 carlots through the Lower Manhattan Market area in 1956 from the first point of arrival in the city to retail outlets and to trucks of out-of-town buyers were approximately \$30.9 million, or about \$279 per carlot equivalent. This could be reduced to about \$20 million, or \$180 per carlot equivalent, at four of five suggested sites, thus saving about \$99 per carlot equivalent if efficient facilities were built on a proper site. The benefits of these savings would be divided among the consumers of Greater New York, the wholesale and retail trade, rail lines and trucking concerns.

To buy land and build a new market for the fruit and vegetable dealers located in the Lower Manhattan area would cost from \$15.9 million to \$107.5 million, depending on the site chosen, on the basis of July 1959 cost estimates. The cost of land, including grading, filling, and developing costs, was estimated to range from \$16,862 per acre in the Jersey City (Meadows) site and \$49,924 per acre in the Hunt's Point (Bronx) site to \$932,786 per acre in the present Lower Manhattan Market area. The high cost of land in the last-mentioned site practically excludes it from consideration.

The total revenue required, including reserves and contingency funds to meet the yearly debt service payments, real estate taxes, and operating expenses would vary with the total investment and type of financing used in constructing and operating a new market. The annual rental per square foot necessary to pay these charges was estimated to range from \$2.13 for store facilities on the Hunt's Point site, financed by a New York State regional market authority, to \$16.80 per square foot for space in the Lower Manhattan Market area, financed by a private corporation.



NEW YORK CITY WHOLESALE FRESH FRUIT AND VEGETABLE MARKETS

By HARRY G. CLOWES, agricultural marketing specialist
Transportation and Facilities Research Division
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Introduction

New York City is the most important market for fresh fruits and vegetables in the country. Excluding bananas, which move through this port, and shipments of fruits and vegetables received directly from producers at retail stores, it received during the year ending June 30, 1956, the equivalent of about 165,500 carlots from 46 States and at least 35 foreign countries. The wholesale value of the 122 different kinds of fruits and vegetables moving into this city is nearly \$350 million, at New York prices. In order to supply the consumers of the New York area with these products throughout the year, quantities are drawn from such distant places as Hawaii, Argentina, and Chile. California and Florida supplied more than two-fifths of the city's total receipts in 1956.

Many changes have taken place in the production, transportation, and delivery to the city of fresh fruits and vegetables since the wholesale markets in New York City began to operate more than three centuries ago.

Since that time the metropolitan area of New York City has expanded to many times its former size and in 1954, according to the estimates of the U.S. Bureau of the Census, it had a population of over 14 million persons (28).¹ This metropolitan area is spread over more than 3,900 square miles, including 5 boroughs of the city. Figure 1 shows the areas in the New York City harbor district served by the wholesale market facilities of the City of New York.

Many other developments also have taken place. Between 1947 and 1958, according to a recent issue of a popular magazine, over \$2 billion was invested in new buildings in the city (12). More than 120 new office buildings and 400 new apartment buildings have been started since then. Superhighways have been developed in many parts of the city.

Changes and improvements have been brought about in almost every phase of city life with the

exception of the facilities and system of getting fresh fruits and vegetables and other perishable food items to the millions of consumers in the city. Present conditions in the primary fresh fruit and vegetable wholesale markets of New York are very unsatisfactory. In the Lower Manhattan Market area, the principal wholesale market, practically all the businesses are housed in old, multistory, outmoded buildings which were not designed for handling fresh fruits and vegetables. The cobblestone streets, which were too narrow for the horse-drawn carts of 40 years ago, are hopelessly inadequate for modern motortrucks. This leads to high costs of handling and causes excessive waste and deterioration of produce.

These costs and relevant conditions affect many groups of persons, including the grower who ships produce to the market, the transportation company, the dealer, the buyer, and the many millions of consumers. It is important, therefore, that every effort be made to correct present conditions and alleviate the uneconomical handling system that is costing so many groups of persons many millions of dollars.

Much has been written about the deplorable condition of the primary wholesale fruit and vegetable markets of New York City.² The Bureau of Markets of the New York State Department of Agriculture and Markets lists in its files over 100 news items, magazine articles, and periodicals describing one or more facets of the problem of distribution of fresh fruits and vegetables in New York City. Studies have been made by such agencies as the New York City Department of Markets and Department of Public Works (14), the New York State Temporary Commission on Agriculture (16), and many others. The U.S. Department of

² For publications describing conditions in the fruit and vegetable markets of New York City and attempts to improve them, see the following items listed under Literature Cited, page 98: (3), (5), (11), (14), (15), (16), (18), (19), and (33).

¹ Italic numbers in parentheses refer to Literature Cited, p. 98.

AREAS OF NEW YORK CITY HARBOR DISTRICT SERVED BY THE
WHOLESALE FRUIT AND VEGETABLE MARKET FACILITIES
OF THE CITY OF NEW YORK

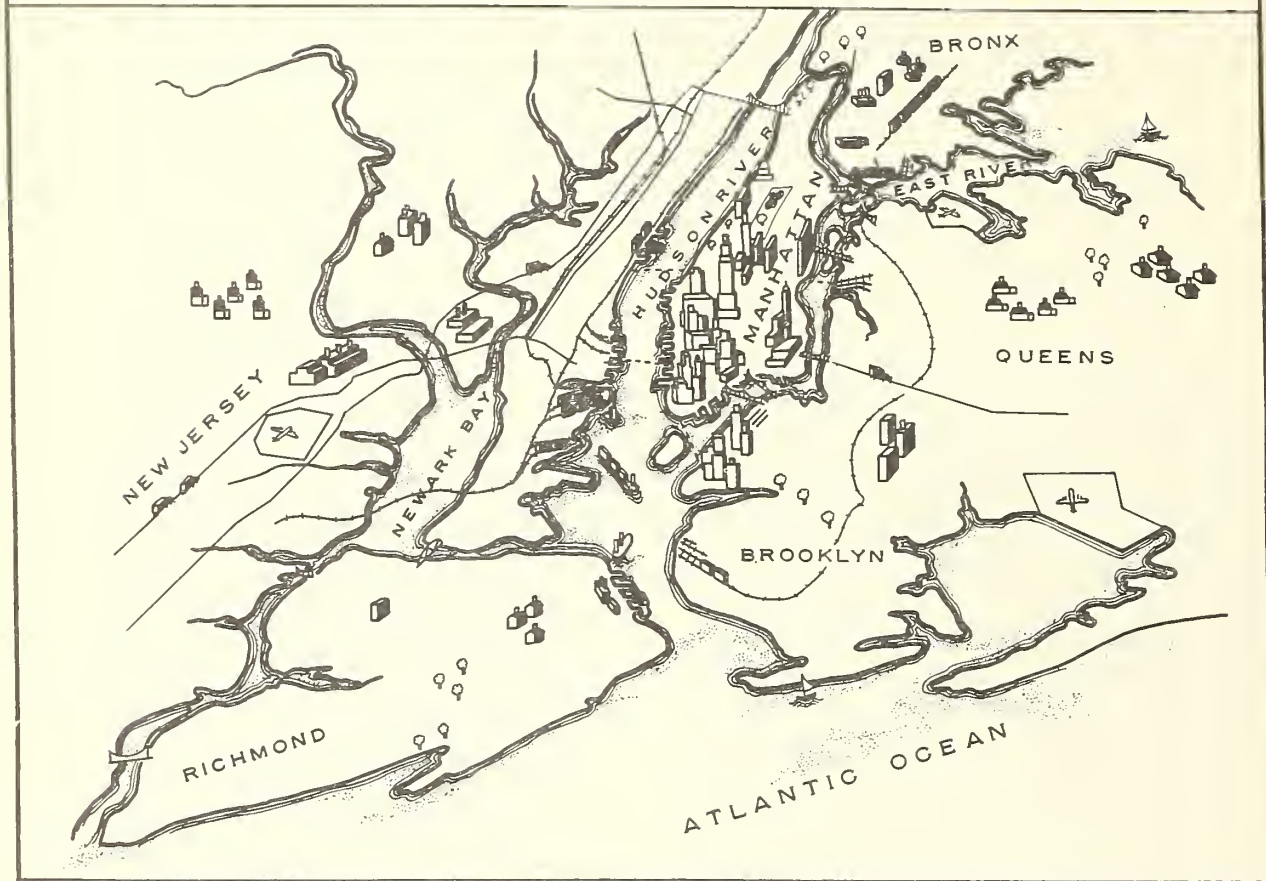


FIGURE 1

Agriculture published, in 1940, a special report describing the marketing conditions for fresh fruits and vegetables in New York City (5). For the most part, the conditions which existed at that time exist today.

Because of the unsettled situation caused by World War II and certain local factors, little has been accomplished toward obtaining a new market since the completion of the Department's report in 1940. However, interest has remained high. Several articles in widely read newspapers and magazines have pointed out the disadvantages of the old market area and the extremely high cost of distribution of fresh fruits and vegetables to the consumer in New York City (6), (13), (32).

This study was begun in June 1956 at the request of the New York Branch of the United Fresh Fruit and Vegetable Association for assistance in planning a new wholesale fresh fruit and vegetable market. It is part of a broad program of research

to improve the facilities used in moving farm and food products from farm to consumer in order to reduce marketing costs.

Objectives of the study were:

1. To analyze and evaluate the wholesale marketing situation for fresh fruits and vegetables for New York City.
2. To estimate the major direct costs in handling these products under present conditions.
3. To determine the kinds and amounts of facilities needed for efficient distribution.
4. To estimate total costs of construction, operating expenses, and sources of income for new marketing facilities in several possible locations in the New York City metropolitan area.
5. To outline the potential benefits to be secured from construction of a new and modern market.

This study deals with *fresh fruits and vegetables* only, but during the study it was found that other wholesale food groups and allied industries operate under the same difficult conditions in the same general marketing area in Lower Manhattan. They, too, would be affected if the present primary fresh fruit and vegetable market were moved. Furthermore, if the present market area were redeveloped they would need to find a new location.

Data shown in this report on flow, volume, and costs of handling are for the year ending June 30, 1956, unless otherwise indicated. These data are, however, still applicable.

These data were obtained primarily through interviews with wholesalers of fresh fruits and vegetables, from buyers who patronize the various

markets in New York City, truckers handling produce to and from these markets, railroad officials, representatives of city, State, and Federal governments, various trade organizations, and other interested persons. A preliminary report was made at a public meeting on November 23, 1957, which was attended by city, business, industrial, and civic leaders (4).

A short, illustrated booklet, giving the highlights of this study, has been published by the U.S. Department of Agriculture. It is Marketing Bulletin No. 6, "Improving Market Facilities in New York City for Wholesaling Fresh Fruits and Vegetables."

This publication sets forth the principal findings and recommendations of the study.

THE PRESENT MARKETING SYSTEM

New York City as a Food Distribution Center

New York City is the country's largest market for fresh fruits and vegetables. Its food marketing facilities serve directly the needs of over 14 million persons in the metropolitan area (29) and many hundreds of thousands additional consumers who come to the city for various purposes. Approximately 8 million persons lived within the five boroughs (Manhattan, Bronx, Queens, Brooklyn, and Richmond) of New York City in 1955, according to estimates of the New York State Department of Health and the Regional Plan Association, Inc. Data prepared by the association in 1957 indicated that the population of the five boroughs attained 8,400,000 that year.³ The city's population is augmented by another 400,000 daily commuters who work in the city's offices and factories, and many additional thousands of shoppers, business visitors, and vacationers. Nearly three-fourths of the Nation's ship-traveling public passes through the port of New York—830,000 in 1953.

According to the U.S. Census of Business (28), there were approximately 42,000 retail food stores in 1954 with sales of \$4.2 billion in the New York City standard metropolitan area. Over half of these sales (56.6 percent) were within the five boroughs of New York City. In addition, there were nearly 30,000 eating and drinking places in the area with sales of \$1.8 billion in 1954. Forty-one percent (\$738 million) of the sales of eating

and drinking places were in Manhattan Borough alone.

The Port of New York handled over 40 percent of the Nation's waterborne trade by value, or nearly 17 percent of its tonnage. Over \$171 million were spent in recent years by the city in improving its port facilities (20).

Twelve railroads and several hundred trucking firms serve the city's wholesale and retail businesses. Railroad freight terminals are operated by the New York Central System and the New Haven Railroad in Manhattan and Bronx, by the Baltimore and Ohio Railroad on Staten Island, and the Long Island Railroad in Queens and Brooklyn. Pier unloading facilities are operated by the Pennsylvania Railroad, the Baltimore and Ohio Railroad, the Lehigh Valley Railroad, the Lackawanna Railroad, the Erie Railroad, the Long Island Railroad, the New York Central System, and several other connecting lines on the Hudson River, East River, and Harlem River piers. Extensive holding and team track yards are operated across the Hudson River in New Jersey by the Pennsylvania Railroad, the Erie Railroad, the New York Central System, the Lehigh Valley Railroad, the Baltimore and Ohio Railroad, the Lackawanna Railroad, and a number of other lines.

Obviously, motor vehicle transportation is of increasing importance to the business and industry of the city. A comprehensive network of highways, expressways, bridges, and tunnels has been constructed within the past 25 years. According to city officials plans are being made to spend nearly \$500 million on 22 road projects within the city in the near future.

³ In *People, Jobs and Land, 1955-1975* (23) decreases were shown for New York and Kings Counties. Small increases were shown for the Bronx and Queens, while Richmond County increased 138 percent. The total population increase for New York City was approximately 4 percent, or 350,000 persons.

Volume, Source of Supplies, and Transportation

New York City's metropolitan area⁴ during the 12 months ending June 30, 1956, received the equivalent of approximately 191,200 carlots of fresh fruits and vegetables, according to estimates made by the Stanford Research Institute. In this report, carlot is used as a measurement of volume and includes carlot equivalents. Of this total an estimated 165,500 carlots moved through either wholesale or retail outlets of New York City proper. The remainder was received and distributed outside the city. Of the remainder, an estimated 16,000 carlots were received in Newark, N.J., and distributed in various parts of the metropolitan area without coming into New York City.⁵

This study is restricted to the *physical move-*

⁴Includes (1) Bronx, Kings, Queens, New York, and Richmond Counties in New York City, (2) Nassau, Rockland, Suffolk, and Westchester Counties in New York, (3) Bergen, Essex, Hudson, Middlesex, Morris, Passaic, Somerset, and Union Counties in New Jersey (U.S. Census definition, 1954).

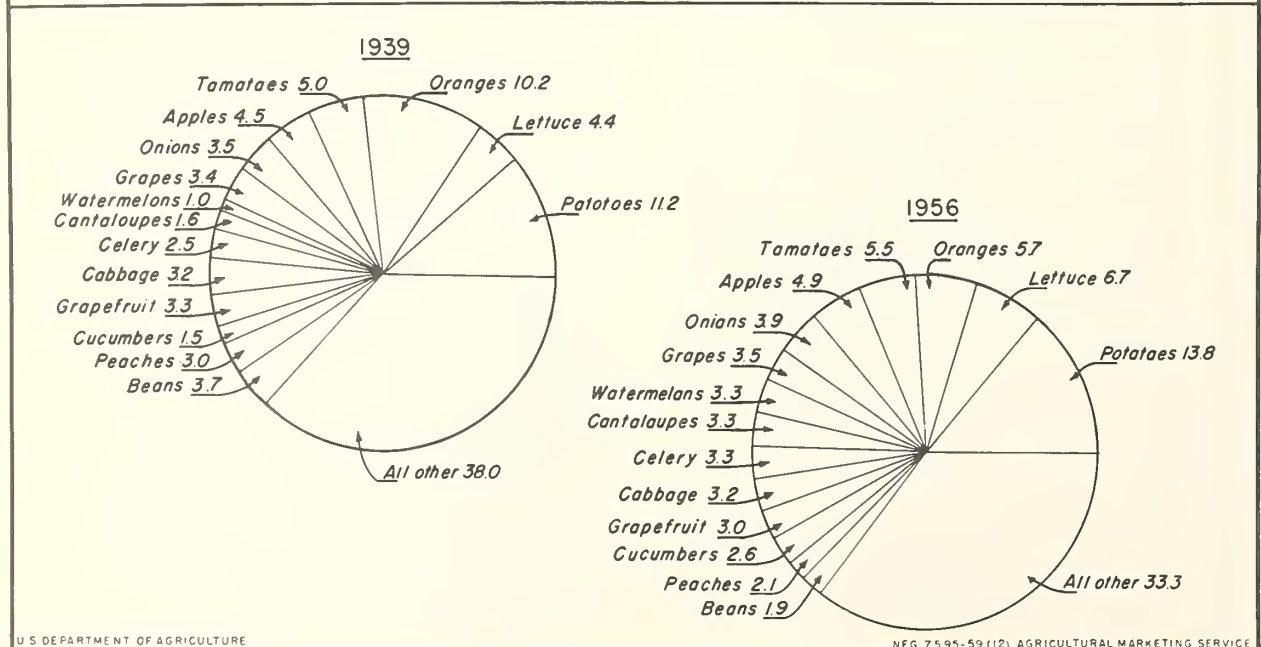
⁵All of the tabulations of volume of fruits and vegetables included in this report exclude banana imports, which are generally received, processed, and distributed through firms devoted almost entirely to that function in a manner which makes it difficult to compare such firms with other fresh fruit and vegetable distributors. In addition, shipments of fresh fruits and vegetables received directly at retail stores were not included in this study.

The volume data given in this report are for the 12 months ending June 30, 1956, and the 12 months ending April 30, 1939.

ment in 1956 of 165,500 carlots of *fresh fruit and vegetables* from the first point of arrival to retail outlets in New York City or to vehicles which moved them out of the city.⁶ In 1956 potatoes were received in the largest quantities, amounting to almost 23,000 carlots, followed by lettuce, oranges, tomatoes, and apples. Other commodities, in order of importance, include onions, grapes, watermelons, cantaloupes, celery, cabbage, grapefruit, and cucumbers (fig. 2). The greatest change in receipts between 1939 and 1956 was for oranges, which decreased from 10.2 per-

⁶Adjustments were made in the volume data obtained from the Market News Service report, "New York City: Unloads of Fresh Fruits and Vegetables—1956" (24). These adjustments were made because (1) the 12 months ending June 30, 1956, are covered in this report whereas the Market News Service report gives data for the calendar year, (2) the 13,400 carlots of bananas reported by Market News Service were excluded from this study, and (3) in the Market News report rail unloads cover all stations in New York City, Hoboken, N.J., Jersey City, N.J., and Kearny, N.J., and some nearby points in Long Island (regardless of final destination), while receipts covered by this report included only physical receipts which were destined for sale within the five boroughs of New York City. The truck receipts, according to the Market News Service, were only 85 percent complete. Based on data supplied by a number of local dealers, totals for New York State (especially Long Island), New Jersey, Delaware, the New England States, and to some extent other major Eastern producing States, such as Florida and Georgia, were adjusted to show more complete truck receipts.

RECEIPTS OF FRESH FRUITS AND VEGETABLES IN NEW YORK CITY
PERCENTAGES BY MAJOR COMMODITIES



cent of total shipments in 1939 to 5.7 percent in 1956. Shipments of potatoes, lettuce, tomatoes, and apples increased from 25.1 percent of total shipments in 1939 to 30.9 percent in 1956.

The estimated volume received from each of the States during the year ending June 30, 1956, is shown in figure 3.

California led all States in 1956 in shipping fresh fruits and vegetables to New York City, with 36,588 carlot equivalents, or 22 percent of the total. Florida was second with 34,458 carlots, or about 21 percent of the total. New York State was third with 25,002 carlots, or 15 percent. Receipts from other important States during 1956 included 12,938 carlots from New Jersey and 9,342 carlots from Maine. Other important States in order were: Texas, South Carolina, Virginia, Arizona, North Carolina, Idaho, Washington, Pennsylvania, and Oregon. Total imports amounted to 8,495 carlot equivalents, Cuba accounting for 2,381 carlots and Canada for 1,010 carlots.

Of the 165,500 carlots which entered New York City wholesale distribution channels, 86,384, or 52 percent, were received by rail; 72,485, or 44 percent by trucks; and 6,631, or 4 percent by boat and airplane. By way of contrast, in 1927, 70 per-

cent of the produce came by rail, 20 percent by boat, and only 10 percent by motortruck, (10) while in 1939, 47 percent came by rail, 16 percent by boat, and 37 percent by motortruck (table 1).

Practically all the receipts from the west coast came by rail. Five western States—California, Washington, Oregon, Idaho, and Arizona—sent over half of all the rail receipts. As would be expected, almost all supplies from nearby States were brought in by motortruck. For example, 24,817 carlots arrived from New York State by motortruck and only 185 by rail, 12,927 carlots came from New Jersey by motortruck and only 11 by rail. Transportation of supplies from the market was almost exclusively by motortruck; an estimated 21,540 carlots moved out of the metropolitan area to cities and towns in surrounding States.

In 1934, 81 percent of the truck receipts were from New York, New Jersey, and Connecticut, and only 2 percent from points as far away as 500 miles (9). In 1956 some produce which originated in Pacific Coast growing areas came by truck and over one-third of the truck receipts came more than 500 miles.

SOURCES OF NEW YORK CITY FRESH FRUITS AND VEGETABLES

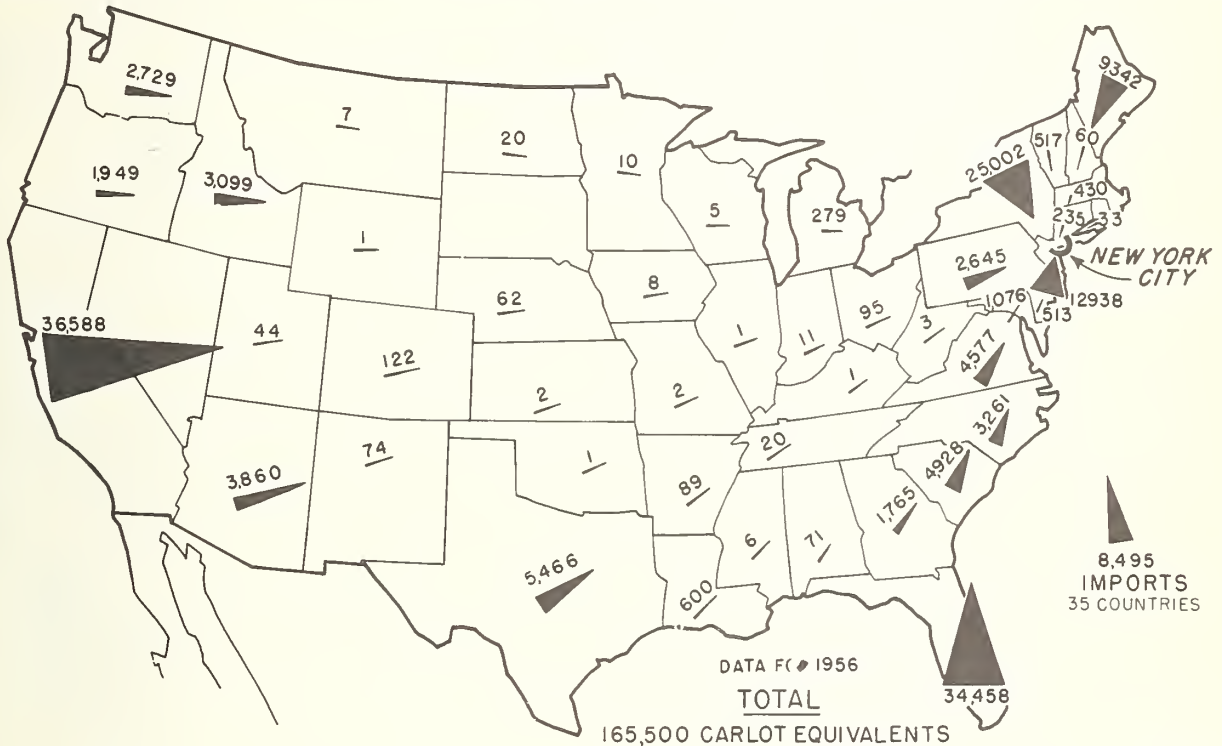


FIGURE 3

Total unloads of fresh fruits and vegetables declined between 1939 and 1956 by about 5 percent, as shown by table 1. An important factor in this decline is the increase in the trend toward use of processed fruits and vegetables by many hotels, restaurants, and other consumers. This decline is more than accounted for by loss of business in the farmers' markets; the volume handled by all other types of operators combined increased. The existence of other satisfactory marketing channels, plus the decline in acreage of local production because of spreading suburban developments, may have been important factors in the decline of volume handled by the farmers' markets.

During the past 30 years the percentage of unloads of fresh fruits and vegetables arriving in New York City by rail, boat, or motortruck has varied each year, according to the U.S. Department of Agriculture Market News Service. Generally, the percentage of total receipts arriving by rail and boat has decreased since 1929. No significant shipments came by boat during the years 1942 through 1947, when all shipping was used for transporting war materials. There was a corresponding increase in rail shipments during these years, while motortruck shipments declined slightly. In later years practically all of the shipments have been by motortruck and rail, while boat shipments have consistently declined.

TABLE 1.—Receipts of fruits and vegetables by method of transportation to New York City, 1939 and 1956

Method of transportation	1939 ¹			1956 ³	
	1939 carlot equivalents	Adjusted to 1956 carlot equivalents ²	Percentage	Carlot equivalents	Percentage
	<i>Number</i>	<i>Number</i>		<i>Number</i>	
Rail.....	94, 729	81, 664	47	86, 384	52
Boat.....	31, 978	27, 567	16	6, 587	4
Air.....	0	0	0	44	(⁴)
Motortruck:					
Wholesale market.....	52, 002	44, 829	26	67, 353	41
Farmers' market.....	23, 081	19, 897	11	5, 132	3
Total.....	201, 790	173, 957	100	165, 500	100

¹ Year ending April 30, 1939.

³ Year ending June 30, 1956.

² Rail cars were loaded 16 percent heavier in 1956 than in 1939.

⁴ Less than 0.05 percent.

Description of Present Wholesale Market Facilities

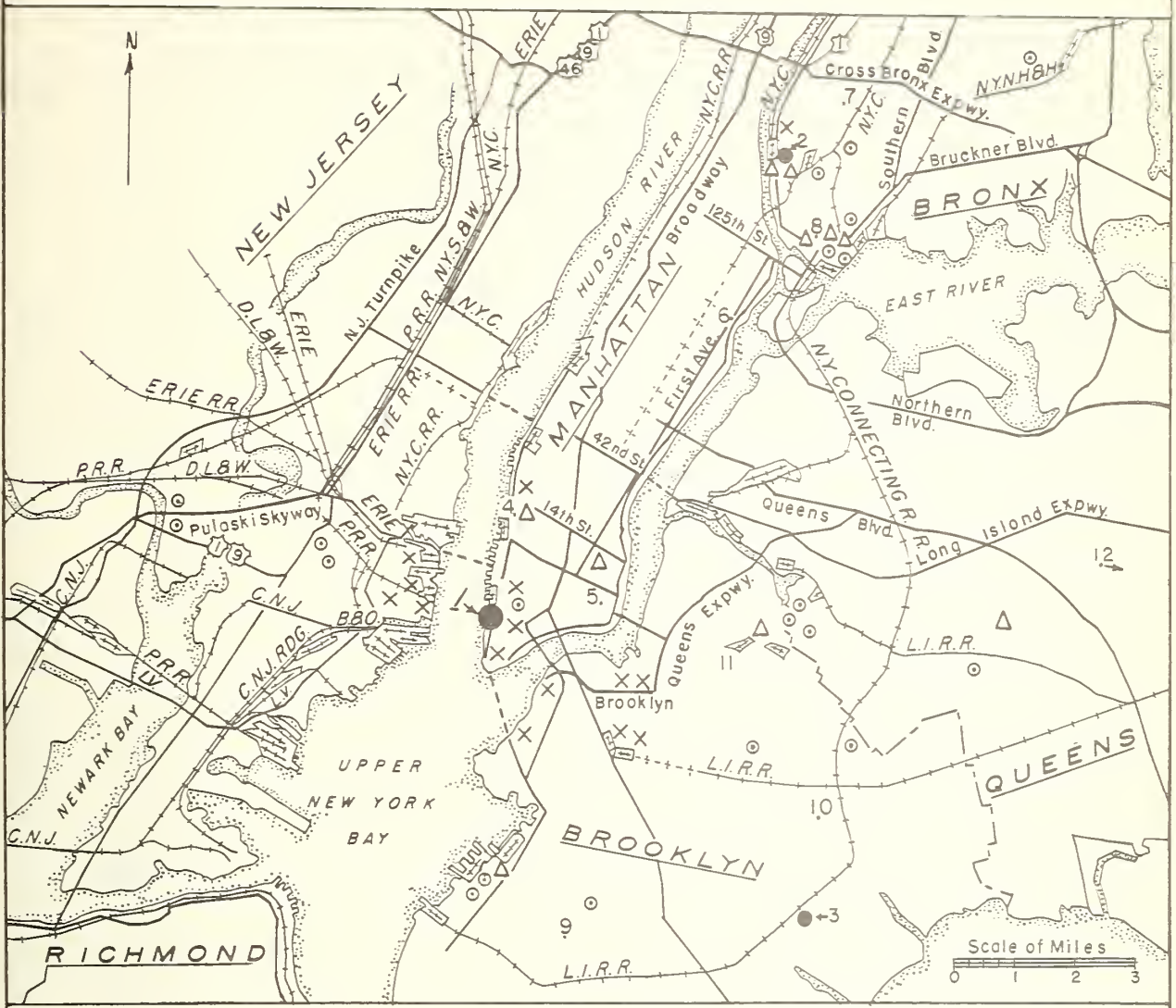
As previously stated, the first objective of this study is to "analyze and evaluate the wholesale marketing situation in New York City." Obviously, a description of the present wholesale facilities through which the products are handled is necessary before this objective can be accomplished.

This chapter describes each of the major wholesale marketing areas and the food chain warehouses through which the fresh fruits and vegetables are handled. It also locates and in some instances describes other facilities which are important to the marketing of fresh fruits and vegetables, such as public refrigerated warehouses, railroad freight terminals and yards, steamship and rail piers, and major highways, bridges, and tunnels. The number and types of facilities used, condition of buildings, assessed valuation, ownership of facilities, and space used are given. Also, information is given on the type of transportation used in delivering the produce to New York City. Finally, the traffic situation in the

Lower Manhattan Market area is described in some detail.

A large part of the wholesale marketing of fresh fruits and vegetables centered about one market area—Washington Street and the "produce piers" (including the auction facilities), along the lower west side of Manhattan. For the purposes of this study, these facilities, the railroad team tracks serving them, and the boat piers are defined as the "Lower Manhattan Market." Supplies not received at the Lower Manhattan Market were mostly of three classifications: (1) Receipts at other jobber markets, (2) direct receipts at food chain warehouses, and (3) receipts at farmers' markets. Eleven jobbing markets for fruits and vegetables, of various sizes and importance, are scattered over the city, with two of them having a farmer's market. Figure 4 shows the location of these markets, food chain warehouses, public refrigerated warehouses, major railroads, railroad freight terminals and yards, steamship piers, major highways, bridges, and tunnels.

LOCATION OF FACILITIES IN NEW YORK PORT DISTRICT USED IN DISTRIBUTING FRESH FRUITS AND VEGETABLES



LEGEND

MARKETS

● Lower Manhattan Market Area

CITY MARKETS

- | | |
|-----------------------|-------------------------|
| 2 ● Bronx Terminal | 8. Brook Ave. |
| 3 ● Brooklyn Terminal | 9. 39 th St. |
| 4. Ganesvaart | 10. Osbarne St. |
| 5. Attorney St. | 11. Maare St. |
| 6. Harlem | 12. Jamaica |
| 7. Bathgate Ave. | |

- | | |
|---|----------------------------------------------------------|
| × | Public Refrigerated Warehouse
(2 located off map) |
| ⊙ | Food Chain Warehouse - Corporate
(13 located off map) |
| △ | Food Chain Warehouse - Voluntary
(1 located off map) |
| ⊞ | R.R. Freight Terminals, Team Track
Yards & Rail Piers |

FIGURE 4

The Lower Manhattan Market

During the 12 months ending June 1956 an estimated 110,950 carlots of fresh fruits and vegetables were handled through the facilities of the Lower Manhattan Market. This represented approximately 67 percent of all fresh fruits and vegetables passing through New York City marketing channels. Table 2 shows the receipts at this market by type of transportation.

TABLE 2.—Receipts of fruits and vegetables in the Lower Manhattan Market, by method of transportation, 1956

Method of transportation	Carlot equivalents
<i>Number</i>	
Rail:	
Railroad piers.....	30, 198
Railroad team tracks.....	30, 638
Total rail.....	60, 836
Boat.....	5, 800
Air.....	44
Motortruck:	
Direct receipts.....	44, 070
Farmers' markets.....	200
Total motortruck.....	44, 270
Total receipts at Lower Manhattan Market.....	110, 950

Wholesale food operations in the Lower Manhattan Market consist of several hundred wholesale food stores, five rail piers, including the two fruit auctions located on three of the rail piers, a number of deepwater boat piers, and several team track yards. The wholesale food stores are located mostly within (1) the Washington Street Market, where many of the fruit and vegetable dealers are located, and (2) an area immediately adjacent to the Washington Street Market, in which wholesale stores for other foods are located. The Washington Street Market area extends roughly from Hubert Street to Barclay Street and between West Street and Greenwich Street. The adjacent area extends from Hubert Street to Barclay Street and from Greenwich Street to Hudson Street.

Table 3 shows the number and types of wholesale food stores and other businesses located within the Lower Manhattan Market area. The location and occupancy of these store facilities and the railroad piers are shown in figure 5 while the location of railroad team track yards is shown in figure 4.

Since this report is restricted to a study of the wholesale fresh fruit and vegetable marketing facilities, no further analysis was made of food marketing facilities of other commodity groups located in the Lower Manhattan Market area.

TABLE 3.—Number of wholesale food facilities and other businesses in the Lower Manhattan Market area, 1956

Type of business	Washington Street Market area ¹	Area east of Washington Street Market ²	Total
Food industries:			
Fresh fruit and vegetable dealers.....	Facilities ³ 213	Facilities 3	Facilities 216
Butter, eggs, and cheese dealers.....	23	72	95
Warehouses.....	7	6	13
Other food dealers.....	11	20	31
Allied industries.....	12	3	15
Other:			
Parking lots.....	4	4	8
Office buildings.....	4	1	5
Hotels, restaurants, garages, gas stations, miscellaneous.....	72	128	200
Vacant buildings.....	27	5	32
Total.....	373	242	615

¹ Includes West Street to Greenwich Street, Hubert Street to Barclay Street.

² Includes Greenwich Street to Hudson Street, Hubert Street to Barclay Street.

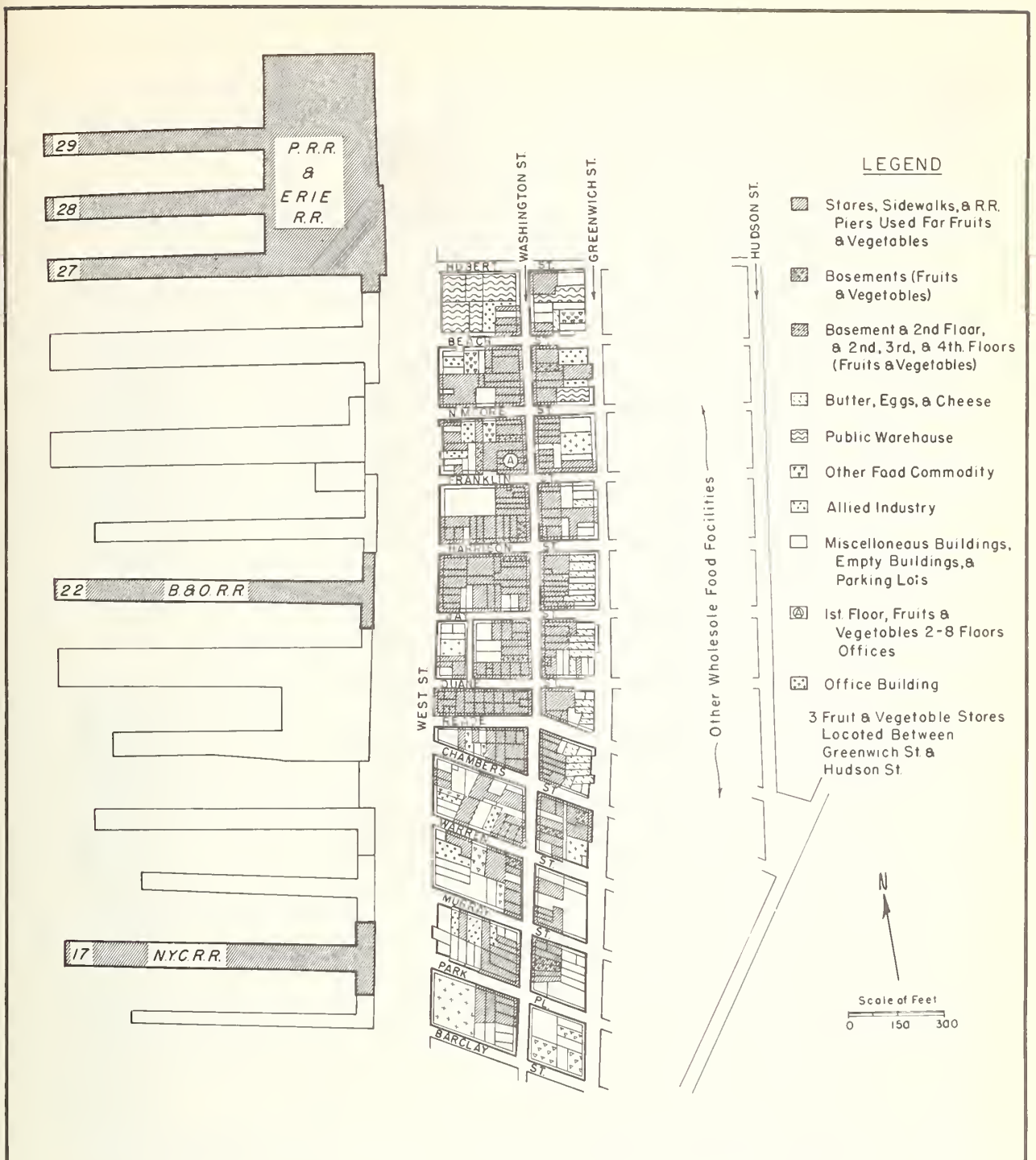
³ Exclusive of 2 auction firms.

Washington Street Market

The Washington Street Market extends roughly from Hubert Street to Barclay Street and between West Street and Greenwich Street (fig. 5), with a few dealers on the fringe of this area. This market is the nerve center of the Lower Manhattan Market and is the place where most of the fruit and vegetable wholesale handling and sales activities are performed. However, the market has no rail connections so that all incoming supplies except those arriving by motortruck are unloaded at a number of railroad yards or piers on the shores of Manhattan and New Jersey. The Washington Street Market is adjacent to the Lower Manhattan financial, business, and wholesale districts, being within a mile of Wall Street, and is in the shadow of the giant skyscrapers nearby (fig. 6). It has been in this location since the early days of the city's development.

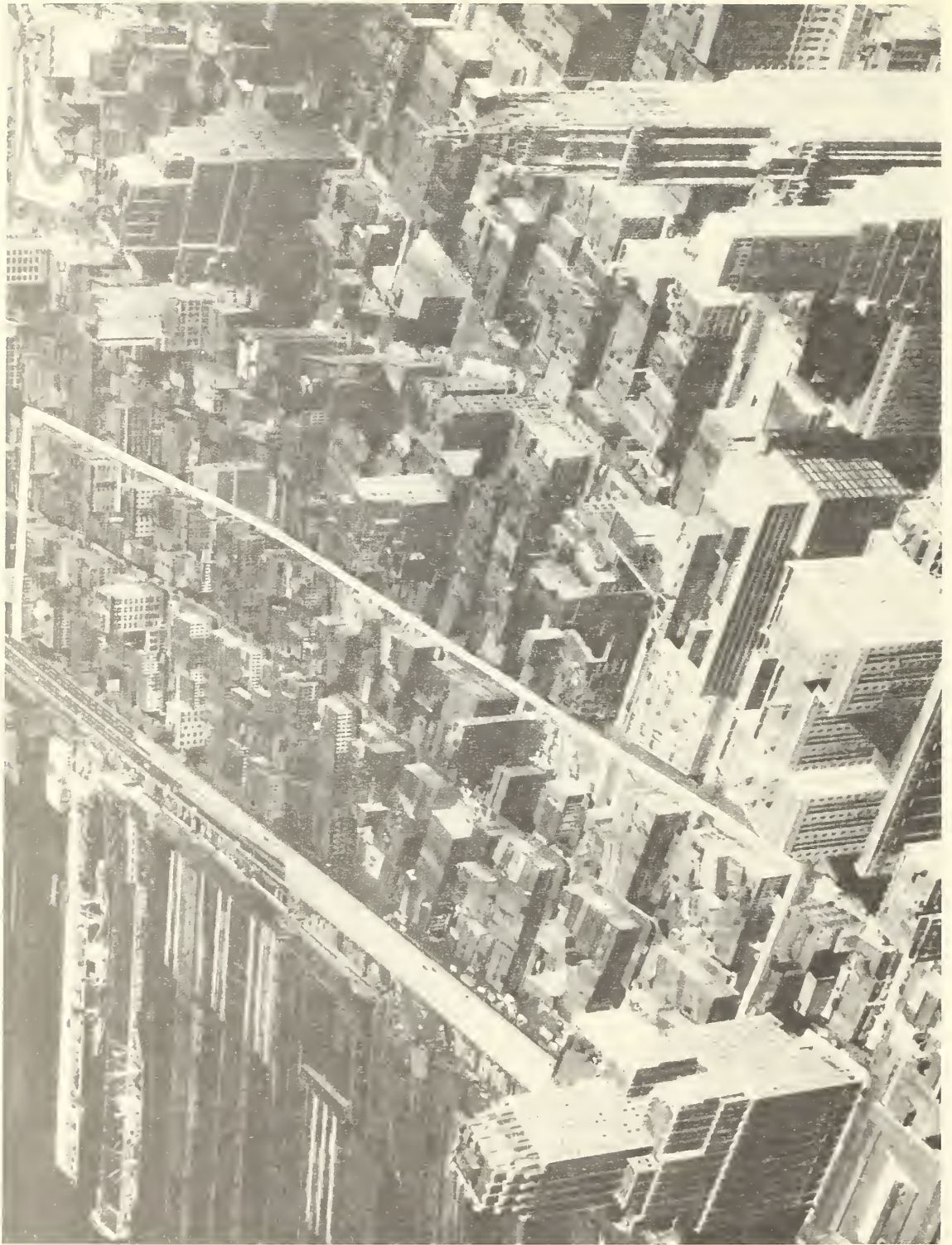
According to a recent study made by the Downtown-Lower Manhattan Association, Inc., 88 percent of all buildings in this area have been standing for 44 years or more; 32 percent of all buildings are 100 years or older. Only 16 percent are of fireproof construction (8).

Buildings being used by the fruit and vegetable dealers were not designed nor built for the handling of these items. The dealers simply used such buildings as had previously been erected—ancient store buildings, tenements, and warehouses located on narrow streets.



WHOLESALE STORES, R.R. PIERS, AND OTHER FACILITIES IN THE LOWER MANHATTAN MARKET AREA

FIGURE 5



BN 7101

FIGURE 6.—Washington Street wholesale fruit and vegetable market, New York City.

Most of the fruit and vegetable stores are located along Washington and Greenwich Streets and various cross streets between Hubert and Barclay Streets. These blocks and the intervening streets have a combined area of approximately 35 acres (including the full width of Greenwich Street and 30 feet of West Street).

Within the Washington Street Market area in 1956 there were 373 business facilities of which 213 were used for wholesale stores by dealers of fresh fruits and vegetables. The 213 facilities included 201 fruit and vegetable stores using first floor space only for sales space, 8 stores using basements only, 1 store using a basement and second floor, and 3 using 2d, 3d, or 4th floors only. Three of the basement stores handled bananas only. Several of the fruit and vegetable dealers operated from more than 1 building because they were unable to find suitable quarters in a single location. In addition, 3 fruit and vegetable stores were located in buildings adjacent to the Washington Street Market area. Also, firms in or connected with the fruit and vegetable industry occupied about 90 offices in the office buildings in the market area or in an adjoining block. Most of these firms were brokers, shipping organizations, representatives of transportation companies, and labor union officers. Several Washington Street produce dealers also had offices in these buildings.

The fruit and vegetable stores differed considerably in size but they used an average of 2,300 square feet of first floor space per dealer. Sidewalks are mostly about 15 feet wide. Washington Street measures 30 feet in width between the curbs. Greenwich Street is 35 feet wide and most of the cross streets are 34 feet in width. In addition to market vehicles many of these streets carry heavy

cross-town traffic directly through this congested market area.

West Street, which separates the Washington Street Market from the piers, is nearly 200 feet wide and is an important part of the city's major west side arterial highway. The elevated section of this highway continues most of the length of Manhattan Island and terminates at Battery Place where it connects with the Brooklyn-Battery Tunnel and the Franklin Delano Roosevelt Highway. Both the West Street ground level and West Street elevated express highway carry a tremendously heavy volume of traffic throughout the day and night.

The backs of most stores in the Washington Street Market are built solidly against the walls of adjacent buildings. Hence, these stores have no rear entrances or loading platforms (fig. 5). Floors are at approximately street level. Since they are not designed for efficient handling of heavy or bulky products, the stores are merely solid rows of ordinary structures fronting on narrow streets. Not one in five has cold storage space.

Buildings in which the stores are located range from 1 to 10 stories in height, averaging about 4 stories. Since the marketing of fruits and vegetables is essentially a one-story industry, very little use, if any, is made of the upper floors, except for offices and record storage.

The value of all lands and buildings in the 24 assessment blocks of the Washington Street Market district was \$17.1 million in July 1957. Figure 7 gives the average assessed value per square foot of all land and improvements in each block.

The properties used by the fruit and vegetable industry were operated by 200 dealers. They had an assessed value of \$10.7 million. The land on

ASSESSED VALUES OF PROPERTY
IN WASHINGTON ST MARKET, NEW YORK CITY, N. Y.

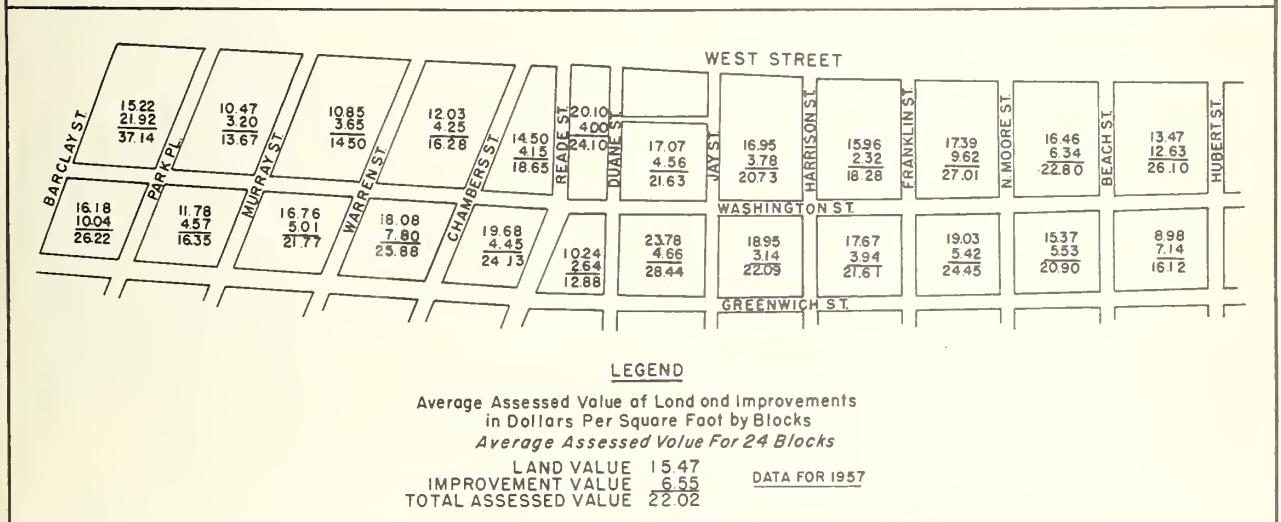


FIGURE 7

which the stores and offices of the fruit and vegetable industry was located was assessed at \$7.6 million and the buildings themselves at \$3.1 million. Thus, over 70 percent of the total valuation of the fruit and vegetable properties was for land. Average assessed value of land and present buildings for the 24 blocks was \$22.02 per square foot, of which \$15.47 per square foot was for land. It was reported during the study that very little, if any, increase in assessed valuation of properties in this area had been made over the past 20 years.

Rail Pier Facilities

Rail delivery of fresh fruits and vegetables is largely concentrated at waterfront terminals on Lower Manhattan's west side where the railroads have pier stations. Most of the perishable freight delivered at the pier stations reaches New York City over the lines of the Pennsylvania Railroad and the Erie Railroad. The Pennsylvania Railroad receives shipments of fruits and vegetables from the southeast and west, especially from the Florida and Texas commercial growing areas. The Erie Railroad handles traffic from the far west, especially from California, which is received at points near Chicago from terminals of several western railroads. The Erie Railroad and Pennsylvania Railroad tracks terminate on the west bank of the Hudson River in the vicinity of Jersey City. Rail cars bound for New York City are moved by car float to the pier stations about 1 mile across the Hudson River in Manhattan or to rail yard facilities throughout the harbor area.

A total of 30,198 carlots of fresh fruits and vegetables was handled at five railroad piers in the Lower Manhattan Market. These are pier 17 of the New York Central System, pier 22 of the Baltimore and Ohio Railroad, and piers 27, 28, and 29 operated jointly by the Pennsylvania and Erie Railroads. These piers extend about 1,000 feet into the Hudson River and cover approximately 30 acres, including the slips between the piers from which the car floats are unloaded (fig. 8).

Pier 17 of the New York Central System receives mostly potatoes and onions; its 30th Street yard receives other vegetables and fruits. Pier 22 of the Baltimore and Ohio Railroad receives all types of fruit, but produce for the two auctions is floated to piers 27, 28, and 29 and handled by the Erie Railroad for the account of the Baltimore and Ohio Railroad.

Piers 27, 28, and 29 include a terminal, approximately 10 acres in size, in addition to the slips. The slips have a berthing capacity of 13 car floats, each float handling from 10 to 14 cars. As many as 267 cars have been unloaded in one night's operation. On this terminal the cars are unloaded and contents sorted and stacked before the produce is sold. Auction rooms, located in the second story of the terminal, can accommodate as many as 2,000 persons at one time. The terminal building also provides for a display of the produce to be auctioned. It has facilities for private sale by

receivers as well as facilities for the two fruit auction companies (fig. 9).

In addition to nine auction rooms, the auction facilities include a telephone center for buyers, several restaurants, and a large directory which indicates what produce has arrived and where it is located. The two auction companies operating on these piers provide sale catalogs to assist the buyers in their examination of the produce in advance of the sale and make appropriate notations to help determine which produce to buy.

A total of 30,638 carlots of fresh fruits and vegetables was received in 1956 at the various railroad team track yards. The Pennsylvania Railroad's Henderson Street yard in Jersey City (sometimes called the "Ball Park") is by far the most important team track yard for the receiving of fruits and vegetables (fig. 10). A large part of the receipts was trucked from Jersey City to the Washington Street wholesale stores or sold to food chain organizations or jobbers from these team tracks. The Pavonia yard in Jersey City is the major receiving point for perishable rail shipments over the Erie Railroad. This yard was formerly much more important than it is now for delivery of produce. The railroads collected an unloading charge on piers 27, 28, and 29, in addition to the through freight charge, from just after World War II until the fall of 1956.⁷ According to reports, this additional charge had the effect of shifting a part of the produce arriving by Erie Railroad to the 30th Street yard of the New York Central System. The New York Central delivers produce to Manhattan with no additional unloading charge. Other lines have relatively few unloads of produce at their team tracks.

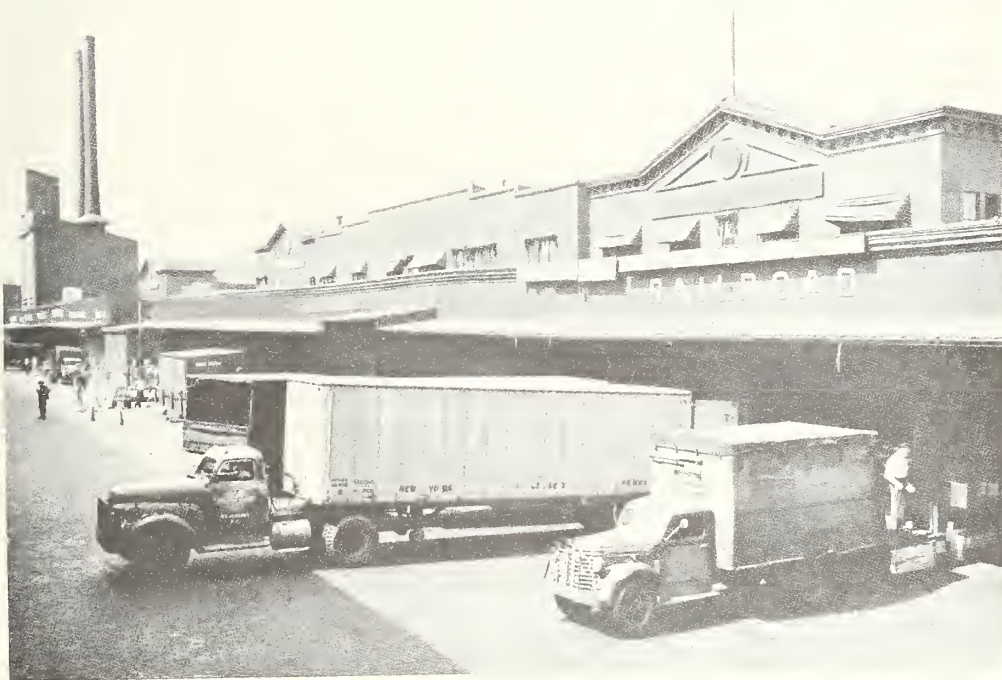
The Erie Railroad team tracks at 28th Street in Manhattan have a capacity of only 56 cars and the Pennsylvania Railroad team tracks at 37th Street have a capacity of 130 cars, most of which are used by shippers of packaged nonperishable freight. The New York Central's team tracks at its 30th Street yard, with a capacity of 350 cars, account for over four-fifths of the team track deliveries of produce in Manhattan.

Perishable fruit and vegetable shipments received by the New York Central System are brought by rail to its 30th Street team tracks or the 60th Street station on Manhattan, or to its Weehawken terminal on the New Jersey shore. Shipments arriving at Weehawken are taken by car float to its Lower Manhattan pier station near Barclay Street (pier 17). Fruits and vegetables from Florida could not be delivered in Manhattan on New York Central System team tracks under through freight rates at the time of the study. Such delivery could be made only by the carrier unloading at piers 27, 28, and 29, except when

⁷ Railroad unloading charges in New York City for perishable fruits and vegetables were reinstated in September 1958, by I.C.C. The railroads were permitted to charge \$2.86 per ton for these unloading services.

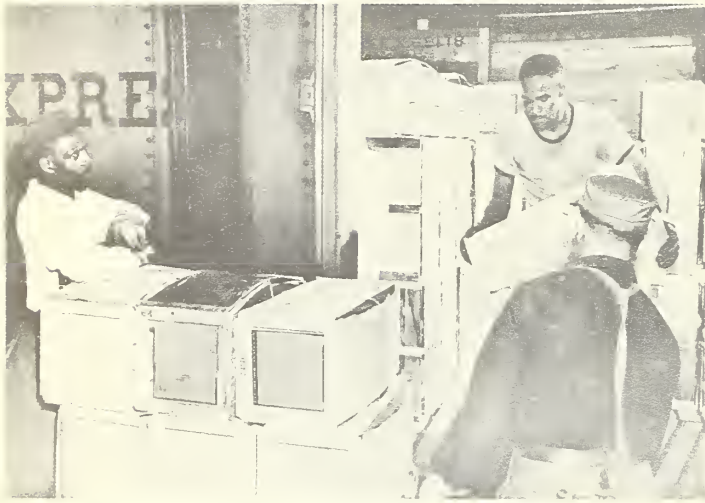


BN 7100X



BN 7153

FIGURE 8.—(a) Car floats at railroad piers. (b) Buyers' trucks loading at rail piers.



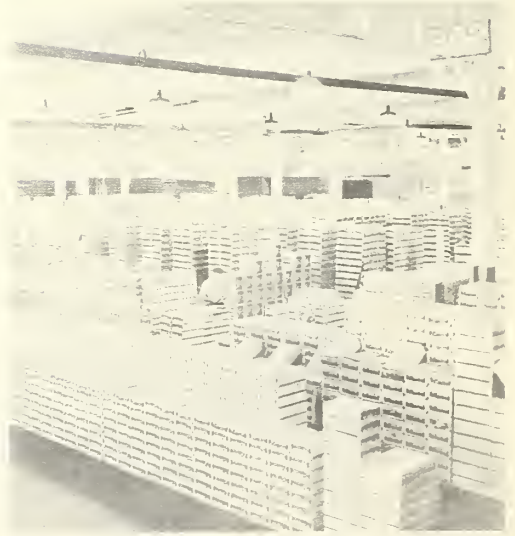
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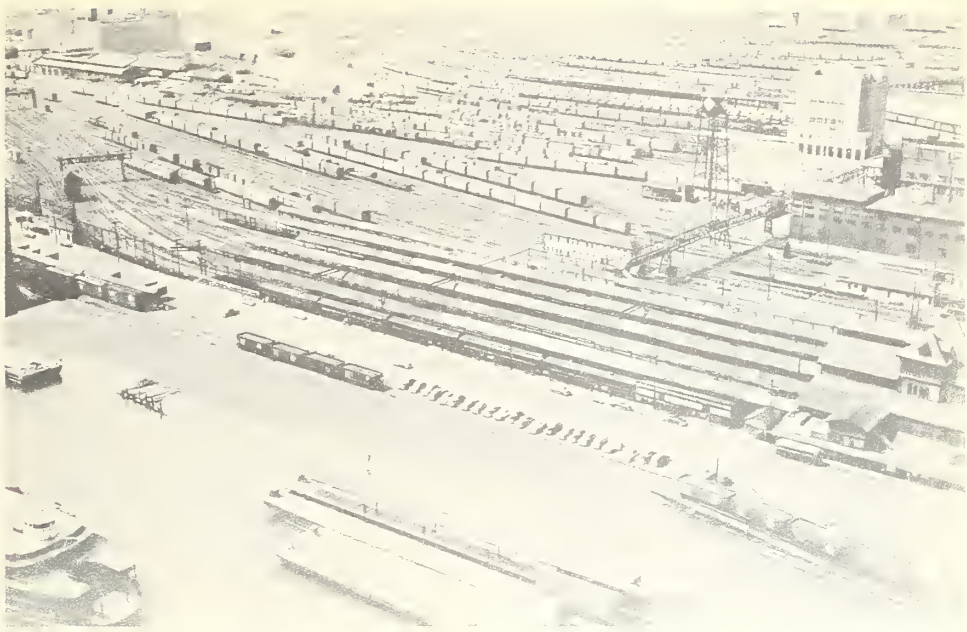


BN 6003



BN 6002

FIGURE 9.—Operations on railroad piers: (a) Unloading from rail cars on float. (b) Moving produce to pier floor for sale at auction. (c) Sampling fruit by buyers before auction sale. (d) Shipments of fruit sorted and stacked on pier floor.



BN 6007

FIGURE 10.—Jersey City team track yard.

space on the Pennsylvania Railroad's 37th Street team tracks was available.

Boat Pier Facilities

An estimated 6,587 carlots of fruits and vegetables were received by boat in New York City in 1956, of which 5,800 carlots were handled through the facilities of the Lower Manhattan Market. These shipments arrived in about a dozen different deepwater piers in Manhattan and Brooklyn, N.Y., and Newark, N.J., depending on the berth of the steamship line carrying the particular shipment. The fruits and vegetables were carted by motortruck or moved by lighter to the sales facilities of the Lower Manhattan Market, or in many instances they were moved from the deepwater piers direct to the facilities of the food chains and other dealers or to the auction for sale.

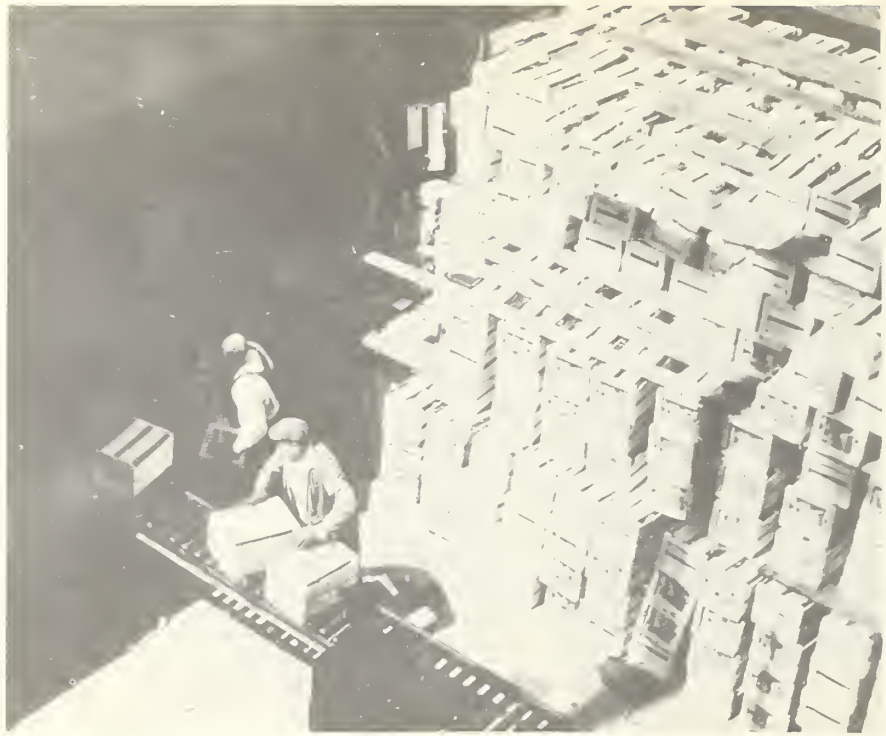
Many of the fruit and vegetable shipments from the Caribbean or South American producing areas consist of fresh pineapples, native vegetables, and deciduous fruits. Pineapples from Puerto Rico usually arrive at piers at 21st and 22d Streets in Brooklyn, mostly in wooden half crates or in heavy cardboard boxes. On arrival they are loaded on pallets while in the holds of the incoming ships. A large part of these shipments is transferred by forklift trucks to a lighter alongside the ship. The lighter is moved by tugboat to piers 27, 28, and 29 where the shipment is unloaded by forklift truck to the floor of these piers, and sold through one or both of the auction companies.

Cuban shipments of fresh tomatoes, other fresh vegetables, and pineapples mostly are unloaded

directly to piers 34 and 36 in Manhattan from the holds of the ship by roller conveyor (fig. 11). Shipments contain from 18,000 to 50,000 half crates of pineapples plus large quantities of Cuban vegetables in season. Each hold in the ship is stacked 10 to 25 crates high, the only support being a number of loosely placed boards between each 6 or 10 layers of crates. On the floor of the pier the crates are sorted by trade name and stacked very loosely on pallets, 18 to 24 crates per pallet. The pallets are moved by forklift truck to the sales area on the pier where the crates are removed by hand from the pallets to the floor of the pier. Employees of the consignee then sort and inspect the shipment and stack it by size and variety. On the piers the products are sold to food chains and other dealers or sold through the auctions.

Shipments of honeydew melons and onions from Chile are unloaded on the boat piers, placed on trucks and moved to the produce dealers in Washington Street. Shipments of Chilean plums, nectarines, and grapes are usually unloaded directly to a lighter alongside the inbound ship, taken to piers 27, 28, and 29 and unloaded and sold through the auctions. They are not palletized.

At the time of the study, shipments from Argentina, mostly grapes, pears, and other deciduous fruits, could not be unloaded in the New York Harbor unless the consignee had a certificate recognized by the U.S. Food and Drug Administration stating that spray residue on the fruit was not excessive. If no certificate was available for the incoming fruit, the consignee had to secure clearance upon its arrival. In this instance the fruit was unloaded from the ship to refrigerated



BN 6328



BN 7096X

FIGURE 11.—(a) Unloading Cuban pineapple from hold of ship. (b) Loading buyers' trucks from dock.

rail cars on a car float and held at the pier until the inspectors certified it was acceptable. In some cases the car float was moved to a rail yard and the refrigerated rail cars were stored in the holding yard until the certificate was available. Several shipments, arriving without certification, were unloaded at the Harborside Terminal in Jersey City and held there under refrigeration until the certificate was available.

Otherwise, fruit arriving from Argentina is, for the most part, unloaded from the ship and trucked directly to the sales floor on piers 27, 28, and 29.

Public Refrigerated Warehouses

No other Atlantic port in the United States can match the 33 million cubic feet of public cold storage space available in the 18 warehouses in the New York City port area. Most of these warehouses are situated at or near the waterfront or at railroad terminals (fig. 4) in Jersey City, Manhattan, and Brooklyn. Over 36 percent of the available space (12 million cu. ft.) is freezer space, and the rest (21 million cu. ft.) is cooler space. Almost all of the facilities are multistory buildings with rail and truck access. A number are equipped to handle loads of perishables directly from the piers to cold storage or freezer rooms where the shipment can be held for further disposal. Some warehouses are equipped to develop temperatures of 40° to 50° below zero and are used in the "flash" freezing of food items. Products are usually handled by pallets and fork-lift trucks. In at least one market a refrigerated warehouse furnishes refrigeration to nearby dealers by piping it under the streets to the dealers' stores.

Secondary Markets of New York City

In the five boroughs of New York City there are 11 other wholesale and jobbing markets for fresh fruits and vegetables (fig. 4). They vary greatly in size and importance, from a small group of stores on a side street to large and well-developed market facilities. Some specialize in specific fruits and vegetables—potatoes, cabbage, onions, grapes, or watermelons. Two include farmers' markets where producers sell directly to all kinds of buyers. A few dealers receive supplies directly from producing areas, either by rail or truck, but most of them deal principally in products which have been bought from wholesalers in Lower Manhattan. In 1956 over half of the produce handled through the Lower Manhattan Market was sold to jobbers within the metropolitan area. Many of the jobbers were located in these other markets. The chief role of these small jobbing markets is that of assembling and dispensing a complete line of produce to the nearby retail stores, performing the functions re-

quired by their immediate clientele, such as extending credit and prepackaging.

Bronx Terminal Market

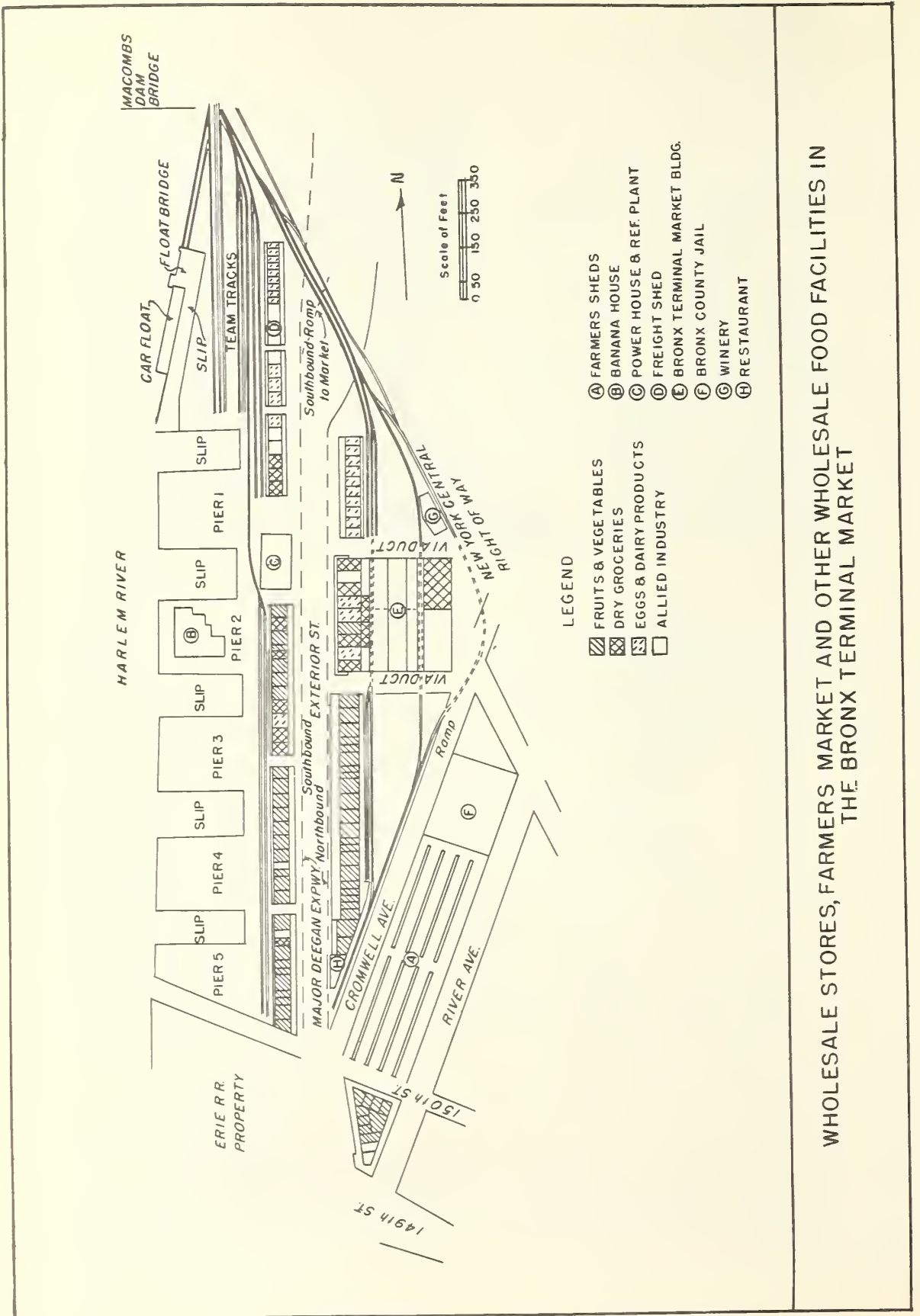
The most important wholesale fruit and vegetable market in New York City other than the Washington Street Market, is the Bronx Terminal Market (fig. 12). This market was built in 1923 by the City Department of Markets as a step in a program to decentralize the wholesale fruit and vegetable business by establishing a receiving market in each borough. The initial market construction cost \$15 million and consisted primarily of a large six-story cold storage warehouse. In 1935 wholesale stores with front and rear platforms were constructed in the immediate area (fig. 13).

The Bronx Terminal Market handled approximately 14,000 carlots of fresh fruits and vegetables in 1956. Nearly half of this was originally received in the Lower Manhattan Market. The Bronx Terminal Market consists of 37 acres, is bounded by the Harlem River on the west, 149th Street on the south, River Avenue on the east, and Macomb Dam Bridge on the north. The assessed valuation of land and buildings of the market in 1957 was \$10.1 million.

This market consists of 115 dealers' stores of varying sizes (totaling 105 units) in 10 buildings. Each unit (except 2 at the ends of one building) is approximately 55 feet by 40 feet and is enclosed; it has a 25-foot truck-height platform in front for display and sales and a 10-foot rail-height platform in the rear. Two of these units have no rear platform and one has only part of a rear platform.

There is one rail track adjacent to the rear platform of 19 store units and two tracks at the rear of 28 units. In the Bronx Terminal Warehouse building there are 18 stores on the first floor. Nine of these face Exterior Street and are approximately 55 feet by 40 feet. These units have an 8-foot front platform, no rear platform, and no rail track access. The other nine stores in the Bronx Terminal Warehouse building vary greatly in size. Part of these have truck-height loading platforms along the bridged market areaway in the center of the terminal refrigerated warehouse first floor. The upper floors of the warehouse building contain approximately 3½ million cubic feet of cold storage space but that space is not included in this study.

In four other buildings, including the building housing the New York Central freight house, there are 29 store units, ten of these are approximately 32 feet by 45 feet, with a 15-foot front platform and a 10-foot rear platform; 10 units in two buildings are 40 feet by 38 feet with 12-foot front platforms and 10-foot rear platforms; and nine units in the New York Central freight station building are 20 feet by 47 feet, with 10-foot truck-height front platforms and 10-foot



WHOLESALE STORES, FARMERS MARKET AND OTHER WHOLESALE FOOD FACILITIES IN THE BRONX TERMINAL MARKET

FIGURE 12



BN 7093X



BN 7094X



BN 7095X

FIGURE 13.—Bronx Terminal Market facilities: (a) Exterior Street underneath Major Deegan Expressway. (b) Bronx farmers' market. (c) Float bridge and team tracks.

rear rail-height platforms. There are two rail tracks adjacent to rear platforms in all but the first 10 units where there is only one track. The New York Central freight house occupies an additional six store units in this building. (These units are not included in the estimated space shown later for market operations.)

There also is a small triangular sales building at the intersection of 149th and 150th Streets and River Avenue which contains 11 small units of various sizes. There are no tracks adjacent to this triangular sales building; all stores have front sidewalk access; only two have rear access, the backs of most stores being built solidly against the walls of other stores in this block.

All but the triangular building have space on the second floor for office and other uses. Except for the office space, this space is mostly wasted or used only for the storage of old crates and boxes. However, a tomato packing concern uses its second floor for repacking operations. A hand-operated chain conveyor is provided in most of the store units to facilitate lifting heavy packages from the first to the second floor, but in most store units this facility is not being used and is in a bad state of repair. The second floor of the triangular produce building is used as a dormitory for truckers. Refrigeration is furnished to each store unit by piping it under the street from the Bronx Terminal Market power and refrigeration plant.

Adjacent to the dealers' stores there are a railroad float bridge, a team track yard, a freight house, and a farmers' market with 246 stalls. Besides the public refrigerated warehouse (in the Bronx Terminal Warehouse building), mentioned previously, there are a wine sales and storage building and a combined powerhouse and refrigeration plant on the market property. A large banana wholesale sales and ripening facility is located between slips 2 and 3 along the Harlem River adjacent to the Bronx Terminal Market buildings.

The number and types of dealers who occupied space in the Bronx Market in 1956 were as follows:

- 53 fruit and vegetable dealers in 42 units and 16 half units
- 9 egg and dairy produce dealers in 27 units
- 13 dry grocery dealers in 14 units and 2 half units (including stores on first floor of the Bronx Terminal Warehouse building)
- 13 allied industries and a restaurant in 12 units and 2 half units.

(These do not include the power and refrigeration plant, freight house, and wine-sales and storage building.)

Brooklyn Terminal Market

The Brooklyn Terminal Market was opened in 1941 by the City Department of Markets as the successor to the old Wallabout Market (fig. 14).

The market is located in the Canarsie section of Brooklyn at Foster and Remsen Avenues, East 83d Street and Avenue D.

The Brooklyn Terminal Market dealers handled in 1956 approximately 10,000 carlots of fruits and vegetables, half of which were bought from Lower Manhattan dealers. There are six buildings containing 12 store units each and three buildings containing six units each, or a total of 90 store units. These units were occupied at the time of the study by 97 wholesale food dealers and two restaurants.

The units are one story, each 40 feet by 55 feet with the firms' offices on a mezzanine floor (fig. 15). There are no direct rail facilities to the stores, but a team track with a capacity of 18 cars is provided by the Long Island Railroad adjacent to the market property. Each store has a 15-foot front loading platform; 72 stores have no rear platform; and 18 stores have a sidewalk along the rear of these buildings. Market streets are 80 feet wide.

A farmers' market with 154 stalls is provided at the north end of the terminal.

The number and type of dealers who occupied space on the Brooklyn Terminal in 1956 were as follows:

- 65 fruit and vegetable dealers in 39 units, 34 half units, 1 one-quarter unit, and 1 three-quarter unit
- 4 poultry, egg, and dairy product dealers in 1 unit and 3 half units
- 2 meat dealers in 1 unit and 1 half unit
- 16 dry grocery dealers in 12 units and 8 half units
- 10 allied food industry dealers in 4 units and 6 half units
- 2 restaurants in 1 unit and 1 half unit.

Two units and five half units were vacant at the time of the survey. Four small fruit and vegetable dealers were located immediately adjacent to the Brooklyn Terminal Market in buildings which were built many years ago; a large banana ripening and packing facility also was adjacent to the terminal.

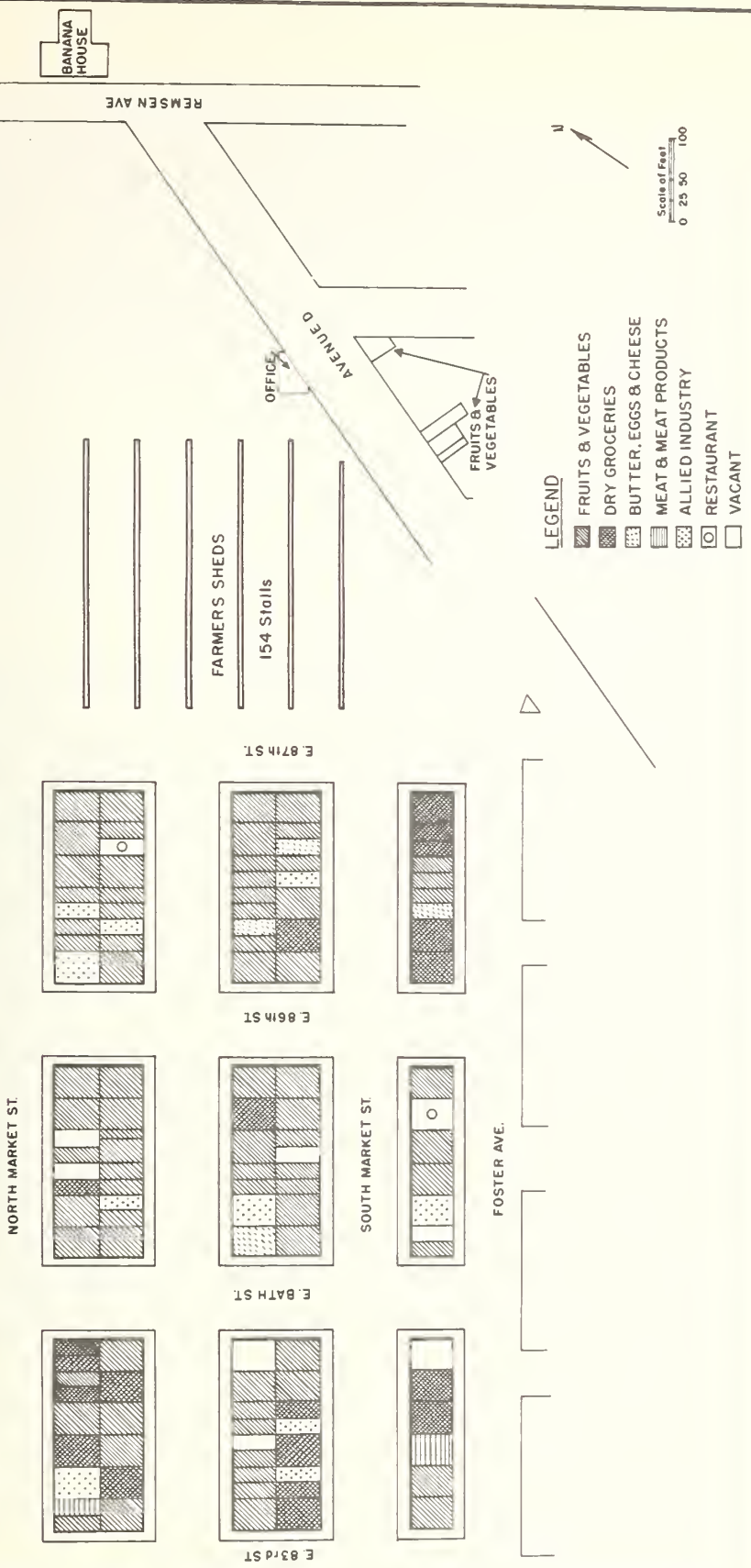
The assessed valuation of land and buildings in 1957 was approximately \$2.8 million.

Other Jobbing Markets

Other wholesale jobbing markets for fruits and vegetables include: Gansevoort Market, Attorney Street Market, and Harlem Market in Manhattan; Bathgate Avenue Market and Brook Avenue Market in the Bronx; 39th Street, Osborne Street, and Moore Street Markets in Brooklyn; and Jamaica Market in Queens (fig. 4).

Dealers in the Gansevoort Market consist primarily of purveyors who serve the needs of many of the Lower Manhattan restaurants, hotels, and steamship lines.

Many of the dealers who are located on the Bronx Terminal originally conducted their busi-



WHOLESALE STORES, FARMERS' MARKET, AND OTHER WHOLESALE FOOD FACILITIES IN THE BROOKLYN TERMINAL MARKET

FIGURE 14



BN 9586X



BN 9582

FIGURE 15.—Brooklyn Terminal Market facilities : (a) Wholesale dealers' stores. (b) Farmers' sheds.

ness in the Harlem Market. Only a few jobbers remained in the Harlem Market after the Bronx Terminal was constructed.

Not included in this study were the jobbing markets located in Jersey City and Newark, N.J., and in Mount Vernon, Yonkers, and Long Island in New York State.

Food Chain Organizations

Forty-four warehouses, operated by 24 corporate food chains and 11 voluntary chain organizations, each serving 10 or more retail outlets, are located in the New York City metropolitan area (fig. 4). They handled approximately 22 percent of the fruits and vegetables moving through trade channels within New York City. Almost three-fourths of the produce handled by these firms was received directly from producing areas.

Large food chain warehouses are located in New Jersey, and in Queens, Bronx, Long Island, and Westchester County in New York. Smaller warehouses are in Brooklyn and Manhattan. No record was obtained of the amount of space used for fruit and vegetable receiving and distribution in

the food chain warehouses. The larger food chains generally have well-designed warehouse facilities with rail sidings and truck unloading bays. They have modern handling equipment, such as forklift trucks and conveyors, which facilitates unloading and loading operations (fig. 16). All except two utilized modern handling equipment extensively, and these two used modern equipment in certain of their operations. Offices and refrigeration and storage space were available.

Ownership of Facilities

Information concerning the number of dealers owning or renting the buildings they occupied was obtained only from the independent wholesalers in the Washington Street Market. The Hudson River piers and the Bronx and Brooklyn Market terminals, however, are owned by the City of New York and obviously the wholesalers, railroads, and other operators located there are tenants of the City of New York. No information on ownership of public refrigerated warehouses was obtained.



BN 6329



BN 9581X

FIGURE 16.—Modern food chain warehouse: (a) Outside view showing loading platform and offices. (b) Inside view showing efficient handling equipment.

Almost 92 percent (195) of the 213 fruit and vegetable stores operated by 200 dealers in the Washington Street Market area were rented. The remaining 18 stores were owned by their operators. The dealers renting their facilities handled an estimated 72 percent (80,150 carlots) of the total produce handled in this area. This included all sales—direct, intramarket, and other—which were handled by the so-called “second handlers.”

Space Used

Based upon measurements made in the study, 1,350,000 square feet (31 acres) was occupied by independent fruit and vegetable dealers in the Washington Street Market area. Table 4 shows the amount of floor space used on first floors and other floors of the buildings occupied by the independent dealers in the Washington Street Market area, the average space used per dealer, and the additional amount of sidewalk space and platform space used. These dealers actually used only 61 percent (823,810 sq. ft.), or 18.9 acres, of the total space plus 155,340 square feet, or 3.6 acres, of sidewalk and platform space. Most of the unused space was in the upper floors because the produce business is essentially a one-story operation. Of the total space used, an estimated 100,525 square feet was office space and 130,260 square feet was used by cooler and other refrigeration facilities.

TABLE 4.—*Estimated floor space and sidewalk and platform space used by 200 wholesale fruit and vegetable dealers in Washington Street Market area, 1956*

Location	Space used	Average per dealer
	<i>Square feet</i>	<i>Square feet</i>
First floor.....	475, 085	2, 375
Other floors.....	348, 725	1, 744
Office space.....	(100, 525)	(503)
Cooler space.....	(130, 260)	(651)
	823, 810	4, 119
Sidewalk space.....	155, 125	776
Platform space.....	215	1
Total or average.....	979, 150	4, 896

NOTE: Items in parentheses are included in space used on first or other floors.

In addition, approximately 414,000 square feet (9.5 acres) was used on the first floor of piers 27, 28, and 29 by the two fruit auction companies to stack and display their produce; 195,000 square feet on the second floor of these piers was used for auction rooms, offices, restaurants, etc.; thus a total of 609,000 square feet was used on these piers. Also, approximately 95,000 square feet on pier 17

and 62,000 square feet on pier 22 were being used in the wholesale distribution of fresh fruits and vegetables.

An estimated 252,000 square feet of space on the first floors, 98,825 square feet on the second floors in the terminal facilities, and 103,125 square feet on the pier in a separate building housing a banana dealer were used by fruit and vegetable dealers in the Bronx Terminal Market. Also, there were approximately 78,100 square feet of space in the 246 stalls of the Bronx Farmers' Market (including loading space).

In the Brooklyn Terminal Market the fruit and vegetable dealers used 149,500 square feet of space, including mezzanines. In addition, the 154 stalls in the Brooklyn Terminal farmers' market had approximately 23,000 square feet.

As stated earlier, no estimate was made of the space used by the fruit and vegetable operations of the food chains or public refrigerated warehouses operating within the city.

If the floor space used by the independent fruit and vegetable dealers at stores and rail piers is totaled, exclusive of the small jobbing markets, approximately 2,348,600 square feet (54 acres) was used by these dealers in 1956. There also were 101,100 square feet (2.3 acres) of sales space available in the Bronx farmers' market and Brooklyn farmers' market facilities.

The Traffic Situation

Several thousand motor vehicles are used each night in moving fruits and vegetables through the Lower Manhattan Market (fig. 17). These can be classified as follows: Buyers' trucks, shippers' and intermarket trucks, and miscellaneous vehicles serving the market facilities. In the latter class, vehicles delivering food and servicing restaurants, offices, and other establishments in the vicinity, such as milk trucks, mail trucks, and garbage trucks were included. Table 5 shows the number of motor vehicles in the Lower Manhattan Market area from 5 p.m. on July 22 to 7 a.m., July 23, 1956.

An actual count of the number of trucks in the Washington Street Market area and in the West Street and pier areas was made by a 7-man crew which took hourly counts in the area assigned to them. Between the counts these men interviewed truckers to determine the length of time they had been in the area and the average length of time it had taken to get through this area with a load of produce. Over 150 trucks were individually timed entering and leaving the market area. The average length of time for the intermarket trucks bringing produce from West Street, the piers, or the team tracks to Washington Street stores was 50 minutes per truck, but both the trucks bringing products from producing areas and buyers' trucks averaged about 4 hours within the market. About



BN 5789

FIGURE 17.—Traffic congestion in Washington Street wholesale fruit and vegetable market.

TABLE 5.—Number and type of motor vehicles in wholesale fruit and vegetable section of the Lower Manhattan Market area, at hourly intervals, July 22-23, 1956

Hour and date	Washington Street area				West Street pier area, all vehicles	Total
	Shippers' and intermarket trucks	Buyers' trucks	Miscellaneous	Total		
July 22, p.m.	<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Number</i>
5-----	236	8	62	306	210	516
6-----	281	15	58	354	225	579
7-----	347	39	75	461	240	701
8-----	333	82	78	493	270	763
9-----	338	131	78	547	300	847
10-----	315	200	65	580	350	930
11-----	296	265	75	636	400	1,036
12-----	207	321	95	623	370	993
July 23, a.m.						
1-----	187	389	87	663	340	1,003
2-----	152	349	98	599	310	909
3-----	139	328	92	559	290	849
4-----	127	338	99	564	270	834
5-----	105	363	110	578	270	848
6-----	94	337	135	566	260	826
7-----	84	325	169	578	250	828

3,000 different trucks were in the market area during the night of July 22-23, 1956. More than 1,000 trucks were in the market at one time during the peak hours. During each hour, throughout a 10-hour period of a typical market day, more than 800 trucks were in the Lower Manhattan Market.

Motortrucks bringing produce to the stores were in greatest number around 7 p.m. Most of these vehicles were in the market until 11 p.m., after which there was a steady decline in the inbound trucks in the market. Most of the intermarket trucks came in the early hours of the morning. The number of buyers' trucks increased steadily until 1 a.m. and remained fairly constant the rest of the night. However, another group of buyers began to appear about 5 a.m. This group included the small retailers, peddlers, and push-cart operators who came late to clean up, at bargain prices, the produce that was left. The peak for the entire Lower Manhattan Market area was reached at 11 p.m., when 1,036 trucks of all types were in the market (fig. 18). The figures apply only to vehicles used for fruits and vegetables and do not include, except for the miscellaneous vehicles serving the market, other thousands of nonmarket cars and trucks which went through the Lower Manhattan Market district.

A major problem was the delivery of produce

from the wholesaler's store to the buyers' trucks, since many buyers arrived before all of the incoming produce trucks were through unloading. Also, produce was carted throughout the night from the piers, from highway trucks on West Street, and from the railroad team tracks. Trucks over 33 feet in length were not permitted by the city to enter the Washington Street Market area.

Many dealers reserved spaces for their trucks in front of their stores for later delivery by parking their empty trucks in this space. Hence, usually it was necessary for the buyers' trucks to park 2 or 3 blocks or, in some instances, as many as 5 or 6 blocks away from the stores at which purchases were made. The produce was brought to these trucks on the back of a porter or on handtrucks which the porters weave in and out among the stacks of produce on the sidewalks and the trucks on Washington Street (fig. 19). Sometimes the porter was unable immediately to locate the truck for which he had produce and this caused further delay.

Traffic congestion on the Washington Street Market has been severe for many years. A Federal Trade Commission report, released 40 years ago, described similar conditions in the market (30). With the increase in recent years in the number of highway trucks using the market, these conditions have not improved.

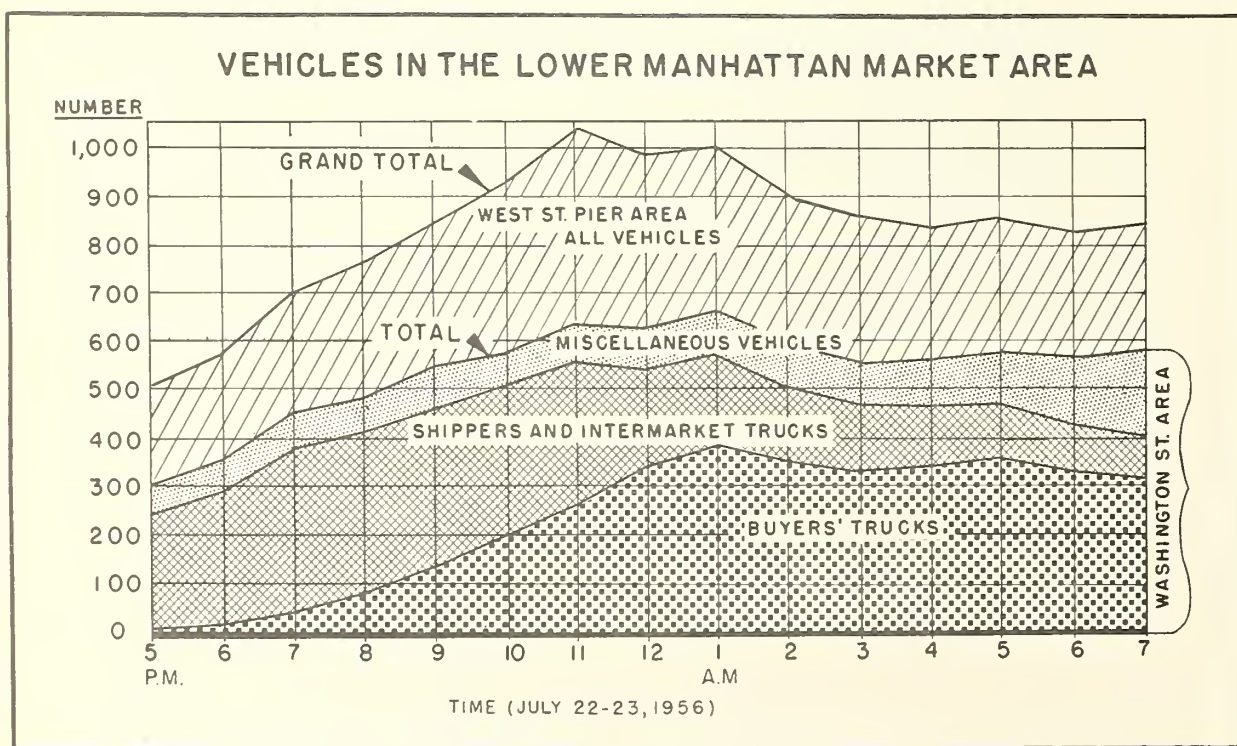


FIGURE 18



BN 5764



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FIGURE 19.—Washington Street fruit and vegetable market: (a) Produce being moved to buyer's truck on back of porter. (b) Produce being moved to buyer's truck on 2-wheel handtruck.

Number and Types of Dealers

There were 391 independent dealers of fresh fruits and vegetables included in this study. In the Lower Manhattan Market the major types of dealers and the number of each operating in 1956 were as follows: 106 receivers, 81 jobbers, 13 purveyors, or a total of 200 dealers, plus the 2 auction companies. In the other wholesale jobbing markets of the city there were 35 receivers, 141 jobbers, 7 purveyors, and 6 service wholesalers. In addition to these 391 independent dealers (including the 2 auctions) there were 24 national and local food chains, 11 voluntary chain organizations, and 2 farmers' markets.

Carlot receivers obtain fresh produce directly from the producing areas. These dealers break the carlot quantities into smaller lots for sale to jobbers or retailers. The receiver usually buys the produce outright, but he sometimes receives it on consignment.

The function of the jobber is primarily to sell to the retailer. The jobber usually offers more commodities and in smaller quantities than the receiver. The purveyor is really a jobber specializing in merchandise for use in hotels, restaurants, and steamship lines. He breaks packages of produce and sells in small lots.

However, the lines of demarcation among the various dealers are not clear cut. Many of the dealers function as receivers, and most of them also are jobbers. On certain occasions a receiver shares a car of produce with a jobber and under certain circumstances a retailer purchases from a jobber, the farmers' market, and a receiver.

Of the 200 dealers (not including the 2 auction firms) who were operating in 1956 in the Lower Manhattan Market, 18 specialized in tomatoes, 10 in handling bananas, 7 in celery and other leafy goods, 2 in melons, 12 in potatoes and other so-

called "hardware," 3 in citrus fruits, 11 in tropical fruits and other such specialties, 5 in imported fruits and vegetables, 5 in peaches and apples, and the remaining 127 were classified as fruit and vegetable dealers handling a general line of products.

Most of the independent dealers' stores in the Washington Street Market area open for business 5 days each week (Sunday through Thursday) around 5 p.m. and do not close until all the produce is sold or about 10 a.m. the next day, whichever occurs sooner. The dealer or his assistant usually arrives before 5 p.m. to receive the produce and often stays after the sales are completed to work on his accounts, supervise his office staff, or superintend the buying of new merchandise.

In addition to the produce dealers, who actually handle the merchandise, the auction companies play a significant role in the marketing of fresh fruits and vegetables in New York by bringing buyer and seller together without themselves taking title to the merchandise. Auction sales are made primarily to jobbers, food chain organizations, and retailers. Most produce sold at the auctions is received by rail float, unloaded, sorted, stacked, and displayed on the piers. Some of the cargoes arriving by boat are transferred by lighter or car float to a railroad pier for display but most of the boat receipts are unloaded at various deep water piers in the city. Samples of such cargoes are then hauled by motortruck to one of the railroad piers to be displayed and sold along with other auction offerings. Auction sales of fruit usually begin about 8:30 a.m. and continue until all auction offerings are sold. A part of the auction receipts, mostly melons and tomatoes, is received in season from highway trucks at two auction warehouses adjacent to the piers and sold at the auctions beginning at midnight.

Receipts of Fresh Fruits and Vegetables

As stated previously, 165,500 carlots of fresh fruits and vegetables moved through New York City wholesale marketing channels in the year ending June 30, 1956. This movement, shown in figure 20, is based on reports of the Market News Branch of the Fruit and Vegetable Division, Agricultural Marketing Service, U.S. Department of Agriculture, records of dealers and auction companies, food chain organizations, railroads, truckmen, managers of the farmers' market, and others.

Supplies are first received at many scattered unloading points in the Lower Manhattan Market area. Buyers visit these places to learn the comparative quality and prices and to obtain a complete line of fruits and vegetables in season.

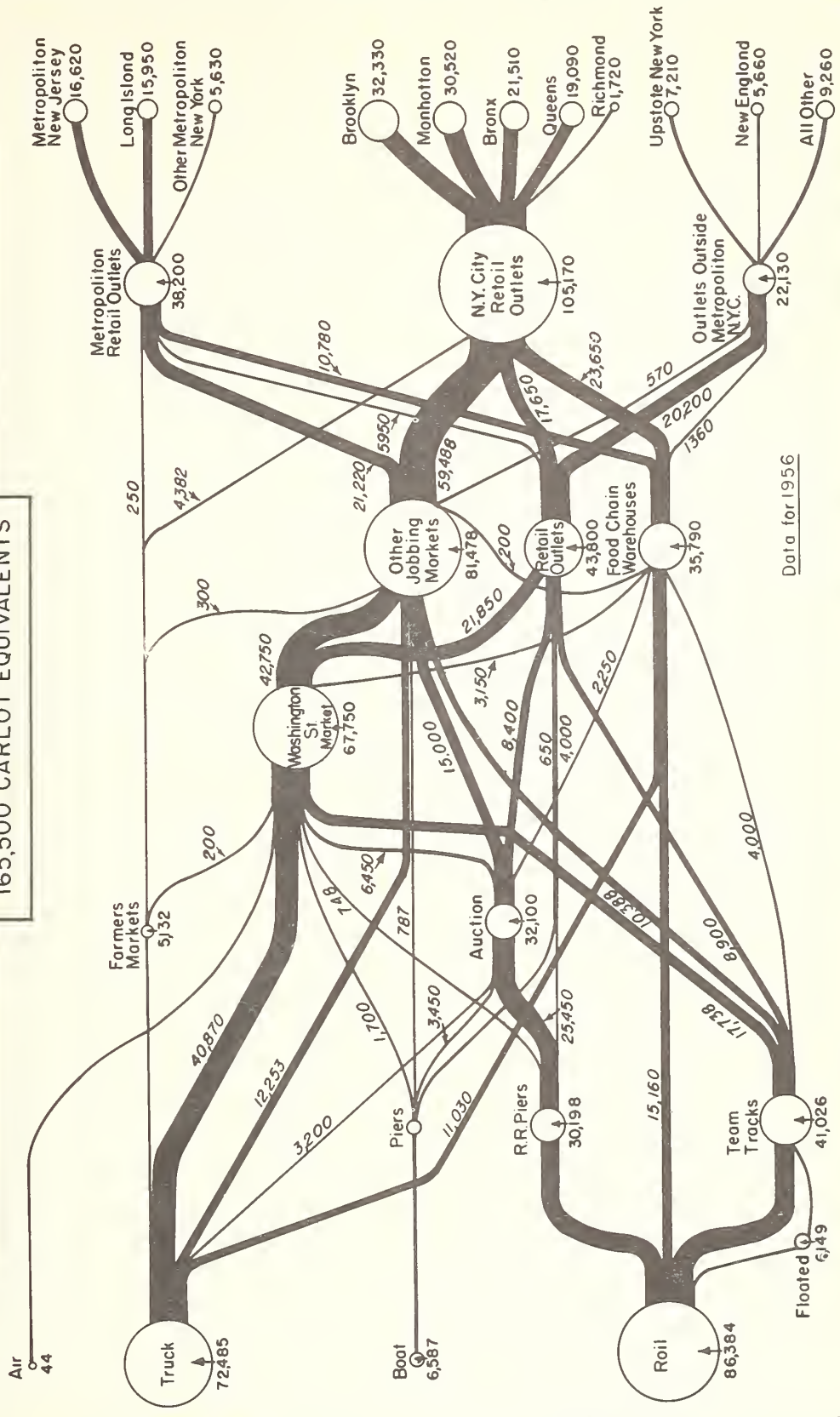
The following tabulation gives the receipts of

165,500 carlots (that is, carlot equivalents) of fruits and vegetables, by method of transportation and movement to points in New York City:

	Carlot equivalents
Received by rail.....	86,384
Floated to railroad piers.....	30,198
To the auctions.....	25,450
To Washington Street Market	748
Direct sales to retailer..	4,000
Placed for team track delivery.....	41,026
To food chain organizations.....	4,000
To Washington Street Market.....	17,738
To other jobbing markets.....	10,388
Direct sales to retailer..	8,900
Direct to food chain warehouses..	15,160

MOVEMENT OF FRESH FRUITS AND VEGETABLES THROUGH NEW YORK CITY MARKET CHANNELS

165,500 CARLOT EQUIVALENTS



U.S. DEPARTMENT OF AGRICULTURE

NEG. 7598-59 (12) AGRICULTURAL MARKETING SERVICE

Figure 20

	<i>Carlot equivalents</i>
Received by motortruck from producing areas--	72,485
To farmers' markets-----	5,132
To Washington Street Market-----	40,870
To jobbing markets-----	12,253
To the auctions-----	3,200
To food chain warehouses-----	11,030
Received by boat-----	6,587
To Washington Street Market-----	1,700
To the auctions-----	3,450
Direct sales to retailer-----	650
To jobbing markets-----	787
Received by air and delivered to Washington Street Market-----	44

Receipts by Market Area and Type of Transportation

Lower Manhattan Market

Approximately 110,950 carlots, or 67 percent (including 200 carlots purchased by Washington Street receivers from the Bronx Farmers' Market), were received at the Lower Manhattan Market and the balance (54,550 carlots) was received at other locations in the city.

Figure 21 shows the receipts of fresh fruits and vegetables at the Lower Manhattan Market area by type of transportation and first point of arrival. Of the 110,950 carlots received at the

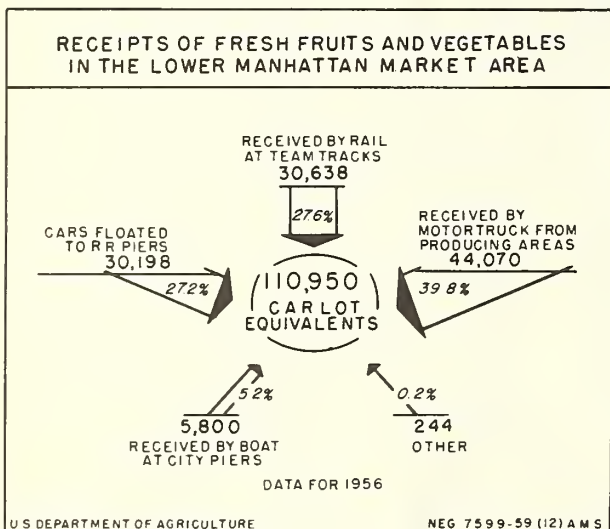


FIGURE 21

facilities of the Lower Manhattan Market approximately 27.2 percent was floated to the five railroad piers; 27.6 percent was received by rail at the team tracks (4.4 percent of which was floated across the Hudson River); 39.8 percent was received directly by motortrucks from producing areas; 5.2 percent was received by boat at other piers; and 0.2 percent was received by air or from farmers' markets.

Figure 22 shows the steps in the movement of the 110,950 carlots received at various facilities in

the Lower Manhattan Market from first point of arrival to retail outlets in the metropolitan area or to trucks of out-of-town buyers.

The following tabulation gives the receipts of 110,950 carlots at the first point of delivery in the Lower Manhattan area and the movement to the next point of destination:

	<i>Carlot equivalents</i>
Floated to railroad piers-----	30,198
To Washington Street Market-----	748
To auction-----	25,450
Direct sales to retailer ¹ -----	4,000
Received at railroad team tracks-----	30,638
To Washington Street Market-----	17,738
To food chain warehouses-----	4,000
Direct sales to retailer ¹ -----	8,900
Received by truck from producing areas-----	44,070
Direct sales at stores or auction facilities-----	28,100
To Washington Street Market-----	26,000
To auction-----	2,100
Received at West Street-----	15,970
To Washington Street Market-----	14,870
To auction-----	1,100
Trucked from farmers' markets to Washington Street Market-----	200
Trucked from boat piers-----	5,800
To Washington Street Market-----	1,700
To auction-----	3,450
Direct sales to retailer ¹ -----	650
Received by air and delivered to Washington Street Market-----	44

¹ Direct sales to retailers were those sales loaded on trucks from railroad piers, team tracks, or boat piers and carted directly to the retail outlets within the metropolitan area without physically entering the Lower Manhattan Market facilities. These sales amounted to 13,550 carlots.

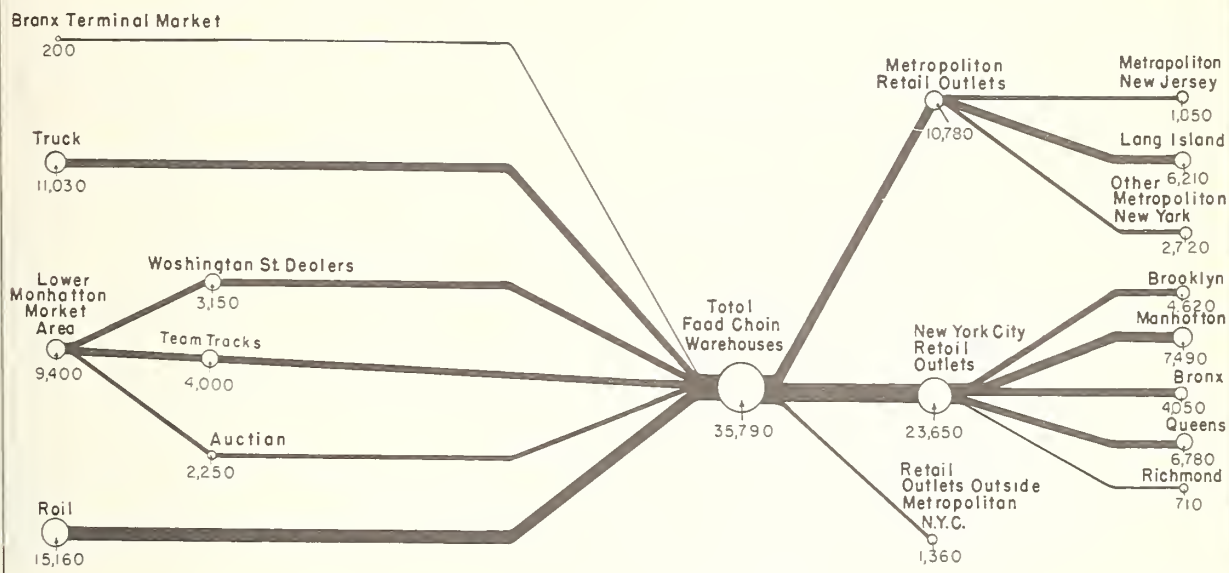
Of the 110,950 carlots received at the Lower Manhattan Market, an estimated 67,750 carlots went to Washington Street stores, including 6,450 carlots which were carted from the two auctions on the piers.

The two fruit auction companies handled 32,100 carlots. The majority of this volume, 25,450 carlots, arrived at the railroad piers. However, 3,200 carlots arrived by motortruck and 3,450 carlots arrived by boat.

The nearest important Manhattan team track yard for unloading fruits and vegetables is about 3 miles from the Washington Street Market (30th Street yard of the New York Central System). About half of the rail shipments (30,638 carlots) to the Lower Manhattan Market was received at team track yards. Many receivers chose to have certain deliveries made in the team track yards in Manhattan or at a team track in New Jersey rather than at the railroad piers which were much nearer to Washington Street. Produce could be held at these yards at a relatively low demurrage charge, and the cars used in the place of cold-storage facilities, which were lacking in many of the stores.

MOVEMENT OF FRESH FRUITS AND VEGETABLES THROUGH FOOD CHAIN WAREHOUSES

35,790 CARLOT EQUIVALENTS



Data for 1956

U.S. DEPARTMENT OF AGRICULTURE

NEG 7603-59(12) AGRICULTURAL MARKETING SERVICE

FIGURE 25

There were 18,850 carlots passing through two or more facilities in Lower Manhattan Market, of which 6,450 carlots were carted from the auctions to the Washington Street stores and 12,400 carlots were transferred between stores within the Washington Street Market area. For sales of products on the piers or team tracks, it was often possible to make direct deliveries to the buyers without first unloading at the seller's store. In most cases, however, such receipts were unloaded at the sellers' stores and when sold to other dealers within the market they were transferred from one store to another.

The Lower Manhattan Market dealers handled an average of about 44 carlots of fruits and vegetables per working day (based on 250 working days per year). Most of each day's supply was received during the night and delivered to the retail buyers by the following forenoon.

Bronx and Brooklyn Terminal Markets

The Bronx Terminal Market received 13,850 carlots of fresh fruits and vegetables in 1956 (fig. 23).

An estimated 9,832 carlots of fresh fruits and vegetables were received at the Brooklyn Terminal Market (fig. 24).

Other Jobbing Markets and Dealers

An estimated 16,228 carlots of fresh fruits and vegetables were received by jobbers and dealers in other locations throughout the metropolitan area. The 1956 receipts by market ranged from 450 carlots to 2,050 carlots.

Food Chain Warehouses

As previously stated, fruits and vegetables were received by the 24 corporate food chains and 11 voluntary food chain organizations in the New York metropolitan area. Of the total fruits and vegetables handled by these food chain warehouses, only 35,790 carlots passed through facilities in New York City (fig. 25). About three-fourths (26,190 carlots) was received directly from producing areas in many parts of the country.

Receipts by Types of Dealers

Table 6 shows that of the 165,500 carlots of direct shipments, approximately 48 percent (78,850 carlots) was received by Washington Street receivers, jobbers, and purveyors, 19 percent

(32,100 carlots) by the two auctions, 16 percent (26,190 carlots) by food chain organizations, 3 percent (4,932 carlots excluding the 200 carlots sold to Washington Street dealers) by farmers' markets, and the balance, 14 percent (23,428 carlots) by other jobbers and dealers located outside the Lower Manhattan Market but within the New York metropolitan area.

Table 6 also shows that of the 86,384 carlots

received in New York City by rail, over 40 percent (35,386 carlots) was handled by Washington Street receivers, jobbers, and purveyors; nearly 30 percent (25,450 carlots) by the auctions; 18 percent (15,160 carlots) by the food chain warehouses; and 12 percent (10,388 carlots) by other jobbing markets and wholesale dealers located outside the Lower Manhattan area but in the New York metropolitan area.

TABLE 6.—Receipts of fruits and vegetables by type of dealer and type of transportation, 1956¹

Dealer	Rail	Truck	Boat	Air	Total
Lower Manhattan Market:					
Washington Street:	<i>Carlot equivalents</i>	<i>Carlot equivalents</i>	<i>Carlot equivalents</i>	<i>Carlot equivalents</i>	<i>Carlot equivalents</i>
Receivers.....	33,986	² 38,820	2,350	44	75,200
Jobbers.....	1,200	1,750			2,950
Purveyors.....	200	500			700
Total Washington Street dealers.....	35,386	² 41,070	2,350	44	78,850
Auction companies.....	25,450	3,200	3,450		32,100
Total Lower Manhattan.....	60,836	² 44,270	5,800	44	110,950
Food chain organizations.....	15,160	11,030			26,190
Farmers' markets.....		³ 4,932			4,932
Bronx Terminal jobbers.....	2,350	2,150			4,500
Brooklyn Terminal jobbers.....	1,000	1,700			2,700
Total Bronx and Brooklyn Terminals.....	3,350	3,850			7,200
Other jobbing markets and wholesale dealers:					
Manhattan jobbers.....	1,200	1,613	787		3,600
Manhattan purveyors.....	80	120			200
Other Bronx jobbers.....	1,800	1,200			3,000
Queens jobbers.....	1,208	1,400			2,608
Other Brooklyn jobbers.....	1,500	2,000			3,500
Long Island jobbers.....	1,000	1,820			2,820
Other metropolitan jobbers.....	250	250			500
Total other jobbers and dealers.....	7,038	8,403	787		16,228
Grand total.....	86,384	72,485	6,587	44	165,500

¹ Includes quantities not actually moved through facilities of the dealers but sold by them.

² Includes 200 carlots carted from farmers' markets.

³ Does not include 200 carlots carted from farmers' markets to Washington Street receivers.

Of the 72,485 carlots received in New York City by motortruck, Washington Street receivers, jobbers, and purveyors handled 57 percent (41,070 carlots including the 200 carlots received from the farmers' market); the two auction companies handled only 4 percent (3,200 carlots); the food chain organization handled 15 percent (11,030 carlots); the farmers' markets, 7 percent (4,932 carlots excluding the 200 carlots sold to Washington Street dealers); and other jobbers and dealers located outside the Lower Manhattan Market but within New York City and its metropolitan area handled 17 percent (12,253 carlots).

Over 88 percent (5,844 carlots) of the 6,631 carlots received by boat and air was handled by the Washington Street dealers and the two auction

companies. The balance, 12 percent, or 787 carlots, was handled by other jobbers.

Receipts of Dealers by Average Annual Volume

An analysis of the data obtained in the study shows that of the total direct receipts by the 200 independent dealers located in the Washington Street Market area, over 23 percent was accounted for by 5 dealers handling over 3,000 carlots each in 1956. Another 35 percent of the receipts was accounted for by 18 dealers handling from 1,000 to 2,999 carlots each. The remainder was accounted for by 177 dealers handling less than

1,000 carlot equivalents each in 1956. If all dealers were considered, the average number of carlots handled was about 400 cars during that year.

Seasonal Differences in Receipts

Table 7 shows the percentage of unloads by month and by various types of transportation, as reported by the U.S. Department of Agriculture Market News Service (24). Receipts by rail coming from relatively long distances and including large shipments of citrus fruits were heavier in

the late winter and spring months than in the summer. Boat and air shipments, although small in comparison, were received in greater proportion during the spring months. The boat shipments included quantities of tropical fruits, especially fresh pineapple from the Caribbean area. On the other hand, receipts by truck were much greater, as would be expected, in the summer and autumn months.

Overall, the receipts of fruits and vegetables at the New York City wholesale markets were lighter in December, January, and February than during other months of the year.

TABLE 7.—Percentage distribution, by months, of fruits and vegetables received at New York City, by method of transportation, 1956

Month and year	Rail	Boat and air	Motortruck			All Receipts
			Farmers' market	Wholesale markets	Total	
1955						
July.....	9.0	6.4	14.9	11.8	12.3	9.8
August.....	8.1	6.3	18.4	11.6	12.1	9.5
September.....	6.9	5.9	16.0	10.9	11.3	8.5
October.....	7.3	6.4	18.2	9.3	10.0	8.2
November.....	7.4	7.1	10.7	9.0	9.1	8.0
December.....	7.5	8.0	3.8	6.6	6.4	7.2
1956						
January.....	8.1	7.0	2.0	6.1	5.7	7.1
February.....	7.5	8.5	1.7	5.4	5.1	6.8
March.....	8.7	12.1	1.2	6.2	5.7	8.0
April.....	9.5	10.6	1.0	5.9	5.5	8.1
May.....	10.4	11.4	3.0	7.2	6.9	9.1
June.....	9.6	10.3	9.1	10.0	9.9	9.7
Total.....	100.0	100.0	100.0	100.0	100.0	100.0

New York City Unloads of Fresh Fruits and Vegetables (24).

Distribution of Fresh Fruits and Vegetables

To determine the most convenient and economical location for a new market, as well as to be able to calculate the costs of handling, it is necessary to know the volume and destination of fruits and vegetables leaving the market. Especially is such information important in a study of a metropolis such as New York with its hundreds of square miles of land area, interspersed with many wide waterways, its congested motortruck routes and high cost for hauling food products that are both bulky and perishable.

Destination of Receipts in New York City, 1939 and 1956

Geographical retail destinations of the New York City receipts of fruits and vegetables in 1956 were compared with the 1939 distribution, as

shown in "The Wholesale Fruit and Vegetable Markets of New York City" (5). The first comparison (fig. 26) is for the distribution of the total receipts for all New York City wholesale markets—173,957 carlots in 1939 and 165,500 carlots in 1956. The second comparison (table 8) is for only that portion of these receipts which passed through the facilities of the Lower Manhattan Market area—132,805 carlots in 1939 and 110,950 carlots in 1956.

Comparison of New York City Receipts

In 1939 nearly 24.5 percent (42,647 carlot equivalents) of all carlots received in New York City were distributed to retail outlets in Manhattan, while in 1956 only 30,520 carlots, or 18.5 percent, were distributed to such outlets.

DESTINATION OF FRESH FRUITS AND VEGETABLES RECEIVED IN NEW YORK CITY

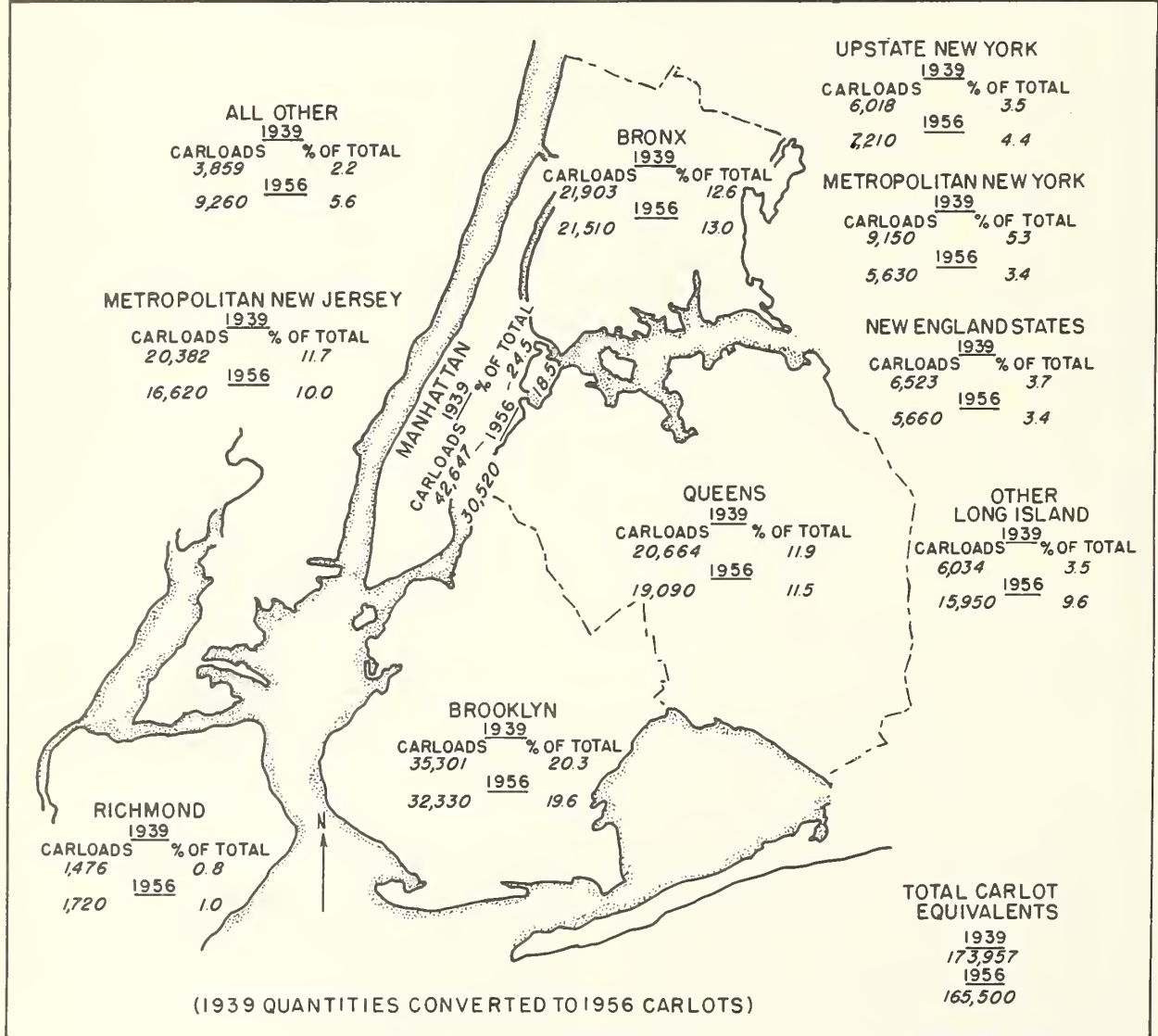


FIGURE 26

TABLE 8.—Destination of fruits and vegetables handled through the Lower Manhattan Market area, 1939 and 1956

Destination	1939		1956	
	Carlot equivalents ¹	Percentage of total	Carlot equivalents	Percentage of total
New York City:	<i>Number</i>	<i>Percent</i>	<i>Number</i>	<i>Percent</i>
Manhattan.....	31,318	23.5	19,590	17.6
Brooklyn.....	26,501	19.9	22,150	20.0
Queens.....	13,336	10.0	8,610	7.8
Bronx.....	12,470	9.4	10,040	9.0
Richmond.....	1,261	0.9	1,070	1.0
	84,886	63.7	61,460	55.4
Other metropolitan districts:				
Metropolitan New Jersey.....	19,368	14.8	16,490	14.9
Metropolitan New York.....	6,874	5.2	2,600	2.3
Long Island.....	5,278	4.0	8,860	8.0
	31,520	24.0	27,950	25.2
Outside metropolitan New York City:				
New England States.....	6,522	4.9	5,290	4.8
Upstate New York.....	6,018	4.5	6,990	6.3
All other.....	3,859	2.9	9,260	8.3
	16,399	12.3	21,540	19.4
Total.....	132,805	100.0	110,950	100.0

¹ 1939 carlots converted to 1956 car equivalents. (In 1956 rail cars were loaded 16 percent heavier than in 1939.)

Percentage distribution for the Brooklyn, Queens, Bronx, and Richmond Boroughs of fruits and vegetables was practically the same in 1939 and 1956. However, the percentage distribution to the rest of Long Island and areas outside the New York metropolitan area has increased substantially during the past 17 years. This, of course, reflects the growth of population in these suburbs. Although Connecticut suburbs and New Jersey suburbs not included in the New York metropolitan area have also grown, the study shows a slight decrease in the distribution of fruits and vegetables to these areas, largely because an appreciable amount of these products is not distributed through New York City facilities.

Comparison of Lower Manhattan Receipts

In 1956 over half (55.4 percent) of the fruits and vegetables handled through the Lower Manhattan Market area were distributed to outlets within New York City, about one-fourth (25.2 percent) to buyers outside New York City but within the metropolitan area, and the remainder (19.4 percent) to points outside the New York City metropolitan area.

The geographical movement of the receipts of the Lower Manhattan Market area in 1956 is shown in figure 27.

In 1939, nearly two-thirds (63.7 percent) of all fruits and vegetables handled through the Lower

Manhattan Market area were distributed to outlets within New York City. Nearly one-fourth (24 percent) was distributed to other metropolitan districts. The remainder (12.3 percent) went to dealers in upstate New York, the New England States, and other destinations outside the metropolitan area. Within the five boroughs of New York City practically the same percentage of the fruits and vegetables handled through the Lower Manhattan area in 1939 and 1956 was delivered to retail stores in Brooklyn, the Bronx, and Rich-

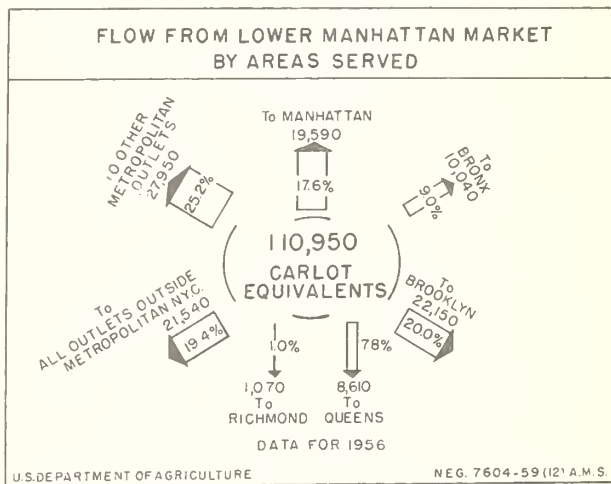


FIGURE 27

mond Boroughs. However, a significant decrease from 1939 to 1956 was shown in the percentage of produce delivered to retail outlets in Manhattan (from 23.5 to 17.6 percent), and a slight decrease was shown (from 10.0 to 7.8 percent) in Queens.

Distribution by Type of Dealer

Table 9 shows by type of dealer the distribution of 110,950 carlot equivalents moving from the

Lower Manhattan Market area in 1956—61 percent going to other New York dealers and jobbers, 21 percent to metropolitan retail outlets, and the balance to outlets outside the New York metropolitan area. Over 58 percent of the 110,950 carlots was distributed by Washington Street receivers, 14 percent by Washington Street jobbers, 5 percent by purveyors, and 23 percent by the two auction concerns.

TABLE 9.—*Destination of 110,950 carlot equivalents of fruits and vegetables handled through the Lower Manhattan Market, 1956*

Destination	From Washington Street Market				From auction companies	Total
	Receivers	Jobbers	Purveyors	Total		
Metropolitan area:	<i>Carlot equivalents</i>	<i>Carlot equivalents</i>	<i>Carlot equivalents</i>	<i>Carlot equivalents</i>	<i>Carlot equivalents</i>	<i>Carlot equivalents</i>
Dealers, jobbers, and food chain warehouses	43,400	6,400	100	49,900	17,250	67,150
Retailers	9,250	7,950	4,750	21,950	1,650	23,600
Outside metropolitan area	12,000	1,200	250	13,450	6,750	¹ 20,200
Total	64,650	15,550	5,100	85,300	25,650	110,950

¹ Does not include 910 carlot equivalents from food chain warehouses and 430 cars from other dealers and jobbers which are distributed outside the New York metropolitan

area. These 1,340 carlot equivalents are included in the 67,150 carlots to New York dealers and jobbers.

Some Costs Incurred in Handling

Previous chapters of this report show that many of the facilities and handling methods used in the present markets are inefficient and wasteful. Thus, the main items of direct cost incurred in handling the fruits and vegetables should be estimated before any plan for improvement is worked out because such a plan should be designed to eliminate or reduce as many of these handling costs as possible.

Costs in this report are confined to those that are incurred from the point of arrival in New York City to the retail outlets. They do not include costs to the shippers for freight or transportation charges incurred before arrival in New York City. The costs are confined mostly to those which are subject to change with an improvement in handling facilities and methods. Thus, costs of such items as heat, light, telephone, management, and wages for the office staff are not included. The costs include only the direct costs or charges for handling the 110,950 carlots of fruits and vegetables that passed through facilities of the Lower Manhattan Market area in 1956 and do not include the costs of handling the other 54,550 carlots that moved through facilities in New York City proper without going through the Lower Manhattan Market area. Such costs and charges comprise:

1. Direct labor costs and fringe benefits paid employees in handling operations.

2. Direct operating costs for motortrucks and handling equipment.
3. Facility rentals paid by dealers, or in lieu of rentals a rental value of the facilities used.
4. Other direct handling costs, such as cartage, portorage, traffic delay, demurrage, etc.
5. An estimate of waste and spoilage because of inadequate facilities and excessive or poor handling.

For the purpose of this study, these costs are classified as follows:

1. Costs from first point of arrival to the Lower Manhattan Market area.
2. Costs within the Lower Manhattan Market area.
3. Costs of moving and handling the produce from the Lower Manhattan Market area to retailers in metropolitan New York, including costs of secondary markets and loading costs of trucks of out-of-town buyers.

The estimated costs shown in this chapter were obtained for the most part with the assistance of Stanford Research Institute. The data supporting the cost estimates were from several sources. For example, estimated floating costs and miscel-

laneous pier costs to the railroads were based on data submitted to the Interstate Commerce Commission in 1956 by the railroads (31). Handling costs within the wholesale dealers' stores were based on the information from the cost account books of a number of dealers in the Lower Manhattan Market area. Intramarket transfer costs were based on cartage rates of several trucking concerns and verified by several dealers who contract this type of service. Actual time elapsed on various trips from the market area was recorded. Other sources of cost information are given in this chapter.

An examination of these costs for the year ending June 30, 1956, shows that the total cost of handling the 110,950 carlots of fruits and vegetables that moved through the Lower Manhattan Market area between the points where they were unloaded and the retail outlets in New York City or the points where they were placed on trucks which moved them out of the city amounted to \$30.9 million, or an average of \$279 per carlot.

Costs From First Point of Arrival to Lower Manhattan Market Area

The costs of such items as car floating, cartage from first point of arrival to the market area, and delays to trucks entering the market area which come directly from producing areas are major costs that could be affected by improving market facilities.

As explained previously, the first point of arrival of a large part of the produce handled in the Lower Manhattan Market area was the rail yards of the Pennsylvania Railroad, the Erie Railroad, the New York Central System, or other roads. Many of the receiving yards are in New Jersey, directly across the Hudson River from Manhattan. An estimated 30,198 carlots were floated by the receiving railroads to rail piers in Manhattan. Another 30,638 carlots were received by rail at nearby team track yards in New Jersey, Manhattan, Bronx, and other parts of New York City (including 4,949 which were floated to such tracks) and were either trucked to the Lower Manhattan Market or loaded directly on buyers' trucks at the team tracks.

An estimated 44,070 carlots were received directly from producing areas by motortruck. Since many of the trucks were too large to enter the Washington Street area, 14,870 carlots of the 44,070 carlots were unloaded to small trucks, which carried the produce into the market area. A smaller quantity (6,044 carlots) was received at the farmers' markets, by boat at deepwater piers, or by air and was carted to the primary market.

Total costs for floating cars, pier upkeep, cartage and avoidable delay to trucks from the point of arrival to the Lower Manhattan Market were estimated to be over \$6 million (table 10).

TABLE 10.—Costs of moving 110,950 carlots of fruits and vegetables from first point of arrival to Lower Manhattan Market, 1956

Item	Receipts	Total cost
Costs which were absorbed by railroads: ¹		
Floating to rail piers and miscellaneous pier costs.....	Carlot equivalent 30, 198	1, 238 1, 000 dollars
Floating and switching to team tracks.....	4, 949	273
Total.....	(35, 147)	1, 511
Cartage costs:		
To auction facilities:		
From boat piers.....	3, 450	276
From trucks on West Street..	1, 100	77
To dealer stores:		
From railroad piers.....	748	64
From boat piers.....	1, 700	136
From trucks on West Street..	² 14, 870	1, 041
From New Jersey team tracks.....	3, 000	300
From Manhattan team tracks.....	12, 738	1, 147
From other team tracks.....	2, 000	200
From airports.....	44	4
From Bronx farmers' market..	200	20
From auction facilities.....	(6, 450)	548
Total.....	39, 850	3, 813
Costs for avoidable delays to inbound trucks.....	(26, 000)	702
Volume on which no cartage costs were charged ³	71, 100	0
Grand total.....	110, 950	6, 026

¹ Based on Interstate Commerce Commission Investigation and Suspension Docket No. 5500 (31).

² Cartage for moving produce from large West Street trucks, but not including 6,450 carlots carted from auction to dealers' stores.

³ No cartage costs were incurred for these receipts from first point of arrival to the facilities of the Lower Manhattan Market since the first point of arrival was in the market itself. For a breakdown of these receipts, see table 28.

NOTE: Items in parentheses are not included in totals because they are part of other items.

Costs Which Were Absorbed by the Railroads

Charges for floating 30,198 cars of produce across the Hudson River from New Jersey rail yards and placing them at the piers, the maintenance and other operating expenses in connection with the piers (exclusive of pier rentals), and the costs of floating and switching 4,949 carlots from car floats to Manhattan and other team tracks were estimated to cost the railroads about \$1.5 million per year (table 10). Figure 28 shows the car floats being moved to railroad piers.

The costs incurred by the railroads in floating the 30,198 cars across the river to piers included lighterage, janitor service on the piers, police pro-



FIGURE 28.—Car floats being moved to railroad piers.

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tection, light, power, heat, water, and maintenance of the facility (31).

Cartage Costs From All Places of Arrival

For purposes of this study, cartage costs include costs for (1) loading trucks from rail cars, rail piers, highway motortrucks parked on West Street, boats, or planes, and at the farmers' markets, (2) hauling the produce to the dealer's store or to the auction facilities, and (3) placing it on the tailgate of the truck for unloading by porters of the receiver. Cartage costs were determined largely from records of more than 50 reliable firms on the actual costs paid by them for hauling from various major receiving points in the city. A published schedule of cartage rates was not available at the time of the study. It was reported that such rates usually were negotiated individually.

Cartage costs for moving products from all points of arrival to the Lower Manhattan Mar-

ket area were estimated to be more than \$3.8 million for the 39,850 cars so handled. Cartage costs were \$353,000 for hauling to the auction facilities 3,450 carlots received from boat piers, and 1,100 carlots from large inbound trucks parked on West Street. The cost of hauling 35,300 carlots from unloading points to dealers' stores in the Washington Street area was about \$3.5 million.

Costs to Inbound Trucks for Avoidable Traffic Delays

Because of the narrow streets and the severe traffic congestion in the Washington Street Market area, motortrucks from producing areas often waste much time in entering the market area and finding a place to unload at the dealer's store. Only those trucks 33 feet, or less, in length are permitted by the city to enter the market area. Those which are longer than 33 feet must park on West Street. The contents of these large trucks are transferred to smaller trucks which deliver

the produce to the dealer's store. Practically all the delay costs to the inbound trucks would be eliminated if a new and efficient market were established, because streets would then be wide enough to permit all the trucks to move directly to the dealers' stores without delay.

Avoidable delay costs of inbound trucks for the 26,000 carlots which went directly to the Washington Street Market area were estimated to be \$702,000. These estimates are based on expenditures of several hundred inbound trucks and were obtained from several large transport firms carrying produce to the Washington Street Market. Avoidable delay costs are also incurred by other trucks operating in the market area, but these costs are included in the cartage rate charged by the cartage firm.

Costs Within Lower Manhattan Market Area

Handling costs at the piers and the dealers' stores, waste and deterioration costs, and facility rental costs for the movement of 110,950 carlot equivalents through the facilities of the Lower Manhattan Market area, were about \$10.4 million (table 11).

These cost estimates cover the following items:

1. Costs absorbed by the railroads or their agents for unloading rail cars at piers and railheads, except to the extent that such unloading is a part of the cartage charge.
2. Costs of unloading trucks at auction warehouse and rail piers.
3. "Service and loading charge" at rail piers.
4. Costs of unloading trucks, handling products into, within, and out of dealers' stores, and loading outbound trucks. These costs cover such operations as moving the produce from the platform or sidewalk at the front of the store into the store, piling, moving it into and out of refrigerated or ripening rooms, assembling orders, and moving the products out of the store to the sidewalk or platform, and for loading onto trucks delivering from the central market area.
5. Costs of waste and deterioration due to inefficient facilities and handling.
6. Rental charges, including rents for that part of the piers used in handling fresh fruits and vegetables, rentals paid by dealers or truckers, or in lieu of rentals a rental value of facilities owned, and rental paid by brokers, shippers' representatives, etc., for office space in office buildings in the market area.

TABLE 11.—Costs of moving 110,950 carlots of fruits and vegetables through the facilities of Lower Manhattan Market, 1956

Item	Receipts	Total cost
At rail piers:		
Handling costs for sales at auction facilities:		
Unloading rail cars, sorting and stacking on pier floors ¹	Carlot equivalents 25,450	1,000 dollars 1,400
Unloading trucks from boat piers on railroad pier floors	3,450	44
Unloading and loading-out of truck receipts direct from shipping point	2,100	53
Unloading and loading-out of truck receipts from West Street	1,100	28
Total	32,100	1,525
Handling costs for other sales:		
Unloading rail cars for sale to Washington Street dealers	(748)	41
Unloading rail cars for private sales	4,000	220
Total	4,000	261
Service and loading charges at railroad piers	(26,450)	1,587
At dealers' stores:		
Unloading inbound trucks:		
From auction	(6,450)	82
Other receipts	61,300	779
Loading out to buyers' trucks	(67,750)	1,199
Handling within stores	(20,680)	474
Intramarket transfers between dealers' stores	² (12,400)	464
Total	61,300	2,998
Volume on which there were no handling or other costs for moving through the market ³	13,550	0
Other costs:		
Waste and deterioration ⁴	(80,150)	1,843
Rentals	(110,950)	2,214
Total		4,057
Grand total	110,950	10,428

¹ Based on Interstate Commerce Commission Investigation and Suspension Docket No. 5500 (31).

² See explanatory note, item 46, p. 108.

³ For breakdown of these receipts, see table 30.

⁴ Based on average wholesale value of \$2,100 per car (25).

NOTE: Items in parentheses are not included in totals because they are part of other items.

Handling Costs at Auctions and Rail Piers

According to the Interstate Commerce Commission (31) the cost per car for unloading from rail cars, moving to pier floor, and sorting and stacking fruits and vegetables was \$55. For the 25,450 cars sold at auction these costs totaled \$1.4 million (table 11). Unloading costs for trucks

arriving from boat piers with produce for sale at the auction averaged \$13 per carlot equivalent, or a total of \$44,000 for 3,450 carlots. The cost of unloading for auction sale and reloading the 3,200 carlots arriving by truck directly from producing areas or from West Street was \$81,000. Thus, the handling costs for sales at the auction facilities amounted to more than \$1.5 million.

The costs of unloading rail cars at the piers for private sale and direct transfer to dealers' stores were estimated at \$55 per car (31), or \$261,000 for the 4,748 cars. In addition to the costs of unloading, sorting, and stacking at the piers, a "service and loading charge" of \$60 per car was levied against 26,450 carlots of the total handled at the railroad piers. This charge was reportedly for protecting the produce against pilferage and for loading buyers' trucks. In 1956 it amounted to a total of about \$1.6 million. The charge did not apply to that volume trucked from the piers to Washington Street stores. Thus, total costs for unloading, handling, and loading at the piers, including the service charge, amounted to about \$3.4 million.

Handling Costs at Dealers' Stores

Labor costs for unloading trucks and handling products into, within, and out of dealers' stores are shown in table 11 to be about \$3 million. Of this amount, costs for unloading 67,750 carlots from inbound trucks from the auction or other receipts were approximately \$861,000. Loading-out costs from dealers' stores amounted to another \$1.2 million. Portage costs from the dealers' stores to the buyers' trucks varied considerably. In some instances much time was spent by the porter, weaving in and through congested market streets with a 2-wheel handcart load or with the produce on his back, going to the buyer's truck (fig. 19). In other cases, the inbound truck was able to deliver its merchandise directly to the buyer's truck with little delay. Portage costs from dealer's store to buyer's truck averaged \$17 per car, but costs may often have been more than \$25 per car. Although 67,750 carlots of produce were actually received at the dealers' stores, only 20,680 carlots were moved into the dealers' stores. The rest was sold and delivered from the dealers' platforms or sidewalks or from trucks in front of the stores, without physically being moved into the store buildings. The cost of handling the 20,680 carlots was \$474,000.

Of the 67,750 carlots received by Washington Street dealers at their stores, about 18.3 percent (12,400 carlots) was sold to other dealers within the Washington Street Market and unloaded at their stores. The cost of trucking these 12,400 carlots from one store to another in Washington Street was about \$94,000. In addition, handling costs of the intramarket movement of the 12,400 carlots were approximately \$370,000, making a total of \$464,000.

Labor costs were estimated upon a basic wage of \$2.10 per hour for unskilled labor and \$3.15 per hour for overtime. In addition to this, the employer paid from 9 to 11.5 percent in fringe benefits, comprised of payments for Social Security, unemployment insurance, a welfare fund, and State workmen's compensation.

Figure 29 shows some of the present antiquated sales and loading methods used in the Lower Manhattan Market in 1956 which have resulted in excess handling costs within the market.

Waste and Deterioration

Cost estimates for waste and deterioration were obtained by Stanford Research Institute from various produce dealers, from refuse collectors, and others. Refuse collectors who clean the area each morning reportedly charged 17 cents per package of refuse that they removed from the stores. Individual dealers estimated that they dumped from 0.1 percent to 3 percent of their total volume as waste. Records of several firms indicated an additional loss for poor quality produce returned of about 0.3 percent of total value received from all produce sold. In addition, about 1 percent of all merchandise sold incurred a loss of $\frac{2}{3}$ of its normal value due to waste and deterioration which was discovered before the buyer accepted it. Thus, the estimate for the cost of waste and deterioration of fresh fruits and vegetables sold on the Washington Street Market averaged 1.1 percent of all produce handled, or more than \$1.8 million (25).

Figure 30 shows some of the breakage and deterioration resulting from the present methods of handling fruits and vegetables which cause high costs.

Rental Charges

Rental charges for the various dealers were obtained by a census of all dealers on the market. When the dealer owned the building in which he operated, an equivalent rental was estimated by comparing his facilities and location with similar firms in the market. Information about rents paid by the railroads for those portions of the piers used for handling fruits and vegetables was secured from fiscal officers of the City of New York. The rental charges consisted of \$1,166,000 for the stores on Washington Street, \$509,000 for the space rented by the railroads from the city on the piers, and \$221,000 for office rent for brokers, wholesale dealers, and others who rent offices apart from the dealers' stores, in other office buildings in the market area.

Interviews with operators in the market reveal that it is the common practice for drivers of trailer trucks parking on West Street to arrange for protection of their trucks and contents, and other services pending the unloading and disposal of the shipment. Representative picture in the



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FIGURE 29.—Some present sales and handling methods: (a) Sales in dealer's store. (b) The horse-drawn vehicle still does business in West Street. (c) Loading buyer's truck on busy market street.



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FIGURE 30.—Breakage and deterioration resulting from present handling methods: (a) Broken hampers of greens. (b) Broken crates of cantaloupes.

market said that the most common charge ranges from \$15 to \$25 per truck. For purposes of this study, the lower figure in the range has been used: thus, this charge approximates \$318,000 for the 15,970 equivalents (1 carlot equivalent is figured at $1\frac{1}{3}$ truckload). While the charges can be placed in more than one expense category, it seems most appropriate to place it in the rental category in table 11. Therefore, rental costs for stores, offices, piers, and for this item of truck protection for highway trucks parked on West Street amounted to \$2,214,000.

Costs Incurred Between Lower Manhattan Market and Retail Outlets

Costs for handling 110,950 carlots from the time they left the Lower Manhattan Market until they reached the retail outlets within the New York metropolitan area amounted to about \$14.4 million (table 12). These costs may be segregated into: (1) Costs for rail delivery and cartage to food chain warehouses, (2) cartage costs to other jobbing markets and wholesale dealers, (3) cartage costs to retail outlets in the metropolitan area, (4) costs for loading out-of-town buyers' trucks, (5) costs for avoidable delay to outbound trucks, (6) other costs at food chain warehouses, (7) costs at other jobbing markets and other wholesale jobbers and dealers, and (8) costs of unloading trucks at retail outlets in the metropolitan area (this does not include costs incurred by the retailer).

Over a third, or about \$5.3 million, was spent for cartage from the Lower Manhattan Market to food chain warehouses, other jobbing markets and wholesale dealers, and to retail outlets in the metropolitan area, and for loading trucks for out-of-town buyers. The \$5.3 million also included a charge made by the receiving railroads for re-consignment of cars from team track yards to food chain warehouses.

Of this \$5.3 million cartage and rail transfer costs, \$378,000 were assessed against 9,400 carlots

TABLE 12.—Costs of moving 110,950 carlot equivalents of fruits and vegetables away from the Lower Manhattan Market, 1956

Cost Item	Receipts	Total cost
Cartage and rail diversion from Lower Manhattan to:		
Food chain warehouses in metropolitan area:		
Rail car transfers from team tracks	2,000	138
Rail car diversion from holding tracks	2,000	0
Cartage from auction	2,250	142
Cartage from Washington Street stores	3,150	198
Total or average	9,400	378

TABLE 12.—Costs of moving 110,950 carlot equivalents of fruits and vegetables away from the Lower Manhattan Market, 1956—Continued

Cost Item	Receipts	Total cost
Cartage and rail diversion from Lower Manhattan to—Con. Other jobbers and wholesalers in metropolitan area:		
From auction	15,000	840
From Washington Street stores	42,750	2,394
Total or average	57,750	3,234
Retail outlets in metropolitan area:		
New York City outlets	17,650	922
Other metropolitan outlets	5,950	427
Total or average	23,600	1,349
Outlets outside metropolitan New York (truck loading only)	20,200	357
Total or average	110,950	5,318
Avoidable delay incurred by trucks going to metropolitan outlets:		
From auction facilities	25,650	558
From railroad piers, direct sales	4,000	87
From Washington Street stores	67,750	1,476
Total or average	(97,400)	2,121
Total or average	(110,950)	7,439
Other costs:		
At food chain warehouses:		
Handling within facilities	(9,400)	416
Cartage to metropolitan retail outlets	8,490	498
Loading trucks to outlets outside metropolitan New York	910	10
Total or average	(9,400)	924
At other jobbers and wholesalers:		
Handling within facilities	(57,750)	1,773
Cartage to metropolitan retail outlets	57,320	2,752
Loading trucks to outlets outside metropolitan New York	430	5
Total or average	(57,750)	4,530
At retail outlets in metropolitan area:		
Unloading, New York City	61,460	1,070
Unloading, other locations	27,950	486
Total or average	(89,410)	1,556
Grand total	110,950	14,449

¹ Average charge by railroads for re-consignment from team track yards to final destination.

NOTE: Items in parentheses are not included in totals because they are part of other items.

for rail car transfers or diversions from team tracks to food chain warehouses in the New York metropolitan area. These charges averaging \$19 per car for 2,000 cars were assessed by the railroads for reconignment of cars from team track yards to food chain warehouses. Another 2,000 cars were sold by the dealers to a food chain organization before arrival at a team track yard and then diverted to the food chain without additional cost. The contents of an additional 5,400 cars were carted from the auctions or from Washington Street stores to food chain warehouses at a cost of \$340,000.

In addition, cartage charges to other jobbing markets and wholesale dealers for moving 57,750 carlots from the auctions or Washington Street stores totaled \$3.2 million.

Moreover, another 23,600 carlots were carted from Lower Manhattan Market facilities direct to New York City retail outlets (17,650 cars) and to other New York metropolitan retail outlets (5,950 carlots) at a cost of \$1.3 million.

The cost for loading the 20,200 carlots on trucks moving to out-of-town destinations was estimated to be \$357,000. Since these carlots were taken outside the New York metropolitan area, no further costs were figured after they were loaded on the out-of-town buyers' trucks.

In addition to the \$5.3 million for cartage and rail diversion costs, avoidable delay to outbound trucks (97,400 carlots) was estimated to cost \$2.1 million. This included delays to trucks loading from and leaving the area of worst traffic congestion, namely, the railroad piers, and from the narrow streets around the stores of Washington Street dealers. In the study little avoidable delay was found for trucks handling direct sales at boat piers or for direct sales at team tracks.

Thus, the total costs from Lower Manhattan Market facilities for (1) cartage and rail car diversion to food chain warehouses in the New York metropolitan area, (2) cartage to other jobbing markets and to other wholesale dealers not located in a jobbing market but within the metropolitan area, (3) cartage costs for sales to retail outlets in New York City and the metropolitan area, (4) costs for loading trucks for out-of-town destination, and (5) costs of avoidable delay incurred by outbound trucks destined for points within the metropolitan area, was \$7.4 million.

An estimated 57,750 carlots were handled through secondary markets or by other jobbers and dealers within the metropolitan area, and 9,400 carlots were handled by food chain warehouses. The cost of handling within these facilities, cartage to retail outlets, and loading 1,340 carlots of the 67,150 carlots on trucks of out-of-town buyers was another \$5.5 million. There was also an unloading cost at New York City and metropolitan retail outlets of \$1.6 million, exclusive of the cost of delay time spent by the de-

livery truck in actually getting in position to unload at the retail outlet.

Therefore, total costs of approximately \$14.4 million were recorded for moving 110,950 carlots away from the Lower Manhattan Market to retail outlets in New York metropolitan area or loading onto trucks of out-of-town buyers.

Cartage costs from the central market to the ultimate retail outlets in the New York metropolitan area were computed by:

1. Determining the time required to drive the round trip from the central market to the several points of distribution in each of the five boroughs in New York City and the other points within the metropolitan area.
2. Determining the average cost per hour to operate the various types of trucks, including the drivers' time.
3. Determining the average size of load hauled from the wholesale store to the many unloading points.

Knowing the time required to make the round-trip delivery, the cost per hour for delivery, and the average size of load per haul, it was then relatively simple to calculate the cost per carlot to deliver to the various points in each area.

The survey team timed many of the buyers' trucks from the central market to their unloading points by following the trucks on their delivery routes. Estimates of time elapsed in this movement were also obtained from a number of truck drivers. The same procedure was followed in determining time for shipments moving from other jobbing markets or dealers to the retail stores. No attempt was made to determine the amount of time lost between arrival of the truck at a retail outlet and the time unloading began because of the driver's inability to put the truck in position to unload at the retail outlet. The operating cost per hour for various types of trucks used was furnished by several cartage companies delivering from the central market and by many of the jobbers and retailers buying on the market who used their own trucks. Information was also furnished by several jobbers and retailers who make pool deliveries to merchants in specific areas of the city.

Total Costs

To summarize, total costs for handling the 110,950 carlot equivalents that passed through the facilities of the Lower Manhattan Market area from point of arrival to retail destination or to the point of loading on out-of-town trucks were estimated to be approximately \$30.9 million in 1956 (table 13). This is an average of \$279 per carlot equivalent. More than \$6 million was spent to bring the produce from the first point of arrival to the facilities of the Lower Manhattan Market area, and \$10.4 million was the estimated cost of moving the 110,950 carlots through the facilities

of the central market area. Thus, over half, or \$16.4 million, was spent just to bring the produce to, and handle it in, the central market where it could be distributed to the retail outlets. Much of this expense was caused by the use of outmoded and inefficient facilities and handling methods. Another \$14.4 million was spent in distributing the 110,950 carlots to the many retail outlets of the New York metropolitan area or to load it onto trucks of buyers from outside the metropolitan area.

These figures do not include the buying time of retailers and out-of-town jobbers and many other costs. Such cost items would include costs of management of the wholesale dealers' stores and costs of operation, such as power and light and heat. Very conservative estimates of waste due to deterioration and spoilage that was attributable to inadequate facilities or inefficient handling practices have been considered in the costs. Some waste in the handling of fresh fruits and vegetables is inherent in the nature of the product and cannot be eliminated entirely, regardless of the adequacy of market facilities.

This chapter does not give a complete breakdown of all costs involved, nor does it include costs of all the 165,500 carlot equivalents of fresh fruits and vegetables passing through New York City or give a detailed explanation of how the estimates were calculated. Those who are interested in a more detailed breakdown of the costs and a more adequate explanation of how these costs were calculated can refer to Appendix A, Receipts, Distribution, and Marketing Costs for Present and Proposed New Markets.

Defects in the Way Fruits and Vegetables are Handled in New York City

The whole purpose of the preceding part of this report is to make it possible to ascertain what is wrong with the present facilities and methods of handling. The primary objective of building any new facilities is to reduce present marketing costs and correct as many as possible of the defects in the present system. Hence, before undertaking conclusions about whether new facilities are needed and the kinds and amounts of facilities required, the main conditions that need correction should be set forth. That is the purpose of this chapter.

Too Much Cartage Between Points of Arrival and Wholesale Facilities

One of the major defects of the New York market is the absence of railroad tracks to the wholesale facilities in the primary market area. The nearly 61,000 rail cars of produce sold in the Lower Manhattan Market each year cannot be

TABLE 13.—Summary of costs of distributing 110,950 carlot equivalents of fruits and vegetables through the facilities of Lower Manhattan Market, 1956

Cost items	Total amount
From first point of arrival to Lower Manhattan Market:	1,000 dollars
Floating and switching (to railroads).....	1,511
Cartage to the market area.....	3,813
Avoidable delay for highway trucks.....	702
Total.....	6,026
Within the Lower Manhattan Market:	
Handling at auction or pier facilities ¹	3,373
Handling at dealer stores.....	2,998
Waste and deterioration.....	1,843
Rent.....	2,214
Total.....	10,428
From Lower Manhattan Market to New York metropolitan area retail outlets:	
Cartage from Lower Manhattan.....	² 5,318
Avoidable delay to outbound trucks.....	2,121
Cartage and handling in food chain warehouses, other jobbing markets and wholesale dealers at other than central market.....	5,454
Unloading at metropolitan retail outlets.....	1,556
Total.....	14,449
Grand total.....	30,903

¹ Includes \$60 per car service and loading charge.

² Includes truck loading charge for 20,200 carlots loaded for outlets outside the New York City metropolitan area, in addition to cartage costs.

brought directly by rail to either the auction facilities or the stores of the wholesale merchants. The boat receipts likewise arrive at facilities outside the market area. More than one-third (15,970 carlot equivalents) of the products that are brought to the market by highway trucks must stop short of the wholesale stores or auction because the trucks are too large to operate in the narrow market streets or they cannot go on the auction floors.

Altogether, the products destined for the Lower Manhattan Market are unloaded at about 50 different locations in New York City and across the river in New Jersey. Since they cannot be sold satisfactorily in so many different places, nearly all of these products must be carted to the warehouse facilities in the market, and the total cost of this cartage is nearly \$4 million. If a market were so designed and located that railroad cars and inbound trucks could be unloaded directly on the floors of the wholesale warehouse, nearly all of this expense could be avoided.

Traffic Congestion in Central Market

Efficient operation of the central market is seriously impeded by its inability to handle properly the traffic that flows through it. In addition to the vehicles hauling to and from the market there is much interference by other traffic that must move through the market area. It has been pointed out previously that many trucks consume hours in getting to the wholesale houses to load or unload. Actual timing of the delays in the primary market reveals the cost due to this cause to be nearly \$3 million, and this figure does not include delays to trucks hauling supplies from the various points within metropolitan New York, including other jobbers' markets and other wholesale dealers. This traffic congestion is caused primarily by the streets being entirely too narrow for handling most vehicles and by the absence of areas for parking trucks when they are not actually in the process of being loaded or unloaded. In new, properly designed facilities with wide streets and parking areas traffic congestion should be eliminated. Hence, practically all of the present costs due to traffic congestion could be eliminated.

Buildings Inadequate

Both the piers used for the operation of the fruit auctions and the wholesale store buildings on Washington Street are deficient in making possible optimum efficiency in performing the wholesale functions. Since the auctions are conducted on piers without railroad tracks adjacent thereto, the supplies arriving by rail must be unloaded from car floats onto the pier floors. With the rise and fall of the tides changing the level of the car float with respect to the pier and the necessity of unloading the cars on the car float through a rather narrow opening on one end of the float, unloading is more costly than it would need to be if the auction warehouses were located on land with railroad tracks alongside them. Furthermore, trucks hauling to and from the piers must go onto the pier floor from one end of the building, and products must be lifted from the floor level to the truck bed.

Wholesale stores in the Washington Street area were not designed for fruit and vegetable wholesaling; therefore, they are deficient in many ways. In the first place, they have no rear entrances, and all products must enter and leave the store from a very narrow frontage. Since it is expensive to move these products to the rear of the store and out again, much of the business is done on the sidewalks or at the front of the building. Only about one-third of the merchandise entering these stores under present conditions actually moves into the store buildings. The floors of these buildings are near ground level; therefore, the packages must be lifted and lowered in transferring

them between trucks and stores. Both the shape and the size of many of these stores are inadequate for low-cost operation.

Handling Costs Too High Within the Central Market

Because of the inadequacies of building design, the lack of rail connections, the narrow streets and traffic congestion, and the lack of platforms of proper height for loading and unloading, the costs of handling fruits and vegetables within the central market are too high. Trucks sometimes must be unloaded a number of blocks from the warehouse to which their merchandise is destined. Porters carry the packages between these vehicles and the store along the congested streets or move them on simple two-wheel handtrucks. Excessive portage is also required to get these same supplies from the stores to the trucks of buyers. Modern materials-handling equipment is almost completely unknown in the market area and unitized handling, such as is used in modern warehouses, is practically nonexistent. The width of the streets is such that the trucks cannot back up to the front of the stores to unload but must park parallel to the curb, and many times the trucks are doubleparked. This condition increases the cost of unloading and decreases materially the number of trucks having access to store frontage at one time. All of these conditions make the cost of moving products into, within, and out of the buildings considerably higher than it would be in properly designed buildings.

Too Much Waste and Spoilage

There is entirely too much deterioration and spoilage of perishable fruits and vegetables as a result of the way they are handled between the point of arrival and the retail stores. Products that are brought across the continent in well-refrigerated railroad cars or trucks remain for considerable periods of time on open trucks in the streets of the market or stacked on the sidewalk because it is almost impossible to handle them any other way. The repeated cartage operations with the resultant handling of the packages one at a time likewise lead to deterioration. Since most of the stores and piers lack refrigerated storage facilities, many of the products cannot be properly protected while they are in the market. In a previous chapter the best figures possible to obtain on losses in the market from deterioration and spoilage were shown. But it is impossible to measure fully the damage done to the products by ways of handling. Some products have not deteriorated enough to be a loss but must be marked down in price. Still others are damaged in such a way that the effects do not become fully evident until the products have remained for some time in a

retail store, and it is impossible to ascertain this loss from unnecessary spoilage and handling in the central market.

Products Move Through Too Many Facilities

The approximately 110,950 carlots per year that move through the Lower Manhattan Market area move through too many facilities before they reach the retailer. Figure 22 showing the flow of products from point of arrival to retail stores, indicates that over three-fourths of the 110,950 carlots move through at least two wholesalers and jobbers and a substantial quantity moves through three such handlers before reaching the retail outlet. An estimated 18,850 carlots handled in the Lower Manhattan Market area go through two sets of facilities within the area, of which 12,400 were handled between two stores in Washington Street Market.

When products move through a succession of wholesalers in one city to the degree they do in New York City, it is, of course, necessary for each operator to add to the price for expense of operation plus a reasonable profit. The products must be hauled from one facility to another, with considerable cartage expense, and rent must be paid at the several facilities through which the products move.

Ideally, products destined for a large city should, to the maximum extent possible, be unloaded from railroad cars and trucks directly on a warehouse floor where they will be protected, processed, and assembled in mixed lots for loading to trucks that will take them directly to the retail outlet. Most of the products consumed in the New York area that bypass the Lower Manhattan Market area are so handled. This condition, of course, works to the disadvantage of all wholesale and retail food dealers whose supplies must move through the Lower Manhattan Market area and is one of the reasons why the volume moving through that area has declined in recent years. Developing suitable market facilities that will minimize the double and triple handling of the products would alleviate this condition.

High Rents

The study shows that the rental value of the 213 stores in the Washington Street area is about \$1.2 million per year, or \$2.45 per square foot of *first floor space used* inside the store buildings. (No account was made of space used on sidewalks or of space occupied on floors other than the first floor. The dealer does not pay rental charges for sidewalk space and most, if not all, his business is done on the first floor.)

This is a very high rental for the kind of facilities being used, but the market is located in Lower

Manhattan where land values are undoubtedly as high as they are anywhere in the world. Even though the primary market is located within the blighted area of Lower Manhattan where land values are not so high as in the area surrounding it, they still are too high for a produce market which must, of necessity, operate on one floor. Hence, the high rents are due largely to the market's location rather than to the quality of the facilities being used. As a matter of fact, it may be possible to provide good store facilities and make them available to the wholesale food merchants at about the same rents that are currently being paid, with proper construction, financing, and choice of site.

Market Poorly Located

The question is often asked why the principal wholesale fruit and vegetable market of New York City is located in an area where land values are high, streets are narrow, space is limited, traffic is congested, railroad access to buildings impossible, and buyers' trucks must travel through the most heavily populated areas of the city. The primary reason is that the market was established many decades ago at which time it very likely met the requirements of the people who used it. But conditions have so changed since then that this location is no longer a good site for a produce market.

Operating Hours Too Long

Primarily because of the inadequacies of the facilities, the narrowness of the streets and resulting traffic delays, and the impossibility of having any uniform regulations throughout the market area, the hours of operation are too long. The receiving of supplies from railroads, boat piers, and out-of-town points continues into the period when sales are being made and buyers' trucks are entering the market. This causes interference between vehicles bringing supplies to the market and those hauling them away. Many operators find it necessary to dispose of a portion of their supplies early in the day in order that they may have space for unloading supplies that arrive later. Since the streets cannot handle the traffic, buyers come to the area over a prolonged period. These excessive hours of operation increase the burden of management, prolong the selling hours, increase the number of salesmen required, and result in excessive overtime payment. There is no reason why, with the right kind of facilities in the proper location, the business of wholesale handling of fresh fruits and vegetables cannot be limited generally to an 8-hour day. To achieve this, it is not only necessary to have proper facilities but also some overall control so that the agreed-upon operating hours can be enforced.

Difficulties in Price Making

One of the important functions of a market is to establish prices. In the Lower Manhattan Market area where supplies are so scattered, it is difficult for either sellers or buyers to get timely or accurate information on the quality and quantity of products available. Furthermore, with buyers arriving over a prolonged selling period, it is difficult to measure the demand. These conditions result in considerable variation of price over a 24-hour period, leading to difficulties and dissatisfaction among shippers, wholesalers, and buyers alike. The U.S. Department of Agriculture Market News Service does its best to obtain timely information on supplies and prices, but its task is difficult under present conditions.

Poor Working Conditions

All in all, the Lower Manhattan Market is not a pleasant place to work. Most of the handling of heavy packages of products must be done without the benefit of modern handling equipment. A majority of the labor is performed outside the buildings on sidewalks and in the streets in all kinds of weather. The hours of operation are long. The facilities and surroundings of the area are not attractive. Hence, there is little com-

parison between working under such conditions as these and employment in a modern wholesale food warehouse designed to meet present-day needs.

Market Unattractive to Buyers

Many buyers who formerly came to the Lower Manhattan Market area to purchase their supplies of fresh fruits and vegetables no longer come there or come less frequently because the market is unattractive to them. When they come they have difficulty getting into and out of the area; they cannot find parking space within the area; a great deal of time is consumed in obtaining supplies; they do not know when the best variety of products is available; and they find it inconvenient to load their vehicles. Consequently, many of these buyers seek other sources of supplies; others pool their operations with similar buyers to minimize the number of trucks that have to go into the area. The total quantity handled in the Lower Manhattan Market declined from 132,805 carlots in 1939⁸ to 110,950 carlots in 1956. This is an average decline of about 1,285 carlots per year in the principal market of a metropolitan area where the population is increasing. This fact alone is probably the best evidence of the excessive costs of handling produce through the Lower Manhattan area and that fresh fruit and vegetable buyers avoid it.

Need for a New Food Distribution Center

The remainder of this report sets forth the points that must be considered in developing wholesale marketing facilities that will correct insofar as possible the conditions that have been described and meet the present as well as the foreseeable needs of the city.

It seems obvious that the deficiencies of the Lower Manhattan Market described in previous chapters cannot be improved by remodeling the present market. It is simply impractical to make the required changes in that location. Widening the streets to handle traffic properly and providing railroad tracks to the buildings would require the complete demolition of present facilities and the construction of new ones. Furthermore, to provide wide streets, rail connections, parking areas, and one-story buildings would require so much land that the cost of land in the present location would be prohibitive. Anything less than a completely new facility would be of doubtful value. Minor modifications would be costly and would not correct the fundamental conditions.

What is needed are modern one-story warehouse buildings with platforms along the front and rear where railroad cars may be unloaded on one side and motortrucks on the other. The warehouses

should have adequate space for the necessary storage and handling operations. The streets should be wide enough so that motortrucks can back up to the platforms for loading and unloading and still leave plenty of room in the middle of the street for the flow of traffic. Parking areas for idle vehicles are just as important as the buildings themselves.

Because a large amount of land would be required, it is prudent to seek such land as may be available at a reasonable price. Otherwise, the rentals required to amortize the complete investment would offset, or partially offset, the savings that might be made. Hence, if any facilities are to be built, they should be located outside the high-price land area of Lower Manhattan.

In selecting a location for a new primary fruit and vegetable market and deciding the type of facilities that should be built, the question arises whether it is prudent to develop plans for facilities that will be restricted to the handling of fresh fruits and vegetables. While it is reported that fruit and vegetable wholesalers in the Lower Manhattan Market area handling most of the tonnage

⁸ The 132,805 carlot equivalents received in 1939 in the Lower Manhattan Market have been adjusted to 1956 carlot equivalent because 1956 rail cars were loaded, on the average, 16 percent heavier than 1939 rail cars.

thought that the market should be relocated, it certainly would facilitate such a relocation if alternative uses could be found for redeveloping the present market areas in Lower Manhattan.

Such a redevelopment should not only put the land to more economic use and be beneficial to the general development of the area but should also simplify the problems of present food wholesalers. If the redevelopment of the present primary market area caused the fruit and vegetable trade to move to a new facility, large numbers of wholesalers of other foods who are located adjacent to the fruit and vegetable wholesalers and who are operating under similar conditions would likewise be uprooted. It would seem to be just as necessary to provide facilities for these people as for the fruit and vegetable wholesalers. For this reason, even though emphasis in this report is on the fruit and vegetable wholesale market facilities, the possible need for providing facilities for the wholesaling of other foods should not be ignored.

HOW THE MARKET FACILITIES CAN BE IMPROVED

Many important decisions must be made before a program can be undertaken to improve the wholesale fresh fruit and vegetable market facilities of New York City. Answers must be found to many questions such as: What kind and amount of facilities would be needed? How large a site is required? How should the facilities be ar-

Another reason why any fruit and vegetable facilities that might be constructed should be a part of a wholesale food distribution center is that the same factors would be paramount in choosing locations for both fruit and vegetable wholesalers and for other food wholesalers. Retail and other buyers who come to the market for one group of commodities often desire to purchase other commodities on the same trip. This would be facilitated by having various kinds of food wholesalers located in the same area. Furthermore, it appears that food wholesalers, particularly those who deliver directly to retailers, will tend to handle a more complete line of food.

All of these conditions, plus other considerations, point toward the need for a wholesale food distribution center to take the place of the present Lower Manhattan Market area. A special effort has been made in this report to show that other types of food wholesale facilities should be located adjacent to the ones proposed for fresh fruits and vegetables.

anged on the site? What are the factors to be considered in selecting a site? How much would the land and facilities cost? What would be the operating costs, taxes, amortization cost, and revenue sources? How would the market be owned and operated? These and many other problems must be considered.

Kind and Amount of Facilities Needed

First, it is necessary to determine just what facilities would be needed, how these facilities should be arranged and operated, and how much space they would require.

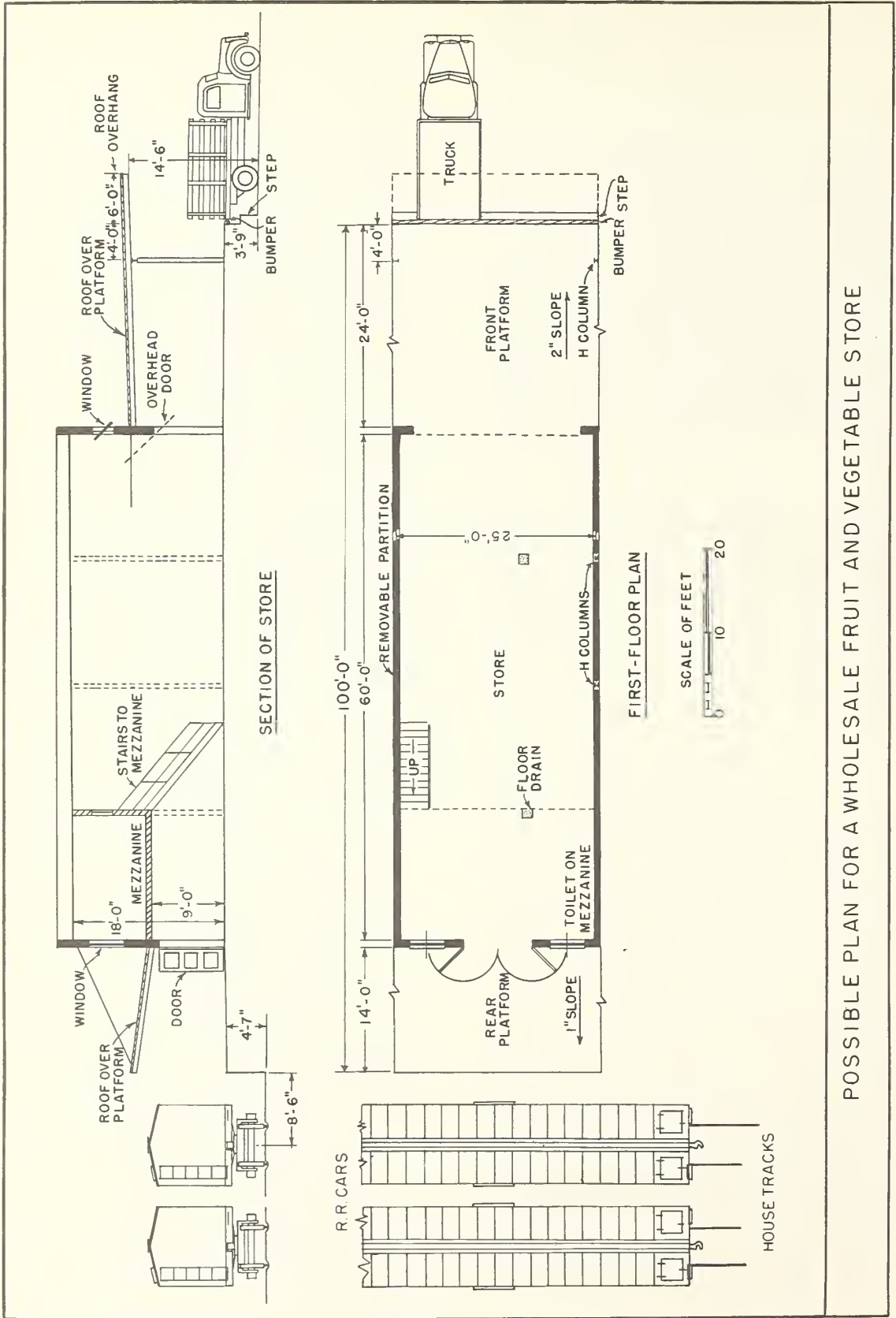
It is essential that any plan for a new wholesale fruit and vegetable market provide the facilities that will eliminate or remedy the defects which have been pointed out. In order to eliminate or remedy the defects, it is necessary to consider the needs of the wholesale trade which would operate in such a market. Provision must be made for the establishment of whatever facilities are required for present and anticipated future needs.

The individual needs of each wholesaler have been determined from personal interviews and from studying his operations in the present market areas. From these interviews and studies it was determined that a new fruit and vegetable wholesale market to replace the Lower Manhattan Market should include in initial construction the following facilities:

1. 240 store units (25 feet x 100 feet overall) with mezzanines at least 15 feet deep for the firms' offices.

2. Two restaurants in two additional store units with public restrooms in basements.
3. 80 offices for brokers, allied organizations, etc.
4. Fruit auction facilities approximating 150,000 square feet on first floor and 50,000 square feet of second floor space.
5. House tracks accommodating 240 rail cars at dealers' stores and 60 cars at auction building.
6. Team track yards for approximately 400 rail cars.
7. Paved streets not less than 150 feet wide (and preferably wider) where store buildings face each other.
8. An 8-foot fence and gates to enclose market area.
9. Parking areas for at least 1,500 cars and motortrucks.
10. An expansion area to permit construction of additional store units, as needed.

The kind and amount of facilities needed are discussed in the following paragraphs. It must



POSSIBLE PLAN FOR A WHOLESALE FRUIT AND VEGETABLE STORE

FIGURE 31

be emphasized, however, that the actual amount of construction should be based upon the *space needed to handle the present volume of fruits and vegetables of responsible tenants who will actually sign definite leases*. This precaution is necessary to prevent overbuilding at the outset and to insure the occupancy of all facilities.

The kind and amount of facilities planned for initial construction are based upon the estimated volume of business handled in 1956 by 200 independent dealers and two fruit auction companies located in the Lower Manhattan Market, who were operating under such conditions that they should move to new facilities. If dealers in some secondary market should desire to locate in the new market, more facilities would be needed.

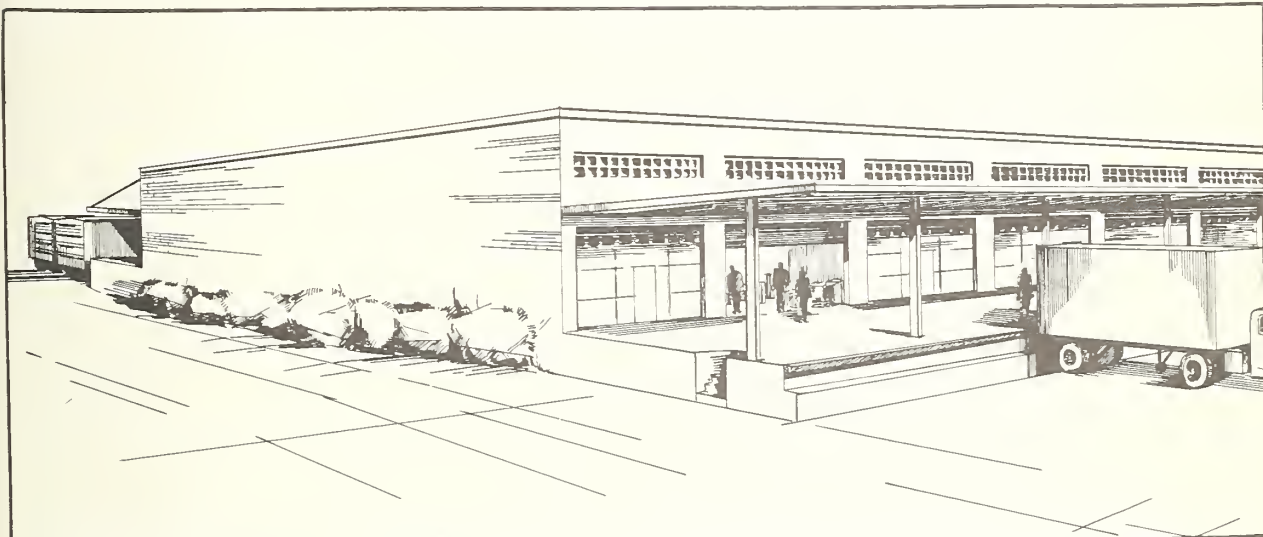
Store Buildings

The 240 fresh fruit and vegetable store units and the 2 additional units which are used by restaurants could be placed in 12 buildings. The store units should be 25 feet wide and 100 feet long, with a 14-foot platform in the rear, 55 inches above the top of the rails, and a front platform 24 feet wide, 45 inches above the street (fig. 31). Each platform should be sloped toward the edge to provide drainage. The enclosed part of each unit should be 25 feet wide by 60 feet long (excluding two 1-foot walls). Thus the overall depth (including the walls) is 100 feet for each building. The roof over the front platform should have a 6-foot overhang to protect the produce from bad weather during loading and unloading operations. Posts supporting the front

platform roof should be placed at least 4 feet back from the edge of platforms to prevent interference with loading and unloading of trucks and damage as they back up to the platforms. A continuous step 22 inches above the pavement at least 2 feet wide should run along the front platform to accommodate small trucks and to permit pedestrians easy access to wholesale stores. A wooden bumper 6 inches by 8 inches should be bolted to the edge of the front platform to protect it from damage by trucks as they park.

The produce would be delivered by rail car to the rear platform or by motortruck to either platform for unloading on the dealer's floor. Part of the width of the front platform is for display and sales purposes; the remainder is for the common use of buyers, for delivery of produce directly to the buyers' trucks, and for a passageway (fig. 32).

Store units should be constructed side by side, with continuous front and rear platforms. Individual dealers might take one or more than one unit, as required for their operations. It would also be possible for two dealers to split a unit between them, each having a half unit, one and a half units, or more. Hence, temporary partitions between units should be placed to provide each dealer with the space he needs. The partitions should be built of material that could be removed easily for expansion and made watertight at the base to prevent moisture seepage between the units. The total length of the building should be determined by the number of units required, the space available in the market area, and the arrangement of the facilities on the market. In



A DESIGN FOR THE PROPOSED FRUIT AND VEGETABLE STORE BUILDING

FIGURE 32

some instances interference from street and sewer easements will determine the location and the total length of the building.

It is recommended that offices for the individual dealers be constructed on a mezzanine floor, each office being at least 15 feet deep and the width of the store unit. When constructed at the rear of the building with windows in the front part of the mezzanine, a view of the sales floor and delivery space is afforded without the offices occupying valuable space on the main floor. If additional office space is needed, the mezzanine could be extended by construction of an additional space 15 feet by 25 feet over the rear platform.

To allow for construction of the mezzanine office and provide adequate space underneath for walk-in coolers or ripening rooms, the height of the ceiling should be *no less than 18 feet* above the main-floor level. Stairs to the mezzanine should occupy a minimum of space. Toilet facilities for each store should be provided on the mezzanine.

Adequate screens and air vents should be provided to facilitate the circulation of air within the store. This is extremely important in New York City where outside temperatures may be high at certain times of the year. Not only the extreme outside temperatures, but the inherent tempera-

ture rise from respiration of the product itself may cause deterioration of the produce, especially in produce held in the store overnight.

Interior of stores should be well lighted. In another city, where power rates are relatively high, extensive use of fluorescent light, corrected for color, is being considered because the operating costs are much lower than for incandescent fixtures. Also, to provide flexibility in lighting the store space, the light fixtures should be controlled by more than one electric switch, so that lights might be extinguished in parts of the store not being used.

The front door should be about 16 feet wide with a 4-foot-wide "access" door built into it. The rear door should be about 8 feet wide. All outside doors should be at least 8 feet high.

There should be at least two floor drains no more than 8 feet from the center of the store unit, and the floor should be pitched to the drain in each store. The floor slabs should have a *nonskid surface* to avoid danger of slipping and bad falls by employees and market customers. Floors in the stores should be designed for a live load of at least 350 pounds per square foot, and mezzanine floors for a live load of 75 pounds per square foot.

Where subsoil requires it, all building foundations and floors should be supported on treated

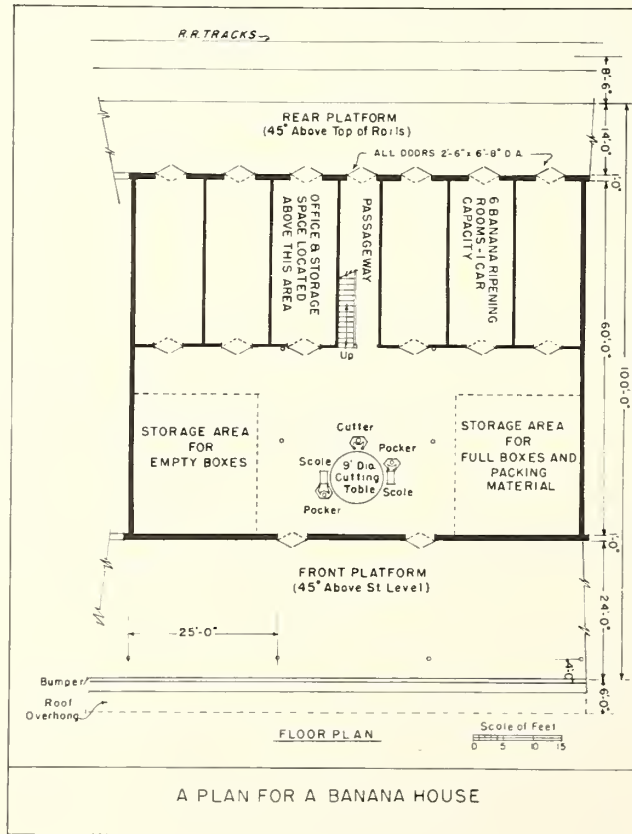


FIGURE 33

wooden piles capped with concrete to support walls and floors.

Two house tracks should be laid parallel to the rear platform behind all fruit and vegetable stores. This will permit direct unloading of rail cars onto the rear platform and into the store or directly into trucks. The equivalent of one rail car can be placed on the two house tracks behind each store unit. (Since each car is approximately 50 feet long only half the car can be placed immediately behind a unit 25-feet wide.) Cars on the second house track can be unloaded through the rail car on the nearest house track to the dealers' store or directly to a truck parked alongside it. The area around the tracks should be paved to the top of the rails. To provide adequate safety for rail employees and others, there should be 8 feet 6 inches between the edge of the rear platform and the center of the house track nearest the platform.

It is recommended that ripening rooms, coolers, other refrigeration equipment, or special installations in the store units be provided by the tenants. Individual dealer requirements for these items vary considerably. Furthermore, a few wholesalers may have equipment which could be transferred to a new store. Dealers should, however, acquaint the market sponsors with their needs for these facilities before the stores are constructed to permit their inclusion in the plans. It is very expensive to install such facilities after the building is completed.

Each unit would contain 1,500 square feet of first floor enclosed space and 950 square feet of platform space (fig. 31). There is an additional 375 square feet in each mezzanine office. Thus, the 240 store units would comprise 360,000 square feet of first floor enclosed space, 228,000 square feet of platform space, 90,000 square feet of mezzanine office space, and 12,000 square feet of space occupied by the two 1-foot walls, or a total of 690,000 square feet. These units should handle efficiently the 67,750 carlots of fresh fruits and vegetables which were handled by the 200 Lower Manhattan area wholesale dealers in 1956. The volume handled per year per unit would be about 282 carlots. The total space used, including sidewalk space, for fruits and vegetables in the Lower Manhattan Market amounted to 979,150 square feet (table 4), but much of this space was inefficiently used because of the design and characteristics of the facilities.

Although store units of the same type are suggested for all types of fruit and vegetable dealers, a layout is suggested also for specialty businesses, such as banana handlers. This layout illustrates how the facilities could be arranged to obtain maximum utilization of floor space and the proper flow of the produce through the store.

Figure 33 shows a layout for the handling of bananas in three standard store units. This layout is planned for a volume of 300 carlots annually. It is based on a 6-day ripening period and con-

tains 6 paneled ripening rooms, 11 feet wide (including partitions) by 28 feet long with a 7½ foot passageway to permit access from the rear platform to the front part of the store. The capacity of each room is about 365 stems or the equivalent of 1 carlot. Ripening rooms cover about one-half of the total enclosed first floor areas, while the balance is planned for cutting, packaging, and shipping operations. As a rule, this ratio makes possible a good flow of the produce through the units. The suggested layout permits the unloading of bananas from the rail car directly into the cutting, packing, and shipping rooms, with comparatively short distances between specific operations. Space above the ripening rooms can be used for offices and storage of cartons and other such items (1).

When the space requirements of the tenants are known, the banana wholesalers, tomato prepackagers, and other dealers who do various kinds of processing may be grouped into one of the suggested fruit and vegetable buildings. Large firms may wish individual buildings.

Auction Facilities

The proposed plan includes a building, which contains approximately 150,000 square feet of space on the first floor and 50,000 square feet on the second floor, for auction sales. The building should be 200 feet wide and 750 feet long. This would permit the sorting, stacking and handling, and auction sales of the 32,100 carlots reported in 1956 by the two auction companies. It is suggested that there be a platform 15 feet wide extending along each of the 750-foot sides of the building; the platform should be about 50 inches above the street level to accommodate rail cars and motortrucks. The building should have two house tracks on each of the two long sides with the space between the tracks paved to track level. The platform roof should be supported from the building to avoid the use of posts. A wooden bumper 6 inches by 8 inches should be bolted to the edge of the platforms to protect them from damage by trucks as they park for unloading or loading produce.

The 50,000 square feet of space on the second floor is for auction sales auditoriums, and offices for auction buyers, wire services, etc. (fig. 34). As previously pointed out, there is over 414,000 square feet of space available on the first floor of piers 27, 28, and 29 for unloading, sorting and stacking, and loading on outbound trucks the fruit handled by the two auction companies. Only 150,000 square feet of usable sales space is being suggested for the new auction building. However, operations on the piers include loading of outbound trucks, which are driven onto the pier floors and loaded from between the stacks and rows of produce. In the suggested plan, trucks would be parked on the street and loaded from



FIGURE 34.—A fruit auction building.

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the two platforms, thus making it possible to decrease the space needed for loading and unloading. Space for offices and for auction salesrooms, provided in the suggested plan, is also somewhat less than now available, but much of the present space on the second floor of piers 27, 28, and 29 is not economically used. The detailed design and layout of the building should be the responsibility of the auction concerns, but it should be built to conform to the master plan of the market.

Space for Farmers' Market Facilities

There is no farmers' market in the Lower Manhattan Market, and at the time this report was written, it was not clear whether farmers desire such facilities in a new market. Accordingly, cost estimates for construction of farmers' and truckers' sales sheds or stalls are not included in any of the calculations of this report. However, space for 200 farmers' stalls (about 11 acres) for a farmers' market adjacent to the fruit and vegetable facilities is shown in the several layouts, and construction cost estimates are shown in Appendix B.

Fence

Some markets have the entire area enclosed with a durable fence to facilitate the enforcement of market regulations and to prevent much of the pilferage occurring in the old facilities without this protection. An 8-foot chain-link fence with gates at proper locations is provided in the estimates of construction costs in this report.

Rail Connections to Stores and Auction Facilities

Direct rail access must be provided to each building occupied by the dealers and to the auction facilities. In the proposed plan, two house tracks are provided adjacent to the rear platform of the store buildings and along both platforms of the auction facilities. Trackage for approximately 20 rail cars is provided at the rear of each of the 12 multiple store buildings. In the proposed plan a total of approximately 240 cars can be spotted at one time at the stores and about 60 cars at the auction building. In order to make the best use of these tracks at the stores and for other reasons, it is important that large receivers be scattered throughout the market area and not concentrated in one or two buildings.

Streets at the rear of each store building and in the front and back of the auction facility should be paved between the tracks and level with the top of the rails so that these platforms can be used in loading and unloading motortrucks when the tracks are not occupied by rail cars and to make it easier to keep these areas clean.

Team Track Yard

A team track yard should be provided within the market area for several hundred cars of produce, where products can be unloaded directly from the cars. The proposed plan provides trackage for approximately 400 rail cars in the team track area. Each pair of tracks should be served by a

60-foot paved street to permit easy access and unloading into trucks. In the proposed plan, the team tracks are placed adjacent to the parking areas at each side of the two groups of dealers' stores for convenience.

In this type of market, a team track yard is an integral part of the market facilities. However, since yards for holding cars and tracks for switching to the market are considered a responsibility of the railroad serving the market, they are not provided in the market plan.

Streets and Parking Spaces

The width of major streets of the proposed market area depends upon their usage. They should be paved to carry heavy traffic and to facilitate proper drainage. All parking at the buildings should be at right angles to loading platforms. When two rows of buildings face the same market street, the streets should be at least 150 feet wide (preferably wider) to permit the parking of motortrucks diagonally in the center of the street and at right angles adjacent to the store buildings and to provide sufficient space for the easy flow of traffic. Other streets, including streets in the team track yards, should be from 60 feet to 100 feet wide, depending on their use and the traffic load. On some streets it may be necessary to provide angle parking for cars and trucks, while in others only sufficient space to handle traffic flow will be needed.

Convenient parking spaces should be provided near the stores for vehicles that are not being loaded or unloaded. Such areas would be used for parking inbound motortrucks that are not ready to unload, buyers' cars and trucks that are not ready to load, and cars of employees. The parking areas should be as near the buildings as possible but should not block market streets or loading areas. It should be emphasized again, *that land for parking in a market is just as important to the market operations as land for buildings.* Also, land for expansion of facilities should not be permanently assigned for parking areas or the efficiency of the market will suffer when the facilities are expanded.

It has been suggested that, because of the relatively high cost of land, parking areas for employees' cars could be provided on the roofs of some of the buildings, with ramps for access. Obviously this would add to the construction costs, but it may be economically feasible for the New York City plan.

Although there are no definite figures to serve as a basis for determining the number of parking spaces that would be needed, approximately 1,500 parking spaces 10 feet wide and 25 feet deep are provided in the proposed plan. This is about half

the estimated total number of trucks that enter the market daily. This does not include any parking spaces for employees' cars.

Other Facilities and Services

Many firms now occupying office space in the Lower Manhattan Market area, or in its vicinity, will probably need office space in the new market. Such firms would include brokers, shippers' representatives, national food processors, telegraph and telephone companies, government market news and inspection offices, transportation lines, and labor organizations. In addition, space would be needed for banking facilities, barber shops, offices for the market management, etc. This space could be provided by adding a second floor over one or more of the store buildings, or by building an administration building, preferably at a central location. No estimates for the construction of an administration building are included in this report. Provision is made, however, for 80 offices, 12 feet by 26 feet on the second floor of one store building (fig. 35). Space is also provided for offices on the second floor of the auction building. It is expected that at least 10 dealers now having space in office buildings will move to their store mezzanine offices.

Two restaurants are provided in the store area by adding two standard store units at convenient locations (fig. 35). Public restrooms are provided in the basements under the restaurants.

Total Land Area Needed

In the selection of the market site, acquisition of land for expansion of the fruit and vegetable wholesale facilities should be considered. In other cities where new wholesale produce facilities have been built, produce dealers not originally included in the new market have gravitated to it and, in many instances, tenants on the new market have needed more space to handle their increased volume of business. In the proposed plans an area is provided for an additional 48 stores, or a 20-percent expansion of store facilities. As mentioned before, areas assigned to parking should not be considered as areas for expansion.

If space is provided for a new market as described in this chapter and an allowance is made for expansion, a site of at least 100 acres will be needed. Of the 100 acres, approximately 85 will be needed for the multiple store buildings, house tracks, team track yards, parking spaces, streets, and expansion area for the dealers' store buildings, and 15 acres for the auction facilities and adjacent parking areas. This compares with 65 acres in the present Washington Street and pier areas where the streets are too narrow and railroad tracks and parking areas are lacking.

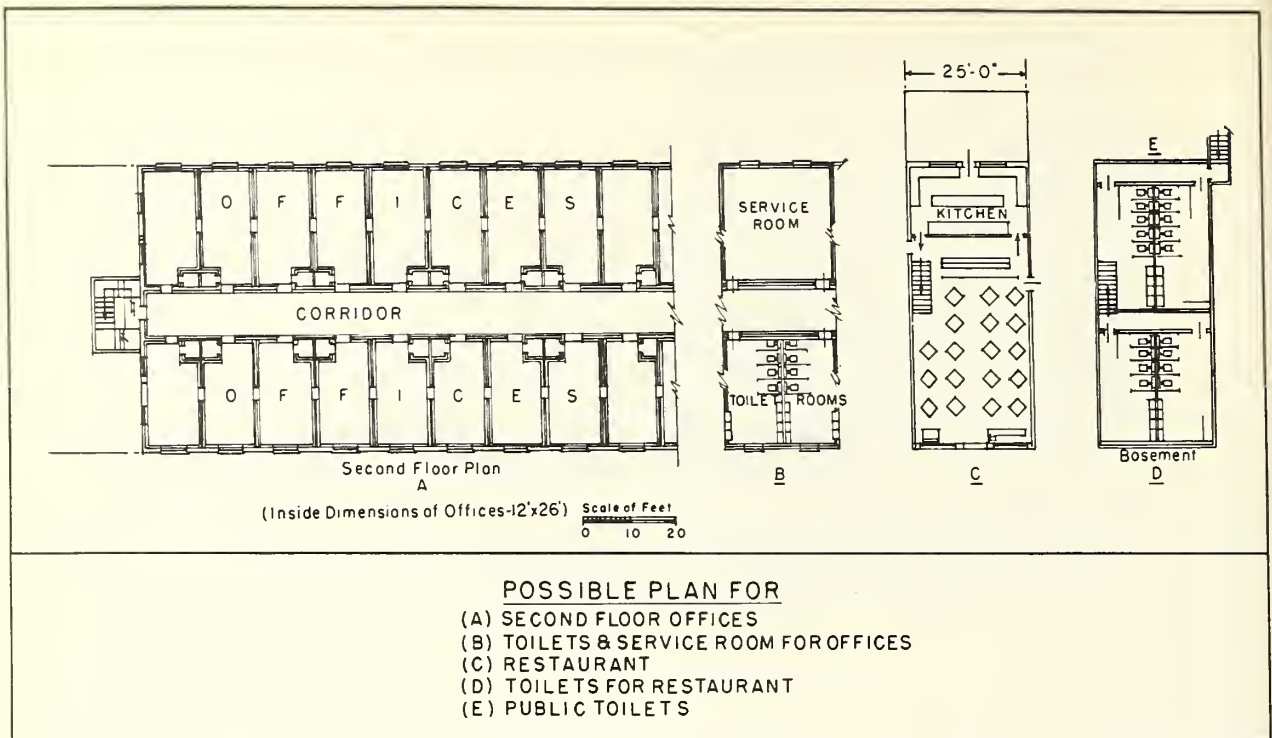


FIGURE 35

No allowances have been made for other types of food wholesalers, such as coffee roasters, food chain warehouses, and public refrigerated warehouses. These industries also have gravitated to the vicinity of new markets in other cities.

Since the acquisition of sufficient land for a new market in New York City seems to be one of the most difficult of all problems to be faced by the sponsoring agency, this aspect of the project should be investigated carefully.

Arrangement of Market Facilities

Arrangement of facilities on any given site depends upon the shape and other physical features of the area selected for the market. Access streets and relative location of railroad tracks also have a strong influence on the location of buildings. If a market is to operate efficiently, the various facilities must be laid out so there is a maximum coordination of the functions each is to perform. Facilities also must be arranged in such a manner that in future expansion they will form an integral and coordinated part of the market. A possible arrangement of facilities for a fresh fruit and vegetable market on a hypothetical site of 100 acres is shown in figure 36. This layout has no relation to any specific site in New York City.

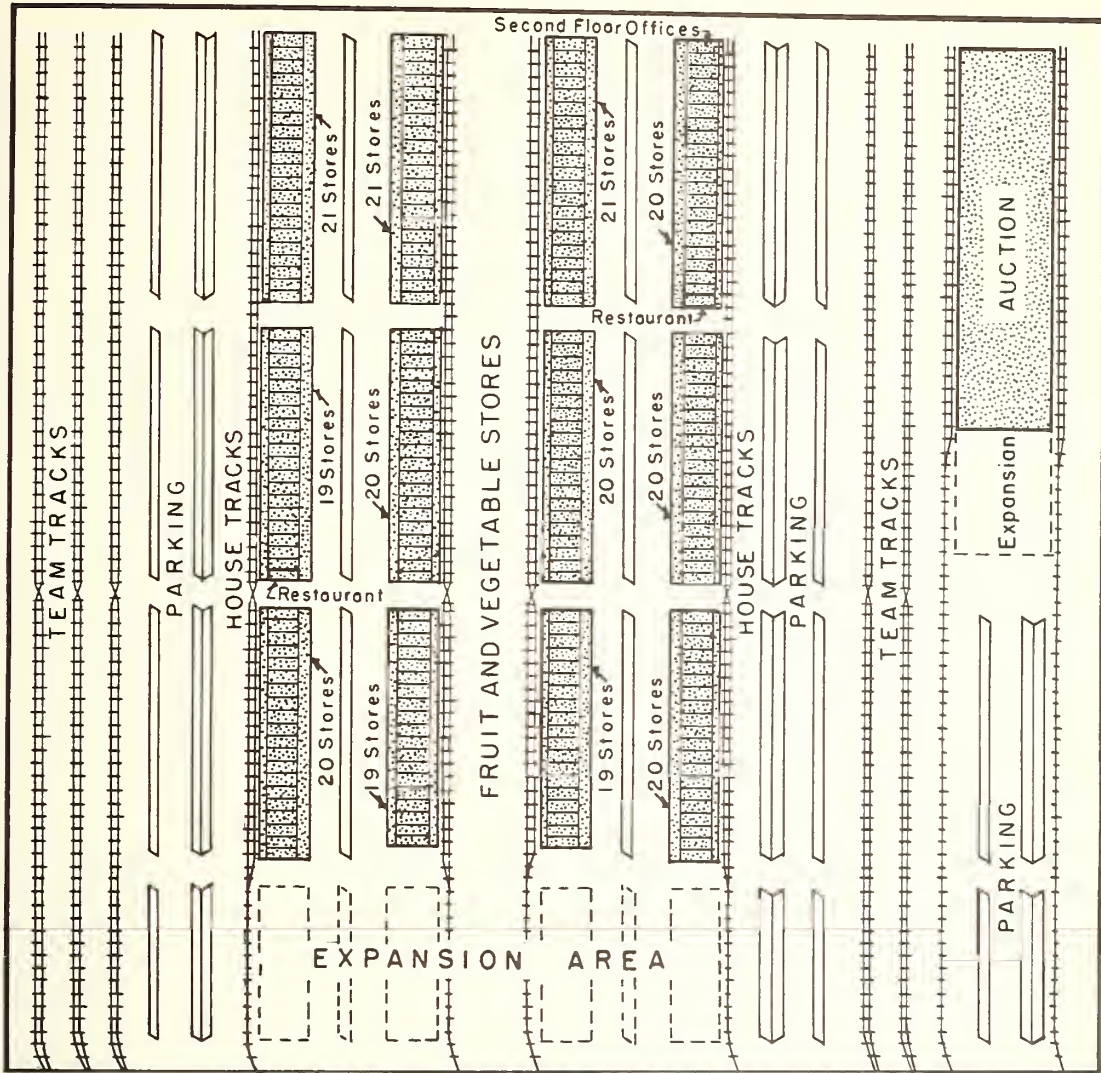
The Fruit and Vegetable Market

In figure 36, the 240 fruit and vegetable store units and the 2 restaurants are arranged in 4 parallel rows of 3 buildings each. The rows of buildings are separated by streets 150 feet wide. This

should provide loading space at the front of these buildings for 600 trucks at one time. There is parking space for one row of vehicles in the center of the street between the two rows of store buildings. Also parking space is provided between the rears of store buildings and the team track yards for one double and one single row of vehicles. Adjacent and parallel to the stores are two team track yards, one with three parallel rows of double-rail tracks at one side of the stores, and the other with two parallel rows of team tracks. Each double track is served by a 60-foot paved street. The two yards have a capacity of about 400 cars.

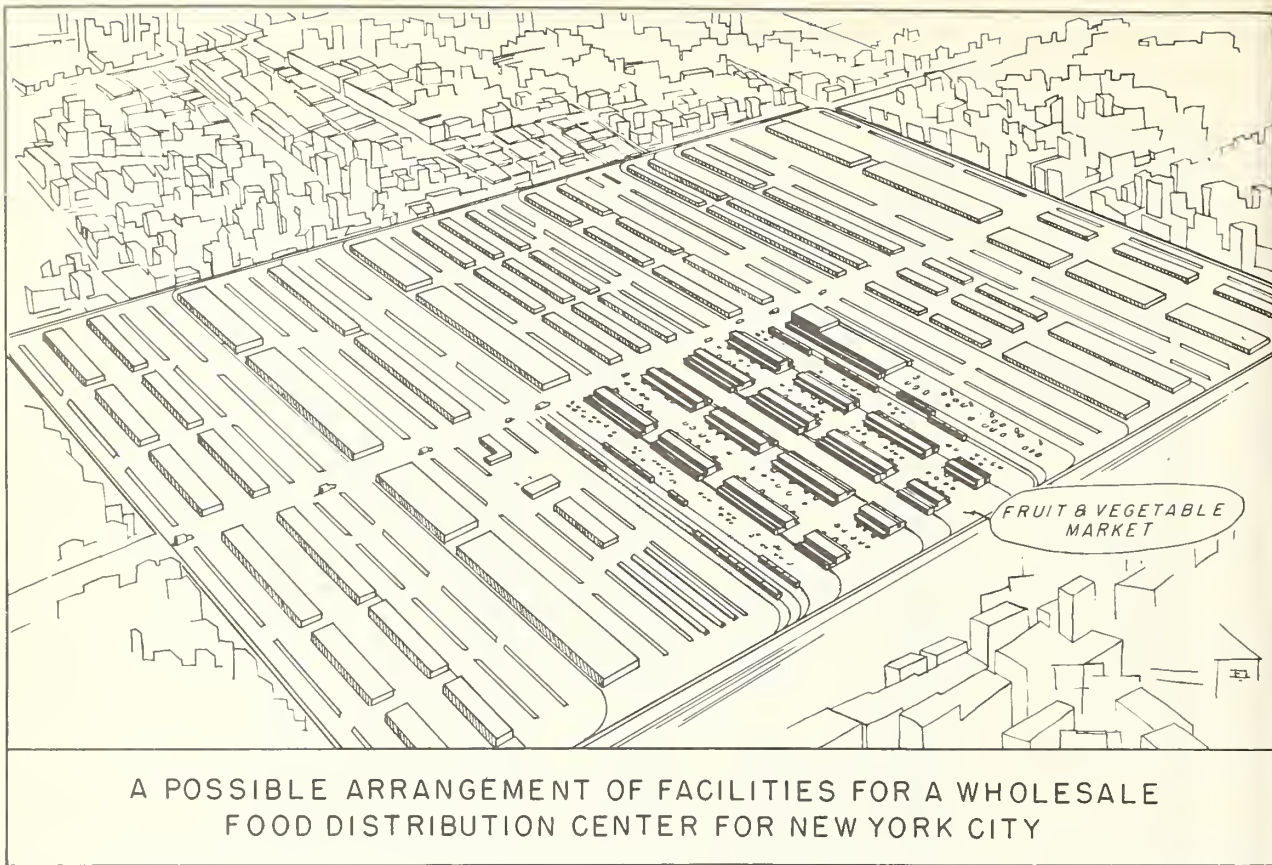
Near the store section is an auction building 750 feet long and 200 feet wide. Two house tracks with a capacity of 60 cars are provided alongside the auction house. There is a 75-foot street on both sides of this building. Expansion areas are provided adjacent to the proposed dealers' stores and auction building.

Space for 80 offices for brokers, government inspectors, and others, is provided on the second



LAYOUT OF A FRESH FRUIT AND VEGETABLE
WHOLESALE MARKET ON 100 ACRES

FIGURE 36



A POSSIBLE ARRANGEMENT OF FACILITIES FOR A WHOLESALE FOOD DISTRIBUTION CENTER FOR NEW YORK CITY

FIGURE 37

floor of a dealers' store building at a convenient location within the market. Two restaurants with public restrooms in the basements are also placed at convenient locations in the end units of 2 multiple store buildings.

The layout was planned in such a way that facilities initially built would form a compact unit, and expansion could be made without destroying the compactness of the facilities at any stage of development. Streets have been designed to minimize traffic problems. Each building has a parking area provided for buyers. Although it may be desirable for the market sponsors to change the layout shown in figure 36, to fit a particular site, the principles set forth herewith should be followed since they are based on experiences in market construction in many cities.

Incorporating a Fruit and Vegetable Market in a Food Distribution Center

Consideration should be given to acquiring land for the inclusion of facilities for the wholesaling and processing of dairy products, eggs, meat and meat products, frozen foods, sea foods, dry groceries, and other foods. However, no estimate has

been made in this report of land needed for facilities other than fruits and vegetables. In a city where a wholesale food distribution center is being constructed, the amount of land provided for the construction of facilities for fresh fruits and vegetables is only a small percentage of the total space provided for all new facilities (26).

A possible arrangement of a modern wholesale food distribution center, with facilities for all types of food wholesalers, is shown in figure 37. Within such a food center individual areas would be set aside for each major wholesale food group or facility.

In the center of the illustration and on one side of the main street are facilities for fresh fruits and vegetables, with facilities for other food wholesalers grouped in an arrangement about the fruit and vegetable market. The layout of facilities for other than the fresh fruit and vegetable area is merely an indication of the location and arrangement of facilities that may be needed, since no formal study has been made of commodities other than fresh fruits and vegetables.

The various food sections should be arranged so that a buyer can obtain his supplies of a commodity in one section, get supplies of other commodities in other sections, and leave by a wide

street without retracing his route and causing market congestion.

Another feature of a food distribution center should be that, insofar as possible, those wholesalers selling a large proportion of their volume direct to buyers visiting the food center should be placed adjacent to each other, while those who take orders and deliver should be placed in an area separate from the first group.

Streets should be designed to minimize traffic problems and each commodity section should have its own parking area. Rail tracks should be

placed to minimize traffic delays in crossing major streets.

A wholesale food distribution center should handle most of the products usually sold in a retail grocery store. It should also have all the services a buyer needs to conduct his business at the market, such as restaurants, wholesale stores, bank, and garage and service station. *Obviously, a master plan for the complete facility should be prepared and adopted at the outset, so that the first buildings to be constructed will not interfere with further development of the entire area.*

Selecting a Site for a New Market

Factors To Be Considered

Three groups of persons are primarily concerned with the location of a new wholesale fruit and vegetable market: (1) Sellers who send produce to the market, (2) buyers who go to the market for supplies, and (3) dealers who will operate there. To serve these groups best the market should be located on a site easily accessible by all forms of transportation. Other important factors that should be considered in determining its location are: Distance to retail outlets, direction of major population growth, land area needed and its cost, accessibility of public utilities, present land use and topography, importance to the city, and how the site would fit into the master plan of the city.

Accessibility to Transportation

Rail Transportation

The volume of fruits and vegetables received in New York City in 1956 by rail was 86,384 carlots. Only two incoming railroads (the New York Central System and the New Haven Railroad) have direct access by land for freight deliveries to the City of New York since all of the city except the Borough of the Bronx is located on islands.⁹ All other rail lines except the Long Island Railroad terminate on the New Jersey shore, and incoming rail cars must be delivered to the city by means of car floats.

Car floats, with a capacity of from 10 to 24 rail cars, are moved from the Jersey shores by tugboat to rail float bridges located throughout the city. Obviously, such transportation of rail cars can be affected by fog, freezing, and strong tides. In most instances, however, the delivery is accomplished without any undue delay.

Where the distance is relatively short and where it is not possible to pull the cars from the car float to a distribution facility on land, an unloading platform is provided between two rows of cars on

each float, and capacity of the float is decreased. This practice was followed in handling the 30,198 rail cars delivered in 1956 to the rail piers in Lower Manhattan. Where the cars can be pulled from the float to a track, however, 20 to 24 cars are placed on a float, and two floats can be handled by one tugboat; thus, almost half a trainload can be delivered at a time. This, of course, reduces greatly the cost per ton or per car for the floating operation, and it may be cheaper to move perishables some distance from the Jersey rail yards and pull them off the floats onto tracks than it is to move them across the Hudson River and unload on the car float to a pier, as is the present practice. Another part of the cost is the length of time for delivering a car float to its destination. Normally it takes 1 to 1½ hours longer for a tug to deliver from the Jersey rail heads to a float bridge at Long Island City or Newtown Creek than to the west side of Manhattan.

Cost of floating rail cars throughout the harbor area is a part of the through freight rate.¹⁰ Even though this cost is borne by the railroad, it is a part of the cost of distribution in New York City. Thus, a relocation of the market may increase or decrease costs to the railroads of deliveries of rail arrivals.

Recently there has been some increase in the quantity of produce delivered by "piggy-back"

⁹ Revised freight rate tariffs were established November 24, 1957 (S.F.T.B. Tariff 783-D, ICC 1629), for rail carlots of mixed vegetables or for rail carlots of vegetables with 10,000 pounds of citrus fruit in the car. These tariffs give the shipper an advantage of \$57 per rail carlot for these items consigned to points in New Jersey as compared to all stations in New York City. This charge is in addition to the \$2.86 per ton charged by the railroad (footnote p. 12) for unloading the car on piers 27, 28, and 29, as established under Ex Parte 212 (Increased Freight Rates 1958, 304, ICC 289). Thus, if this charge continues in effect, Florida shippers would have an advantage by consigning these items to a market in Jersey City instead of a market located in any part of New York City. A complaint before ICC (Docket No. 3-3105) was filed June 24, 1959, by the Port of New York Authority and City of New York versus the various railroads which are parties to the tariffs, to equalize the freight rate between Florida shipping points and stations in New York City and the rates to New Jersey points.

¹⁰ The Borough of Manhattan is on Manhattan Island; the Boroughs of Brooklyn and Queens are on Long Island; and the Borough of Richmond is on Staten Island.

trailer trucks are placed on rail flatcars at the shipping point and moved to a terminal yard in the New York area and then delivered directly to the store by local motortruck tractors. This arrangement makes possible more direct use of motortruck and rail facilities. A "staging" yard for unloading the trailers from the rail cars has been built in the Newark, N.J., Port District.

Any of the sites considered for a new market must be so located that railroad cars can be brought into the site and delivery made directly to the dealers' stores or to auction facilities.

Motortruck Transportation

Accessibility to motortruck transportation for both incoming and outgoing shipments is a primary consideration in the selection of a site for a market. Almost 44 percent of the total receipts, or 72,485 carlots, was received in 1956 by motortruck. This percentage has been growing each year, although the ever-present traffic congestion of the Lower Manhattan Market area and the regulation of the size of motortrucks permitted in the Washington Street area have made it difficult to get maximum usage of highway trucks.

By using the New Jersey Turnpike and its connections with the Pennsylvania Turnpike, the Ohio and Indiana Turnpikes, and the Calumet Expressway, it is now possible to drive from Chicago to New York on limited-access highways and eliminate the usual delays caused by local traffic. Limited-access expressways have also been built to the south, north, and northeast. The Delaware River Bridge, its connection with the New Jersey Turnpike and U.S. Route No. 40, and the Baltimore Harbor Tunnel make for relatively easy motortruck access from the south. To the north and northwest, the New York State Thruway can be used, and to the east the New England Thruway was rapidly nearing completion in 1960.

The City of New York is constructing a number of limited-access highways that connect with the Hudson River and East River tunnels and bridges. As these are completed, inbound motortruck traffic will be able to reach, directly, any one of the sites considered for a new fresh fruit and vegetable market without serious traffic congestion and the resulting delays. Among the more important facilities are The Major Deegan Highway, connecting the George Washington Bridge with the Triborough Bridge; the Cross-Bronx Highway; the improved Bruckner Boulevard; the Grand Central Parkway; Northern State Parkway; the Bronx-Whitestone Bridge; and the Throgs Neck Bridge between East Bronx and Queens. Many other developments are being planned, which will increase the accessibility to various points in New York.

Boat and Air Transportation

An estimated 6,587 carlots of fruits and vegetables were received by ship in 1956. Most of these

ships docked at deepwater piers and unloaded their cargoes of fresh fruits and vegetables to lighters or car floats or directly to motortrucks. The lighters usually were moved by tugboats to piers 27, 28, and 29 on the Lower Manhattan Market where the cargoes were sold at auction. The trucks moved from the piers directly to the wholesale house or directly to the retailer. Little change is expected in this movement should a new facility be built, because usually fruits and vegetables are only a part of a ship's cargo and all unloading of the vessel is expected to continue at the one dock.

An estimated 44 carlots of fruits and vegetables were received by air in 1956 and were brought by truck from the airports to the wholesale stores. No substantial change is contemplated in this movement.

Elimination of Nonmarket Traffic

The handling of fruits and vegetables necessarily involves a great deal of trucking of heavy and bulky merchandise. The handling of the normal and necessary movement of motortrucks and automobiles can be a serious problem. When vehicles not related to the market also move through the market area, necessary traffic may be seriously impeded. Therefore, a new fruit and vegetable market should be located in an area which is reasonably free from nonmarket traffic, or where nonmarket traffic can be excluded.

Accessibility to Retail Outlets

Since the principal function of a wholesale fruit and vegetable market is to receive supplies from producing districts and distribute them to retail outlets, a new market must be located so that buyers and wholesale dealers require a minimum of time to obtain their supplies or make deliveries.

The ideal location for a new fruit and vegetable wholesale market would be a point at which the average time and distance from the market to all retail outlets would be at a minimum. This point is called the *center of distribution*. The distances of the center of distribution from each of the sites considered in this study are shown in figure 38.

The center of distribution has been determined in two ways: (1) As shown by the retail destination within the metropolitan area of wholesale sales by dealers in the Lower Manhattan Market area and (2) as shown by the location and sales of retail food stores and restaurants in New York City.

The center of distribution of the metropolitan area in 1956 as shown by retail destination of sales of fruits and vegetables within the area was in the Borough of Queens. It was about 3 miles south of the northern tip of Queens, 2 miles east

TABLE 14.—Retail food stores, eating places, and drinking places and refreshment stands: Number of establishments and annual sales for each of the 5 boroughs of New York City, 1954 (27)

Item	New York City boroughs					Total New York City
	Manhattan	Bronx	Brooklyn	Queens	Richmond	
Food stores:						
Grocery stores and food stores:						
Number.....	2,750	1,689	3,685	1,701	278	10,103
Sales (1,000 dollars).....	373,623	227,803	406,947	350,365	43,872	1,402,610
Percent of sales.....	27	16	29	25	3	100
Fruit and vegetable stores:						
Number.....	689	556	1,037	358	24	2,664
Sales (1,000 dollars).....	26,755	19,232	36,151	14,139	593	96,870
Percent of sales.....	27	20	37	15	1	100
Other stores:						
Number.....	3,373	2,569	5,775	2,810	277	14,804
Sales (1,000 dollars).....	236,408	146,114	310,511	178,747	14,847	886,627
Percent of sales.....	27	16	35	20	2	100
Total number.....	6,812	4,814	10,497	4,869	579	27,571
Total sales (1,000 dollars).....	636,786	393,149	753,609	543,251	59,312	2,386,107
Percent of sales.....	27	16	32	23	2	100
Eating places:						
Number.....	4,615	930	2,456	1,376	197	9,574
Sales (1,000 dollars).....	578,987	52,838	134,372	85,419	7,838	859,454
Percent of sales.....	67	6	16	10	1	100
Drinking places and refreshment stands:						
Number.....	2,473	895	2,093	1,469	251	7,181
Sales (1,000 dollars).....	158,603	37,013	80,317	57,840	7,864	341,637
Percent of sales.....	46	11	24	17	2	100
Total, eating and drinking places and refreshment stands.....	7,088	1,825	4,549	2,845	448	16,755
Total sales (1,000 dollars).....	737,590	89,851	214,689	143,259	15,702	1,201,091
Percent of sales.....	62	7	18	12	1	100
Grand total number.....	13,900	6,639	15,046	7,714	1,027	44,326
Grand total sales (1,000 dollars).....	1,374,376	483,000	968,298	686,510	75,014	3,587,198
Percent of sales.....	38	14	27	19	2	100

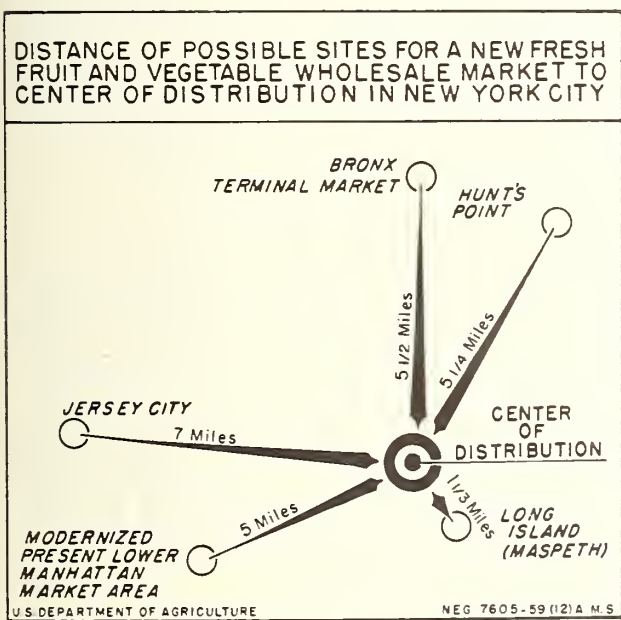


FIGURE 38

of East River, and 1.5 miles north of the center of population.¹¹

The center of distribution as shown by location and sales of retail outlets was 0.7 miles east of the center of distribution as shown by destination of wholesale sales. Since the two centers were so near together, a point midway between the two was used.

The center of distribution as shown by retail outlets was determined by studying the location, number, and annual sales of retail food stores of all types and of eating and drinking places, including refreshment stands, and the percentage of sales for each of the five boroughs (table 14).

¹¹ The center of distribution was determined by applying the quantity of fruits and vegetables distributed to each of the major political areas within the metropolitan area to the center of population in that area. Population coordinates for each square mile in the metropolitan area, based upon the 1950 population distribution map of the Regional Plan Association, were multiplied by the volume of flow to that area and divided by the sum of the product. In other words, the center of distribution was based on the weighted average population adjusted by the volume of fruits and vegetables moving to that area.

Much of the fruits and vegetables reach consumers through retail food stores and eating and drinking places. In 1954, there were 44,326 retail food stores, eating and drinking places, and refreshment stands in New York City. About half of these were grocery stores (10,103), fruit and vegetable stores (2,664), and eating places (9,574). These establishments accounted for approximately 66 percent of the total sales: 38 percent in the Borough of Manhattan, 27 percent in Brooklyn, and smaller percentages in the other boroughs. An estimated 67 percent of total sales of eating places alone was accounted for in Manhattan.

The U.S. Bureau of the Census (28) does not list such retailers as hucksters and pushcart operators, who handle a substantial amount of New York's supplies. Therefore, an analysis of the location and volume of retail food stores and eating and drinking places does not give a complete picture of the distribution, but it represents such a large part of the total that it indicates what the total distribution may be.

Direction of Major Population Growth

To many persons, particularly to many of the financial and business interests, theatres, etc., Manhattan is considered to be the "center" of New York City. Many industries are located in Manhattan and many hundreds of thousands of persons are employed there. However, in 1950 the population of the Borough of Brooklyn exceeded that of Manhattan. Brooklyn was larger in 1950 than any other city in the United States except Chicago. The Borough of Queens has grown more proportionately since 1900 than any other part of New York, with the Bronx a close second. On the other hand, Manhattan's population has been decreasing for several years.

The 1950 center of population for New York City was in Borough of Queens at the Brooklyn borderline, about 2 miles east of the East River (fig. 39) (23).

According to the Regional Plan Association, Inc. (22), New York City's population increases by 1975 will occur largely in Queens and Richmond. With the construction of the proposed bridge over the Narrows and continued expansion of employment opportunities in nearby New Jersey counties, Richmond County's population may be expected to grow considerably. According to the Regional Plan Association, Inc., Brooklyn probably will lose population within the next 20 years, and the Bronx's population is not expected to increase. In Queens, however, areas of vacant land are still available for development.

New York City has been "maturing" over the past 50 years (23). This has resulted in a slowing

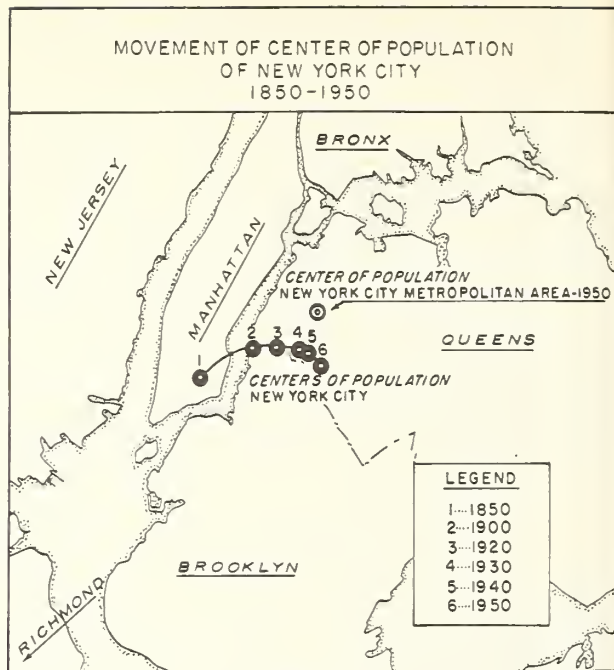


FIGURE 39

trend in the growth of its population and an increasing importance of the surrounding suburbs. Access to other areas by improved highways, and availability of land have been important factors in this movement. During the next 20 years the Regional Plan Association, Inc., expects that the greatest growth of population will occur in the counties adjacent to the city, mostly to the east and west (22). Population pressures that cannot be absorbed in Nassau County, will probably be absorbed by Suffolk and Westchester Counties. The Association also expects that over 60 percent of the population increase west of the Hudson River will occur in Monmouth, Middlesex, Somerset, and Morris Counties of New Jersey, and Rockland and Orange Counties of New York.

Land Area and Cost

The cost of the land for a market (including the cost of placing the land in condition for construction) affects the cost of the market project greatly and obviously will affect the amount of rental income necessary to finance the market. An area large enough to meet the needs of the fruit and vegetable market, plus room for expansion, must be available for the new market. Failure to acquire enough land for market needs and to allow for expansion can result in high operating costs for the new market, and much greater expense in expanding the market.

Accessibility of Public Utilities

Public utilities, such as gas, electricity, and sewerage, are necessary in the construction and operation of a market. It may be that the lack of one or more of these would make an otherwise desirable location highly undesirable.

Present Land Use, Topography, and Shape of Tract

The present use and topography of a prospective site may be such that excessive costs of preparation of the land to build upon would render it undesirable. For example, marsh land must be drained and filled to be usable. Piling may be necessary if the subsoil will not support the weight of the buildings. Additional costs for drainage and piling will affect the rentals necessary to support the market. Present buildings on the site may have to be demolished. The presence of obnoxious gases and other undesirable waste from nearby industries may make the site worthless for a new market. Therefore, the possibilities of adapting the land economically to market use should be fully investigated.

A market site should be properly shaped to permit its full utilization with an efficient arrangement of facilities. Sites improperly shaped to permit economical use require more acreage than sites properly shaped and, as a result, increase market costs.

Importance to the City of New York

Operation of the primary fruit and vegetable market of New York is one of the city's major industries, the produce handled per year having a wholesale value of more than \$350 million. The market properties are assessed at millions of dollars, and the firms employ many hundreds of people. A very large part of the city's food supplies is handled here. Thus, reorganization and relocation of the market would be vital to the city.

It is doubtful whether the City of New York would give the same degree of assistance in establishing a new market on a site outside its boundaries as it would give to one within its corporate limits, and the construction of new facilities might be difficult without the active assistance and cooperation of the various agencies of the municipal government.

Recent plans of the City Planning Commission and the Downtown-Lower Manhattan Association have shown that the present primary market area

should be occupied by industries which can use it more efficiently. The Downtown-Lower Manhattan Association has recommended that the area between Canal Street and Cortland Street on the lower west side of Manhattan be declared a redevelopment project with a view to relocation of the produce market and a general redevelopment for new industrial and commercial users (8).

Sites Evaluated

Possible sites for a new market were suggested by various persons and organizations, including officials of the City of New York, transportation agencies, fruit and vegetable dealers, and others interested in improving the local food marketing situation. Sites in several general sections of the city were proposed. Some were too small; others had other serious drawbacks; but all were considered. Only five are analyzed in this study: (1) The Bronx Terminal Market area; (2) the Hunt's Point section of the Bronx; (3) Maspeth, in Queens County in western Long Island area; (4) Jersey City, in the vicinity of the Secaucus Meadows; and (5) modernization of the present Lower Manhattan Market area. None of these sites completely satisfies the factors enumerated previously, but each was considered in relation to these factors. There may be other available sites that would adequately serve as the location for a new produce market, but after much consideration only these five sites were selected for study.

The sponsoring organization, whether governmental or private, will need to make a careful investigation of each site suggested before a final decision is made. The site should not only be adequate for a fruit and vegetable market, but more land should be available for a wholesale food distribution center to handle all food items. Problems comparable to those now confronting the fruit and vegetable industry will need to be solved for several other food commodity groups if the produce market is relocated.

In three of the five sites—the Hunt's Point site, Jersey City (Meadows) site, and the Long Island (Maspeth) site—more land is available for the development of a food center than is shown in the layouts for these sites. The layouts, however, are confined to areas adjacent to those selected for the fruit and vegetable market.

Table 15 sets forth the principal facts about each of the five sites, including a short description of the land area. How well each meets the requirements for a good market site is also set forth to aid the market sponsors in selecting a site.

TABLE 15.—An appraisal of 5 sites for a proposed wholesale fruit and vegetable market, New York City

Item	Bronx Terminal	Hunt's Point	Jersey City (Meadows)	Long Island (Maspeeth)	Modernized Lower Manhattan
Location and boundaries	Bounded by: Depot Place (1 block south of High Bridge), Walton Ave., NYC RR, 140th St., Harlem River.	Bounded by: Spofford and Randall Aves., Bronx River, East River, City of New York disposal plant and Worthen St. (extended).	Bounded by: N.J. State Road No. 3, New County Road, PRR elevated main line; NYS&W and PRR and Erie freight lines are adjacent on south.	Bounded by: Long Island Expressway, Long Island RR (Maspeeth yards), Brooklyn-Queens Expressway, Grand Ave., Newtown Creek, and English Kills.	Bounded by: Desbrosses St., Hudson St., Barclay St., West St., and Hudson River.
Land area: Available acreage ¹	100 acres (plus 12 acres for farmers' market).	638 acres, including Consolidated Edison property and space for farmers' market.	631 acres, including space for farmers' market.	273 acres, including space for farmers' market.	100 acres.
Estimated cost of land	\$207,591 per acre for 100 acres.	\$49,924 per acre for 348 acres.	\$16,862 per acre, based on 246 acres.	\$119,630 per acre.	\$932,786 per acre (with present buildings).
Present land use	A number of new buildings for light industry have been built recently; Bronx Farmers' Market on property.	Small warehouses, junk yards, wholesale lumber yards, etc.	Vacant.	Oil storage tanks, coal storage and lumber yards, and U.S. Navy installation on east side of creek. Property of Brooklyn Gas Light Co. and warehouses on west side of Newtown Creek.	Present produce district in old loft buildings or other wholesale buildings.
Topography, soil condition, etc.	About ½ of site hilly (40 ft. rock), other ½ reclaimed marshland.	Flat, mostly filled land, piling necessary.	Flat, marshland; relocation of present high tension lines and steel towers across site necessary; needs heavy piling to support facilities. Relocation of Penhorn Creek necessary.	Flat. Originally marsh land; fill and piling necessary. Nearby heavy industries have obnoxious waste which is undesirable.	All present market structures would have to be demolished to build new market.
Access to rail transportation.	Direct access only by NYC RR, Erie RR (Harlem Station adjacent) B&O, DL&W LV RR, access by car float direct or float from N.J. yards to 60th St. (Manhattan) and rail from there to Bronx by NYC RR (no extra charge) PRR access by car float with extra light-erage charge.	Direct rail access via Oak Point yards by New Haven RR only; B&O, LV RR by car float to site. PRR arrivals—float from Greenville, N.J., to Bay Ridge (Brooklyn), N.Y. Connecting RR (Hellgate Bridge) to Oak Point yards of New Haven RR. NYC RR via Port Morris yard adjacent interchange track to	Direct access to Erie RR (Croton yards), DL&W RR, Secaucus yards. NYC RR via Weehawken branch, Hoboken. PRR interchange with NYS&W adjacent to property CNJ RR & B&O at Jersey City.	No railroad connection on south side of Newtown Creek. Possible connection—Long Island RR, by building 150-ft. bridge across Newtown Creek—approximate cost \$200,000. Long Island RR on east side of property.	None. Across Hudson River by car float to piers 17, 22, 27, 28, and 29. Various RR team tracks located in near-by Manhattan and N.J. used as supplement to piers.

Convenience to motortruck transportation.	N. Y. State Thruway connects with Major Deegan Expressway which bisects market area. New England Thruway and Cross-Bronx Expressway to Major Deegan Expressway. N. J. Turnpike, U. S. 1 and U. S. 9 to Geo. Wash. Bridge to Major Deegan Expressway. Long Island via Triborough Bridge. Manhattan via 138th St. Bridge—149th St. Bridge, High Bridge, Macomb Dam Bridge.	N. Y. State Thruway to Major Deegan Expressway to Bruckner Blvd. New England Thruway to Bruckner Blvd. N. J. Turnpike U. S. 1 and U. S. 9 to Geo. Wash. Bridge—Major Deegan Expressway to Bruckner Blvd. or Cross-Bronx Blvd. Long Island—Triborough Bridge to Bruckner Blvd. Manhattan—149th St. Bridge to Major Deegan Expressway.	Adjacent to U. S. 1 and U. S. 9 (Tonnele Ave.)—Lincoln Tunnel (4.6 miles), Holland Tunnel (2.7 miles), N. J. Turnpike to Pulaski Skyway to U. S. 1.	Adjacent to Brooklyn-Queens Expressway, Metropolitan and Grand Aves. (heavy trucks).	Near Canal Street-Holland Tunnel. Traffic very bad. Proposed Lower Manhattan Expressway to run through Greenwich Street.
Convenience to other wholesalers.	Bronx Market public cold storage building. Fruit and veg. wholesalers, farmers' market, wine merchant, dairy, and dry grocers on market.	Several new, large dry grocery warehouses adjacent. 3 miles to Bronx Terminal Market.	Near new wholesale food warehouse district on N. J. Turnpike.	A&P Warehouse adjacent to site. H. C. Bohack Co. warehouse adjacent.	Fruit and vegetable, egg and dairy dealers, and some dry grocery warehouses within market area. Piers 27, 28, and 29, and auction facility within market area.
Convenience to retail outlets. ³	5½ mi. to center of distribution.	5¼ mi. to center of distribution.	7 mi. to center of distribution.	1¼ mi. to center of distribution.	5 mi. to center of distribution.

¹ Except for a modernized Lower Manhattan site, includes farmers' market area.

² Minimum acreage considered is the 100 acres required for an adequate fruit and vegetable market. Additional acreage is desirable for wholesalers of other foods.

³ See fig. 38.

MAJOR ACCESS HIGHWAYS AND RAILROAD CONNECTIONS THAT WOULD SERVE A MARKET ON THE BRONX TERMINAL SITE

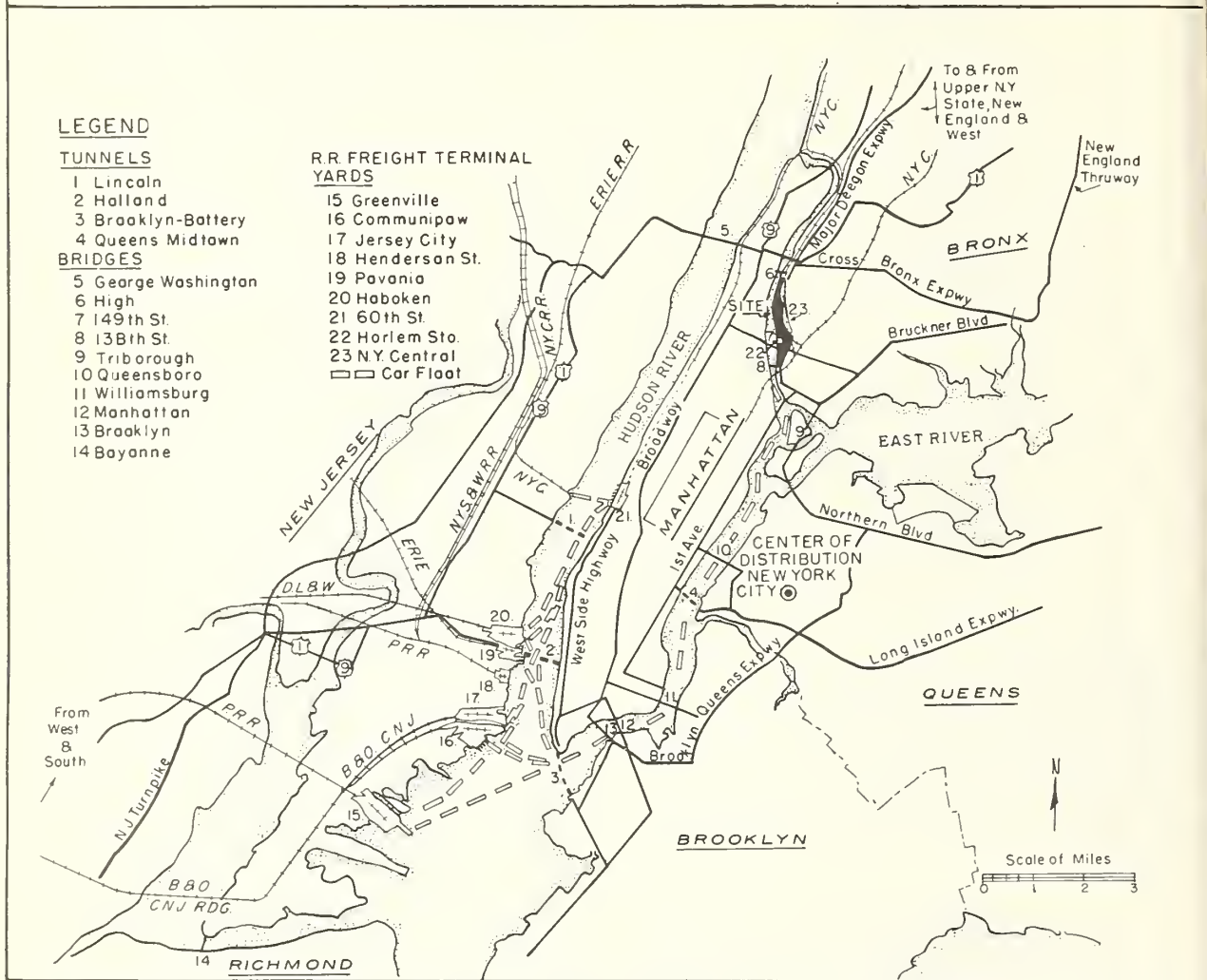


FIGURE 40

Bronx Terminal Market

The present Bronx Terminal Market has the advantage of having available some usable buildings, including a refrigerated warehouse which is owned by the City of New York. It is well located in relation to motortruck transportation (fig. 40). By rail, it is served mainly by the New York Central System, which is an important originating carrier of fresh fruits and vegetables. It may be difficult, however, to arrange for an interchange with the other important originating rail carriers of fresh produce. There is a float bridge on the site to handle part of these shipments. Other railroads, except the Pennsylvania

Railroad, have an agreement with the city to use the car float on market property with no extra charge. The Pennsylvania Railroad has access by lighter but with an extra charge.

The site is located about 5½ miles from the center of distribution. Major disadvantages to the site are its shape and size. It is narrow and irregular and is largely composed of a 40-foot rocky hill on one side of the site and a deep fill along the Harlem River on the other side. This makes it extremely difficult to plan a good layout of facilities (fig. 41). The land area available is limited, and nearby property is very high priced. The site is too small for a complete food distribution center, and it would barely accommodate the

MAJOR ACCESS HIGHWAYS AND RAILROAD CONNECTIONS THAT WOULD SERVE A MARKET ON THE HUNT'S POINT SITE

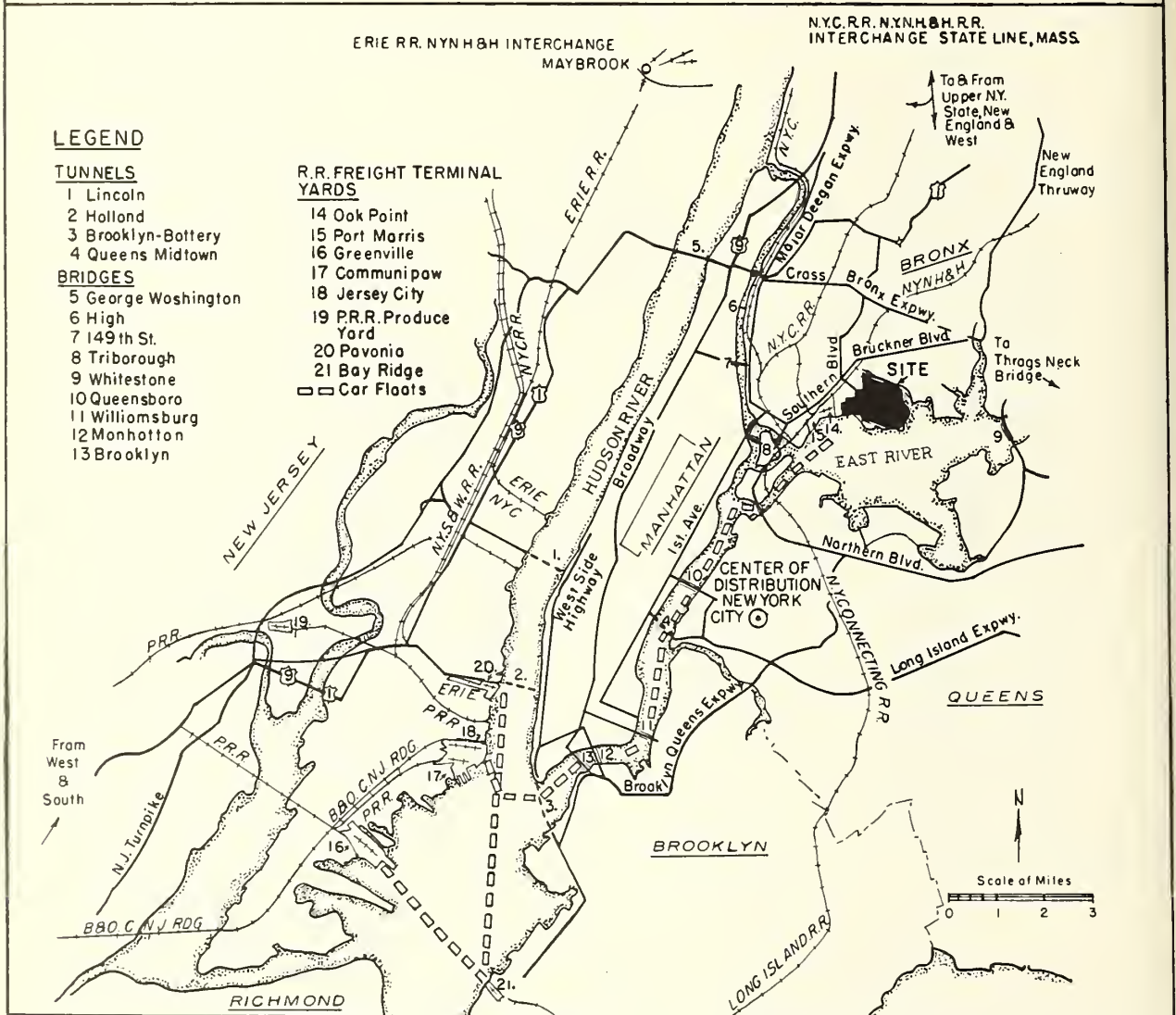


FIGURE 42

primary fruit and vegetable market if transferred from the Lower Manhattan Market. The layout in figure 41 has several disadvantages. Among these are: (1) The distance from the team track yards to the stores of the dealers is too great, (2) dealers' stores are too spread out, and (3) because of the shape of the site the stores cannot be planned as a compact unit. However, access to other parts of the city is excellent since the Major Deegan Expressway cuts through the site. Public utilities such as gas, water, electricity, and sewerage are available on the site.

Hunt's Point

The Hunt's Point site is about $5\frac{1}{4}$ miles from the center of distribution. The report shows that the movement of fruits and vegetables to the north of the city is greater than the movement to the south and that this movement will pull the center of distribution north. Thus, this northward pull improves the Hunt's Point site in its relationship to the center of distribution. The site is well located in relation to incoming rail and motortruck shipments (fig. 42). It is served only by the New

Haven Railroad, but this road is not a major originating rail line for fresh fruit and vegetable shipments. It accepts delivery of thousands of cars from other lines for movement into New England. Hence, arrangements may be made easily for interchange of freight with other lines. There already exist several interchange points with other railroads. Perishable freight could be picked up by the New Haven Railroad from the Pennsylvania Railroad at the Greenville, N.J., terminal, from the Erie Railroad at its Maybrook, N.Y., terminal or its Jersey City receiving points, from the Baltimore and Ohio Railroad at Jersey City, and from the New York Central System at the Port Morris (Bronx, N.Y.) interchange adjacent to its Oak Point yard. The Oak Point yard of the New Haven Railroad is a large holding yard with 5 float bridges and a 3,000-car capacity. It is adjacent to the site. Excellent limited access and other highways are available to handle inbound and outbound motortruck shipments. The site is adjacent to Bruckner Boulevard with direct connections to Long Island via Triborough Bridge, Whitestone Bridge, and Throgs Neck Bridge (under construction in 1960); to Manhattan and Bronx via the 149th Street Bridge; and to the west and south by the George Washington Bridge, which can be reached via Bruckner Boulevard, Southern Boulevard, and the Cross-Bronx Parkway, or by Bruckner Boulevard and the Major Deegan Expressway.

In this location a sufficient area could be obtained at a reasonable cost for an efficient layout of fruit and vegetable facilities with sufficient adjacent land for wholesalers of other foods.

For the most part, present land use is not a deterring factor in the acquisition of land. However, a large public utility establishment with artificial gas manufacturing facilities, which are only partly in use, is located on the site. There may be a question about the inclusion of part of this area in a new market site. There is also some doubt that the approximately 5 acres occupied by the Joseph Rodman Drake Park located at Hunt's Point Avenue and Oak Point Avenue can be acquired for a wholesale fruit and vegetable market. It is reported that the land has been dedicated to perpetual park use and that it contains a small burial ground.

Two possible arrangements of facilities for a wholesale fruit and vegetable market on the Hunt's Point site are shown in fig. 43. Figure 43a shows a possible arrangement of facilities for a wholesale fruit and vegetable market bounded by the following streets: Randall, Vielle, and Halleck. The western boundary is approximately 350 feet east of Tiffany Street. In this plan it is assumed that the area now included in the Joseph Rodman Drake Park can be used as part of the market. Facilities for wholesalers of other foods are roughed in to show a possible arrangement of a wholesale food distribution center.

In figure 43b, it has been assumed that the area included in the Joseph Rodman Drake Park would not be available for the market development and must be kept permanently as a park. In this plan the fruit and vegetable market is divided into two sections: (1) The wholesale store buildings, parking lots, and house tracks section is bounded by a line 350 feet east of Tiffany Street, and by Ryawa, Halleck, and East Bay Avenues, and (2) the team track yards and auction facility section, which is located in the area south of the produce stores, is bounded by Ryawa Street, the Consolidated Edison property, the city sewage disposal plant, and the East River.

Average costs of land per acre (table 16) and other data are based on a site of 348 acres only. This excludes the Consolidated Edison Co. property, mainly because it has not been determined how much of this property would be available. All public utilities are available on the site.

There would be little nonmarket traffic to interfere with traffic within the market area since the Hunt's Point site is a peninsula and is not crossed by any major truck route.

Jersey City (Meadows)

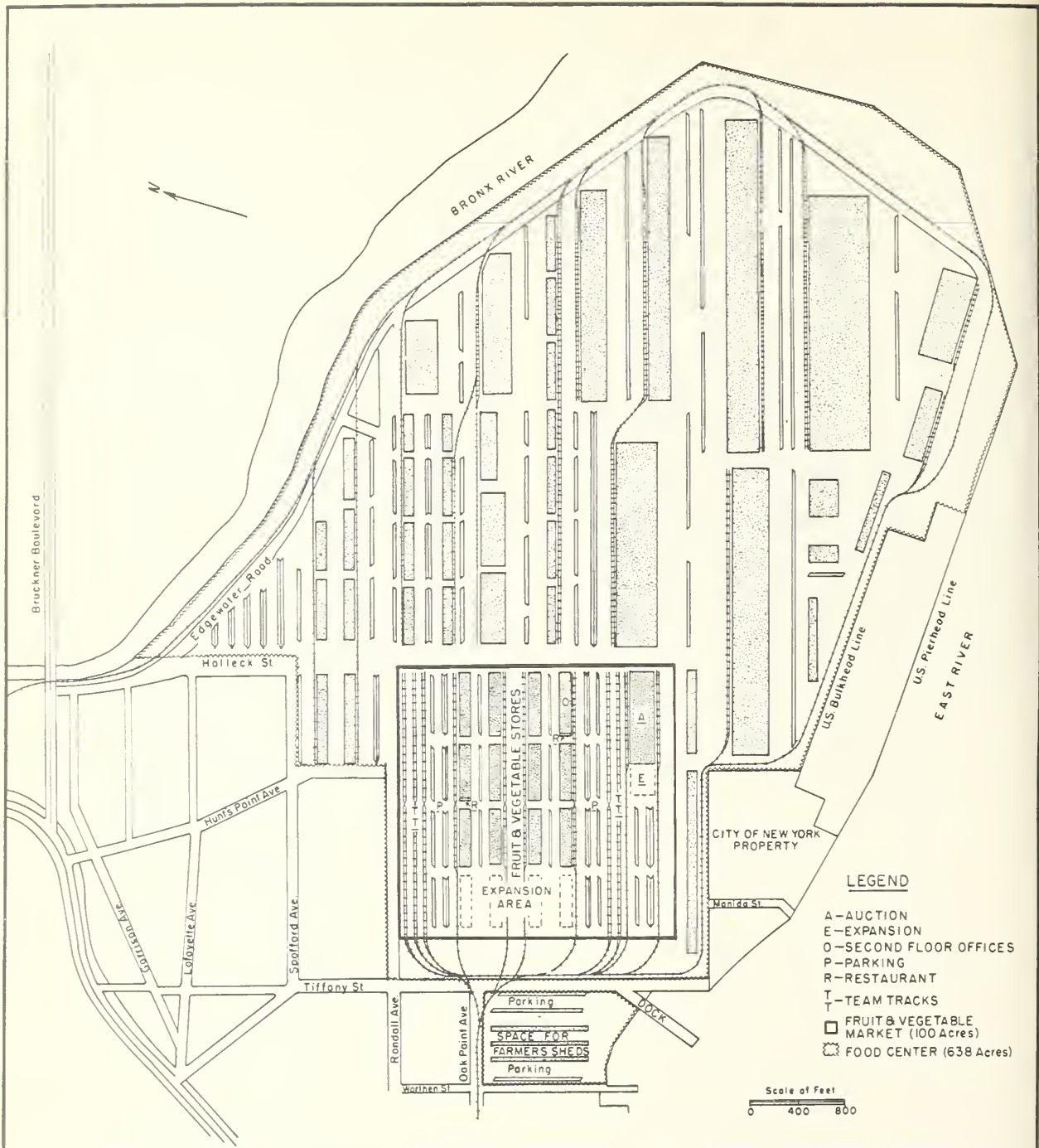
A market in the Jersey City area would be located across the Hudson River from most of the retail outlets it would serve. The site considered is about 7 miles from the center of distribution. Figure 44 shows the major highways and railroads that would serve a new market on this site.

A market located on the Jersey City Meadows site would be easily accessible to incoming rail and motortruck transportation. The terminal yards of several important railroads are located in this area, and the New Jersey Turnpike and other trunk roads, such as U.S. No. 1 and U.S. No. 9, are adjacent to the site. If the primary market is located on the Jersey City site, the railroads would save the costs of floating cars arriving from west and south of the Hudson River, and trucks coming from the south and west would save on tunnel and ferry tolls. A great deal of crosstown hauling would be required, however, by many buyers coming to market. The buyers would have additional costs in tunnel and bridge tolls and delays from traffic congestion in crossing Manhattan.

Another disadvantage would be the reluctance by New York City officials to relocate the primary market of their city outside the State.

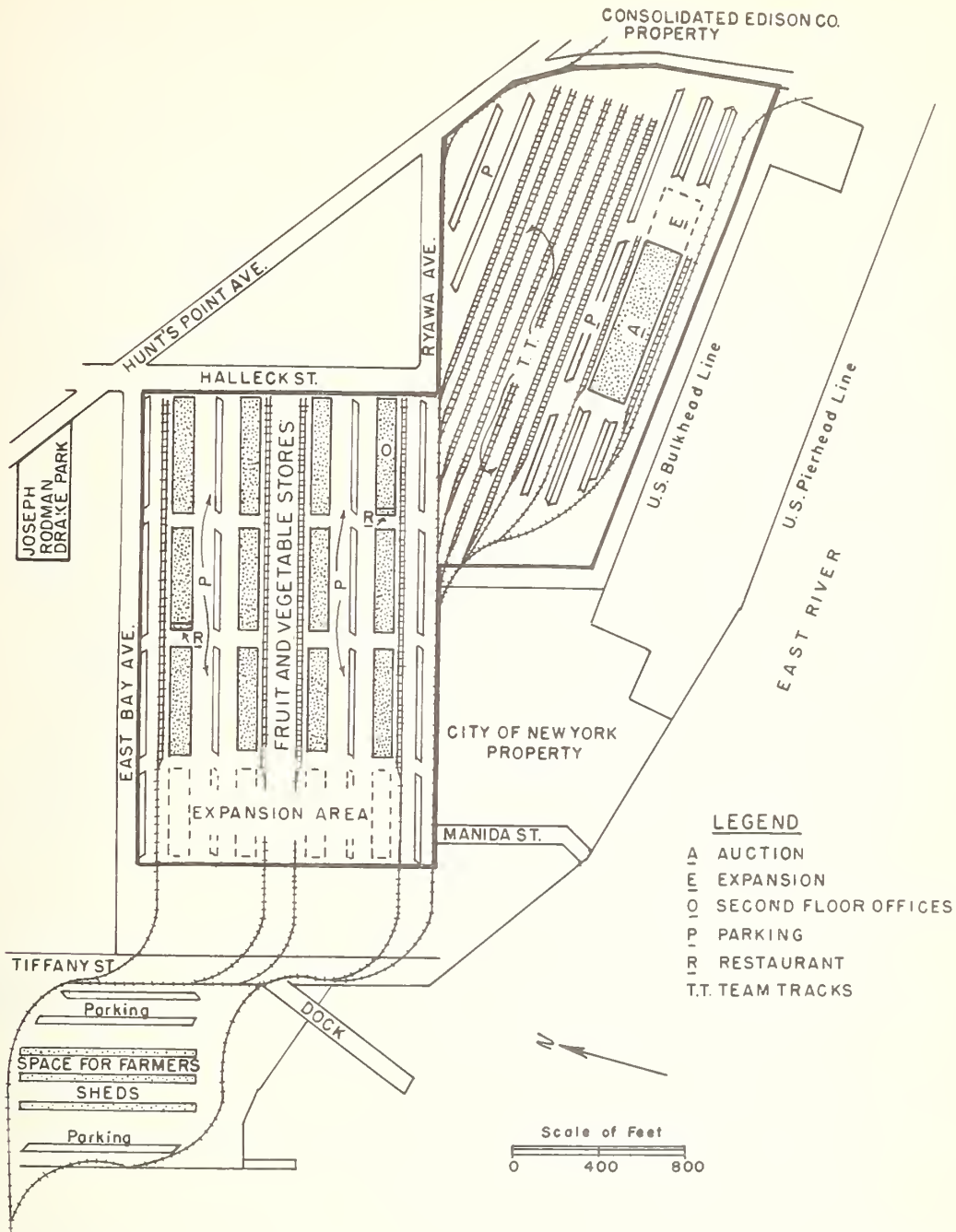
Some public utilities are not presently available on the site but are located within a very short distance on Tonnele Avenue.

Sufficient acreage for a market could be obtained at a reasonable cost. Land development costs, however, would be considerable in relation to the cost of the land alone, for most of the area is now a partially filled marsh and costs for land fill and building supports would be very high.



A POSSIBLE ARRANGEMENT OF FACILITIES FOR A WHOLESALE
FRUIT AND VEGETABLE MARKET ON THE HUNT'S POINT
SITE WITH FACILITIES FOR WHOLESALERS
OF OTHER FOODS ROUGHED IN

FIGURE 43a



AN ALTERNATE ARRANGEMENT OF FACILITIES FOR A WHOLESALE MARKET IF THE PARK REMAINS IN ITS PRESENT LOCATION

FIGURE 43b

MAJOR ACCESS HIGHWAYS AND RAILROAD CONNECTIONS THAT WOULD SERVE A MARKET ON THE JERSEY CITY SITE

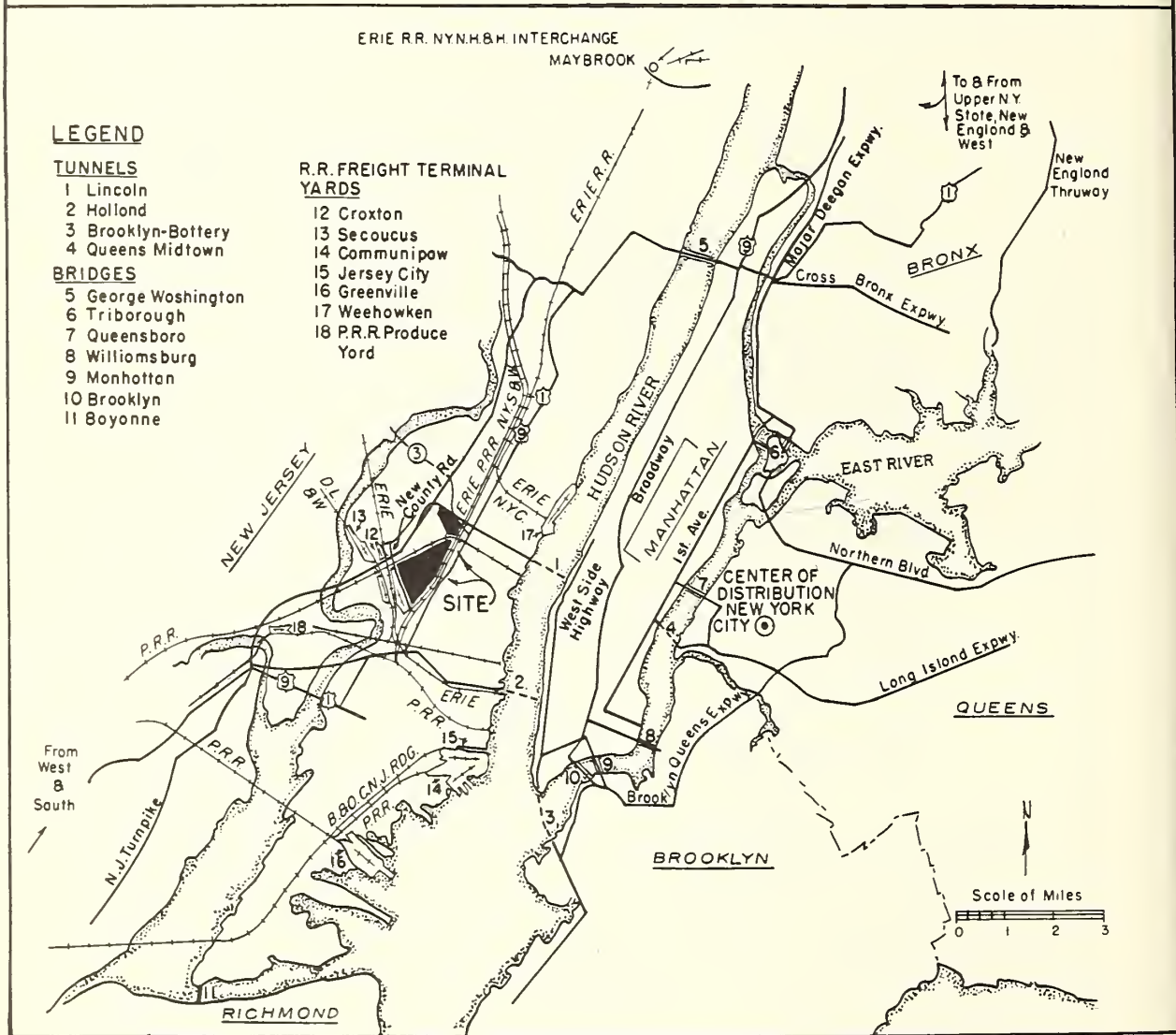


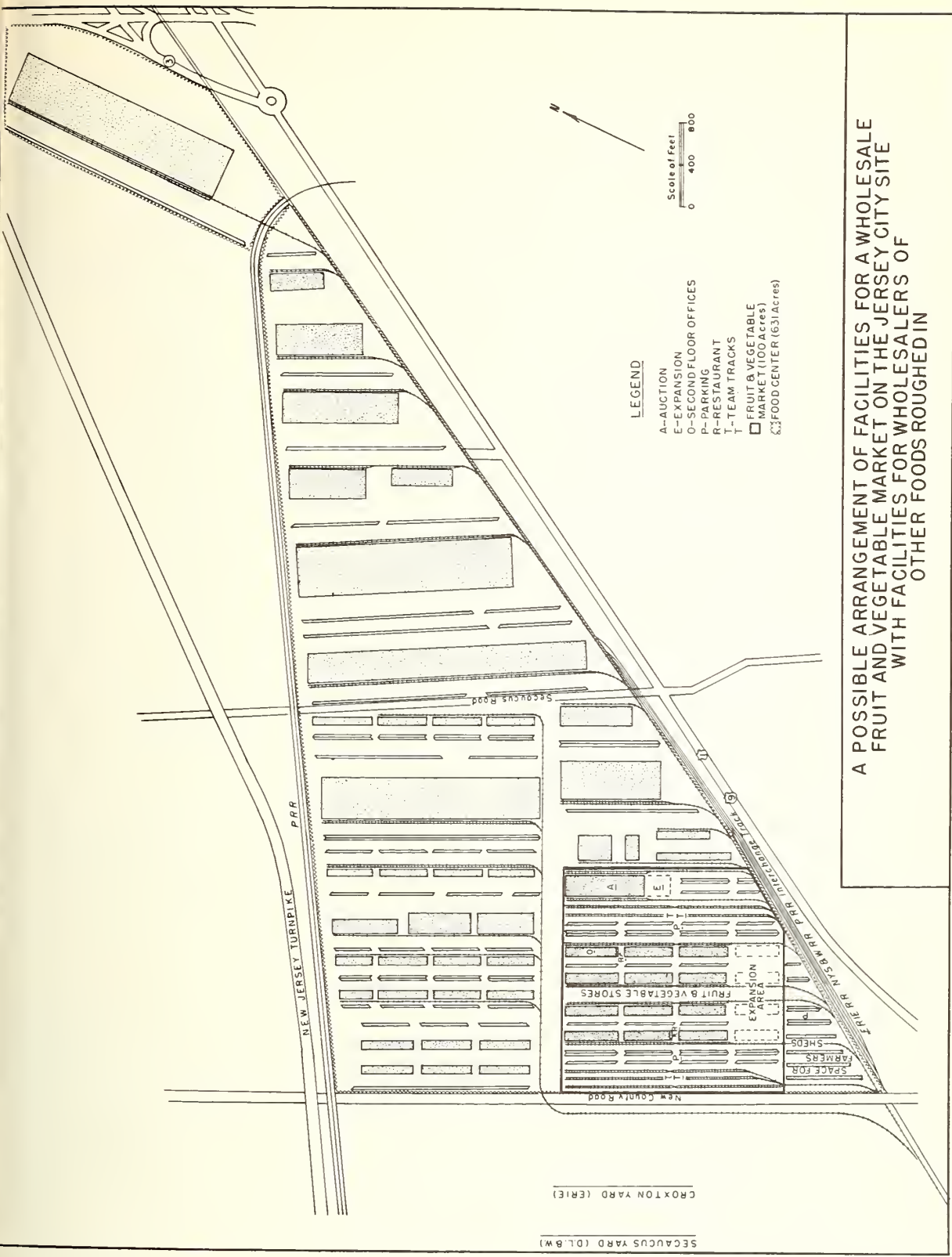
FIGURE 44

Part of the development costs would result from the relocation of high tension power lines now crossing the property, the replacement of the electric towers, and the acquisition of power line right-of-way. It would be necessary also to relocate or divert Penhorn Creek which meanders across the northern half of the site.

A possible arrangement of facilities for a wholesale fruit and vegetable market on the Jersey City site, with facilities for other food wholesalers roughed in, is shown in figure 45.

Long Island (Maspeth)

A site on the western end of Long Island in the Maspeth section of Queens would be only $1\frac{1}{3}$ miles from the center of distribution (fig. 46), the nearest of the five sites to this center. At present no direct rail access is available to the west side of Newtown Creek. However, the east side of the creek would be accessible to incoming rail transportation either by means of car float deliveries to Long Island City or by direct rail connections



LEGEND

- A--AUCTION
- E--EXPANSION
- O--SECOND FLOOR OFFICES
- P--PARKING
- R--RESTAURANT
- T--TEAM TRACKS
- FRUIT & VEGETABLE MARKET (100 ACRES)
- ⊞ FOOD CENTER (631 ACRES)

Scale of Feet
0 400 800

A POSSIBLE ARRANGEMENT OF FACILITIES FOR A WHOLESALE FRUIT AND VEGETABLE MARKET ON THE JERSEY CITY SITE WITH FACILITIES FOR WHOLESALERS OF OTHER FOODS ROUGHED IN

FIGURE 45

MAJOR ACCESS HIGHWAYS AND RAILROAD CONNECTIONS THAT WOULD SERVE A MARKET ON THE LONG ISLAND (MASPETH) SITE

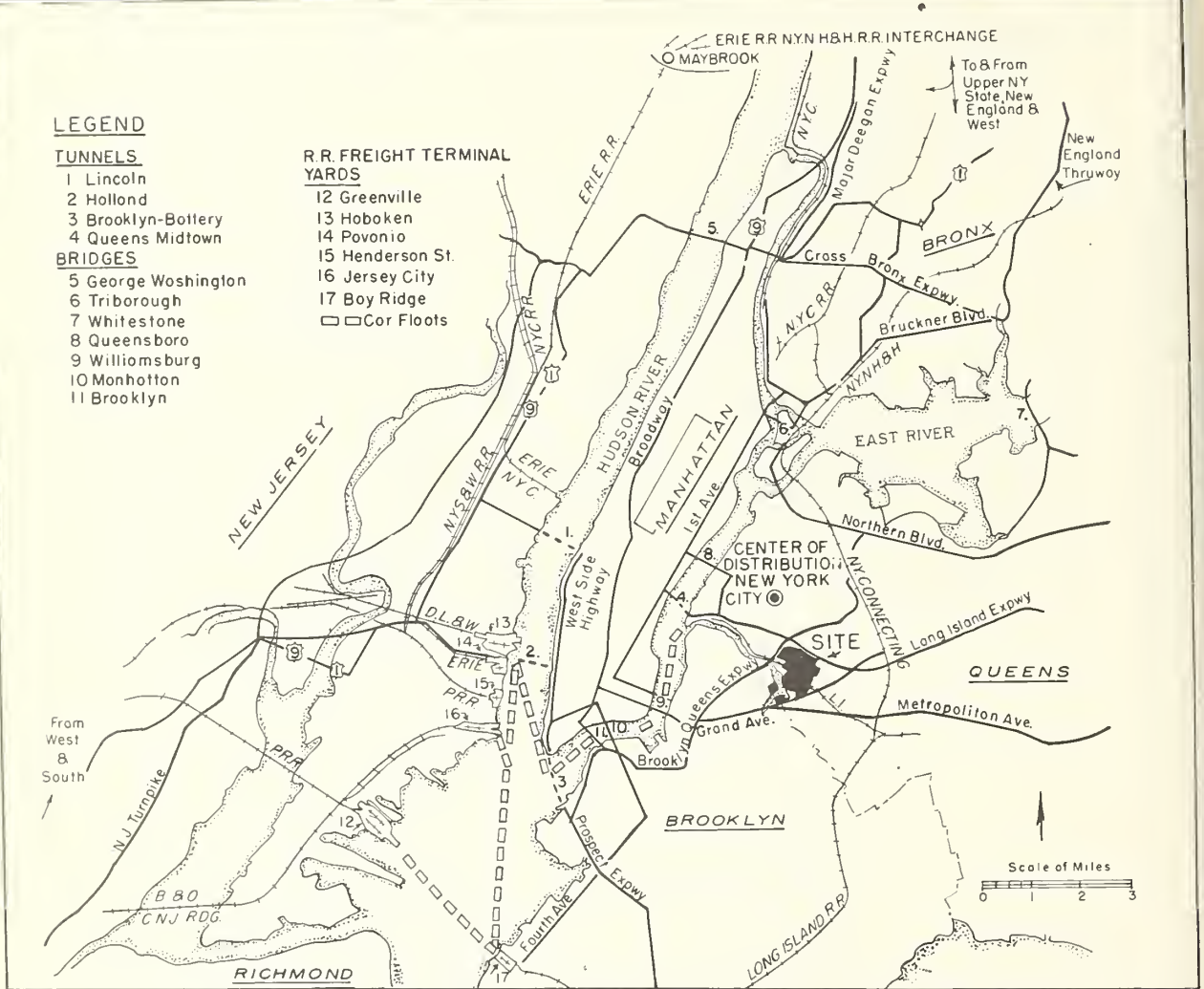


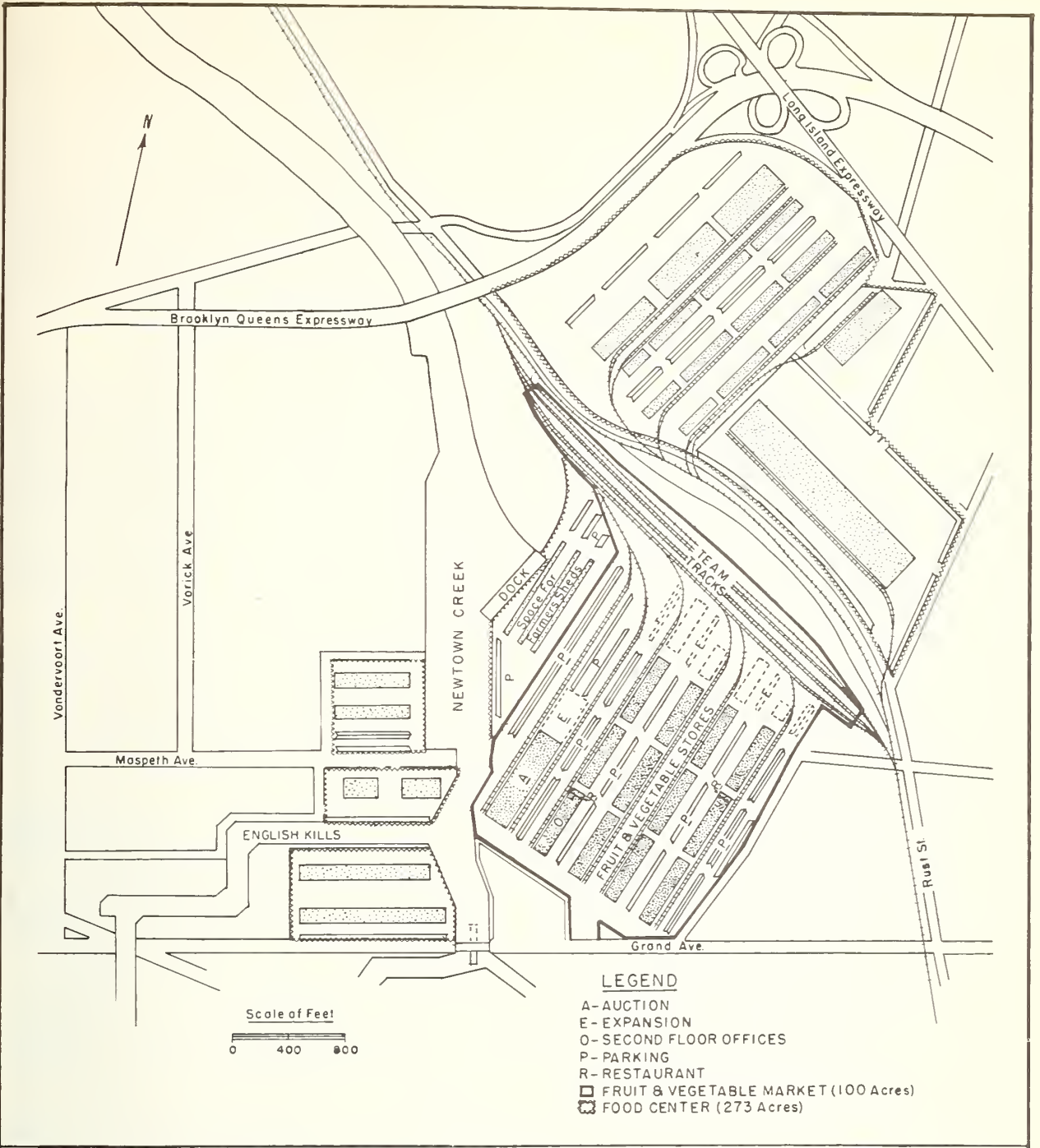
FIGURE 46

with the Bay Ridge-Greenville car float and rail connections of the Long Island Railroad. It would be easily accessible by motortruck by the Brooklyn-Queens Expressway, the Grand Central Parkway, the Northern State Parkway, and their connections, including the Queens Midtown Tunnel, the East River bridges, and the Hudson River tunnels.

A sufficient area of land probably could be obtained at a reasonable cost for a fruit and vegetable market. The shape of the tract, however, is somewhat irregular, which may prevent a proper layout of facilities being made. A U.S. Navy installation, only partly used, is located on

the eastern part of the site. Also, the presence of a large gas storage facility, which occupies part of site, and the recent construction of a number of other warehouse facilities on it may limit the amount of land that may be purchased for a wholesale food distribution center at a reasonable cost. The use of Newtown Creek for disposal of industrial waste and as an important delivery point for nearby heavy industries may hamper the development of this site as a produce market area.

A possible arrangement of facilities for a wholesale fruit and vegetable market on the Long Island site, with some facilities for wholesalers of other foods roughed in, is shown in figure 47. All public utilities are available on the site.



A POSSIBLE ARRANGEMENT OF FACILITIES FOR A WHOLESALE FRUIT AND VEGETABLE MARKET ON THE LONG ISLAND SITE WITH SOME FACILITIES FOR WHOLESALERS OF OTHER FOODS ROUGHED IN

FIGURE 47

Lower Manhattan Market Area

A number of operators and others would favor building new facilities on the present site in Lower Manhattan since this has been the traditional primary market area of the city. Most of the land now in use may be available, if present structures are removed. But the extremely high cost of the land and present structures on it would make the cost of the project prohibitive to the market users, if amortized without a large subsidy.

This site is about 5 miles from the center of distribution. There are no direct rail connections. It is accessible to incoming rail shipments over the

present rail-car floats, but at a high cost. Railroads would have to cross streets carrying heavy truck traffic if house tracks are placed by the buildings. Furthermore, traffic congestion would continue on the narrow approach highways and streets, causing delays and increasing costs of delivery or pickups by motortrucks of sellers or buyers. Unless a large area of the nearby, very high-cost property is acquired, the area for rebuilding the market would not be adequate to meet the requirements of a good fruit and vegetable market. All public utilities are available.

No layout or access maps are provided because of the many disadvantages of the site.

Estimated Investment Costs of Land and Facilities

Estimated costs for putting 100 acres of land in condition for a new fruit and vegetable market in New York City and for constructing the facilities described in this report show extreme variations for the five sites. The furnishings and equipment for the offices and other facilities, such as cooler and freezer boxes, are not included in the estimates, nor are the costs to the city for construction of certain streets, sewerage, water, and other public facilities.

The costs cited are July 1959 estimates. No allowance for subsidies is recognized. If subsidies with respect to real estate taxes, land values, amortization, etc., should be forthcoming, such measures would, of course, reduce the rental costs to the occupants of the market.

Land

Table 16 shows the assessed valuation of land, per acre, and buildings, the estimated cost of acquiring land, demolishing old buildings, grading or filling, and constructing facilities on 100 acres

at each of the five sites. The table also shows the estimated total cost and the average cost per acre as of 1959. Estimates for construction of tie-in sewers to the property line, engineering costs, and legal and administrative charges for acquiring the land are included in the acquisition costs. Charges for constructing major sewer lines and water mains to the market property, for grading, and for constructing and lighting the adjacent city streets are *not* included in these estimates of land costs.

The land acquisition costs in each of the five sites are based on an *average* assessed valuation of all of the land. For example, in figuring the average cost of land for the Hunt's Point site, the assessed valuation of 348 acres (excluding the Consolidated Edison property) was used, not the assessed valuation of a particular 100-acre tract within the site. This procedure is used primarily to eliminate extreme variations in lot assessments due to various improvements or other factors considered by the assessor in his valuation.

TABLE 16.—*Estimates of specified costs of land per 100 acres for a fruit and vegetable market at 5 sites*

Proposed site	Acreage used as basis for calculation	Cost items for 100 acres				Average cost per acre
		Assessed value of property ¹	Grading or filling	Acquiring site and constructing facilities ²	Total	
	<i>Acres</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>
Bronx Terminal Market.....	100	14, 062, 442	³ 1, 742, 000	4, 954, 701	20, 759, 143	207, 591
Hunt's Point.....	⁴ 348	3, 260, 000	250, 000	1, 482, 360	4, 992, 360	49, 924
Jersey City Meadows.....	⁵ 246	135, 000	1, 254, 000	297, 250	1, 686, 250	16, 862
Long Island (Maspeth).....	⁵ 262	8, 078, 000	⁶ 750, 000	3, 135, 000	11, 963, 000	119, 630
Modernized Lower Manhattan Market.....	100	65, 471, 800	0	27, 806, 790	93, 278, 590	932, 786

¹ Based on average assessment of land area available in site.

² Includes 35 percent of total assessed value of property for a condemnation award for sites in New York City and 67 percent in Jersey City, and a charge of 20 percent of assessed value of present structures for demolition of these structures.

³ Includes cost of new retaining wall along Harlem River.

⁴ Does not include property owned by Consolidated Edison Co. adjacent to this site.

⁵ Still more land of low enough value for use as a food center lies adjacent to this acreage.

⁶ Includes cost of new railroad bridge and approach to site.

Based on estimates of city officials, the cost of land and its acquisition was approximately 135 percent of the assessed value of land and buildings in New York City and 167 percent of value in Jersey City. A demolition charge of 20 percent of assessed valuation of the buildings is additional to these costs.

Total costs of land acquisition, grading and fill, development, etc., for a 100-acre site range from approximately \$1.7 million for the Jersey City Meadows site to \$93.3 million for rebuilding the Lower Manhattan Market area. The costs for the Bronx Terminal Market site were estimated at \$20.8 million, about \$12 million for the Maspeth site, and almost \$5 million for the Hunt's Point site.

Several suggestions were made during the study to reduce the amount of land needed and the resultant costs for these sites. Construction engineers with whom the problem was discussed suggested that most of the cars and small motortrucks might be parked on the roof of multiple-store buildings by strengthening the foundations and roofs and building a ramp. It should be pointed out, however, that the parking space provided in the 100-acre layout is primarily for trucks and makes no provision for cars of employees.

Figure 48 shows a possible arrangement for parking motor vehicles on the roof of a modern truck terminal. Several construction engineers suggested that this type of arrangement might be built with an additional expenditure of approximately \$3.50 per square foot (1959 basis). Since the multiple-store buildings are 60 feet deep, ex-

cluding the platforms, at least two rows of diagonal parking should be available on the roof of each building (each parking space being about 10 feet by 20 feet with a space in the center for moving the vehicles). However, the provision of facilities for parking on the roof would depend on the cost of construction and the comparative cost of land for ground-level parking lots.

Facilities

Estimated costs of structures and other facilities are based on a number of factors: (1) Indexes of costs for construction in New York City for July 1959, (2) estimates of construction costs submitted by local architects and contractors, and (3) costs of constructing similar facilities in other comparable areas. An allowance of \$1.80 per square foot of building area was made for costs of 50-foot piling. Other costs included are for plumbing, floor drains, and wiring. Otherwise, cost estimates are for the shell of the building, since it was assumed that individual firms would supply their own refrigeration or temperature-controlled rooms and other special equipment. The paving costs are based on estimates, provided by the Federal Bureau of Public Roads, of the average 1959 New York City costs for a 2-inch asphaltic concrete surface, a 4-inch macadam base, and a 7-inch gravel foundation. It is also assumed that the city will pave a public street 100 feet wide on each of the four sides of the site and that the remaining area, except expansion areas, will be paved at the expense of the project.

The estimates shown in this chapter should be used only as a guide in arriving at a total cost for the project; they are NOT intended to replace firm estimates made by local architects and contractors at the time of construction. Local estimates of costs may differ considerably from the following estimates, which are calculated for the hypothetical layout shown in figure 36.

A. Multiple-store structures:

Buildings:

240 multiple-store units (in 12 buildings) @ \$25,000 (690,000 sq. ft.)	
@ \$8.70, including 15 ft. x 25 ft. mezzanines), without piling ¹ ----	\$6,000,000
Piling (50 ft.)—600,000 sq. ft.	
@ \$1.80-----	1,080,000
80 brokers' offices and service room and toilets (on second floor) (26,000 sq. ft. in offices, 1,300 sq. ft. in service room and toilets, 4,200 sq. ft. in corridor) 31,500 sq. ft. @ \$7.83-----	246,640
2 restaurants in multiple-store units, with public restrooms in basements, @ \$29,000+\$4,500 for 2,500 sq. ft. of piling @ \$1.80----	67,000

Total cost of buildings----- 7,393,640

¹ These building costs are based on brick and steel construction. If it is necessary to make the buildings more fire resistant to meet city codes, an additional \$1.50 per sq. ft. of building should be added to the cost.



BN 9587X

FIGURE 48.—Parking motortrucks on roof.

A. Multiple-store structures—Continued

Other construction costs:

Rails:

House tracks—12,800 ft. (90# rail) @ \$10-----	\$128,000
Team tracks—20,200 ft. (90# rail) @ \$10-----	202,000
Lead-in tracks—1,600 ft. (108# rail) @ \$15-----	24,000
Switches:	
9 crossover @ \$10,000-----	90,000
4 single @ \$3,600-----	14,400

Sewers:

12 in. sanitary—6,400 ft. @ \$2.25-----	14,400
15 in. storm—11,600 ft. @ \$3.50-----	40,600

Blacktop combination paving:

Multiple-store area—190,000 sq. yds. @ \$4-----	760,000
Team track area—100,000 sq. yds. @ \$4-----	400,000
30 floodlights @ \$150-----	4,500
Public address system-----	2,000
Fence (including gates)—8,510 ft. @ \$3-----	25,530

Total cost of buildings and other construction----- 9,099,070

Other costs:

Architect and engineer fees @ 6% ² -----	545,945
Construction loan @ 5% for 1 yr ³ -----	482,251
Contingency @ 10% ⁴ -----	1,012,727

Total cost of multiple-store structures----- 11,139,993

B. Auction facilities:

Sales building:

1st floor—150,000 sq. ft. @ \$10-----	\$1,500,000
2d floor—50,000 sq. ft. @ \$10-----	500,000
Piling (50 ft.)—150,000 sq. ft. @ \$1.80-----	270,000

Total cost of sales building----- 2,270,000

Other construction costs:

Rails:

House tracks—3,000 ft. @ \$10 (90# rail)-----	30,000
Lead-in tracks—2,400 ft. @ \$15 (108# rail)-----	36,000
Switches, 2 single @ \$3,600-----	7,200

Sewers:

12 in. sanitary—200 ft. @ \$2.25-----	450
15 in. storm—4,400 ft. @ \$3.50-----	15,400

Blacktop combination paving:

45,125 sq. yds. @ \$4-----	180,500
10 floodlights @ \$150-----	1,500
Fencing-----	(⁵)

Total cost of sales building and other construction----- 2,541,050

Other costs:

Architect and engineer fees @ 6% ² -----	152,463
Construction loan @ 5% for 1 yr ³ -----	134,676
Contingency @ 10% ⁴ -----	282,819

Total cost of auction facilities----- 3,111,008

Total cost of multiple stores and auction facilities----- 14,251,001

If the market were built on the Bronx Terminal Market site, only 147 new store units would be needed; 93 of the present units of the terminal could be refurbished and used in the new market, thus decreasing construction costs. The following listing shows the estimated cost of construction of market facilities (July 1959 basis) for the Bronx Terminal Market site:

A. Multiple-store structures:

Buildings:

147 new units (15 ft. x 25 ft. mezzanines) @ \$25,000 (for business being handled in Washington St. Market) ¹ -----	\$3,675,000
Piling (50 ft.)—367,500 sq. ft. @ \$1.80-----	661,500
Piling (difference in depth between 50 ft. and 90 ft. for 79 units along Harlem River)—197,500 ft. @ \$1-----	197,500
Refurbishing 93 old units @ \$5,000 (including store office on second floor) ² -----	465,000
2 restaurants in multiple-store units, with public restrooms in basements, @ \$29,000 + \$4,500 for 2,500 sq. ft. of piling @ \$1.80-----	67,000
80 brokers' offices above 16 refurbished units—30,900 sq. ft @ \$4 (including stairway, etc.)-----	123,600

Total cost of buildings----- 5,189,600

Other construction costs:

Rails:

House tracks—10,100 ft. @ \$10 (90# rail)-----	101,000
Team tracks—22,000 ft @ \$10 (90# rail)-----	220,000
Lead-in tracks—2,200 ft. @ \$15 (108# rail)-----	33,000

Switches:

1 crossover @ \$10,000-----	10,000
20 single @ \$3,500-----	70,000

Sewers:

12 in. sanitary—300 ft. @ \$2.25-----	675
15 in. storm—3,000 ft. @ \$3.50-----	10,500

Blacktop combination paving:

Multiple-store area—151,300 sq. yds. @ \$4-----	605,200
Parking area—177,277 sq. yds. @ \$4-----	709,108
Floodlights—20 @ \$150-----	3,000
Public address system-----	2,000
Fence ³ -----	--

Total cost of buildings and other construction----- 6,954,083

¹ Replacement costs of present units are provided for in land cost estimates of the Bronx Terminal market.

² Refurbishing includes the removal of temporary partitions between present store units where necessary; repair of walls, ceilings, and floors by repairing cracks and painting walls and ceilings; removing hand-operated conveyors between first and second floors and repairing plumbing fixtures, doors, etc., where needed.

³ Not possible to fence entire market area since major thoroughfares pass through area.

² 6 percent of total cost of constructing facilities.

³ 5 percent of cost of constructing facilities plus architect's and engineer's fee.

⁴ 10 percent of cost of constructing facilities plus architect's and engineer's fees and construction loan.

⁵ Included in cost of multiple-store structures.

Other costs:	
Architect and engineer fees @ 6% ⁴ -----	\$417, 245
Construction loan @ 5% for 1 yr. ⁵ -----	368, 567
Contingency @ 10% ⁶ -----	773, 990
Total cost of multiple-store structures--	<u>8, 513, 885</u>

B. Auction facilities:

Sales building:	
1st floor—150,000 sq. ft. @ \$10-----	\$1, 500, 000
2d floor—50,000 sq. ft. @ \$10 (of- fices and auction auditorium)---	500, 000
Piling (90 ft.—along Harlem River) 150,000 sq. ft. @ \$2.80-----	420, 000
Total cost of sales building----	<u>2, 420, 000</u>

Other construction costs:

Rails:	
House tracks—3,000 ft. @ \$10 (90# rail)-----	30, 000
Lead-in tracks—800 ft. @ \$15 (108# rail)-----	12, 000
Switches—2 single @ \$3,600---	7, 200
Sewers:	
12 in. sanitary—200 ft. @ \$2.25--	450
15 in. storm—4,400 ft. @ \$3.50--	15, 400
Blacktop combination paving—1,000 sq. yds. @ \$4-----	4, 000
Floodlights—10 @ \$150-----	1, 500

Total cost of sales building and
other construction -----

2, 490, 550

Other costs:

Architect and engineer fees @ 6% ⁴ --	149, 433
Construction loan @ 5% for 1 yr. ⁵ ---	132, 000
Contingency @ 10% ⁶ -----	277, 199

Total cost of auction facilities----

3, 049, 182

Total cost of multiple stores and
auction facilities-----

11, 563, 067

⁴ 6 percent of total cost of constructing facilities.

⁵ 5 percent of construction costs plus architect's and engineer's fees.

⁶ 10 percent of construction costs plus architect's and engineer's fees and construction loan.

Modifications That May Be Needed for Hunt's Point Site

If new fruit and vegetable wholesale facilities are built at the Hunt's Point site, 3 miles from the Bronx Terminal Market, fruit and vegetable wholesalers now operating at the Bronx Terminal might or might not desire to locate in the new market.

As previously noted, dealers and farmers located on the Bronx Terminal Market received 13,850 carlots of fresh fruits and vegetables, of which 7,600 carlots were received by rail or truck directly from producing areas. Of the 7,600 carlots, 3,100 were handled through the Bronx Terminal Farmers' Market and 4,500 by Bronx Terminal dealers (fig. 23). Most of the dealers are jobbers or purveyors, and as such they use more space per carlot than the average used in the Washington Street Market. It was assumed that each new store unit built for Washington Street dealers would handle an average of 282 carlots per year.

If new facilities were built for the Bronx dealers at Hunt's Point, however, it was assumed that the

annual capacity of each store unit would be only 180 carlots because of the type of the dealers' present operations. Thus, for the 4,500 carlots handled by the Bronx dealers, 25 units would be needed on the Hunt's Point site in addition to the 240 units assumed to be sufficient to handle the 110,950 carlots from the Lower Manhattan Market area.

Also, provision may be made to supply farmer-trucker sheds with 200 stalls, 10 feet wide and 20 feet deep, to care for the 3,100 carlots handled at the Bronx Terminal Farmers' Market. Total additional costs of facilities and land for these items would approximate \$1.3 million. (The detailed calculations of these costs will be found in Appendix B.)

Importers of deciduous fruits from South America and of pineapples and vegetables from the Caribbean area have suggested that a covered and heated shed be provided on the Hunt's Point site to receive their shipments and be used as a sales pavilion and delivery facility. The city pier at the bottom of Tiffany Street, which is about 100 feet wide by 600 feet long, could be developed for this purpose. Products from boats bringing the commodities to deepwater piers throughout the city could be brought by tug and lighter to the Tiffany Street pier and unloaded directly to such a building. Cost for improvement of the Tiffany Street pier would approximate \$300,000, according to local engineers.

Estimated costs for these three types of additional facilities (dealers' facilities, farmers' facilities, and importers' sheds) are *not* included in table 17, or in any other tables in the report, because the calculations in table 17 are based solely on relocating the former Lower Manhattan fruit and vegetable market at this site.

Modifications That May Be Needed for Bronx Terminal Site

If the volume of fruits and vegetables being handled in 1956 on the Lower Manhattan Market were transferred to facilities on the Bronx Terminal site, most of the dealers handling foods other than fruits and vegetables would be displaced because the available space is not adequate to care for all such groups. About 25 new store units would be needed for the fruit and vegetable wholesale dealers now operating on that market and 200 farmers' stalls to provide for the needs of the Bronx Terminal Farmers' market. These facilities would be in addition to the 240 units planned for handling the 110,950 carlots to be moved from the Lower Manhattan Market. (Detailed calculations for these costs will be found in Appendix B.)

Modifications That May Be Needed for the Maspeth Site

In 1958 and 1959 the Maspeth Development Corporation and the Brooklyn Gas Light Com-

pany built a number of warehouse-type buildings on the west side of Newtown Creek on the Maspeth site, which have an assessed valuation of over \$1 million. The construction costs of these buildings are not included in the estimates in this report. It is thought that these new buildings could not be used as multiple-store buildings for fruits and vegetables, but they might be used as warehouses for other commodity wholesalers, if a wholesale food center is eventually built on the Maspeth site.

Summary of Investment Costs

The total costs of facilities and land for each of the five sites are shown in table 17. These figures are based on a site of 100 acres and facilities described on pages 51 and 58.

Ownership and Management

Regardless of how well a wholesale fruit and vegetable market may have been designed, how complete it may be, or how accessible, its success will depend to a large extent on the type of ownership and the character of its management. To operate successfully, it must be as well managed as any other business of comparable size. Moreover, it should be operated without discrimination against any type of buyer or seller, against any form of transportation, or because of the origin of the shipments.

Many groups and interests are concerned with the type of management placed in control of the wholesale fruit and vegetable market. Growers, shippers, transportation companies, wholesale dealers, retail grocers, and consumers, all have a large stake in the management of the market. Investors make up another group vitally concerned with the success of the market. Whether private funds are invested or public funds are appropriated by a State or city, the investors have a right to expect that their investments will be protected. It is desirable that the managerial board be composed of members, if possible, who would represent the interest of those groups most concerned with its successful operation.

A market of the type that is needed in New York will be almost a monopoly so far as facilities go. That is, if the market is successful, wholesalers and buyers will use only one such facility. There are several logical consequences. When the market is established as a going concern, it is a safe financial investment, and its income is more or less steady and dependable. It then becomes very important that the ownership be prevented from exploiting the industry. That is, certain safeguards should be provided, for the market should function as a public service facility.

TABLE 17.—*Estimated investment costs for 100 acres of land and needed facilities on each of 5 sites for a new fruit and vegetable market*

Proposed site	Land	Facilities	Total
	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>
Bronx Terminal Market.....	20, 759	¹ 11, 563	¹ 32, 322
Hunt's Point.....	4, 992	² 14, 251	² 19, 243
Jersey City (Meadows).....	1, 686	14, 251	15, 937
Long Island (Maspeth).....	11, 963	14, 251	26, 214
Modernized Lower Manhattan.....	93, 279	14, 251	107, 530

¹ Does not include 25 additional store units that would be required if the fruit and vegetable dealers now operating on the Bronx Market continue in business.

² Does not include 25 additional store units that would be required if the fruit and vegetable dealers now operating on the Bronx Market moved to Hunt's Point site.

Regardless of what agency constructs and finances the market, there should be definite assurance that: (1) It will be properly located, designed, and equipped, (2) construction of unnecessary facilities will be prevented, (3) investment funds will be spent wisely to provide for real needs, in order that the increased efficiency will not be offset by high rent for the facility, and (4) the facilities will be used in the real interest of the industry and the public.

Type of Ownership¹²

With these items in mind, the proposed market may be built and managed (1) by a private corporation for profit, nonprofit, or limited profit, (2) through direct State ownership, (3) through municipal ownership, (4) by a public benefit corporation, sometimes called a market authority, or (5) by a combination of these.

Private Corporation

A private corporation is not an agency or instrumentality of government. It is a legal entity, organized in conformity with existing State statutes, and made up of individuals bound together for a common purpose or objective. A private corporation usually is organized for profit, but may be operated as a nonprofit organization.

Profit Corporation

When a private corporation is operated for profit, there are usually no restrictions on the sale

¹² For more information on types of market ownership and methods of financing wholesale food market facilities see *Wholesale Food Market Facilities—Types of Ownership and Methods of Financing* (2).

of voting stock to any individual because of his occupation or profession. Nor are there restrictions on the number of shares of voting stock that may be held by any one individual. Stockholders have one vote in corporate affairs for each share of voting stock held.

A number of wholesale food markets are owned and operated by private corporations. In some instances the principal stockholders in these corporations are food wholesalers. In other cases, the corporation is a railroad company or some other firm which was organized primarily for other types of business.

To form a private corporation, the incorporators usually obtain a charter from the State. This charter defines the power of the corporation and of its officers and directors. It also specifies what the stockholders' rights shall be and how they shall exercise their control.

In a private corporation, the board of directors can make decisions quickly and without the delay found in some other types of organizations. Quick decisions on major policy matters sometimes make the difference between success and failure of the organization.

On the other hand, wholesale fruit and vegetable markets owned by private corporations tend to become "closed" markets. In recent years, several private market corporations have prohibited the delivery on the market of food items by motortruck, especially by out-of-State trucks. Often, no space is provided for future expansion, either for increased volume or for new food handlers and allied industries.

Furthermore, at certain times, sponsors of markets to be built by a private corporation have found it difficult to obtain necessary funds to take care of preliminary organization and equity fund requirements.

Nonprofit Corporation

A nonprofit private corporation must be organized in conformity with existing State statutes. In a private corporation operated for profit, each stockholder usually has as many votes in the affairs of the corporation as he has shares of common or voting stock. In a nonprofit private corporation, participation in corporate rights and activities is usually based either on a system of dues, which limits each member (stockholder) to one vote, or bylaws which restrict ownership of voting stock to one share per member.

As a rule, State statutes place no limitations on participation in the corporation because of the business or occupation. However, membership in these nonprofit corporations can usually be limited or restricted through bylaws. Thus, it is possible for farmers, food wholesalers, retail grocers, and others who are directly interested in the ownership and operation of a wholesale food market to be-

come associated in a nonprofit private corporation for the purpose of constructing and operating such a market. In many cases, the amount of stock owned by each firm is based on the amount of floor space occupied, and the shares transfer with changes in occupancy.

State Ownership

Some markets are owned and operated by an agency of the State, usually an organization set up by the State legislature.

A State-owned market is financed in whole or the greater part through the use of State funds or credit. Provision may be made in the appropriation act for the amortization or "repayment" of the expendable portion of the investment made with State appropriated funds. With this type of ownership it should be possible to obtain funds at a lower interest rate, and land can be acquired by eminent domain.

Municipal Ownership

Municipal ownership of a market is another form of public ownership and is comparable in its basic aspects to State ownership.

The City of New York operated in 1953, under its Commissioner of Markets, three wholesale fruit and vegetable markets, eight retail food markets, two city markets which do not handle fruits and vegetables.¹³ The construction and operation of all these markets were financed by city appropriation.

If construction of a new fruit and vegetable market is to be financed by the city, it is assumed that the Commissioner of Markets will operate the market. Several methods may be open for the city to finance such a market: (1) Issuance of municipal bonds, (2) issuance of revenue warrants, (3) loans from private corporations, and (4) city appropriations. In any case, the proposal must be approved by the City Board of Estimate.

Objections frequently voiced in conjunction with municipal ownership of a market are that often the management may not appreciate the problems of all groups using the market facility, the management may be unduly influenced by political considerations, and continuity of management may be difficult to achieve. These objections might be overcome, however, by the municipal government's purchasing the market site, constructing the market, and leasing it to a public benefit corporation or a nonprofit corporation to operate.

¹³ The city-operated markets were: Live poultry market (Long Island City), Bronx Terminal Market, Fulton Fish Market, Gansevoort wholesale market, Brooklyn Terminal Market, Arthur Ave., Essex St., First Ave., Harlem retail, Park Ave., Havemeyer St., Moore St., and 13th Ave. markets.

Public Benefit Corporation

A public benefit corporation is a legal entity or agency of government and as such is usually granted many of the rights and prerogatives given to local political subdivisions, such as school districts or drainage districts. A public benefit corporation created for market ownership and operation is sometimes referred to as a market authority. For such purposes it is usually an instrumentality of the State government. A number of public benefit corporations own and operate wholesale food distribution facilities in New York State.

The sole business of a market authority is that of financing, constructing, and operating the market facility. It has no authority to engage in the wholesale food business. As a nonprofit public corporation it does not fix rental rates above the amount required to raise the revenue needed to amortize the investment, meet operating expenses, and maintain a reserve for contingencies.

The facilities operated may be taxed or be exempt from taxes, depending on the views of law-making bodies.

The several laws authorizing the creation of regional market authorities in New York State are similar in most respects except for regional designation and the amount of State appropriation. Each regional market authority has a board of directors; all directors except one are appointed by the various boards of supervisors of counties included in the region. One member of each board is the State Commissioner of Agriculture and Markets or his representative. One of the board members appointed from each county must be a farmer, who must actually sell all or part of his produce on the market when it is established. The board of directors has authority to prepare plans and contract to build market facilities; hire all employees or other officers; operate all market facilities owned by the authority within the district; prepare plans for financing the acquisition, construction, equipment, and operation of any market facilities; and make and enforce rules and regulations governing the authority's market facilities.

Under existing statutes, the New York State Legislature, on recommendation of the State Commissioner of Agriculture and Markets appropriates and lends to an "authority" up to 50 percent of the cost of constructing approved new facilities or the repair and expansion of existing market facilities under their control. The remainder of the cost is financed by the issue and sale of 3 percent, 30-year revenue bonds. The State loan is without interest and is paid back in annual installments.

Combination of Organizations

A combination of organizations working together may be necessary to obtain a site, construct the facilities, and operate the market.

A city government in a nearby State asked its redevelopment authority to obtain the land and set up a market corporation to build the facilities. A contract was agreed upon in which the city redevelopment authority acquired title to the land, demolished substantially all structures on it, graded and filled the site, and placed it in condition to build upon. The city also defrayed the cost of certain municipal facilities, including paving public streets and installing water and sewer services under the streets, and conveyed the property to the market corporation as needed for construction. The contract also stated that the management would develop the facilities and operate and service the market; that it would be governed by a board of directors; that the management would have powers to lease land and sell land, subject to approval of the city; that management would pay annually to the city a certain percentage of the gross rentals received from facilities under lease and licensing agreements, in addition to a lump sum paid annually in consideration of the contract. At the expiration of the contract the corporation may be required to convey to the city, title and interest in all land and buildings.

There are other combinations of ways to build a market. For instance, an agency or government may acquire the site and place it in condition to build upon, and then build facilities for a part of the tenants, lease or sell land to others to build their facilities, and work out arrangements with a farmers' cooperative association for such an agency to build a farmers' market.

Management of a Wholesale Food Market

Several methods may be used in the management of a wholesale fruit and vegetable market. In one approach the market administration (private corporation, city, or State agency), may prepare a master plan and lease or sell sites to individual firms who would arrange for the construction of their own buildings. This arrangement has its disadvantages. For instance, many facilities, such as railroad tracks, driveways, and parking areas, must be provided for the joint use of a number of tenants. Then too, many of the smaller firms would be located in one or more units of a multiple-store building, and it would be difficult for each group to finance and construct its own building.

Another approach is for the market administration to construct, according to approved plans of the wholesaler, adequate facilities on the basis of a lease to the wholesaler for a long period of time. This plan would place operating responsibility on the market administration organization. The market administration would collect rentals regularly for each facility, handle all repairs, and have

total responsibility for general maintenance and for many other activities. This would entail the employment of a large clerical, maintenance, and management staff.

A third possibility, being followed in another large city, is for the tenants of each major section of a market to form their own nonprofit private corporation to lease their section of the market from the market administration and operate it, collecting rentals from the individual store operators. This plan enables the market administration to finance and direct the construction, but not be burdened by its management.

Under the third plan, the wholesalers would apply for a corporation charter as a private trade corporation. All common stock of the corporation would be owned by the occupants of the facilities. The number of shares owned by each tenant could be based on the facilities occupied. For example, to operate a New York City market under this arrangement, the operator of each of the 240 store units and the 2 restaurants would lease facilities from the trade corporation. Each operator might be required to purchase 100 shares of stock in the corporation for each store unit he occupied. Thus, an operator requiring 3 store units would buy 300 shares of common stock. If leases were obtained for 240 store units and 2 restaurants, the total amount of stock outstanding would be 24,200 shares. As additional units were built, the amount of stock outstanding would be increased by 100 shares for each unit built. The trade corporation in turn would lease the total facilities from the owner or, if it had the financial strength to do it, build the facilities needed.

The price per share for this stock would be determined by the amount of equity money which the corporation would have to provide to support the lease or to obtain the remaining funds needed for the construction of this section of the food center. Undoubtedly, the trade corporation would

have to raise more funds to provide equity money if it undertakes to construct its own buildings than would be needed if the market administration retains title to the facilities and then merely leases to the trade corporation.

The trade corporation would then work directly with the market administration building the market on all problems connected with the construction of the facilities. When the facilities were completed, the trade corporation would handle all problems of management in its section of the market; it would collect rents from the individual tenants and take care of all expenses such as street cleaning, street lighting, garbage removal, repairs, traffic management, policing, taxes, and office expenses of the trade corporation. In addition it would pay the rental called for in the lease, which of course, would be a sum at least sufficient to make amortization payments on the loan with reasonable reserves.

With an arrangement of this kind, the market administration, instead of dealing with the many problems of the operators of the 240 store units and 2 restaurants, would deal only with the manager of the fruit and vegetable section, who would be employed by the trade corporation. In like manner, the market administration might deal with the auctions and tenants of other facilities in the market. The rentals charged the individual tenants by the trade corporation, of course, should be sufficient only to meet all the obligations of the corporation, with reasonable reserves; they should not be high enough to yield a profit, since no useful purpose would be served in having the tenants pay excessive rents to their own corporation only to have the excess returned to them in the form of dividends.

This type of arrangement with the tenants might be especially appealing to the market administration if a complete wholesale food distribution center is to be developed.

Estimated Operating Costs and Revenue Requirements

Since this report deals only with the facilities for a new fruit and vegetable market, the only management costs included are those required to run such a market. If other food sections of a wholesale food distribution center are built, they might likewise have their management corporations. The market administration would deal with all the trade group corporations and large individually operated facilities.

The operating costs and revenue requirements are discussed in this chapter under 3 conditions: namely, the market will be financed by (1) a private corporation, (2) a New York State regional market authority, or (3) the City of New York.

Financing by a Private Corporation

Operating Costs

Regardless of the method of financing, certain operative costs of the market must be paid. They include, mainly, the salaries and wages of the management staff, fees for special services, costs of office supplies and equipment, advertising and promotion, maintenance and repair of facilities and equipment, fire and liability insurance premiums, telephone and telegraph charges, and costs of utilities for hallways, offices, and public toilets, and of refuse or snow removal. The estimated annual operating costs, including a 10-percent operating

contingency fund to allow for variation in these estimates, for the proposed New York market are computed at \$273,612 for each of the suggested sites. No allowance has been made for real estate taxes and debt service charges in the management cost estimates, because they are presented in this report as separate items of expense. Costs which the dealer is responsible for, such as repair and maintenance costs and insurance premiums for his office and store equipment, are not included in these costs.

The operating expenses for market management for a new market on the five sites were estimated to be:

Personal services:		
Manager -----	\$15,000	
Assistant managers (2) -----	12,000	
Watchmen (4 @ \$4,500) -----	18,000	
Janitor (for 2d floor offices) ----	4,000	
Secretary -----	5,000	
Telephone operator—clerk typist -----	3,600	
Cleanup crew (6 laborers @ \$4,000) -----	24,000	
Payroll benefits (12%) ¹ -----	9,792	
		\$91,392
Administrative and office expenses:		
Promotion, travel -----	1,200	
Telephone, telegraph -----	1,500	
Office supplies -----	1,500	
Utilities for office -----	600	
Auditing services -----	6,500	
		11,300
Other market operating expenses:		
Maintenance and repairs ² -----		106,833
Insurance:		
Fire—80% building costs (including auction facilities) @ \$1.15/\$1,000 ³ -----	11,288	
Liability — \$1.75/\$1,000— \$500,000 -----	875	
		12,163
Utilities (water, electricity, etc., for 2d floor offices, halls, public toilets, etc.) -----	4,500	
Refuse removal -----	20,000	
Miscellaneous expense -----	2,500	
		248,738
10% contingency fund -----		24,874
		273,612

¹ Includes payments for social security, sick benefits, and accident compensation.

² Based approximately on $\frac{3}{4}$ of 1 percent valuation of \$14,251,001 facilities cost, including dealers' multiple stores and auction facilities for 4 sites, with a higher percentage on the Bronx Terminal because some of the buildings are now nearly 25 years old. This includes major building repairs and maintenance, rail maintenance, and road maintenance.

³ Based on investment cost of insurable facilities (including auction facilities) of about \$9.8 million on 4 sites (slightly less on the Bronx Terminal site).

Debt Service Payments

If the proposed market is to be self-liquidating, the investment must be repaid from market revenue, and certain standards for repayment of the investment must be followed.

Observations on several markets indicated that these facilities, if properly designed and operated, should not become fully depreciated or obsolete in less than 20 to 30 years, although generally they can be used for a much longer period. However, the financial plan selected by sponsoring groups for capital improvements of this type may vary, and the time period selected may depend upon their decision. Usually loan agencies request that such loans be repaid over a 25- to 30-year period, either in equal installments, including interest, or with a fairly large sum due at the end of the period. For the purposes of this report, it is assumed that a first mortgage loan could be obtained for 65 percent of the total funds needed. An amortization period of 25 years for the repayment has been used and for these loans an annual interest rate of 5 percent has been assumed.

There may be several ways of obtaining the remaining 35 percent of the funds needed. About 10 percent of the total funds needed probably could be obtained by a private corporation selling stock to its tenants. No interest charge would be paid on this 10 percent. If the first mortgage produces only 65 percent of the funds needed and the tenants raise 10 percent, this leaves 25 percent to be raised in some other way, probably by sale of preferred stock, debenture bonds, or by a second mortgage on the property. An amortization period of 20 years for repayment of the second mortgage and an interest rate of 6 percent have been assumed. Admittedly, mortgage interest charges will vary considerably from time to time. The above rates are suggested for illustrative purposes only. The market sponsors should allow for such variations when they plan the actual financing of a new market.

Under certain conditions, especially when the mortgage money market is "tight", investors will insist that annual income of the market organization be larger than the amount needed to pay the debt service charges on the first and second mortgages. Obviously, the percentage of debt reserve required will vary according to the time of financing. An agreement can probably be worked out on the percentage of the debt service payments required for a reserve and the number of years this must be collected by the market organization and held in escrow. For the purposes of this study a debt reserve of 20 percent is assessed against the annual debt service payments.

Table 18 shows for each of the five sites the annual debt service payments required for amortizing the investment cost of buildings and land, and a 20-percent reserve. Debt service payments range from \$1.3 million for the Jersey City site to \$8.8 million for a modernized Lower Manhattan Market area.

TABLE 18.—Source of funds, annual debt service payments and debt reserve for a fruit and vegetable market on 5 proposed sites, if financing is arranged by a private corporation

Item	Bronx Terminal	Hunt's Point	Jersey City (Meadows)	Long Island (Maspeth)	Modernized Lower Manhattan
Source of funds:	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>
Equity fund ¹	3, 232	1, 924	1, 594	2, 621	10, 753
First mortgage ²	21, 009	12, 508	10, 359	17, 039	69, 895
Second mortgage ³	8, 081	4, 811	3, 984	6, 554	26, 882
Total funds needed for investment in land and facilities.....	32, 322	19, 243	15, 937	26, 214	107, 530
Debt service payments:					
First mortgage ²	1, 491	887	735	1, 209	4, 959
Second mortgage ³	705	419	347	571	2, 344
Annual debt service payments.....	2, 196	1, 306	1, 082	1, 780	7, 303
Debt reserve 20% ⁴	439	261	216	356	1, 461
Total debt service and reserve.....	2, 635	1, 567	1, 298	2, 136	8, 764

¹ Assumed to be 10% of total investment cost of land and facilities. No interest is charged for this item.

² Assumed that 65% of total investment cost of land and facilities would be raised by issue of first mortgage at 5% for 25 years, with annual debt service payment of \$70.95 per \$1,000.

³ Assumed that remaining 25% of total investment cost of land and facilities would be raised by issue of

second mortgage at 6% for 20 years, with annual debt service payment of \$87.18 per \$1,000.

⁴ The percentage reserve required will vary according to conditions at time of financing, and agreement can probably be worked out to discontinue collecting this amount after a number of years when the reserve reaches an agreed-upon amount.

Real Estate Taxes

It is assumed that real estate taxes or an equivalent sum will be paid by the market organization on the land, buildings, and other facilities. Services provided by the city for this payment would include fire protection, street cleaning, and sewerage service. The 1959 tax rate for New York City was \$42.50 per \$1,000 assessed valuation, and the tax rate for Jersey City was \$86.68 per \$1,000 assessed valuation. For the purposes of this study these tax rates are assessed against 100 percent of the valuation. There is some question regarding the specific Jersey City tax rate, because some properties may be assessed at a different percentage of the market valuation.

A 10-percent reserve is provided to take care

of increases in the real estate tax rate over the years. The annual real estate tax payments based on these rates plus 10 percent reserve would be: Bronx Terminal site, \$1,511,054; Hunt's Point site, \$899,611; Jersey City site, \$1,519,593; Maspeth site, \$1,225,505; and for a modernized Lower Manhattan Market site, \$5,027,028.

Total Annual Revenue Required

Estimates of the amount of revenue needed by the market organization for operating expenses, debt service payments, and real estate taxes (including reserves and contingency funds) for a new produce market on each of the five sites, if financed by a private corporation, are found in table 19.

TABLE 19.—Total annual revenue (including reserves and contingency) required for a new fruit and vegetable market on each of 5 proposed sites, if financed by a private corporation ¹

Cost item	Bronx Terminal	Hunt's Point	Jersey City (Meadows)	Long Island (Maspeth)	Modernized Lower Manhattan
	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>
Operating costs.....	274	274	274	274	274
Debt service payments and reserve.....	2, 635	1, 567	1, 298	2, 136	8, 764
Real estate taxes.....	1, 511	900	1, 520	1, 226	5, 027
Total revenue needed.....	4, 420	2, 741	3, 092	3, 636	14, 065

¹ These figures do not include handling costs and other such costs.

Sources of Revenue

The revenue needed to support a market must be derived from charges and rentals for the use of its facilities. There are many possible ways of assessing such charges among the users, such as rentals; fees for parking; charges for use of rail tracks; and other service charges. The management will have to decide the best ways of apportioning these revenue needs among the users.

For purposes of this report it has been assumed

that all the income required will be derived from rentals. Obviously, such rentals would be reduced if some of the needed income is derived in other ways. Table 20 shows that the estimated annual revenue charges based on July 1959 prices range from \$2.88 per square foot, for dealers' stores in a new market on the Hunt's Point site, to \$16.80 per square foot for stores in the modernized Lower Manhattan Market area. These figures are all based on the cost for a 100-acre market area with 240 multiple store units and other stated facilities, financed by a private corporation.

TABLE 20.—*Estimated rentals that would have to be charged in a new fruit and vegetable market, at 5 proposed sites, if financed by a private corporation*

Rental item	Bronx Terminal	Hunt's Point	Jersey City (Meadows)	Long Island (Maspeth)	Modernized Lower Manhattan
	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>
Total annual revenue needed.....	4, 420	2, 741	3, 092	3, 636	14, 065
Revenue to be obtained from:					
Auction ¹	902	551	652	684	2, 279
Offices.....	180	180	180	180	180
Restaurants.....	20	20	20	20	20
Multiple stores.....	3, 318	1, 990	2, 240	2, 752	11, 589
	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>
Annual rental per sq. ft. for stores ²	4. 22	2. 88	3. 25	3. 99	16. 80
Monthly rental per unit for stores ³	1, 153	691	778	956	4, 024

¹ Computations are based on investment cost for auction facilities and land as a percentage of total investment cost for fruit and vegetable facilities and land at the 5 proposed market sites. These percentages were computed as follows:

Site	Investment for auction facilities and land			Total investment for fruit and vegetable facilities and land	Percentage
	Facilities	Land	Total facilities and land		
	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>Percent</i>
Bronx Terminal.....	3, 050	3, 529	6, 579	32, 322	20. 4
Hunt's Point.....	3, 111	764	3, 875	19, 243	20. 1
Jersey City (Meadows).....	3, 111	256	3, 367	15, 937	21. 1
Long Island (Maspeth).....	3, 111	1, 836	4, 941	26, 214	18. 8
Modernized Lower Manhattan Market.....	3, 111	14, 272	17, 383	107, 530	16. 2

² Bronx Terminal contains 786,000 sq. ft. of multiple-store space; other locations contain 690,000 sq. ft. of multiple-store space.

³ 240 store units assumed.

Financing by a New York State Regional Market Authority

In a previous chapter, a description is given of the organization of a New York State regional market authority, under the present laws of the State. Since this type of financing was not available for a new market located in New Jersey, no estimates are given for the Jersey City site.

Operating Costs

Little, if any, differences in operating costs would result if a New York State regional author-

ity financed a market compared with one financed by a private corporation. Thus, for the purposes of this study, it is estimated that costs for personal services, administrative and office expenses, maintenance and repair, insurance, auditing costs, and costs for utilities for hallways, offices, and public toilets, and for refuse and snow removal, and a 10-percent operating contingency fund would amount to \$273,612 annually for a market on each site in New York.

Debt Service Payments

In a previous chapter it was stated that under a New York State law establishing regional mar-

ket authorities [1950 (L2,613, Book 42, pp. 257-286) Article 4, Title 1] the State legislature, on the recommendation of the State Commissioner of Agriculture and Markets, can appropriate and lend to a regional market authority up to 50 percent of the cost of constructing approved new market facilities. The remaining 50 percent of the cost is financed by the issue of 3-percent, State, 30-year revenue bonds. The State loan is without interest and, for purposes of this study, to be paid back in 30 annual installments. No allowance for the discounting of bonds, when sold on the market, has been made in this study.

Under this type of financing, debt service payments would be made by the market to the State Treasurer to pay off the investment costs of the facilities and land. Table 21 shows the total cost of investment at each of 4 sites and the annual payments made toward liquidating the 50 percent appropriated by the legislature and the 3-percent, 30-year revenue bonds. To sell the revenue bonds on the open market, it is assumed that it would

TABLE 21.—*Source of funds, annual debt service payments, and debt reserve required for a fruit and vegetable market on 4 proposed sites, if financing is arranged by a New York State regional market authority*¹

Item	Bronx Terminal	Hunt's Point	Long Island (Maspeth)	Modernized Lower Manhattan
Sources of funds:	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars
State loan (30-year)---	16, 161	9, 622	13, 107	53, 765
Revenue bonds (3% interest)-----	16, 161	9, 621	13, 107	53, 765
Total funds needed for investment in land and facilities-----	32, 322	19, 243	26, 214	107, 530
Debt service payments:				
State loan (30-year)---	539	321	437	1, 793
Revenue bonds ² -----	825	491	669	2, 743
Total debt service payment-----	1, 364	812	1, 106	4, 536
Debt reserve (20%) ^{3,4} ---	165	99	134	549
Total debt service and reserve-----	1, 529	911	1, 240	5, 085

¹ Authorized under the New York State Act [1950 (L2,613 Book 42)].

² Annual debt service payment for 30-year revenue bonds with 3% interest would be \$51.02 per \$1,000 per year.

³ See footnote 4, table 18.

⁴ Applies to revenue bonds only.

be necessary for the market authority to set aside a reserve over and above the required debt service payments. There is a possibility that this reserve may not be required if the bonds are sold to a public agency using its own funds for investment. For the purposes of this study, however, a debt reserve of 20 percent annually is assessed against the annual debt service payment for the revenue bonds only.

Total annual debt service payments including the 20-percent reserve on the revenue bonds range from \$911,000 for the Hunt's Point site to \$5,085,000 for a modernized Lower Manhattan Market (table 21). For the Bronx Terminal site the payments would be \$1,529,000, and for the Maspeth site, \$1,240,000.

Real Estate Taxes

For the purpose of this study, it is assumed that the real estate taxes would be paid by a market authority or a lump sum payment made in lieu of taxes, the payment being made at the \$42.50 per \$1,000 assessed valuation for sites in New York City. The real estate taxes, including a 10 percent reserve based on these tax rates, would be the same as for private financing for the four sites: Bronx Terminal site, \$1,511,054; Hunt's Point site, \$899,611; Long Island (Maspeth) site, \$1,225,505; and for a modernized Lower Manhattan Market site, \$5,027,028.

Total Annual Revenue Required

Combining the annual operating costs, debt service payments, and real estate taxes, the total annual revenue required to finance the construction of a new market on the four sites, if the market is financed by a New York State regional market authority, are shown in table 22.

TABLE 22.—*Total annual revenue required (including reserves and contingency funds) for a new fruit and vegetable market at each of 4 proposed sites, if financed by a New York State regional market authority*

Item	Bronx Terminal	Hunt's Point	Long Island (Maspeth)	Modernized Lower Manhattan
	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars
Operating costs-----	274	274	274	274
Debt service payments and reserve-----	1, 529	911	1, 240	5, 085
Real estate taxes-----	1, 511	900	1, 226	5, 027
Total revenue needed-----	3, 314	2, 085	2, 740	10, 386

Sources of Revenue

As pointed out on page 88, these revenue requirements could be met by several types of charges, but for purposes of comparison it is assumed again that all revenue will be obtained from rental of buildings. Table 23 shows the estimated rentals that would have to be charged if the new market were financed by a New York State regional market authority. The rentals range from \$2.13 per square foot on the Hunt's Point site to \$12.33 per square foot for a modernized Lower Manhattan market. The annual rental for the Bronx Terminal site would be \$3.10 per square foot and for the Maspeth site \$2.94 per square foot.

TABLE 23.—*Estimated rentals that would have to be charged for facilities in a new fruit and vegetable market, at 4 proposed sites, if financed by a New York State regional market authority*

Item	Bronx Terminal	Hunt's Point	Long Island (Maspeth)	Modernized Lower Manhattan
Total annual revenue needed	1,000 dollars 3,314	1,000 dollars 2,085	1,000 dollars 2,740	1,000 dollars 10,386
Revenue to be obtained from:				
Auction ¹	676	419	515	1,683
Offices	180	180	180	180
Restaurants	20	20	20	20
Multiple stores	2,438	1,466	2,025	8,503
Annual rental per sq. ft. for stores ²	Dollars 3.10	Dollars 2.13	Dollars 2.94	Dollars 12.33
Monthly rental per unit for stores ³	847	509	704	2,953

¹ See footnote 1 of table 20 for calculation of prorated investment costs for auction facilities.

² Bronx Terminal will contain 786,000 square feet, due to available space in existing buildings; new facilities in the other locations will contain 690,000 square feet.

³ 240 units assumed.

Municipal Financing

Formula in Computing Rentals

The New York City Commissioner of Markets is authorized to construct and operate food markets, both wholesale and retail. If it is decided that the city should build and operate the proposed wholesale fruit and vegetable market, it is assumed that the policy of basing annual rentals on a formula which approximates 11 percent of the investment costs of land and facilities will continue.¹⁴ This formula includes all debt service charges, a charge in lieu of real estate taxes, struc-

¹⁴ Based on formula for computing rents in new municipal projects, as furnished by the New York City Department of Markets, 1959.

tural maintenance and repair costs, operating expenses, an administrative charge to defray costs of supervising the market property, and a charge to offset losses from vacancies. Management, office expenses, and travel allowances for supervising staff are included in administrative expense. The operating expense item includes personnel service, operation of the market, and general maintenance. Police protection and general street cleaning are provided by the city.

In addition to the 11 percent rental charge, the tenant is responsible for costs of: (1) Refuse collection, (2) fire insurance for his property, (3) all repairs except structural repairs, (4) liability and property damage insurance charges, and (5) all charges for water, gas, and electricity consumed on the premises. There is no contingency fund provided in these operating charges.

Obviously, this type of financing would not be available for a new market if built on the Jersey City site.

Total Annual Revenue Required

In table 24 the rentals are shown for 4 sites, if financed by City of New York. Annual city rental charges would range from \$2.1 million for facilities on the Hunt's Point site to \$11.8 million for a modernized Lower Manhattan Market area. Annual revenue needed for a market on the Bronx Terminal site would be about \$3.6 million, and at Maspeth, \$2.9 million.

TABLE 24.—*Estimated rental that would have to be charged for facilities in a new fruit and vegetable market at 4 proposed sites, if financed by the City of New York*

Item	Bronx Terminal	Hunt's Point	Long Island (Maspeth)	Modernized Lower Manhattan
Investment in land and facilities	1,000 dollars 32,322	1,000 dollars 19,243	1,000 dollars 26,214	1,000 dollars 107,530
City rental formula (11%)	3,556	2,117	2,884	11,829
Revenue to be obtained from: ¹				
Auction	726	426	543	1,917
Offices	180	180	180	180
Restaurant	20	20	20	20
Multiple store units	2,630	1,491	2,141	9,712
Annual rental per sq. ft. for multiple stores ²	Dollars 3.35	Dollars 2.16	Dollars 3.11	Dollars 14.08
Monthly rental per unit for stores ³	914	518	744	3,373

¹ See footnote 1, table 20, for calculation of prorated investment costs for auction facilities.

² Bronx Terminal will contain 786,000 sq. ft., due to available space in existing buildings; new facilities in the other locations will contain 690,000 sq. ft.

³ 240 store units assumed.

Summary of Estimated Rental Charges

In this chapter the rental charges necessary to pay for operating expenses for management, debt service charges, and real estate taxes, including reserves and contingencies, for a new market have been discussed for five sites, if financed by a private corporation, and for four sites, if financed by a New York State regional market authority or by the City of New York. Obviously, the rental charges resulting from these considerations vary considerably by type of financing and for each of the sites.

Table 25 summarizes the data in tables 20, 23, and 24.

Rental charges would be the lowest for all three types of financing if the new market was built on the Hunt's Point site and highest if the present Lower Manhattan Market area was used. Financing by a New York State regional market authority results in a slightly lower annual rental—\$2.13 per square foot for dealers' stores on the Hunt's Point site—while the same facilities on the Hunt's Point site, if built by the City of New York, would require an annual rental of \$2.16 per square foot, and by a private corporation, \$2.88 per square foot.

TABLE 25.—Summary of estimated annual rentals that would have to be charged in a new fruit and vegetable market, if financed by a private corporation, a New York State regional market authority, or the City of New York

Item	Bronx Terminal	Hunt's Point	Jersey City (Meadows)	Long Island (Maspeth)	Modernized Lower Manhattan
	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>
Total annual revenue needed from:					
Restaurant and 2d floor offices (for all types of financing) - Auction, if financed by: ¹	200	200	200	200	200
Private corporation.....	902	551	652	684	2,279
New York State regional market authority.....	676	419	(²)	515	1,683
City of New York.....	726	426	(²)	543	1,917
Stores, if financed by:					
Private corporation.....	3,318	1,990	2,240	2,752	11,589
New York State regional market authority.....	2,438	1,466	(²)	2,025	8,503
City of New York.....	2,630	1,491	(²)	2,141	9,712
Annual rental per sq. ft. for stores, ³ if financed by:	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>
Private corporation.....	4.22	2.88	3.25	3.99	16.80
New York State regional market authority.....	3.10	2.13	(²)	2.94	12.33
City of New York.....	3.35	2.16	(²)	3.11	14.08
Monthly rental per unit for stores, ⁴ if financed by:					
Private corporation.....	1,153	691	778	956	4,024
New York State regional market authority.....	847	509	(²)	704	2,953
City of New York.....	914	518	(²)	744	3,373

¹ See footnote 1, table 20, for computations of prorated investment costs for auction facilities.

² This type of financing would not be available for a market in New Jersey.

³ Bronx Terminal contains 786,000 sq. ft., due to available space in existing buildings, and facilities in the other 4 locations contain 690,000 sq. ft.

⁴ 240 store units assumed.

Measurable Marketing Costs in a New Produce Market

Estimates of those major cost items (such as cartage, portorage, waste and deterioration, and rent) presented in this section do not include the dealers' costs for light, heat, and power, telephone and telegraph, other costs of management, and costs of office staff and other supervisory personnel.

These handling costs are based on the type and arrangement of facilities shown in figure 36, on the preceding discussion of facilities needed in a new market, and on the assumption that the proper kinds of handling equipment will be used.

Costs in the proposed facilities were computed from a composite of costs, adjusted to New York rates, obtained by Stanford Research Institute at 16 wholesale stores in 3 modern terminal markets over the country, and at 8 modern and efficient food chainstore warehouses. The 16 wholesale dealers were located in the Denargo Wholesale Produce Terminal, Denver, Colo.; the San Antonio Wholesale Produce Terminal, San Antonio, Tex.; and the Columbia State Farmers Market, Columbia, S.C. The 8 food chain warehouses were located in the New York metropolitan area,

Denver, Colo., and Columbia, S.C. These facilities were chosen because of their similarity to the ones proposed for New York. The data so obtained were checked against data obtained for similar facilities located in various other parts of the country. All direct labor costs and fringe benefits paid employees in handling operations were included in the handling costs. (A more detailed description of facilities included in the 3 markets and the 8 food chain warehouses can be found in Appendix C).

All labor costs were computed at \$2.10 per hour, the reported union rate for unskilled labor for New York City in 1956. Rental costs are based on rentals that would be applicable if construction of the facilities were financed by a private corporation, since this is the only method that would be applicable to all five sites.

Estimated costs cover the major direct cost items that are subject to change with an improvement in handling facilities and methods and are based on 110,950 carlots handled in the Lower Manhattan Market.

Estimated costs for each of the sites cover the three consecutive steps in wholesale movement of the commodities, as follows:

1. Costs from first point of arrival to each of the sites.
2. Costs within the new market.
3. Costs of moving and handling the produce from each site to retail outlets within the metropolitan area or to trucks of out-of-town buyers.

For a more complete breakdown of costs and a more detailed explanation of how the calculations were made, refer to Appendix A, Receipts, Distribution, and Marketing Costs for Present and Proposed New Markets.

Costs From First Point of Arrival to Central Market

This item represents an opportunity for major savings in a new modern terminal because there is much double handling and cartage which can be eliminated by having rail cars and overlength trucks unloaded directly at dealers' stores. However, because of differences in their general locations, the five sites will have different patterns of rail, truck, and boat delivery. The cost from first point of arrival to the central market varies from \$744,000 at the Jersey City (Meadows) site to \$1.7 million at the Bronx Terminal site (table 26).

The differences in the pattern of shipments to the various markets shown in this report are based on Stanford Research Institute estimates of flow and volume, if the central market were moved to new facilities provided to handle the products.

Floating and Switching Costs

Costs of \$1.5 million were absorbed by the railroads for floating, switching, and other pier costs. These costs could be decreased considerably if a new market were built. The present floating and pier costs could be eliminated if a new market were built in Jersey City. The floating and switching costs to the five sites are based on estimates provided by several railroads and on present costs to these points from the major receiving points of these railroads in New York City.

Cartage Costs to Market Area

Present cartage costs from all places of arrival to the Lower Manhattan Market area were estimated to be more than \$3.8 million (table 10). Table 26 shows that this cost could be radically reduced with construction of new facilities with house tracks adjacent to the store building; the products could be unloaded on the store floor, and thus, most of the cartage costs would be eliminated.

Avoidable Delay to Inbound Trucks

The cost of avoidable delay is approximately \$702,000 annually within the Lower Manhattan Market for produce hauled into the market. In a modern market the cost of avoidable delay would be entirely eliminated since the facilities, such as streets and loading space, should be adequate for efficient operation.

Costs Within the Central Market

Handling at Auction or Pier Facilities

Unloading costs and service charges at railroad piers in Lower Manhattan totaled \$3.4 million in 1956. It is estimated that the total costs of unloading and the service charge could be reduced to about \$1.3 million at each of the sites if new facilities were built (Appendix A, page 99). The costs at the piers include unloading, sorting, and stacking for all cars unloaded at the rail piers. The present cost of unloading is \$55 per carlot for all rail-car receipts at the rail piers. At a new market there would continue to be unloading of cars to sort the fruit into sizes and grades, but many of the cars would need to be unloaded only partially, with the contents sold by sample. It is estimated that no more than half of the present unloading would be required at a new market.

Handling at Dealers' Stores

Costs for unloading inbound trucks at dealers' stores, loading buyers' trucks, handling within the market, and intramarket transfers were estimated to be about \$3 million in the present Lower Manhattan Market. By use of modern handling

TABLE 26.—Summary of estimated 1956 marketing costs for fruits and vegetables sold through the present Lower Manhattan Market, from unloading point to metropolitan retail outlet or to trucks of out-of-town buyers, and estimated costs for new markets in 5 sites, 1956¹

Cost item	Costs in Lower Manhattan Market	Estimated costs in a new market				
		Bronx Terminal	Hunt's Point	Jersey City (Meadows)	Long Island (Maspeth)	Modernized Lower Manhattan
From point of arrival to central market:	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars
Floating and switching cost and other pier costs to railroads.....	1,511	904	598	0	452	761
Cartage to market area.....	3,813	796	796	744	851	784
Avoidable delay to inbound trucks.....	702	0	0	0	0	0
Total.....	6,026	1,700	1,394	744	1,303	1,545
Within central market:						
Handling at auction or pier facilities.....	3,373	1,287	1,287	1,287	1,287	1,287
Handling at dealers' stores.....	2,998	2,279	2,279	2,279	2,279	2,279
Waste and deterioration.....	1,843	338	338	338	338	338
Rent ²	2,214	4,420	2,741	3,092	3,636	14,065
Total.....	10,428	8,324	6,645	6,996	7,540	17,969
From central market to metropolitan retail outlets:						
Cartage from central market ³	5,318	5,227	5,227	6,134	5,025	5,163
Avoidable delay to outbound trucks.....	2,121	0	0	0	0	0
Costs at food chain warehouses, other jobbing markets, and other wholesalers.....	5,454	5,454	5,454	5,454	5,454	5,454
Unloading at retail outlets.....	1,556	1,556	1,556	1,556	1,556	1,556
Total.....	14,449	12,237	12,237	13,144	12,035	12,173
Grand total.....	30,903	22,261	20,276	20,884	20,878	31,687

¹ For a more detailed breakdown of costs see Appendix A, page 99.

² Rental charges for auction facilities and multiple stores on a new market are based on rental charges needed if the construction is financed by a private corporation.

³ Includes charges for loading trucks of out-of-town buyers.

equipment these costs could be reduced at a new market at any of the 5 sites. No allowance was made for cost of installing modern handling equipment in this study.

Waste and Deterioration

At the Lower Manhattan Market waste and deterioration costs were about \$23 per carlot in 1956. Waste and deterioration at the Denargo Market were estimated at about \$4 per carlot. Three of the eight food chain warehouses sampled had data which agreed very closely with this figure, and in one large food chain warehouse the estimate was only \$3 per carlot. The fact that these costs have been held to \$4 or less in a number of modern facilities indicates that it also may be possible to keep these costs at this level in a modern terminal in New York City. It is estimated that total costs for waste and deterioration could be reduced by four-fifths in new facilities.

Rents

As explained previously, the rental cost data shown in table 11 are based on the rental values of buildings now occupied by the 200 independent fresh fruit and vegetable wholesalers or the equivalent rentals they would be paying if they did not own their facilities. The data also include the rents paid by the railroads for the use of the five rail piers and charges for protective services to incoming trucks parking on West Street. Charges for those who rent space away from the stores are also included. For the Lower Manhattan Market area total rents were estimated to be \$2,214,000 for 1956. Rental charges for new facilities are based on total revenue that would be needed to take care of operating expenses, debt service payments, and taxes (including reserve and contingency funds) if the market were constructed and financed by a private corporation.

Total revenue required (rents) in a new market would vary from \$2.7 million at the Hunt's Point

site to \$14.1 million at a modernized Lower Manhattan Market, if private financing methods were used.

Costs From Central Market to Retail Outlets

The location of the market with respect to the retailer is very important. Other things being equal, the market should be located so that the cost of getting the produce to the retailer is minimized.

In order to determine this cost, it was necessary to determine to what extent the flow in figures 22, 23, 24, and 25 would be altered in each of the situations.

Cartage Costs

Total costs of cartage from a central market to retail outlets range from \$6.1 million for produce distributed from a new market at the Jersey City (Meadows) site; to \$5.0 million at the Maspeth site (table 26).

Of the \$5.3 million cartage costs in 1956 at the present market, \$357,000 was for loading 20,200

carlots to trucks of out-of-town buyers. This cost is estimated to be \$202,000 at modern facilities at any of the 5 sites.

Avoidable Delay to Outbound Trucks

Cost of avoidable delays total about \$2.1 million per annum in the Lower Manhattan Market for trucks hauling produce out of the market, as shown in table 26. Cost of avoidable delay to outbound trucks would be completely eliminated on a new market which would provide wide streets, adequate unloading and loading space, etc.

Costs at Food Chain Warehouses, Other Jobbing Markets, Other Wholesalers, and Retail Stores

The costs in 1956 of approximately \$5.5 million for cartage and handling at food chain warehouses, at other jobbing markets in the city, and for wholesalers not located on the primary market would not be changed with the construction of a new central market. Neither would unloading costs at retail stores be changed since no changes in present facilities at these outlets are planned in this study.

Savings Resulting From Construction of a New Wholesale Market

A decrease in costs of distribution through increased marketing efficiency is the principal justification for proposing new wholesale market facilities for fresh fruits and vegetables. The first test that should be applied to any such proposal for a market is: Just how much would be saved by the construction of a new market? By subtracting costs for modern market facilities at each of the five sites from present costs a net saving results for four of the sites (table 27).

These measurable savings fall into two categories: (1) Savings that would result solely from a modern market layout and (2) savings that would result if the primary market moved to a location more suitable to efficient operation.

Measurable Savings

Savings Due to Modern Layout

In this category savings would result from reduction of cartage charges, avoidable delay to inbound and outbound trucks, handling costs within the market, and waste and deterioration.

From table 27, it is evident that most of the savings would accrue from having a good layout rather than from location of the market. For example, at Hunt's Point, if market facilities were built where rail receipts could be unloaded directly in one primary market area with wide streets and other efficient facilities, savings from

elimination of cartage charges alone would be approximately \$3 million. Also, spreading the market over an area wide enough to remove traffic congestion would result in savings in avoidable delay charges of \$702,000 to incoming trucks and \$2.1 million to outbound trucks. Handling costs at auction or pier facilities would approximate \$2.1 million less, and at dealers' stores \$719,000 less. Furthermore, the provision of modern facilities for expeditiously handling the fruits and vegetables within the market would make an estimated annual saving of \$1.5 million in deterioration and spoilage. Thus, the provision of a modern market efficiently designed and operated, without consideration of location, would yield an average annual saving of more than \$10 million.

Savings Due to Location

The location of a new market might increase or decrease the total savings that would result in the relocation. If the market were built in New Jersey, savings to railroads would be increased. On the other hand, if the market were built some distance from the center of distribution, cartage and other handling charges between the market and the retail outlets would be greater than from a market located nearer the center; or, if outbound trucks must travel through highly congested areas between the market and the retail outlet, cartage costs would be greater. Similarly, if the market

is built on high-priced land, total rental charges would be greater than if it were constructed on land obtained at a more reasonable price.

Thus, cartage costs from the Jersey City site would increase \$816,000 over present costs because of the longer distance to retail outlets, the congestion met in crossing Manhattan, and tunnel and bridge tolls. Hence, some of the savings within the market at the Jersey City site would be offset by higher costs of distribution from the market. However, savings of \$91,000 due to location would accrue at either the Bronx Terminal site or the Hunt's Point site and savings of \$155,000 would accrue at a modernized Lower Manhattan Market. The savings due to location would be largest at the Maspeth site, \$293,000, because of the proximity of the site to the center of distribution.

Total rental charges (for stores, auction facilities, and offices) would be greater for new facilities at any of the five sites, than the \$2.2 million paid for present outmoded facilities. It was estimated that the total revenue needed (rent) on a modernized Lower Manhattan Market would be far greater than on any other site—\$11.9 million greater than the rentals presently paid in the Lower Manhattan Market.

Savings for floating and switching cars to facilities on the new site or for pier costs, which are absorbed by the railroads, would vary on account

of distance to the new site from main railroad receiving yards, most of which are in New Jersey, and the difficulty in getting the produce to the new site. These savings would range from \$607,000 for a market at the Bronx Terminal site to \$1.5 million at the Jersey City site, since the necessity of floating would be eliminated entirely at this site.

There would be no appreciable savings in transportation and other costs from other wholesale markets to New York retail outlets or for unloading at metropolitan New York retail outlets, since these facilities would not change with the construction of a new market.

Total Net Savings Measured

Table 27 shows that annual measurable savings that might be expected to follow the construction of the recommended facilities in each of the suggested sites are as follows: Bronx Terminal Market about \$8.6 million, Hunt's Point, about \$10.6 million, Jersey City, about \$10.0 million and Long Island (Maspeth), \$10.0 million. Obviously, there would be no such savings in a modernized market on the Lower Manhattan area, because of the extremely high cost of land and its development. If the market were rebuilt and modernized on the Lower Manhattan Market site, estimated costs

TABLE 27.—Summary of potential annual savings resulting from the construction of a new market on 5 sites

Cost item	Estimated savings at a new market				
	Bronx Terminal	Hunt's Point	Jersey City (Meadows)	Long Island (Maspeth)	Modernized Lower Manhattan
From point of arrival to central market:					
Floating and switching, or pier costs, to railroads	1,000 dollars 607	1,000 dollars 913	1,000 dollars 1,511	1,000 dollars 1,059	1,000 dollars 750
Cartage to market area	3,017	3,017	3,069	2,962	3,029
Avoidable delay	702	702	702	702	702
Total	4,326	4,632	5,282	4,723	4,481
Within central market:					
Handling at auction or pier facilities	2,086	2,086	2,086	2,086	2,086
Handling at dealers' stores	719	719	719	719	719
Waste and deterioration	1,505	1,505	1,505	1,505	1,505
Rent ¹	-2,206	-527	-878	-1,422	-11,851
Total	2,104	3,783	3,432	2,888	-7,541
From central market to metropolitan retail outlets:					
Cartage from central market	91	91	-816	293	155
Avoidable delay to buyers' trucks	2,121	2,121	2,121	2,121	2,121
Costs at food chain warehouses, other jobbing markets, and other wholesalers	0	0	0	0	0
Unloading at retail outlets	0	0	0	0	0
Total	2,212	2,212	1,305	2,414	2,276
Grand total	8,642	10,627	10,019	10,025	-784

¹ Based on rental charges if the construction of facilities is financed by a private corporation.

would be greater by \$784,000 than those being paid on the present market.

As mentioned before, the wholesalers themselves would provide any special features that might be needed, such as refrigerated or temperature-controlled rooms, new handling equipment, and other equipment. Costs for the use of and amortization of such special features are not reflected in the estimated savings. A large part of the savings in the first years of operation could be used to pay for these special facilities.

Nonmeasurable Savings

Many other possible savings of a new wholesale fruit and vegetable market cannot be measured easily in dollars. They undoubtedly would be great, and would be shared by wholesalers, buyers, farmers, transportation agencies, market employees, consumers, and the City of New York.

Wholesalers

In addition to the specific savings enumerated previously, the individual wholesalers would find that in a new market it should be possible for them to operate their business in fewer hours each day. While products could be unloaded into their stores at any time of the day, with regulated selling hours which could be established in a unified market the sales period could be much shorter than it is at present. Also, merchants no longer would find it necessary to operate in two or more places.

Buyers

In a market of the kind proposed, retail grocers in the New York City metropolitan area and out-of-town buyers could obtain their fruits and vegetables more quickly and much more satisfactorily than at present. Moreover, there should be no traffic congestion to delay them in making purchases, loading trucks, and getting back to their stores. It should be possible to have definite hours of selling so that all buyers would know when to get to the market for the best selection of merchandise. Produce should be available in better condition than when it is hauled from one market area to another and displayed in poor facilities over a relatively long period as it is now. It has been reported that many out-of-town buyers no longer come to New York to obtain food products, or come for only a portion of their supplies, because of the time required for making their purchases under present conditions. It seems likely that with satisfactory market facilities purchases by out-of-town buyers would increase.

Growers

Growers would benefit in several ways from the construction of efficient wholesale market facilities in New York. Improvement in the operation of the price-making forces should affect the prices

not only of the volume which moves through New York but also of the large quantities they sell at other points on the basis of prices established by this primary market. The limited number of farmers who bring their products to New York in their own trucks could get to the wholesale stores promptly, unload, and return to their farms in less time than is now required. Finally, the elimination or reduction in costs of handling should tend to increase returns to growers shipping to this market.

Transportation Agencies

Railroads long have been at a disadvantage in not being able to place cars for unloading directly at the stores of the merchants. When shippers compare the cost of transporting their products from farm to market by rail and by truck, the cost of cartage from the railroad track to the store often makes the total transportation bill greater for rail shipments than for motortruck shipments. Furthermore, the extra handling involved in carting the products from railroads to stores increases the time required for shipping by rail. If the facilities suggested in the report were constructed, the railroads would be able to place their cars at the stores and thus be more competitive with trucks.

In addition to these savings, the report shows that if the market were located at Hunt's Point railroads would save an estimated \$900,000 annually in floating and switching and pier costs now being paid for their operations in Lower Manhattan. Another \$425,000 in rentals would be saved by the railroads if the market or auction companies paid the rentals for these facilities on the Hunt's Point site. Even if the railroads paid the rentals for new auction facilities on Hunt's Point, there would be a saving of \$84,000 annually from the \$509,000 now being paid to the City of New York for the Lower Manhattan pier terminals.

Truckers hauling products to and from the new market would benefit through the elimination of traffic congestion and the ready availability of parking areas.

Market Employees

Working conditions for persons employed in handling operations would be improved materially in a new market. Since the buildings are designed for efficient handling by proper equipment, the workers' job should be less arduous, their productivity should be increased, and over a period of time their hourly earnings might be expected to increase. Regular hours of work could be arranged, and large amounts of overtime or irregular employment should not be necessary. With the building of a completely new market, the general environment for work would be improved considerably, and many conveniences not now available could be provided.

Consumers

The consumers in and around New York would benefit as much from improved market facilities as any other group. They should be able to get perishable foods at their retail stores in better condition and at more reasonable prices than under present conditions. Given the opportunity, housewives would probably purchase more of those foods needed in the average family diet.

The City

The construction of a new wholesale fruit and vegetable market would benefit the City of New

York in several ways: (1) Such a market would bring an increased volume of business to the merchants operating in it. (2) The acute traffic problem in the present market areas would be solved. (3) The tax returns from the new market area and from new and more efficient use of the present market area would be greater than those received under present conditions. (4) The removal of the wholesale fruit and vegetable business from the present market areas would facilitate the redevelopment of those areas and many of the benefits, thereby, would accrue to the city. (5) The transfer of the wholesale fruit and vegetable business to modern facilities would assist the city in the enforcement of sanitary and fire regulations.

Conclusions and Recommendations

That a new and efficient wholesale market should be built to handle the distribution of fruits and vegetables now passing through the Lower Manhattan Market area at a very high cost and that the new market should be part of a wholesale food center handling all types of foods are supported by the findings of this report. However, since the report is restricted to the distribution of fresh fruits and vegetables, no data were obtained relative to needs of wholesalers of other food commodities. Experience in other cities has proved conclusively that benefits from a "one-stop" wholesale food distribution center at which a number of food commodities are handled outweigh the advantages when new and efficient facilities are built for only one commodity group. It is strongly recommended that the needs of the other food groups be assessed and taken into account in an overall plan for relocation. When the present wholesale facilities for fruits and vegetables at the Lower Manhattan Market are relocated, many other wholesalers also will be affected.

Needs of independent fruit and vegetable dealers indicate that the new and efficient facilities for handling 110,950 carlots would require a site of approximately 100 acres. If facilities for other foods were included, a much larger site would be needed. The layout for the fresh fruit and vegetable wholesalers should be designed so that additional facilities can be built as needed. It should provide direct rail and truck access to each store. It should contain its own parking facilities and rail yard facilities. The buildings should be one-story (with mezzanines), multiple-unit warehouses with covered platforms for refrigerator cars in the rear and for motortrucks in the front of each building. So far as possible the design of these buildings should be such that they can be modified with small expense to meet changes in future distribution patterns. *No facilities should be built that have not been previously leased to a responsible tenant for a rental*

that will be adequate to cover all costs. The needs for offices and other facilities for allied firms not needing store space should also be considered. Such offices could be located on a second floor of one or more of the store buildings centrally located within the market. Restaurants and public restrooms also should be provided, and the needs of the inspection and market news staff, banks, etc., should not be overlooked. Main market streets should be at least 150 feet wide (preferably wider) and provision should be made for a team track yard. A facility for the two auction companies should be provided.

A master plan for a complete fruit and vegetable wholesale market (and preferably for a food distribution center) should be adopted at the outset so that the first buildings to be constructed will not interfere with the development of the entire area and the first construction not increase the price of adjacent land that would be needed later.

The new market should be open to all forms of transportation; no restriction should be placed on a shipment at the market because of origin, except as required by quarantine regulations. Rail operation to and from the market should provide access to all major carriers either by reciprocal switching or other equitable arrangement.

Under present conditions it is possible for the new market to be built by a private corporation, the State of New York, or the City of New York.

The management should be empowered to protect the interests of consumer, dealer, and farmer. The benefits from such protection should be considerable. At present the lack of regulation of hours of selling and lack of timely information on supplies available for sale disorganize the markets and cause wide variations in prices. These conditions might be greatly improved. Proper management of the new market would

undoubtedly make prices more uniform throughout the market. As New York City price quotations are followed closely in many of the city markets this would have an important effect.

The U.S. Department of Agriculture will continue to assist the market sponsors, transportation agencies, food wholesalers, architects, engineers, and financial institutions to bring about the con-

struction and successful operation of a new market. It is hoped that through this work foods moving through this market may be handled more efficiently, that waste and deterioration will be reduced, that food dealers can improve their operations, that increased outlets for farm products may result, and that consumers may obtain better products at more reasonable prices.

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Appendix A

Determining Flow of Fresh Fruits and Vegetables Through New York City Markets¹⁵

The flow of fresh fruits and vegetables from the point of receipt to the retail outlet was determined by studying sales records of the various handlers of produce.

Records of the two fruit auction companies were examined and the actual sales by customer were recorded and classified for 1 week in March and 1 week in June 1956. The customers were classified by type of dealer and by location, such as food chains in Queens or retailers in Brooklyn. The percentages obtained for the two periods were similar, and these percentages were applied to the total volume handled by the auction companies.

¹⁵ Based on dissertation, "The Wholesale Produce Market in New York City—Its Relocation and Modernization To Reduce Marketing Costs," which Howard Nielson submitted to the Graduate School of Business of Stanford University for the degree of Doctor of Philosophy.

Twenty-two carlot receivers and commission merchants were selected according to a stratified sample in order to obtain an accurate distribution of the produce from Washington Street receivers. The sample was obtained in the following manner:

A complete listing of firms, together with their stated volume, was obtained from the Packer Publishing Company *Red Book* (17) and the Produce Reporter Company *Blue Book* (21). The firms were classified in three categories—those that were listed as receiving over 4,000 carloads a year in either publication; those listed as receiving over 2,000 carloads in either book, but less than 4,000 carloads in both books; and those listed in both books as receiving less than 2,000 carloads.

A sampling method known as "sampling-proportionate-to-size" was used to obtain the maximum information per dollar of expenditure. This method is described in detail in *Some Theory of Sampling* (7) and is used extensively by the

United States Bureau of the Census to obtain various estimates of industrial activity. In simple terms, it involves sampling the largest and most important segments more intensively than the smaller elements of the industry. In this instance, there were 8 firms in the first category, 18 firms in the second category, and 50 small firms.

The exact number to be selected from each

category depended on the unknown variation within each group multiplied by the total volume of each group. On the assumption that the variance in the small-volume group was half that of the large-volume group and that the variance in the medium-volume group was three-quarters of the large-volume group, the following sample was devised.

Group	Number of firms	Average volume (per list)	Total volume	Assumed variation	Volume times variation	Sample
Large firms-----	8	4,500	36,000	1.00	36,000	8
Medium firms-----	18	3,000	54,000	.75	40,500	9
Small firms-----	50	900	45,000	.50	22,500	5
Total listed-----	76	-----	135,000	-----	99,000	22

In each category the dealers selected were drawn at random. They were also drawn in sequence so that substitution was possible in the event that any of the firms were unable to cooperate. In only one instance was it not possible to use a firm originally selected in the sample.

The complete sales records of each company were tabulated for 4 uniformly spaced 1-week periods. The data were summarized and later classified by type of customer and location. All data were confined to 4 months of the year (March, June, September, and December) with the particular week in each month rotated among firms systematically as follows:

	First week	Second week	Third week	Fourth week
Large firms-----	2	2	2	2
Medium firms-----	2	2	3	2
Small firms-----	1	2	1	1

The 4 months selected totaled virtually one-third of the total receipts, and had the advantage of representing 4 uniformly spaced periods with special characteristics. March has heavy rail receipts and light truck receipts, June heavy rail and heavy truck receipts, September light rail and heavy truck receipts, and December light rail and light truck receipts.

The data on sales were in terms of packages. For each firm sales were recorded by commodity for sample days to obtain a "package per carload" conversion, which was used to combine the data by firms.

The final estimate of volume sold to each type of customer by location was obtained by adjusting the values obtained from each dealer in accordance with the number of dealers in each category. Thus, the carlots sold by the small dealer were multiplied by 10, the carlots sold by the medium dealers by 2, and the carlots sold by the large dealers by 1. The figures thus obtained were considered to be the estimate of volume for the market as a whole.

The data obtained for this sample had some limitations. For example certain cash sales were not available by customer or location. In some firms, this amounted to about 25 percent of their volume, but for the market as a whole, the sales which could not be classified totaled about 10 percent. Moreover most of the volumes recorded in the directories (17), (21), were too high. This limited the usefulness of the estimates rather less, however, than might be expected since such over-estimation was true of the market as a whole. In any case, the ranking of the firms by size was the best that could be done prior to obtaining actual volume data.

For the volume handled at markets other than Washington Street, it was necessary only to obtain the direct receipts. The sales by area were determined in much the same manner as for Lower Manhattan. Over 50 jobbers were used as a basis for determining the flow of produce to the retailers from the various markets outside the Lower Manhattan Market.

Receipts, Distribution, and Marketing Costs for Present and Proposed New Markets

Detailed cost comparisons are shown in tables 28, 30, and 32 for the present Lower Manhattan Market and for a new market located at each of five sites: (1) The Bronx Terminal site, (2) Hunt's Point, (3) Jersey City (Meadows), (4) Long Island (Maspeth), and (5) for modernized Lower Manhattan Market area. The new market is assumed to be on 100 acres of land and to have adequate facilities to handle the equivalent of 110,950 carlots of fresh fruits and vegetables, which was the quantity sold through the Lower Manhattan Market during 1956.

Distribution from the present Lower Manhattan Market to jobbers, food chain warehouses, re-

tailers in the various boroughs, and out-of-town buyers is based on information supplied Stanford Research Institute by dealers and handlers. Certain assumptions were made about the movement and distribution in markets on each of the five sites because of location and improved methods of handling.

In this analysis all costs from point of arrival until the products reach the retail outlets or trucks of out-of-town buyers are considered as costs of marketing in New York City without regard to who paid the charges. The costs are set up in three consecutive steps for comparison purposes: (1) Costs of moving the products from the *first point of arrival* to the central market area, (2) costs of handling *through the facilities* of the central market area, and (3) costs of transporting and handling *away from* the central market directly to retail outlets in the New York City metropolitan area or through other jobbing markets and food chain warehouses. These costs do not include the cost of the shipper in bringing the products to New York City.

Explanatory Notes of Items in Table 28¹⁶

1. The costs of floating rail cars across the river to Manhattan and the miscellaneous rail pier costs were estimated at \$41 per car for 30,198 cars. As stated earlier, these costs were based on information obtained from I.C.C. Investigation and Suspension Docket 5500 (31). In a new market located at any of the five proposed sites delivery to the rail piers would be eliminated and all deliveries made to team tracks or house tracks.

2. Costs for floating and switching to team tracks in the present Manhattan Market were estimated at \$55 per car for 4,949 cars. These cars are placed on team tracks in Manhattan and the floating and switching costs are absorbed by the railroads. In a new market located at four of the five sites the railroad floats would be moved to the new site and the cars placed at house tracks or team tracks at a reduced cost. If the market is located on the Jersey City site, however, no floating costs would accrue since the major delivery points of several major railroads are located nearby and deliveries could be made by an all-land route. Shipments for which floating and switching costs to team tracks and house tracks are assessed will increase at a modernized Lower Manhattan Market to 50,728 cars. If a new market were constructed at the Bronx Terminal Market, it is assumed that 30,117 cars would be moved to team and house tracks. If the market were built at Hunt's Point, 39,847 cars would be moved to team and house tracks, and 30,117 cars would be floated to Maspeth.

¹⁶ Paragraph numbers correspond to item numbers in table 28.

Table 29 shows calculations used by contractor in arriving at these estimates.

Average costs per car are estimates of floating and switching costs to the railroad for delivery to the team tracks at each of the sites. These estimates were furnished by officials of the railroads.

It is assumed that half of the produce presently received by rail and handled from New Jersey team tracks would be floated to the new sites in Lower Manhattan and Hunt's Point. None of it would be floated to New Jersey, of course. In addition, it is assumed that one-third of the Erie Railroad's present tonnage would be diverted to the New York Central System's lines to avoid the costs of floating and switching if the Bronx Terminal Market site is selected.

Produce arriving at the market site directly, without floating, includes the produce from the New York Central System which would come directly to Lower Manhattan, assuming that the new market would have float bridges and rail yards. For the Jersey City site, it is assumed that all of the Manhattan pier and team-track cars would come to New Jersey and that three-quarters of present unloads at New Jersey team tracks would be sold at the market. It is further assumed that half of the deliveries at other team tracks, such as Bronx and Long Island, would no longer go through the New Jersey market, but that these would be offset by increased receipts of produce that is now going to New Jersey jobbers.

For the two Bronx sites, it is assumed that most of the produce presently handled at outlying team tracks would go through directly to the central market. A larger amount would be expected to go through Hunt's Point because of the importance of the potato shipments via the New Haven lines. As mentioned previously, one-third of the produce shipped on the Erie railroad is assumed to arrive at Bronx Terminal via the New York Central System.

The carlots handled at New Jersey team tracks are those which were not assumed to arrive directly at the central market. Similarly, the amount of produce delivered at other team tracks is obtained by subtracting the amount assumed to come direct from the present volume handled at outlying team tracks.

4. The \$80 cost per carlot from boat piers to the auction is the rate computed by Stanford Research Institute from information supplied by dealers in the present Lower Manhattan Market area. This includes truck delay time because of congestion. The rates to each of the other markets are based on the present rate adjusted for distance and tunnel and ferry tolls.

5. It is assumed that the 1,100 carlots that are carted from West Street to the present auction at a cost of \$70 per carlot will move directly to the auction in a new market, and the cartage cost will

TABLE 28.—Costs of moving 110,950 carlots of fruits and vegetables from first point of arrival to Lower a new market

Item No.	Item	Present Lower Manhattan Market			Proposed sites		
					Bronx Terminal		
		Receipts	Average cost per car	Total cost	Receipts	Average cost per car	Total cost
	<i>Carlot equivalents</i>	<i>Dollars</i>	<i>1,000 dollars</i>	<i>Carlot equivalents</i>	<i>Dollars</i>	<i>1,000 dollars</i>	
1	Costs which were absorbed by railroads: ¹						
2	Floating to rail piers and miscellaneous pier costs	30,198	41	1,238	0	0	
	Floating and switching to team and house tracks	4,949	55	273	30,117	30	
3	Total or average	(35,147)	43	1,511	(30,117)	30	
	Cartage and delay costs:						
	Cartage:						
	To auction facilities:						
4	From boat piers	3,450	80	276	3,450	90	
5	From trucks on West Street	1,100	70	77	0	0	
6	Total or average	4,550	78	353	3,450	90	
	To dealers' stores:						
7	From railroad piers	748	85	64	0	0	
8	From boat piers	1,700	80	136	1,700	90	
9	From trucks on West Street	14,870	70	1,041	0	0	
10	From New Jersey team tracks	3,000	100	300	200	110	
11	From Manhattan team tracks	12,738	90	1,147	0	0	
12	From other team tracks	2,000	100	200	200	80	
13	From airports	44	100	4	44	100	
14	From Bronx farmers' market	200	100	20	0	0	
15	From auction facilities	(6,450)	85	548	(6,450)	45	
16	Total or average	35,300	98	3,460	2,144	229	
17	Total or average cartage	39,850	96	3,813	5,594	142	
18	Avoidable delay to inbound trucks	³ (26,000)	27	702	0	0	
19	Total or average cost for moving to the market	39,850	151	6,026	5,594	304	
	No cartage costs: ⁴						
	At auction facilities:						
20	Rail cars at piers	25,450	0	0	25,450	0	
21	Trucks from shipping points	2,100	0	0	3,200	0	
22	Total	27,550	0	0	28,650	0	
	At dealers' stores, trucks direct:						
23	From shipping points	26,000	0	0	41,070	0	
24	From house tracks	0	0	0	25,478	0	
25	Total	26,000	0	0	66,548	0	
	Direct sales: ⁵						
26	From railroad piers	4,000	0	0	0	0	
27	From boat piers	650	0	0	650	0	
28	From team tracks	8,900	0	0	5,508	0	
29	Rail car transfers to food chain warehouses	4,000	0	0	4,000	0	
30	Total	17,550	0	0	10,158	0	
31	Total volume, no cartage costs	71,100	0	0	105,356	0	
32	Grand total	110,950	54	6,026	110,950	15	

¹ Based on Interstate Commerce Commission Investigation and Suspension Docket No. 5500 (31).

² Not including 6,450 carlot equivalents carted from auction to dealers' stores.

³ Avoidable delay cost applies to those inbound trucks that unload directly at dealers' stores.

NOTE: Items in parentheses are not included in totals because they are part of other items.

Manhattan Market in 1956, and the estimates for moving the same volume from first point of arrival to at 5 proposed sites.

Proposed sites—Continued											
Hunt's Point			Jersey City (Meadows)			Long Island (Maspeth)			Modernized Lower Manhattan Market		
Receipts	Average cost per car	Total cost	Receipts	Average cost per car	Total cost	Receipts	Average cost per car	Total cost	Receipts	Average cost per car	Total cost
<i>Carlöt equivalents</i>	Dollars	1,000 dollars	<i>Carlöt equivalents</i>	Dollars	1,000 dollars	<i>Carlöt equivalents</i>	Dollars	1,000 dollars	<i>Carlöt equivalents</i>	Dollars	1,000 dollars
0	0	0	0	0	0	0	0	0	0	0	0
39,847	15	598	0	0	0	30,117	15	452	50,728	15	761
(39,847)	15	598	0	0	0	(30,117)	15	452	(50,728)	15	761
3,450	90	311	3,450	80	276	3,450	100	345	3,450	80	276
0	0	0	0	0	0	0	0	0	0	0	0
3,450	90	311	3,450	80	276	3,450	100	345	3,450	80	276
0	0	0	0	0	0	0	0	0	0	0	0
1,700	90	153	1,700	80	136	1,700	100	170	1,700	80	136
0	0	0	0	0	0	0	0	0	0	0	0
200	110	22	200	80	16	200	120	24	200	100	20
0	0	0	0	0	0	0	0	0	200	90	18
200	80	16	200	110	22	200	90	18	200	100	20
44	100	4	44	100	4	44	100	4	44	100	4
0	0	0	0	0	0	0	0	0	200	100	20
(6,450)	45	290	(6,450)	45	290	(6,450)	45	290	(6,450)	45	290
2,144	226	485	2,144	218	468	2,144	236	506	2,544	200	508
5,594	142	796	5,594	133	744	5,594	152	851	5,994	125	784
0	0	0	0	0	0	0	0	0	0	0	0
5,594	249	1,394	5,594	133	744	5,594	233	1,303	5,994	258	1,545
25,450	0	0	25,450	0	0	25,450	0	0	25,450	0	0
3,200	0	0	3,200	0	0	3,200	0	0	3,200	0	0
28,650	0	0	28,650	0	0	28,650	0	0	28,650	0	0
41,070	0	0	41,070	0	0	41,070	0	0	40,870	0	0
25,478	0	0	25,478	0	0	25,478	0	0	25,278	0	0
66,548	0	0	66,548	0	0	66,548	0	0	66,148	0	0
0	0	0	0	0	0	0	0	0	0	0	0
650	0	0	650	0	0	650	0	0	650	0	0
5,508	0	0	5,508	0	0	5,508	0	0	5,508	0	0
4,000	0	0	4,000	0	0	4,000	0	0	4,000	0	0
10,158	0	0	10,158	0	0	10,158	0	0	10,158	0	0
105,356	0	0	105,356	0	0	105,356	0	0	104,956	0	0
110,950	13	1,394	110,950	7	744	110,950	12	1,303	110,950	14	1,545

⁴ Obviously there were no cartage costs incurred for these receipts from first point of arrival to the facilities of the Lower Manhattan Market since the first point of arrival was in the market itself.

⁵ Receipts that move directly from railroad and boat piers or team tracks to retail outlets and do not pass through facilities of the Lower Manhattan Market.

TABLE 29.—*Rail receipts of fruits and vegetables floated to the present Lower Manhattan Market in 1956, and estimated rail receipts at team and house tracks for auction or for dealers at 4 proposed sites, by major shipping railroad*

Railroad	Present Lower Manhattan	Proposed sites			
		Bronx Terminal	Hunt's Point	Long Island (Maspeth)	Modernized Lower Manhattan
Erie.....	<i>Carlots</i> 13, 192	<i>Carlots</i> 9, 112	<i>Carlots</i> 15, 092	<i>Carlots</i> 9, 112	<i>Carlots</i> 14, 392
New York Central.....	1, 195	0	0	0	13, 941
Pennsylvania.....	14, 582	18, 005	21, 428	18, 005	15, 828
Baltimore and Ohio.....	2, 674	2, 918	3, 163	2, 918	3, 063
All other.....	3, 504	82	164	82	3, 504
Total.....	35, 147	30, 117	39, 847	30, 117	50, 728

be eliminated. The cartage cost of \$70 per carlot was computed from rates per package supplied by various dealers in the market.

7. It is assumed that the 748 carlots which were carted from the rail piers to the dealers' stores will be moved to the house tracks in the modern markets. The rate of \$85 per carlot is based on a per-package rate paid by the dealers for the various commodities, the number of packages per car, and the number of cars of each product carted to the stores. This charge will be eliminated at a new market.

8. It is assumed that the 1,700 cars upon which cartage was charged from boat piers to the dealers' stores in 1956 will not change at any of the five sites. The \$80 per car average is assumed to be equal to the present charge per car from boat piers to the auction facilities.

9. It is assumed that cartage charges to dealers' stores from trucks on West Street will be entirely eliminated, for facilities in a new market will be available for direct delivery to the stores.

10-12. The cartage costs from various team track yards to the wholesale stores were computed from information supplied by the dealers. The current cartage rates per package to the market, the number of packages per car, and the number of carlots of each specific commodity trucked to the stores, and the truck and driver time lost because of market congestion also entered into the calculations. A published schedule of cartage rates was not available at the time of the study.

The rates per carlot to modern market sites were corrected for distances and tunnel and ferry tolls. Much of the cartage from team tracks to the stores is eliminated in the modern markets since house tracks will be used.

It is assumed that all but 200 carlots of the 3,000 cars now being carted from the New Jersey team tracks will be moved directly to house tracks on the new market at any of the five sites. The 200 cars which will continue to be unloaded at the New Jersey team tracks and trucked to dealers'

stores will supply some of the demand of Lower Manhattan purveyors and small jobbers who are not expected to move to a new market. Moreover, it was assumed that all of the 12,738 carlots now being carted from Manhattan team tracks will be delivered directly to house tracks and the cartage cost of \$90 per carlot eliminated. It also was assumed that all but 200 carlots of the 2,000 carlots now being carted from other team tracks in Bronx, Brooklyn, etc., will be moved directly to house tracks on the new market. Most of the contents of the 200 cars remaining on other team tracks and carted to dealers' stores will be potatoes and other produce shipped from New England to the Port Morris team track yards of the New York Central System and the Harlem River yard of the New Haven Railroad.

13. The cartage cost from the various airports to the dealer stores was supplied by wholesalers. The rate to new markets was not corrected for distance because of the similar distances from the various airports to the present market and to the various market sites.

14. It is assumed that the 200 carlots carted from the farmers' market to the present dealer stores will not be moved to any of the modern markets except to the modernized Lower Manhattan Market site. Because of the locations of the present farmers' markets with respect to the Bronx Terminal, Hunt's Point, Jersey City, and Maspeth sites, it is assumed that the buyers would visit a new market for these products and the costs of second handling through wholesalers' stores could be eliminated. (See page 56.) The cartage cost of \$100 per carlot for this operation was calculated in the same way as the cartage rates of movement from the team tracks. (See items 10-12).

15. There were 6,450 carlots of various commodities carted from the auction to the stores in the present market and in the new markets it is assumed that this volume of movement would remain the same. The rate of \$85 per carlot for

cartage was obtained from various dealers. For a new market this rate was calculated to be \$45 per carlot because of a reduction in service charges and in pilferage costs.

17. It is assumed that the 39,850 carlots upon which cartage costs were made for delivery from boat piers, rail piers, trucks on West Street, team track yards, airports, the farmers' markets, auction facilities (to dealers' stores), to auction facilities or dealers' stores, will be decreased to 5,594 carlots (except at the modernized Lower Manhattan Market). The balance, or 34,256 carlots, would be spotted on house tracks or be trucked directly to dealers' store platforms, and no cartage charge would be assessed against them. If the Lower Manhattan Market were modernized, the present 39,850 carlots would be decreased to 5,994 carlots, since cartage would continue on 200 cars from the Manhattan team tracks and 200 carlots from the farmers' market in addition to the 5,594 cars mentioned above.

18. "Avoidable delay," the value of time lost because of congestion in the market, by trucks bringing products to the market was calculated by the contractor. There were two types of incoming trucks moving produce to the market: (1) Those which were over 33 feet in length and must park on West Street, and (2) those which could enter the market to deliver the produce at the wholesale store. The time spent in the market by trucks that unload at the store averaged about 4 hours. About 3 hours of this time is spent in moving through traffic and waiting for parking space at the store and could be avoided. Considering the cost per hour to operate the truck, the hourly wage rates for driver and helper, and the average size of load (about one-half carlot), a total cost of avoidable delay was calculated at \$27 per carlot for 26,000 carlots trucked direct to the stores. This cost could be eliminated in a modern market. However, the cost of avoidable delays for local cartage trucks that move produce from trucks parked on West Street and from other points of arrival to the auction and to the dealer stores is included in the cartage rates.

20. It is assumed that in a modern market the two auctions will receive 25,450 carlots by rail upon which no cartage will be charged. The cost of moving these cars to the auction is included in item 1.

21. It is assumed that direct truck receipts at the two auctions in a modern market will be increased to 3,200 carlots (item 5), or 1,100 more than the 2,100 carlots received at the present Washington Street Market.

23. Direct truck receipts at the stores will be increased to 41,070 cars at a modern market by direct delivery to dealers' stores of trucks now unloading on West Street.

24. It is assumed that receipts at dealers' stores from house tracks will be 25,478 carlots at a modern market (except at a modernized Lower Man-

hattan Market where receipts will be 25,278 carlots). House tracks are not available in the present market but in the modern markets it is assumed that most of the commodities which are carted from team tracks and are sold direct from team tracks, or sold direct from the present rail piers, will be handled from house tracks on a new market.

26. The 4,000 carlots now sold privately at the piers would be handled on the house tracks in a new market.

27. The 650 carlots presently sold privately at the boat piers would not be affected by the construction of a modern market.

28. It is assumed that the number of carlots now sold direct from team tracks would be decreased since the modern markets will operate with house tracks. Based on operations of modern markets in other cities, it is assumed that only from 15 to 20 percent of rail receipts by wholesale dealers will be sold direct from team tracks.

29. The transfer of 4,000 carlots to food chain warehouses would not be affected by changing the present market operations.

31. The total number of cars upon which no cartage would be charged would be increased from 71,100 cars to 105,356 at a new market on 4 of the 5 sites. At the modernized Lower Manhattan Market no cartage would be charged against 104,956 carlots since cartage would be charged on an additional 400 cars, as explained under item 17.

Explanatory Notes by Items in Table 30¹⁷

33. The cost of unloading rail cars at the piers in the present market was based on data supplied by the Interstate Commerce Commission (31), the weighted average of unloading costs being \$55 per carlot. For a modern market the average cost for unloading at the auction was figured at \$28 per carlot based on data furnished by dealers operating in three modern markets and eight food chain warehouses in New York and three other cities. It is assumed that the number of cars unloaded, sorted, and stacked on auction floors at the new facilities will be the same as is now unloaded, sorted, and stacked for auction sale on piers 27, 28, and 29.

34. It is assumed that the amount of produce arriving at auction from boat piers will remain the same at a new market at any of the five sites. The rate per carlot for unloading at auction was based upon the time required to unload a truck, the wage rates for labor needed, the number of packages per truckload, and the number of truckloads per carlot equivalent. This cost of unloading should not change at any of the five sites.

¹⁷ Paragraph numbers correspond to item numbers in table 30.

TABLE 30.—Costs of moving 110,950 carlot equivalents of fruits and vegetables through the facilities of the produce market at

Item No.	Item	Present Lower Manhattan Market			Proposed sites		
					Bronx Terminal		
		Receipts	Average cost per car	Total cost	Receipts	Average cost per car	Total cost
	At rail piers:	<i>Carlot equivalents</i>		<i>1,000 dollars</i>	<i>Carlot equivalents</i>		<i>1,000 dollars</i>
	Handling costs for sales at auction facilities:		<i>Dollars</i>		<i>Dollars</i>		
33	Unloading rail cars, sorting and stacking on pier floors ¹	25,450	55	1,400	25,450	28	713
34	Unloading trucks from boat piers on railroad pier floors.....	3,450	13	44	3,450	13	44
35	Unloading and loading-out of truck receipts direct from shipping point.....	2,100	25	53	3,200	25	81
36	Unloading and loading-out of truck receipts from West Street.....	1,100	25	28	0	0	0
	Total or average.....	32,100	48	1,525	32,100	26	838
	Handling costs for other sales:						
38	Unloading rail cars for sale to Washington Street dealers.....	(748)	55	41	0	0	0
39	Unloading rail cars for private sales.....	4,000	55	220	0	0	0
40	Total.....	4,000		261	0	0	0
41	Service and loading charges.....	² (26,450)	60	1,587	(22,450)	20	449
	Total or average at rail piers.....	36,100	93	3,373	32,100	40	1,287
	At dealer stores:						
	Unloading inbound trucks:						
42	From auction.....	(6,450)	13	82	(6,450)	10	65
43	Other receipts.....	61,300	13	779	68,692	10	686
44	Loading out to buyer trucks.....	(67,750)	17	1,199	(75,142)	10	751
45	Handling within stores.....	(20,680)	23	474	(75,142)	7	526
46	Intramarket transfers between dealer stores.....	(12,400)	37	464	(9,300)	27	251
	Total or average at dealer stores.....	61,300	49	2,998	68,692	33	2,279
	Total or average at rail piers and dealer stores.....	97,400	65	6,371	100,792	35	3,566
	No handling or other costs for moving through the market:						
47	Direct sales from boat piers.....	650	0	0	650	0	0
48	Sales from team tracks.....	8,900	0	0	5,508	0	0
49	Rail car transfers to food chain warehouses.....	4,000	0	0	4,000	0	0
50	Total.....	13,550	0	0	10,158	0	0
	Other costs:						
51	Waste and deterioration ³	(80,150)	23	1,843	(84,442)	4	338
52	Rentals.....	(110,950)	20	2,214	(110,950)	40	4,420
53	Grand total.....	110,950	94	10,428	110,950	75	8,324

¹ Based on Interstate Commerce Commission Investigation and Suspension Docket No. 5500 (31).

² This total (26,450 carlot equivalents) includes sales at auction (32,100 carlots) plus private sales at the piers

(4,000 carlots) less auction sales received by truck (3,200 carlots) and auction sales hauled to Washington Street Stores (6,450 carlots).

Lower Manhattan Market in 1956, and estimates for moving the same volume through the facilities of a new 5 proposed sites

Proposed sites—Continued											
Hunt's Point			Jersey City (Meadows)			Long Island (Maspeth)			Modernized Lower Manhattan Market		
Receipts	Average cost per car	Total cost	Receipts	Average cost per car	Total cost	Receipts	Average cost per car	Total cost	Receipts	Average cost per car	Total cost
<i>Carlot equivalents</i> 25, 450	<i>Dollars</i> 28	<i>1,000 dollars</i> 713	<i>Carlot equivalents</i> 25, 450	<i>Dollars</i> 28	<i>1,000 dollars</i> 713	<i>Carlot equivalents</i> 25, 450	<i>Dollars</i> 28	<i>1,000 dollars</i> 713	<i>Carlot equivalents</i> 25, 450	<i>Dollars</i> 28	<i>1,000 dollars</i> 713
3, 450	13	44	3, 450	13	44	3, 450	13	44	3, 450	13	44
3, 200	25	81	3, 200	25	81	3, 200	25	81	3, 200	25	81
0	0	0	0	0	0	0	0	0	0	0	0
32, 100	26	838	32, 100	26	838	32, 100	26	838	32, 100	26	838
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
(22, 450)	20	449	(22, 450)	20	449	(22, 450)	20	449	(22, 450)	20	449
32, 100	40	1, 287	32, 100	40	1, 287	32, 100	40	1, 287	32, 100	40	1, 287
(6, 450)	10	65	(6, 450)	10	65	(6, 450)	10	65	(6, 450)	10	65
68, 692	10	686	68, 692	10	686	68, 692	10	686	68, 692	10	686
(75, 142)	10	751	(75, 142)	10	751	(75, 142)	10	751	(75, 142)	10	751
(75, 142)	7	526	(75, 142)	7	526	(75, 142)	7	526	(75, 142)	7	526
(9, 300)	27	251	(9, 300)	27	251	(9, 300)	27	251	(9, 300)	27	251
68, 692	33	2, 279	68, 692	33	2, 279	68, 692	33	2, 279	68, 692	33	2, 279
100, 792	35	3, 566	100, 792	35	3, 566	100, 792	35	3, 566	100, 792	35	3, 566
650	0	0	650	0	0	650	0	0	650	0	0
5, 508	0	0	5, 508	0	0	5, 508	0	0	5, 508	0	0
4, 000	0	0	4, 000	0	0	4, 000	0	0	4, 000	0	0
10, 158	0	0	10, 158	0	0	10, 158	0	0	10, 158	0	0
(84, 442)	4	338	(84, 442)	4	338	(84, 442)	4	338	(84, 442)	4	338
(110, 950)	25	2, 741	(110, 950)	28	3, 092	(110, 950)	33	3, 636	(110, 950)	127	14, 065
110, 950	60	6, 645	110, 950	63	6, 996	110, 950	68	7, 540	110, 950	162	17, 969

³ Based on average wholesale value of \$2,100 per car (25).

NOTE: Items in parentheses are not included in totals because they are part of other items.

35. Trucks that arrive from producing areas for auction sale are usually unloaded in auction warehouse facilities adjacent to the railroad piers. The unloading cost for this operation was calculated in the same manner as for item 34. The rate per carlot for unloading was estimated to be the same as for loading onto buyers' trucks (\$12.70), or \$25.40 per carlot for unloading and loading out. It is assumed that this cost of operation would not be changed in a modern market.

36. Trucks that move the products from West Street to auction facilities unloaded at the same facilities as trucks from producing areas. Thus, costs for unloading and loading out were the same as for other trucks, or \$25 per carlot. In the new market this operation will be discontinued, and the amount of produce moving to the auction direct from producing areas will be increased by the 1,100 carlots moved from West Street.

38-39. It is assumed that the 748 carlots transferred to dealer stores, and the 4,000 carlots that were sold privately at the railroad piers will be handled on house tracks in the modern markets. Thus the \$261,000 for unloading at the rail piers is eliminated.

41. There is a service and loading charge included in the handling operations on the present pier facilities of \$60 per carlot. This charge is reportedly for protecting the merchandise against pilferage and for loading the buyers' trucks. This charge was made on 26,450 carlots, which included sales at auction (32,100 carlots) plus private sales at piers (4,000) less auction sales received by truck (3,200) and auction sales carted to the dealers' stores (6,450). For a new market on each of the five sites the service and loading charge was figured at \$20 per carlot for 22,450 cars, of which only a portion would be unloaded at the auction. It was assumed that \$40 of the \$60 charge was for protection from pilferage, and with a new market pilferage losses could be reduced considerably. Also, selling by sample display will reduce much of the labor cost. The 4,000 carlots of private sales at the railroad piers on which a service charge is presently made will be handled on house tracks at a new market; thus, the number of carlots on which the service and loading charge is assessed will be reduced from 26,450 to 22,450 carlots.

42-44. The cost of unloading trucks at the dealers' stores was computed by the contractor from information supplied by various wholesalers and jobbers in the market; information was made available by these operators for estimating an average cost per carlot to unload the products, handle them through the stores, set up displays in the stores or on the sidewalks, and move the produce to the buyers' trucks.

Additional information relating to the man-hours required for unloading and loading operations, the average number of packages unloaded and loaded per hour, the wage rates, and the number of packages per carlot was obtained by

the U.S. Department of Agriculture by using time and motion studies and by observing the operations during a typical marketing period. Information also was supplied to the Department's survey team by drivers of the trucks delivering produce to the market, as well as by the buyers coming to the market to pick up the products. From this information a cost of \$13 per carlot was computed for the unloading operation and \$17 for loading the buyers' trucks. In a new market, the unloading and loading costs were estimated at \$10 for each operation by the contractor from cost information obtained by him from dealers in three modern markets in other cities and eight modern food chain warehouses, based on a composite cost of unloading produce at Denargo, San Antonio, and Columbia Markets. (See Appendix C.) Adjustments were made for the New York City wage rates, fringe benefits, overtime payments, use of handling equipment, and other improved methods of operations.

45. Of the total receipts unloaded at the wholesale stores only 20,680 carlots were physically moved into the stores and later loaded out to buyers' trucks. Other receipts were sold from the sidewalks or sold direct from the incoming trucks. In a modern market it is assumed that all the receipts will be unloaded into the store or onto the front platforms, which are considered a part of the store. The handling costs in these modern stores were calculated from cost data obtained from modern markets in other cities, and amounted to \$7 per carlot.

Costs of handling merchandise within the dealers' stores in the Washington Street Market were about \$23 per carlot. The eight modern food chain warehouses investigated by Stanford Research Institute had higher costs because of extensive handling into and out of refrigerated storage. Also there is considerable assembling of orders within the establishment. However, produce tends to be kept in one place within the dealers' stores in New York City with a minimum of restacking and shifting of produce. In general, dealers sold their supply of produce on the first day after its arrival, and there was little carryover of merchandise from one day to another. There was, thus, very little movement of produce into storage at the close of the day. In a new market mechanical equipment and improved facilities will make such movement of produce as does occur more efficient, but improved refrigerated storage may increase the amount of carryover each day.

46. The transfer of produce from one dealer to another within the present market amounted to 12,400 carlots in 1956. Much selling to the second handler is done before the products are unloaded at the first handler's store. The sale is made and the truck is unloaded at the second handler's store, and thus the cost of unloading and reloading at the original consignee's facility is eliminated.

There were 9,300 carlots that were unloaded at the stores and later sold to other dealers in the market. These fruits and vegetables were reloaded onto trucks, moved to a second store, and unloaded. About 4,100 of these carlots moved into and out of the first store, and all 12,400 carlots were loaded onto other trucks going out of the market. The cost of \$37 per carlot for this second handling operation was computed as shown in table 31.

TABLE 31.—Receipts of fruits and vegetables transferred between dealers in present market, average cost per car, and total cost by various handling operations

Cost items	Carlots	Average cost	Total cost
		per car	
	Number	Dollars	Dollars
Loading trucks at first store... ¹	(9,300)	13	118, 110
Transporting between stores... ²	(9,300)	10	94, 157
Unloading at second store...---	12,400	13	157, 480
Handling within second store... ³	(4,100)	23	94, 013
Total or average.....	12,400	37	463, 760

¹ About $\frac{3}{4}$ of the products are unloaded from trucks at the first store before being sold to the second buyer. They are then loaded onto other trucks for transporting to the next unloading point. The cost of this loading of \$13 per carlot is much less than for loading other buyers' trucks in that the buyer is a wholesaler who picks up the commodities usually when there is little traffic congestion and the truck can be parked at the store, thus eliminating much of the cost of carrying the packages a block or more to the truck.

² The cost per carlot for transporting the produce between stores is based on the cost per hour for the operation of the truck, including the driver, and the time required to make the round trip. The transporting cost for the volume that is not unloaded at the first store but sold while on the truck is part of the cartage cost for moving the goods to the market and does not constitute an additional cost under this category.

³ The cost of \$23 per carlot for handling within the stores applies to only $\frac{1}{2}$ of the quantity that moves between stores.

In new facilities at any of the five sites the carlot receivers will tend to sell a greater quantity of products to out-of-market buyers and less to jobbers and other handlers in the market. The volume that is handled a second time is expected to decrease to about three-fourths of the present amount, or to 9,300 carlots. The costs for these operations were estimated to be: Loading \$10, unloading \$10, transporting \$3, handling through the store \$7, or a weighted average of \$27 per carlot for the amounts so handled.

47-49. There was no handling or other cost for direct sales from boat piers or team tracks. The charges on rail car transfers to food chain warehouses were not included here.

47. The 650 carlots presently sold privately at boat piers would not be affected by the construc-

tion of a modern market and no charges would be assessed.

48. The 8,900 carlots that are sold direct from team tracks are expected to decrease to 5,508 carlots because it is expected that house tracks in a new market would handle 3,392 carlots of this amount.

49. The same number of carlots as in 1956 (4,000) will probably continue to be transferred to food chain warehouses.

51. Estimates of the quantity of produce lost through spoilage and deterioration because of inadequate facilities and handling methods were furnished to the contractor by the various dealers on the market, by refuse collectors, and through observation by persons making the marketing study.

Because of the congestion, inadequate facilities, exposure to the elements, delay, excessive jolting and handling on handtrucks along the streets, and extra cartage in the present market, there is considerable waste or spoilage that could be avoided. This loss is estimated at 1.1 percent of the volume handled through the Washington Street Market and amounts to \$23 per carlot.

52. The amount of rent paid by the wholesale dealers in the present market includes rent paid by the railroad for use of the piers and rent for office space in separate office buildings used by brokers and certain wholesale dealers, rentals for store space used, and by truckers using West Street.

The total annual rent for a market at each of the five sites is based upon the estimated total revenue required to amortize the cost of construction, pay real estate taxes, and pay operating expenses.

Explanatory Notes by Items in Table 32¹⁸

54-62. The average cost of carting fresh fruits and vegetables from the present market to food chain warehouses, other jobbing markets and wholesale dealers, and retail outlets in New York City and in other parts of the metropolitan area was obtained by the U.S. Department of Agriculture's survey team. Information on 1956 cartage rates was obtained from cartage companies, from conversations with various buyers, and from individuals that rent trucks and haul the products for various buyers. Truckers provided hourly data for operating the average size of truck for this purpose, together with the wage rates for the driver and helper in some instances. It was found that the average load moving by motortruck from the market area was equivalent to one-third carlot. Only about 1 percent of the products moved out in small loads of 50 packages or less. The time required to drive the round trip from the market to the various central retail points in the metro-

¹⁸ Paragraph numbers correspond to item numbers in table 32.

TABLE. 32—Costs of moving 110,950 carlots of fruits and vegetables away from the Lower Manhattan Market

Item No.	Cost item	Present Lower Manhattan Market			Proposed sites		
		Volume	Average cost per car	Total cost	Bronx Terminal		
					Volume	Average cost per car	Total cost
		Carlots equivalents	Dollars	1,000 dollars	Carlots equivalents	Dollars	1,000 dollars
	Cartage and rail diversion from Lower Manhattan to:						
	Food chain warehouses in metropolitan area:						
54	Rail car transfers from team tracks.....	2,000	¹ 19	38	2,000	19	38
55	Rail car diversion from holding tracks.....	2,000	0	0	2,000	0	0
56	Cartage from auction.....	2,250	63	142	2,250	63	142
57	Cartage from Washington Street stores.....	3,150	63	198	3,150	63	198
58	Total or average.....	9,400	40	378	9,400	40	378
	Other jobbers and wholesalers in metropolitan area:						
59	From auction.....	15,000	56	840	15,000	57	850
60	From Washington Street stores.....	42,750	56	2,394	42,750	57	2,423
	Total or average.....	57,750	56	3,234	57,750	57	3,273
	Retail outlets in metropolitan area:						
61	New York City outlets.....	17,650	52	922	17,650	54	947
62	Other metropolitan outlets.....	5,950	72	427	5,950	72	427
	Total or average.....	23,600	57	1,349	23,600	58	1,374
63	Outlets outside metropolitan New York (truck loading only).....	20,200	18	357	20,200	10	202
	Total or average.....	110,950	48	5,318	110,950	47	5,227
	Avoidable delay incurred by trucks going to metropolitan outlets:						
64	From auction facilities.....	25,650	22	558	0	0	0
65	From railroad piers, direct sales.....	4,000	22	87	0	0	0
66	From Washington Street stores.....	67,750	22	1,476	0	0	0
67	Total or average.....	(97,400)	22	2,121	0	0	0
68	Total or average (items 54-67).....	110,950	67	7,439	110,950	47	5,227
	Other costs:						
	At food chain warehouses:						
69	Handling within facilities.....	(9,400)	44	416	(9,400)	44	416
70	Cartage to metropolitan retail outlets.....	8,490	59	498	8,490	59	498
71	Loading trucks to outlets outside metropolitan New York.....	910	11	10	910	11	10
72	Total or average.....	(9,400)		924	(9,400)		924
	At other jobbers and wholesalers:						
73	Handling within facilities.....	(57,750)	31	1,773	(57,750)	31	1,773
74	Cartage to metropolitan retail outlets.....	57,320	48	2,752	57,320	48	2,752
75	Loading trucks to outlets outside metropolitan New York.....	430	12	5	430	12	5
76	Total or average.....	(57,750)		4,530	(57,750)		4,530
	At retail outlets in metropolitan area:						
77	Unloading, New York City.....	61,460	17	1,070	61,460	17	1,070
78	Unloading, other locations.....	27,950	17	486	27,950	17	486
79	Total or average.....	(89,410)	17	1,556	89,410	17	1,556
80	Grand total.....	110,950	130	14,449	110,950	110	12,237

¹ Charge by railroad for reconsignment from team track yards to final destination.

NOTE: Items in parentheses are not included in totals because they are part of other items.

in 1956, and estimates for moving the same volume away from a new produce market at 5 proposed sites

Proposed sites—Continued

Hunt's Point			Jersey City (Meadows)			Long Island (Maspeth)			Modernized Lower Manhattan Market		
Volume	Average cost per car	Total cost	Volume	Average cost per car	Total cost	Volume	Average cost per car	Total cost	Volume	Average cost per car	Total cost
<i>Carlot equivalents</i>	<i>Dollars</i>	<i>1,000 dollars</i>	<i>Carlot equivalents</i>	<i>Dollars</i>	<i>1,000 dollars</i>	<i>Carlot equivalents</i>	<i>Dollars</i>	<i>1,000 dollars</i>	<i>Carlot equivalents</i>	<i>Dollars</i>	<i>1,000 dollars</i>
2,000	19	38	2,000	19	38	2,000	19	38	2,000	19	38
2,000	0	0	2,000	0	0	2,000	0	0	2,000	0	0
2,250	63	142	2,250	63	142	2,250	63	142	2,250	63	142
3,150	63	198	3,150	63	198	3,150	63	198	3,150	63	198
9,400	40	378	9,400	40	378	9,400	40	378	9,400	40	378
15,000	57	850	15,000	66	995	15,000	59	825	15,000	56	840
42,750	57	2,423	42,750	66	2,837	42,750	59	2,351	42,750	56	2,394
57,750	57	3,273	57,750	66	3,832	57,750	59	3,176	57,750	56	3,234
17,650	54	947	17,650	73	1,297	17,650	50	882	17,650	52	922
5,950	72	427	5,950	71	425	5,950	66	387	5,950	72	427
23,600	58	1,374	23,600	73	1,722	23,600	55	1,269	23,600	57	1,349
20,200	10	202	20,200	10	202	20,200	10	202	20,200	10	202
110,950	47	5,227	110,950	55	6,134	110,950	45	5,025	110,950	47	5,163
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
110,950	47	5,227	110,950	55	6,134	110,950	45	5,025	110,950	47	5,163
(9,400)	44	416	(9,400)	44	416	(9,400)	44	416	(9,400)	44	416
8,490	59	498	8,490	59	498	8,490	59	498	8,490	59	498
910	11	10	910	11	10	910	11	10	910	11	10
(9,400)	-----	924	(9,400)	-----	924	(9,400)	-----	924	(9,400)	-----	924
(57,750)	31	1,773	(57,750)	31	1,773	(57,750)	31	1,773	(57,750)	31	1,773
57,320	48	2,752	57,320	48	2,752	57,320	48	2,752	57,320	48	2,752
430	12	5	430	12	5	430	12	5	430	12	5
(57,750)	-----	4,530	(57,750)	-----	4,530	(57,750)	-----	4,530	(57,750)	-----	4,530
61,460	17	1,070	61,460	17	1,070	61,460	17	1,070	61,460	17	1,070
27,950	17	486	27,950	17	486	27,950	17	486	27,950	17	486
(89,410)	17	1,556	(89,410)	17	1,556	(89,410)	17	1,556	(89,410)	17	1,556
110,950	110	12,237	110,950	118	13,144	110,950	108	12,035	110,950	110	12,173

politan area and to the other wholesale and jobber markets during a typical period was measured by the survey group. Only about 20 percent of the total cost of cartage was for the time required to drive the round trip from the market to the retail outlet.

By using this information, together with the cost of tunnel and ferry tolls, where applicable, the cartage cost per carlot to each destination was computed.

Avoidable delay time incurred by buyers' trucks did not enter into these cartage rates because they were calculated separately and are included in items 64-66.

It is likely that average cartage costs for outbound trucks from the Jersey City site to the retail outlets in the metropolitan area would increase because of the additional distance in crossing Manhattan from the market to the retail stores and because of tunnel tolls that must be paid.

It is assumed that Manhattan retailers will purchase from a central market the quantities purchased at present from the Lower Manhattan Market if the central market is located at the Bronx Terminal site or the Hunt's Point (East Bronx) site. All customers in Bronx and Queens now being served by the Lower Manhattan Market and the Bronx Terminal Market, as well as most of the Brooklyn and New Jersey customers, could be served by either location. In addition, it is expected that many of Westchester County's retailers could be served by the new terminal if it were in the Bronx.

Total costs of cartage from a central market to retail outlets were estimated as approximately \$6.1 million for produce distributed from a new market at the Jersey City Meadows site; about \$5.2 million for a market at the Bronx Terminal or at the Hunt's Point sites, and about \$5.0 million at the Maspeth site. Cartage costs from the present facilities in Lower Manhattan in 1956 were estimated to be about \$5.3 million and avoidable delay cost to outbound trucks to be \$2.1 million, or a total of \$7.4 million.

54. The cost of transferring 2,000 carlots of fruits and vegetables from team tracks to food chain warehouses amounted to \$19 per carlot, according to the wholesale dealers who had sold to the food chains. It is assumed that the same amount and at the same cost would be handled in a modern market.

55. It is assumed that the 2,000 carlots that are diverted from holding tracks to food chain warehouses in the present market would not differ in amount in a modern market because no change is planned in the operation of food chain warehouses.

63. The costs for transporting products outside the New York City area are not considered in this analysis. Labor costs for loading the produce into such outbound trucks is a part of the market operations, and these rates amount to \$18 per car-

lot in the present market. It is assumed that the use of more efficient facilities, with platform level with truckbeds, will reduce the cost to \$10 in a new market.

64-66. The cost of avoidable delay time to outbound trucks amounted to \$22 per carlot. Avoidable delay time is the time spent by the truck driver trying to move through the traffic congestion and waiting for parking space near the stores. This cost to the outbound trucks was figured in the same way that delay cost was computed for trucks delivering to the market, as discussed under item 18. Allowances were made for differences in costs for truck operation and drivers' wages. It is expected that this cost will be eliminated in a modern market.

69. The handling costs in food chain warehouses were figured in a manner similar to that used in the present Lower Manhattan Market. (See items 42-45.)

The costs of handling within the warehouses were found to be greater than the present cost of handling by independent dealers in Lower Manhattan Market and in modern markets (see item 73). Many of the food chain warehouses move produce into the warehouse in large volumes. Assembling and moving orders to truck docks require more labor than the faster movement at the carlot receivers' wholesale stores. No change in these facilities is planned and the cost of operation would remain the same.

70. Cartage costs from food chain warehouses to metropolitan retail outlets were computed from information obtained from several warehouse managers and dispatch men who worked with the cost records. The cartage rate of \$59 per carlot is an average paid by food chain warehouses in the metropolitan area. However, no change in these facilities is planned and costs would remain the same as at present.

71. The rate of \$11 per carlot for loading at food chain warehouses trucks that move to areas outside metropolitan New York is the average rate paid by the eight food chain warehouses visited by the contractor during the market study (Appendix C). No change is planned in these facilities and, therefore, the cost is assumed to be the same as at present in all five sites.

73. In the other wholesale and jobber markets the handling costs amounted to \$31 per carlot. This higher cost is attributed largely to the repacking and sorting operations of the restaurant and hotel suppliers and extra labor required by jobbers that "break" packages and sell small lots to meet the needs of small retailers and hucksters. No change is planned in these facilities and, therefore, the charge remains the same in all five sites.

74. The cartage rate of \$48 per carlot for moving produce from other jobbing markets and wholesale dealers to retail outlets in metropolitan New York was obtained from visits to these job-

bers and wholesale dealers. No change is planned in these facilities and, therefore, the charge remains the same in all five sites.

75. The loading cost for produce moving outside New York City is the average of such costs furnished by several wholesalers and jobbers in the secondary wholesale markets. No change is planned in these operations, therefore, the charge remains the same as at present for all five sites.

79-80. The average cost of unloading at retail points in metropolitan New York was \$17 per car-

lot. This was figured from information obtained by observation and from interviewing many of the buyers. The average number of packages unloaded at each stop, the man-hours required to unload the packages, the standing time for the truck while unloading, and the wage cost of the labor to unload entered into the computation. The waiting time, or set-up time, at the retail points was not considered in this operation. No change is planned in these operations on any of the five sites.

Appendix B

Costs of Constructing Additional Market Facilities for the Bronx Terminal Market at Hunt's Point Site

Dealers' facilities:

25 multiple-store units in 1 building @ \$25,000 per unit (without piling)	71,875
sq. ft. (including mezzanines) @ \$8.70	\$625,000
Piling (50 ft.) 62,500 sq. ft. @ \$1.80	112,500
Rails—house tracks 1,250 ft. @ \$10	12,500
Blacktop paving, 15,000 sq. yds. @ \$4	60,000
Sewers:	
Storm, 15 in., 550 ft. @ \$3.50	1,925
Sanitary, 12 in., 675 ft. @ \$2.25	1,520
8 floodlights @ \$150	1,200

Construction cost of 25 additional wholesale store units	814,645
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Farmers' facilities:

Farmers sheds:

200 spaces, 10 ft. x 20 ft.=40,000 sq. ft. @ \$3.50	140,000
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Farmers' facilities—Continued

Blacktop paving, 23,800 sq. yds. @ \$4	\$115,200
Sewers: Storm, 15 in., 2,400 ft. @ \$3.50	8,400
10 floodlights @ \$150	1,500

Cost of constructing farmers' facilities	265,100
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Total cost of constructing needed facilities	1,079,745
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Other costs:

Architect's and engineer's fees @ 6% ¹	64,785
Construction loan @ 5%, 1 yr. ²	57,227
Contingency, 10% ³	120,176

Other costs	242,188
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Total cost of facilities	1,321,933
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¹ 6 percent of total cost of constructing facilities.

² 5 percent of cost of constructing facilities plus architect's and engineer's fees.

³ 10 percent of cost of constructing facilities plus architect's and engineer's fees and construction loan.

Appendix C

Facilities and Costs of Handling Produce in Modern Markets and Food Chain Warehouses

Costs of handling produce in a modern facility, including 16 wholesale dealers in 3 produce markets and 8 food chain warehouses, were studied in October and November 1956 by representatives of the Stanford Research Institute with assistance by the U.S. Department of Agriculture. The 16 firms selected for sampling had both loading and unloading platforms at refrigerated rail-car floor and truckbed height, which provided direct unloading from rail cars and loading of trucks. The markets all had wide pavements and ample parking space so that traffic congestion was at a minimum.

The three produce markets selected for study were the Denargo Food Terminal at Denver, Colo.; the San Antonio Wholesale Produce Terminal, San Antonio, Tex.; and the Columbia

State Farmers Market, Columbia, S.C. Considered by many to be among the best in the country, these produce markets were efficiently arranged and well managed. The markets were all about the same size—each handling about 10,000 carlots annually. Many dealers on these markets utilized modern and efficient handling equipment, such as forklift trucks, skids, and pallets. Other dealers continue to use 2-wheel hand trucks as their main item of handling equipment.

The eight food chain warehouses studied were located in the New York metropolitan area, Denver, Colo., and Columbia, S.C. With certain exceptions, they utilized modern handling equipment, such as electric jacks, forklift trucks, clamp trucks, skids, and pallets. The methods of loading and unloading were directly applicable to those of the Lower Manhattan produce dealers because the volume handled at these food chain warehouses was comparable in most cases to that handled at the larger produce stores of Washington Street.

Denargo Market

The Denver Food Terminal Market, known as the Denargo Market, has been described as an outstanding market of the West. It consists of 304 covered stalls (in the Grower's Public Market); 15 small stores for jobbers; 12 produce stores for jobbers; and 30 large produce warehouses for wholesale receivers, in a terminal market building. The streets are broad, providing easy access for trucks. Each produce store has double-track rail facilities, with unloading facilities at car-bed height at the rear of the store. The market has a capacity of 200 cars and contains restaurant facilities, brokers' offices, telegraph offices, a barber shop, and several offices for accountants, railroad officials, and others connected with the industry. A grocery warehouse is adjacent to the market, in addition to the 15 wholesale receivers and the 23 jobbers in the area.

Information on cost and volume was obtained from 7 firms which handled about 80 percent of the produce received at the Denargo Market.

The costs of handling produce into, within, and without the produce stores averaged \$38.75 per carlot. For the market as a whole, \$5.82 per carlot was the cost of unloading and \$8.72 per carlot was the cost of loading the trucks for delivery of produce. The remaining \$24.23 per carlot was the cost of moving the produce within the store, including stacking, and displaying the produce, and moving it into and out of refrigerated storage.

Costs of the Denargo Market were lower for unloading and loading out than those of the Washington Street Market in New York City, but were higher for handling produce within the dealers' establishments, partly because there was considerable overnight storage of produce in the Denargo warehouses. In New York, the typical load of produce was stacked on the sidewalk and moved only if it failed to sell by the end of the business day. The Denver wholesalers, on the other hand, had considerable cold storage space and moved produce in and out of the refrigerated units to a much greater extent. Also, the storage space was on the first floor and basement, and there was considerable moving of produce between floors.

There was very little waste and spoilage at the Denargo Market. It is estimated that less than 0.4 percent of the wholesale price was lost because of spoilage. Also, there was no cartage to the store, inasmuch as all rail receipts were unloaded at the rear of the store and all truck receipts were unloaded at the front platform.

San Antonio Wholesale Produce Terminal

The San Antonio Terminal was built in 1951. It has two store buildings, one with 17 units and the other with 25 units. Each unit is 22½ feet

wide and 60 feet deep, with a 28-foot front loading platform and a 12-foot rear unloading dock.

The market has an administration building with offices for the market manager, brokers, shippers, the U.S. Department of Agriculture, and others. The market also has an excellent communications system. A barber shop, a restaurant, and other facilities also are located in the main administration building. In the center of the market are six farmers' sheds containing over 2,000 square feet of sale space for use by local growers and shippers. The produce buildings themselves are used by 14 wholesale dealers and a food chain organization.

Only six dealers were included in the study as having comparable operations to those of New York dealers. These six dealers handled about 60 percent of the produce received in San Antonio.

Handling costs varied from \$9.67 to \$14.63 per carlot, with an average of \$12.75. For 9 months of the 1956 fiscal year, the labor rate was \$0.75 per hour and for 3 months the rate was \$1 per hour, following a revision of the Federal minimum wage law. The labor cost was adjusted to a \$1 per hour rate, and an average cost of \$15.69 per carlot was recorded. At the New York City wage rate (\$2.10), this cost would be \$32.95 per carlot. In contrast to Denver, stores in the San Antonio Market had fewer but larger refrigerators, and all except one of the firms had all the refrigerated and other storage space on the main floor. There was, therefore, far less handling of produce within the store. After observation of the loading and unloading operations at San Antonio, it was estimated that the costs at San Antonio, on the basis of the New York union wage, were \$8 per carlot for unloading, \$14.95 per carlot for handling within, and \$10 per carlot for loading out.

Columbia State Farmers' Market

The Columbia State Farmers' Market, Columbia, S.C., included 2 large farmers' sheds with 169 stalls and 2 produce buildings containing 61 wholesale units, 36 of which had rail spurs at the rear. The individual units were 22½ feet by 90 feet including platforms. These 36 units were occupied by 18 dealers. A restaurant, barber shop, administration offices, and service station were provided in the market area.

Of the 18 firms, 3 were selected for study of their costs. These firms were the largest in the market and were the most advanced in their use of mechanical equipment. Data obtained indicated that the 3 firms received 89 percent of the 885 cars arriving in the market by rail in 1956. No comparable estimate of the firms' percentage of truck receipts was available, but it was estimated that they constituted about 45 percent of the total.

The labor cost in 1956 for handling produce into, within and out of dealers' stores varied from \$13.08 to \$16.19 per carlot, with an average of \$14.37. Translated into New York costs, this was \$30.18 per carlot, slightly less than the average for the San Antonio firms. Costs of unloading were reported as \$5.67 per carlot for those arriving via rail, and \$4.28 for those arriving by truck. Internal handling costs were low, \$3.69; and filling orders and loading trucks cost \$4.73. On a New York City basis, these costs would be \$12.50 per carlot for unloading, \$7.75 per carlot for handling within, and \$9.93 per carlot for loading out.

Food Chain Warehouses

Most of the eight food chain warehouse facilities visited in November 1956 had efficient layouts. All but two of the eight utilized modern handling equipment extensively; two used modern equipment in certain of their operations. The food chain warehouses served a great many outlets and were equipped with efficient refrigerated storage. Assembling orders for delivery to retail stores was a great deal more complicated for food chain organizations than for wholesale receivers; and certain food chain costs were higher. In the unloading and loading functions which were directly comparable, the food chain receivers were much more efficient than the Washington Street dealers. The costs of the food chain operations have been placed on a basis equivalent to New York carlot receivers in labor rates.

Warehouse "A" served 136 stores over a wide geographical area. The warehouse, built in 1954, had a total of 72,581 square feet. There were a 60-foot truck bay and a 20-foot loading dock in the front which could be enclosed with overhead doors. There was also a 20-foot unloading dock for rail cars at the rear of the warehouse, with a double track capable of handling 14 cars at one time.

Temperature and humidity were controlled in the warehouse. The loading and unloading operation was completely palletized, using forklift trucks, in addition to jacks and skids. For assembling the produce into lots for various retailers, the warehouse used interlocking four-wheel carts which could be towed by a "mule-type" electric tow tractor. The layout and equipment of this warehouse were modern in every respect. The warehouse also had eight refrigerated rooms, six of which could be reached directly from rail cars.

Warehouse "B" served 64 stores. It was 210 feet long and 140 feet wide. Sixty feet of this width on one end was used for a truck loading bay. Loading docks and offices were located at the other end of the building. A double track with a capacity of eight rail cars was located at the rear of the warehouse. This warehouse contained eight refrigerated rooms, seven of which were for storing poultry. These refrigerators were placed four on each side of a 24-foot vesti-

bule. The warehouse also contained an egg grading and packing plant and a large banana-ripening area. All produce was unloaded onto skids or pallets and then hauled down the vestibule to the appropriate storage room. If the produce was to be shipped out soon, or if it needed no refrigeration, it was stacked on pallets on the front loading dock. The warehouse used skid jacks, forklift trucks, and four-wheel trucks in its operation.

Warehouse "C" functioned as a service wholesaler's warehouse. Unlike warehouses A and B, this warehouse handled groceries, frozen foods, butter, eggs, and margarine, as well as produce.

Warehouse "D" served 26 stores. It was located in a modern rectangular building which provided direct unloading from rail cars at the rear of the warehouse. Direct truck unloading was also provided at the rear of the building. Trucks were loaded from a 32-foot platform at the front of the warehouse. As in warehouse "A", doors were provided outside the truck bay. In warehouse "D", eight refrigerated storerooms were provided and all produce was unloaded directly in those refrigerated rooms, with the exception of onions and potatoes. Sixteen rail cars could be spotted at one time on double house tracks. Handtrucks were used to a considerable extent, but forklift trucks and four-wheel jacks were used for unloading. Merchandise was stacked on small pallets and hauled on these pallets by handtruck to the loading docks.

Warehouse "E" had three straight sides and one elliptical side. It was approximately 210 feet long and about 108 feet wide. A single house track with a capacity of 4 cars was located along the rear of the warehouse. Two refrigerated storage rooms and a tomato and banana-ripening room were provided. There was a higher ratio of open storage and assembly area to total floor area in this warehouse than in any other in this study. The operating firm utilized handtrucks for selection and loading. Four men with handtrucks kept one checker and one loader busy on each truck, which was loaded from an 18-foot loading rack. For unloading supplies from the rail cars, the warehouse used skids and hydraulic jacks.

Warehouse "F" was approximately 195 feet by 250 feet. It was served by a single house track with a capacity of 14 rail cars. There were 20 truck bays for receiving and loading produce.

The warehouse had four refrigerated storage units on one side; rail cars were not unloaded directly into these coolers but, instead, produce was received in the same manner as in warehouse "B". The order assembly space was very large, permitting most efficient palletization. Three large and six small forklift trucks, a hydraulic jack, four-wheel trucks, and pallets were used extensively at this warehouse. All of the selection, loading, and transportation of produce for the operating

firm was done by another firm on a contract basis.

Warehouse "G" was about 225 feet long and about 180 feet wide. Rail cars were received on one side of the building, at double tracks with a capacity of 10 rail cars. Another siding of 20-car capacity was available. Nearby team tracks were also used. The cars could not be unloaded directly into the cold storage areas, but produce was moved there via forklift trucks.

There were 3 coolers and several banana-ripening rooms, plus an overhead rig designed to pull the four-wheel loaded grocery carts from the order assembly area. Other mechanical equipment included a high-lo forklift truck, 3 transporters, 11 selector jacks, and 4 walk-along trucks.

Warehouse "H" was similar to warehouse "A" in design. The warehouse was 650 feet long and 240 feet wide. Double house tracks with a capacity of 16 rail cars provided direct unloading into five of the eight refrigerated storage rooms. There were 7 banana-ripening rooms and a large cutting and storing area for bananas. Two 16-foot vestibules among the coolers permitted rail unloads to be distributed anywhere on the main assembly floor, to the potato and onion storage areas, or to the three coolers which were not adjacent to the rail tracks.

Handling equipment was modern, and included 3 high-lo forklift trucks, 15 hydraulic walk-along trucks, and many four-wheel trucks. Pallets were used in all of the unloading and loading operations.

All eight of the warehouses were well designed for the handling of fresh fruits and vegetables. The variation in time required to unload produce among the warehouses was not large. The major difference between them was in the amount of internal handling and assembling required before the actual loading of the trucks. In several instances, one shift of laborers spent their entire time moving the produce into position for the night's requirements. The second shift then filled orders, loaded the trucks, and in some cases, drove the trucks to their various destinations. The average length of time to receive, unload, and store a carload for the eight firms was 5.4 man-hours. The time to assemble and segregate the various retail stores' requirements was 10.3 man-hours per carlot.

Translated into equivalent Washington Street Market costs (\$2.10 per hour, exclusive of fringe benefits), the estimated average costs were approximately \$11.34 per carlot for unloading, \$21.55 for handling within the warehouse, and \$11.34 for loading out.



