THE SOUTH HOUSTON INDUSTRIAL AREA

AN OLD LOFT SECTION IN LOWER MANHATTAN

CHESTER RAPKIN

NEW YORK CITY PLANNING COMMISSION

SOUTH HOUSTON INDUSTRIAL AREA

Economic significance and condition of structures in a loft section of Manhattan

by **Chester Rapkin**

CITY OF NEW YORK • DEPARTMENT OF CITY PLANNING

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February 19, 1963

Honorable Francis J. Bloustein
Acting Chairman
Department of City Planning
City of New York
2 Lafayette Street
New York 7, N. Y.

Dear Sir:

In accordance with Contract dated June 1, 1962, between the City of New York, represented by the Department of City Planning, and myself, I am herewith transmitting my report on the South Houston Industrial Area.

Sincerely,

Chester Rapkin

Chester Rapkin
Economic Consultant

CR/mw

THE SOUTH HOUSTON INDUSTRIAL AREA

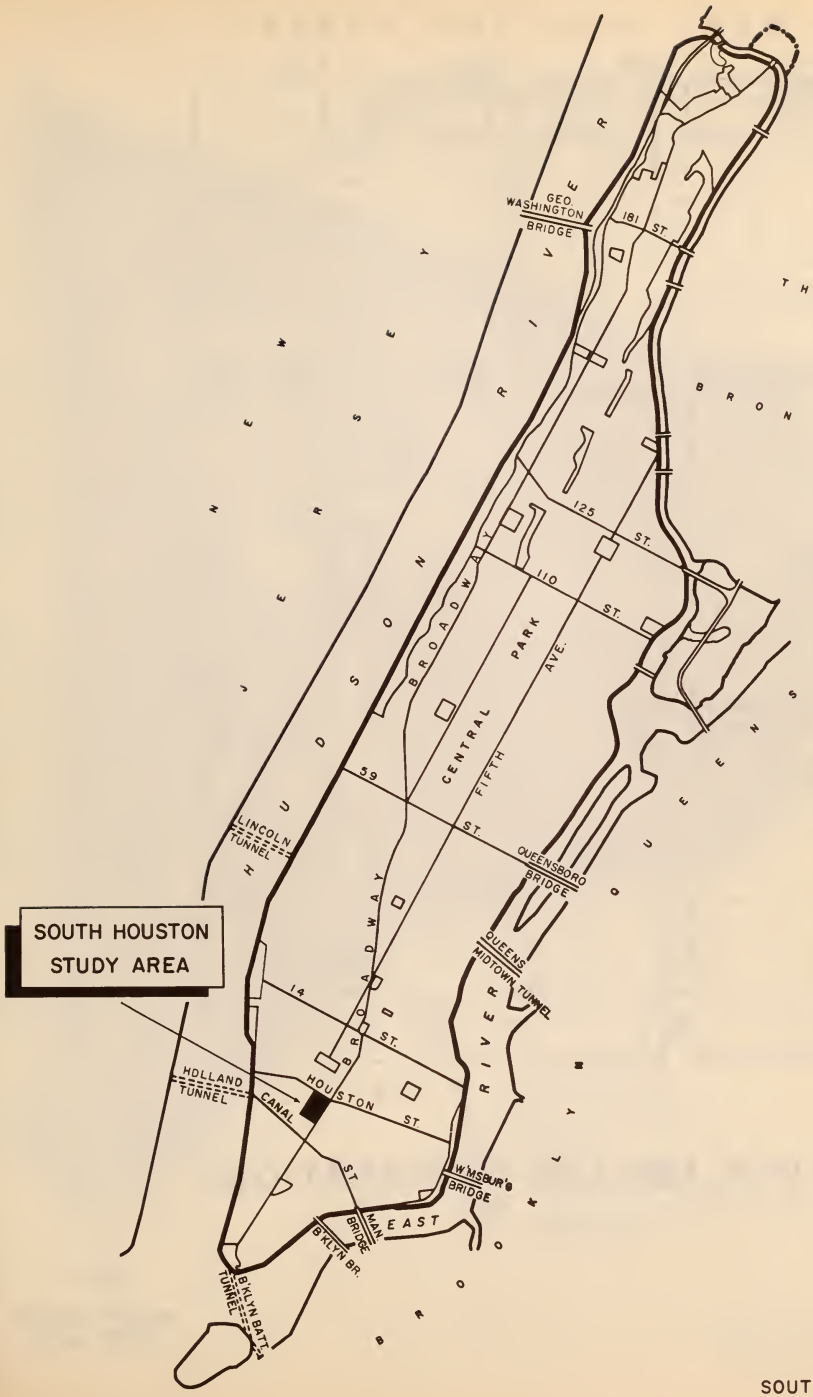
A Study of the Economic Significance of Firms, the Physical Quality of Buildings, and the Real Estate Market in an Old Loft Section of Lower Manhattan

Chester Rapkin

Prepared for the

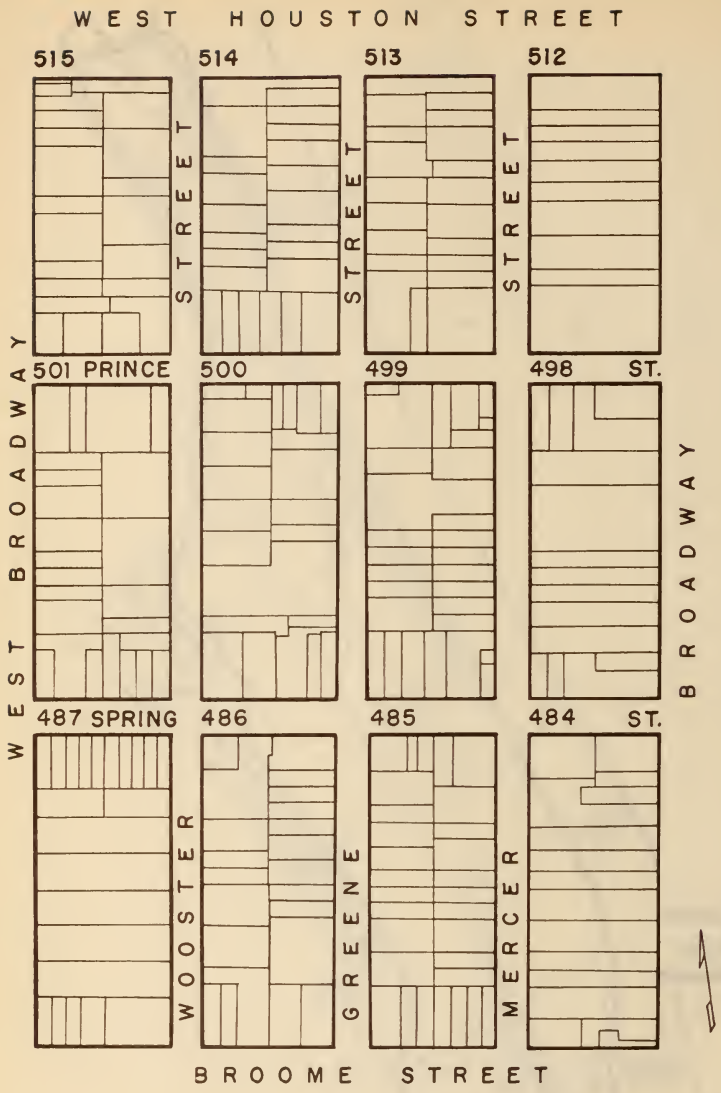
City of New York
CITY PLANNING COMMISSION-DEPARTMENT OF CITY PLANNING
New York 7, N. Y.

February 1963



MAP I

SOUTH HOUSTON
STUDY AREA



BLOCK AND LOT DESIGNATIONS

MAP II

SOUTH HOUSTON
STUDY AREA

GENERALIZED, PREDOMINANT LAND USE - LOWER MANHATTAN

MAP III

SOUTH HOUSTON STUDY AREA

Acknowledgments

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The principal participants in this study were Dr. John E. Ullmann,

Industrial Engineer and Professor of Management, Chairman of the Department of Management, Marketing and Business Statistics, Hofstra College, who was in charge of the economic section of the study, including field survey of establishments, and who drafted portions of the final report; Mr. Walter Thabit, City Planner, who was in charge of the section of the study concerned with building violations and quality of structures, and who also drafted portions of the final report.

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These acknowledgments are merely intended to convey my appreciation for the generous assistance extended by the persons mentioned above in the course of this study. Responsibility for the facts and interpretation in this report rest entirely with the author.

Chester Rapkin
New York 25, New York
January, 1963

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Chapter I

The Scope of the Study

Role of Research in City Planning

This study of the South Houston Industrial Area is indicative of the new direction that city planning has taken in recent years. As difficult as land-use decisions are when they are concerned with the future utilization of vacant land, their complexity is infinitely greater when changes are contemplated by public action in the older built-up areas of the city. In the past, the condition of its structures has usually largely determined the fate of an area. But experience has shown us that this is but one element in a catalogue of considerations that must be evaluated before a sound decision can be formulated.

In the case of residential areas, valuable community associations have frequently been irreparably disrupted by the destruction of habitations even when they were of slum caliber. In the case of non-residential districts, employment has been lost, firms dispersed, and business establishments have not only been compelled to incur considerable cost in relocation, but also have very often found themselves in quarters or locations inferior to those they occupied previously.

As the city grows and adjusts to advances in technology, economic organization, and human relations, the physical structure of specific local areas alters to suit the changing needs of firms and

households for accommodation and location. In the most part, the more dramatic changes occur when existing structures are demolished and new buildings erected in their stead. The demolished structures are usually old and obsolete, but this need not be the case if there is a gross disparity between the net revenue of an old and a contemplated new structure because of changes that have taken place in the economic or social merit of the site on which it is located. When such a gap exists and other conditions are salubrious, the business world undertakes the change through the mechanism of the real estate market. It is frequently necessary, however, for the government to intervene in those cases where the market place cannot acquire existing property for new use, but where a new use is indicated or desirable. Under these circumstances, the power of eminent domain and of the public purse is utilized to acquire existing structures so that they may be rehabilitated or the land that they occupy may be devoted to the type of use which will enhance the net social revenue for the total community.

In the course of considerations regarding the disposition of existing areas, bitter decisions must be made which involve the lives and livelihood of thousands of individuals and families, and the very existence of many business establishments. Because of these consequences, responsible city officials, and particularly city planners, have sought to examine an area in its totality to uncover its economic and social composition and venture some guesses regarding the possible outcome of

alternative actions, so that those responsible for the ultimate decisions will be aware of the consequences of their actions. This study of the South Houston Industrial Area is thus part of this type of planning process. It attempts to describe and define the kinds of establishments located within the study area, their economic viability, employment characteristics, and internal and external operating problems. In addition, it also has devoted a substantial proportion of its effort to an evaluation of the condition of each building in the area, including study of the violations of the building and of the fire codes, as well as considering the alterations and installations needed to elevate the quality of these structures, which have been used intensively for almost three-quarters of a century, to acceptable levels of safety, operation, and appearance.

Sources of Data

The data for this study have been drawn from a wide variety of sources.

(1) An extensive interview was conducted with approximately 125 firms representing a cross-section of business establishments in the area. Each interview took approximately one hour to administer. The respondent in all cases was either the principal or a major executive officer of the establishment. The questionnaire was designed and tested by the study staff, but the administration and supervision of the field interviews, the editing and coding of the questionnaire forms, and the subsequent summary of the experience of the interviewers were under-

taken by the firm of E. L. Reilly, Inc., 35 West 53rd Street, New York 19, N. Y. In addition, interviews were conducted with 20 of the 25 firms that had moved from the study area between 1957 and mid-1962.

(2) The real estate market in the area was also studied. Data were collected on the major physical characteristics of the land and improvements, assessed value in 1962-63 and in 1950-51, the consideration and year of last bona fide sale, mortgage amounts and terms, source of financing for the transaction, plus the assessed valuation in the year of sale and the name and address of the purchaser. These data were collected through an intensive search of the public records.

(3) The records of the Fire Department and of the Building Department were searched and the existing building and fire violations as well as the disposition of previous violations were recorded.

(4) Individual inspection was made of each building in the area, and structural defects and required installations and improvements were recorded. The details for each building were summarized in accordance with a rating system into an index of the building condition. All the details, however, have been preserved on the field record sheets.

(5) Special tabulation was made of gross business receipts of business firms in the study area by type and location of establishment. The tabulation was prepared by the New York City Department of Finance from its revenue records.

(6) A tabulation of firms covered by unemployment insurance,

indicating the number of employees and their remuneration by type and location of employer, was prepared by the New York State Department of Labor from its operating records.

(7) Data on the fire insurance ratings and the premiums per $100 of value were collected from records made available by the New York Fire Insurance Rating Organization.

(8) A field survey was made of the vacancy characteristics of each building in the area. Each building was visited, the amount of vacant space recorded, and notation made whether or not it was available for rent or sale. Individual records for each building are in the files of this study.

(9) A tabulation was made of the Dun & Bradstreet ratings of firms in the study area, and a special survey was made of the ratings of firms similar to the type found in the study area, but located in other sections of Manhattan and in the Bronx.

The Organization of the Report

The main body of this report is subdivided into four major sections. The first section is concerned with the characteristics of the firms in the area, the structure of employment, business experience, space utilization and operating problems, external economies, length of occupancy, and previous location and mobility intentions. The second section is devoted to a description of the buildings and the units of land on which they are located. It also includes an analysis of the

condition of the structures and the problems involved in rectifying the existing deficiencies. The third section is devoted to a study of the real estate market in the area, including such matters as property values, the frequency of transactions and the terms and sources of mortgage finance, rentals and rent-paying capacity, and the vacancy rate. The fourth section of the report is devoted to a summary of the principal findings of the study and to a statement of the major issues that have been pointed up by the research findings.

Part A. Economic Composition of the Area

II History and Present Composition of the Area

III Structure of Employment

IV The Caliber of Business Firms in the Area

V Operating Problems of Firms in Multi-Story Buildings

VI Space Utilization

VII Linkages and Transportation

VIII Elements in the Locational Decision

Chapter II

History and Present Composition of the Area

The South Houston Industrial Study Area consists of twelve blocks bounded by Broadway, Broome Street, West Broadway, and Houston Street in the Borough of Manhattan. It is located in the broad belt of industrial wholesaling and related business activities that extends through the central section of lower Manhattan from 14th Street to the Battery, an area that encompasses one of the major concentrations of employment in the City of New York. Some sections of this belt contain groups of homogeneous establishments, while others, like the study area, are varied in their composition. Typical of the entire area, however, is the fact that the non-residential activities take place in old, worn-out buildings that occupy a substantial proportion of the lot on which they are located. In some sections, of which the study area is typical, the loft buildings form an unrelieved facade block after block, which gives the narrow streets a canyon-like and dismal appearance even on a bright day. These dingy exteriors, however, conceal the fact that the establishments operating within them are, for the most part, flourishing business enterprises of considerable economic value to the City of New York.

Historical Development[1/]

The industrial development of the Valley, as the non-residential section of Manhattan below 14th Street is called, was part of a surge of economic expansion that took place in the United States in the latter part of the 19th century. Technological innovations, the growth of manufacturing and of transportation facilities, the opening of markets, and the burgeoning population, all contributed to the generation of demand for a wide variety of commodities. The more basic industries like steel tended to locate near sources of raw materials, while the finished goods industries were attracted to areas with large populations and substantial markets. These soft goods industries tended to be comprised of a large

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1/ The materials in this section were drawn from the following sources:

R. L. Duffus, Mastering a Metropolis (New York: Harper Bros., 1930).

Manna-hatin (New York: The Manhattan Company, 1929).

New York City Department of Commerce and Public Events, New York, The City that Belonged to the World (New York, 1956).

"History of Real Estate, Building and Architecture in New York City, 1868-1893," Real Estate Record and Builder's Guide, 1849, p. 22.

Edgar M. Hoover and Raymond Vernon, Anatomy of a Metropolis (Cambridge: Harvard University Press, 1959).

R. M. Haig, Major Economic Factors in Metropolitan Growth and Arrangement (New York: The Regional Survey of New York and Its Environs, 1928), Vol. 1.

Leybl Kahn, "The Loft Building in the Central Business District of New York City" (Brooklyn, Pratt Institute), manuscript in preparation.

number of small firms which sought locations in the center of the city in order to to close both to an ample supply of labor and to other establishments with which they had business associations. Most particularly, central locations were desired because of their proximity to the large and small mercantile establishments to which the manufactured goods were sold.

For these firms, capital was scarce, the future uncertain, and the need for space limited. In the smaller towns of our nation, such establishments purchased a piece of cheap land and erected a makeshift structure which served as factory and workshop at least until the solvency of the firm was fully established. In the city, land was too expensive to be used so freely, and the loft building five to ten stories in height emerged to meet the needs of the day. Here was centrally located space available by the square foot and requiring only short-term commitments. It was the counterpart of the tenement house erected to provide for similar needs of the working-class families which were reaching these shores from Europe. In fact, the workers who occupied the loft buildings in the Valley by day returned after only a short walk to their Lower East Side tenements in the evening.

The construction boom in non-residential facilities in Lower Manhattan began in the last half of the decade of the 1870's and continued for almost fifteen years. Its full momentum was gained after the completion of the Cohnfield Building at Bleecker and Greene Streets,

just a few blocks north of the study area. Mercer Street, which by then had passed through the usual stages of middle-class occupancy, obsolescence, deterioration, and slum, was rapidly razed and replaced with loft buildings which provided space for the developing industries. In its early stages, the South Houston Industrial Area provided accommodations for the overflow of manufacturing activities which previously had been located almost exclusively on the Lower East Side south of Canal Street. By 1900, the study area was located in the heart of the overlapping concentration of two principal manufacturing industries, the production of women's and children's garments and the wholesale fur trades. In addition, there was also a scattering of firms in millinery activities, wood and metal production, wholesale jewelry, hardware, and paper.

By the beginning of World War I, the center of the two major industries in the area had already moved to more preferred locations in the vicinity of Pennsylvania Station, a district that they continue to occupy to this day. As more and more garment and fur firms left the study area, the space that they vacated was occupied by a variety of establishments, with a concentration in firms dealing with low value paper and textile wastes. The garment industry, however, never fully abandoned this area. The heritage of the early developments coupled with the changes that occurred in the past half century have

yielded the considerable diversity of business activity that characterizes the area today.

Present Activities

The South Houston Industrial Area contains approximately 650 business establishments that employ in aggregate about 12,700 workers (Tables 1 and 2). These firms, when classified by type of activity, are found to occupy almost 50 standard industrial classification (SIC) designations; for the sake of convenience and simplicity, they have been organized for the purposes of this study into five major categories.

Group 1, containing textiles and apparel, is the largest, accounting for 26 percent of the establishments and 42 percent of the employees. Apparel firms in the study area differ from the kinds found in the Seventh Avenue garment center. For the most part, the South Houston Industrial Area produces women's and children's underwear, blouses, skirts, and sportswear of standard design, which are not affected by the vagaries of fashion or the violence of fads. This characteristic gives the garment firms in the study area a somewhat greater degree of stability than that possessed by firms in other sections of the garment industry of Manhattan. In addition, since they are removed from the need for daily observance of style trends, they can remain in the study area where rents are considerably lower than in the heart of the garment district.

Table 1

Business Establishments in the
South Houston Industrial Area
First Quarter, 1962

Industry Group	Broadway Frontage (1)	Broadway Blocks (2)	Rest of Area (3)	Total (2) + (3)
	A. Number of Business Establishments			
1 Textiles, Apparel	57	87	82	169
2 Printing, Chemicals, Leather, Paper	8	17	94	111
3 Other Manufacturing, Construction	10	27	110	137
4 Wholesale	26	38	123	161
5 Retail & Services	14	30	43	73
Total	115	199	452	651
	B. Percentages by Area			
1 Textiles, Apparel	49.6	43.7	18.1	26.0
2 Printing, Chemicals, Leather, Paper	7.0	8.5	20.8	17.1
3 Other Manufacturing, Construction	8.7	13.6	24.3	21.0
4 Wholesale	22.6	19.1	27.2	24.7
5 Retail & Services	12.2	15.1	9.5	11.2
Total	100.0	100.0	100.0	100.0
	C. Percentages by Industry Groups			
1 Textiles, Apparel	33.7	51.5	48.5	100.0
2 Printing, Chemicals, Leather, Paper	7.2	15.3	84.7	100.0
3 Other Manufacturing, Construction	7.3	19.7	80.3	100.0
4 Wholesale	16.1	23.6	76.4	100.0
4 Retail & Services	19.2	41.1	58.9	100.0
Total	17.7	30.7	69.3	100.0

Source: Special Tabulation by New York State Department of Labor.
Establishments covered by unemployment insurance.

Table 2

Number of Employees in the
South Houston Industrial Area
First Quarter, 1962

Industry Group	Broadway Frontage (1)	Broadway Blocks (2)	Rest of Area (3)	Total (2) + (3)
	A. Number of Employees			
1 Textiles & Apparel	2,698	3,469	1,879	5,348
2 Printing, Chemicals, Leather, Paper	396	700	1,463	2,163
3 Other Manufacturing, Construction	485	903	1,898	2,801
4 Wholesale	266	379	808	1,187
5 Retail & Services	107	899	273	1,172
Total	3,952	6,350	6,321	12,671
	B. Percentages by Area			
1 Textiles & Apparel	68.3	54.6	29.7	42.4
2 Printing, Chemicals, Leather, Paper	10.0	11.0	23.1	17.1
3 Other Manufacturing, Construction	12.3	14.2	30.0	22.1
4 Wholesale	6.7	6.0	12.8	9.4
5 Retail & Services	2.7	14.2	4.3	9.2
Total	100.0	100.0	100.0	100.0
	C. Percentages by Industry Groups			
1 Textiles & Apparel	50.4	64.9	35.1	100.0
2 Printing, Chemicals, Leather, Paper	18.3	32.4	67.6	100.0
3 Other Manufacturing, Construction	17.3	32.2	67.8	100.0
4 Wholesale	22.4	32.0	68.1	100.0
5 Retail & Services	9.1	76.7	23.3	100.0
Total	31.2	50.2	49.8	100.0

Source: Special Tabulation by New York State Department of Labor.
Establishments covered by unemployment insurance.

The second major category of establishments consists of printing, chemical, rubber, leather, and paper products, which together account for 17 percent of the establishments and a similar percentage of the total number of employees in the study area. The printing firms plus ancillary establishments, which include photoengraving, platemakers, and bookbinders, are scattered throughout the area rather than being concentrated in buildings devoted entirely to the representational arts. These firms are attracted to the South Houston Industrial Area because of the relative ease of access to their principal customers, which consist of advertising agencies, head offices of national corporations, banks and insurance companies, and the marketing departments of large firms. A variety of types of printing takes place in the area, although much of the product consists of promotional material. Other firms in Group 2 include the manufacturers of envelopes, folding boxes, and other types of containers. The wholesale paper dealers in the area supply the printing and other industrial users nearby when the quantity required is too small to be ordered directly from the mill.

Group 3, which contains all other manufacturing activities plus a few construction firms, accounts for 21 percent of the establishments and 22 percent of the employees in the study area. Some of the firms manufacture a variety of mechanical and electrical products which are generally considered to be in the "hardware" category. In addition, several machine shops service local firms, such as printing, for which

they manufacture spare parts, rebuild machines, and undertake necessary repairs. These machine shops located on the fringe, tend to be smaller on the average than firms to be found in the large complex of this activity in the Canal-Spring Street area east of Broadway. Group 3 also includes a sizable concentration of doll and toy factories. Some of the doll manufacturing firms were founded by artisans in papier mache, and originally there appears to have been a fair degree of craftsmanship in the industry. Most of the dolls today, however, are made of vinyl plastisols so that the industry essentially consists of light plastics manufacture.

Group 4, wholesale trades, represents another major activity, accounting for 25 percent of the establishments and 10 percent of the employees in the study area. The waste industry, which predominates in this category, occupies a considerable amount of space in the study area. It consists, however, largely of establishments of modest size. A payroll of twenty people would be considered large for a firm in this activity. Some of these firms buy textile scraps, mill ends, and other remnants and then sort, clean, and bale them for use as wiping cloths. This industry exports a considerable amount of its product. Recently it has acquired a new market in the Far East, where small lots of fabric such as mill ends are made into clothing. The firms that deal in waste paper receive their raw material from widely scattered sources in the city and bale it for sale to paper mills, mostly for the manufacture of paper board. Other establishments purchase used cardboard boxes,

which are then sorted and resold to industrial users and to some retail stores. Their main sources of raw material are assembly plants which receive components in boxes for which they have no further use. For the most part, the wholesaling establishments occupy buildings in the Mercer Street and West Broadway section of the study area, where their operations, which consist essentially of storage, are conducted in the older and more obsolete structures.

Group 5, containing 11 percent of the establishments and 9 percent of the employees, consists of a varied set of retail and service activities, of which eating and drinking places make up the largest homogeneous subgroup. They are mostly located on the east-west streets, with a few along Broadway. Transportation service, the next largest component, consists almost exclusively of local truckers, whose premises range from small offices to terminals that include some warehouse space but no off-street loading facilities. Several retail stores are in the area, especially dry goods and discount stores, largely along Broadway and on the east-west side streets. There are also a number of finance, insurance, and real estate firms, and three banks have branches in the area. The rest of Group 5 consists of miscellaneous personal and business services.

Broadway and Off-Broadway Blocks

Activities, establishments, and building quality are not uniformly distributed throughout the study area. Approximately 30 percent of all the establishments in the area are located in the better buildings on the blocks

between Broadway and Mercer Street, which are dominated by the Broadway frontage, but 50 percent of the textile and apparel firms and 40 percent of the retail and service establishments are to be found there. The remainder of the area, between Mercer Street and West Broadway, contains the concentration of manufacturing activities in Groups 2 and 3, as well as the wholesale firms.

The geographic distribution of employment within the study area shows an even greater degree of concentration than that revealed by firms. Exactly half of all the jobs are to be found in the three Broadway blocks, but 77 percent of the employees in retailing and service establishments and 65 percent of the apparel and textile workers are located in this strip. By and large, the firms in the Broadway blocks are larger, employing 32 persons on the average, while establishments in the remainder of the area employ only 14 persons on the average. Largely because of the difference in types of activity, firms in the Broadway blocks also utilize their space more intensively. In buildings located in that strip, approximately 240 square feet of floor space are allocated to each employee on the average, while in the remainder of the area 620 square feet of floor space is the average per worker.

The Size of Establishments

Business firms in the South Houston Industrial Area tend to be relatively small. Approximately two out of three establishments employ

fewer than 25 persons, and almost one-third of the workers are employed by firms of this size (Table 3). The smaller firms are concentrated in the section of the study area lying between Mercer Street and West Broadway, where 70 percent of the establishments and 41 percent of the employees fall into this category.

The small firm is typical of the low-rent area, regardless of where it is located. It has frequently been asserted that the older industrial sections, by providing low-priced space, make it possible for the new and less secure establishment to gain a foothold in the business world. With low overhead, the recurrent burden is minimized and the opportunity for expansion and development is enhanced. It is for this reason that areas of this type are frequently called "incubators," despite the fact that the period of incubation may be quite lengthy. It is important, moreover, that the possibility of existence for a small firm offers entrepreneurial opportunity to individuals who wish the independence and creative potentiality that self-employment affords. Large cities in general and New York in particular abound in such opportunities, and the proliferation of business establishments which is generated provides the metropolis with its awe-inspiring diversity as well as with the seedlings from which larger industries will develop. It is not insignificant that the average firm in Manhattan as a whole employs approximately 20 employees, which, incidentally, equals the average size of firm in the South Houston Industrial Area.

Table 3

Percent of Firms and Total Number of Workers in Establishments with Less than 25 Employees, by Type and Location of Activity South Houston Industrial Area, 1962

A. Type of Activity

Industry Group	Percent of Firms	Percent of Employees
1 Textiles, Apparel	60.3	21.8
2 Printing, Chemicals, Leather, Paper	79.3	39.2
3 Other Manufacturing, Construction	66.4	25.8
4 Wholesale	61.5	55.3
5 Retail & Services	67.1	20.8
Total	65.9	28.7

B. Location of Activity

Subarea	Percent of Firms	Percent of Employees
Broadway Frontage	57.4	15.5
Broadway Blocks	55.8	16.3
Rest of Area	70.3	41.2
Total	65.9	44.6

Source: Special Tabulation by New York State Department of Labor. Establishments covered by unemployment insurance.

Chapter III

Structure of Employment

One of the ways in which the economic merit of an area can be evaluated is in terms of the quality of its employment structure, the kinds of occupations in its industries, the wage level, and the prospects for continuity and stability of employment. In addition to examining these indicators of the viability of an area, one must look beyond its present activities and potentials to the alternatives that might be open to its industrial occupants and their employees if the area is converted to a different use. The prospects of employees in turn depend on the kind of work they do and the opportunities for similar work that exist elsewhere in the city. They are also affected by the personal characteristics of the employees, notably age, race, and sex, which bear importantly on the ability of the workers to obtain other jobs.

Occupational Composition

The occupational characteristics of the study area reflect its predominantly industrial character. Production workers with varying degrees of skill are the largest group by a substantial margin. They make up from 84 to 91 percent of the employees in the three manufacturing industry groups, and account for 83 percent of the total for the entire area. This lower proportion is accounted for by the fact

that the production workers make up a smaller, though still sizable part of the wholesale trades and retail and service firms (Table 4).

The relative proportion of skilled and unskilled production workers differs among the various industry groups. The greatest preponderance of skilled over unskilled workers is shown in the textile and apparel firms in the study area. A more equal division is shown in printing, leather, and paper, and in miscellaneous light manufacturing. In these industries a larger proportion of the workers are either engaged in materials handling, that is, the internal transport of product, or else tend relatively simple automatic machinery, as for instance, in the manufacture of paper boxes and plastics manufacture. In the non-manufacturing groups, there are relatively high proportions of unskilled laborers, mostly warehousemen, but the total numbers involved are relatively small.

Among the non-production employees, clerical workers, executives, and professionals predominate. Salesmen as such do not appear to make up a significant proportion of the employees, except in wholesale trades and retail and service firms, and they are a small minority even there. Of course, many of the executives of the firms personally take a hand in selling. The proportion of clerical employees is particularly low in the manufacturing groups, especially in apparel. This predominance of production jobs in the manufacturing

Table 4

Number of Employees by Type of Occupation and Industry
South Houston Industrial Area, 1962

Type of Occupation	Total		Group 1		Group 2	
	Number	Percent	Number	Percent	Number	Percent
Production	9,501	82.7	4,686	90.9	1,742	89.7
Skilled	5,660	49.3	3,195	62.0	992	51.1
Unskilled	3,715	32.3	1,449	28.1	730	37.6
Maintenance	126	1.1	42	0.8	20	1.0
Non-Production	1,988	17.3	468	9.1	200	10.3
Clerical	854	7.4	136	2.6	100	5.1
Sales	391	3.4	65	1.3	51	2.6
Executive	697	6.1	267	5.2	49	2.5
Other	46	0.4	-	-	-	-
Total	11,489	100.0	5,154	100.0	1,942	100.0

	Group 3		Group 4		Group 5	
	Number	Percent	Number	Percent	Number	Percent
Production	2,056	83.8	494	49.2	523	55.9
Skilled	1,018	41.5	182	18.1	273	29.2
Unskilled	1,029	41.9	272	27.1	235	25.1
Maintenance	9	0.4	40	4.0	15	1.6
Non-Production	397	16.2	510	50.8	413	44.1
Clerical	164	6.7	183	18.3	271	29.0
Sales	55	2.2	146	14.5	74	7.9
Executive	178	7.3	135	13.4	68	7.2
Other	-	-	46	4.6	-	-
Total	2,453	100.0	1,004	100.0	936	100.0

industries of the area is more pronounced than in the corresponding industries in the United States as a whole.[1/] For example, in Group 1 in the study area, 91 percent of the employees are in production work, compared with 88 percent in the apparel industry as a whole. In Group 2, 90 percent of the employees are production workers; in commercial printing in the United States, a category which comprises a large portion of Group 2, 79 percent of the workers are considered to be in production occupations. Similarly, in Group 3 in the study area, the proportion is 84 percent, compared with 70 percent for miscellaneous manufacturing in the United States at large.

The dominant element among the employees of the study area is thus to be found in its production workers. They have many different skills, but the only single occupation that constitutes a large group is that of sewing machine operator. Most of the apparel made in the area is, as previously noted, women's underwear and sportswear, generally of low price. The production processes have accordingly been rationalized to permit section work. Although this work is considered skilled by the employers and unions, it can frequently be learned fairly easily by relatively new employees.

1/ U.S. Bureau of the Census, 1958 Census of Manufactures (Washington: U.S. Government Printing Office, 1960), Vol. I.

Remuneration of Employees

Workers in the South Houston Industrial Area earned over $13 million in aggregate during the first quarter of 1962 (Table 5). All manufacturing activities taken in aggregate provided over three-quarters of these earnings. The largest share of these wage payments came from the textile and apparel industry, Group 1, which accounted for over one-third of the total disbursements. Wholesaling activities, Group 4, disbursed 13 percent of the total wage payments, and retail and service establishments, Group 5, accounted for the remainder of 9 percent. Establishments in the Broadway blocks disbursed over 48 percent of the total, a ratio slightly less than their share of the total employment.

The average weekly earnings of workers in the area amounted to $79.10 during the first quarter of 1962[2/] (Table 6). A considerable

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2/ This figure was calculated by dividing aggregate earnings first by the number of employees to derive the average quarterly earnings per employee, and then again by 13 to arrive at a weekly figure. The data utilized in this calculation were based entirely on a special tabulation prepared at the request of the New York City Planning Commission by the New York State Department of Labor. Information on the number of establishments, quarter employment, and remuneration were compiled from the official records relating to employment insurance coverage in the Division of Employment. The request stipulated that the data be subdivided by types of industry, size of establishment, and location of firm. This degree of subdivision resulted in some cells containing only one or two establishments. Under these circumstances, the data for these cells were omitted in order to prevent disclosure of confidential information on individual firms. It is quite evident that, if there is one firm in a given category, interested parties can readily identify the establishment and learn basic and private information regarding its

(Con't p. 28)

Table 5

Remuneration of Employees in the South Houston Industrial Area

First Quarter, 1962

Industry Group	Broadway Frontage (1)	Broadway Blocks (2)	Rest of Area (3)	Total (2) + (3)
	A. Amounts (in thousands)			
1 Textiles & Apparel	$2,248	$2,879	$1,558	$4,437
2 Printing, Chemicals, Leather, Paper	324	974	1,523	2,497
3 Other Manufacturing, Construction	364	967	2,227	3,194
4 Wholesale	362	558	1,146	1,704
5 Retail & Services	93	934	265	1,199
Total	$3,391	$6,312	$6,719	$13,031
	B. Percentages by Area			
1 Textiles & Apparel	66.3	45.6	23.2	34.0
2 Printing, Chemicals, Leather, Paper	9.6	15.4	22.7	19.2
3 Other Manufacturing, Construction	10.7	15.3	33.1	24.5
4 Wholesale	10.7	8.8	17.1	13.1
5 Retail & Services	2.7	14.8	3.9	9.2
Total	100.0	100.0	100.0	100.0
	C. Percentages by Industry Groups			
1 Textiles & Apparel	50.6	64.9	35.1	100.0
2 Printing, Chemicals, Leather, Paper	13.0	39.0	61.0	100.0
3 Other Manufacturing, Construction	11.4	30.3	69.8	100.0
4 Wholesale	21.2	32.7	67.3	100.0
5 Retail & Services	7.8	77.9	22.1	100.0
Total	26.0	48.4	51.6	100.0

Source: Special Tabulation of the New York State Department of Labor.

Table 6

Estimated Average Weekly Wages by Industry
South Houston Industrial Area
First Quarter, 1962

Industry Group	Total Earnings (000)	Number of Employees	Average Weekly Wage
1 Textiles, Apparel	$4,437	5,348	$63.80
2 Printing, Chemicals, Leather, Paper	2,497	2,163	88.80
3 Other Manufacturing, Construction	3,194	2,801	87.70
4 Wholesale	1,704	1,187	110.40
5 Retail & Services	1,199	1,172	78.70
Total	$13,031	12,671	$79.10

Source: Special Tabulation by New York State Department of Labor
Establishments covered by unemployment insurance.

degree of variation in weekly earnings is revealed by this calculation. In Group 1, textiles and apparel, the estimated average weekly wages were $63.80, the lowest for the area. Groups 2 and 3 revealed estimated average earnings of $88.80 and $87.70, respectively, per week. Wholesaling activities, Group 4, paid the highest average wage by far, with the estimated average weekly remuneration standing at $110.40. The estimated weekly earnings of workers in the Broadway blocks amounted to $76.50, compared with $81.80 for employees in the remainder of the area. Part of this difference is due to the fact that the higher paying jobs in wholesaling and warehousing activities tend to be located largely in the off-Broadway blocks.

The average earnings in the area, assuming a 40-hour work-week as the basis for the earnings cited above, yield a rate of approximately $2.00 per hour. This figure compares with $1.79 per hour, the median hourly wage rate revealed by the field survey of establishments in the study

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Footnote 2/ cont'd: operations. Similarly, if there are two firms in a category, each can derive information regarding his competitor's activities merely by subtraction. The omission of these firms in order to respect the pledge of privacy has resulted in an undercount of the number of establishments, the number of workers, and the aggregate earnings. There is, however, some slight degree of overcounting of employment to the extent that workers who were employed for less than a full quarter are included in the totals, which may, to some degree, compensate for employment in the firms omitted from the tabulation. The inclusion of part-time workers and their earnings, however, tends to lower the average since it is assumed in the calculation that they were employed for 13 weeks.

area.[3] (Table 7). In the area as a whole, approximately 30 percent of the workers are paid between $1.15, the minimum wage, and $1.49 per hour, 31 percent between $1.50 and $2.00 per hour, and 39 percent over $2.00 per hour. Wage rates are highest in Group 4, wholesaling activities, in which two-thirds of the workers earn over $2.00 per hour and are lowest in Group 1, textiles and apparel, in which less than one-quarter of the workers earn this amount.

Employees' earnings in the study area appear to compare favorably with the remuneration of workers in similar industries in the United States as a whole. The average weekly earnings in the women's apparel and undergarment industries in September, 1962, were $61.80 and $56.60, respectively, amounts below the corresponding figures for workers in Group 1 in the study area.[4] In the United States as a whole, workers in leather products earned $62.80, in printing $110.30, and in folded paper boxes $84.00. These three industries are similar to those contained within Group 2 of the study area, in which the average weekly earnings were $88.80. In the United States as a whole, workers in the doll and toy industry earned $68.20 on the average, and in electrical equipment

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3/ These two measures of central tendency are consistent by virtue of the fact that the arithmetic mean is typically larger than the median in skewed distributions, which are characteristic of data on income and earnings.

4/ U.S. data drawn from U.S. Department of Labor, Bureau of Labor Statistics, Employment and Earnings, IX (October, 1962), p. 3. Data refer to average weekly earnings of production workers in manufacturing and non-supervisory workers in other industries.

Table 7

Distribution of Hourly Wage Rates by Type of Industry
South Houston Industrial Area
First Quarter, 1962

Industry Group	Total	Median	$1.15 - $1.49		$1.50 - $2.00		Over $2.00	
			Number	Percent	Number	Percent	Number	Perc
1	5,196	$1.70	1,918	35.0	2,012	36.8	1,266	23.
2	2,180	1.80	713	32.7	634	29.1	833	38.
3	2,756	1.97	672	24.4	726	26.3	1,358	49.
4	1,175	over 2.00	211	18.0	192	16.3	772	65.
5	1,280	over 2.00	214	16.7	371	29.0	695	54.
Total	12,587	$1.79	3,728	29.6	3,935	31.2	4,924	39.

$97.00 for the average week in September, 1962. These employment categories are roughly comparable to those contained within Group 3 of the study area, in which an average wage of $87.60 was revealed. Wholesaling firms in the United States paid their workers $96.50 on the average per week, compared with wage payments of $110.30 by similar types of establishments in the study area. It is thus evident that earnings in the South Houston Industrial Area are at least equal to those in similar industries in the rest of the country and, in several instances, the remuneration to workers in the study area is decidedly superior.

Stability of Employment

Stability of employment is influenced by several significant factors. The first is the viability of the individual firm, which is a function of the managerial prowess of the owner as well as the economic atmosphere in which he attempts to operate. If business establishments are unable to cope with the vicissitudes of the competitive world so that a high rate of bankruptcy characterizes a given area, then the workers who are employed by these firms are not only compelled to seek alternative employment but they also lose valuable seniority rights and, in some instances, union protection. Moreover, the anxieties that characterize the atmosphere of an establishment on the verge of demise, while not influencing the worker's income at the moment, surely affects his total outlook.

The second element in the evaluation of stability is the degree to which employment is subject to cyclical variations. Are workers afflicted

with recurrent periods of substantial unemployment or do they weather the economic storms without too many being separated from the permanent staff?

The third measure is concerned with the degree to which employment is influenced by the annual seasonal cycles. Are workers compelled to seek alternative temporary jobs frequently or are they reasonably assured of continued employment in the course of the year?

In evaluating the security of employment in the study area, ideally we should focus on all of these factors for the analysis. Unfortunately, however, it was possible to obtain only fragmentary data which offer us only a partial indication of the larger question at issue.

The usual measurement of seasonal variations is based upon the analysis of monthly time series covering a protracted period. Such data, unfortunately, are not available for the study area, but two other indices do provide a satisfactory indication of the degree of seasonality in employment. In the field survey of establishments, firms were asked whether they considered their business to be significantly seasonal; that is, whether they experienced sharply varying rates of production during different intervals of the year. While most said that they experienced some degree of perturbation, 28 percent of the firms, employing 35 percent of the workers, maintained that they were in seasonal business (Table 8). The greatest incidence of seasonality was to be found in Industry Group 1, textiles and apparel, where 47 percent of

Table 8

Indications of the Incidence of Seasonality in Employment
South Houston Industrial Area

Industry Group	Total Employment Number	Total Employment Percent	Percent of Firms in Seasonal Businesses	Percent Range in Variation from Average Employment
1 Textiles, Apparel	5,348	42.4	47.3	± 19
2 Printing, Chemicals, Leather, Paper	2,163	17.1	27.0	± 11
3 Other Manufacturing, Construction	2,801	22.1	35.0	± 25
4 Wholesale	1,187	9.4	9.3	± 7
5 Retail & Services	1,172	9.2	14.0	± 18
Total	12,671	100.0	28.3	± 18

the firms reported they were affected seriously by seasonal variations. Industry Groups 4 and 5, wholesaling and retail and service establishments, revealed the lowest degree of seasonal influence.

Another index of seasonality in the area is the range of employment, which had an average variation of plus or minus 18 percent from the average for the year. This range of variation in employment is highest, plus or minus 25 percent, for miscellaneous types of manufacturing firms, Group 3, with firms in Group 1 showing a range of plus or minus 19 percent. Employment in wholesaling reveals the lowest degree of variation, plus or minus 7 percent. Firms in the area state that they are busy during the first, third, and fourth quarters of the year, and that in general the second quarter is the slack season.

An index of the long-term stability of employment is to be found in the experience rating for unemployment insurance assigned to firms by the Division of Employment of the New York State Department of Labor. Under the New York State law, a separate account is maintained for each firm in which a record is kept of all premiums paid and disbursements made as a result of claims against it. Firms that retain a positive balance in their account are eligible to have their contributions reduced from the standard 4.2 percent of all wages up to $3,000 per employee per year to as little as 2.1 percent. The reduction is based on an actuarial analysis of the firm's experience that takes into account (1) the ratio of the amount remaining in the account to the total payroll for the previous year, (2) a quarterly factor that adjusts for seasonal

variations, (3) an annual factor that compensates for secular or cyclical changes, and (4) an age factor which depends on how many years the employer has been liable for tax under the unemployment insurance law.[5/] As it takes time to build up an account, unemployment insurance rates provide a useful long-range measure of employment stability, that summarizes the major systematic, as well as the more significant sporadic, fluctuations.

The median unemployment insurance rate for firms in the area is 3.6 percent (Table 9). Approximately 38 percent of the firms display ratings between 2.1 and 3.2 percent, a range that can be considered extremely favorable. An additional 33 percent fall in the 3.3 to 4.0 range, which may be considered good. Only 29 percent of the establishments in the study area pay the full 4.2 percent maximum rate. When examined by industrial group, wholesaling activities reveal the most satisfactory experience, with 83 percent of all establishments carrying insurance ratings below 4.2 percent. The proportion of firms carrying rates below 4.2 percent in the other industrial groups are 59 percent for textiles and apparel, 77 percent for printing, chemicals, etc., 66 percent for other types of manufacturing establishments, and 66 percent for retail and service activities.

5/ 1960-61 Handbook for Employers with Key Forms, New York State Department of Labor, p. 22 ff.

Table 9

Distribution of Establishments by Tax Rate for Unemployment Insurance, by Industry Group South Houston Industrial Area, 1962

Tax Rates in Percent	Total		Group 1		Group 2	
	Number	Percent	Number	Percent	Number	Perce
2.1 - 2.4	93	16.9	6	4.3	28	27.3
2.5 - 2.8	62	11.3	20	14.2	4	3.9
2.9 - 3.2	54	9.9	0	1.0	4	3.9
3.3 - 3.6	57	10.4	17	12.0	20	19.3
3.7 - 4.0	124	22.5	40	28.4	23	22.3
4.2	160	29.0	58	41.1	24	23.3
Total	550	100.0	141	100.0	103	100.0
NA	118	-	28	-	8	-
Median	3.6		3.9		3.5	

	Group 3		Group 4		Group 5	
	Number	Percent	Number	Percent	Number	Perce
2.1 - 2.4	18	13.3	31	25.5	10	26.3
2.5 - 2.8	10	7.5	10	8.3	5	13.2
2.9 - 3.2	21	15.7	25	20.7	4	10.5
3.3 - 3.6	10	7.5	10	8.3	0	0.0
3.7 - 4.0	30	22.4	25	20.7	6	15.8
4.2	45	33.6	20	16.5	13	34.2
Total	134	100.0	121	100.0	38	100.0
NA	15	-	40	-	27	-
Median	3.8		3.1		3.0	

It is possible to compare the distribution of unemployment insurance tax rates in the study area with New York State as a whole for the apparel industry and for wholesale trades, the data for which are published in official reports.[6/] (Table 10). By and large, these comparisons reveal that the experience of South Houston firms is considerably more favorable than those in the remainder of the state. In the apparel industry, for example, 19 percent of the firms in the study area enjoyed ratings between 2.1 and 3.2 percent, while only 7 percent of the firms in the state at large were in this category; in wholesaling trades 50 percent of the study area establishments carried ratings between 2.1 and 3.2 percent, compared with 32 percent for wholesale establishments in the state as a whole. It would thus appear that even in such industries as apparel, which show a considerable seasonal fluctuation, stability of employment in firms in the South Houston Industrial Area is appreciably higher than in comparable establishments throughout the state.

Prospects of Alternative Employment

The prospects of alternative employment for the workers now in the study area are influenced by the personal characteristics of the employees, as well as the outlook for their occupations and their industries. Particularly, the ability of the workers to obtain other jobs that may be available is importantly affected by their race, their sex, and their age.

6/ New York State Department of Labor, Unemployment Insurance Tax Rates, 1960, (New York, 1961), pp. 22 ff.

Table 10

Percent Distribution of Establishments by Tax Rates for Unemployment Insurance In the Apparel Industry and in Wholesale Trade

South Houston Industrial Area, 1962
New York State, 1960

Tax Rate in Percent	Apparel Industry		Wholesale Trades	
	SHIA	NYS	SHIA	NYS
2.1 - 2.4	4.3	3.3	25.5	19.5
2.5 - 2.8	14.2	2.0	8.3	7.7
2.9 - 3.2	0.0	2.0	20.7	5.5
3.3 - 3.6	12.0	4.7	8.3	11.9
3.7 - 4.0	28.4	40.6	20.7	50.0
4.2	41.1	47.4	16.5	5.4
Total	100.0	100.0	100.0	100.0

A large proportion of the employees in the South Houston Industrial Area comes from the city's minority groups (Table 11). Data drawn from the survey of the establishments indicate that approximately 20 percent are Negro, 40 percent Puerto Rican, and 40 percent white other than Puerto Rican. The proportion of minority workers is somewhat higher in the three groups of manufacturing industry. For example, in textiles and apparel, 21 percent of the employees are Negro and 48 percent are Puerto Rican. These proportions are much lower in wholesale trades and in retail and service, where the ratio of these groups combined is 28 percent and 42 percent, respectively.

A substantial proportion of the white non-Puerto Rican workers are also drawn from minority groups. They include a large but undetermined number of Jews, Italians, Irish, and Slavs. In fact, one might be hard pressed to discover a recognizable non-minority concentration of workers in this area.

The South Houston Industrial Area has a relatively high proportion of women workers. The survey of the establishments indicates that the proportion of women varies from 18 percent in wholesaling to 70 percent in apparel and textiles, with an average of 47 percent for the study area as a whole. Many of these women are young and their employment is, therefore, subject to interruption due to family obligations. There is evidence that this is a principal cause of employee turnover, at least among major employers in the apparel industry of the area, and that a

Table 11

Percent Distribution of Employees by Age, Race and Sex
South Houston Industrial Area, 1962

Industry Group	Total Employment	Percent of Total by Age				Percent of Total by Race				Percent of Total by Sex		
		Total	Under 25	25-40	40+	Total	White*	Negro	P. R.	Total	Male	Female
1	5,348	100.0	20.7	50.2	29.1	100.0	31.1	20.9	48.0	100.0	30.2	69.8
2	2,163	100.0	14.2	44.7	41.1	100.0	39.5	16.7	43.8	100.0	61.6	38.4
3	2,801	100.0	16.7	61.5	21.8	100.0	34.7	24.1	41.2	100.0	67.4	32.6
4	1,187	100.0	3.9	31.2	64.9	100.0	71.8	16.5	11.7	100.0	82.3	17.7
5	1,172	100.0	9.7	62.0	28.3	100.0	57.9	13.1	29.0	100.0	72.7	27.3
Total	12,671	100.0	16.0	51.0	33.0	100.0	40.3	19.5	40.2	100.0	52.8	47.2

*White other than Puerto Rican.

number of their female workers return to work sometime after they have had their children.

A large proportion of the women who work in the area are heads of households or the major contributors to the family income. Thus, while in general women are sometimes considered to be secondary or discretionary components of the labor force, in the study area they constitute primary income sources in many of their households.

The age distribution of persons employed in the South Houston Industrial Area shows substantial concentrations in the categories marked by a high proportion of household heads. Only 15 percent are under 25 years of age. Almost 50 percent are between 25 and 40 years old, and approximately 38 percent are over 40 years of age. The proportion of young workers is somewhat higher in the textile and apparel industries, reaching 21 percent of the total, and lower than the average in the remaining types of establishments, particularly in the wholesaling industry, in which only 4 percent of the employees fall in this age category. On the other hand, two out of three workers in the wholesaling industry in the study area are over 40 years of age, which may reflect a lower rate of turnover and a longer tenure of the workers in this industry.

The prospects for suitable re-employment of the workers depend on whether their industry is expanding or contracting in the city. In manufacturing as a whole, the New York City Department of Labor expects a

decline in employment of 2 percent between 1960 and 1970.[7/] No change is expected in wholesale and retail trades. These projections are based on the continuation of past trends and not on large scale clearance of manufacturing areas that in all likelihood would greatly accelerate the decline in manufacturing and be the cause of one in wholesale trades.

For the employed persons residing in New York, moreover, the occupational opportunities are likely to shift during the current decade from manual occupations to white-collar employment, especially professional, technical, and kindred workers. Among production workers, only craftsmen, foremen, and kindred workers are expected to show an increase in numbers.[8/] Declines of 8 and 19 percent, respectively, are anticipated in the operative and unskilled categories, in which Puerto Rican and Negro workers are now concentrated. These minority groups have considerable difficulty in changing or upgrading their skills because of discrimination in hiring and in the apprenticeship systems of the craft unions. Many already find it impossible to obtain work. At the time of the 1960 Census, the unemployment rate among nonwhite men in Manhattan was 7.9 percent, and among Puerto Rican men, 11.3 percent (Table 12). The rate for male whites resident in Manhattan, other than Puerto Rican, was only 5.8 percent. For all of New York

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7/ New York City Department of Labor, Division of Labor Research, The Manpower Outlook in New York City, 1960-1970. (1962) Table II, p. 8.

8/ Op. cit., Table III, p. 12.

Table 12

Percent of Labor Force Unemployed, By Race and Sex, Manhattan and New York City, 1960

Area	Male	Female
Manhattan		
White	5.8	NA
Nonwhite	7.9	NA
Puerto Rican	11.3	NA
Total	6.9	6.3
New York City		
White	4.2	NA
Nonwhite	6.9	NA
Puerto Rican	9.9	NA
Total	5.0	5.5

Source: U.S. Bureau of the Census. U.S. Censuses of Population and Housing: 1960. Census Tracts. Final Report PHC (1)-104, Part 1. Tables P-3, P-4, P-5. U.S. Government Printing Office, Washington, D. C., 1962.

City, the rates of unemployment among male workers was 4.2 percent for whites other than Puerto Ricans, 9.9 percent for Puerto Ricans, and 6.9 percent for nonwhites.[9/]

The general lack of growth will in part be due to a continuation in the migration of manufacturing firms away from the city. The apparel industry in particular has tended to move away from Manhattan, although much of it has remained in the Metropolitan Area.[10/] If firms move to other loft structures in Manhattan or to nearby Brooklyn or Long Island City, their employees may transfer with them. Those that move to Nassau County or New Jersey, however, except for a few executives, generally hire a new set of employees. Although these firms still make their economic contribution to the region, their former employees are compelled to seek jobs elsewhere and often remain unemployed. If this policy were generally followed by firms that moved from the contracting industrial areas of Manhattan, an increase in unemployment would undoubtedly result.

Summary

Employment conditions in the South Houston Industrial Area compare favorably with the rest of the community. The average hourly

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9/ U.S. Bureau of the Census, Censuses of Population and Housing: 1960, New York, N. Y. Final Report, PHC (1)-104, Part I, Tables P-3, P-4, P-5.

10/ M. Hall (Ed.), Made in New York (Cambridge: Harvard University Press, 1959), p. 74.

earnings are approximately $2.00 per hour and in the various industry groups wage levels are generally higher than the corresponding national averages. Only a minority of the firms consider their businesses seasonal and the area as a whole does not experience any sharp seasonal peak. These favorable conditions have led to considerable stability of employment. At least two of the principal industries of the area, apparel and wholesale trades, have a much better record than corresponding firms in the state as a whole, as indicated by their experience ratings for unemployment insurance.

Employees in the area would face difficulties in finding other jobs, should this contingency arise. Production workers predominate. Employment in production occupations has declined in New York City in the past and the contraction is expected to continue in the next decade. In fact, there appears to be little prospect of expanded opportunity in manufacturing in general. Moreover, many of the employees belong to minority groups, especially Negroes and Puerto Ricans, for whom opportunities for change to non-manufacturing industries or to higher skilled occupations are likely to be limited.

Chapter IV

The Caliber of Business Firms in the Area

Just as wage levels and job stability indicate the quality of employment that a firm offers, so its general business experience provides a measure of its economic contribution to the community, as well as some intimation of its future prospects. The aggregate earnings, the net worth, the length of time that a firm has been in existence, and its growth in the recent past, all are indicators of the financial and economic prowess of the business establishment. When taken in aggregate for the study area, these measures provide significant indexes of the economic status of the firms that operate within that district. The strength of business establishments is not only an indicator of their ability to withstand economic vicissitudes, but it is almost inevitable that the community at large will take special interest in maintaining a salubrious business atmosphere for firms that contribute materially to income and employment.

Gross Business Receipts

Gross business receipts consist entirely of the total payments made to business establishments. They are equivalent in effect to the payments made for the purchase of raw materials by the firms in the area, the disbursements for labor, rent, maintenance and repair, as

well as any financial costs incurred by the firm and profits earned by it. They are in toto then a representation of the aggregate volume of goods and services produced in the area. In a sense, they are roughly analogous to the gross national product of a nation. In 1960, establishments in the study area enjoyed gross business receipts of about $203 million[1/] (Table 13). The largest share, 32 percent of the total, originated in the wholesale trades, and textiles and apparel ranked next with each having 25 percent of total. The shares of the three remaining groups ranged from 13 to 17 percent. About 46 percent of the total receipts were derived from establishments located in the Broadway blocks, a proportion that corresponds closely to its share of employees in the area.

The average firm in the area had gross revenues of $312,000 in 1960 (Table 14). The variation among the different industrial groups was not very great, with printing, chemicals, leather and paper revealing an average of $237,000, miscellaneous manufacturing $254,000,

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1/ Data were taken from a special tabulation prepared by the New York City Department of Finance. The data were tabulated by industry group and location, a degree of subdivision of the data that resulted in some cells containing only one or two establishments. Under these circumstances, the data for these cells were omitted so as not to reveal confidential information (see Footnote 1/, Chapter II). The total gross business receipts, then, as given in the tabulations, is understated by the extent of the revenues received by the omitted firms. In addition, there is the usual downward bias contained in any body of data on income or revenues derived from tax declarations.

Table 13

Gross Receipts of Business Establishments
South Houston Industrial Area, 1960

Industry Group	Broadway Frontage (1)	Broadway Blocks (2)	Rest of Area (3)	Total (2) + (3)
	A. Amounts in Thousands			
1 Textiles & Apparel	30,113	32,861	17,513	50,374
2 Printing, Chemicals, Leather, Paper	11,264	11,619	14,705	26,323
3 Other Manufacturing, Construction	5,800	7,246	27,595	34,841
4 Wholesale	22,169	26,942	38,747	65,689
5 Retail & Services	14,494	15,436	10,256	25,692
Unclassified		5		
Total	83,840	94,109	108,816	202,925
	B. Percentages by Area			
1 Textiles & Apparel	35.9	34.9	16.1	24.8
2 Printing, Chemicals, Leather, Paper	13.4	12.4	13.5	13.0
3 Other Manufacturing, Construction	6.9	7.7	25.4	17.1
4 Wholesale	26.5	28.6	35.6	32.4
5 Retail & Services	17.3	16.4	9.4	12.7
Total	100.0	100.0	100.0	100.0
	C. Percentages by Industry Group			
1 Textiles & Apparel	59.8	65.2	34.8	100.0
2 Printing, Chemicals, Leather, Paper	42.8	44.1	55.9	100.0
3 Other Manufacturing, Construction	16.6	20.8	79.2	100.0
4 Wholesale	33.7	41.0	59.0	100.0
5 Retail & Services	56.4	60.1	39.9	100.0
Total	41.3	46.3	53.7	100.0

Source: Special Tabulation of the New York City Department of Finance.

Table 14

Average Gross Revenue Per Firm and Per Employee
South Houston Industrial Area, 1960

Industry Group	Gross Revenue (000)	Number of Firms	Number of Employees	Average Gross Per Firm (000)	Average Gross Per Employee
1	$ 50,374	169	5,348	$ 298	$ 9,400
2	26,323	111	2,163	237	12,200
3	34,841	137	2,801	254	12,400
4	65,689	161	1,187	408	55,300
5	25,692	73	1,172	352	21,900
Total	$202,925	651	12,671	$ 312	$16,000

textiles and apparel $298,000, and retail and service establishments $352,000. Wholesale establishments on the average revealed the highest gross, $408,000.

Gross revenue per employee, in contrast, showed considerable variation among the industrial groups. The gross per employee in textiles and apparel was $9,400; in the other two manufacturing groups, approximately $12,000; for retail and service firms, $21,000; and for wholesaling establishments, a substantial $55,300. For the area as a whole, the average gross revenue per worker was $16,000.

In addition to displaying substantial gross revenues in 1960, firms in the area have revealed a marked pattern of growth in recent years. During the five-year period 1957-1962, the business volume of approximately two-thirds of the firms increased, approximately one-fifth of the establishments showed little or no change, and only about 15 percent stated that they suffered a decrease in volume (Table 15). The business of three-quarters of the textile and apparel firms increased, the highest proportion among the industry groups, whereas the lowest proportion of firms with increased business, 56 percent, was found in wholesale trades.

Another significant measure of growth is found in the considerable expansion of payrolls that has occurred over the past years. Between 1950 and 1962, the average annual employment in the 130 firms included in the field sample of establishments increased about two-and-one-half

Table 15

Changes in Business Volume of Firms
South Houston Industrial Area, 1957-1962

Industry Group	Total	Percent of Firms		
		No Change	Increased	Decreased
1 Textiles & Apparel	100.0	13.0	72.2	14.8
2 Printing, Chemicals, Leather, Paper	100.0	14.0	69.2	16.8
3 Other Manufacturing, Construction	100.0	25.5	62.1	12.4
4 Wholesale	100.0	27.1	56.3	16.6
5 Retail & Services	100.0	28.1	59.6	12.3
Total	100.0	20.8	64.4	14.8

times, from approximately 2,200 to 5,600 workers. The firms that are now in the area have not only expanded in employment but, in addition, have absorbed space previously vacant or formerly occupied by firms that moved to other quarters or that went out of business. The growth of employment among the firms took place at an average rate of 7.8 percent, compounded annually (Table 16). Among the various industry groups, textiles and apparel showed the largest rate of growth, 10.7 percent per annum, while wholesale establishments and retail and service firms revealed the lowest rates, 3.0 and 3.7 percent, respectively. Thus, even the lower level of the range reveals a rate of growth which is quite satisfactory, being in excess of the national average during the time interval under consideration.

The Financial Status of Establishments

The financial status of a business firm is determined by a large number of factors, including the manner of capitalization, its debt structure, the operating record of the firm, and its earnings' history. Such an analysis of establishments requires a considerable effort, both in the accumulation of the necessary profit and loss and balance sheet statements and in the analysis of their meaning. There are, however, general indexes of the financial stability of establishments other than those just indicated. The length of time that a firm has been in existence is, on the face of it, a demonstration of its viability. Since the demise of business establishments is highest in the early days of existence, continued

Table 16

Average Annual Rate of Growth, 1950-1962, in Number of Employees in a Sample of 130 Establishments South Houston Industrial Area

Industry Group	Number of Establishments	Annual Growth Rate
1 Textiles, Apparel	30	10.7
2 Printing, Chemicals, Leather, Paper	24	6.0
3 Other Manufacturing, Construction	28	8.5
4 Wholesale	32	3.0
5 Retail & Services	16	3.7
Total	130	7.8

survival demonstrates that a firm has been able to meet its operating problems, find its market, and cope with its competition. Net worth is another significant index of strength. Quite obviously, the size of the difference between assets and liability is a measure of the reserve upon which the establishment can depend in time of need and an indication of the extent to which business financing can be undertaken from internal sources. The credit rating of the establishment is another significant measure, for in it we find the depth to which a private firm can draw upon the resources of the total financial community to meet its own needs. These three indicators, based upon measures drawn from the Dun & Bradstreet Credit Reference Book, constitute the basis for the financial analysis of business firms in the study area.

Over three-quarters of the firms in the area are established business enterprises, having been in existence for over a decade[2/] (Table 17). Of the remainder, 12 percent are between five and ten years old, and only 10 percent were established after 1957. There is singularly little variation in age of establishments by industry group. The percentage of firms founded in 1952 or earlier ranges from 74 percent for Group 3 to 89 percent for Group 4, with the remainder standing at approximately 75 percent.

2/ Dun & Bradstreet, Inc., Credit Reference Book, July, 1962. Information on age of firm is available for 426 out of 650 firms in the study area. Absence of a listing does not imply anything regarding its age, net worth, or credit status.

Table 17

Date of Establishment of Rated Companies, By Industry Group
South Houston Industrial Area, 1962

Industry Group	Total		1952 or Earlier		1953 - 1957		1958 or Later	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
1	110	100.0	82	74.5	16	14.5	12	11.0
2	74	100.0	58	78.4	7	9.4	9	12.2
3	114	100.0	84	73.7	18	15.8	12	10.5
4	100	100.0	89	89.0	7	7.0	4	4.0
5	28	100.0	21	75.0	3	10.7	4	14.3
Total	426	100.0	334	78.4	51	12.0	41	9.6

Source: Dun & Bradstreet, Inc. Credit Reference Book, July 1962.

A comparative analysis of the ages of firms in two of the largest industries in the area with those in the same industry in Manhattan indicates, moreover, that the firms in the study area are significantly older as a group than similar firms in Manhattan. Random samples of the apparel industry and of wholesale trades were taken, each consisting of one hundred Manhattan firms, and their age distribution computed. As shown in Table 18, each of the industries in the study area has a substantially greater proportion of firms more than ten years old than exists among their counterparts elsewhere in Manhattan.

The median net worth of the 192 firms for which ratings were available amounts to $41,000 (Table 19). This figure differs widely among industry groups, with wholesaling establishments revealing a median worth of $74,000, textiles and apparel $51,000, and, as one would expect, retail and service shops showing the lowest net worth, a median of $12,500. For the most part, the financial status of establishments is modest. Fifty-five percent have a net worth of less than $50,000, and 23 percent fall between $50,000 and $125,000. There are a few larger firms. For example, 5 percent enjoy a net worth between $300,000 and $750,000, and 2 percent of the establishments have a rating of $1 million or more.

Firms in the study area have a considerably larger net worth than comparable establishments in the remainder of Manhattan (Table 20). The median net worth of apparel firms in the study area is approximately 16 percent larger, and wholesale trade firms almost 60 percent larger,

Table 18

Percent Distribution of Date of Establishment
of Apparel and Wholesale Trade Companies
South Houston Industrial Area and Manhattan, 1962

Date	Apparel Percent of Total		Wholesale Trade Percent of Total	
	SHIA	Manhattan	SHIA	Manhattan
1952 or earlier	75.0	64.0	89.0	78.0
1953-1957	14.6	16.0	7.0	10.0
1958 or later	10.4	20.0	4.0	12.0
Total	100.0	100.0	100.0	100.0

Source: Dun & Bradstreet, Inc., Credit Reference Book, July 1962.

Table 19

Net Worth of Rated Companies, By Industry Group
South Houston Industrial Area, 1962

Net Worth $ (000)	Total	Group 1	Group 2	Group 3	Group 4	Group 5
Under 5	5	-	-	2	-	3
5-9	10	1	3	3	-	3
10-19	39	10	6	10	7	6
20-34	36	15	6	12	2	1
35-49	16	9	2	2	3	-
50-74	26	14	1	1	9	1
75-124	19	8	2	1	8	-
125-199	13	4	1	5	3	-
200-299	15	6	2	2	5	-
300-499	6	2	-	2	2	-
500-749	3	2	-	-	1	-
750-999	-	-	-	-	-	-
1,000 and over	4	1	-	1	1	1
Total	192	72	23	41	41	15
Median $ (000)	40.6	51.1	26.2	26.9	74.2	12.5

Source: Dun & Bradstreet, Credit Reference Book, July 1962.

Table20

Percent Distribution of Net Worth of Rated Companies in the Apparel Industry and in Wholesale Trade South Houston Industrial Area and Manhattan, 1962

Net Worth $ (000)	Apparel Percent of Total		Wholesale Trade Percent of Total	
	SHIA	Manhattan	SHIA	Manhattan
Under 5	-	1.0	-	1.0
5-9	1.6	3.0	-	3.0
10-19	15.6	19.0	17.1	15.0
20-34	17.2	18.0	4.9	19.0
35-49	12.5	13.0	7.3	15.0
50-74	18.7	14.0	22.0	9.0
75-124	12.5	10.0	19.5	12.0
125-199	6.3	8.0	7.3	6.0
200-299	7.8	4.0	12.2	8.0
300-499	3.1	2.0	4.9	1.0
500-749	3.1	1.0	2.4	3.0
750-999	-	1.0	-	2.0
1,000 and over	1.6	6.0	2.4	6.0
Total	100.0	100.0	100.0	100.0
Median $ (000)	52.5	45.4	74.2	47.0

Source: Dun & Bradstreet, Inc., Credit Reference Book, July 1962.

than similar establishments in the remainder of Manhattan. Clearly, these two industry groups in the study area contain substantial establishments when compared with the other firms in their industries.

The Dun & Bradstreet credit rating is a composite of two major ingredients, the net worth of the establishment and the readiness with which it has repaid obligations in the past. Since net worth has already been discussed in the previous paragraphs, this section is restricted to that portion of the credit rating which indicates the reliability of the firm. For purposes of this analysis, establishments in the study area were classified according to the Dun & Bradstreet categories of "high," "good," "fair," and "limited." One-quarter of the establishments in the study area received ratings of "high" and an additional 44 percent of "good" (Table 21). Thus, over two-thirds of the total number of business establishments were placed in a preferred credit category. Moreover, 30 percent were rated "fair" and less than 2 percent placed in the "limited" credit classification. To put these figures for the study area in their proper perspective, once again we resorted to comparison with similar establishments in the rest of Manhattan, and once again the comparison revealed the establishments in the study area to be above the average for the borough as a whole. Among the apparel firms, 31 percent were rated "high," compared with only 15 percent in this category in the remainder of Manhattan. Wholesale trade in the study area revealed a slightly higher proportion of establishments in the "high" credit rating

Table 21

Credit Rating Compensated for Financial Strength
of Rated Companies, By Industry Group
South Houston Industrial Area, 1962

Industry Group	Ratings					Percent of Firms
	Total	High	Good	Fair	Limited	Rated High or Good
1 Textiles & Apparel	72	21	33	17	1	75.0
2 Printing, Chemicals, Leather, Paper	23	3	8	12	-	47.8
3 Other Manufacturing, Construction	41	10	17	14	-	65.9
4 Wholesale	41	12	17	12	-	70.8
5 Retail & Services	15	1	10	2	2	73.3
Total	192	47	85	57	3	-
Percent	100.0	24.5	44.3	29.7	1.5	68.8

Source: Dun & Bradstreet, Inc., Credit Reference Book, July 1962.

category when compared with the rest of Manhattan, but was somewhat inferior in the proportion of firms that received "good" credit ratings (Table 22).

Summary

On the basis of evidence presented in this chapter, there is little doubt regarding the sound status of the establishments in the South Houston Industrial Area. Their gross receipts are ample, expressed both as an aggregate and as an average gross revenue for the various types of establishments in the area. Firms have revealed a substantial measure of growth, particularly in the recent past, and have maintained their progress in the face of sharp price competition and rising costs. The financial status of establishments, whether expressed in terms of net worth or credit rating, is of a high order and compares favorably with similar establishments in the remainder of Manhattan. On the whole, therefore, despite the shabby appearance of the buildings and the drabness of the district, the establishments in the study area are substantial and stable business firms.

Table 22

Percent Distribution of Credit Ratings Adjusted for Financial Strength of Rated Companies in Apparel and Wholesale Trade South Houston Industrial Area and Manhattan, 1962

Credit Ratings	Apparel Percent of Total		Wholesale Trade Percent of Total	
	SHIA	Manhattan	SHIA	Manhattan
High	31.2	15.0	29.3	27.0
Good	46.9	57.0	41.4	52.0
Fair	21.9	25.0	29.3	21.0
Limited	-	3.0	-	-
Total	100.0	100.0	100.0	100.0

Source: Dun & Bradstreet, Inc., Credit Reference Book, July 1962.

Chapter V

Operating Problems of Firms in Multi-Story Buildings[1/]

For many firms in the study area, difficulties and diseconomies result from their location in multi-story buildings. Firms that spread over several floors are handicapped in their efforts to obtain an efficient layout and in the control and management of their operations, particularly materials handling. These problems are intensified by the fact that most of the loft buildings in the area have dimensions smaller than 30 x 100 feet so that less than 3,000 square feet, a relatively small amount of space, is available on each floor. These factors militate against the maximum efficiency of space utilization in the South Houston Industrial Area or in any other loft area.

Materials handling problems exist in all industrial operations. Materials handling is the transport of work in process or of finished product between manufacturing operations or internal locations. It does not add anything to the value of the product and, therefore, its minimization has long been one of the chief objectives of sound industrial engineering. Materials handling encompasses a variety of tasks not all of which are affected by the arrangement of the building. Machine loading and

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1/ A description and analysis of the buildings in the South Houston Industrial Area, including an account of the inventory, structural characteristics, and range of quality, is presented in Part B of this study.

orientation of the work piece, for example, are important materials handling problems in apparel manufacture, although they have nothing to do with the building. The transport operations between machines, however, are decisively affected by the way the plant is laid out.

The costs of materials handling are considerable, but because they are often closely associated with other production costs, many firms have little idea of how high they are. The industries of the study area may generally be classified as light fabrication and bench work. In this group, materials handling costs have been estimated at from 6 to 10 percent of the wage bill.[2/] Moreover, half of this or more is usually paid employees who do no other work. In warehouses, the entire production work force is usually engaged in some form of materials handling, such as sorting, repacking, or simply transferring materials in and out of storage. Clearly, there are strong potentialities for savings here. In testing the economic utility of a building, therefore, it is necessary to find out to what extent its layout inhibits the realization of these cost reductions. In the study area, this means an analysis of the deleterious effects of multi-story layouts.

The Extent of the Problem

Except for the few that are located entirely on the street floor, all the firms in the study area are affected to some degree by operational

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2/ "Factory's 1960 Audit Guide," Factory, Vol. 117, No. 12, (Dec. 1959), p. 55.

problems related to the building type. Firms on the ground floor usually have separate entrances and thus avoid both elevators and crowded building lobbies in the movement of goods and persons. Only 7 percent of the firms, however, have these advantages and more than half of them are retail and service establishments.

The effects of the operational shortcomings of the buildings on the other firms depend on the number of floors occupied. Firms located on only one floor use elevators only for the receipt of raw materials and the shipment of finished products. Though this still involves waiting for elevators at certain times and contending with congested lobbies, such occasions for delay are much less numerous than when elevators have to be used for internal transportation as well. The layout of the firm is also not affected by the need to split activities among floors.

In the study area, 52 percent of all firms, including those on the first floor only, occupy one floor or less and are thus able to avoid the worst of the operational difficulties (Table 23). Almost 70 percent of the firms in the textile and apparel group and in the printing, chemicals, leather and paper industries are so situated. The firms in other manufacturing and construction and those in the wholesale trades have the lowest proportion of single-story operation, 36 and 40 percent, respectively.

Table 23

Percent Distribution of Firms by Number of Floors Occupied, By Industry Group South Houston Industrial Area, 1962

Industry Group	Total	Number of Floors	
		One or Less	Two or More
1 Textiles & Apparel	100.0	69.2	30.8
2 Printing, Chemicals, Leather, Paper	100.0	68.5	31.5
3 Other Manufacturing, Construction	100.0	36.2	63.8
4 Wholesale	100.0	40.4	59.6
5 Retail & Services	100.0	55.4	44.6
Total	100.0	51.6	48.4

Many firms thus conduct their operations on several floors. Most of them have only two or three floors, but about 8 percent of the wholesale firms have four or more, usually occupying an entire building. A few in other industries also have that much space. All these firms are affected in varying degrees by the problems inherent in their operations under modern conditions of costs and technology.

Historical Reasons for Multi-Story Operations

Multi-story operations are generally considered obsolete for many of the types of industry found in the study area. When the buildings were constructed, however, there were sound reasons why they were highly appropriate as factories. Apart from the locational factors discussed in Chapter II, there were two main technical reasons for stacking the space vertically. First, before 1900, there was a marked contrast in the degree of mechanization of horizontal and vertical transportation of material in process. Powered elevators existed at an early time, long before horizontal conveyors, powered industrial trucks, or similar equipment were used. Elevators thus provided a relatively fast method of transportation compared with the slow hand trucks and hand carrying which were then the standard methods of moving material from one work station to another. Today, the intermittent operation of elevators is at a severe cost disadvantage compared with the continuous movement of material by conveyors.

Secondly, machines depended on a central source of power. This was typically in the form of a large steam engine, which was connected by means of elaborate drive arrangements to each floor, where the power was in turn distributed to individual machines by overhead line shafts. The maximum horizontal distance of a machine from the prime mover was limited in order to prevent excessive twisting of the line shafts.

In the study area, power supply was initially a less important problem because relatively few firms used powered machines extensively. Only machine shops and other light manufacturing firms had to resort to a line shaft system on each floor to serve their machines, driven by one of the large, heavy and expensive prime movers of the time, the high ceilings of the buildings permitting the installation of the drive mechanism well above the work space. Sewing machines, however, were hand driven well after the buildings were erected. In the early 1920's, electric motors were successively reduced in size, weight, and price. It became possible to mount them on individual machines, which could then be put virtually anywhere on a plant floor, their position determined solely by good layout practice.

Layout of Operations

Production operations may be laid out according to the product made or according to the operation performed. The first method requires the arrangement of a set of machines in sequence to produce a

certain product, with relatively little possibility of major change in output. Such methods are typically employed in industries in which the range of product is limited. In the second method, machines are grouped by type, and the materials are shunted back and forth between them as required. Such process layouts involve much more handling than product layout, but they have greater flexibility and can be adjusted to a wide variety of products. Establishments in which process layout predominates are known as job shops. A substantial majority of the manufacturing firms in the study area are in this category.

Whichever method is adopted, it is clear that departmentalization of the production process is involved in any but the simplest production operations. Even in a commercial warehousing operation it will usually be found advantageous to keep different classes of inventory in different locations.

The need to spread operations over several usually equally-sized floors can be a severe handicap to the efficient arrangement of individual departments, since not every department requires the same amount of floor space. This restriction can lead to two practical difficulties. First, departments may have to be split up among floors if they require more space than is available on one. Secondly, the need to avoid such an unsatisfactory arrangement may lead to overcrowding on one floor and wasted space on another. Crowding leads to reduced productivity and, by preventing adequate storage of material at work places, may frequently

leave individuals waiting for work. Wasted space, on the other hand, tends to lead to the accumulation of unnecessary inventories and, generally, to bad housekeeping.

One group of firms, to be sure, still apparently obtains an advantage from using several small floors that have relatively large wall areas. When waste materials or used paper boxes have to be stored, it is often difficult to bale and stack them in such a way that the pile stands up by itself and it is useful to be able to lean such materials against a wall. The same effect, however, could be obtained in a single-story layout merely be providing suitable partitions, and the other advantages of single-floor layout could then also be realized.

Elevator Service

For most of the firms, multi-story production systems have disadvantages that go beyond merely those of space utilization. The firms depend on elevator systems in which delays are inevitable, and they are also prevented from using modern equipment for horizontal materials handling. Most firms in the study area rely on elevators for their vertical transportation. There are a few warehouses in which pulleyblocks and hatchways are used, and in a few firms in all industry groups there are chutes that augment the elevators in certain special

locations. A few structures are walkups.[3/]

The quality of elevators is defined by the numbers and capacities of those in use and by the speed with which service is rendered. It is also relevant to examine the characteristics of the traffic flow of the elevators. An excess of empty trips, for example, would indicate an inefficient use of the system because it would tend to increase waiting times.

In most buildings, there is only one elevator. About half the firms in the textile and apparel industries, however, are in the larger buildings which have two or more elevators. Very few structures have three or more. In the other industry groups, single elevators are the rule.

In the field survey, most of the firms reported that they were satisfied with their elevator service. Only 17 percent were not. The highest proportion of complaints was found in the textile and apparel field, in which 30 percent of the firms were dissatisfied, and the lowest, 8 percent, in the wholesale trades.

3/ Over 60 percent of the 244 buildings in the study area are five and six stories in height, with the remainder equally divided among higher and lower structures. In only a few cases, however, do one-story structures occupy the site or are buildings over nine stories encountered. Among the 37 buildings which are three stories or less, all but one lack elevators, although many of the second and third stories are utilized for the processing or storage of goods. Among the structures that contain four or more stories, 23, or 11 percent of the total number of buildings, use lifting devices other than elevators. In 10 buildings, hoists are used. A winch is used in one case and a conveyor in another. In three structures (one four-story and two five-story buildings), goods were carried up and down by hand. In eight cases, the upper floors were permanently closed off or temporarily vacant.

Dissatisfaction with elevator service can be due to excessive delay or insufficient capacity. The complaints that exist are mostly about the former. A few firms stated that it took eight minutes or more to get service. Such delays can have several causes. For example, if there is only one elevator in a building, it must be used for both freight and passengers. In addition, several tenants may receive deliveries or make shipments at the same time, which may cause crowding in the first floor lobbies and delays in loading and unloading. Single tenancy and low passenger loads undoubtedly help explain the high degree of satisfaction among wholesale firms.

The elevators in the study area are for the most part of relatively low capacity. About 45 percent can carry one ton or less, 45 percent two tons, and the rest three tons or more. Nevertheless, they appear to be sufficient for the light operations of the area. In several of the industries, the loads have low specific weight and the capacities of the elevators are limited by the volumes of their cages rather than by maximum allowable loads.

When used for internal handling, the elevator traffic flow is generally balanced between upward and downward trips, which tends to minimize empty journeys. A few firms have a greater flow upwards, such as may occur when components are made on lower floors and assembled on an upper one. The reverse of this arrangement is usually preferred because the firm can then use chutes to bring small components

down to a lower assembly floor, thus avoiding the use of elevators. There is little backtracking, however. Products made on one floor usually do not have to be returned to the same one after intermediate work on another.

There is a relatively stronger imbalance in the flow of deliveries and shipments. The latter are more numerous, but in buildings where the elevators must also be used for internal handling, this external volume is usually relatively small. The greater number of shipments results from the distributive character of wholesale trades and of many of the industries of the area.

The elevator systems thus appear to be generally equal to their tasks, given the physical setting of the area. The use of elevators in any form, however, for internal handling generally results in extra costs, especially in materials handling, since it has a strong inhibiting effect on the modernization of horizontal transportation systems.

Horizontal Transportation

The disadvantages of multi-story layouts in horizontal materials handling lie in the longer distances over which the material must be moved and the technological shortcomings created by the interposition of elevators. A multi-story layout usually requires transportation over longer distances than a corresponding single-floor operation. If material is to be transferred to another place only a few feet away horizontally but separated by a floor or two, it is necessary to bring the material

to the elevator, which may be a substantial distance away, wait for service, ride up or down and then carry the material over a corresponding horizontal distance. If the floors were laid out next to each other, only a single short horizontal transfer would usually be required.

This general condition may take on special meaning in the type of structure found in the study area. Some multi-story firms try to arrange each department according to single line flow in order to have modern layouts at least within departments. This results, however, in either the raw materials or the finished product winding up at the end of the floor remote from the elevator which, in the study area, is usually near the front or narrow side of the building. Thus, all material must be carried the whole length of the department.

A way around this difficulty might be to lay out operations in horseshoe fashion so that all material starts and finishes its production cycle near the elevator. Unfortunately, it is usually hard to create such a layout in a width of 25 feet and, moreover, raw materials and finished product would tend to clutter up the entrance to the department, a marked safety hazard. A firm with a multi-story layout thus has little alternative to material hauls that are, on the average, substantially longer than in single-story arrangements.

A second drawback of multi-story operation in material handling is in the obstacles it creates to the introduction of modern materials handling equipment. Two categories of machines are usually involved,

powered or gravity conveyors and industrial trucks (fork trucks or lift trucks). Conveyors give continuous service, but their routes are restricted and they can only be justified where the traffic volume warrants. Industrial trucks are largely two-dimensional in coverage, although they may, in fact, be able to do some lifting as well. They are intermittent in service, although they are much faster than hand trucks and have greater capacity.

A multi-story layout, however, interposes technical difficulties in the use of both types of equipment. A conveyor is a reasonably cheap and fast means of transporting materials over regular routes. A whole group of them cannot converge on the elevator on one floor and spread out again on another, even if there were room to do this. First, the whole advantage of continuous service by conveyor is thereby lost and, secondly, the length and cost of the conveyors would be greatly increased.

Fork or other industrial trucks are also handicapped. To take advantage of their speed and capacity, they have to be in revenue service as much as possible. If they have to spend their time waiting for elevators, they are wastefully used. If they ride up and down, moreover, their relatively high weight appreciably reduces the pay load of the elevator. It would probably be economically unfeasible to avoid this by buying a truck for each floor. The different intensity of floor space utilization on each floor also presents difficulties. On a crowded floor it may be physically impossible to have wide enough aisles for

the trucks to operate or to be able to turn, load, or unload properly.

Both kinds of equipment save manhours at the cost of a capital investment. The economic justification of this in a given case depends on whether or not it is possible to take full advantage of the technical potential of the equipment and on the number of specific employees that can be transferred from materials handling work. It is not enough merely to "save" manhours spread over many employees. The fact that men are employed on nothing but materials handling usually assures that there are at least some that could be eliminated.

These difficulties in justifying new methods are undoubtedly factors in the relatively small amount of modern equipment to be found in the study area. The survey indicates that little mechanized equipment is in use, aside from a few conveyors and fork trucks that are used mostly by printing and paper firms and by the wholesalers. It is estimated that there are only about 40 lift or fork trucks in the area. Hand trucks appear to be the standard method of materials handling in the apparel and textile firms as well as in the other industry groups.

The layout and operating conditions in many cases militate strongly against the adoption of modern methods of materials handling. On the other hand, such conditions leave the way open for possible savings that could be realized if single-story layouts could be provided for the firms concerned.

The Problems of Management

Multi-story layouts are also at a relative disadvantage in assuring effective control and supervision of the operations. Foremen or managers can generally see only relatively small areas at a time and the opportunities for pilfering, idling, and misplacement of materials are correspondingly multiplied. To counteract these potential troubles, firms may have to put in extra supervisory personnel so that someone in authority is on each floor. Production control, inventory control, and employee discipline are all involved in these operational difficulties which may be responsible for a considerable monetary loss.

The firms in the area with multi-story operations are generally aware of these impediments to efficient operation. Almost three-quarters of them consider that they would be better off on one floor and cite improved control and cost reduction as the principal effects of such a change. Measured against the size of the industrial population of the study area, however, the incentives have thus far been rarely translated into action. Of the 19 firms that moved between 1957 and 1959, eight had single-story layouts in the study area and kept to them. Eight more firms changed from multi-story to single-story operation. Only two firms changed from one to two floors, and one firm kept to its multi-story layout. Thus, when a move took place, most firms with multi-story layouts took advantage of their opportunity to eliminate a source of inefficiency in their production system. Others would very likely take similar action if they had to move.

Summary

Multi-story operations of the type carried out by almost half of the firms in the study area could be justified in an earlier time, but developments in technology and management have rendered them obsolete. Under present conditions, such operations greatly complicate the task of allocating floor space among departments efficiently. They are also dependent on an elevator system which, in addition to operational shortcomings and delays of its own, strongly inhibits the introduction of modern materials handling equipment of the type that has usually led to substantial cost savings in other firms. As a result, relatively costly manual methods of materials handling are the most widely used in the area.

The firms in the area with multi-story operations are generally satisfied with the elevator service they have, but they are equally aware of the deficiencies of their layouts and of the extra cost and loss of control that results. A substantial majority would like to make the change to single-story layout, and several of the small number of firms that moved did so. Opportunities for cost savings due to such rearrangements are, therefore, well accepted and are important elements in evaluating alternative uses of the study area.

Chapter VI

Space Utilization

The amount of space required by an establishment for its operations represents one of the major points of contact between the economic and engineering or architectural components of the real estate or planning world. In order to carry out its functions most efficiently and comfortably, each establishment has its own requirement for physical accommodation. In the previous chapter the types of facilities and arrangement of space were considered. In this chapter the amount of space is discussed.

The amount of space utilized by a firm is a consequence of a number of factors. The scope and magnitude of its activity dictate the minimal requirement, but the actual amount of space acquired initially by the firm is the resultant of such elements as the amount of rent, lease commitments, the availability of space, and the locational requirements of the establishment. The extent of space actually utilized at any moment in time represents a compromise among all the considerations that enter into the decision regarding its use. For the city as whole, the accumulation of the compromises made by each firm with its own specific needs provides us with a body of experience that enables us to arrive at certain empirical conclusions regarding characteristic usage of space by establishments of different types and sizes.

Radical departure from the average experience may indicate excessive overcrowding on the one hand or profligate use of space on the other. If space is used excessively as a consequence of abnormally low rents, and if the low rents prevail because building accommodations are obsolete and in disrepair, and if, in turn, such buildings occupy strategic or preferred locations within the community, then this chain of circumstances constitutes an occasion for re-examination of the land-use pattern of which such a constellation is a part. Conversely, if it is found that in low-rent areas space is used moderately and economically by the resident establishments, then it may be assumed that the same principles that govern rent expenditure in areas of higher building quality also prevail in sections in which older and obsolete structures dominate the supply.

Distribution by Type of Firm

There are approximately 5.4 million square feet of floor space in buildings in the South Houston Industrial Area. The two major space users are the industrial groups containing the textile and apparel firms and the wholesale establishments, each of which occupies approximately 30 percent of the total space. Next in importance are all other types of manufacturing, which occupy 20 percent of the aggregate, and the printing, chemical, leather and paper firms, which account for 14 percent of the space. Retail and service firms account for the remainder, approximately 10 percent of the total.

The average firm in the study area occupies 8, 220 square feet of floor space. As one would expect, however, there is very wide variation in the amount of space used by establishments in different types of activities, a fact which is concealed by the relative similarity in the average amount of space used in each of the five major industry groupings that have been employed in the analysis thus far. These figures reveal, for example, that the range in the average space per establishment runs from 6, 700 square feet for Group 2 to 9, 700 square feet for Group 4. An examination of the components of each of these groups, made possible by the data presented in Table 24, shows that the range is indeed much greater. The average floor space occupied by several types of establishments, including paper manufacture, automobile, hardware, and machinery wholesaling, and paper and furniture wholesaling is in the vicinity of 14, 000 square feet. These are firms whose activities involve a considerable amount of storage. On the other hand, aside from eating and drinking places, 3, 500 square feet appears to be the smallest average for the subgroups, with the typical firm occupying between 6, 500 and 10, 000 square feet of space. There are a relatively small number of users of very large space in the area. Several firms occupy between 35, 000 and 40, 000 square feet of space, a few utilize 50, 000 to 75, 000 square feet, and one or two have in the vicinity of 100, 000 square feet. A number of these larger establishments occupy

Table 24

Total Floor Space, Average per Firm and per Worker, By Type of Establishment
South Houston Industrial Area, 1962

Type of Establishment	Number	Total Employment	Total Floor Space (000 sq. ft.)	Average Floor Space per Firm	Average Floor Space per Wo
Textile Mill Products	29	693	210.3	7,250	303
Apparel Manufacturing	140	4,655	1285.8	9,180	276
Total Group 1	169	5,348	1496.1	8,850	276
Paper	23	444	312.8	13,600	704
Printing	48	687	269.1	5,610	392
Chemicals, Rubber, Leather	40	1,032	162.3	4,060	157
Total Group 2	111	2,163	744.2	6,700	344
Contract Construction	20	411	294.8	14,740	717
Lumber-Furniture	17	204	144.3	8,490	707
Misc. Machinery, Metal Products	50	1,290	322.0	6,440	250
Misc. Manufacturing	50	896	296.9	5,940	331
Total Group 3	137	2,801	1058.0	7,720	378
Auto, Hardware & Machinery	17	136	248.2	14,600	1,825
Apparel Wholesaling	35	265	255.2	7,290	963
Scrap and Waste Material	50	273	387.4	7,750	1,419
Paper and Furniture	46	414	646.2	14,050	1,561
Other	13	99	35.8	2,750	362
Total Group 4	161	1,187	1572.8	9,770	1,325
Transportation Services	7	38	24.7	3,530	650
Retail Establishments	11	161	63.9	5,810	397
Eating & Drinking Places	14	115	11.1	790	97
Personal & Business Services	41	858	415.3	10,130	484
Total Group 5	73	1,172	515.0	7,050	439
Grand Total	651	12,671	5386.1	8,270	425

the entire building and, in some instances, also utilize space in adjacent or nearby quarters.

Distribution by Type of Activity

A multiplicity of activities are conducted by even the smallest and simplest of establishments in carrying out their functions. For the larger and more complex firms these activities may be departmentalized and, in some instances, physical separation may take place if the departments are large enough and have varying locational requirements. In any event, classifying the use of land by the type of structure that is located on it, or even by the predominant function of the major establishments occupying the structures, cloaks the variety of activities that take place within a given area. In the field survey conducted for this study, establishments were asked to report the amounts of space devoted to their major types of activities, which were classified into five categories. The first was space devoted to office and administrative use, the second to the production of commodities, the third to showroom and sales areas, the fourth to warehousing and storage, and the fifth category included space devoted to transportation, utilities, washrooms, etc. When these data were tabulated for the area as a whole (Table 25), it was found that 51 percent of the aggregate floor space in the South Houston Industrial Area was devoted to the production of goods and 29 percent to warehousing and storage. Offices occupied 7 percent of the space and

Table 25

Amount of Floor Space by Type of Activity and Industry Group
South Houston Industrial Area, 1962

Industry Group	Total	Office	Production	Sales	Warehouse & Storage	Other
A. Amount of Floor Space in Thousands of Square Feet						
1 Textiles & Apparel	1,491.6	71.9	1,083.5	21.4	199.4	115.4
2 Printing, Chemicals Leather, Paper	745.4	49.7	606.0	9.5	48.6	31.6
3 Other Manufacturing Construction	1,051.4	118.8	490.6	6.9	267.1	168.0
4 Wholesale	1,566.3	102.3	296.8	143.5	908.9	114.8
5 Retail & Services	515.7	36.4	231.1	18.3	134.9	95.0
Total	5,370.4	379.1	2,708.0	199.6	1,558.9	524.8
B. Percentages by Type of Activity						
1 Textiles & Apparel	27.8	19.0	40.0	10.7	12.8	22.0
2 Printing, Chemicals Leather, Paper	13.9	13.1	22.4	4.8	3.1	6.0
3 Other Manufacturing Construction	19.6	31.3	18.1	3.4	17.1	32.0
4 Wholesale	29.0	27.0	11.0	71.9	58.3	21.9
5 Retail & Services	9.6	9.6	8.5	9.2	8.7	18.1
Total	100.0	100.0	100.0	100.0	100.0	100.0
C. Percentages by Industry Group						
1 Textiles & Apparel	100.0	4.8	72.6	1.4	13.4	7.8
2 Printing, Chemicals Leather, Paper	100.0	6.7	81.3	1.3	6.5	4.2
3 Other Manufacturing Construction	100.0	11.3	46.7	0.6	25.4	16.0
4 Wholesale	100.0	6.5	19.0	9.2	58.0	7.3
5 Retail & Services	100.0	7.0	44.8	3.5	26.2	18.5
Total	100.0	7.0	50.5	3.7	29.0	9.8

sales and showrooms 4 percent. Miscellaneous activities accounted for the remainder. The area thus is predominantly devoted to processing and production activities. As one would expect, the highest proportion of space devoted to production was found in Industry Groups 1 and 2, in which 73 percent and 81 percent, respectively, of the total was devoted to this activity. In Group 4, wholesale trade, where one would expect space to be almost entirely concentrated in warehousing and storage, 19 percent of the total is devoted to production and 9 percent to sales and showrooms. Looking at the figures from another perspective, that is from the point of view of the concentration of space in each of the major activities, it is found that 40 percent of all space in production is concentrated in Group 1, 72 percent of all sales and showroom space in Group 4, and 58 percent of all warehouse and storage space is also in Group 4.

Floor Space per Worker

Floor space per worker is a versatile measure which has been used for a wide variety of purposes in generally different fields. In projecting future space needs, this ratio enables projections of employment to be translated into requirements for floor space and land. In cost accounting, it provides a measure of the relationship between labor cost and rent. In industrial engineering, the ratio serves as a measure of the efficiency of alternative space arrangements. In municipal planning,

it provides an index of the efficiency with which space in scarce strategic locations is being utilized.

A low ratio of floor space to work force for any firm or type of industry when taken by itself is, of course, not necessarily an indication of efficient use of space. Ideally, this ratio should be compared with a standard ratio of floor space per worker, computed so that there is the optimum deployment of all factors of production - that is, so they are arranged to provide the highest revenue - for any given type and size of establishment. Such a measurement is outside the scope of this study, but a reasonable approximation is available in the plans that have been made for the proposed 415-acre College Point Industrial Park and the proposed 747-acre Staten Island Industrial Park shortly to be built in the City of New York. In these circumstances, where the arrangement of space is not limited by existing structures or by archaic street patterns, the average amount of floor space allowed each employee is in the vicinity of 500 square feet. This is a rather ample amount, which represents a greater utilization of machines and other mechanical equipment than would ordinarily be encountered in the older, built-up industrial sections. In Manhattan as a whole, the loft establishments provide approximately 380 square feet of space per worker. Essentially, in the South Houston Industrial Area, the over-all ratio is 425 square feet per worker. In aggregate, therefore, if comparisons are limited to the total figures alone, admittedly a faulty and inadequate basis for serious judgment,

both loft buildings in general in Manhattan and industrial space in the study area compare favorably with an ideal measure. When taken by major industry group, the ratio shows remarkably little variation for four of the five categories, which tend to cluster around the average for the area. The fifth industry group, wholesale trade, allocates 1,320 square feet of space per worker.

Some limited comparisons are possible between space per worker in the area and in Manhattan for a few specific types of similar establishments (Table 26). Unfortunately, the data for Manhattan as a whole are quite old, having been published in June, 1949. Moreover, the data refer to an unspecified earlier period, which is generally accepted to be the late 1930's or early 1940's.[1/] In general, when specific comparisons are made for more or less similar types of establishments, the floor space per worker in the study area is considerably larger in four instances and about the same in three of the seven comparable categories. Even though a greater degree of storage and warehousing occurs in the study area, even among manufacturing establishments, than is encountered elsewhere in Manhattan, these figures would appear to indicate that some establishments in the study area utilize space more generously than those located elsewhere. It must be kept in mind, however, that an interval of approximately two decades elapsed between

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1/ Harrison, Ballard & Allen, Business and Industrial Requirements, Technical Report No. 3, June, 1949.

Table 26

Floor Space per Worker, by Selected Types of Establishment
South Houston Industrial Area 1962, and Manhattan 1949

SIC Code	Type of Establishment	Floor Space per Worker (sq. ft.)	
		SHIA	Manhattan
22	Textiles	303	206
23	Apparel	276	160
26	Paper	704	460
27	Printing	392	347
31	Leather	157	145
36	Electrical Machinery	206	208
39	Misc. Manufacturing	331	264

Source: Manhattan data from Harrison, Ballard & Allen, Business and Industrial Requirements, Technical Report No. 3. June, 1949.

the two measurements that have been discussed and, therefore, that considerable alteration in the general averages may have taken place during this protracted interim period.

Conclusion

Despite the ambiguities which are present in the comparison of the extent of space usage presented in this chapter, there is no evidence that floor space is being used wastefully in the South Houston Industrial Area as a whole. In some types of activity, notably some of the components of wholesale trade, there is a much greater ratio of floor space per worker than in the other activities. This, however, is to be expected by virtue of the nature of the business.

Chapter VII

Linkages and Transportation

Linkages are those interactions between firms or groups of firms and other establishments which occur sufficiently often to establish a regular flow of goods and persons. The efficiency with which the necessary exchanges take place is determined by the character of the transportation system and other traffic channels.

Linkages encompass the dominant external transactions of a firm and thus are the product of its functions. To understand them fully for any area would require an investigation of the sources of raw materials, the markets, employment, and business negotiations of each firm, a depth of analysis that is beyond the scope of this study. It is possible, however, to identify the major transactions and patterns of movement which are important to the operations of the firms in the area, and in this manner present a first approximation of a linkage analysis.

Relations are maintained with suppliers, customers, competitors, employees, and with other individuals that visit the area on business. Linkages with suppliers and customers are indicated by the principal origins and destinations of the goods produced or traded in the study area. Thos with employees are shown by the distribution of their residences. For persons other than employees, the prevalence of visits

and the geographic origins of the visitors are relevant. The geographic distribution of competing firms is also important, for it indicates the degree of dispersion of the market of which firms in the study area are a part.

Some linkages are served by proximity while others depend upon existing channels of movement for their effectuation. Other things being equal, a firm will seek to be as close as possible to those establishments that have the most significant impact on its net income position. The relative proportion of proximate linkages indicates the extent to which an area constitutes a cohesive and self-sufficient industrial community in which a high proportion of the needs of establishments can be met within a very narrow radius. On the other hand, the linkages that exist with establishments in other parts of the city, especially in Manhattan, reflect the degree to which the area is woven into the commercial life of the entire community.

Linkages with Suppliers

The geographic distribution of suppliers and the intensity of the linkages with them indicate the degree of dependence by the firms of an area on others in their own vicinity or elsewhere. There are two types of transactions with suppliers. One is the purchase of raw materials and parts. For this type to be significant, materials must be shipped frequently and in substantial amounts. The second type of transaction

consists of those which occur less frequently but are nevertheless crucial to the operation of the production system of the firm, and thus of an urgency lacking in other purchases. The principal example of this type are the supply of spare parts or repairs of machinery.

To obtain an estimate of the distribution and intensity of the first type of linkage, the firms in the field survey were asked to classify the movements of incoming supplies by area of origin and by frequency. Those movements occurring more than once a day were considered significant. The proportion of firms in each industry group having this frequency of movement from another area or from South Houston itself established the importance of the linkage.

The study area clearly emerges in all industry groups as the most common origin from which this kind of frequent shipment is received (Table 27). Depending on the industry group, from 55 to 74 percent of the firms have more than one delivery a day from other establishments within the study area. In the individual groups, other significant relationships are apparent. In textiles and apparel, 29 percent of the firms indicate that a second concentration of frequent movements comes from outside the metropolitan area. These are mainly fabric shipments from the mills that are either sent directly to the users or to wholesalers in the general area which, in turn, sell them to the manufacturers. Less frequently, though still often, supplies come from the Valley, Downtown Manhattan, and Other Manhattan and the Bronx.

Table 27

Percent of Firms with More than One Delivery a Day
Originating in Designated Area, By Industry Group
South Houston Industrial Area, 1962

Origin	Total	Group 1	Group 2	Group 3	Group 4	Group 5
S. H. I. A.	63.8	69.8	66.7	55.0	59.6	73.8
Valley-Manhattan	12.5	16.0	3.6	8.7	19.2	10.8
Downtown Manhattan	11.1	-	18.9	16.8	13.0	9.2
Other Manhattan-Bronx	9.3	16.6	16.2	10.1	-	-
Brooklyn-Queens	8.7	6.5	14.4	13.4	6.2	-
Long Island	8.1	5.9	15.3	17.4	-	-
Staten Island-New Jersey	6.2	3.6	12.6	6.7	6.8	-
Other Metropolitan Area	6.2	3.6	3.6	10.1	6.2	9.2
Outside Metropolitan Area	16.2	29.0	20.7	12.1	6.2	9.2
Foreign	-	-	-	-	-	-

Note: Percentages in each group add to more than 100.0 because many firms receive more than one delivery a day from more than one origin.

In Industry Groups 2 and 3, the distribution is more uniform, except again for the strong dominance of the study area. In these industries it is possible to obtain a large volume of raw materials and other supplies within the area itself. In some activities, there is actually a serial operation; for example in printing, there is typesetting, lithographic work, printing, and mailing, all carried out within the area but by different firms. The wholesale trades, Group 4, also have internal linkages, with many of them trading with each other. Waste dealers also get some inputs from the neighborhood, especially paper and fabrics. In general, therefore, each industry group receives its raw materials most frequently from other firms in the immediate vicinity.

Accessibility to repair and service facilities is important not because of the physical volumes involved but because of the urgency of the need when it arises. There is an unusually strong concentration of establishments rendering this kind of service to the firms in the study area, located partially in the area itself and partially between Spring and Canal Streets east of Broadway. For most firms using special process machinery or machine tools, a breakdown means a telephone call to a service establishment a few blocks away. One apparel manufacturer, for example, listed as a major convenience the presence in the area of the Singer Sewing Machine Company store which specializes in industrial machines. Machine hardware, tools, V-belts, electrical supplies, etc., can be obtained within walking distance. If the manufacturing establishments

now in the study area were to move some distance from this concentration of service firms, they would have to keep a considerable inventory of spare parts. Because of the cost involved, a complete supply of repair parts cannot be kept by small firms, who must judge which are most likely to be needed. If they misjudge, they may be faced with long interruptions in their machine operations.

Linkage with suppliers thus exhibits a strong concentration within the study area itself, taking place largely within each of the industry groups. The prevalence of these intra-industry linkages suggests that the locational problems of the industry groups may be approached separately. However, the special and rather unusual proximity of service firms, used by all the other firms, is also an important element which bears on the advisability of using the area for manufacturing or non-manufacturing purposes.

Linkages with Customers

The linkages with customers were examined in the same way as those with suppliers. Shipments by firms to given destinations that take place more than once a day were considered sufficiently regular to constitute a significant linkage. In general, the locations of customers exhibit a marked contrast to those of suppliers (Table 28). Indeed, a substantial proportion of the firms, ranging from 32 to 50 percent among the industry groups and averaging 41 percent for the area, make deliveries more than once a day within the study area. A similar or

Table 28

Percent of Firms with More than One Shipment a Day
to Designated Area, By Industry Group
South Houston Industrial Area, 1962

Destination	Total	Group 1	Group 2	Group 3	Group 4	Group 5
S. H. I. A.	40. 6	36. 7	41. 4	32. 2	50. 3	44. 6
Valley-Manhattan	38. 9	44. 4	29. 7	30. 9	47. 2	38. 5
Downtown Manhattan	28. 2	13. 0	27. 9	34. 2	34. 8	38. 5
Other Manhattan-Bronx	37. 6	43. 8	43. 2	38. 9	34. 2	16. 9
Brooklyn-Queens	27. 8	23. 1	28. 8	35. 6	28. 0	20. 0
Long Island	18. 0	20. 1	11. 7	28. 2	15. 5	9. 2
Staten Island-New Jersey	15. 6	12. 4	-	22. 1	24. 8	12. 3
Other Metropolitan Area	24. 4	34. 3	18. 9	17. 4	28. 0	15. 4
Outside Metropolitan Area	34. 8	45. 6	24. 3	44. 3	28. 0	20. 0
Foreign	4. 3	10. 0	4. 5	4. 0	-	-

Note: Percentages in each group add to more than 100. 0 because many firms send more than one shipment a day to more than destination.

greater proportions of firms, however, ship as frequently to other areas. Thus, in textile and apparel, the study area ranks fourth as a destination of frequent shipments, and in Industry Group 3 it places fifth. Only in wholesale and retail trades is the study area itself served more than once a day by a larger proportion of firms than any other area. Locations in the Valley, in Other Manhattan and the Bronx, and outside the metropolitan area emerge as the other large concentrations of destination of shipments.

The concentration of wholesalers and department stores in Manhattan north of the study area undoubtedly explains the frequency of shipments to this area. In textile and apparel and in other manufacturing, in which toys and miscellaneous light manufacturing predominate, more firms ship more often out of town than to any other destination. The margin in either case, however, is not great.

Few firms make shipments to foreign destinations more than once a day. Some 10 percent of all firms ship abroad with a frequency ranging from once a day to once a week. Foreign shipments, of course, are usually coordinated with the departure of vessels from the piers in Brooklyn and Manhattan.

Firms involved in goods movement to and from sections outside of the study area more than once a day, ship almost twice as frequently as they deliver, corroborating the generally distributive character of industry in the area, as opposed to aggregative industries in which

Table 29

Percent of Firms with Strongest Competition in South Houston Industrial Area, 1962

Industry Group	Percent of Firms
1 Textiles & Apparel	29.6
2 Printing, Chemicals Leather, Paper	69.4
3 Other Manufacturing Construction	47.7
4 Wholesale	72.0
5 Retail & Services	64.6
Total	54.3

shipments would be fewer than deliveries. A further result of this comparison is that shipments, on the average, are smaller and lighter than deliveries. These characteristics of freight linkage have important implications for the transportation problem.

Linkages with Competitors

The last two sections have drawn attention to a large volume of trade within each industry group of the study area. These relationships, however, coexist with intense competition among firms in similar lines of business. Wholesalers, for example, may deal with each other, but they still compete strongly for other business.

More than one-half of all firms in the field survey said that sor of their strongest competition comes from within the area itself. The views of management on the location of their chief competitors are sharply different in the various industry groups, ranging from 30 perce of the firms in textile and apparel, who located their strongest competitors in the study area, to 72 percent in wholesale trades (Table 29). Most textile firms thought their main competition comes from firms located elsewhere in the Valley and downtown; apparel firms thought it comes from the other garment centers of the city, that is, in both case largely from Manhattan. Other firms saw their strong competition as largely confined to other parts of the metropolitan area. Competition from elsewhere in the United States or from abroad appears to affect critically only a small minority of the firms.

Linkages with the Labor Market

Linkages of the study area with the labor market are given by the distribution of residence of the employee (Table 30). Since there is virtually no residential population in the area, all the linkages are external. The most important feature of the distribution is the large proportion of employees living in Manhattan; in this respect it resembles the other linkages discussed previously.

In the study area as a whole, 46 percent of all employees live in Manhattan. Indeed, 13 percent live below 14th Street, that is, in the residential sections closest to the study area. Manhattan residents are the largest group in all industries, although the proportion of those living in Manhattan is higher in the three manufacturing groups than it is in wholesale trades and retail and service. This is undoubtedly due to the lower proportion of Puerto Rican and nonwhite workers in these industries compared with manufacturing.

The next highest concentration of workers' residences is to be found in Brooklyn, 23 percent, followed by the Bronx with 19 percent. This sequence of locations is to be found in all industry groups except retail and service, in which Bronx residents outnumber those of Brooklyn. All other areas are of minor significance except in isolated industry groups. Thus, a relatively high proportion of employees of the wholesale trades lives in Queens and a similarly high proportion of retail and service employees live outside New York City. The linkages

Table 30

Percent Distribution of Place of Residence of Workers, By Industry Group
South Houston Industrial Area, 1962

Place of Residence	Total	Group 1	Group 2	Group 3	Group 4	Group 5
Below 14th Street	13.0	15.9	5.0	16.0	17.6	9.1
Above 14th Street, E. of 5th Ave.	15.7	11.9	20.0	18.4	6.5	20.3
Above 14th Street, W. of 5th Ave.	17.0	21.7	26.5	9.5	12.7	5.0
Total Manhattan	45.7	49.5	51.5	43.9	36.8	34.4
Brooklyn	23.4	22.7	21.2	28.7	26.0	17.6
Bronx	19.2	20.6	15.4	18.4	16.0	25.3
Queens	5.3	4.2	5.1	3.0	14.6	7.1
Other Metropolitan Area	5.0	2.2	5.0	4.5	5.6	12.8
Outside Metropolitan Area	1.4	0.8	1.8	1.5	1.0	2.8
Total	100.0	100.0	100.0	100.0	100.0	100.0

with the labor market thus show a high concentration in Manhattan, Brooklyn, and the Bronx, with the share of Manhattan, in the aggregate, greater than that of the other two boroughs combined.

Linkages with Business Visitors

A sizable, though undetermined, number of persons visit the study area every business day. The industries of the area, however, require relatively less personal contact than many other activities in the Central Business District. The salesmen or executives engaged in selling conduct much of their business outside the area, and a further substantial volume of business is done by telephone. Showroom facilities in the area are limited. The intensive internal linkage shown in the preceding sections does not require entry into the area from outside, even if personal visits are involved. Compared with the volume of employee traffic therefore and that associated with the transfers of goods and services, the volume of other visitors from outside the area is relatively light.

Passenger Transportation Facilities

The consummation of the linkages with the labor market and with other persons has the advantage of a concentration of public transit facilities rivaled by few other areas of Manhattan. At the boundaries of the area, there are subway stations of all the major systems. Along Broadway are the Prince Street Station of the BMT and the Broadway-

Lafayette Street Station of the Independent subway. The Prince Street Station of the East Side IRT is one block east of Broadway. West of the area, there are the Spring Street Station of the Independent, one and a half blocks west of West Broadway, and the Houston Street Station of the West Side IRT, about three blocks west of the northwest corner of the study area.

The area is further served by north-south bus lines on Broadway, Avenue of the Americas, and Lafayette Street, the last two about a block distant from the study area. There are also cross-town bus lines on Houston Street, Spring Street, and Grand Street, the latter a block south of the area. The bus lines, especially the cross-town lines, are primarily used by those living below 14th Street.

The proximity of the study area to the Holland Tunnel is of little significance in commutation. First, very few regular employees live in New Jersey. Secondly, most bus lines to New Jersey use the Lincoln Tunnel and the few that go through the Holland Tunnel load at the Port Authority Bus Terminal and have no subsequent stops in Manhattan. The Bus Terminal is easily accessible, however, by Independent subway, the Hudson Tubes, and the BMT Broadway line.

Only a small minority of those working in the area use cars, and most of these are salesmen or executives who do not spend their entire working day there. For them, there are several parking lots and parking garages whose rates are substantially lower than those prevailing

in the downtown or midtown business districts. This was stated as an important advantage by many of the occupants of the area.

Visitors to the area come by public transportation, cars, or taxis. Those using the first two have the stated advantages, and many of those relying on taxis benefit from using Broadway or Avenue of the Americas for downtown-midtown journeys. The chances of obtaining a taxi are therefore good, except in the morning and evening rush hours when obtaining a taxi anywhere in Manhattan is a challenge and of dubious utility.

Freight Transportation

A freight transportation system is characterized by the volume it is required to handle and the efficiency with which it is able to do so. The efficiency of movement depends on the methods of loading and unloading, which in turn have an important effect on traffic conditions and on resultant congestion. The latter, of course, is also caused by other factors, including street layout and general traffic patterns of the city.

The transportation advantages of the study area lie in its relative ease of access to both other sections of the city and elsewhere. It is located near the through truck route from the Holland Tunnel to Long Island and Brooklyn, and is equally accessible to north-south truck traffic by a variety of routes. The general traffic pattern, while congested at times, usually appears easier at any given time than in midtown or downtown areas.

An estimated 3,500 trucks on the average enter or leave the area each day in order to make pick-ups or deliveries. The largest volume is generated by the wholesale firms, with 37 percent of the total. The textile and apparel firms are the next largest group, with 19 percent of total truck movements (Table 31.).

From these estimates of movement, an average arrival rate per building per hour may be derived. With 244 buildings in the area, assuming a loading and unloading period from 8 a.m. to 6 p.m., there is an average rate of 1.4 trucks per building per hour. This average arrival rate is, of course, subject to considerable variation over the working day, so that at times there may be heavy demand followed by slack periods.

The ability of the area to handle its traffic depends first on the number of trucks that can be serviced simultaneously at each building and, secondly, on the loading or unloading time. Almost half the firms in the area report that they can only attend to one truck at a time. The firms in the wholesale trades are generally able to do better, but even they have a median service level of less than two trucks.

The estimated arrival rate also sets a limitation on the average permissible waiting time for each truck. If it is assumed that one truck is handled at a time at each building, the average combined waiting and loading period would be estimated by the reciprocal of 1.4 trucks per hour, or 43 minutes, so that statistically the likelihood of expected delays is not very great, for most firms require less than this period

Table 31

Median Number of Truck Stops per Firm on an Average Day
and Estimated Aggregate Traffic Volume
South Houston Industrial Area, 1962

Industry Group	Truck Stops per Firm	Total Truck Volume	
		Number	Percent
1 Textiles & Apparel	4.0	676	19.4
2 Printing, Chemicals, Leather, Paper	5.8	644	18.5
3 Other Manufacturing, Construction	3.3	492	14.1
4 Wholesale	8.0	1,288	36.9
5 Retail & Services	6.0	390	11.1
Total	4.5	3,490	100.0

for their truck stops. The median time taken for loading or unloading small consignments is about 14 minutes (Table 32). Except for Industry Group 2, the median time for large loads is about half an hour. While this is less than the suggested average limit of 43 minutes, it is sufficiently close to exceed it in many movements of large loads.

The total delays in loading and unloading depend on the type of loading facilities, the type of trucks, the operations needed to load or unload them, and internal delays due to the operations and layout of the firms. At present, for practical purposes, there is no off-street loading or unloading in the South Houston Industrial Area. Trucks must either be serviced across the sidewalk or backed up across the sidewalk to the building.

Ideally, a dock should be so constructed that a truck can back straight in and be loaded through the back. If this is not possible, a truck may back up to the building but in this way, as noted, it blocks the sidewalk. A trailer truck, in fact, either finds it impossible to back in at all, or if it does so it has to "break the rig," that is, the tractor has to be at right angles to the trailer and even then there is a considerable traffic blockage. In most of the streets of the area, such maneuvers are impossible. The alternative then is to park parallel to the building. This takes up four or five times the curb space and may take up even more if, as is common, the truck cannot be side-loaded, so that space must be

Table 32

Median Time Required to Load or Unload Trucks
South Houston Industrial Area, 1962

Industry Group	Small Shipments (minutes)	Large Shipments (minutes)
1 Textiles & Apparel	14	27
2 Printing, Chemicals, Leather, Paper	15	50
3 Other Manufacturing, Construction	13	35
4 Wholesale	14	30
5 Retail & Services	14	NA
Total	13	30

left behind the truck to permit end-loading. Moreover, side-loading, even if possible, must usually be done manually or with external mechanized equipment, whereas the often used hydraulic tailgates greatly simplify end-loading.

These problems are most pronounced in the wholesale trades in the north-south streets west of Broadway because the heavy equipment is used most often by these firms. The efficiency of loading and unloading operations is also impaired by the lack of fork trucks and similar equipment in the area, which generally increases the time required to load trucks. The lack of off-street parking and the type of equipment that must be used therefore create traffic bottlenecks at peak periods that one would not expect to encounter solely on the basis of the volume statistics discussed earlier in this section.

The delays in loading and unloading due to the operation of the firm mainly occur through its inability to have shipments ready to be loaded or space to store materials received, without having to use elevators while the truck is waiting and tying up curb space. To avoid such delays, the firm must occupy enough space on the street floor for a shipping and receiving department with a certain amount of "suspense" storage space. Loads can then be assembled for each expected shipment, and arrangements can be made for storing incoming materials quickly without being concerned about their eventual distribution to the various

departments. When a truck comes, the whole work force of the department can then concentrate on loading or unloading it quickly.

About 38 percent of all firms have all or part of the street floor, 29 percent having all of it. There is considerable variation in the industrial distribution, however. There are almost no firms on the first floor in Industry Groups 1 and 2 (Table 33). The highest proportion is to be found in the wholesale trades, in which the proportion of single occupancy of buildings is highest. The value placed on street floor occupancy can be seen from the fact that firms that moved generally took advantage of their opportunity to increase their share of street floor occupancy; 14 firms out of 17 respondents now have more and only 2 firms less than they did in the South Houston Industrial Area (Table 34).

The transportation system is thus seen to be reasonably efficient for small loads but much less so for the larger ones that are typically associated with warehousing operations. The total effect of this depends, of course, on the relative proportion of large and small loads. No information was obtained on this in the survey, but observation in the area indicates that small consignments are much more numerous than large ones. Consideration of these characteristics of traffic flow gives weight to the view often expressed during the survey that transportation problems, though significant, are less serious than

Table 33

Number and Proportion of Firms Occupying All or Part of Street Floor
South Houston Industrial Area, 1962

Industry Group	Firms Occupying Entire Street Floor		Firms Occupying Part of Street Floor	
	Number	Percent	Number	Percent
1 Textiles & Apparel	-	-	-	-
2 Printing, Chemicals, Leather, Paper	9	8.1	-	-
3 Other Manufacturing, Construction	71	47.6	17	11.4
4 Wholesale	86	53.4	25	15.5
5 Retail & Services	24	36.9	16	24.6
Total	190	29.0	58	8.9

Table 34

Changes in Amount of Street Floor Occupied Among Firms that Moved From South Houston Industrial Area Between 1957 and February 1962

Industry Group	N. A.	Now More	Now Same	Now Less	Total
1 Textiles & Apparel	1	-	1	1	3
2 Printing, Chemicals, Leather, Paper	-	4	-	-	4
3 Other Manufacturing, Construction	1	6	-	1	8
4 Wholesale	-	1	-	-	1
5 Retail & Services	-	3	-	-	3
Total	2	14	1	2	19

in much of the rest of Manhattan, even under the present physical conditions of the study area.

Summary

The study area exhibits a strong linkage with firms and persons within the metropolitan area in general and Manhattan in particular. Though the firms of the area make shipments to many locations, they appear to go most frequently to these local destinations. Indeed, the area itself is an important market for its own industries and by a large margin serves as the most frequent source of raw materials. The industries of the area thus share in many transactions, even though for most of them strong competitors are also to be found there. The labor force is drawn largely from Manhattan, especially in the more labor-intensive industries.

The passenger transportation facilities of the study area are rivaled by only a few other areas of Manhattan. Subway stations of all major systems are either within the area or short distances away, and it is served by three cross-town buses and accessible to three north-south routes. Garages and parking lots, while not numerous, have lower rates than corresponding accommodations uptown or downtown.

On the other hand, freight transportation presents a mixed picture. Volume statistics of traffic and the expected waiting times suggest that there should be relatively little congestion, but the physical shortcomings of the area, notably the narrow streets and lack of off-street loading facilities, in fact create bottlenecks at times, especially in large loads.

Chapter VIII

Elements in the Locational Decision

In previous chapters, notably those on employment, operations, and linkages and transportation, a number of advantages of the South Houston Industrial Area were noted. In general, it was found that the area can meet most of its requirements either within itself or within Manhattan and other nearby boroughs. In order to assess the total usefulness of an area to its inhabitants and to identify the determinants of locational decisions, it is necessary to determine the significance and order of importance of the features of the area, as they are considered by the firms there. The existence of important advantages has a strong bearing on the length of tenure of the firms concerned. Conversely, one must also note the views of those firms that have found it necessary to move, whether in order to change the scale or nature of their operations, or for other reasons. Lastly, one must assess potential future moves by examining the sufficiency of present premises as seen by the firms in the area and their plans, if any, to make other arrangements.

The decisions in plant location are usually made in three steps. First, the general region in which operations are to take place is selected, on the basis of broad characteristics of markets, the location of sources of raw materials, the existence of a suitable labor supply,

and the different tax structures, wage rates, and legal restrictions of the various states. Then, a specific area within a region is selected. To do this, advantages in transportation, power supply, access to local labor, etc., are balanced against the costs of specific sites. Finally, an evaluation of the different types of available accommodations is made. For most of the firms in the study area, a location in or near New York was determined long ago. Attention must accordingly be given to those factors that distinguish the area and its structures from other similar industrial areas of the New York region.

The attractiveness of the area as a whole, of course, is the resultant of an aggregation of the factors considered by each individual firm. To perform an analysis of this type for an individual firm requires a thorough study of its finances, markets, production processes, and raw material needs, as well as of the comparative cost structures and real estate markets of alternative locations. Information of this scope usually cannot be assembled from outside sources and would be exceedingly laborious to analyze and assess. It is nevertheless possible to obtain subjective judgments on the importance of many factors associated with the locational decision of the firms in the area which can be summarized to reveal the attractive features of the area as a whole.

Locational Factors

The views of the firms in the area on the relative importance of various locational factors were obtained by asking each to rate a number

of possible characteristics as "essential," or "important," or as meriting "some" or "no" consideration. The distribution of "essential" characteristics is given in Table 35. The cost of space clearly emerges as the most important factor to the firms, taken together and in all industry groups except retail and service. A total of 57 percent consider it essential, with a range of 45 percent in Industry Group 3 to 70 percent in Industry Group 2.

Nearness to passenger transportation is of next most importance, in the aggregate, in textiles and apparel, and in Industry Group 3. It also comes close to second place in Industry Group 2. Clearly, it is a highly important consideration in all the manufacturing industries.

Nearness to customers is the third ranking characteristic in the aggregate, but its importance varies considerably among industry groups. The highest rating is in retail and service where, as might be expected, it is of most importance. It takes second place in Industry Group 2, whose printing and paper firms particularly depend on being able to give rapid service to their customers.

Several other characteristics, although not essential to the firms generally, are considered essential by many establishments in a particular industry. Sizable percentages of firms in the textile and apparel group find availability of skilled and unskilled labor, nearness to employees' homes, and nearness to truck routes essential. Nearness to employees' homes, however, to many firms means one subway ride away, without changing or walking much at their end. In the printing, chemicals, leather,

Table 35

Percent Distribution of Locational Factors Rated "Essential" by Firms, Ranked in Order of Importance South Houston Industrial Area, 1962

Locational Factor	Total	Group 1	Group 2	Group 3	Group 4	Group
Cost of Space	56.8	49.7	70.3	45.0	65.8	56.9
Nearness to Passenger Transportation	36.8	43.2	55.8	34.9	24.8	21.5
Nearness to Customers	36.6	25.4	58.6	22.1	37.3	60.0
Availability of Skilled Labor	19.5	37.9	13.5	18.8	3.1	24.6
Nearness to Suppliers	18.0	18.3	36.9	8.0	15.5	13.8
Nearness to Truck Routes	16.9	22.4	16.2	14.8	18.6	4.6
Availability of Unskilled Labor	15.7	29.0	13.5	19.5	6.2	-
Suitability for Process	14.3	17.1	24.3	7.4	15.5	3.1
Nearness to Employees' Homes	13.6	29.6	9.0	12.1	3.1	9.2
Nearness to Service Industries	9.6	9.5	30.6	5.4	3.1	-
Nearness to RR Freight Depots	7.5	10.0	12.6	-	9.3	4.6
Nearness to Competitors	7.0	3.0	3.6	-	21.7	3.1
Consolidation of Scattered Operations	5.3	3.0	3.6	4.0	9.3	7.7

Note: Percentages in each group add to more than 100.0 because many firms checked more than one factor.

and paper group, many firms find nearness to supplier and service firms and suitability for process essential. The latter usually means a floor load capacity sufficient to support machinery. The only other factor warranting special comment is the relatively high proportion of wholesale firms that require nearness to competitors. This is to be expected in view of the high degree of linkage with competitors that has been shown to exist.

The importance of the cost of space and nearness to passenger transportation is emphasized when "essential" and "important" ratings for these factors are added. Eighty percent of the firms consider the cost of space essential or important, with little variation among industry groups (Table 36). The manufacturing industries also give high ratings to the need for nearby passenger transportation.

In examining the essential locational factors, it is clear that the cost of space emerges not only as the most important but also as the only one that is related to the accommodations themselves. Nearness to passenger transportation is associated with the site obtainable in the area independent of the types of structures. Nearness to customers, skilled labor, and suppliers are, to a large extent, regional characteristics, though they too have site implications. Except for the relatively few firms whose processes call for some special building characteristics, the major advantage of the accommodations themselves is low rent.

Length of Tenure

The advantages of the study area are reflected in the long tenure of

Table 36

Percent of Firms Rating Cost of Space and Nearness to Passenger Transportation as "Essential" or "Important" Locational Factors, by Industry Group
South Houston Industrial Area, 1962

Industry Group	Cost of Space	Nearness to Passenger Transportation
1 Textiles & Apparel	81.8	83.2
2 Printing, Chemicals, Leather, Paper	82.0	81.8
3 Other Manufacturing, Construction	72.8	72.4
4 Wholesale	78.4	62.8
5 Retail & Services	76.9	60.0
Total	79.5	74.6

many of its firms. Only about one-third of the firms settled in the area in the last six years, while a quarter have been there since before 1942. Among industries, the greatest proportion with such long tenure are in miscellaneous manufacturing, where 30 percent have been there for over twenty years (Table 37). Included in this number are several machine shops, doll manufacturers, and firms in the electrical industry. The proportion in the wholesale group is almost as high.

In spite of this long tenure, most firms moved at one time or other from their original address. Only 9 percent of all firms are still at their first address, with a variation among industry groups from none in printing, chemicals, leather and paper to 15 percent in textiles and apparel (Table 38). However, a large majority that did move came from the study area itself. As their needs changed, two-thirds of the firms simply moved a block or two from their old premises. A few firms settled in the area after having been displaced from the cleared blocks north of Houston Street. Most of the rest came from downtown or elsewhere in the Valley.

In the past, many firms were able to satisfy their needs for extra space right within the buildings, or by renting space in a second building in the area. As shown in Table 39, 26.5 percent of all the firms at one time or other expanded in the same building, and another 20 percent took space in a second building in the area. Firms in Industry Group 3, in which miscellaneous manufacturing and machine shops are the largest

Table 37

Percent of Firms by Year in which Establishment Moved to South Houston Industrial Area, 1962

Industry Group	Total	Before 1942	1942-1952	1953-1956	After 1956
1 Textiles & Apparel	100.0	15.4	22.5	18.3	43.8
2 Printing, Chemicals, Leather, Paper	100.0	24.3	30.6	20.7	24.4
3 Other Manufacturing, Construction	100.0	30.2	24.8	8.0	37.0
4 Wholesale	100.0	28.6	21.7	21.7	28.0
5 Retail & Services	100.0	20.0	26.2	7.7	46.1
Total	100.0	24.0	24.6	16.2	35.2

Table 38

Percent Distribution of Previous Place of Business
of Present Firms, by Industry Group
South Houston Industrial Area, 1962

Industry Group	Total	SHIA		Manhattan		Other Manhattan & Bronx	Elsewhere
		First Address	Other Bldg.	Below 14th St.	Above 14th St.		
1	100.0	15.0	57.6	3.9	18.9	4.6	-
2	100.0	-	73.3	21.9	4.8	-	-
3	100.0	14.0	63.0	-	17.0	3.0	3.0
4	100.0	3.4	72.7	13.7	6.8	-	3.4
5	100.0	12.5	58.4	12.5	2.0	6.3	8.3
Total	100.0	9.0	65.4	9.4	11.6	2.4	2.2

Table 39

Percent of Firms that Expanded and Percent of Space Added, by Industry Group
South Houston Industrial Area, 1962

Industry Group	Proportion of Firms that Expanded in		Percent of Floor Space Added
	Same Building	Other SHIA Building	
1 Textile & Apparel	27.2	13.6	61.5
2 Printing, Chemicals, Leather, Paper	25.2	17.1	53.1
3 Other Manufacturing, Construction	38.3	14.1	58.0
4 Wholesale	22.4	35.3	45.8
5 Retail & Services	9.2	18.5	62.5
Total	26.5	20.0	55.3

constituents, were most readily able to expand in the same building, while wholesalers most often resorted to space elsewhere in the area. In the course of such expansion, the firms in the various groups added a median 46 to 63 percent of space. To obtain a correct picture of the adequacy of the area, one must consider the firms that wish to move for a variety of reasons, principally the need for more space, and whose plans have been formulated to a significant extent.

About 30 percent of the firms in the study area have plans for moving. Of that number, however, about one-third would relocate elsewhere in the area if accommodations were available. Other areas of Manhattan, Brooklyn, the Bronx, and Queens also have some partisans among Industry Group 3. The wholesalers have the fewest expansion plans at present (22 percent of the firms) and Industry Group 3 the most (34 percent of the firms). A substantial number of firms are still undecided as to location, but 15 percent of those that have decided on a location now have plans for expansion outside the metropolitan area. Half of these are in the apparel field.

The firms with insufficient space at present have a median need for 40 percent more. In spite of the fact that many firms were able to make an addition of this size in the past, the rate of turnover and current vacancy rate are too low to accommodate, within a reasonable period, even the firms that wish to stay in the area.

Firms that Moved

From January, 1957, to February, 1962, 26 firms moved from the study area. Of these, four subsequently went out of business; there is no evidence of what effect their move had on their later existence. Of the others, 19 furnished information on their reasons and on the results of their move. They represent a very small turnover. The 19 firms whose departure was spread over five years represent 3 percent of the present industrial population and 5 percent of present employees. This loss of about one percent of the jobs per year was more than made up by the substantial expansion that has been taking place among the firms that remained. Nevertheless, the experience of the departed firms is significant in that it identifies the motivations of those who found it in their interest to move or who were forced to move.

All of the 19 firms remained in the metropolitan area, so that the selection of a new plant was based on considerations of site and building, rather than interregional issues. In fact, except for two firms, one that moved to Nassau County and one to New Jersey, all of them remained in the city, with twelve still in Manhattan (Table 40). Long Island City, with three firms, was the only other area selected by more than one.

For most of the firms, the primary reason for the move was a change in the scale of operation, usually expansion. Few firms changed their product lines or basic mode of operation. One manufacturer

Table 40

Destination of Firms that Moved from
the South Houston Industrial Area, 1957-1962

Destination	Number of Firms					
	Total	Group 1	Group 2	Group 3	Group 4	Group 5
anhattan below 34th St.	10	1	3	4	-	2
anhattan between 34th and 60th Sts.	2	2	-	-	-	-
rooklyn and Queens	5	-	1	3	-	1
assau County	1	-	-	-	1	-
ew Jersey	1	-	-	1	-	-
Total	19	3	4	8	1	3

abandoned his production department in favor of working with contractors, while another changed from jobber to manufacturer. On balance, the firms rented substantially more space than they had in their old locations. Sixteen of them increased their holdings, with the median net change in space for all the firms an increase of 70 percent. At the same time, their employment was also increased, though by a smaller amount. Five firms retained the same number of employees and eleven now employ more, with a median net increase in total employment of 25 percent. The firms, for the present at least, have more floor space per employee, and thus have enough space for further expansion. The median increase in the former was 36 percent.

The firms, however, were also able to make considerable improvements in their physical surroundings. As noted in previous chapters, most of those with multi-story operations in the study area consolidated them on one floor at their new address, and several also took the opportunity to obtain more of the street floor. There were other changes, too. Fifteen of the firms moved to buildings with greater fire resistance, and for some column spacing and floor loading were also better. For the firms that moved out of Manhattan and for a few that remained, the journey to work was lengthened and costs generally increased, though parking facilities improved. Unit material and labor costs generally remained the same. Most of the firms therefore took advantage of one or both of two potent methods of cost reduction - single-story layout and decreases in insurance

rates through movement to fire-resistant structures. For some firms, an added advantage was also the better appearance of the building itself.

The move was generally satisfactory to most firms, but three of them had originally been forced to move from the study area by the Fire Department and had found few virtues in this necessity. They and three others complained of the higher cost of their new quarters, resulting in substantially increased overhead. For them, clearly, a major advantage of their old location, its low rent level, had ceased to exist and they had been unable to obtain compensating savings in cost.

Summary

The principal advantage of the accommodations of the area is considered to be the low cost of space. The other main advantages of the area to its inhabitants, notably nearness to passenger transportation and to customers, are independent of the type of building.

These advantages peculiar to the area as it now exists, when added to other favorable characteristics of the metropolitan area, have contributed to a relatively stable industrial population. A substantial number of firms have been there more than twenty years. Moreover, for the most part the firms are satisfied with the amount of space they have. Those that needed extra space in the past were often able to obtain it in the same building or elsewhere in the immediate neighborhood.

The relatively few firms that moved generally did so in response to increased business levels, though three of them were forced out by the Fire Department. All surviving firms remained in the metropolitan area, almost two-thirds of them in Manhattan. By taking advantage of such cost-saving steps as greater space on the first floors, single-story layouts, and moving to fire-resistant buildings, many firms were able to justify the much higher cost of their new premises. However, for almost a third of them, the sharp increase in overhead created substantial and unwelcome new business pressures.

Part B. Characteristics of the Structures

Chapter IX

Inventory of Land and Buildings

An inventory is, in essence, a catalogue of property. In its simplest form it merely consists of the number of items in various categories. If it is to be more useful, however, the inventory must be enlarged to include subdivision by quality as well as by categories which indicate the state of the economic or physical life of the item. Part B of this study is devoted to an exposition of the characteristics of land and particularly of buildings in the South Houston Industrial Area. This chapter is concerned merely with the numerical aspects of the inventory. The later chapters in this section present a discussion of the structural and fire problems of buildings in the area, an evaluation of the general quality of the stock, and estimates of the investment necessary to raise the inventory to acceptable levels of safety, utility, and appearance.

Building Use

In the twelve blocks which form the study area there are 31 acres of land, of which 5 are devoted to streets and the remainder, 26 acres, subdivided into 255 parcels of land. The overwhelming majority of the parcels (244) are occupied by non-residential structures, the bulk of which consist of loft buildings that characterize the area by any of a variety of measures. They represent between 80 and 90 percent of the

number of structures, of the total floor space, of the lot area, and of the assessed valuation (Table 41). Most of the remaining buildings consist of warehouses, factories, garages, and some stores which, taken together with the loft buildings, house the industrial and wholesaling activities that dominate the area. There are, in addition, a few residential buildings and some structures in municipal use. A small number of scattered vacant sites from which buildings have been removed are being used temporarily for parking purposes.

The structures in the area contain a large number of stores. According to the real estate tabulations, 60 percent of the buildings have at least one store in them. Of this group, 126 have one store and 21 have two or more. In total, the data indicate 199 store facilities. There are, in fact, only 25 retail establishments and eating and drinking places in the area. The discrepancy is caused by store facilities being used for purposes other than retailing in approximately five-sixths of the cases.

Lot Size and Coverage

Because this section is part of the original platting of Manhattan Island, the largest proportion of lots are to be found in the groups with frontage of 20 to 29 feet and depth of 100 feet (Table 42). In fact, 58 of the lots are exactly 25 x 100 feet in dimension. Over the years, there has been some fragmentation of land, resulting in 26 lots less than 30 x 80 feet. On the other hand, there has also been some consolidation, although

Table 41

Real Property Inventory: Type of Structure
Floor Space, Lot Area, Assessed Valuation
South Houston Industrial Area, 1962

Type of Property	Number of Structures	Floor Space (000) sq. ft. Total	Floor Space (000) sq. ft. Average	Lot Area (000) sq. ft. Total	Lot Area (000) sq. ft. Average	AV 1962-3 $ (000)
Residential	6	42	7.0	14.5	2.4	222
Warehouse	10	132	13.2	32.8	3.3	385
Factory	3	106	35.3	17.1	5.7	513
Garage	6	80	13.3	33.5	5.6	612
Store	11	63	5.7	36.0	3.3	523
Loft	202	4,948	24.5	885.7	4.4	17,634
Office	1	45	45.0	5.0	5.0	325
Miscellaneous	3	24	8.0	20.1	6.7	443
City Owned Building	2	28	14.0	5.0	2.5	50
Total	244	5,468	22.4	1,049.7	4.3	20,747
City Owned Vacant	3	-	-	12.5	4.2	116
Other Vacant	8	-	-	25.0	3.1	142
Total	11	-	-	37.5	3.4	258
Grand Total	255	5,468	22.4	1,087.2	4.3	21,005
Broadway Blocks	34	1,547	46.9	2,426.0	7.1	6,549
Rest of Area	221	3,921	17.8	8,446.0	3.8	14,456

Table 42

Distribution of Real Estate Parcels According to Lot Dimensions
South Houston Industrial Area, 1962

Depth in Feet	Total	Frontage in Feet								
		Under 20	20-25	26-29	30-39	40-49	50-59	60-79	80-99	100 & Over
Under 40	4	-	2	-	-	-	-	-	-	2
40 - 59	9	3	4	-	-	-	1	1	-	-
60 - 79	25	1	13	3	-	4	1	3	-	-
80 - 99	23	-	14	-	3	3	2	-	-	1
100 - 119	154	1	74	6	17	6	34	10	3	3
120 and over	40	-	9	4	5	4	13	3	1	1
Total	255	5	116	13	25	17	51	17	4	7
Broadway Blocks										
100 - 119	5	1	2		-	-	2	-	-	-
120 - 199	4	-	1		1	-	2	-	-	-
200 and over	25	-	11		4	3	5	-	1	1
Total	34	1	14		5	3	9	-	1	1

only four of the lots have dimensions of 100' x 100' or larger. Because the standard dimensions still continue to prevail in a large number of lots, the greatest concentration of lot areas is to be found in the 2,000 to 2,999 square foot category (Table 43). Well over half the lots are concentrated in the group of 1,000 to 3,999 square feet, and less than 10 percent have sizes of 10,000 square feet or greater. This type of parcelization was ill-suited to industrial use, even during the latter part of the 19th century when the structures in the area were erected.

The land coverage ratios in the area are extremely high (Table 44). Only 10 percent of the buildings occupy less than 80 percent of the ground area. Over half the structures occupy 90 percent or more of their site, while one-third of the buildings completely cover the land.

Size of Structure

The structures in the study area are of moderate size. Over 60 percent of the 244 buildings are five and six stories in height, with the remainder equally divided among higher and lower structures (Table 45). Approximately 20 percent of the structures contain less than 10,000 square feet of space. One-quarter contain between 10,000 and 14,999 square feet of floor space, and an additional one-quarter are in the size range from 15,000 to 29,999 square feet (Table 46). Only ten buildings possess more than 50,000 square feet and of these only three are 100,000 square feet or larger.

Table 43

Distribution of Real Estate Parcels According to Lot Area
South Houston Industrial Area, 1962

Lot Area	Total		Broadway Blocks		Rest of Area	
	Number	Percent	Number	Percent	Number	Percent
Under 1,000	4	1.6	-	-	4	1.8
1,000 - 1,999	27	10.6	-	-	27	12.2
2,000 - 2,999	87	34.1	3	8.8	84	38.0
3,000 - 3,999	29	11.4	1	2.9	28	12.7
4,000 - 4,999	17	6.7	3	8.8	14	6.3
5,000 - 5,999	46	18.0	11	32.4	35	15.8
6,000 - 7,999	16	6.3	4	11.8	12	5.4
8,000 - 9,999	10	3.9	6	17.6	4	1.8
10,000 - 11,999	15	5.9	4	11.8	11	5.0
12,000 and over	4	1.6	2	5.9	2	0.9
Total	255	100.0	34	100.0	221	100.0

Table 44

Distribution of Real Estate Parcels According to Land Coverage Ratio
South Houston Industrial Area, 1962

Land Coverage Ratio	Total		Broadway Blocks		Rest of Area	
	Number	Percent	Number	Percent	Number	Percent
Under .60	6	2.5	1	3.0	5	2.4
.60 - .69	9	3.7	2	6.1	7	3.3
.70 - .79	10	4.1	-	-	10	4.7
.80 - .84	40	16.4	2	6.1	38	18.0
.85 - .89	48	19.7	-	-	48	22.7
.90 - .94	41	16.8	1	3.0	40	19.0
.95 - .99	4	1.6	3	9.1	1	0.5
1.00	86	35.2	24	72.7	62	29.4
Total Buildings	244	100.0	33	100.0	211	100.0
Vacant	11	-	1	-	10	-
Total	255	-	34	1	221	-

Table 45

Distribution of Buildings According to Number of Stories
South Houston Industrial Area, 1962

Number of Stories	Total		Broadway Blocks		Rest of Area	
	Number	Percent	Number	Percent	Number	Percent
1	10	4.1	1	3.0	9	4.3
2	9	3.7	1	3.0	8	3.8
3	18	7.4	-	-	18	8.5
4	16	6.6	1	3.0	15	7.1
5	93	38.1	15	45.5	78	37.0
6	65	26.6	6	18.2	59	28.0
7	13	5.3	-	-	13	6.2
8	10	4.1	1	3.0	9	4.3
9 and over	10	4.1	8	24.2	2	0.9
Total Buildings	244	100.0	33	100.0	211	100.0
Vacant	11	-	1	-	10	-
Total	255	-	34	-	221	-

Table 46

Distribution of Real Estate Parcels According to Total Floor Area
South Houston Industrial Area, 1962

Floor Area (Sq. Ft.)	Total		Broadway Blocks		Rest of Area	
	Number	Percent	Number	Percent	Number	Percent
Under 5,000	25	10.2	-	-	25	11.8
5,000 - 9,999	32	13.1	2	6.1	30	14.2
10,000 - 14,999	65	26.6	4	12.1	61	28.9
15,000 - 19,999	31	12.7	3	9.1	28	13.3
20,000 - 29,999	40	16.4	6	18.2	34	16.1
30,000 - 39,999	14	5.7	5	15.2	9	4.3
40,000 - 49,999	14	5.7	4	12.1	10	4.7
50,000 - 99,999	17	7.0	4	12.1	13	6.2
100,000 and over	6	2.5	5	15,2	1	0.5
Total Buildings	244	100.0	33	100.0	211	100.0
Vacant	11	-	1	-	10	-
Total	255	-	34	-	221	-

Floor Area Ratio

The floor area ratio (FAR), which is the ratio of building space to land area, is a widely utilized measure of density employed for planning purposes.[1/] In the South Houston Industrial Area, 60 percent of the FAR's lie between 4.0 and 5.9; 16 percent are in excess of 6.0; and the remainder are less than 4.0 (Table 47). Taken by itself, this FAR distribution would not indicate an excessive degree of intensity of land utilization. In conjunction with other measures, however, the true degree of intensity of use in this area becomes evident. As was indicated by the relatively low variation in number of stories and land coverage ratios, there is almost a perfect correlation between the height of the building in stories and the FAR. Thus, approximately 55 percent of all structures fall within the narrow range of FAR of 4.0 to 5.9

1/ Three manufacturing districts, M1, M2 and M3, are specified in the new zoning ordinance. The M1 districts are designed to accommodate high performance industrial activities with little or no nuisance characteristics. They cover a wide range of conditions, with the garment district and its tall loft buildings at one extreme and the portions of the vacant industrial land reserve in Staten Island at the other. The maximum permitted FAR in district M1 varies from 1.0 for areas close to residential neighborhoods (the most widely zoned manufacturing district) to 10.0 for the garment center in Manhattan. The South Houston Industrial Area is zoned as M1-5, which is subject to a maximum FAR of 5.0. Districts M2, of medium level of performance, are not generally designated adjacent to residential areas. The FAR's for M2 are 2.0 to 5.0. M3 districts, designated primarily for heavy industrial concentrations, accommodate plants with operations having considerable nuisance characteristics. They are located away from heavily populated areas and have a maximum permitted FAR of 2.0.

Table 47

Distribution of Real Estate Parcels According to Floor Area Ratio
South Houston Industrial Area, 1962

Floor Area Ratio	Total		Broadway Blocks		Rest of Area	
	Number	Percent	Number	Percent	Number	Percent
Under 1.0	8	3.3	-	-	8	3.8
1.0 - 1.9	14	5.7	2	6.1	12	5.7
2.0 - 2.9	18	7.4	-	-	18	8.5
3.0 - 3.9	18	7.4	5	15.2	13	6.2
4.0 - 4.9	77	31.5	7	21.2	70	33.2
5.0 - 5.9	69	28.3	7	21.2	62	29.4
6.0 - 6.9	21	8.6	3	9.1	18	8.5
7.0 - 9.9	11	4.5	2	6.1	9	4.3
10.0 and over	8	3.3	7	21.2	1	0.5
Total Buildings	244	100.0	33	100.0	211	100.0
Vacant	11	-	1	-	10	-
Total	255	-	34	-	221	-
Average	5.2	-	6.3	-	4.9	-

and land coverage ratios of .80 to 1.00. The data reveal similar concentrations of FAR's with respect to floor areas and lot areas, with 40 percent of the structures possessing FAR's of 4.0 to 5.9 and total floor area of 10,000 to 29,999 square feet, and a similar proportion with the same FAR's of 4.0 to 5.9 and lot area of 2,000 to 5,999 square feet.

Broadway Blocks

The totals for the entire study area conceal the fact that the larger buildings tend to be concentrated in the three blocks which have Broadway frontage. This strip, containing 33 buildings and one vacant parcel, or 13 percent of the total, accounts for 28 percent of the floor space and 31 percent of the assessed value of the total study area. Virtually all of the deepest lots are to be found in these blocks, which are also marked by the greatest land coverage ratios. Of the 33 buildings in the Broadway strip, 24 completely cover the lot area. The floor area ratio for this group is 6.3, compared with 4.9 for the other blocks in the study area. The Broadway buildings also tend to be taller than those elsewhere. Eight of the ten buildings that are nine stories or over have a Broadway entrance. It is thus evident that the disproportionate concentration of values and floor space encountered in the Broadway portion of the study area has been achieved by intensive land coverage.

Summary

The statistical data confirm the visual impressions of anyone who has observed the area. There is a great deal of homogeneity in the size, shape, and land coverage of the buildings. In fact, one would not go far amiss by indicating that a typical structure is indeed characteristic of the area. Such a structure would be a loft building five stories high, situated on a lot 25' x 100', with the building covering 90 percent of the land. This structure would thus have a building base area of 2, 250 square feet, a total floor space of 11, 250 square feet, and a lot area of 2, 500 square feet, yielding a floor area ratio of 4. 5. Although no precise data are available on the age of these structures, they are known to have been constructed prior to the turn of the century, and informed opinion places their origin between 1870 and 1885.

Chapter X

Structural and Fire Problems

The poor condition of the buildings constitutes the essence of the problem in the study area. Not only are they old and in need of repair, but many are also considered public hazards because they contain a variety of both major and minor structural defects. Part of the problem stems from inherent limitations in the building techniques employed during the era in which the structures were erected, and part is attributable to deficient maintenance and housekeeping practices by the tenants and landlords in the area.

Structural Characteristics

Most of the structures in the South Houston Industrial Area were built after the Civil War and before 1895, a period during which the bulk of loft construction south of 14th Street took place. Construction north of 14th Street occurred after the turn of the century, particularly after 1910. This relatively minor difference in age made a considerable difference in the quality of construction. After 1895, cast iron columns, which were an intrinsic element in loft buildings, were manufactured by a new foundry process which strengthened them considerably. Shortly afterward, the cast iron column was abandoned entirely and the structural steel skeleton was employed for support instead of the load-bearing wall.

In general, the buildings in the study area have stone foundations. Quite often the ground floor extends the full length of the lot, with the floors above the first story set back from the rear, a building design which allows additional light to enter the lower story through a glass skylight, but which prevents the rear foundation from bearing a load. Hence, the side walls bear the essential building load. In many instances, they are three feet thick for a five-story building and reach four feet for a seven-story building. They are usually constructed of brick and, in many instances, the mortar binding the brick was made with lime and fly ash rather than cement. As a consequence, in many buildings the mortar has eroded and the bricks are held only loosely in the wall. Excavations under sidewalks extend the basement space of some buildings, but reduce the pavement to being merely a skin stretched over a pit. Trucks loading and unloading on the narrow streets sometimes mount the sidewalk to maneuver their loads, and a heavily loaded vehicle runs the risk of crashing through the surface into the basement, a contingency which fortunately has not occurred so far.

In buildings of 25 feet or less in width, the floors are supported by wooden beams which run between two brick side walls, a rather secure means of support. In buildings wider than 25 feet, cast iron columns are used to support the beams extending from each of the side walls. In addition, cast iron columns spaced from 15 to 20 feet on the average are used to support the weight of the front and rear walls. In

the rear, where the ground floor setbacks are found, they usually bear a greater part of the load than in the front, but where an excavated sidewalk exists, the front columns bear the full load of the front walls. The cross beams are frequently attached both to the main beams and to the walls by mortise and tenon joints which, by cutting away a large part of the cross section, weaken both cross beams and main beams. In other structures, the beams are held loosely in metal stirrups usually without being fastened otherwise.

The columns made of cast iron are the Achilles heel of this type of building. Each column rests on the one below it, so that the whole building is maintained by this stack of columns running from the basement to the roof. Even when normal operating conditions prevail, the cast iron column is in danger of collapsing or cracking. In modern operations powered lifting and moving equipment is used, and a collision with a column could conceivably (and apparently did in at least one case) crack, shift, or knock out one of these columns, for some are not even bolted in place. If a column in the basement is dislodged, the whole building of course is endangered.

Fire Hazards and Control

Virtually all of the buildings in the study area were constructed prior to the enactment of fire codes. As the result, the overwhelming proportion of structures are not fireproof. Of 217 buildings for which the

fireproof class could be ascertained, only three, or 1.4 percent of the total, are in Class 1, fireproof structures, in which the walls and structural members are made of incombustible material and with minimum fire resistive ratings of four hours for exterior walls, three hours for floor partitions, and two hours for exterior panel walls. None are in Class 2, which includes fire-protected structures. The bulk of the buildings, 191, or 88 percent of the total, are in Class 3, non-fireproof structures, made of incombustible material inadequate to meet the fire resistive rating requirements of Class 1 or Class 2 structures, in which the exterior walls are of masonry or reinforced concrete, and the interior framing is of wood or unprotected iron or steel. In this class, the non-bearing walls must have a fire resistive rating of at least two hours, and the bearing walls, of at least three. In addition, openings must be protected. Twenty-three, or 10.6 percent, of the buildings are in Class 5, metal structures, in which the structural framework is metal and in which the walls and roofs are of metal, flat or corrugated cement asbestos composition sheets, or of incombustible material other than masonry, and which are without sufficient fire resistive protection to withstand the fire tests required for other classes of structures.[1/]

1/ For the source of these definitions and for a more complete description of each class see the Administrative Code of the City of New York, Department of Housing and Buildings, Subarticle 2, Paragraph C26-238.0 to 245.0, plus amendments to Subarticle 2, Paragraph C26-239.0, 241.0, and 243.0.

Many of the structural defects found in the buildings in the study area also constitute fire hazards. The cast iron column, for example, displays its worst features in the event of a fire. While it has respectable compression strength, its tensile strength is weak, and its ability to stand rapid changes in temperature is low. Thus, if a fire gradually heats the cast iron column to around 1,500 degrees F., it is liable to crack or fail. If, in fighting the fire, the hot column is struck by a stream of cold water before it has reached breaking temperature, it may also crack and fail. If it does, the building will probably collapse.

The weakness of the cast iron column is greatest in buildings built before 1895 because the foundry process in use before that date often resulted in uneven thicknesses of columns. Some parts of a column might be only an eighth of an inch thick while others would be thicker than necessary. The weak point, of course, establishes the safe load.

In addition to the cast iron columns and the weak front and back walls, the reduced dimension of tenoned beams at the point of pressure frequently cannot support the additional weight of water pumped into the building in the course of fire fighting. In many cases, the strength is further reduced by the fact that beams have begun to rot. Other basic fire weaknesses include straight-line stairways which rise diagonally from the first to the top floor without interruption, open stair wells, open elevator shafts, open lift shafts, and openings between

buildings made primarily to accommodate firms that needed more space at one time or another. All these help to spread fires rather than contain them, and when combined with the basic structural faults, make fighting fires an extremely difficult and dangerous task. Further difficulty arises from the fact that the roofs of the ground story extensions are mostly glass, which often will not support the weight of a man and will almost certainly collapse under water pressure. The internal court, which is narrow and completely unpredictable, readily fills with smoke and fumes, and is hardly a spot from which to escape a burning building. Yet it is here that many fire escapes lead.

The street and density patterns of the area also interfere with the efficient combat of fires. The building area is almost completely covered by moderately high structures and the north and south streets (Wooster, Greene, and Mercer) are only 26 feet wide between curbs. Even during periods when they are not congested with business traffic, the operation of fire equipment is severely hampered by the narrow streets.

Business activities and housekeeping practices in the area also contribute to the fire menace. In addition to the hazards that exist in any type of industrial establishment, there are a number of firms in the study area that engage in businesses in which the danger of fire is above the average. There are 89 firms dealing in waste paper, scrap, and rag, 24 in paper boxes and crates, and 42 in paint-spraying and silk-screening processes. In addition, there are several garages and restaurant

The housekeeping practices of the business establishments vary considerably. There are many firms in which the space and layout is orderly, floors are clean, and inventory as well as goods in process stored neatly. On the other hand, there are numerous establishments in which the clutter is great. Scraps, rags, and excess materials litter the floor, parcels obstruct the passageways, and there is an encrustation of grime and grease accumulated through the years of neglect. Under any circumstances, it is difficult to keep an industrial plant neat and orderly, but in the study area housekeeping practices could certainly be improved.

Of the several controls which have been put on these buildings since their erection, the most common, and probably the only completely effective one, is the installation of automatic sprinklers with connected fire alarms which are in operation all year round. But before this point was reached - and even in today's regulations, sprinklers are not universally required in these buildings - a plethora of lesser controls and regulations were instituted.

In the rear yards, for example, where less than 30 feet of space exists between facing windows, iron shutters are required to prevent fires from spreading from one building to another. When the iron shutter regulation was not in force, the internal court could easily become a death trap for both firemen and workers.

Many of the buildings in the area are of considerable depth, some running 200 feet through the block. Fire fighting under these

circumstances is greatly hampered because the hoses drawn in from the outside frequently cannot reach the center of the floor. This difficulty is compounded when doors are cut between buildings to enlarge the space available to a firm. The regulations require that fire doors be installed in these apertures as well as in other potentially dangerous locations. The doors are designed to close automatically when the temperature reaches 165 degrees. Often, however, they are tied back with a permanent fastening or the passageway is obstructed by boxes or articles of furniture so that the door cannot close. A fire originating in one building, therefore, might spread very quickly to two or more structures through such openings.

Among the earlies types of sprinkler systems is the perforated pipe.[2/] This is a galvanized iron pipe with holes in it attached to a Fire Department connection outside the building. Its use has been discontinued because fires closed the holes or the pipes fell off their hangers by the time water got to them. Similarly, dry pipe systems without fire alarm devices are likely to fail for the same reasons. By the time the fire is

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2/ "A sprinkler system, for fire protection purposes, may be defined in principle as a network of specially sized piping installed usually throughout a building generally at the ceilings and to which sprinkler heads (called in this standard sprinklers) are connected and systematically spaced. The system is connected to a suitable water supply through a controlling valve and a device for sending an alarm when the system is in operation. The system is usually activated by heat from a fire to discharge water over a fire starting at any point." Standard of the National Board of Fire Underwriters for the Installation of Sprinkler Systems, National Board of Fire Underwriters, June, 1961, p. 3.

reported, the system has been damaged too much to make effective use of the water supplied. By far the most effective use of Fire Department connections is in fully automatic sprinkler systems with auxiliary water supplies.

The half-time automatic sprinkler system is also in use, mostly in unheated buildings. In this system, because of the danger of freezing, a building is permitted to shut off and drain its sprinkler system for six months of the year, from mid-October to mid-April. Regulations do not require that alarm systems be connected to these systems in the off months. The danger in this arrangement could be averted by changing regulations to require the use of anti-freeze so that the system could be kept connected during the cold months. A full-time alarm system would also be an important improvement.

The existence of buildings in which several of the hazards mentioned co-exist actually calls the structural quality of the whole area into question. The buildings in poor condition are so widely distributed that a fire starting in any one of them could readily spread to the rest of the buildings, whether good or bad. Even a good sprinkler system cannot always deal with a fire that initially takes the form of a wide conflagration, breaking out simultaneously in several points. Such a situation can of course arise when fire spreads to a building from another one that is already burning extensively. A remedy of the fire hazards would, therefore, call for treatment of the area as a whole. One such treatment might

be the requirement of a fully automatic year-round, multi-source, alarm-fitted sprinkler system for all buildings in the industrial zone, regardless of the degree of hazard of the present use. With such systems, the Fire Department believes that virtually all of the fires can be locally contained and that most will be extinguished by the time the fire fighting equipment arrives.

Incidence of Fires

The menace of fire does not merely hover over the area creating uneasiness among its occupants. It breaks out with uncomfortable frequency.[3/] In the two-year period 1960-61, thirty fires important enough to call out fire-fighting equipment and to be recorded by the Fire Department took place in the study area.[4/]

The predominant cause of fire in the area, accounting for eleven

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3/ On March 25, 1911, a tragic fire claimed the lives of over 140 employees of the Triangle Shirtwaist Company, which occupied the top three floors of a ten-story building on Greene Street and Washington Place, less than one-half mile from the study area. The building had been completed scarcely ten years before. It contained no sprinklers, the doors opened inward, and the fire escapes proved hopelessly inadequate. The employee density in the Triangle Factory was incredible; on one floor, over 250 people worked in 10,000 square feet. The storm of protest that followed the tragedy led eventually to major reforms in building codes both in New York City and throughout the country. For a full account of the fire and its aftermath, see Leon Stein, The Triangle Fire, (Lippincott, New York, 1962).

4/ Letter from Fire Commissioner Edward Thompson to Francis J. Bloustein, Acting Chairman, City Planning Commission, dated May 1, 1962.

out of the thirty fires, was given as "smoking carelessness" by the employees (Table 48). On first glance it would seem that neither the firm nor the building management can or should be held responsible for these incidents, but there is a strong likelihood that poor housekeeping with its accumulation of inflammable refuse and dry as tinder buildings were contributing factors. Without evidence, however, it is manifestly incorrect to mitigate the irresponsible activities of the persons whose carelessness may have jeopardized the lives of many.

The business activities of firms caused eight of the thirty fires. Most of these originated in restaurants, where hot fat and the accumulation of grease in ventilators are a constant problem, and in garages, where gasoline vapors and electrical equipment present repeated opportunity for fire. Other business activities that resulted in fire were the igniting of accumulated soot in a metal-treating plant and the use of defective electric motors and other equipment.

Seven of the thirty fires could be attributed to defects in the buildings. In some cases, fires originated in oil burners and defective or inadequate electric wiring. Of the remainder, one fire arose spontaneously, and the cause of three could not be ascertained.

Fire Violations

In order to prevent fires, to contain them should they break out, and to facilitate fire fighting, a considerable body of law and regulations have been written into the various administrative codes of the City of

Table 48

List of Fires
South Houston Industrial Area, 1960-61

Date	Address	F. D. Block	Cause	Business
1960				
Jan. 2	27 Greene St.	25	smoking carelessness	storehouse-waste cardboard
Jan. 22	22-26 Wooster St.	25	not ascertained	sheet metal boxes
Jan. 25	57-59 Wooster St.	11	oil burner	factory loft
Feb. 6	107 Spring St.	6	electric	restaurant
Feb. 10	143 Prince St.	24	soot	metal treating
Feb. 23	65 Wooster St.	26	smoking carelessness	manufacture brass accessories
Mar. 11	164 Mercer St.	27	heat from radiator	furniture
May 3	131-137 Spring St.	5	not ascertained	hallway, factory loft building
June 10	103-105 Wooster St.	11	spark electric	textiles, factory loft building
June 12	133-5 Greene St.	25	electrical appliance	rainwear
Sept. 6	165 Mercer St.	26	ignition of gasoline vapors	garage
Sept. 8	387 W. Broadway	11	friction	storage garage
Oct. 15	127 Prince St.	24	cooking carelessness	restaurant
Oct. 21	87 Greene St.	12	electric, radio	restaurant
Oct. 28	22-26 Wooster St.	25	smoking carelessness	toy factory
Dec. 5	143 Prince St.	24	smoking carelessness	textiles
Dec. 17	142-4 Wooster St.	25	smoking carelessness	loft
1961				
Jan. 3	446 Broome St. and 491 Broadway	14	electrical	factory loft
Jan. 10	127 Greene St.	25	spontaneous	woodworking
Apr. 17	165-7 Mercer St.	26	ignition inflammable vapors	garage
Apr. 19	102-104 Prince St.	6	electrical	metal work
June 24	102 Wooster St.	5	smoking carelessness	textiles, factory loft
July 1	541 Broadway	7	smoking carelessness	loft building
Aug. 2	149 Mercer St.	26	smoking carelessness	factory loft
Aug. 4	91 Spring St.	7	smoking carelessness	factory loft
Sept. 5	90 Prince St.	7	electric fan	luncheonette, factory
Sept. 9	62 Wooster St.	12	smoking carelessness	manufacture lamps loft building
Oct. 16	427 Broadway	4	electrical	textile contractors factory loft
Nov. 11	597 Broadway	27	not ascertained	cafeteria
Nov. 25	143 Prince St.	24	smoking carelessness	loft

New York. Some are administered by the Fire Department and by the Building Department in a rather complicated cooperative arrangement. Building code violations are usually uncovered after investigation following a complaint, but the Fire Department inspects each building in the study area routinely at least once a year.

In general, the types of violations encountered can be classified into those that relate to the housekeeping practices of the business firms and building management, those that require extensive expenditures for alteration and repair, and those that pertain to the installation of water sprinkler systems. As of May 1, 1962, the official records of the Fire Department indicate that automatic sprinkler systems were lacking in 89 buildings; stairway and shaft enclosures were required in 36 buildings; and inadequate means of egress found in 42 buildings. In a few cases, all three deficiencies occurred in the same structure.[5/]

In order to obtain more detailed information on the catalogue of fire violations in the area, a special study was made of the Fire Department's records of housekeeping violations and the status of sprinkler violations.[6/] During 1962, in the course of fire inspections, 681

5/ Ibid.

6/ Because of the geographic and administrative distribution of responsibility in the study area, it was necessary to consult the fire records at District 1 Headquarters, at Engine Co. 13, and Ladder Co. 20, the latter located in the study area.

housekeeping violations were posted on buildings and establishments in the study area (Table 49). Many of the violations were easily rectifiable. For example, 23 percent called for the provision of pails of sand or fire extinguishers or fireproof receptacles; 27 percent called for such matters as removal of obstructions or the placement of signs. Eight percent demanded proper paint spraying conditions, sprinkler maintenance, and storage and handling of fuel oil. Eleven percent required the provision of lights and signs in exits and the removal of obstructions in passageways. The remainder, called specials, included all other types of violations not classified elsewhere. In October, 1962, the time of the survey, fewer than one hundred of the posted violations were still pending and a spot check at the end of December, 1962, indicated that compliance had taken place in virtually all of the housekeeping cases.

In addition to the housekeeping inspections, the Fire Department maintains a close surveillance on sprinkler condition and requirements throughout the area. Sprinkler violations are kept in a special file in the local Engine Company's records, lists of offending buildings are kept prominently posted, and a meticulously elaborate procedure of continued inspections and recording of progress on the installation of sprinkler systems is observed. In October, 1962, there were orders on file for 86 buildings requiring that sprinklers be installed. Of this number, sprinklers had been installed partially or completely in 26 buildings and plans filed with the Building Department for two more.

Table 49

Pending Fire Department Violations by Type of Infraction
South Houston Industrial Area, October, 1962

Violation	Number	Percent
FP 1-10 Failure to provide pails of sand, fire extinguishers, fireproof receptacles, metal protection for inflammable wastes or coal or wood stoves	158	23.1
FP 11-29 Failure to eliminate hazardous materials, use of storage space, open flame or other fire hazards, removal of obstructions and placing signs at exits	183	26.7
FP 30-61, FP 100-117, CF 1-39, FO 1-17, R 1-23 Improper paint spraying conditions, standpipe and siamese conditions, sprinkler conditions (maintenance only), use of hazardous materials, items under the Multiple Dwelling Law, storage and handling of fuel oil, operation of refrigeration equipment and repair of defective wiring	57	8.3
FP 70-99 Maintenance of exits including signs, lights, unobstructed passage, painting and repair of fire escapes, fire doors, windows, storage or rubbish, etc. Labor Laws	78	11.1
"Specials" - Violations not elsewhere classified	210	30.8
Total	681	100.0

For 17 buildings, the order had been rescinded and in 21 additional an appeal had been filed by the landlord with the Board of Standards and Appeals and a calendar number obtained. In 11 of the remaining cases, enforcement was delayed by the Division of Fire Prevention, pending the final decision by the City Council on the Lower Manhattan Expressway, which had been scheduled to cross Broome Street.

In addition to the buildings for which there are sprinkler orders, 69 buildings do not have sprinkler systems. Many of these are one-story garage type structures, while others are of fireproof construction; neither type of building requires a sprinkler system.

Some 14 particularly hazardous buildings are under regular surveillance by the fire companies in the South Houston Industrial Area. The buildings are visited weekly or monthly in order to make sure that activity deemed hazardous is not being continued, that vacate orders are being carried out, or to see that there are watchmen on duty where they are required.

Building Violations

In the usual course of events inspection is undertaken by the Department of Buildings on the basis of a complaint emanating from the occupants or by referral from the Fire Department or Police Department, or one of the state inspection services. In the South Houston Industrial Area, additional attention is paid to the structures, and routine inspections augment those undertaken as a result of complaints. The major

difficulty in analyzing the building violations stems from the complicated laws governing the provision of required facilities and the large number of violations that exist. Most of the violations were infractions of Chapter 26 of the Administrative Code, while others applied to the Factory Exit Rule adopted by the Board of Standards and Appeals, and various others are governed by the labor laws of the State of New York.[7/]

At the time of the study, a total of 391 violations were recorded on buildings in the South Houston Industrial Area (Table 50). The records reveal that approximately 161 were imposed prior to 1962 and that 120 violations had been removed between January and October, 1962. Approximately 21 percent of the violations were on buildings located in the three Broadway blocks, which contain 14 percent of the buildings but 28 percent of the floor space in the study area. The number of violations was by no means evenly distributed on buildings throughout the area (Table 51). Some 45 percent were found to have no violations at all; 25 percent had one or two violations, 20 percent between three and five violations. The remaining buildings, 21 in number, were substantial

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7/ The regulations are published in four volumes entitled "Building Regulations of the City of New York." The record of violations is kept in three places. The original field inspector's report is included in the violation docket and records of infraction are specific and in considerable detail. Each violation is entered into an official ledger along with an abridged description. The violation history of each building is recorded on a card which lists each violation imposed, the docket number in which the violation is recorded, the date of issuance, and the disposition of the case. The data summarized in this study were drawn from the larger entries.

Table 50

Pending Building Department Violations by Type of Infraction
South Houston Industrial Area, October, 1962

Violation	Total		Broadway Blocks		Rest of Area	
	Number	Percent	Number	Percent	Number	Percent
Fire Resistive Enclosure	87	22.3	19	27.9	68	21.1
Legal Compliance	70	17.9	13	19.1	57	17.6
Lack of Egress	37	9.5	5	7.4	32	9.9
Skylights	26	6.6	7	10.3	19	5.9
Structural Defects	114	29.1	13	19.1	101	31.2
Exit Lights	36	9.2	8	11.8	28	8.7
Elevators	21	5.4	3	4.4	18	5.6
Total	391	100.0	68	100.0	323	100.0

Table 51

Pending Building Department Violations, Number of Infractions per Building
South Houston Industrial Area, October, 1962

Number of Violations	Percent of Buildings		
	Total	Broadway	Rest of Area
None	45.9	43.9	46.3
1 - 2	25.4	29.3	24.6
3 - 5	20.1	12.2	21.7
6 - 9	5.7	7.3	5.4
10 and over	2.9	7.3	2.0
Total	100.0	100.0	100.0

offenders. Fourteen, or approximately 6 percent of the total, had between 6 and 9 violations and seven, or 3 percent of the total, had ten or more violations.

A small building located in the center of the area presents a typical case of multiple violations. For a building that is 25 feet wide and considerably less than 100 feet deep, it has an impressive set of infractions. These include: (a) inadequate party wall opening to adjacent building; (b) hallway ceiling plaster loose and falling; (c) insecure balustrade in interior stairway; (d) stairway sagging; (e) printing presses improperly supported; (f) interior stairs not enclosed so as to be fire resistive.

The violations were varied in their nature and in their importance. The incidence and character of these infractions are summarized below and the number of violations and their seriousness indicated.

Fire Resistive Enclosures: (87 violations, 72 serious). This group includes violations for failure to enclose in fire resistive materials such items as stairways, elevator shafts, hoistway shafts, ceilings, partitions, etc. It also includes failure to remove glass from floors and doors which are required to be enclosed in fire resistive materials and to install fire windows or steel shutters.

Legal Compliance: (70 violations). This group refers to a wide variety of legal requirements, including the filing of plans, the following

of plans filed, payment of fees, changes of use without approval, the posting of live load signs, and similar items.

Lack of Egress: (37 violations, 25 serious). This group is difficult to assess properly because of the lack of information on whether or not the violation is due to a structural deficiency. It includes failure to provide two means of egress, obstructions to egress, locked exits, missing stairs, self-enclosing doors, direction of door swing, blocked exits, etc.

Skylights: (26 violations). This group includes all violations involving skylights, including those with missing or broken glass or screens, or lack of skylights where required.

Defective or Deficient: (114 violations, 31 serious). A general heading which covers all parts of a building and can refer to anything broken, defective, nonfunctioning, missing, loose, unsafe, etc. Used to describe conditions such as loose brick, falling ceilings, corroded steel in water tower structure, loose cornice, defective beams or girders, and similar items.

Exit Lights: (36 violations). The most common violation posted in this group was for failure to have 75-watt bulbs or hall lights on a separate circuit. Also includes lack of exit signs, defective lights, etc.

Elevators: (21 violations). This group refers to defective freight or passenger elevators. It includes such items as reshackling of hoist cables, testing of safety devices, renewing hoist rope fastenings, working

order of gates, designation of an operator, approved elevator locks, cleaning of shaft and equipment, repairing of cab, and similar items.

In all, of the 391 violations, 128 were found to be of major significance. These were distributed among 76 buildings, a little more than half of the structures for which violations were pending. Of this group, 43 buildings had one major violation, 22 buildings had two violations, and 5 buildings had three or more.

Conclusion

The major problems in the area revolve around fire hazards and structural weakness which, in fact, reinforce each other. The difficulties and dangers in fighting a fire once it has started are compounded by some elements of the construction and building design found in many of the structures. The danger of collapse, arising from the type of construction, is worsened by the action of fire on the cast-iron columns. Because of the density of the buildings, a fire in one can easily spread to others. The inherent problems are made more serious by widespread poor housekeeping practices. Although the building and fire departments are vigilant in their inspections, and most violations are reported and corrected with some degree of expedition, current regulations do not provide sufficient protection. Requiring automatic, year-round, alarm-fitted sprinkler systems in all the buildings would do much to bring the fire hazard within acceptable limits.

Chapter XI

The Condition of Buildings

The previous chapter was devoted to a general description of the structural problems encountered in buildings in the area. In order to introduce a greater degree of precision into the description of building quality, a field survey was undertaken in which each building was visited by a trained inspector who surveyed in detail the quality of the facade, the adequacy and state of repair of the elevators, heating equipment, and washrooms, and the repairs required in the building interior. A detailed check list was employed as a guide by the surveyor, but often departures from the list were necessitated by conditions that could not be stipulated in advance. In these cases, special notations describing the problem were entered onto the study sheets and retained in the structure's docket.

Separate ratings were developed for each of the five elements of building condition noted above. These results were summarized into an average which reflected the general conclusions regarding the quality of the building developed from the field inspection. A second and more comprehensive over-all index of building quality was then developed based upon the following three components:

(1) The degree of fire proofing, the fire insurance rating, and the assessed value per square foot, all of which were taken to represent in some general manner a summary evaluation of the entire structure.

(2) Fire violations, building violations, and the sprinkler status of the building were taken to represent the degree of improvements necessary to elevate the structure to levels of legal acceptability.

(3) The average building condition rating based on the inspection survey.

The summary index developed for each structure was analyzed for each basic building type in order to derive some indications of the extent to which the various structures were susceptible to remedial treatment. In the current chapter, the analysis of this problem is undertaken entirely from a physical point of view. In the following chapter, estimates are made of rehabilitation costs based upon the repairs and improvements needed both to correct conditions revealed by the inspection and to remove violations of building and fire codes.

Physical Condition Based on Field Inspection

Facade and Lobby - The ground floor and lobby entrance were evaluated separately from the upper floors of the building by the surveyor, though ultimately a single rating for both was derived. They were difficult to rate largely because of the intermingling of obsolescence and deterioration. When a cast iron front, replete with columns, fancy cornices, and metal decorations in places more suitably occupied by

window or loading space, is encountered, the surveyor was called upon to decide whether the whole facade should be torn down and replaced with a modern front, or whether the improvement should be limited to repair and painting.

The problem was further complicated by the present use of the structure. If it is a rag dealer's building, replacement of the front may not be recommended because, even in poor shape, the building is satisfactory for the present use. Moreover, the fronts of a few buildings have been replaced and others have been repaired frequently, concealing some of the defects. Although the surveyor was called upon to exercise a considerable amount of judgment, he was guided in his evaluation by a detailed list of items, which are summarized in the rating schedule presented in Table 52.

In the survey, only 11 percent of the buildings received a rating of 1, and only 8 percent received a rating of 4. The overwhelming proportion of buildings received ratings of 2 or 3. Those with a rating of 2, almost 50 percent of the total, generally require cleaning of brick or stone facades, cleaning and painting of iron fronts, and plastering and painting of the lobby. Light repair to doors, windows, sills, or store fronts appear frequently, as do such items as painting of the cornice, pointing of bricks, repair of bricks, and painting of fire escapes.

Only rarely does a heavy structural item, such as the replacement of doors or a loading dock, appear in a building with a 2 rating.

Table 52

Rating of Condition of Facade and Lobby of Buildings
Percent of Total Buildings by Location
South Houston Industrial Area, 1962

Rating	Description of Condition	Percent of Buildings		
		Total	Broadway Blocks	Rest of Area
1	Neither facade nor lobby needs work of a structural or repair nature. Either may need a light coat of paint or slight cleaning	10.9	17.9	9.5
2	Needs maintenance and light repair only. Includes surface preparation and painting, brick or stone cleaning, no replacement of structural parts	48.0	48.7	47.9
3	Needs moderate replacement of doors or windows, store-front decoration, plaster and floor repair in lobby, repointing of brickwork, replacement of chipped stone and brick, etc.	32.8	33.3	32.6
4	Obviously structurally unsound or visibly in need of major overhaul or replacement	8.3	-	10.0
	Total	100.0	100.0	100.0

In such cases, the doors or dock are not a substantial portion of the building frontage affected, and the upper facade usually rates 1. By and large, both facade and lobby need rectification, usually one or two items on each. With rare exceptions, the ground floor and lobby always require some work.

Buildings with a rating of 3 require much more extensive repair or replacement. In addition to all the items mentioned in the 2 ratings (which are often repeated in the buildings with a 3 rating), buildings in the 3 category have additional defects. Usually the iron front is rusted and in need of repair or replacement. Bricks need repointing and replacement in spots. Windows, sills, stonework, doors, wooden parts of the facade, ceilings in the lobby, all require repair or replacement. Loading docks have to be replaced, as do the lobby partitions of flimsy construction. Invariably the cleaning of brick, stone, or iron is urgently needed.

Because the surveyor called for replacement of the entire front of a building only if it was absolutely necessary, those buildings put into the replacement category are in danger of collapse or seem held together by extensive patchwork. Of the buildings receiving a facade rating of 4, most are used for rag or paper storage. In all cases, either the facade, particularly the windows, or the ground floor needs a major overhaul, and in some cases both are required. Total replacement of the ground floor, including loading docks, doors, store-

fronts, and metalwork, is often required, and almost as often there are bulging brick walls, disintegrating brick or iron fronts, and broken stonework on the sills and lintels on the ground floor decorations.

Elevators - Each elevator in the building was separately rated on the basis of four factors: the capacity, size, power, and condition of the cab of the elevator. The elevator's capacity was taken directly from the record which is posted in the cab itself as required by law. The evaluation was based on inspection utilizing the following criteria:

Capacity: Acceptable capacity for passenger elevators was set at 1,500 pounds; for freight elevators, 2,000 pounds. In buildings with only one elevator for both passengers and freight, the elevator was required to have the 2,000 pound capacity.

Size: Passenger elevators were required to have at least 16 square feet and freight elevators 20 square feet of floor area.

Power: The power was unacceptable if an elevator was started by the operator pulling a cable.

Frame: The cab was required to be structurally sound, its doors rigidly held in place at top and bottom, and it could not sway nor appear rickety when in motion.

Buildings of three floors or less were not penalized because of the absence of elevators. Buildings of four stories or more were rated according to the number of defects present. Elevators with three or

more defects, which presumably required replacement, were given the lowest rating (4). The absence of an elevator where one was required was also rated 4.

Results of the elevator survey, shown in Table 53, reveal that 24 percent of the buildings have elevators which fully met the criteria, and 32 percent more show only one defect. Buildings rated 3 and 4 each come to 22 percent of the total, but if the buildings rated 4 because they have no elevators are excluded, those found to have three or more deficiencies fall to 9 percent of the total.

By far the greatest number of deficiencies are found in the elevator cab. In almost 40 percent of the defective elevators, a faulty cab enclosure or structure is at least partly to blame. In the overwhelming number of cab defects, moreover, the type of door is inadequate. The majority of these elevator doors are of flimsy wire construction which bulges out and rubs against the elevator shaft beyond when a passenger leans against it. A number of elevators have no door at all. In still other cases, the sides of the elevator are roughly constructed of scrap wood, and often two or three sides are entirely open.

Inadequate capacity, substandard size, and cars that are started by tugging on a cable, each accounts for 15 percent of the remaining defects. In addition to these, other specific defects most frequently found are rickety or shaky elevators (5 percent) and slowness (5 percent),

Table 53

Rating of Condition of Elevators of Buildings
Percent of Total Buildings by Location
South Houston Industrial Area, 1962

Rating	Number of Defects	Percent of Buildings		
		Total	Broadway Blocks	Rest of Area
1	None	24.2	28.6	23.2
2	One	32.3	42.9	29.8
3	Two	21.5	17.1	22.5
4	Three or more, or no elevator where one required	22.0	11.4	24.5
	Total	100.0	100.0	100.0

with the remainder of the poor ratings due to deterioration or to frequent breakdown.

Heating - Since it was not possible in this limited survey to make an engineering check of the heating system of each building, the surveyor obtained the necessary information from the owner, the superintendent, or any occupant if neither of these two was available. In addition, he was called upon to observe the quality of the heating in the building, a fair test, since the survey was conducted during December, 1962, and January, 1963. All respondents cooperated freely and the empirical check by the surveyor in virtually all cases confirmed their report.

One rating system was applied where the heating for the building was or should have been centrally supplied. It was used also where there were workers in most parts of the building, even if the heat was not supplied centrally. The same criteria were not applicable, however, in buildings where the storage of goods took up a large amount of space, in establishments where incoming and outgoing trucks were an important part of doing business (as in rag and paper storage and garages), and in cases where space heaters were used on one or two floors of a building. In these circumstances, the need for full heating was not always demonstrable, and several other ground rules had to be established.

In the course of the survey, it was found that employees in such establishments were not satisfied with the heating. While owners often complained that, if the ground floor were heated, the heat would escape through the open doors, people frequently worked full time on the second floors or basements of their buildings without heat. It was also found that the lack of heat was not a necessary hardship in these businesses. In a few rag shops, for example, the buildings were heated centrally, and the employees were quite happy with the arrangement. Further, even on the ground floor, some of these establishments had installed space heaters which were turned on when the doors were closed, a system which also worked quite well. It was therefore decided to stipulate central heat in a building where employees regularly worked above or below the ground floor, and to require a space heater if only the ground floor was used. Only in a truck garage or in a building used entirely for storage were these rules relaxed.

A summary of the findings is presented in Table 54. A substantial 65 percent of the buildings are satisfactorily heated by a central system or by a space heater where appropriate. Another 9 percent, given a rating of 2, are afflicted with minor ills, which could probably be cured without major repairs to the system. An equal number of reports of uneven and inadequate heat could as easily be attributed to a landlord policy as to a structural or system deficiency, and it is likely that both are at work. Trouble with radiators and breakdowns

Table 54

Rating of Condition of Heating System of Buildings
Percent of Total Buildings by Location
South Houston Industrial Area, 1962

Rating	Description of Condition	Percent of Buildings		
		Total	Broadway Blocks	Rest of Area
1	In good condition, heating satisfactory	64.7	59.5	65.7
2	Parts of building inconsistently heated or insufficiently heated. *Space heaters satisfactory on more than one floor	9.3	18.9	7.3
3	Heating unsatisfactory, frequent breakdowns reported, cool, a fault of the system. *No space heater or unsatisfactory space heater on first floor. *Central system needed for less than whole building	15.8	16.2	15.7
4	No central heating system	10.2	5.4	11.2
	Total	100.0	100.0	100.0

* Applicable to buildings used for warehousing and storage.

are rare at this level. Three buildings which achieved a satisfactory heat by use of space heaters on more than one floor were also given a rating of 2.

In category 3, the problems are much more substantial. They range from the need for new systems for heating several floors of a building, encountered in fifteen structures, to the need for major overhaul or replacement of nine central systems, or for installation of adequately sized and spaced space heaters on the ground floors of seven buildings. Radiator troubles (too few or inoperative), in addition to inadequate heat throughout the buildings, are also included in this group.

In buildings rated 4, a full central system is needed. In only three cases are the buildings already supplied with central heaters, but these are antiquated coal-fired burners, which are unable to provide sufficient heat to keep the building from being cool or cold most of the time. In seven buildings, in which workers occupy all or most of the floors, there is no heat at all. In another fourteen cases, the building is partially heated by a space heater, gas burner, an electric stove, and, in one case, a pot-bellied stove.

For the 25 percent of the buildings inadequately heated or not heated at all, workers, at the time of the survey, were typically dressed in winter lumberjackets or overcoats, and wore innumerable sweaters and mufflers, hats and earmuffs. They almost invariably commented strongly on the lack of heat.

Washrooms - The survey revealed an almost universal neglect of washroom facilities in the survey area, which, in the great majority of cases, were rated one and often two levels below the rest of the building. By and large, the washrooms were inadequate, antiquated, dirty, and in need of repair.

The washroom ratings were based on two components, the existence of required facilities and their condition. The check list of facilities included toilet, washbasin, and space to hang clothes or to rest (in factory buildings, for example, the washroom is often one of the few places where smoking is permitted). Other items included an assessment of the washroom enclosure, the condition of the toilet and other facilities, and the general appearance of the washroom. In determining the adequacy of facilities, the relation of those facilities to their use was roughly gauged. If a floor was unused by employees (or only used incidentally, as on storage floors), no demerits for a lack of facilities was given. If more than 12 employees had to use a single toilet, however, the facilities were considered inadequate. In general, where both men and women were employed, at least two washrooms were considered necessary. Details concerning the deficiencies and the condition of facilities appear in Table 55.

In only 16 percent of the buildings are the washrooms adequate and in good condition, and in another 12 percent only light repair or addition of amenities or painting is required. Some 40 percent of the

Table 55

Rating of Condition of Washrooms of Buildings
Percent of Total Buildings by Location
South Houston Industrial Area, 1962

Rating	Description of Condition	Percent of Buildings		
		Total	Broadway Blocks	Rest of Area
1	Enough washroom facilities of the required type for both men and women on all floors requiring them. No repair needed	15.6	13.9	16.0
2	One basic inadequacy on each floor or less than 25 percent of the facilities. Light repair, painting, lighting, towel bars, medicine cabinets, etc.	12.3	11.1	12.6
3	Two defects on each floor or less than 50 percent of the building. Moderate structural repair, including replacement of toilet, addition of washbasin, enclosure of washbasin, etc.	39.3	50.0	37.1
4	Three or more defects on each floor, two-thirds or more of the building requires treatment. Complete replacement of facilities or new facilities required, existing facilities essentially primitive.	32.7	25.0	34.3
	Total	100.0	100.0	100.0

buildings were rated 3. Washrooms in most of these buildings require the enclosure of washbasins (60 percent), and about 40 percent call for the addition of new facilities or the replacement of toilets or washbasins. In addition to these major items, the field survey showed a need for cleaning, painting, repairs, and the addition of towel bars and other amenities in many cases.

Washrooms which were rated 4, the case in 33 percent of the buildings, almost invariably call for total replacement. A washroom rated 4 is an almost unbelievable phenomenon. In many cases, the partitions are flimsy wood construction, generally missing boards and even doors. Inside, the equipment is antiquated, absolutely filthy, unpainted for years, floors almost black. Much of the equipment does not work at all, and that which does is sluggish and uncertain. In contrast with the washrooms for employees, many owners of establishments point with pride to their executive and office washrooms, which are models of cleanliness and modernity.

Building Interior - The interior of the building (exclusive of the elevators, washrooms, and heating which, as noted above, were rated separately) was rated on the basis of the extent of the deficiency and the degree of treatment required. The list of items included floors, ceilings, stairways, walls, windows, and partitions. Note was taken of the material finishes, lighting conditions, obvious structural defects, and poor arrangements of space. Each floor was rated separately, and the

existing deficiencies and the extent of the repair required was recorded (Table 56).

Buildings which were rated 2, approximately 26 percent of total, need painting and minor repair. Items such as replacement of some steps on the stairway, window repair, ceiling repair in some spots, replacement of a small portion of the floors, are typical of this group. In general, these buildings are in fairly good shape, requiring only a moderate amount of attention, such as the painting of all or a major portion of the building, or the repair or replacement of a single structural item in a limited part of the building.

Buildings which were rated 3, 49 percent of the total, are in need of a much greater degree of attention. At least one major structural repair or replacement is necessary, including such items as the replacement of floors, plastering and painting of the building, replacement of the stairway, major repair of ceilings, partitions, walls or windows. Cases in this category usually include at least two other items in the same group with moderate requirements, such as the replacement of flooring on a single story, repair of wooden ceilings, replastering of a wall or painting of the stairway. In some buildings devoted to heavy storage, the wood floors are dangerously rutted and sections were covered with diamond plate. In these cases, a concrete floor was considered necessary and the existing floor was rated inadequate. In some cases, three major items are involved, all requiring considerable work in at least half to three-

Table 56

Rating of the Condition of the Interiors of Buildings
Percent of Total Buildings by Location
South Houston Industrial Area, 1962

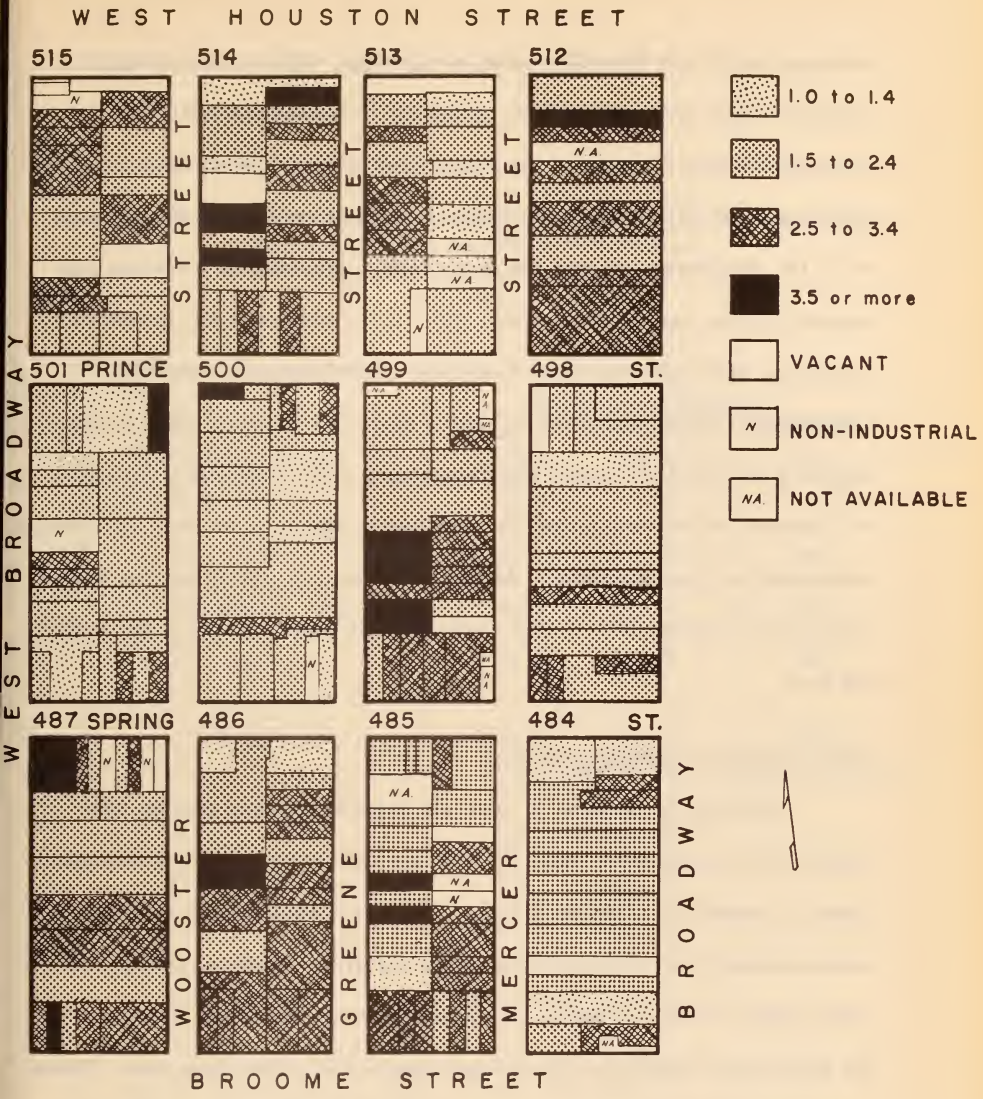
Rating	Description of Condition	Percent of Buildings		
		Total	Broadway Blocks	Rest of Area
1	No condition requiring more than normal maintenance. No repair required	9.6	17.9	7.8
2	Less than 25 percent of building requires treatment. Light repair, painting, plaster in spots, replace steps, no major structural faults	26.0	28.2	25.5
3	About 50 percent of building requires treatment. Moderate structural repair, walls, windows, floor replacement, ceiling replacement, but not requiring gutting or more than 50 percent replacement	48.8	38.5	51.1
4	Virtually all of the building requires treatment. Major structural alterations including gutting, several replacement items of major expense	15.5	15.4	15.5
	Total	100.0	100.0	100.0

quarters of the building. A few of the buildings were rated 3 instead of 4 only because they seemed basically substantial and able to take the proposed improvements without having to be gutted.

Approximately a quarter of the buildings rated 3 need paint and plaster, and an equal proportion require new flooring. Repair of ceilings and walls (exclusive of plastering small areas) are necessary in about 10 percent of the buildings, as was window and sash repair or replacement. A variety of other items, involving partitions, stairs and stairways, floor sanding, and others make up the remainder.

Buildings rated 4, 16 percent of total, are generally too deteriorated for effective rehabilitation. At least three major items require replacement or reconstruction throughout the building. This might include the replacement of a stairway, all the flooring, the rebuilding of walls and painting the whole building. In some cases, the whole building has deteriorated beyond recovery and the enumeration of specific defects is not warranted. Buildings which have been badly neglected also tend to be the smallest buildings in the area, which have little attraction for the average tenant. Typically, they are occupied by rag-picking and waste storage establishments.

Building Condition Summary of Physical Inspection - In order to summarize the ratings of buildings for each of the five major categories described above, a simple arithmetic average was employed, that is, the ratings for the items were summed and the total divided by 5. The



SUMMARY OF BUILDING CONDITION

MAP IV

SOUTH HOUSTON
STUDY AREA

averages were then classified into four groups, each corresponding to a whole integer from one to four, a system in consonance with the ratings employed for each of the five components and interpreted roughly in the same manner. The distribution of scores revealed that 8 percent of all the structures fall into the first class, consisting of buildings that merely require maintenance (Table 57). In an additional 49 percent of the cases, only light repair or moderate rehabilitation is required. Slightly more than 34 percent fall into a marginal class, containing buildings in a poor state of repair and requiring a major rehabilitation effort. In 9 percent of the structures, the physical condition is so poor that further investment seems imprudent. As one would expect, the Broadway structures are in considerably better condition than those located in the rest of the area.

Over-all Index of Building Quality

In order to develop an over-all index of building quality, two factors were considered, in addition to the information derived through physical inspection of the structures. The first consisted of several measurements of the over-all quality of any given building summarized in the degree of fire-proofing, the fire insurance rating per $100, and the assessed valuation in 1962-63 per square foot of building area. These components were rated in accordance with the system presented in Table 58. The second set of factors was concerned with the deficiencies of the buildings which were in contravention of existing statutes. The

Table 57

Average Rating of the Condition of Five Elements in the Field Inspection
Percent of Total Buildings by Location
South Houston Industrial Area, 1962

Average Rating	Percent of Buildings		
	Total	Broadway Blocks	Rest of Area
1.0 - 1.4	8.0	8.3	7.9
1.5 - 2.4	49.3	55.6	48.1
2.5 - 3.4	33.8	33.3	33.9
3.5 - 4.0	8.9	2.8	10.1
Total	100.0	100.0	100.0

Table 58

Rating System for the General and the Violation Components of the Overall Index of Building Quality South Houston Industrial Area, 1962

A. General

Rating	Degree of Fireproofing	Fire Insurance Rating per $100	Assessed Value 1962-63 per sq. ft.
1	Fireproof	Under $. 30	$6. 00 and over
2	-	$. 30 - . 59	3. 00 - 5. 99
3	Brick non-fireproof	. 60 - . 99	1. 50 - 2. 99
4	Wood	1. 00 and over	Under 1. 50

B. Number and Type of Violation

Rating	Fire	Sprinkler Status	Building		
			Legal		Structural
1	None	None or 2A - installed and approved	None	and	None
2	1 - 4	2B - installed, not approved	None	and	1 - 2
			or 1 - 4	and	None
3	5 - 9	2C - partially installed	None	and	3 - 4
			or 1 - 4	and	1 - 2
			or 5+	and	None
4	10 and over	All other code numbers	None	and	5+
			or 1 - 4	and	3 - 4
			or 5+	and	1 - 2

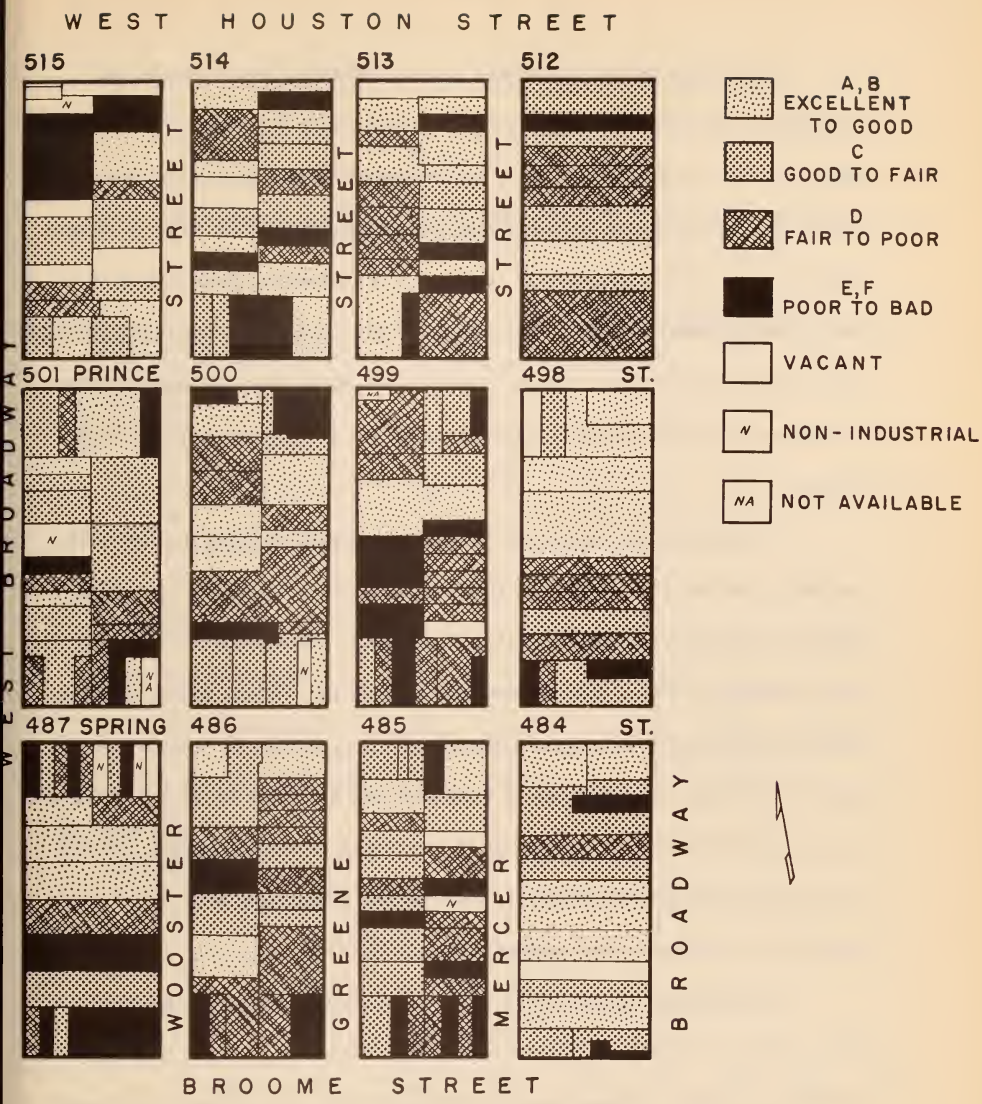
number of fire violations, the sprinkler status of the structure, and the number and importance of building violations constituted the rated elements in this case.

The over-all index of building quality was taken as the simple arithmetic average of the index of building condition, the general indicators, and the existing violations. The average ratings were arrayed, the distribution of the ratings studied, and buildings corresponding to each level of the average were analyzed in some detail. As the result, the average rating, which now may be considered as an index of building quality, was divided into six sub-categories. The first, or best condition, consists of structures with an average rating of 1.8 or less. Each successively lower quality category was marked off by an interval of .3, with the lowest category containing structures which rated 3.1 or over. Approximately 9 percent require some maintenance, but are otherwise in excellent condition; 38 percent are in need of minor or moderate rehabilitation; 30 percent are in need of heavy investments, either to rectify physical deficiencies or to improve the general appearance and efficiency of the building (Table 59). Sixteen percent of the cases are borderline, that is, the decision to rehabilitate or to clear is not clear-cut. The remainder, or 8 percent of the buildings, are in such a deteriorated state and presumably are so encrusted with violations that there appears little alternative to removal.

Table 59

Over-all Index of Building Quality
Percent of Total Buildings by Location
South Houston Industrial Area, 1962

Average Rating	Quality Index	Description	Percent of Buildings		
			Total	Broadway Blocks	Rest of Area
Less than 1.9	A	Excellent, maintenance only	8.9	10.3	8.6
1.9 - 2.1	B	Good, light repair only	11.9	17.9	10.7
2.2 - 2.4	C	Fair to good, rehabilitation moderate	25.8	33.3	24.4
2.5 - 2.7	D	Fair to poor, heavy rehabilitation	29.7	25.6	30.4
2.8 - 3.0	E	Poor, rehabilitation or clearance	16.1	7.7	17.8
3.1 and over	F	Bad, clearance	7.6	5.1	8.1
		Total	100.0	100.0	100.0



INDEX OF BUILDING QUALITY

MAP V

SOUTH HOUSTON
STUDY AREA

Buildings on the Broadway blocks tended by and large to be classified in the better categories. Comparatively few require extensive rehabilitation, or are sufficiently deteriorated to call unequivocally for demolition. This is not to imply that the remainder of the area is singularly poor; quite the contrary is the case. The spatial distribution of index quality shows a liberal sprinkling of good buildings scattered throughout the entire study area. In all, there is no solid concentration of poor structures unrelieved by a scattering of better structures anywhere in the area.

To assess the implications of the index of building quality more precisely, the various buildings in the area were grouped into roughly similar classes on the basis of size and height. The basic size groupings and height classes are presented in Table 60. While some of these classes include very divergent shapes and sizes (Class 1, for example, includes buildings as small as 20 x 40 feet and as large as 25 x 119 feet), the proportion of atypical buildings in any class is rather small. Of the 121 buildings falling into Class 1, only 26 buildings have a depth of less than 80 feet, and most are between 20 and 25 feet wide.

The height classes were chosen for rather specific reasons. First, there are differences in the physical requirements for buildings of different height. Three-story buildings or less do not require elevators, for example. On the other hand, buildings of over six stories have water pressure problems for sprinkler systems. Tall buildings therefore

Table 60

Over-all Index of Building Quality by Size and Shape of Structure
South Houston Industrial Area, 1962

Base Area and Height	Total	Index of Building Quality					
		A	B	C	D	E	F
I 25' by 119' or less							
A 1 to 3 stories	22	4	3	6	2	3	4
B 4 to 6 stories	80	1	2	13	33	22	9
C 7 stories and over	7	0	1	1	1	2	2
II 26' or more by 120' to 199'							
A 1 to 3 stories	10	6	2	2	-	-	-
B 4 to 6 stories	69	4	8	24	22	9	2
C 7 stories and over	21	3	6	8	3	1	0
III Any Width by 200' or more							
A 1 to 3 stories	1	1	-	-	-	-	-
B 4 to 6 stories	21	1	5	5	8	1	1
C 7 stories and over	5	1	1	2	1	-	-
Total	236	21	28	61	70	38	18

incur additional expense in sprinklering. In addition, taller buildings seem to be better maintained than low buildings, with some few exceptions noted later.

Building Quality by Structure Types

When the Building Conditions Index was classified by the various size and height classes, a distinct pattern emerged. In general, the smaller the building, the more likely it is to fall into a lower classification. Of all the buildings in Class I, 72 percent fall into the lowest three categories of condition. In Class II, the percentage is 37, and in Class III, it is 40. When grouped by heights, buildings one to three stories high show only 27 percent in the lowest three categories, four to six-story buildings show 63 percent, and buildings seven stories or higher, 27 percent. The smallest buildings of moderate height, Class IB, are the most deteriorated. Eighty percent of the buildings in this class fall in the three lowest quality categories.

To analyze the condition of buildings in somewhat greater detail, particular studies were made of the three lowest categories of condition. Buildings of each sub-type were examined to determine the kinds of repairs that were required, how extensive the rehabilitation effort would be, and what unusual circumstances or problems would be encountered because of the nature of the building. A brief report on each of the subtypes examined is given below:

Class IA - 25 x 119 feet or less, 1-3 stories - The great majority (about 70 percent) of buildings in this class received the lowest ratings and all of these are three-story buildings. The three-story buildings are often among the worst in the study area. They are small, do not have elevators (nor does it pay to put one in), and they rank in general as the least desirable type of building in the South Houston Industrial Area. At least two are vacant, and several others are being used primarily for storage.

Class IIA - 26 or more x 119 feet or less, 1-3 stories - All ten of these buildings are in the top three condition classes. Most are two-story and one-story buildings, and many are new. The older structures are larger with significantly more floor space per floor and are usually well maintained.

Class IIIA - any width x 200-foot building, 1-3 stories - There is only one building in this category, rated in the highest group.

Class IB - 25 x 119 feet or less, 4-6 stories - In the IB and IIB classes which follow, the greatest concentration of building deterioration is found. Together, the IB and IIB buildings account for 78 percent of all buildings requiring heavy rehabilitation or clearance. the IB class alone accounts for 50 percent of the total. Since 64 of these buildings are in the three lowest condition category, they warrant separate notice.

Buildings with Quality Index F: These are the worst rated buildings in the group, and would not seem to be worth rehabilitating.

All the buildings have received ratings of 4 on most substantive items; many require sprinklers and elevators as well. Heat is satisfactory in only one-ninth of these buildings. There are major violations in many of them, defects such as bulging and settling walls and structures are commonplace, and wholesale rebuilding of floors and walls is usually required.

Buildings with Quality Index E: This is the clearance or rehabilitation group, in somewhat better condition than the F buildings. The buildings that are marginal cases for rehabilitation usually require sprinklers, heating systems, much internal repair, and possibly the removal of major violations. Ratings of 4 on substantive items still dominate many of the condition categories.

Buildings with Quality Index D: Many of these require major rehabilitation, usually including elevator repair or installation, and substantial internal repair and renovation. In this group are some buildings that require gutting before they can be put into proper condition. Several have major violations. Even among the buildings that are worth rehabilitating, the effort required is considerable.

Class IIB - 26 or more x 119 feet or less, 4-6 stories - The IIB building averages twice the width of the IB building (50 as against 25 feet) and ranks about one-half a grade higher in condition. While 80 percent of the 25-foot buildings fall into the lowest 3 condition categories, only 49 percent of the Class IIB buildings do. Only two IIB buildings are in the lowest class. As with the Class IB buildings, the large number

of buildings in Class E and Class F justifies individual discussion.

Buildings with Quality Index E or F: There appears to be a basic difference between Class IIB and Class IB buildings immediately apparent in studying the actual conditions in the buildings. In Class IIB, sprinklers have been installed in at least half the buildings, and there are signs of other improvements in the process. Whereas half the Class IB buildings do not seem worth rehabilitating, only one-third appear to be equally questionable among the Class IIB buildings. Those which cannot be rehabilitated easily require major improvements in the building, plus the installation of elevators and sprinklers, and the removal of major violations. Those that seem possible to save have considerably lower requirements, but even these call for a sprinkler system, an elevator, plus a moderate amount of interior work, or a need for one of the two installations plus a major interior overhaul.

Buildings with Quality Index D: All the buildings in this group seem to be worth a rehabilitation effort. A typical repair in these buildings involves one major item, such as a sprinkler or an elevator, plus substantial interior repairs. One or two buildings are very badly deteriorated and have major building violations, but do not need sprinklers or elevators.

All is not completely sanguine for the Class IIB buildings. In view of the slow rate at which improvements are being made and the inadequacy of some of the efforts, reflected in the numerous violations,

it is reasonable to assume that these buildings will not hold their own in the future unless a special program is undertaken.

Class IIIB - any width x 200 feet or more, 4-6 stories - These also are about half a grade above the Class IB buildings. Only one is in such bad condition that rehabilitation seems unlikely. Not only does this building need a sprinkler, but its interior is as bad as many of the worst of the 25 x 100 foot structures. For the rest, rehabilitation is certainly possible. All need considerable work in the interior, but only one or two require sprinklers or an elevator. Most of these buildings are only 25 feet wide; one, however, is a full 100 x 200 feet. This building needs four new elevators and twenty new washrooms. Considering the amount of floor space involved and the utility of that space, the investment may be warranted. If these improvements alone were made, that building's quality rating would rise from D to C. If interior and exterior improvements were also made, it would become a B building.

Class IC - 25 x 119 feet or less, 7 or more stories - Two-thirds of the seven buildings in this group are in the lowest three categories, and the outlook for buildings of this type is not good. There are sprinkler violations in every building, a violation that is not easy to eliminate in this type of structure. Because it is more than six stories in height, pumps or water towers must be installed to guarantee the delivery of sufficient pressure to the sprinkler heads; this is an expensive undertaking. Several of the buildings have multiple building violations of a

major character, and in some cases elevators are needed. Renovation requirements are heavy. One of the buildings is closed above the first floor. In one or two instances rehabilitation is in process, but the effort is inadequate, judging from the deficiencies noted by the building inspectors who filed the violations.

Class IIC - 26 or more x 119 feet or less, 7 or more stories - Of the 21 buildings in this group, only four rated low, three in the heavy rehabilitation category and one in the marginal clearance group. Only one of the four would seem to present major difficulties in rehabilitation. Two require moderate amounts of work and a third needs a sprinkler in addition. The fourth building, however, calls for both a sprinkler system and an elevator, in addition to heavy interior repairs. Considering the type of effort being put into rehabilitation on buildings of similar types, it is doubtful that a sufficient amount of improvement would be warranted in this building. A sprinkler may ultimately be put in, a new elevator and other repairs made, but the quality of this work and its extent is likely to fall short of a desirable standard.

Class IIC - Any width x 200 feet or more, 7 or more stories - Only one of the five buildings in this class falls into the lower categories, the heavy rehabilitation class. The owner of this building is now undertaking a program of repair and a sprinkler system has been installed, though not yet approved. Overhaul of the freight elevator is evidently needed. All items in the field survey were rated 3, with the exception

of the heating system which merited 2. The building can be rehabilitated, but it will require a push.

Summing up the buildings above six stories in height throws a sharper focus on the area as a whole. In general, the larger buildings are in better condition than smaller structures and can more easily be rehabilitated when repairs or installations are required. The smaller the building size, the less feasible is the modernization of the building from the physical standpoint.

Chapter XII

The Cost of Rehabilitation

The condition of buildings described in the previous chapters indicates a compelling need for an extensive repair and replacement program in order to bring the structures in the study area up to satisfactory levels of safety, efficiency, and appearance. This objective immediately raises a series of questions. What would it cost to achieve this result, and what are the principal items which comprise the total cost? How does the cost of rehabilitation vary with type and size of building or with its location in the study area? Is the investment warranted, and how would such a question be examined?

The General Approach

In order to assess these and other questions related to the feasibility of rehabilitation, the field inspection data, utilized in the previous chapter to provide a basis for an over-all index of quality, were employed again, this time for the purpose of determining the costs involved in rectifying the existing deficiencies. Costs were estimated separately for 220 of the 244 buildings in the study area. The remainder were omitted, some because of inability to gain access, but most because their defects were of a type that made it difficult to

estimate rehabilitation costs within acceptable limits of accuracy.

The estimates were prepared in two stages. First, four buildings in the area were studied in great detail by Mr. John Post, a building contractor with long experience in rehabilitating such structures, both in the study area and elsewhere. The cost figures derived in this manner were then used as a guide by Mr. Ahmet Semir Nakisbendi, an architect with extensive experience in cost estimation, who utilized the inspection data, supplemented by visits to the area, as the basis for developing the component rehabilitation costs.

Several general considerations must be kept in mind in reviewing the estimates. First, it was assumed that each building would be improved individually. For example, though a single large water tank could be built on each block to provide 550 gallons of water per minute for each sprinkler installation, the savings for each structure resulting from such a cooperative venture were not considered. Secondly, the cost of removing building and fire violations were estimated separately only when they were not included in the general repair program for the building as a whole. Some items, however, such as the installation of sprinkler systems and the enclosure of stairways and elevator shafts in fire-resistive material were considered separately, because these represent substantial components in total rehabilitation cost. Third, it must be recognized that many items cannot be estimated

with accuracy in the general fashion employed in this study. It is believed, however, that the total error for any building does not exceed 25 percent.

Estimating the Cost Components

Costs were estimated separately for nine major components of the total rehabilitation process. In most instances, the components were built up from an evaluation of a series of individual items, but for a few an average cost for a specific condition category was employed. Costs for each component include only materials and labor. In each building an allowance of 20 percent for builder's overhead and profit was added to the total material and labor cost for the nine components, in order to derive the grand total of required rehabilitation expenditures. The procedures employed in arriving at cost estimates for each of the components are described in the following paragraphs.

Sprinkler Installation - It was assumed that sprinklers are to be installed in (1) all buildings in which an official order had been issued, even if the order had been rescinded or held in abeyance, and in (2) all non-fireproof buildings more than one story in height which do not now have sprinkler systems. This added some 25 buildings to those for which violations were listed, bringing the total to about one hundred. In estimating the expense of installing a sprinkler system a base cost of $.60 per square foot was used. If the building was five or six stories in height, a further cost of $4,000 for a pump was added.

If the building was seven stories or more, a total of $27,000 for a tank system (which includes a pump, water tower, water heater, alarm system, etc.) was added to the base cost.

Fire-Resistive Enclosures - As previously noted, only major defects which affected the entire building, such as the need for enclosure of elevator shafts and stairways, were included in this item. Some thirty buildings need this alteration. On the assumption that approximately $500 is required to enclose either a stairway or elevator shaft for one floor, the total cost was derived by multiplying this figure by the number of stories in the building.

Facade - As will be recalled, the rating of the facade in the field was separated into (1) the section above the first floor and (2) the ground floor exterior and lobby combined. This separation was utilized in the cost analysis, which was based upon the seven separate categories of rehabilitation cost presented below. The specific items entering into the computation of facade costs are shown in Table 61.

Cost Category	Required Repair or Replacement
1.	Cleaning and very light repair of the upper facade only.
2.	Cleaning and light repair of both upper and lower facade.
3.	Cleaning and light repair of upper facade, moderate repair on lower facade.
4.	Moderate repair on both upper and lower facade.

Table 61

Items Included in the Cost of Rehabilitating the Building Facade per Front Foot per Story, by Condition of Facade South Houston Industrial Area, 1962

Item	Condition of Facade 1	2	3	4	5	6	7
cade cleaning d painting	$2.00	$2.00	$2.40	$2.40	$2.40	$2.40	$ -
cade wall repair d replacement	-	-	.60	2.00	1.00	4.00	14.00
cade window paint, pair and replacement	.50	1.00	1.60	3.60	1.60	3.60	10.00
rnice repair or placement	-	-	.40	2.00	1.00	2.00	4.00
restair repair d paint	.50	1.00	1.00	2.00	2.00	3.00	4.00
bby wall paint, pair or replacement	-	1.00	2.00	3.00	8.00	8.00	12.00
bby window (storefront) pair or replacement	-	1.00	3.00	3.00	12.00	12.00	12.00
ntrance, loading, evator door repair or placement	-	2.00	3.00	4.00	10.00	10.00	10.00
Total	$3.00	$8.00	$14.00	$22.00	$38.00	$45.00	$66.00

Cost Category	Required Repair or Replacement
5.	Cleaning and light repair of upper facade, replacement of major components of lower facade.
6.	Major repair of upper and lower facade, replacement of major components on lower facade.
7.	Both upper and lower facade require extensive structural replacement.

Elevators - Several basic decisions affecting the cost of elevator facilities were made. It was decided that any elevator with a rating of 4, which means that at least three basic defects involving cab structure, size, type of control, and capacity are present, requires replacement. Any elevator that is started by hand (by means of the operator pulling a cable) should also be replaced. Old elevators found deficient in size were scheduled for expansion, if it could be accomplished at a reasonable price, or for replacement. If there is no elevator where needed, the cost of a new installation was included. In a large number of cases, repair seems to be all that is necessary to rectify the existing defects. In these instances, the cab most generally requires better enclosure or more adequate gate structure. Less frequently, an increase in the weight load capacity of the elevator is needed.

Building Interior - Much the same system was followed in developing the cost estimate for the building interior as for the facade. The various items were analyzed according to condition rating, and

unit costs developed (Table 62). Since those buildings rated 4 exhibited a wide range of conditions, they were distributed into two classes (4 and 5) and estimated separately.

Washrooms - Estimates were made for washrooms that require total replacement, those that need combinations of repairs which amount to total replacement, and those where expansion of facilities is needed. In addition, an allowance was made for new toilets or washbasins. For each washroom added or replaced, a total of $1,500 was applied to rehabilitation cost.

Heating - Almost two-thirds of the buildings require no heating repair or replacement and a considerable number need only minor repairs. Where central heating is present but inadequate, the records indicated that a moderate amount of repair either to the burner or to the radiators would be sufficient to correct the condition. Where people work on the ground floor only, it was assumed that space heaters would be sufficient. Accordingly, the following costing basis was used: buildings rated Condition 3, $100 per floor; buildings rated Condition 4, which require new heating system installed, $1,000 per floor. Where a space heater is required on one floor, $300 if the area was 3,000 square feet or less, and $600 if in excess of 3,000 square feet.

Roof - It was found that the cost of repairing the roof correlated very highly with the building quality index. For structures in the A, B, and C categories, virtually no repairs are necessary. For D and E

Table 62

Items Included in the Cost of Rehabilitating the Building Interior per Square Foot of Building Area, by Building Condition South Houston Industrial Area, 1962

Item	Building Condition 1	2	3	4	5
Painting and minor repair - walls, ceilings	$ .04	$.05	$.05	$.05	$.05
Stairway, paint	-	.03	.03	.03	.03
Doors, paint	-	.02	.02	.02	.02
Wall - repair or replacement	-	-	.13	.24	.40
Stair - repair or replacement	-	.02	.10	.20	.30
Floor - repair or replacement	-	.03	.18	.40	.60
Ceiling - repair or replacement	-	-	-	.27	.40
Door - replacement	-	.01	.04	.07	.10
Light - repair or replacement	-	.03	.04	.07	.10
Total	$.04	$.19	$.59	$1.35	$2.00

buildings, the required rehabilitation cost is $.32 per square foot, and for F buildings, $.65 per square foot.

Cellar - The condition of the cellar was not examined routinely in the course of the field survey. It is known, however, from individual inspections that the cost of repairing the cellar provides a particularly complex problem. Many buildings in the area have more than one cellar, and some have none. Many unusual defects are found in these subterranean areas, including foundation problems, eroded concrete floor, excess and unprotected piping, and other items which can add significantly to cost. In order to include this item in the total cost for the structure, the general condition of the interior of the building was used as an index. For one-story structures, no cellar repairs were included. For buildings of two or more stories, the following schedule was employed: buildings with interior rating 1, $.19 per square foot; 2, $.59 per square foot; 3, $1.35 per square foot; 4, $2.00 per square foot.

The Composition of Total Rehabilitation Costs

The aggregate cost of rehabilitating structures in the study area involves a substantial capital outlay. The grand total for the 220 buildings subjected to detailed analysis amounts to $13,055,800 (Table 63). If it is assumed that the remaining structures in the area have a rehabilitation cost distributed in the same manner as

Table 63

Components of Aggregate Cost of Rehabilitation of 220 Buildings
South Houston Industrial Area, 1962

	Amount	Percent
Sprinkler	$ 2,111,800	16.2
Fire-Resistive Enclosures	92,500	.7
Facade	891,100	6.8
Elevators	2,914,000	22.3
Building Interior	2,671,700	20.4
Washrooms	915,000	7.0
Heating	144,100	1.1
Roof	138,400	1.1
Cellar	1,001,600	7.7
Total	10,880,200	83.3
Builders Overhead & Profit	2,175,600	16.7
Grand Total	$ 13,055,800	100.0

those that were studied, the total rehabilitation cost for all structures would be estimated to lie in the vicinity of $17 million. The major components of cost are for the repair and installation of elevators, 22 percent of total; the removal of violations and the improvement of building interiors, 21 percent of total; and the installation of sprinklers, 16 percent of total. The remaining amount is distributed among expenditures for facade improvement, washroom installation and repair, and the rectification of defects in the roof and cellar.

The rehabilitation cost per building varies very widely (Table 64). In approximately 10 percent of the structures, costs are under $10,000, and in a few cases they range up to several hundred thousand dollars. The median rehabilitation cost is approximately $53,000, with the expenditures in this category conforming in general to the pattern described above for the grand total for the area. When rehabilitation costs are adjusted for size of structure, the range of variation in cost per square foot runs from under $1 to slightly over $10 (Table 65). The bulk of the cases, however, are to be found in the lower portions of the range, with the median cost falling at $3.10 per square foot.

Since costs were based on condition, it is hardly unexpected to find that the average rehabilitation cost per square foot revealed a decided correlation with the index of building quality. Rehabilitation costs progress steadily from $.80 for buildings with quality index A up

Table 64

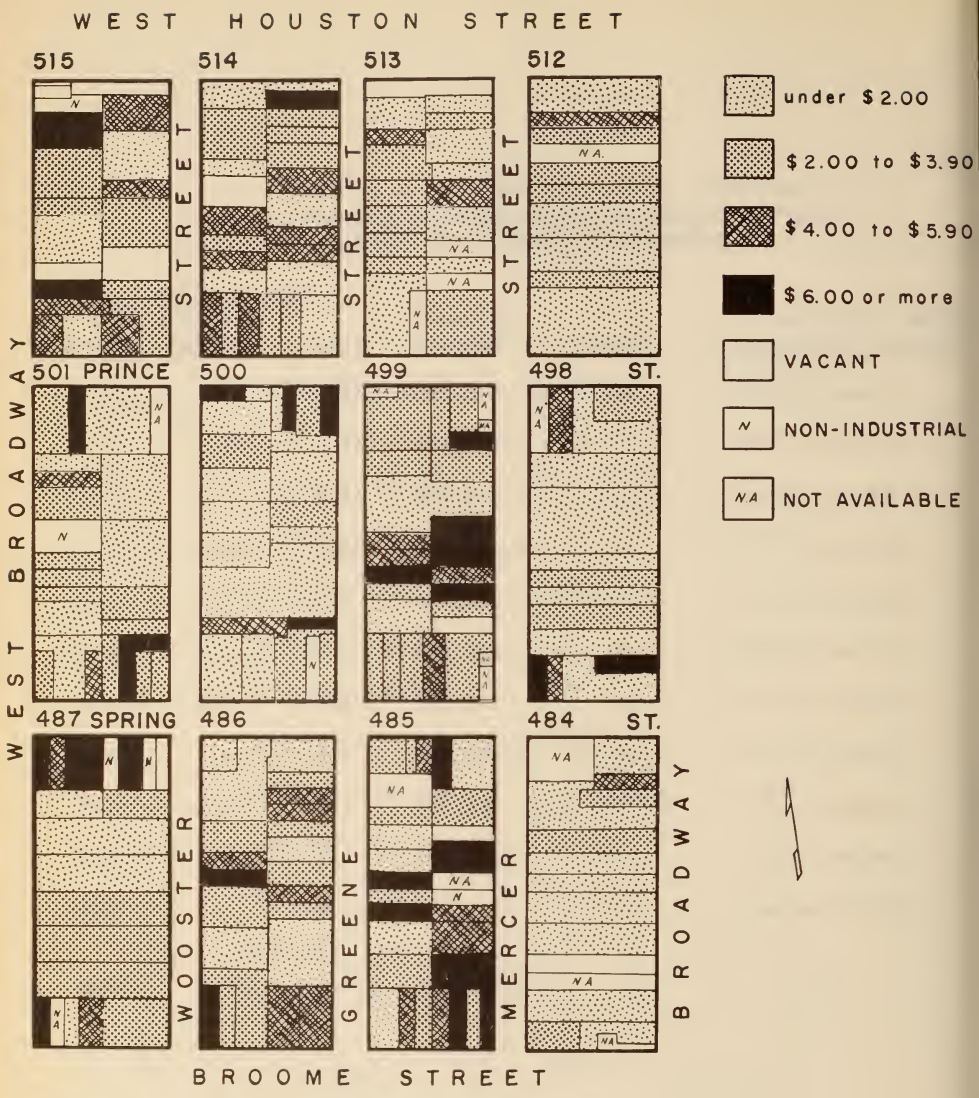
Distribution of Cost of Rehabilitation, by Amount per Building
South Houston Industrial Area, 1962

Total Rehabilitation Cost	Number	Aggregate Amount
Under $10,000	21	$ 73,000
$10,000 - 19,999	14	219,500
$20,000 - 29,999	16	385,100
$30,000 - 39,999	25	889,100
$40,000 - 49,999	27	1,220,800
$50,000 - 59,999	23	1,268,400
$60,000 - 69,999	19	1,209,500
$70,000 - 79,999	17	1,242,500
$80,000 - 89,999	18	1,520,500
$90,000 - 99,999	6	570,900
$100,000 - 149,999	27	3,228,100
$150,000 and over	7	1,228,400
Total	220	$13,055,800

Table 65

Distribution of Cost of Rehabilitation, by Cost per Square Foot of Building Area, by Location South Houston Industrial Area, 1962

Total Rehabilitation Cost per Square Foot	Number	Aggregate Amount	Percent of Total		
			Total	Broadway Blocks	Rest of Area
Under $1.00	30	$ 550,700	13.6	25.7	11.4
$1.00 - 1.99	38	2,074,200	17.3	28.5	15.1
$2,00 - 2.99	37	1,830,100	16.8	2.9	19.5
$3.00 - 3.99	41	3,278,300	18.6	25.7	17.3
$4.00 - 4.99	21	1,420,400	9.5	8.5	9.7
$5.00 - 5.99	17	1,266,800	7.7	2.9	8.6
$6.00 - 6.99	10	591,300	4.5	2.9	4.9
$7.00 - 7.99	16	1,354,800	7.3	-	8.6
$8.00 - 8.99	4	251,400	1.8	2.9	1.6
$9.00 - 9.99	2	155,000	.9	-	1.1
$10.00 and over	4	293,300	1.8	-	2.2
Total	220	$13,066,300	100.0	100.0	100.0



REHABILITATION COST PER SQUARE FOOT OF FLOOR AREA

MAP VI

SOUTH HOUSTON STUDY AREA

to $7.40 for buildings rated F (Table 66). The weighted arithmetic mean for all structures is $3.40 per square foot. Within each condition category, there is substantial variation depending upon the size and height of the structure. The IB buildings (under 25 x 100 for the most part) exhibit the greatest range of costs. This is an inevitable consequence of their size acting in combination with the need for expensive repairs in only some of the buildings.

To a certain extent at least, these costs are the same for small as for large buildings, creating a great range in costs per square foot among different size structures in the same condition. An elevator requirement, for example, can easily add $2.50 a square foot to a Class IB building, but only $1.00 to a Class IIB building, and less than $.50 per square foot to a Class IIIB building, which can have 16 times the floor area of the smaller building. Similar spreads of cost per square foot can be found in sprinkler system components, facade costs, and other items. This higher per square foot cost for smaller buildings over that for larger buildings with the same condition rating fortifies the observations expressed in Chapter XI. The general impressions of difficulty of rehabilitation of smaller buildings found there are considerably corroborated by the cost estimates reported here.

Costs as a Ratio of Value

A significant indication of the feasibility of rehabilitation is

Table 66

Cost of Rehabilitation per Square Foot, by Index of Building Quality and Size and Shape of Structure
South Houston Industrial Area, 1962

Base Area and Height	Average	Index of Building Quality A	B	C	D	E	F
I 25' by 119 or less							
A 1 to 3 stories	$3.20	$1.30	$1.80	$3.20	$3.50	$6.60	$5.70
B 4 to 6 stories	5.20	-	1.20	3.40	5.20	6.50	8.90
C 7 and over stories	5.10	-	3.60	4.60	3.90	7.30	5.70
II 26' or more by 120' to 199'							
A 1 to 3 stories	1.00	.70	.80	2.20	-	-	-
B 4 to 6 stories	2.60	1.10	1.00	2.10	3.40	3.50	-
C 7 and over stories	2.70	.50	1.70	3.30	4.40	4.80	-
III Any width by 200' or more							
A 1 to 3 stories	.30	.30	-	-	-	-	-
B 4 to 6 stories	1.50	1.40	.60	3.10	2.30	3.80	5.40
C 7 and over stories	1.20	1.30	.40	1.20	1.90	-	-
Average	$3.40	$ .80	$1.20	$2.80	$4.30	$5.50	$7.40

Note: Because of the range of repair costs of buildings in the same size and condition class and the small number of buildings in some of the classes, the difference in average costs among classes does not always follow a regular pattern.

given by the relationship between the rehabilitation cost and the estimated market value of the building. Quite obviously, repair and replacement are more likely to take place when they represent a small proportion of the value of the building than if the contrary is the case, other things being equal. In the study area, rehabilitation cost taken as a ratio of estimated current market value[1/] reveals that in 15 percent of the buildings rehabilitation cost is less than 20 percent of the market value of the structure, and in an additional 15 percent, the cost lies between 20 and 39 percent of value (Table 67). The median ratio, however, is quite high, standing at 83 percent of market value. In fully 39 percent of the buildings, moreover, the cost of rehabilitation is equal to or exceeds the estimated market value of the property, and in 13 percent of the structures, it is in excess of twice the market value of the property. This is indeed a dramatic indication of the deteriorated state of many of the buildings in the area and offers substantial evidence that the rehabilitation of these structures is not likely to prove financially feasible.

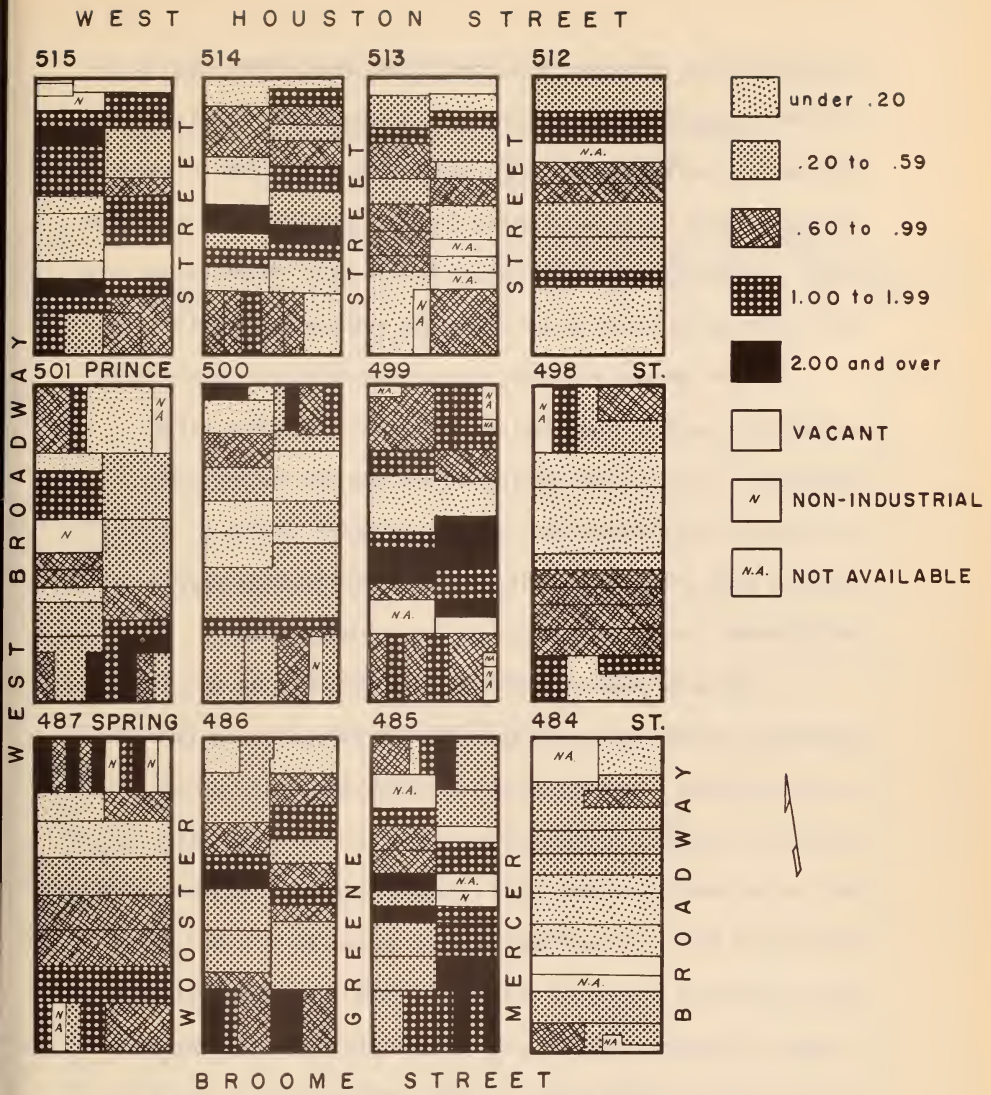
There is a marked contrast between the buildings on the

1/ Market value of buildings was estimated in the following manner: (1) For properties that had been acquired since 1945, the total consideration was multiplied by the price increase that had taken place between the date of acquisition and 1962. (2) For properties acquired at an earlier date, the assessed valuation 1962-63 was multiplied by 1.10, which is the current ratio of consideration to assessed value. See Chapter XIII.

Table 67

Percent Distribution of Ratio of Rehabilitation Cost to Estimated Market Value, by Location South Houston Industrial Area, 1962

Ratio of Cost to Value	Percent of Total		
	Total	Broadway Blocks	Rest of Area
Under .19	15.1	22.9	13.6
.20 - .39	14.6	25.7	12.5
.40 - .59	5.9	5.7	6.0
.60 - .79	12.3	14.3	12.0
.80 - .99	13.2	11.4	13.6
1.00 - 1.49	15.1	14.3	15.2
1.50 - 1.99	10.5	5.7	11.4
2.00 - 2.49	8.7	-	10.3
2.50 - 2.99	2.3	-	2.7
3.00 and over	2.3	-	2.7
Total	100.0	100.0	100.0



RATIO OF REHABILITATION COST TO MARKET VALUE

MAP VII

SOUTH HOUSTON STUDY AREA

Broadway blocks and those in the rest of the area in this regard. In the former group, only 20 percent show a rehabiliation cost in excess of estimated market value. In the remainder of the area, however, 42 percent of all the structures fall into this category. As one might expect, the more expensive buildings tend to have rehabilitation costs that represent the lower proportion of the estimated market value.

In the structures valued at less than $50,000, 30 percent of the buildings have a rehabilitation cost less than building value (Table 68). In structures valued between $50,000 and $99,000, 73 percent of the buildings fall into this category, and in structures valued at $100,000 or more, 94 percent of the buildings register a rehabilitation cost substantially less than building value.

The same general pattern is revealed when the structures are analyzed by market value per square foot to adjust for any differences in value that may result because of quantity rather than quality. For buildings in which the estimated market value is less than $4 a square foot, 44 percent of the total show rehabilitation costs less than building value (Table 69). For buildings between $4 and $5.99 a foot, this group constitutes 82 percent of the total, and in buildings valued at $6 or more per square foot, all of the structures reveal rehabilitation costs less than building value. In fact, for structures in this group, 57 percent show costs of rehabilitation less than 20 percent of the market value per square foot.

Table 68

Ratio of Rehabilitation Cost to Estimated Market Value, by Estimated Market Value, by Location
South Houston Industrial Area, 1962

atio of ost to alue	Total	Estimated Market Value in Thousands of Dollars											
		Under 20	20-29	30-39	40-49	50-59	60-69	70-79	80-99	100-149	150-199	200-249	300 & over
Total Area													
nder .19	33	1	2	4	1	1	2	2	4	4	-	8	4
20 - .39	32	2	2	2	-	2	2	-	1	9	7	1	4
40 - .59	13	-	-	-	-	1	1	1	4	1	1	4	-
60 - .79	27	-	-	3	2	2	2	3	6	3	3	3	-
80 - .99	29	1	2	3	2	6	1	1	3	7	2	1	-
.00 - 1.49	33	1	2	11	4	4	1	3	3	1	3	-	-
.50 - 1.99	23	1	4	9	5	1	1	2	-	-	-	-	-
.00 - 2.49	19	-	6	9	2	2	-	-	-	-	-	-	-
.50 - 2.99	5	2	1	2	-	-	-	-	-	-	-	-	-
.00 - 3.99	5	1	4	-	-	-	-	-	-	-	-	-	-
Total	219	9	23	43	16	19	10	12	21	25	16	17	8
Broadway Blocks													
Under .19	8	-	-	-	-	-	-	-	-	1	-	4	3
20 - .59	11	-	-	-	-	-	1	-	-	2	3	1	4
60 - .99	9	-	-	-	-	-	-	1	1	5	1	1	-
.00 - 1.49	5	-	-	1	-	2	-	-	2	-	-	-	-
.50 and over	2	-	-	-	1	-	-	1	-	-	-	-	-
Total	35	-	-	1	1	2	1	2	3	8	4	6	7
Rest of Area													
Under .19	25	1	2	4	1	1	2	2	4	3	-	4	1
20 - .59	34	2	2	2	-	3	2	1	5	8	5	4	-
60 - .99	47	1	2	6	4	8	3	3	8	5	4	3	-
1.00 - 1.49	28	1	2	10	4	2	1	3	1	1	3	-	-
1.50 - 1.99	21	1	4	9	4	1	1	1	-	-	-	-	-
2.00 and over	29	3	11	11	2	2	-	-	-	-	-	-	-
Total	184	9	23	42	15	17	9	10	18	17	12	11	1

Table 69

Ratio of Rehabilitation Cost to Estimated Market Value by Estimated Market Value per Square Foot, by Location South Houston Industrial Area, 1962

Ratio of Cost to Value	Total	Estimated Market Value per Square Foot in Thousands of Dollars								
		Under 3.00	3.00-3.49	3.50-3.99	4.00-4.49	4.50-4.99	5.00-5.99	6.00-7.99	8.00-9.99	10.00 over
Total Area										
Under .19	33	-	4	1	4	3	4	4	2	11
.20 - .39	32	1	4	5	3	7	5	6	1	-
.40 - .59	13	1	1	6	3	-	-	1	1	-
.60 - .79	27	3	6	8	3	3	3	1	-	-
.80 - .99	29	3	6	9	5	1	2	3	-	-
1.00 - 1.49	33	8	16	6	-	1	2	-	-	-
1.50 - 1.99	23	6	9	4	2	1	1	-	-	-
2.00 - 2.49	19	6	6	3	2	-	2	-	-	-
2.50 - 2.99	5	3	2	-	-	-	-	-	-	-
3.00 - 3.99	5	3	1	1	-	-	-	-	-	-
Total	219	34	55	43	22	16	19	15	4	11
Broadway Blocks										
Under .19	8	-	1	1	1	1	1	1	-	2
.20 - .59	11	-	-	2	3	3	2	-	1	-
.60 - .99	9	2	1	2	1	2	1	-	-	-
1.00 - 1.49	5	1	2	1	-	-	1	-	-	-
1.50 and over	2	1	-	-	1	-	-	-	-	-
Total	35	4	4	6	6	6	5	1	1	2
Rest of the Area										
Under .19	25	-	3	-	3	2	3	3	2	9
.20 - .59	34	2	5	9	3	4	3	7	1	-
.60 - .99	47	4	11	15	7	2	4	4	-	-
1.00 - 1.49	28	7	14	5	-	1	1	-	-	-
1.50 - 1.99	21	5	9	4	1	1	1	-	-	-
2.00 and over	29	12	9	4	2	-	2	-	-	-
Total	184	30	51	37	16	10	14	14	3	9

Repair and Replacement 1945-1962

An indication of the readiness with which rehabilitation is likely to be undertaken is given by the past experience of the area. The amount of repair and replacement activity that took place since the end of World War II is indicated by the total of approximately $2,242,600 in building permits issued and used between 1945 and 1962.[2/] Approximately 30 percent of the total was disbursed between 1945 and 1949 (Table 70). In the ensuing five-year interval, there was a considerable contraction in expenditures, with the total for that period dropping to 16 percent of the aggregate. Between 1955 and 1959, there was a resurgence of activity, which in total amounted to $750,500, or 34 percent of the total for the post-war era. In the three-year period 1960 to 1962, $448,800 was spent, roughly 20 percent of the total, representing a rate equivalent to that experienced during the peak of the post-war years.

In analyzing the expenditures made during the past eighteen years, it must be remembered that a sharp increase in the cost of

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2/ In evaluating the permit data, it must be remembered that the actual amount expended invariably is substantially higher than the amount specified in the permit, occasionally ranging as much as 50 to 100 percent above the stipulated sum. On the other hand, often permits are permitted to lapse without the work being undertaken. Careful effort was made in compiling the data cited above to correct for this circumstance by limiting the tabulation to those permits which were issued and used. No attempt was made to include the value of additions or improvements installed in the buildings without a permit.

Table 70

Number and Amount of Buildings, Electrical, Plumbing and Elevator Permits Issued and Used, by Location
South Houston Industrial Area, 1945 to 1962
(Amounts in Thousands)

Period	Total		Building		Elevators		Heating		Sprinklers	
	Number	Amount	Number	Amount	Number	Amount	Number	Amount	Number	Amount
Total Area										
1945-49	257	$ 677.2	187	$ 422.5	21	$ 134.4	39	$ 76.6	10	$ 43.6
1950-54	168	362.1	126	192.8	11	64.0	26	61.9	5	43.5
1955-59	214	754.5	175	410.7	14	256.0	12	24.9	13	62.9
1960-62	174	448.8	127	191.5	5	69.7	10	28.2	32	159.3
Total	813	$2,242.6	615	$1,217.5	51	$524.1	87	$191.6	60	$309.3
Broadway Blocks										
1945-49	75	$ 304.3	57	$ 219.2	8	$ 42.8	8	$ 26.9	2	$ 15.4
1950-54	61	183.6	48	116.8	6	24.0	4	9.4	3	33.4
1955-59	67	330.5	55	112.8	8	203.0	3	9.7	1	5.0
1960-62	56	191.2	37	61.0	3	50.8	4	14.4	12	65.0
Total	259	$1,009.6	197	$ 509.8	25	$320.5	19	$ 60.4	18	$118.8
Rest of Area										
1945-49	182	$ 372.9	130	$ 203.3	13	$ 91.7	31	$ 49.8	8	$ 28.2
1950-54	107	178.5	78	76.0	5	40.0	22	52.4	2	10.1
1955-59	147	423.9	120	297.8	6	53.0	9	15.2	12	57.9
1960-62	118	257.6	90	130.5	2	18.9	6	13.8	20	94.3
Total	554	$1,233.0	418	$ 707.7	26	$203.6	68	$131.2	42	$190.5

Source: Special tabulation of records, Department of Buildings, prepared by New York City

construction took place during that period, so that a dollar purchased approximately half as much in real construction in 1962 as during the early part of the period.

The bulk of the building permit expenditures was made on items concerned with structural elements, facade, or interior of the buildings. This group accounted for 54 percent of the total, with elevator repair and replacement amounting to 23 percent, sprinkler installation and improvements to 14 percent, and heating equipment to 9 percent of the total. Approximately 45 percent of the total expenditures were made in the three blocks fronting on Broadway. In these blocks, elevator expenditures principally for the conversion of manual to automatic systems, amounted to 32 percent of the total, in contrast to the remainder of the area, where permits for this purpose constituted only 17 percent of the aggregate.

The amount of repair completed since 1945 is relatively small compared with the current inventory of need, even if adjustment is made for the understatement of the amount specified in the permit and for changes in building cost. The amount of repair in the past seventeen years is not likely to have been more than $5 million expressed in 1962 prices, about one-third of the estimated current requirement. Even at that, most of the expenditures took place as the result of the necessity to rectify building or fire violations rather than as a

consequence of a spontaneous desire to improve the quality of the building stock or to reach higher strata of space uses.

Part C. Real Estate Market

XIII Ownership, Values, and Financing

XIV The Incidence of Vacant Space

XV Present and Potential Rent Payments

Chapter XIII

Ownership, Values, and Financing

In a sense, the entire study has been concerned with the real estate market. The occupants, of course, are demanders for space; the inventory and characteristics of the structures describe the nature of the commodity purveyed. Part C of the study, although entitled Real Estate Market, focuses specifically on the factors that relate more immediately to real estate market activities. This chapter, for example, is devoted to a discussion of property ownership, values, and financing. The remaining chapters in this section are concerned with an analysis of the rents and with demand as measured by the vacancy and occupancy ratios.

Type and Location of Owner

The largest concentration of ownership of property in the study area is to be found in the hands of realty corporations, which possess approximately 40 percent of all the holdings in the district (Table 71). Individuals or partnerships account for a similar proportion, with commercial firms and holding corporations comprising the remainder. Only two properties in the area are in the hands of syndicates.

Table 71

Type of Owner as of July 1, 1962
South Houston Industrial Area

Type of Owner	Percent of Parcels		
	Total	Broadway Blocks	Rest of Area
Individual	25.1	20.6	25.8
Two or More	10.6	17.7	9.5
Realty Corporation	41.2	50.0	39.8
Holding Corporation	5.5	2.9	5.9
Commercial Firm	14.9	5.9	16.3
Syndicates	.8	2.9	.5
Other	2.0	-	2.3
Total	100.0	100.0	100.0

In 40 percent of the buildings the owner is to found on the premises (Table 72). In these cases, the owner occupies all or part of the structure for business purposes and owns the building, presumably to insure his tenure. A similar proportion of ownership is to be found in other sections of Manhattan, and approximately 20 percent is located in the other boroughs of New York City. In no case was the address of the owner outside the New York City standard metropolitan statistical area.

Duration of Ownership

The rate of property turnover reveals several disparate movements during the post-World War II period. In 1946, there were 22 property acquisitions in the study area, or almost 10 percent of the total (Table 73). Transactions declined sharply from that point to a low level in the period around 1950. From 1951 on, acquisitions rose steadily, reaching thirteen in the year 1959; 1960 and 1961 were marked by another reversal and only four transactions occurred in the latter year. Viewed in five-year intervals, the following pattern emerges. An annual average of ten acquisitions occurred between 1945 and 1949; an average of five per year between 1950 and 1954; 1955 to 1959 was marked by a rise to ten acquisitions, which was then followed by a decline to eight per year during the period 1960 to June, 1962. For the entire post-war period, there were a little more

Table 72

Location of Owner as of July 1, 1962
Percent of Total Parcels by Location
South Houston Industrial Area

Location of Owner	Percent of Parcels		
	Total	Broadway Blocks	Rest of Area
Same Building	38.8	23.5	41.2
Manhattan - 14th Street and below	22.0	26.5	21.3
Manhattan - above 14th Street	12.9	26.5	10.9
Rest of New York City	20.4	17.6	20.8
SMSA other than New York City	4.3	5.9	4.1
NA	1.6	-	1.8
Total	100.0	100.0	100.0

Table 73

Period of Property Acquisition by Current Owner
Percent of Total Parcels by Location
South Houston Industrial Area, 1962

Period	Percent of Parcels		
	Total	Broadway Blocks	Rest of Area
Prior to 1945	47.1	47.0	47.1
1945 - 1949	15.7	14.7	15.8
1950 - 1954	9.4	20.6	7.7
1955 - 1959	20.0	11.8	21.3
1960 - 1962	7.8	5.9	8.1
Total	100.0	100.0	100.0

than eight acquisitions a year, or a turnover rate of approximately 3.3 percent. Viewed from another angle, approximately 45 percent of the present owners were in possession of property in the study area prior to the termination of World War II, and in 1962 fully two-thirds of the owners had been in possession for a decade or longer. Only 20 properties, or less than 8 percent of the total, were acquired subsequent to January 1, 1960. This unusual length of tenure indicates considerable stability of property ownership in the study area.

Assessed Values

The real property in the area represents a substantial concentration of assets. According to the valuations for tax assessment purposes, land and improvements for the 1962-63 fiscal year averaged $19.00 per square foot of net land area and in total amounted to $21.0 million, of which $6.6 million represented land and $14.4 million improvements (Table 74). The average value of all property in the area was $85,000, slightly less than the average for loft buildings alone, which amounted to $87,300. Between 1950-51 and 1962-63, the total assessment increased from $17.4 million to $21.0 million, a rise of 21 percent. In actuality, the increase was somewhat larger because the 1950-51 total includes a number of buildings on Houston Street which have since been demolished.

Table 74

Assessed Valuation 1962-63 and 1950-51
by Type of Property and Location
South Houston Industrial Area

Type of Property	Assessed Valuation in Thousands 1962-63 Total	Average	Land	Improvements	1950-51 Total
Residential	$ 222	$ 37.0	$ 75	$ 147	$ 173
Warehouse	385	38.5	139	246	327
Factory	513	171.0	116	397	470
Garage	612	108.7	191	421	296
Store	523	47.5	242	281	427
Loft	17,634	87.3	5,282	12,352	14,521
Office	325	325.0	80	245	300
Miscellaneous	443	147.7	155	288	386
City Owned Building	50	25.0	25	25	47
Total	$ 20,747	$ 85.0	$ 6,305	$ 14,442	$16,947
City Owned Vacant Parcels	116	38.7	111*	-	260
Other Vacant Parcels	142	17.8	142	-	216
Total	$ 258	$ 23.5	$ 253	$ -	$ 476
Grand Total	$21,005	$ 82.4	$6,558	$14,447	$17,423
Broadway Blocks	$6,549	$192.6	$2,278	$ 4,271	$ 5,613
Rest of Area	14,459	65.4	4,280	10,176	11,810

*There is a small shack on one property classified as vacant.

The real estate tax revenue derived from property in the study area amounts to approximately $895,000, a figure which reflects the rate of $4.26 per $100 for the year 1962-63. In addition to the real estate taxes, the area also produces revenue derived from the impost on gross business receipts of firms operating in the area. In 1960, as has been observed earlier in this report, gross receipts amounted to $203,000,000 and the tax bill, based upon a rate of 0.4 percent, came to $812,000. From these two sources of revenue combined, the City of New York obtains $1,700,000 annually.

In order to derive some judgment of the relative capital value of building space in the study area, the total assessed value of buildings was divided by the aggregate amount of space in the area. According to this calculation, the average square foot of building space in the study area was valued at approximately $2.64, considerably below the average for loft space in Manhattan as a whole, which amounts to $4.10 per square foot.[1/] The simplest type of one-story cinder block building today costs roughly $7 per square foot to construct in the New York metropolitan area, and new multi-story loft space in Manhattan will run between $12 to $15 per square foot in construction cost, exclusive of land.

1/ The assessed value of loft buildings in Manhattan 1962-63 was $620 million. It was estimated that 150 million square feet of floor space was contained in the loft buildings in Manhattan. Dividing these two figures yields an average assessed valuation of $4.10 per square foot.

There is a considerable range of variation in building valuation for the area as a whole (Table 75). Approximately 22 percent of all buildings have a value of less than $2.00 a foot; 53 percent are valued between $2.00 and $2.99 per square foot, and 20 percent fall between $3.00 and $5.99 per foot. Approximately 6 percent of all buildings are valued at $6.00 a foot and over, a level that begins to approach new construction costs. There appears to be relatively little variation in the square foot value of the Broadway buildings compared with those in the rest of the area. In the former group, the building value averages $2.76 per square foot, whereas in the latter group the valuation is $2.60 a foot.

In the study area, assessed value appears to be an acceptable approximation of market price. Analysis of the ratio of consideration to assessed value in the year of sale for properties conveyed in bona fide transactions indicates a narrow range of variation between 1.00 and 1.15 (Table 76). Although the short-term fluctuations tend to be erratic because of the relatively small number of transactions in any given year, the five-year averages show a remarkable degree of stability for this measure, which is usually characterized by considerable variation. The median C/AV for 1945-49 stood at 1.14. During the decade of the 1950's, it was 1.02 to 1.03, and for the period January, 1960, to June, 1962, the median ratio was 1.09.

Table 75

Assessed Value 1962-63 per Square Foot of Building Space
Percent of Total Buildings, by Location
South Houston Industrial Area

Assessed Value per Square Foot	Percent of Buildings		
	Total	Broadway Blocks	Rest of Area
Under $1.00	1.3	-	1.5
$1.00 - 1.49	5.5	12.8	4.1
1.50 - 1.99	15.3	15.4	15.2
2.00 - 2.49	34.7	25.6	36.5
2.50 - 2.99	18.2	20.5	17.8
3.00 - 3.49	7.6	10.3	7.1
3.50 - 3.99	3.8	-	4.6
4.00 - 4.99	5.1	10.3	4.1
5.00 - 5.99	3.0	2.6	3.1
6.00 and over	5.5	2.6	6.1
Total	100.0	100.0	100.0
Average	$2.64	$2.76	$2.60

Table 76

Consideration as a Percent of Assessed Value in Year of Sale
South Houston Industrial Area, 1945-62

Period	Total	NA	Median	Under 80	80-89	90-99
1945 - 1949	40	2	114	2	3	6
1950 - 1954	24	1	103	3	3	4
1955 - 1959	51	4	102	6	5	11
1960 - 1962	20	-	109	2	3	2

	100-109	110-119	120-139	140-159	160 & over
1945 - 1949	5	6	7	9	-
1950 - 1954	5	1	4	3	-
1955 - 1959	7	8	5	5	-
1960 - 1962	3	2	5	3	-

In general, the real estate tax base for lofts in the study area represents a higher proportion of market value than it does for similar structures in Manhattan as a whole. The ratio of C/AV for lofts in Manhattan rose steadily from 1.05 during the period 1945-49 to 1.10 and 1.25 during the first and second five-year period of the 1950's. Preliminary figures for 1960-62 show the ratio to be in the vicinity of 1.35. This means that in Manhattan at large consideration is approximately 35 percent above assessed value for loft buildings, whereas in the study area it is only 9 percent higher than the assessed value.

Real Estate Prices and Estimated Current Value

The price of property in the study area appears to have risen steadily but modestly since the end of World War II. There are many obstacles to the accurate measurement of price trends in real estate. It is possible, however, to derive a satisfactory approximation of a price index in which the base period 1950-51 equals 100. As in the case of the ratio of consideration to assessed value, year by year movements of this index reveal wide fluctuations because of the relatively small number of transactions in some years. The five-year averages, however, show a smooth rise from an index of 91 in the last half of the 1940's to 109 in the first half of the 1950's, to 114 in the period 1955-59, reaching 125 in the interval 1960 to June, 1962 (Table 77). Since 1950, therefore, prices have increased by approximately 25 percent and since

Table 77

Consideration as a Percent of Assessed Value in 1950
South Houston Industrial Area 1945-62

Period	Total	NA	Median	Under 80	80-89	90-99
1945 - 1949	40	-	91	8	10	13
1950 - 1954	24	-	109	2	3	3
1955 - 1959	51	1	114	4	4	5
1960 - 1962	20	-	124	-	2	3

	100-109	110-119	120-139	140-159	160 & over
1945 - 1949	3	4	2	-	-
1950 - 1954	4	3	5	2	2
1955 - 1959	9	7	8	7	6
1960 - 1962	1	3	5	3	3

the end of World War II by 36 percent on the average. This climb is considerably more modest than that experienced in other sections of Manhattan, even if we exclude from consideration the more spectacular areas of development in midtown and on the East Side.

Nevertheless, these properties represent a considerable repository of real estate values. Since in recent years the market values have been approximately 10 percent above assessed valuation, a conservative but reasonable estimate of aggregate valuation for the twelve-block area would be in the vicinity of $23 million.

Mortgage Financing

At present, there are approximately $7 million in first mortgages and roughly a half million dollars in junior liens on real property in the area (Table 78). The total mortgage debt thus constitutes approximately one-third of the aggregate property value in the area. The data reveal that 82 properties, or approximately one-third of the total, are unencumbered. If values are assumed to be proportionately distributed between mortgaged and unmortgaged properties, then, in the encumbered structures, liens constitute approximately 50 percent of the property value.

One of the most significant indexes of the financial viability of an area is the ability to obtain necessary mortgage funds for the financing of property transactions. The study area shows several indications of the fact that mortgage money has become increasingly difficult to obtain.

Table 78

Number and Amount of First Mortgages by Type of Mortgagee
South Houston Industrial Area, 1962

A. .Number

Type of Mortgagee	Total	Prior to 1945	1945-1949	1950-1954	1955-1959	1960-1962
Savings Banks and Savings & Loan	44	25	9	6	3	1
Commercial Bank and Trust Co.	10	5	1	1	2	1
Insurance Co.	8	3	4	1	-	-
Investment Funds	5	-	3	1	1	-
Real Estate Co.	12	2	3	1	5	1
Other	21	6	4	2	6	3
Individuals	69	15	7	8	28	11
Total	169	56	31	20	45	17

B. Amount in Thousands

Savings Banks and Savings & Loan	$1,987	$1,044	$308	$489	$46	$100
Commercial Bank and Trust Co.	631	277	48	67	222	17
Insurance Co.	628	220	323	85	-	-
Investment Funds	65	-	37	20	8	-
Real Estate Co.	496	63	165	20	148	100
Other	1,486	268	266	134	544	274
Individuals	1,699	181	174	213	581	550
Total	$1,6992	$2,053	$1,321	$1,028	$1,549	$1,041

Of 169 first mortgages, 37 percent of the number and 46 percent of the amount are held by financial institutions, including savings banks, savings and loan associations, commercial banks, trust companies, and insurance companies. Savings banks hold the largest proportion of the institutional total. A substantial shrinkage in the volume of financing obtained from institutional sources has taken place in the past two decades. In mortgages placed prior to 1945, institutions accounted for 75 percent of the total amount. In the ensuing half decades, this proportion dropped successively from 51 percent to 36 percent to 17 percent and, in the period 1960-62, institutions accounted for only 11 percent of the first mortgage lending.

Interest rates have risen successively on first mortgages in the study area (Table 79). Mortgages made prior to 1945 show one-third at 4 percent, one-third at 5 percent, and one-third at 5 1/2 and 6 percent. During the period subsequent to 1945, however, there was a steady climb from the prior full array of interest rates. In 1945-49, the modal rate, which included more than one-half of the cases, was 4 percent. Between 1950 and 1954, the typical rate rose to 5 percent, but with a sprinkling of mortgages at 4 percent and 4 1/2 percent. Between 1955 and 1959, the modal rate was 5 percent and this interest charge typified two-thirds of all loans, with the remainder carrying lower interest charges. The rates in the study area appear to have kept pace with the average in Manhattan, which reflects the rise in general levels of interest rates both in

Table 79

Interest Rates on First Mortgages
South Houston Industrial Area, 1945-62

Amounts in Thousands

Interest Rate	Prior to 1945		1945-1949		1950-1954		1955-1959		1960-1962	
	No.	Amt.	No.	Amt.	No.	Amt.	No.	Amt.	No.	Amt.
3.0	-	$ -	1	$ 25	-	$ -	-	$ -	-	$ -
3.5	1	40	-	-	-	-	-	-	-	-
4.0	18	657	17	836	1	67	-	-	-	-
4.5	1	45	5	221	5	101	-	-	1	31
5.0	19	489	8	239	13	835	30	1,066	4	271
5.5	5	425	-	-	-	25	9	255	2	107
6.0	12	397	-	-	-	-	6	228	10	632
Total	56	$2,053	31	$1,321	20	$1,028	45	$1,549	17	$1,041

the money market at large and for mortgages in particular during the post-war period. 2/

Of the 169 mortgaged properties, 126 carry only one mortgage, 40 have both first and second liens, and three properties have three or more mortgages. The proportion of properties carrying the junior liens appears to have increased in recent years. During the period 1945 to 1954, 29 percent of the property transactions involved two or more mortgages. In 1955 to 1959, this ratio dropped to 19 percent. However, 1960 to June, 1962, saw a considerable rise in junior financing, with 11 out of 24 transactions, or 45 percent of the total, carrying two or more mortgages.

Between 1945 and 1959, there was a gradual downward trend in the proportion that mortgages represented of total consideration at the time of transaction (Table 80). Between 1945 and 1949, the median ratio of mortgages to consideration was .69. This figure declined gradually to .67 in 1950-54, and then to .65 in 1955-59. In the period between January, 1960, and June, 1962, however, there was a sharp reversal in the pattern. During this 18-month period, the ratio jumped

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2/ Mortgage interest rates in Manhattan went up steadily from an average of 3.99 percent in 1946-49 to 4.28 in 1950-54 to 5.08 in 1958-59 to 5.69 in 1960-62. Averages were computed on the basis of monthly interest rate distributions presented in James Felt & Company, Newsletter, January, 1946, to September, 1962. Interest rates are for first mortgages of $10,000 and over on income-producing property. Purchase money mortgages are not included.

Table 80

Total Mortgage Amounts as a Percent of Consideration
Properties Acquired 1945-1962
South Houston Industrial Area

Year of Sale	Median	Total	Under 39	40-59	60-79	80-99	100	NA
1945 - 1949	69	40	2	9	14	4	4	7
1950 - 1954	67	24	2	5	10	3	-	4
1955 - 1959	65	51	6	12	22	3	2	6
1960 - 1962	77	20	1	3	6	7	-	3
Total		135	11	29	52	17	6	20

to .77, which was largely the result of the substantial increase in the incidence of junior mortgaging noted above. It thus appears that the equity contribution of the property purchaser has declined substantially from a range of 30 to 35 percent between 1945 and 1959 to 20 to 25 percent between 1960 and June, 1962.

Summary

The pattern of ownership shows a considerable degree of stability and involvement. Two-thirds of the structures have been in the hands of their present owners for a decade or longer, and almost half have been held at least since the end of World War II. Moreover, 40 percent of the owners are business firms located on the premises, which gives these establishments a double stake in the future of the district.

The area has been characterized by a contraction in the availability of mortgage funds. Since World War II, there has been a sharp curtailment of financing from institutional sources, an average rise in interest rates, an increase in the incidence of junior liens, and a decline in the amount of equity contributed by a purchaser at the time of acquisition. The contraction in the availability of mortgage money is undoubtedly a consequence of the inability of the area to keep pace with general trends in real estate prices, which have risen 25 percent since 1950, substantially less than the increase experienced in

other sections of Manhattan Island. It is possible, however, that this tightening of mortgage funds has retarded price rises which might have taken place were mortgage money freely available.

Chapter XIV

The Incidence of Vacant Space

Vacancy surveys are intended to supply information on the amount of unutilized space, but in actual practice they usually provide simply for a count of vacant space expressed as a ratio to the total existing inventory. Since vacancy data are taken as a measure of the relative balance of demand and supply for space, or, more specifically, the capacity of the existing inventory to absorb additional occupants, it is not at all clear that a vacancy count based on available floor space is necessarily its best expression. Certainly in the years during World War II, loft space in New York continued to accommodate an increasing number of workers, even after the vacancy ratios dropped to zero. In some way, the unutilized portions of supposedly fully occupied areas were made available because of the exigencies of the situation.

On the other hand, as working standards change and as the ratio of men to machines is altered, the prospects for the future are reassessed, and the amount of space occupied by a given number of persons or utilized for a given volume of output may be expanded. Thus, a given physical supply may become too large or too small as the state of the arts and social norms change. Moreover, there is no unique

definition of the aggregate physical supply. During periods in which the pressure of demand on the supply of space is great, boarded up accommodations are returned to active use and, indeed, ancillary and makeshift types of space located in converted tenements, stores, basements, and other areas are brought into the supply to supplement the available amount of loft space. Thus, since quality standards can greatly alter the effective supply at a given moment in time, it becomes almost impossible to define supply without first defining demand.

Vacant space then becomes an overt manifestation of demand, which has many other but less evident implications. To the extent, however, that a change in the amount of vacant space is an indicator of change in a more intricate pattern of business activity, the measures of vacancy ratios perform a useful function.

Accepting the vacancy ratio with all its imperfections as an important clue to the state of the market for non-residential space, the problem of how to define vacancy remains to be asked. Shall substandard as well as standard space be included? Net vacancies (that is, space in adequate condition provided with necessary facilities and available for sale or rent) come closest to the needs of market analysis, but as we have seen, dilapidated accommodations have a way of returning to the market under certain conditions. Moreover, a distinction between standard and substandard vacant space presents a perplexing problem, inasmuch as the latter might be virtually identical with the quality of

space that is currently occupied in the same building or elsewhere. It is evident that the market often employs standards that vary considerably from the necessarily arbitrary categories employed by analysts. Because distinction in regard to quality is too blurred to allow easy allocation, it is always well to account for all vacant space available for rent or sale. This, perforce, excludes from the count of vacancies space for which rent is paid or which is held off the market by an owner-occupant, despite the fact that it may not be fully utilized throughout the year. In the city's wholesale food distribution center, for example, it is well known that the upper stories of buildings are used largely for storage and that their degree of utilization fluctuates widely with the season of the year and the type of commodity purveyed. Space is held in inventory so that it will be available during the peak periods of harvest and shipment.

Vacancies in the Study Area

A survey of vacant space in the South Houston Industrial Area was conducted by the staff of the New York City Department of City Planning in November, 1962. Each of the 244 buildings was visited and information on vacancy and occupancy obtained from a landlord, superintendent of the building, or some other responsible employee. For each building in which a vacancy was encountered, an annotated record was kept of the location of the space, its dimensions, and major characteristics.

In many buildings "For Rent" signs were prominently displayed. Upon investigation, the interviewers found space in these buildings to be completely occupied. Inquiries revealed that the management continued to display these signs in order to elicit inquiries from individuals or firms seeking loft space. In this way, a list of potential tenants was developed which could be drawn upon in the event that a vacancy materialized. In addition, the "For Rent" signs were a means of indicating the name and address of the owner or agent.

Throughout the entire study area, 310,825 square feet of floor space were found to be vacant and available for rent or sale. The vacant space was more or less typical of the quality of occupied space in the area, although it did include some accommodations that were markedly deficient in necessary facilities and in condition of the structure. The total floor space constituted 5.7 percent of the total gross floor area in the entire twelve-block district.

Within the study area, the vacancy ratio varied considerably by block. In four of the blocks the ratio was 3 percent or less, while in two blocks it stood at 12 percent. In general, the row of blocks north of Broome Street showed a somewhat higher vacancy rate, 6.4 percent, than the area as a whole, with the buildings that fronted on Broome Street accounting for a larger than average proportion of the vacant space, 7.6 percent. For many years, the proposal to construct the Lower Manhattan Expressway across Broome Street made

it difficult to rent space in that section of the area as it became vacant. Pending a final decision, the city waived the enforcement of some of the building and fire regulations and, in general, the impending decision led to lower utilization of Broome Street space. In mid-December the Board of Estimate abandoned the proposal, but too short a time has elapsed for the reaction to this decision to make itself felt in the real estate market in that area. In addition, since so much time and effort went into the proposal and substantial sums were spent on construction, including enlarging the approach to the Manhattan Bridge and increasing its traffic capacity, there is some feeling in the area that the proposal may be reconsidered at a later date.

Vacancy in the Surrounding Industrial District

In order to determine the amount of vacant space in the larger industrial sector of which the South Houston Industrial Area forms a part, the staff of the Department of City Planning surveyed 75 blocks in the South Valley Area lying between Eighth Street on the north, Lafayette Street on the east, Worth Street on the south, West Broadway up to Houston Street on the west, and then continuing up Mercer and then Greene Streets between West Houston and Eighth Street. Excluding the study area, there are 21 million square feet of floor space in non-residential buildings in this district. Of this total, 1.2 million square feet of floor space, or 5.7 percent of the aggregate, are vacant

and for sale or rent, a vacancy ratio equal to that of the study area. Of the vacant space in the surrounding district, 298,000 square feet are in 33 loft buildings which are entirely vacant and 51,000 square feet are in six buildings of other types, also entirely vacant. In the section of the South Valley surrounding the study area, 38 percent of the blocks had a vacancy ratio under 4 percent, 29 between 4 and 7.9, 18 percent between 8 and 11.9. In the remaining blocks, 16 percent of the total, the vacant space amounted to 12 percent or more of the inventory (Table 81).

The bulk of the vacant space is located south of Canal Street, the old textile center of New York City, which drifted into shoe and other wholesaling as well as general miscellaneous uses when textile manufacture moved up Fourth Avenue and then out of the city several decades ago. At the present time, this area is in the path of the government center which has been steadily moving northward and westward from Foley Square.

The industrial sections both directly north and south are similar in appearance and composition to the study area and the vacancy rates are roughly the same. To the east, located largely between Broadway and Lafayette Street, there is a greater concentration of printing establishments and machine and metal working shops and other heavy types of activities. Among the loft buildings in this area, vacancy rates tend to be lower than the average for the district as a whole.

Table 81

Distribution of Blocks by Percent of Non-residential Space Vacant
South Valley Area, Manhattan, December, 1962

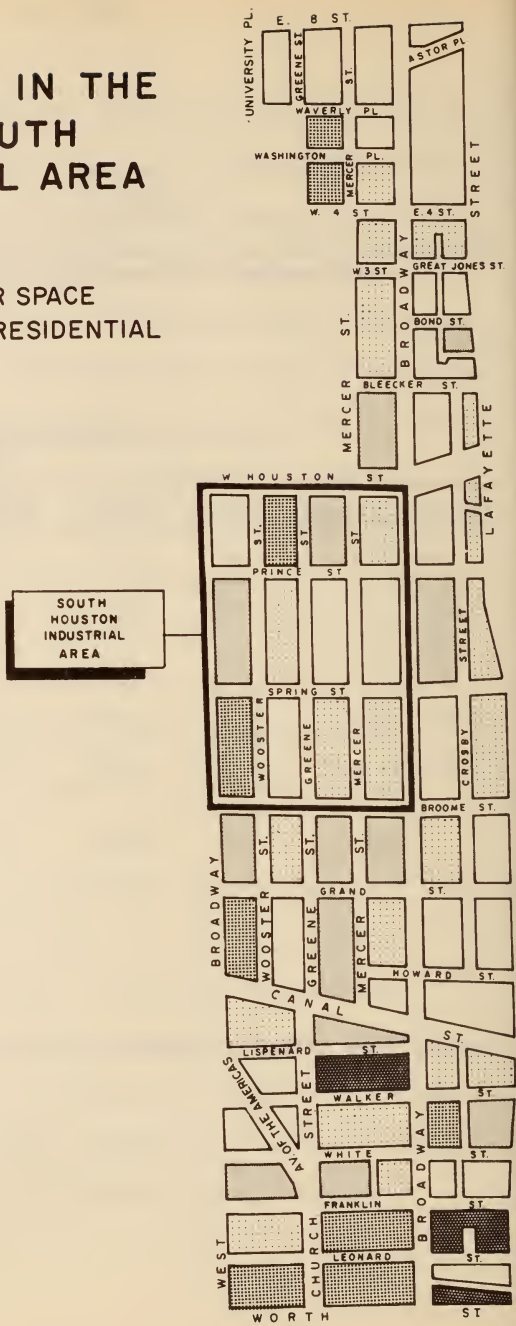
Percent of Space in Block Vacant	Number and Percent of Blocks					
	Total		South Houston Study Area		Rest of South Valley	
	Number	Percent	Number	Percent	Number	Percent
Under 4.0	28	37.3	4	33.3	24	38.1
4.0 - 7.9	22	29.3	4	33.3	18	28.6
8.0 - 11.9	13	17.3	2	16.7	11	17.5
12.0 - 15.9	9	12.0	2	16.7	7	11.1
16.0 and over	3	4.0	-	-	3	4.8
Total	75	100.0	12	100.0	63	100.0

Source: New York City Department of City Planning.

INDUSTRIAL SECTION IN THE VICINITY OF THE SOUTH HOUSTON INDUSTRIAL AREA

VACANT NON-RESIDENTIAL FLOOR SPACE AS PERCENTAGE OF TOTAL NON-RESIDENTIAL FLOOR SPACE BY CITY BLOCK

DECEMBER 1962



PERCENT

- 0 - 3
- 4 - 7
- 8 - 11
- 12-15
- 16 & OVER

MAP VIII

SOUTH HOUSTON STUDY AREA

Loft Vacancy in Manhattan

Throughout Manhattan as a whole loft space is in considerable demand. According to a survey conducted by the Real Estate Board of New York in April, 1962, occupancy in competitive loft buildings amounted to 97.3 percent and vacancies to 2.7 percent (Table 82). The vacancy rate is, in fact, even lower than 2.7 percent because this ratio is based on a denominator that excludes the sizable volume of owner-occupied loft buildings. 1/ Not all of the vacant loft space is in manufacturing buildings. Approximately one-third is in non-manufacturing lofts and, of the remaining 66 percent in manufacturing lofts, 10 percent consists of space located on ground level or in the basement. When analyzed by district, a concentration of vacancies in all loft buildings is found in the district south of Canal extending to Fulton Street. Even in this area, however, the vacancy rate for above grade loft space in manufacturing lofts is only 1.8 percent, the average for the area being raised considerably by the concentration of available space in non-manufacturing loft buildings. In the district between Canal and 14th Street, the vacancy ratio for all lofts was shown to be 2.4 percent and above 14th Street, 2.3 percent.

1/ The Occupancy Survey of Competitive Loft Buildings in Manhattan is conducted annually by the Real Estate Board of New York; the April, 1962, survey covered 832 buildings, which represented 14.0 percent of the 5,964 loft buildings in Manhattan.

Table 82

Percent of Loft Space Vacant, by District,
Manhattan, 1962

District	All Lofts	Manufacturing		Non-Manufacturing	
		Above Grade	Grade & Basement	Above Grade	Grade & Basement
Downtown	4.3	2.5	1.8	19.5	10.9
A. Fulton to Canal, Centre St. to Sixth Ave.	8.6	1.8	3.5	19.5	10.9
B. Canal to 14th St., Centre St. to Sixth Ave.	2.4	2.7	1.3	-	-
Uptown					
14th St. to 39th St. Fourth Ave. to Ninth Ave.	2.3	2.5	1.1	2.5	0.6
Total Manhattan	2.7	2.5	1.3	4.3	3.3

Source: The Real Estate Board of New York, Inc., Competitive Loft Buildings in Manhattan, Loft Series No. 43-29, April, 1962.

The low levels of vacancy result from the fact that the inventory of loft space and other types of accommodations suitable for industrial use has contracted faster than the decline in manufacturing activity in the city. According to the records of the New York City Tax Department, there were 7,407 lofts in 1951. By 1955, the number had declined to 6,843, and in 1962, there were only 5,964 loft buildings in Manhattan. Mr. Robert Joseph, a prominent industrial realtor, commenting on this phenomenon said, "While it is true that some major industrial tenants have migrated to the suburbs, their exodus has invariably resulted in the immediate rental of the same space to a greater number of new lessees. These lessees are engaged in a much wider range of manufacturing operations."[2/] He further asserted that the turnover brings higher rentals because the former occupants held long-term leases written at a time when rents were low. The pressure of demand on the available space has resulted in an appreciable rise in industrial rentals in the last decade, according to the report. Mr. Joseph states that loft space for manufacturing and storage is approximately 25 percent above the 1952 level and 50 percent higher than the rental rates prevailing at the end of World War II. The same observer, commenting on the stringency of the market, pointed out that the five major industrial

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2/ New York Times, "Industrial Space Dwindling in City," March 4, 1962.

complexes in the City of New York had an occupancy ratio of nearly 99 percent in 1962 and have been above 90 percent since 1950. 3/

How much vacant loft space is available in Manhattan at the present time? According to a study by the Department of City Planning, there were 181 million square feet of space in loft buildings in 1957. 4/ Between 1959 and 1962, approximately 600 loft buildings containing an average of 15,000 square feet of floor space were demolished, indicating a reduction of 9,000,000 square feet in the supply of loft space. Moreover, many of the lofts are not available for industrial use and some are not in the competitive market by virtue of being occupied by their owners. Thus, at the present time, the likely amount of industrial loft space in buildings in the competitive market is perhaps somewhere between 135 and 155 million square feet of floor space out of a total of 172 million. A vacancy rate of 2.7 percent would thus indicate a range of 3.6 to 4.2 million square feet of space available for rent or sale. Even if the exaggerated figure of 181 million square feet is employed as a measure of the total inventory, the amount of vacant space would be estimated at 4.9 million square feet. Today, firms in the South Houston Study Area occupy 5.2 million square feet of space, an amount in excess of even the most inflated estimate of the total vacancy.

3/ "Manhattan Lofts Gaining Business," New York Times, March 25, 1962.

4/ Department of City Planning, City of New York, Commercial and Industrial Floor Space Inventory, December, 1957.

Summary

In the foregoing presentation it appears quite evident that levels of demand for space in the study area are extremely high and that loft space in general in Manhattan is at a premium. In part this is due to sustained levels of employment and in part to the fact that the supply of space has been contracting steadily in the past years. It is also evident that the total amount of occupied space in the study area is considerably greater than reasonable estimates of the total amount of vacant space available in Manhattan as a whole.

Chapter XV

Present and Potential Rent Payments

The low cost of space is one of the principal reasons why the firms have located in the study area. In order to examine the financial feasibility of improvements, it is, therefore, necessary to establish the levels of rent in the area at present, and to consider possible ways in which increases connected with changes for the better could be justified. Rehabilitated or new structures would result in higher space costs, which can only be justified by the firms in question through an opportunity to save on other expenses, notably production costs and fire insurance premiums.

The realization of savings of the above kind is associated with two possible forms of physical improvement. The potential operating savings would result primarily from shifts to single-story layouts and from the provision of better loading and unloading facilities. Hence, for at least half the firms, this would require new buildings that permit such arrangements. On the other hand, rehabilitation of present structures, particularly the installation of sprinklers, could result in savings in fire insurance expense. By means of an analysis of the practical limitations of the savings involved it is possible, in both cases, to determine what increase in rent in exchange for better quarters might reasonably be expected from the firms of the study area. This limitation is set by a series

of breakeven points of increased rents with realized savings.

Rental and Ownership

For most of the firms of the area, 84 percent of total, space cost takes the form of rent. As shown in Table 83, in textiles and apparel, the paper, printing, and leather industries, and in retail and services, virtually all firms rent their premises. Only in wholesaling is there substantial ownership of property.

Further, this preference for rental was carried over to their new location by the firms that moved. As shown in Table 84, 14 out of 19 firms moved from rental to rental premises, and one which owned a building in the study area now rents its quarters. Only three firms, all of which moved out of Manhattan, rented in the study area and subsequently bought buildings elsewhere.

Level of Rent

The relatively low rents are a reflection of the current market for space of the quality found in the study area, and not of rent control. Less than 10 percent of the firms have controlled rents and quite a number did not even know that there is a rent control law which could apply to them. Commercial and business space in New York City has been subject to emergency rent controls since 1945, and at the present time it is under the supervision of the New York State Supreme Court. The law provides for rent increases through arbitration between owner and tenant, by special

Table 83

Percent of Firms that Rent their Premises, by Industry Group
South Houston Industrial Area, 1962

Industry Group	Percent of Firms
1 Textiles & Apparel	97.0
2 Printing, Chemicals, Leather, Paper	96.4
3 Other Manufacturing, Construction	74.5
4 Wholesale	65.8
5 Retail & Services	96.9
Total	84.1

Table 84

Comparison of Tenure in Previous and Current Accommodations, of Firms that Moved from South Houston Industrial Area, 1957-1962

Industry Group	Total	Rented in SHIA		Owned in SHIA	
		Rent Now	Own Now	Rent Now	Own Now
1 Textiles & Apparel	3	3	-	-	-
2 Printing, Chemicals, Leather, Paper	4	3	1	-	-
3 Other Manufacturing, Construction	8	6	2	-	-
4 Wholesale	1	-	-	-	1
5 Retail & Services	3	2	-	1	-
Total	19	14	3	1	1

written agreement with the tenant, or by decision of the Court. The coverage of the law, however, has been greatly curtailed by decontrolling space vacated March 31, 1950, or later, certain subleases, and premises for which the rent is $10,000 a year or more. In addition, there have been some statutory increases.

It has been estimated that from 70 to 80 percent of all loft space in the Central Business District had been decontrolled or reached free market rentals by 1957.[1/] Since then, the amount of controlled space has been reduced further so that the proportion of rent-controlled firms in the study area is probably typical of the Central Business District as a whole.

According to the field survey of establishments, the median rent in the area is $.81 per square foot per year. The range of rents paid by the middle half of the firms is $.62 to $.96 per square foot per year (Table 85). The highest level among the manufacturing groups is in textiles and apparel, due largely to the concentration of that industry along Broadway. The lowest space costs are enjoyed by the wholesale firms, with Industry Groups 2 and 3 next in order. The highest rent level is to be found among retail and service firms.

1/ Julian M. Bond, Effects of Post-War Inflation on Net Income of Urban Properties, 1946-57, (New York: East River Savings Bank, 1959).

Table 85

Annual Rents per Square Foot, by Industry Group
South Houston Industrial Area, 1962

Rent per Year per Square Foot	Number of Firms					
	Total	Group 1	Group 2	Group 3	Group 4	Group 5
$ .30 - $ .39	9	5	-	4	-	-
.40 - .49	14	-	-	-	6	8
.50 - .59	37	5	8	19	5	-
.60 - .69	43	5	18	-	20	-
.70 - .79	81	27	24	20	10	-
.80 - .89	79	23	13	28	10	5
.90 - .99	52	17	11	13	5	6
1.00 - 1.09	90	46	13	21	10	-
1.10 - 1.19	26	5	4	6	5	6
1.20 - 1.29	22	6	10	-	5	1
1.30 - 1.39	7	-	-	-	5	2
1.40 - 1.49	10	-	4	-	-	6
1.50 - 1.59	18	13	-	-	-	5
1.60 and over	8	-	-	-	-	8
Total	496	152	105	111	81	47
NA or owner-occupied	155	17	6	26	80	26
Grand Total	651	169	111	137	161	73
Median	$.81	$.96	$.82	$.85	$.80	$1.18
Interquartile Range	$.62-.96	$.78-1.07	$.70-1.15	$.63-.99	$.65-1.05	$.78-1.42

Rent Increases Justified by Operating Savings

In earlier chapters, attention was drawn to various methods by which firms could obtain operating savings. Single-story layouts present opportunities for substantial cost savings, as do off-street loading facilities. These, however, are usually ruled out in existing areas in which multi-story occupancy is common. For most of the firms in the area, therefore, savings of this kind would largely be associated with new structures that would, of necessity, have higher space costs than the present buildings. It is nevertheless important to determine practical limits to the extra cost that could reasonably be absorbed by the firms concerned.

In assessing the possible benefits and costs involved in any move, consideration must be given both to long-run changes and to one-time costs and savings. First, there are the one-time expenditures of the actual moving and the costs associated with interruption of business. To some extent, the latter effects may be mitigated by making the move in the slack season, although, as noted before, some industries in the study area are less seasonal than similar firms elsewhere.

In some circumstances, there are savings that offset removal costs. Whenever a firm takes as drastic a step as a removal, it usually finds it useful to re-evaluate its operations, product lines, etc. It may well be possible to get rid of slow-moving lines and to write off obsolete, damaged, or shopworn inventory. It may, in fact, be possible to operate

in the new premises with reduced inventory. Quite apart from the continuing operating savings, the abbreviated production cycle made possible by single-story layout often results in a reduction both in inventory in process and in finished inventory, because the production system as a whole finds itself able to respond more readily to short-run fluctuations in demand. It is by no means impossible that the savings in inventory may more than compensate for the cost of moving, yielding the firm a net gain from its action.

The decline in operating expenses is derived mainly from reduction in payroll due to materials handling, a cost that amounts to 6 to 10 percent of the wage bill in the general types of industry found in the study area. A hypothetical calculation was undertaken to examine the consequences of two levels of payroll reductions; the first of 2 percent, equivalent to eliminating one employee in fifty, and the second of 5 percent, equivalent to eliminating one in twenty. Savings of this magnitude range from one-third of the low estimate of materials handling costs to half of the high estimate, and thus may conservatively be considered as limits of what is practicable. This is not to say that such savings can necessarily be realized by all firms. The exact outcome will, of course, depend upon individual circumstances.

Working with these estimates of savings in wages, it is possible to calculate the extra rent which a firm could afford to pay and still break even. It is realized, of course, that by this "trade-off" the variable

expense of wages is exchanged for a fixed expense, rent, which may or may not be advisable for a specific firm.

If the same amount of floor space is used in the new plant as in the old, the extra rent which could be paid is given by 2 or 5 percent of the remuneration of employees per square foot of space. For the five industry groups, this averaged $. 19 and ranged from $. 09 to $. 27 per square foot per year with a 2 percent savings, and averaged $. 49 with a range of $. 22 to $. 67 for a 5 percent savings (Table 86). In both instances, the increases are at about the same relatively high levels in the three manufacturing groups, and are least in the wholesale sector. In wholesale firms, however, most of the non-office personnel is in materials handling so that savings of more than 5 percent are possible for many of them.

These calculated increases in general represent a substantial percentage of the present rent. The 2 percent labor saving could offset rent increases ranging from 11 percent in wholesale trades to 33 percent in Industry Group 2, and a 5 percent saving from 28 percent to 82 percent. Again, the proportions are higher in the manufacturing groups because of high labor intensity. Applying the computed increases to the existing rent structure yields revised ranges for the center 50 percent of firms, which are compared in Table 87 with those prevailing at the present time.

Table 86

Additional Rent per Square Foot Equivalent to
Hypothetical Payroll Savings
South Houston Industrial Area

Industry Group	Present Median Rent	Wages & Salaries	Payroll Savings of Amount 2 Percent	Amount 5 Percent	Percent 2 Percent	Percent 5 Perce
1 Textiles & Apparel	$ .96	$11.90	$ .24	$ .60	25.0	62.5
2 Printing, Chemicals, Leather, Paper	.82	13.41	.27	.67	32.9	81.7
3 Other Manufacturing, Construction	.85	12.16	.24	.61	28.2	71.8
4 Wholesale	.80	4.35	.09	.22	11.2	27.5
5 Retail & Services	1.18	9.29	.18	.45	15.2	38.1
Total	$ .81	$ 9.71	$ .19	$ .49	23.4	60.4

Table 87

Interquartile Range of High Rent per Square Foot Made Possible Because of Hypothetical Payroll Savings South Houston Industrial Area

Industry Group	Present Rent Range	Range of Higher Rent Made Possible by Payroll Savings of 2 Percent	Range of Higher Rent Made Possible by Payroll Savings of 5 Percent
1 Textiles & Apparel	$.78-1.07	$1.00-1.29	$1.38-1.67
2 Printing, Chemicals, Leather, Paper	.70-1.15	.97-1.42	1.37-1.82
3 Other Manufacturing, Construction	.63- .99	.87-1.23	1.24-1.66
4 Wholesale	.65-1.05	.74-1.14	.87-1.27
5 Retail & Services	.78-1.42	.97-1.61	1.24-1.86
Total	$.62- .96	$ .81-1.15	$1.11-1.45

If, with a new and more efficient layout, a firm can manage with less space, the total rent paid would of course be reduced. On the other hand, firms that have outgrown their present quarters would find it advisable to obtain extra space when they move.

The firms that did move from the study area actually combined higher rents per square foot with an increased amount of space. As Table 88 indicates, twelve of fifteen respondents paid higher rents per square foot. The median net increase in the rents per square foot paid by all fifteen firms was 32 percent, somewhat more than the extra amount corresponding to a 2 percent labor savings for the manufacturing industries. Many firms that moved reported major cost savings through the adoption of a single-story layout and other readjustments of the type discussed earlier in this chapter.

Rent Increase Justified by Insurance Savings

A further potential source of savings is to be found in the reduction in fire insurance premiums.[2/] Ratings for fire insurance for individual firms take into account a variety of factors, only one of which is the condition of the building. The processes carried out by the firm, the claims

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2/ Many firms carry business interruption insurance as well, which is designed to meet fixed charges, salaries of key people or other expenses arising as a result of a break in operation due to fire or other causes. Its premiums are lower than those for fire insurance and proportional to them. Total insurance savings, taken as a function of fire insurance alone, is somewhat of an underestimate.

Table 88

Changes in Expenditures for Space Among Firms that Moved from South Houston Industrial Area, 1957-1962

Percent Change	Number of Firms					
	Total	Group 1	Group 2	Group 3	Group 4	Group 5
Reduction						
0 - 24	2	-	-	1	-	1
25 and over	1	-	1	-	-	-
Increase						
0 - 49	7	1	1	3	-	2
50 - 99	2	1	-	1	-	-
100 - 199	1	-	-	1	-	-
200 and over	2	-	1	1	-	-
Total	15	2	3	7	-	3
NA	4	1	1	1	1	-

experience, and process-connected safeguards are also evaluated. The rate for the firm, in fact, is determined first. The rate for the structure itself usually depends on that of its most dangerous occupant.

The condition of the building, nevertheless, does play a major part in rate setting. The most crucial element is the type and quality of sprinkler system in the structure. Elevator shafts, general access, and the other elements discussed previously are also important, though less so than sprinklers.

Accordingly, a distribution of insurance rates by industry group and by quality of the buildings was prepared, using data furnished by the New York Fire Insurance Rating Organization and the over-all index of building quality developed in Chapter XI. From the rate distribution it was possible to determine the difference in average fire insurance rate for structures of varying quality and, therefore, the savings that could be realized if buildings were improved or if a firm upgraded its space. The results indicate a wide range of effects. Firms at present in the same quality of accommodation exhibit wide variation in potential savings according to their industry groups. Firms now in buildings with quality index E or F, for example, could expect savings ranging from $.60 in wholesale trades to $2.02 in textile and apparel if their structures were to be remodeled to quality index A or B (Table 89).

A substantial proportion of the firms are involved in such possible changes. In all industry groups, only a minority of the firms

Table 89

Additional Rent per Square Foot Equivalent to
Hypothetical Fire Insurance Savings
South Houston Industrial Area

Industry Group	Present Median Rent	Annual Gross Business Receipts	Assumed Coverage (3 months) (gross)	Difference in Insurance Rate Between A or B Buildings and			Additional Rent Equal to Savings Between A or B Buildings and		
				C	D	E or F	C	D	E or F
1	$ .96	$33.70	$ 8.43	$.33	$.57	$2.02	$.03	$.05	$.17
2	.82	35.30	8.83	.18	.62	1.53	.02	.05	.14
3	.85	33.20	8.30	.29	.75	1.66	.02	.06	.14
4	.80	41.90	10.48	.06	.26	.60	.01	.03	.06
5	1.18	49.90	12.48	.33	1.00	1.31	.04	.12	.16
Total	$ .81	$37.80	$ 9.45	$.24	$ .53	$1.31	$.02	$.05	$.12

(22 percent) are situated in structures with quality indexes of A or B, whose fire insurance rates would not be appreciably reduced by improvement. Almost 18 percent of all firms are in buildings with quality indexes of E or F (Table 90).

The extent of possible savings cannot be assessed without information on the amount of coverage, which is not known for the firms in the area and must be estimated. A firm typically insures both its inventory at cost and its fixed assets for their replacement value less accumulated depreciation. In the absence of this information, coverage is estimated on the basis of gross receipts, for which data are available. If it is assumed, for example, that coverage of $3, $6, or $9 per square foot of space exists in the various firms, this is equivalent to assuming insurance coverage of one, two, or three months' sales, respectively, with gross business receipts of about $36 per square foot. In order to develop an outside estimate so that maximum savings can be realized and the maximum amount of additional rent estimated, it was assumed in this calculation that fire insurance coverage was equivalent to three months' gross, or one-quarter of annual business receipts.

The additional rent per square foot that can be paid as a result of savings in fire insurance can be calculated for individual firms by employing a simple formula: $dR = .01\ D(dI)$.[3/] For example, a saving

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3/ The change in rent equals one percent of the present insurance coverage per square foot times the change in insurance premiums per $100.

Table 90

Distribution of Firms by Over-all Index of Building Quality, by Industry Group
South Houston Industrial Area

Industry Group	Total	Index of Building Quality			
		A or B	C	D	E or F
1 Textiles & Apparel	100.0	30.3	24.2	33.2	12.3
2 Printing, Chemicals, Leather, Paper	100.0	31.8	29.7	29.7	8.8
3 Other Manufacturing, Construction	100.0	16.8	32.8	30.4	20.0
4 Wholesale	100.0	7.2	21.6	48.2	23.0
5 Retail & Services	100.0	27.3	26.1	19.3	27.3
Total	100.0	21.7	26.5	34.2	17.6

of $1.40 per hundred in insurance premiums with a coverage of $3 per square foot would correspond to a change in rent of 4.2 cents per square foot per year. The maximum amount of extra rent justifiable, assuming the highest differential (that is, for an apparel firm going from an E or F to an A or B building), is seen to be only $.17 per square foot per year. Though 12 percent of the firms in this industrial group are in buildings that could undergo this degree of rehabilitation, the amount of extra rent that could be applied towards this is limited by the actual coverage of the firm, which is very likely less than the amount assumed. Savings of this kind are, of course, also available to firms that move into superior new structures. Hence, the possible savings for fire insurance would, in such a case, be additional to those previously specified for operating savings alone.

Can Rent Increases be Restrained by Reducing Yield?

If earnings on real estate in the study area were very high or excessive, one could expect that current rents could be curbed or that increases brought about through rehabilitation could be moderated by reducing yield on property to standard levels. The fact of the matter is that in the study area income from real property is indeed modest and little reduction from this quarter can be anticipated. This conclusion is based upon an analysis of a general income and expense statement compiled for the area in aggregate and delineated below.

The gross rental income in the study area is approximately $4,320,000, an estimate derived by multiplying the average rental by the total occupied floor space. Real estate taxes amount to approximately $890,000, computed on the basis of an assessed value of $21 million and a tax rate of $4.26 per $100. Data on operating expenses are not available, but Julian M. Bond[4/] indicates that operating expenses, including wages, fuel and utilities, repair and maintenance, and management expenditures, stand at approximately 40 percent of gross income for loft buildings of the type characteristic of the study area. Accepting this ratio to apply to the study area yields an estimate of operating expenses of $1,728,000. These figures in combination indicate that estimated net income before debt service is $1,700,000, which represents a return of 7.4 percent on the estimated current market value of the property in the area. There are roughly $7 million outstanding mortgages on property in the study area and debt service averages $100 per $1,000 per annum. The financial charges for interest and amortization thus are estimated at roughly $700,000 a year. This means that net income after debt service is approximately $1 million or 6.3 percent cash return on the aggregate equity for the area as a whole.

Rent Increases Due to Rehabilitation

The median additional rent that would be required if the rehabili-

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4/ Julian M. Bond, op. cit., p. 95.

tation program specified in Chapter XII is undertaken would amount to approximately $.58 a square foot, or an amount roughly equivalent to three-quarters of the median rent currently prevalent in the area. This figure is comprised of $.14 for real estate taxes (4.26 percent times average rehabilitation cost of $3.40 per square foot), $.10 per square foot for additional operating expenses ($.26 per square foot increased maintenance cost to keep the buildings at their higher quality, minus $.15 savings on the conversion from manual to automatic elevators, minus $.01 savings on premiums for fire insurance on the structures themselves), plus $.34 per square foot for debt service if the rehabilitation costs are financed. This calculation assumes that if the cost of rehabilitation is totally financed, the property will yield a net income which will be the same percentage of equity after debt service as it is at present. It also assumes that the same rate of net return on total estimated market value before debt service will prevail. The latter statement is based on the assumption that the $3.40 expended for rehabilitation per square foot will be added to the market value of the property.

How much of the estimated rent increase could be offset by savings in operating and fire insurance costs, were the buildings to be rehabilitated? According to the calculations presented earlier in this chapter, operating savings, assuming a 2 percent reduction in

costs,[5/] would provide on the average $. 19 per square foot in extra rent expenditures, and savings in fire insurance would add $. 12 on the average, were the most deteriorated structures improved to acceptable levels of quality, bringing the total in savings which could be added to current rent expenditures to approximately $. 30 per square foot per annum. This amount is roughly one-half of the median rent increase which would come about as a consequence of additional investment in rehabilitation of the structures in the study area.

Examining the distribution of estimated rent increases in detail reveals that 15 percent of the firms would find their rent augmented by less than $. 20 per square foot, and that an additional 21 percent would experience rent rises between $. 20 and $. 39 a foot (Table 91). On the other hand, 15 percent of the business establishments would find themselves burdened with an additional rent of $1 or more per square foot, a considerable increase in view of the fact that 64 percent of the establishments pay less than $1 a foot at the present time. In fact, examining the estimated rent increase in terms of the present rent distribution reveals the fact that 34 percent of the establishments would experience a rent rise of 100 percent or more were the rehabilitation program carried out fully in accordance with the standards set forth in this study.

5/ Since much of the operating savings described earlier are contingent upon moving operations from multi-story to single-story space, the 2 percent reduction in costs is considered more appropriate for rehabilitation than the 5 percent reduction.

Table 91

Distribution of Estimated Increase in Rent Associated with the Rehabilitation of Buildings, by Present Rent per Square Foot Paid by Firms South Houston Industrial Area, 1962

Present Rent per Square Foot	Total	Estimated Rent Increases per Square Foot							
		Under $.20	$.20-.39	$.40-.59	$.60-.79	$.80-.99	$1.00-1.19	$1.20-1.39	$1.40 a over
Under $.50	23	3	10	5	5	-	-	-	-
$ .50- .59	37	4	7	7	14	5	-	-	-
$ .60- .69	43	5	10	9	19	-	-	-	-
$ .70- .79	81	11	13	12	25	7	7	-	6
$ .80- .89	79	13	14	21	16	15	-	-	-
$ .90- .99	52	-	17	8	9	9	8	-	-
$1.00-1.19	116	38	19	20	19	-	-	10	10
$1.20-1.39	29	-	5	-	-	6	-	8	10
$1.40-1.59	28	-	5	-	8	4	-	6	5
$1.60 & over	8	-	3	2	-	-	-	-	3
Total	496*	74	103	84	115	46	15	24	34
Percent	100.0	14.9	20.8	17.0	23.2	9.3	3.0	4.8	6.9

*Rent data for 46 firms not available and 99 firms own the building they occupy.

There is no doubt that some of the establishments would be willing to make up a portion of the extra rent over and above the savings on operations and insurance by drawing upon their present earnings. How many firms would be able or willing to do this, however, is problematical. There are no data available on the earnings of business firms presently located in the area. The few figures on other aspects of rental payments that might relate to this decision are difficult to interpret. For example, rent constitutes 2.1 percent of gross business receipts of firms in the area and, in fact, the range around this average is rather narrow, lying between 1.9 percent for wholesale firms and 2.8 percent for textile and apparel establishments. In addition, an analysis of the relationship of rent to wages and salaries shows that this ratio is virtually the same in all industry group categories for firms in the study area and for the New York City metropolitan area as a whole. In general, however, there is not sufficient knowledge of the normal values of these measures to permit their use in predicting the possibility of establishments in these circumstances drawing upon their general resources to meet additional rent payments.

On the whole, therefore, it appears that rehabilitation would impose a considerable burden of additional rent on firms presently located in the area. But it must be remembered that the resultant rents would still be considerably below the level associated with new industrial construction, and, therefore, even the rehabilitation of old

buildings, with all of the remaining imperfections, might still be deemed worthy of further consideration.

Part D. Planning Issues

XVI Implications of the Planning Alternatives

Chapter XVI

Implications of the Planning Alternatives

The purpose of this study has been to analyze the present economic, structural, and market characteristics of the South Houston Industrial Area in order to provide information that will facilitate planning decisions regarding the area. This differs considerably from the so-called land use and marketability study that seeks to estimate the demand for specific types of accommodations or to determine the most propitious use of land after major decisions regarding the disposition of an area have been reached. Since public deliberation on the study area is in its early stages, the issues center around the composition and quality of the area, the existing problems, the costs and benefits of possible actions, and the directions that might be taken in the contemplation of alternatives. This study is thus diagnostic rather than therapeutic in nature.

Summary of the Major Findings

In general, it was revealed that, contrary to prevailing impression, the South Houston Industrial Area is devoted principally to production activities and not to storage. In the most part, the firms are flourishing establishments that provide employment for almost 13,000 persons, pay prevailing wages, and reveal a high degree of

stability and solvency. A large proportion of the firms deal with others located nearby, or in other sections of Manhattan's business district, or at places across one of the two rivers readily accessible to the study area. For this reason, they find it necessary to seek accommodations somewhere in the central district. What attracts them specifically to the study area is the large supply of space available at modest rents, averaging $.80 per square foot per year. So popular is this area that 94 percent of all the space is occupied, a rate that coincides with that prevailing in the larger section extending from 8th Street down to Worth Street and from Lafayette Street to West Broadway.

In consonance with general observations, however, a large proportion of the structures are obsolete and inefficient and, what is more important, contain health and fire hazards. The cost of rehabilitation, while beyond reason for some structures, would appear to be within the realm of consideration for others. For the building inventory as a whole, however, rehabilitation would necessitate a rent increase of roughly $.60 a square foot, on the average. This amount is approximately twice as great as the average savings that could be expected to accrue from both the greater productive efficiency which would result and the reduction in fire insurance premiums brought about by the installation of sprinklers and other preventative or fire restrictive items of construction in buildings where they are presently required.

Regardless of the complexities of the problem, there are only a limited number of decisions possible in prescribing a course of action related to the physical composition of the area. There is total demolition or major rehabilitation of existing structures, or some combination of the two. A less dramatic course of action consists largely of code enforcement and the encouragement of property improvement by the present owners, in effect continuing the course pursued heretofore, but with an intensification of effort. As a last possibility, public concern and attention could be totally withdrawn from the area. This would mean ignoring an existing body of law and administrative regulations as well as continuing serious hazards to the rest of the community, so it cannot be considered an alternative worthy of analysis. Rational men do not deliberately choose chaos.

These general courses of action constitute the framework within which the consequences of each will be evaluated. The balance sheet, however, will be incomplete. While an effort will be made to include all of the major assets and liabilities of each alternative, they will not be weighed against each other to arrive at a measure of net worth. Although some of the items are subject to precise quantification, others have complex original and secondary effects on the city and its people, and still others are intangibles which are evaluated diversely by different sectors of the community. The factual data for a decision are presented; the policy decision rests with public authority.

Alternative One: Total Clearance

Buildings have been demolished in the past either because they have been so deteriorated that they constituted a menace to health and welfare, or because a new use was pressing and markedly superior. Ordinarily, these separate motives distinguished the public and private efforts. They differed in size as well, with the former taking place over an area of several blocks, while the latter was generally restricted to considerably smaller sites, usually less than a block in size. In recent years, the distinction in motive has been blurred as urban renewal has moved into a larger and more sophisticated arena of city reconstitution.

Total clearance has much to commend it, particularly if it is undertaken under Title I. Existing property can be acquired with ease through the exercise of the power of eminent domain, a substantial proportion of the net project cost is contributed by the federal government and by the state, and a large tract of land, which is less restrictive architecturally, is made available for more productive economic and social use.

In the South Houston Industrial Area, however, the costs and problems accompanying such a course of action would be many and serious. First, it is estimated that the net project cost of acquiring the twelve-block area for residential or industrial reuse would amount to $24,000,000 to $35,800,000. This estimate is based on the

following calculation: The present assessed value of the area is approximately $21,000,000. Since assessed value has equalled approximately 65 percent of court awards, the estimated cost of condemnation would be in the vicinity of $33,000,000. Adding to this sum $3,000,000 for relocation fees, $2,000,000 for demolition, and $1,000,000 for administrative costs produces a total acquisition cost of $39,000,000. If the site were used for middle-income housing, its estimated reuse value would lie between $3,200,000 and $5,100,000. This assumes a range of density of 83 to 130 dwelling units per acre for 26 net acres, or 2,160 to 3,380 dwelling units, with the land costs estimated at approximately $1,500 per dwelling unit. An estimate for luxury housing would place the reuse value at approximately $6,500,000. Thus, the range of write-down for residential reuse is $32,500,000 to $35,800,000. If the contemplated alternative use were industry, assuming a floor area ratio of five, reuse value would lie between $10,000,000 and $15,000,000, placing the range of the required write-down between $24,000,000 and $29,000,000.

Even if the required write-down amounts to the lower sum, it will roughly equal the total available for all Title I urban renewal in the City of New York for a year. Thus, if the sum is applied to the South Houston Industrial Area, it means that no other Title I clearance

can be subsidized anywhere else in the city for a twelve-month period. A sum of $30,000,000 in write-down is capable of clearing a considerably larger area of slum or deteriorated structures in the Bronx or Brooklyn, and the decision to utilize these funds, therefore, requires judgment regarding priorities associated with various kinds of land uses and geographic areas in the City of New York.

If middle-income housing is the reuse designated for the cleared area, an additional cost is to be considered. The real estate tax yield from a development containing 2,160 to 3,380 units would be roughly $840,000 to $1,300,000 per year. This was calculated on the following basis: The current costs for land and construction for Mitchell-Lama projects in New York is approximately $19,000 per unit. The average assessment is roughly 80 percent of total cost and tax remission of 40 percent of assessed value is commonly extended. Thus, at a rate of .0426 the real estate tax per dwelling unit will amount to slightly less than $400. At the present time, real estate plus gross business receipts taxes amount to approximately $1,700,000, so that municipal revenues for this area would be reduced by approximately $400,000 to $860,000 per annum.

Second, clearance poses the large question of the fate of the establishments and employment presently located in the area. These are not fly-by-night nomad firms, nor can the jobs that they provide be summarily dismissed. The overwhelming proportion of the establish-

ments are of a caliber at least equal to the average of firms found in their respective industries, and the average earnings of workers corresponds to the average of industrial employment in the city at large. Moreover, a majority of the workers are recruited from minority groups, whose employment opportunities are restricted. The vacancy surveys conducted by the Real Estate Board and by the New York City Department of City Planning indicate that there is not enough vacant loft space in all of Manhattan to accommodate the total space needs of firms presently located in the study area, even if every square foot of vacant space were to be utilized for this purpose. This means that many firms would, of course, move to Brooklyn, the Bronx, or Queens, others would select sites in New Jersey, and still others would leave the metropolitan area. In addition, there are a substantial number of firms that would be forced out of business if they were compelled to move, either because they are marginal with low rentals and meager earnings, or because the principals are elderly persons approaching retirement age, for whom the re-establishment of the business at a new location would seem hardly worth the effort. Thus, in the reshuffling of firms some would meet their demise.

A portion of the surviving jobs would be found outside of New York City, contributing to employment elsewhere and to sustaining national levels, but probably adding to unemployment rolls in New York City. Some of the workers presently employed would move along with

the establishment, but experience has shown that the proportion below the executive level who do si is indeed small. Even if this were the workers' intention, Negro or Spanish-speaking workers encounter rigid residential barriers when they seek to move to suburban areas convenient to the new location of their firm. Some of these workers would undoubtedly find other employment within the City of New York, but it must be remembered that the unemployment rates for minority groups are considerably above the average and their alternative opportunities are circumscribed. Thus, a compulsory removal of business establishments would have a reduction in the total volume of employment as a cost to be considered.

Law and conscience dictate public aid in relocation of existing business establishments. Without a carefully conceived and developed relocation program hardships and business losses would proliferate and public sentiment be highly charged. The relocation program would be particularly difficult, not only because of the low vacancy described earlier, but also because it would be necessary to find a location suited to the business linkage of each of the establishments and, at the same time, accommodations available at a rent that the firm can pay. These three requirements, location, accommodation, and price, are severe restrictions indeed and, in the absence of any substantial alterations in the supply of, or in the demand for, industrial space, a relocation program that attempted to meet the individual requirements of the

existing firms would undoubtedly take many years to complete under the best of circumstances.

Third, total clearance would involve the demolition of a substantial number of buildings in satisfactory condition. One-fifth to one-quarter of the structures in the area were graded excellent or good (A or B) in the index of building quality. The demolition of these buildings, on the face of it, would appear to be wasteful, particularly when in many of them minor existing defects could be rectified at relatively low cost. The better buildings are distributed throughout the study area, but a concentration is to be found in the three blocks facing Broadway, a fact whose relevance is developed in a later section of this chapter.

Alternative Two: Rehabilitation of Existing Structures

Rehabilitation of existing buildings to satisfactory levels of safety, efficiency, and appearance would rectify the major structural deficiencies and remove existing hazards, although it would not, of course, provide as desirable space as new construction. It would also minimize the relocation of firms and the loss of business and employment. In many cases, the improvements can be made while the existing firms remain in operation so that losses during the interim period can be reduced and, in a few instances, eliminated. Rehabilitation would also tend to diminish the disruption of the rent schedules and

of the patterns of business association and spatial distribution built up over the years between local firms and those located elsewhere. In other words, rehabilitation would seem to cushion the shock of improvement that can be expected to take place in the area. As in the case of total clearance, however, total rehabilitation would be accompanied by many costs and problems.

First, many buildings in the area are in so severe a state of dilapidation that rehabilitation is not warranted, either physically or financially. There seems to be little doubt that buildings in this condition should be slated for early removal. In several instances, these deteriorated buildings are located contiguously so that their demolition could provide a plot of land which offered flexibility of use. Areas of this sort might be employed for truck docks, parking lots, or for new construction. In many instances, however, the buildings that should be demolished are located between two structures that are in considerably better condition. The removal of these scattered structures would leave vacant lots with highly restricted reuse potential There are today in the study area eleven such vacant spaces, some of which are used productively and some of which merely serve as repository for refuse.

Second, the costs of improvement of many of the remaining structures are quite high, very often exceeding the current value of the structures. This in itself would not necessarily be a barrier to im-

provement. On the East Side of Manhattan, residential rehabilitation has taken place in which investment many times the acquisition cost of an old structure was justified by virtue of the considerably higher level of rents that could be obtained afterwards. In the study area, a considerable increase in rent would also be required to pay for the investment necessary to improve the quality of some of the structures. In the majority of instances, the new rents would be in excess of the operational and insurance savings that the present firms can realize by virtue of an upgrading of their quarters. Many firms, therefore, would find the new level of rents too heavy to bear, and they would be compelled to leave their present accommodations, perhaps being replaced by establishments with superior rent-paying capacity now located elsewhere. If it should occur, it would be fine for the area, but it would reduce one of the great advantages of rehabilitation, which is to minimize relocation of establishments.

Third, in redevelopment areas throughout the country, great difficulty has been encountered in attempting to induce landlords to repair properties voluntarily in areas in which spontaneous upgrading has not taken place. The complexity of the problem is compounded by the fact that the redevelopment authority must work with a large number of individual property owners, each with his own motivations, financial positions, and personal quirks. In the study area, as in many of these situations, a further complication is added by the fact that, in a sprinkling

of cases, title to an individual piece of property may be in litigation, held by an estate or trustee, or in the hands of as many as a dozen participant owners. To achieve the participation of property owners under these circumstances is a difficult task indeed.

Approximately one hundred of the buildings in the study area are held by owner-occupants, which should make the authority's task easier. The greatest concentration of ownership, however, is found among firms engaged in wholesale trade and storage. Although these buildings tend to be lower in quality than the average for the area and, therefore, in greatest need of repair, wholesale firms which devote a substantial amount of their space to storage of low-value commodities have very little incentive to improve their quarters. If rehabilitation is to take place in these structures, it would seem necessary to acquire them through public action.

Fourth, because of the character of the buildings, significant residual deficiencies will remain even after optimum rehabilitation. For example, rehabilitation could not increase space per floor to any significant extent. In some instances, neighboring buildings are sufficiently similar in construction and the floors sufficiently well aligned to permit combining two or more buildings into a single structure. It is questionable, however, whether there would be the fortunate coincidence of firms that could benefit from single-story operation presently occupying the space in which the combination could occur.

Most buildings, moreover, would not be susceptible to this type of treatment and would remain long and narrow, with all the attendant goods-handling problems to be found in space of this nature. It is problematical also whether all the structural deficiencies could be removed by any rehabilitation or repair program short of virtual reconstruction.

It must be remembered that the resultant rent after rehabilitation of structures will be approximately one-half of that required for new construction. According to prevailing building costs in Manhattan, new loft construction will amount to $12 to $15 a square foot plus $2 to $3 for land. At present mortgage arrangements, operating cost, and expected rates of return, rent for new loft space would range from $2.50 to $3.50 per square foot per annum. The calculations performed in this study indicate that industrial space satisfactorily rehabilitated could rent for somewhere between $1.25 and $1.75 per square foot. Thus, with all its residual deficiencies, rehabilitated space in the study area could compete successfully with similar accommodations in Manhattan and in other boroughs of the city.

Alternative Three: Combination of Rehabilitation and Clearance

In order to avoid or minimize some of the social and economic costs of total clearance or total rehabilitation, a combination of the two might be considered. The Broadway blocks in particular warrant special consideration. This strip, occupying one-quarter of the land of the study

area, contains 40 percent of the floor space, 30 percent of the firms, 50 percent of the employment, 50 percent of wages and salaries, 46 percent of the gross business receipts, and 31 percent of the assessed value of the land and improvements. Thus, the preservation of the buildings on the Broadway blocks alone would safeguard a large proportion of the employment and earnings in the area and, at the same time, reduce the net project cost. Assuming that the remaining nine off-Broadway blocks were cleared, total acquisition costs would amount to $26,300,000 and the write-down would range from $21,400,000 to $23,900,000, were the use after clearance middle- or high-rent residential structures, or from $15,000,000 to $18,800,000 if the use were non-residential, principally industrial. This compares with $24,000,000 to $35,800,000 for total clearance.

A combination of clearance and rehabilitation need not be divided in this manner, however, for a more rational plan might well be devised. It must be remembered that, although the buildings along Broadway are largely in good condition, most are narrow and 200 feet deep, making for difficulties in space use and in fire fighting. The rear sections of some of these structures are in a considerably poorer state of repair than the facades and lobbies that face Broadway. Setting back of the Mercer Street frontage would reduce the length of the building and, at the same time, provide off-street space for loading and unloading.

More important perhaps than this problem is the fact that three or four of the Broadway buildings appear to warrant demolition and several are in poor to fair condition. On the other hand, there are many structures in the remaining nine blocks that are in excellent or good condition and many others in which rehabilitation is financially and physically feasible. The scatter of these structures, however, is almost at random so that the resultant open space would be ragged and of limited usefulness if buildings were to be scheduled for demolition on the basis of present condition or excessive cost of rehabilitation. In order to rationalize this pattern to provide suitable space for new construction, loading and unloading or parking, it would most certainly be necessary to demolish some of the better structures that would otherwise be retained. It is impossible within this study to designate which structures would be saved and which demolished according to a plan based on these criteria of saving as many of the better buildings as possible, while providing usable space through clearance of others, or to estimate the write-down costs or extent of relocation which would result. These would obviously be less than those of total clearance, and greater than those of rehabilitation alone.

The rentals for space in existing buildings after rehabilitation (averaging $1.40 per square foot) or in the new industrial space that could conceivably be provided (averaging $2.50 to $3.50 per square foot) would be considerably higher than those presently paid by the

resident establishments. This not only would result in a certain volume of relocation, but it also requires consideration of the potential demand for accommodations of the type and rent level contemplated. If the resultant rents proved to be higher than the market would countenance, an industrial rehabilitation or new construction program might very well require public subsidy to be successful. On the other hand, if a sizable volume of potential demand capable of supporting rehabilitation or new construction rents were found to exist, then no subsidy would be necessary and municipal revenues from both real estate and gross business receipts taxes would be substantially augmented. In addition, many firms finding new and efficient space available to them might remain in the city rather than moving elsewhere in order to obtain accommodations of higher quality than those which they presently occupy in Manhattan's old loft buildings. In view of the many cross-currents presently at work, and in the absence of a careful analysis of this subject, one is hard pressed to hazard a guess regarding the likely level of potential demand.

Alternative Four: Intensified Code Enforcement

Rigid and extensive code enforcement to remove all existing building and fire violations would appear to be a minimal course of action in the study area. This area has evidently been subject to a higher degree of scrutiny by inspectors than others in the city because

of the concentration of hazards and of working population. Heretofore, fire inspections have been on a routine cycle basis, but building inspections largely depend upon complaints or referrals. It would appear desirable that all types of inspections in the study area be made routine to take place at least once a year on an irregular schedule. This, without question, would increase municipal costs, but the amount would be nowhere near that required by total or partial clearance.

An intensification of effort would undoubtedly be required in order to ensure that property owners make the expenditures necessary to remove all of the existing violations because they are substantial in amount. For the areas as a whole, the installation of sprinklers would amount to $2 million. If this amount is added to the cost of fire-resistive enclosures, the removal of major building violations, and the improvement of washroom facilities, a minimum expenditure of $5 million is required today. This sum is equivalent to the total expenditures for repairs and improvements (expressed in 1962 dollars) made in the area during the 17-year period 1945-62. In view of this record of expenditures, much of which was made as a result of law enforcement, one can hardly expect a sudden revolution in the disbursement policies of landlords to take place merely because a public pronouncement has been uttered. It would take an absence of equivocation on the part of public officials and a stringency of penalty which were not present in the past. In order to expedite this process, the city

might consider the establishment of a revolving fund upon which landlords could draw to finance the necessary repairs and installations if funds proved to be unavailable through the usual channels of financing.

Such modest improvements would tend to keep the increase in rents considerably below the level necessitated by thoroughgoing rehabilitation or by new construction. But since few operating savings would result from these installations and the reduction in insurance premiums would be trivial, even this small rent increase would mean a hardship for some and a reduction of revenues of others. Some turnover would undoubtedly result from the rent consequences of such an enforcement effort, but it would be substantially less than that accompanying a higher order o rehabilitation.

At the very least, however, there seems to be little alternative to the redoubling of efforts to raise the buildings in the area to legal levels of acceptability. If this limited program is undertaken, it might also be desirable at this time to place a limit on the remaining legal life of the buildings in the area, in view of their present condition and their age.

Some General Planning Considerations

It is extremely difficult to arrive at a satisfactory planning decision on a project by project basis. Under these circumstances, the disposition of an area tends to be influenced by purely local condi-

tions, or by particularly pressing community needs. As a consequence, decisions are made on an ad hoc basis rather than from the point of view of the optimum role that the area can play in the life and land-use pattern of the city as a whole. In order to make the more considered judgment, it is necessary for a community to possess a comprehensive plan, or at least to have formulated a satisfactory approach to one.

In New York City, substantial progress is being made in this direction. In fact, a new approach to urban planning is being developed which emphasizes the guidance of change, and in this manner will be more responsive to the evolving goals and physical and social requirements of the community. In conjunction with this effort, an extensive community renewal program is in process which will bridge the terrain between project and comprehensive planning. Until these two massive enterprises reach further stages of development, intelligent decisions regarding the use of local areas in the interest of the total community will be seriously hampered.

But even in the absence of a comprehensive plan, there are some factors that are obviously worthy of note in the development of judgments regarding the future of the study area. First, the twelve-block section is one of the most accessible in all of Manhattan for it possesses an enormous richness of transportation facilities. Every major subway line has a station in or near the area, and it is criss-crossed with bus lines. In addition, its immediate access to the East

River crossings and the Holland Tunnel places it within ready contact with other sections of the metropolitan area without incurring long delays in traveling through Manhattan traffic. It is within reasonable walking distance of Manhattan's growing civic center and thus can be reached readily from numerous concentrations of significance. The investment in this transportation system is of most value when it serves the concentration of employees and business visitors required by industrial or commercial use, rather than the more limited needs of a warehousing or a residential area.

Second, at the present time, the twelve-block section is physically indistinguishable from areas adjacent to it in three directions. It would appear, therefore, that any decision made with regard to this area would be equally applicable to the contiguous blocks. Thus, consideration might well be given to enlarging the area covered should it reach the project stage, although, of course, such a move would proportionately increase write-down and other costs.

Third, and most important perhaps, is the fact that the study area lies on the border of the great divide; to the north lies expanding Greenwich Village with its array of charming residences, unusual shops and interesting restaurants, and in the other three directions a major concentration of New York's industry. It is evident that decisions made with regard to this area will fortify prevailing land uses or establish new patterns which will have repercussions in many directions for long years

to come. In view of the obviously critical significance of the decision regarding the future of the South Houston Industrial Area, it is evident that the determination warrants the most intensive consideration of the possible alternatives in order to arrive at a plan that will serve the broad community interests of the City of New York and, at the same time, consider the needs of the people who earn their living in the area.

There is much movement of goods in and out of the area. Sometimes it is goods in process or finished product, other times waste material. In all instances, it goes by truck and, strangely enough, trucks usually find a berth at a nearby curb.

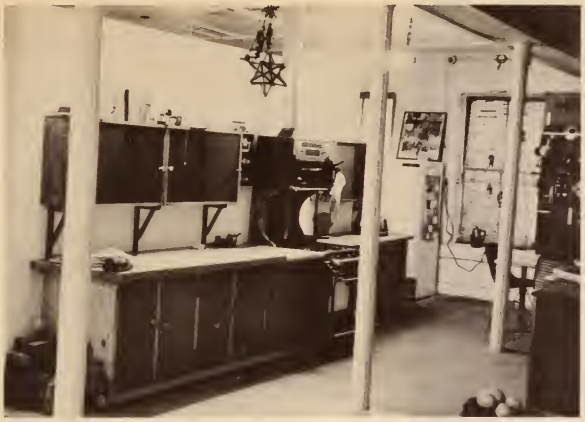
The facade of these buildings betray their age, for the cast iron pillars mark the period between 1875 and 1895. Although the typical building is five to six stories high, there are a few smaller structures usually inherited from an earlier era. In most cases, the full lot is covered, and often basement space is extended by excavations under the sidewalk.

The linear staircase extending uninterruptedly from the ground floor front to the top floor rear is commonly encountered. Sometimes it is clear of obstructions; at other times, it is not.

Many of the buildings are used for wholesaling and storage. In some cases, goods are baled and stacked neatly with aisles clear of obstructions. In others, burlap sacks or loose goods are strewn about the premises.

Ladies retiring room. Worse than the average, but not as bad as some others.

A variety of firms, a variety of jobs, and a variety of people. The 13,000 workers in this twelve-block area possess many different degrees and types of skill. More than a majority come from New York's principal minority groups.



AIR 4- Artist in residence on the fourth floor. Behind this inauspicious exterior a man of creativity and taste has transformed bleak, undifferentiated space into a graceful atmosphere for working and living. While infrequent in the twelve-block area, artists of many types have taken to lofts in nearby sections of Manhattan.

Of the eleven vacant lots, a few are used intensively for automobile parking. Others merely serve as repositories for refuse. The space they provide is insufficient in size or too limited in shape to be used for more productive purposes.