COST AND TIME ASSOCIATED WITH NEW MULTIFAMILY HOUSING CONSTRUCTION IN NEW YORK CITY

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ABSTRACT

The costs and time presently associated with constructing new housing in New York City are discussed. The most recent projects either completed, or substantially completed, for which accurate cost information was available late in 1967 from Federal Housing Administration and the Housing Assistance Administration of the Department of Housing and Urban Development, and from the New York City Housing Authority, are used to provide the cost data. Emphasis here is on the cost of constructing low-cost housing for lower-income families under programs administered by these three organizations. Social consideration related to relocation, etc., are not discussed.

TABLES

FIGURES

FIGURES

(continued)

PREFACE

This report describes the cost and time factors associated with the provision of housing for lower-income families in New York City, particularly Manhattan. This report deals only with new construction; a projected report will include a comparison with rehabilitation costs and time, as set forth in an earlier comparison paper entitled "Cost and Time Associated with Tenement Rehabilitation in Manhattan, New York City." We do not discuss the various views held in the City, and elsewhere, about the comparative "quality" of housing that results from new construction relative to rehabilitated tenements. Also, this report subordinates concern for the social influence which construction time has on the residents of the neighborhood in terms of family relocation and any related disruption of the neighborhood social fabric. Such important social considerations are beyond the scope of this report.

Contributions have been made to this study by H.U.D.'s F.H.A. and H.A.A. Offices, both in Washington and in New York City; by the New York Housing Authority; and by the MITRE Corporation.

Responsibility for the report and its conclusions remains with the Office of Urban Technology and Research of the Department of Housing and Urban Development.

INTRODUCTION

This study presents information about the cost and construction time associated with building new, low- and moderate-income housing in New York City. This information will permit comparison to be made with similar data for rehabilitation, presented in an earlier H.U.D. comparison report.[1] This report is intended to provide factual information about the cost of providing improved housing in the city insofar as cost and time factors are concerned. It must be emphasized that there is not a "one-to-one" correspondence between the information contained in the rehabilitation report and in this report; such detailed information is not available.

Projects selected for this report are those completed most recently in New York City, or well under construction there late in 1967, that involve the use of three housing programs: H.U.D./F.H.A., H.U.D./H.A.A. and N. Y. (Mitchell-Lama). No information is presented for conventionally financed multifamily housing; because of the present rent structure, it is seldom available to low- and moderate-income families. Further, locating and collecting information for any conventional projects that might have low rents was beyond the resources immediately available to us for this work. Except for two projects in Manhattan, the H.U.D./F.H.A. projects are insured under the H.U.D. Section 221 Program which is intended to result in the production of moderate-income housing. Since only one H.U.D./F.H.A. 221(d)(3) project had been built in Manhattan at that time, the cost of two other H.U.D./F.H.A. projects in Manhattan is presented even though they are considered "luxury" apartments and are insured under Section 207;

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[1] Cost and Time Associated with Tenement Rehabilitation in Manhattan, N.Y.C.

use of these particular cost data, properly normalized, is judged necessary in order to provide a broader basis for cost comparison.

COMPARABILITY OF COST FIGURES

In an effort to obtain broadly representative costs, projects have had to be selected from three different housing programs. This has introduced a difficult problem of comparability, since the cost records of each project are kept in a manner developed through the years to satisfy the management needs of the particular programs of which it is a part. Since the several programs are responsibilities of different agencies, widely separated organizationally, it would be remarkable if cost data were directly comparable and, in fact, they are not. This has necessitated the use of considerable judgment in rearranging costs and delineating them into more nearly comparable categories.

These considerations prompt two important observations, the first directly applicable to the interpretation of the present report, the second more general in nature:

1. In comparing data in this report, careful attention should be paid to the differences between projects, and the probable effect of those differences on the data being compared.
2. If comparisons of this sort provide useful information, an effort should be made to adopt uniform systems of recording, transmitting and presenting data so that any such future comparisons could be made with ease and greater accuracy.

In addition, the rising cost of construction during the years in which the different projects were executed makes it necessary to adjust costs to a common base: Fall 1967 dollars. Tables I and II present the specific "multipliers" used for each project to normalize the cost to the time period chosen for comparison.

NEW MULTIFAMILY HOUSING PROJECT DEVELOPMENT COSTS

The characteristics and development costs of 21 new multifamily housing projects in New York City are presented in Tables I and II. These projects were the most recent ones completed prior to Fall 1967 or where construction was well underway at that time; all were constructed using one of the H.U.D./F.H.A., or New York State (Mitchell-Lama) Programs.

Table I presents the information for the twelve New York City projects located in the Borough of Manhattan. Information about nine additional projects in other New York City boroughs is presented in Table II. The projects have been separated in this way principally because those projects outside of Manhattan were typically built using "semi-fireproof" construction which results in a lower cost; those in Manhattan used "fireproof" construction, at relatively higher cost. The difference in type of construction is related to complex economic and zoning practicalities. For instance, the higher value of land in Manhattan has the effect of requiring more intensive land use and therefore higher buildings. High-rise buildings are built using "fireproof" construction.

A large amount of information is included in Tables I and II. It can be analyzed and compared in a variety of ways. An analysis of some items follows in this report, but other comparisons can be made for specific purposes.

Tables I and II present the total development cost for each project. In addition to housing, these projects also include rental and/or service spaces such as garages, stores and professional suites, and therefore,

the costs include varying amounts not strictly attributable to housing alone. This cost aspect is discussed in greater detail in a later section of this report.

The acquisition cost of land was one amount particularly difficult to obtain for several projects since, in some instances, certain subsidies were involved. Where any H.U.D./R.A.A. "writedown" cost and/or land gifts were identified, a "fair value" amount has been included and considered to be part of the cost of acquiring the site.

Demolition costs,if any, involved in clearing the site to make it available for new construction were included as well. The authors recognize that this method of accounting for true housing costs is not universally accepted. Some authorities prefer to look upon the cost of removing old structures to make the site suitable for new construction as a "social" cost that society should pay to remove unsuitable buildings and not one that should be attributable to the cost of the new construction itself. For some projects this is a substantial amount and, for the purpose of this particular report, it should be included. Insofar as possible, the land acquisition cost indicated on Tables I and II is the fair market value for which an informed buyer and an informed seller could have been expected to exchange ownership of the land at the time.

Information presented in these two tables is categorized into three main groups; i.e., characteristics, construction cost, and miscellaneous cost The totals of the latter two are shown as the development cost of the project. The general contractor's profit and bonding cost, if any, are included in

the project construction cost; the architectural fee, as is sometimes the practice, is not. This is set out separately as one of the miscellaneous costs.

A cost of dollars per person housed is presented. To do this, we have made assumptions regarding the average number of persons expected to be housed in living units containing various numbers of bedrooms. We have used the judgment of the New York City Rent and Rehabilitation Administration in regard to the number of persons expected to be housed in living units with various numbers of bedrooms; they are presented in Table No. III.

One can conclude from a study of Table I that total development costs for new multifamily projects in Manhattan range from $19,000 ± $900 per living unit to $30,000 ± $1,500. The median cost is about $25,000 ± $1,300 per unit; this is equivalent to some $34 ± $4.0 per net sq. ft. of living unit area, $27 ± $3.2 per gross sq. ft. of living unit area, and $7,900 ± $500 per person housed--all in Fall 1967 dollars.

From a study of Table II, one can conclude that development costs for new multifamily projects in New York City, but outside of Manhattan, range from $15,000 ± $800 per living unit to $22,000 ± $1,100. The median cost is $19,000 ± $900 per unit; this is equivalent to some $29 ± $3.5 per net sq. ft. of living unit area, $21 ± $2.6 per gross sq. ft. of living unit area, and $6,000 ± $400 per person housed--all in Winter 1967-68 dollars.

These figures clearly show that the cost of developing housing is appreciably higher in Manhattan than it is in other parts of the city; i.e., about $6,000 per living unit, $5 per net sq. ft., $6 per gross sq. ft., and $2,000 per person housed, respectively, using the median cost figures.

TABLE I

NEW MULTIFAMILY HOUSING PROJECT CHARACTERISTICS AND ESTIMATED DEVELOPMENT COSTS IN THE BOROUGH OF MANHATTAN, NEW YORK CITY, NEW YORK

	LaGuardia Addition Project HAA 5-61	Bethune Project HAA 5-70	Independence House Mitchell-Lama	Tompkins Sq. N. Project FHA 012-55021	Grammercy East Project FHA 012-00980	Oxford East Project FHA 012-00950	Jefferson Towers Mitchell-Lama	RNA Houses Mitchell-Lama	West Side Development Project HAA 5-56	Strykers Bay Apts Mitchell-Lama	830 Amsterdam Ave. Project HAA 5-59	Columbus Park Mitchell-Lama	Estimated Possible Error in Data Percent
CHARACTERISTICS OF PROJECTS													
Number of Buildings	1	1	1	4	1	2	1	1	3	2	1	1	±0
Number of Stories	16	22	12	2,10,15,26	16	12,12	20	14	9,18,22	16,20	20	26	±0
Number of Living Units	150	210	120	371	263	203	189	207	396	236	159	162	±0
Approx. Area Per Floor in Gross Sq.Ft.	6,600	6,700	8,300	6,000-9,700	12,000	6,500	10,400	17,300	6,800-7,990	6,400	7,400	7,500	±1
Garages, Automobile Spaces	0	0	34	187	41	28	82	83	45	116	0	45	±7
Professional, Stores (in rooms or sq.ft.)	0	0	2,500	3	5	2	10	11	0	11,000	0	10,000	±7
Number of Efficiency Units 1/	31	42	33	22	97	51	0	0	5	19	2	2	±1
Number of One-Bedroom Units	119	126	87	78	107	126	38	52	149	60	63	44	±1
Number of Two-Bedroom Units	0	42	0	130	44	25	113	103	148	88	38	66	±1
Number of Three-Bedroom Units	0	0	0	141	15	1	38	52	81	49	36	44	±1
Number of Four-Bedroom Units	0	0	0	0	0	0	0	0	11	19	18	8	±1
Number of Five-Bedroom Units	0	0	0	0	0	0	0	0	2	0	2	0	±1
Average Number of Bedrooms Per Unit	.79	1.00	.73	2.05	.91	.88	2.00	2.00	1.87	1.95	2.07	2.10	±1

TABLE I (CONTINUED)
NEW MULTIFAMILY HOUSING PROJECT CHARACTERISTICS AND ESTIMATED DEVELOPMENT COSTS IN THE BOROUGH OF MANHATTAN, NEW YORK CITY, NEW YORK

	LaGuardia Addition Project HAA 5-61	Bethune Project HAA 5-70	Independence House Mitchell-Lama	Tompkins Sq. N. Project FHA 012-55021	Grammercy East Project FHA 012-00980	Oxford East Project FHA 012-00950	Jefferson Towers Mitchell-Lama	RNA Houses Mitchell-Lama	West Side Development Project HAA 5-56	Strykers Bay Apts Mitchell-Lama	830 Amsterdam Ave. Project HAA 5-59	Columbus Park Mitchell-Lama	Estimated Possible Error in Data Percent
CHARACTERISTICS OF PROJECTS (CONT'D)													
Average Number of Rooms Per Unit 2/	3.39	3.60	3.67	4.77	3.63	3.52	4.98	4.75	4.38	4.67	4.57	4.60	±1
Average Net Area Per Living Unit, Sq.Ft. 3/	510	540	680	940	560	660	920	840	700	870	740	960	±7
Average Gross Area Per Living Unit, Sq.Ft., Less Other Space 4/	560	690	760	1,080	700	800	1,120	1,110	920	1,130	930	1,210	±7
Average Gross Area Per Living Unit Sq.Ft. 5/	N/A	N/A	N/A	1,290	780	870	N/A	N/A	N/A	N/A	N/A	N/A	±7
No. of Persons Per Project 6/	270	440	210	1,410	550	380	680	750	1,370	860	610	620	±1
Average No. of Persons Per Unit	1.8	2.1	1.8	3.8	2.1	1.9	3.6	3.6	3.5	3.6	3.8	3.8	±1
Percent of Land Covered by Building(s) at Ground Level	22	12	54	20	95	100	37	50	31	42	27	58	±5

TABLE I (CONTINUED)
NEW MULTIFAMILY HOUSING PROJECT CHARACTERISTICS AND ESTIMATED DEVELOPMENT COSTS IN THE BOROUGH OF MANHATTAN, NEW YORK CITY, NEW YORK

(WINTER 1967-68 DOLLARS)

	LaGuardia Addition Project HAA 5-61	Bethune Project HAA 5-70	Independence House Mitchell-Lama	Tompkins Sq. N. Project FHA 012-55021	Grammercy East Project FHA 012-00980	Oxford East Project FHA 012-00950	Jefferson Towers Mitchell-Lama	RNA Houses Mitchell-Lama	West Side Development Project HAA 5-56	Strykers Bay Apts Mitchell-Lama	830 Amsterdam Ave. Project HAA 5-59	Columbus Park Mitchell-Lama	Estimated Possible Error in Data Percent
CONSTRUCTION COSTS OF PROJECTS 7/													
(The construction costs have been adjusted to a common base - Fall '67 from the bid date or other representative date).													
Bid date (or other date used for cost adjustment)	7/63	1/65	12/64	9/65	12/64	8/65	5/66	3/63	10/63	12/64	10/63	6/65	--
Update Percent Included in Construction Cost	121	112	115	108	115	108	105	118	120	115	120	112	±5
Per Living Unit	17,000	12,500	16,000	20,000	17,000	17,000	19,000	23,000	18,500	18,500	19,500	22,500	±5
Per Room	5,200	3,500	4,400	4,250	4,700	4,900	4,200	5,100	4,250	4,350	4,250	4,950	±5
Per Bedroom	21,500	12,500	22,000	9,850	18,500	19,500	9,400	11,500	9,950	9,500	9,400	11,000	±5
Per Net Sq. Ft. Living Unit Area	34	23	24	22	30	26	21	27	27	21	26	24	±12
Per Gross Sq. Ft. Living Unit Area	30	18	21	16	22	19	17	21	20	16	21	19	±12
Per Person	9,550	6,000	9,400	5,300	8,100	9,000	5,250	6,300	5,400	5,100	5,050	5,950	±6

TABLE I (CONTINUED)
NEW MULTIFAMILY HOUSING PROJECT CHARACTERISTICS AND ESTIMATED DEVELOPMENT COSTS IN THE BOROUGH OF MANHATTAN, NEW YORK CITY, NEW YORK

	LaGuardia Addition Project HAA 5-61	Bethune Project HAA 5-70	Independence House Mitchell-Lama	Tompkins Sq. N. Project FHA 012-55021	Grammercy East Project FHA 012-00980	Oxford East Project FHA 012-00950	Jefferson Towers Mitchell-Lama	RNA Houses Mitchell-Lama	West Side Development Project HAA 5-56	Strykers Bay Apts Mitchell-Lama	830 Amsterdam Ave. Project HAA 5-59	Columbus Park Mitchell-Lama	Estimated Possible Error in Data Percent
MISCELLANEOUS COSTS OF PROJECT (Not adjusted for inflation, if any)													
Architectural Fees													
Per Living Unit	530	440	590	770	370	450	700	550	540	520	490	670	±5
Per Gross Sq.Ft. of Living Unit Area	0.95	0.64	0.78	0.60	0.47	0.52	0.62	0.50	0.59	0.46	0.53	0.55	±12
Financing Costs													
Per Living Unit	360	470	620	1,800	1,000	1,200	820	880	370	770	770	950	±5
Per Gross Sq. Ft. of Living Unit Area	0.64	0.68	0.82	1.4	1.3	1.4	0.73	0.79	0.40	0.68	0.83	0.79	±12
Legal and Organization Expenses													
Per Living Unit	720	650	560	780	170	210	530	930	640	1,050	560	1,100	±5
Per Gross Sq. Ft. of Living Unit Area	1.3	0.94	0.74	0.60	0.22	0.24	0.47	0.84	0.70	0.93	0.60	0.93	±12

TABLE I (CONTINUED)
NEW MULTIFAMILY HOUSING PROJECT CHARACTERISTICS AND ESTIMATED DEVELOPMENT COSTS IN THE BOROUGH OF MANHATTAN, NEW YORK CITY, NEW YORK

	LaGuardia Addition Project HAA 5-61	Bethune Project HAA 5-70	Independence House Mitchell-Lama	Tompkins Sq. N. Project FHA 012-55021	Grammercy East Project FHA 012-00980	Oxford East Project FHA 012-00950	Jefferson Towers Mitchell-Lama	RNA Houses Mitchell-Lama	West Side Development Project HAA 5-56	Strykers Bay Apts Mitchell-Lama	830 Amsterdam Ave. Project HAA 5-59	Columbus Park Mitchell-Lama	Estimated Possible Error in Data Percent
MISCELLANEOUS COSTS OF PROJECT (CONT'D)													
Acquisition Cost of Land													
Per Living Unit	2,350	4,000	2,750	5,300	3,200	5,900	4,250	3,700	1,850	7,300	4,900	4,000	±5
Per Gross Sq. Ft. of Living Unit Area	4.2	5.8	3.6	4.1	4.1	6.8	3.8	3.3	2.0	6.5	5.3	3.3	±12
Relocation Costs Per Living Unit	N/A	370	100	N/A	N/A	N/A	110	200	270	130	400	85	±5

TABLE I (CONTINUED)
NEW MULTIFAMILY HOUSING PROJECT CHARACTERISTICS AND ESTIMATED DEVELOPMENT COSTS IN THE BOROUGH OF MANHATTAN, NEW YORK CITY, NEW YORK

(WINTER 1967-68 DOLLARS)

	LaGuardia Addition Project HAA 5-61	Bethune Project HAA 5-70	Independence House Mitchell-Lama	Tompkins Sq. N. Project FHA 012-55021	Grammercy East Project FHA 012-00980	Oxford East Project FHA 012-00950	Jefferson Towers Mitchell-Lama	RNA Houses Mitchell-Lama	West Side Development Project HAA 5-56	Strykers Bay Apts Mitchell-Lama	830 Amsterdam Ave. Project HAA 5-59	Columbus Park Mitchell-Lama	Estimated Possible Error in Data Percent
TOTAL MISCELLANEOUS COST OF PROJECTS													
Per Living Unit	3,950	5,950	4,600	7,850	4,750	7,800	6,400	6,250	3,650	9,750	7,100	6,850	± 5
Per Gross Sq. Ft of Living Unit Area	7.0	8.6	6.1	6.1	6.1	8.9	5.7	5.7	3.9	8.7	7.6	5.7	± 12
Per Person	2,200	2,850	2,650	2,050	2,250	4,100	1,800	1,750	1,050	2,700	1,850	1,800	± 6
DEVELOPMENT COSTS OF PROJECTS 8/													
Per Living Unit	21,000	18,500	21,000	28,000	21,500	24,500	25,000	29,000	22,500	28,500	26,500	29,500	± 5
Per Net Sq. Ft. of Living Unit Area	41	34	31	29	39	37	28	40	32	33	36	31	± 12
Per Gross Sq. Ft. of Living Unit Area	38	27	27	21	28	28	23	26	24	25	29	24	± 12
Per Person	12,000	8,850	12,000	7,100	10,500	13,000	7,000	8,050	6,450	7,750	6,900	7,700	± 6
TIME CHARACTERISTICS													
Approx. Date a decision was made to build the project	2/61	2/62	1963	1/65	6/62	8/62	Early in 1966	7/63	9/60	1963	12/60	1963	-
Date Construction Began	8/63	3/65	7/65	12/65	10/64	11/64	10/66	3/65	1/64	10/65	1/64	7/65	-
Date of First Occupancy	9/65	3/67	4/67	9/67	10/65	4/66	Under Construction	4/67	5,8&10/65	3/67	9/65	4/67	-
Date of Occupancy	10/65	3/67	6/67	11/67	6/66	10/66	--	5/67	5,8&10/65	4/67	10/65	5/67	-

FOOTNOTE

1/ Efficiency units are defined as 0-bedroom units.

2/ Average number of rooms per unit computed by dividing total rooms by number of living units. Room count assumes 3 rooms for efficiency; 3½ for one-bedroom; 4½ for two-bedrooms, etc.

3/ Net living unit area is the sum of the floor area assigned to the apartment from the innerface of the exterior wall to the center line of the partitions separating it from public circulation or another apartment.

4/ Average gross apartment area per living unit in sq. ft., less other space, is defined as floor area of building, including basement area from outerface of exterior walls less area occupied by professional offices, stores and garages -- divided by number of living units.

5/ Average gross apartment area per living unit in sq. ft. includes assignment of area occupied by professional offices, stores and garages to the living unit.

6/ Assuming: Efficiency 1 person; 1 bedroom 2 persons; 2 bedrooms 3½ persons; 3 bedrooms 5½ persons; 4 bedrooms 7½ persons; 5 bedrooms 9½ persons; best estimate of New York City Rent & Rehab administration.

7/ Project costs include costs incurred to produce all improvements -- including residential, commercial, professional offices, garages, utilities, landscaping, etc.

8/ Project development costs obtained by adding miscellaneous costs to project construction costs.

TABLE II

NEW MULTIFAMILY HOUSING PROJECT CHARACTERISTICS AND ESTIMATED DEVELOPMENT COSTS IN NEW YORK CITY, OUTSIDE OF MANHATTAN

	Stuyvisant Mnr. Herkiner & Schentrdy FHA 012-55007	Carter Comm. 112-25 167 St. FHA 012-55043	Tysen Park Mill Rd. & Tysens FHA 012-55047	Fox Hill Osgood & Vanderbilt FHA 012-55001	Hancook - Saratoga HAA 5-67	Mitchell HAA 5-50	Park Hill Park View Ave. FHA 012-55019	Summer-Myrtle HAA 5-68	71-15 Beach Chanel Dr. HAA 5-73	Estimated Possible Error in Data Percent
CHARACTERISTICS OF PROJECTS										
Number of Buildings	1	1	3	3	1	10	3	1	1	±0
Number of Stories	6	6	6	6	16	17,19,20	6	24	11	±0
Number of Living units	37	66	381	367	125	1732	402	234	174	±0
Approx. area per floor in gross sq. ft.	5,300	8,000	16,500	18,000	6,900	8,200	20,000	9,500	14,000	±7
Garages, automobile space	0	25	0	0	0	0	260	0	0	±1
Professional, Stores (number)	1	1	1	6	0	0	0	0	0	±1
Number of Efficiency Units 1/	0	22	102	36	1	64	0	0	0	±1
Number of one-Bedroom Units	12	44	243	37	31	664	294	69	74	±1
Number of Two-Bedroom Units	25	0	36	294	62	541	72	71	70	±1
Number of Three-Bedroom Units	0	0	0	0	30	385	36	71	20	±1
Number of Four-Bedroom Units	0	0	0	0	0	63	0	23	9	±1

TABLE II (CONTINUED)
NEW MULTIFAMILY HOUSING PROJECT CHARACTERISTICS AND ESTIMATED DEVELOPMENT COSTS
IN NEW YORK CITY, OUTSIDE OF MANHATTAN

	Stuyvisant Mnr. Herkiner & Schentrdy FHA 012-55007	Carter Comm. 112-25 167 St. FHA 012-55043	Tysen Park Mill Rd. & Tysens FHA 012-55047	Fox Hill Osgood & Vanderbilt FHA 012-55001	Hancock - Saratoga HAA 5-67	Mitchell HAA 5-50	Park Hill Park View Ave. FHA 012-55019	Summer-Myrtle HAA 5-68	71-15 Beach Chanel Dr. HAA 5-73	Estimated Possible Error in Data Percent
CHARACTERISTICS OF PROJECTS (CONT'D)										
Number of Five-Bedroom Units	0	0	0	0	1	15	0	0	1	±1
Average Number of Bedrooms per unit	1.68	.67	.83	1.70	2.00	1.86	1.36	2.21	1.81	±1
Average Number of Rooms per unit 2/	4.19	3.33	3.46	4.25	4.50	4.39	3.86	4.71	4.31	±1
Average Net Area Per Living Unit-Sq. Ft. 3/	660	580	740	820	720	690	880	760	690	±7
Average Gross Area Per Living Unit-Sq. Ft. Less Other Space 4/	930	690	790	1,100	880	850	1,000	970	860	±7
Average Gross Area Per Living Unit Sq.-Ft. 5/	950	890	790	1,100	N/A	N/A	1,000	N/A	N/A	±7
No. of Persons Per Project 6/	112	109	714	1,140	455	6,020	1,040	950	580	±1
Average No. of Persons Per Unit	3.02	1.65	1.87	3.10	3.64	3.47	2.58	4.06	3.33	±1
Percent of Land Covered By Building(s) at Ground Level	58	54	19	36	13	14	31	10	10	±5

TABLE II (CONTINUED)
NEW MULTIFAMILY HOUSING PROJECT CHARACTERISTICS AND ESTIMATED DEVELOPMENT COSTS
IN NEW YORK CITY, OUTSIDE OF MANHATTAN

(WINTER 1967-68 DOLLARS)

	Stuyvisant Mnr. Herkiner & Schentrdy FHA 012-55007	Carter Comm. 112-25 167 St. FHA 012-55043	Tysen Park Mill Rd. & Tysens FHA 012-55047	Fox Hill Osgood & Vanderbilt FHA 012-55001	Hancock - Saratoga HAA 5-67	Mitchell HAA 5-50	Park Hill Park View Ave. FHA 012-55019	Summer-Myrtle HAA 5-68	71-15 Beach Chanel Dr. HAA 5-73	Estimated Possible Error in Data Percent
CHARACTERISTICS OF PROJECTS (CONT'D)										
CONSTRUCTION COSTS OF PROJECTS 7/ (The construction costs have been adjusted to a common base -- winter 1967-68-from the bid date or other representative date)										
Bid date (or other date used for cost adjustment)	1/65	12/64	5/66	1/64	6/65	6/63	9/65	6/65	9/64	-
Update Percent Included in Constr. Cost	112	115	105	120	112	121	108	112	115	-
Per Living Unit	16,000	15,500	11,500	14,000	15,500	15,000	12,500	16,500	17,000	±5
Per Room	3,800	4,650	3,450	3,250	3,500	3,450	3,250	3,500	3,950	±5
Per Bedroom	9,500	23,000	14,500	8,150	7,850	8,150	9,200	8,600	9,450	±5
Per Net Sq. Ft. of Living Unit Area	24	27	16	17	22	22	14	22	25	±12
Per Gross Sq. Ft. of Living Unit Area	17	17	15	13	18	18	12	17	20	±12
Per Person	5,250	9,300	6,400	4,450	4,300	4,350	4,850	4,050	5,100	±6

TABLE II (CONTINUED)
NEW MULTIFAMILY HOUSING PROJECT CHARACTERISTICS AND ESTIMATED DEVELOPMENT COSTS
IN NEW YORK CITY, OUTSIDE OF MANHATTAN

	Stuyvisant Mnr. Herkiner & Schentrdy FHA 012-55007	Carter Comm. 112-25 167 St., FHA 012-55043	Tysen Park Mill Rd. & Tysens FHA 012-55047	Fox Hill Osgood & Vanderbilt FHA 012-55001	Hancock - Saratoga HAA 5-67	Mitchell HAA 5-50	Park Hill Park View Ave. FHA 012-55019	Summer-Myrtle HAA 5-68	71-15 Beach Chanel Dr. HAA 5-73	Estimated Possible Error in Data Percent
MISCELLANEOUS COSTS OF PROJECT (Not adjusted for inflation, if any)										
Architectural Fees										
Per Living Unit	395	635	245	210	560	250	260	490	705	±5
Per Gross Sq. Ft. of Living Unit Area	.42	.72	.31	.19	.63	.29	.26	.51	.82	±12
Financing Costs										
Per Living Unit	840	1,550	865	1,000	530	360	730	555	545	±5
Per Gross Sq. Ft. of Living Unit Area	.88	1.7	1.1	.91	.60	.43	.72	.57	.63	±12
Legal & Organization Expense										
Per Living Unit	925	300	175	63	895	350	785	910	945	±5
Per Gross Sq. Ft. of Living Unit Area	.98	.33	.22	.06	1.0	.41	.77	.93	1.1	±12
Acquisition Cost of Land										
Per Living Unit	440	340	2,300	755	3,050	4,150	730	3,350	1,800	±5
Per Gross Sq. Ft. of Living Unit Area	.46	.38	2.9	.68	3.5	4.9	.71	3.4	2.1	±12
Relocation Costs										
Per Living Unit	N/A	N/A	N/A	N/A	135	390	N/A	195	165	±5

TABLE II (CONTINUED)
NEW MULTIFAMILY HOUSING PROJECT CHARACTERISTICS AND ESTIMATED DEVELOPMENT COSTS
IN NEW YORK CITY, OUTSIDE OF MANHATTAN

(WINTER 1967-68 DOLLARS)

	Stuyvisant Mnr. Herkiner & Schentrdy FHA 012-55007	Carter Comm. 112-25 167 St. FHA 012-55043	Tysen Park Mill Rd. & Tysens FHA 012-55047	Fox Hill Osgood & Vanderbilt FHA 012-55001	Hancock - Saratoga HAA 5-67	Mitchell HAA 5-50	Park Hill Park View Ave. FHA 012-55019	Summer-Myrtle HAA 5-68	71-15 Beach Chanel Dr. HAA 5-73	Estimated Possible Error in Data Percent
TOTAL MISCELLANEOUS COST OF PROJECTS										
Per Living Unit	2,600	2,800	3,550	2,050	5,200	5,500	2,500	5,500	4,150	±5
Per Gross Sq. Ft. of Living Unit Area	2.7	3.2	4.5	1.8	5.5	6.5	2.5	5.7	4.8	±12
Per Person	860	1,700	1,900	660	1,450	1,600	970	1,350	1,250	±6
DEVELOPMENT COSTS OF PROJECTS 5/										
Per Living Unit	18,500	18,500	15,500	16,000	21,000	20,500	15,000	22,000	21,000	±5
Per Net Sq. Ft. of Living Unit Area	28	32	21	20	29	30	17	29	31	
Per Gross Sq. Ft. of Living Unit Area	20	21	20	14	24	24	15	23	25	±12
Per Person	6,150	11,000	8,300	5,100	5,750	5,950	5,800	5,400	6,350	±6
TIME CHARACTERISTICS										
Approx. Date a Decision Was Made to Build the Project	10/63	6/61	7/65	3/62	10/61	12/59	6/64	12/61	4/62	-
Date Construction Began	1/65	3/65	5/66	1/64	7/65	8/63	10/65	7/65	10/64	-
Date of First Occupancy	5/66	1/67	5/67	2/65	1/67	10/65	10/66	6/67	4/67	-
Date of Complete Occupancy (90-95%)	5/66	2/67	11/67	6/65	2/67	5/66	3/67	7/67	8/67	-

FOOTNOTES

1/ Efficiency units are defined as 0-bedroom units.

2/ Average number of rooms per unit computed by dividing total rooms by number of living units. Room count assumes 3 rooms for efficiency; 3½ for one-bedroom; 4½ for two-bedrooms, etc.

3/ Net living unit area is the sum of the floor area assigned to the apartment from the innerface of the exterior wall to the center line of the partitions separating it from public circulation or another apartment.

4/ Average gross apartment area per living unit in sq. ft., less other space, is defined as floor area of building, including basement area from outerface of exterior walls less area occupied by professional offices, stores and garages -- divided by number of living units.

5/ Average gross apartment area per living unit in sq. ft. includes assignment of area occupied by professional offices, stores and garages to the living unit.

6/ Assuming: Efficiency 1 person; 1 bedroom; 2 persons; 2 bedrooms 3½ persons; 3 bedrooms 5½ persons; 4 bedrooms 7½ persons; 5 bedrooms 9½ persons; best estimate of New York City Rent & Rehab Administration

7/ Project costs include costs incurred to produce all improvements -- including residential, commercial, professional offices, garages, utilities, landscaping, etc.

8/ Project development costs obtained by adding miscellaneous costs to project construction costs.

TABLE NO.III

AVERAGE NUMBER OF PERSONS HOUSED IN LIVING UNITS OF VARIOUS TYPES

Note: This information was obtained from the New York City Rent and Rehabilitation Administration. It is their estimate of occupancy densities of the user groups who live in Old-Law and New-Law Tenement Buildings in Manhattan, New York City.

Living Unit Type	Average Number of Persons Housed
Efficiency	1
One Bedroom	2
Two Bedrooms	$3\frac{1}{2}$
Three Bedrooms	$5\frac{1}{2}$
Four Bedrooms	$7\frac{1}{2}$
Five Bedrooms	$9\frac{1}{2}$

GRAPHIC DISPLAY OF NEW MULTIFAMILY DEVELOPMENT COSTS

Figures I and II display the development cost of new multifamily projects in New York City in terms of dollars per living unit. Figure I shows the development costs of those projects located in Manhattan and Figure II shows those outside of Manhattan. Single building projects and multi-building projects are separated for easier comparison.

The total cost, the construction cost, the land cost and "other" costs all shown on these figures -- all in terms of cost per living unit.

Figures III and IV display the development cost in terms of dollars per net square foot of living unit area. (Definition of this square foot measurement is given in a footnote in Tables I and II.) Figure III shows the cost of the projects in Manhattan and Figure IV shows the cost of the projects outside of Manhattan. In these figures, the single building and multi-building projects are grouped together-again, for easier comparison.

The development cost of each project is separated into construction cost and miscellaneous cost; miscellaneous cost includes all costs except those of construction.

The parameter, cost per net square foot of living unit area, reflects the relative efficiency with which the building structure is used for housing. A project having large halls, lobbies, garages, etc. will cost more per net square foot of living unit area than one which provides less such space.

FIGURE 1 - MULTIFAMILY PROJECT DEVELOPMENT COSTS IN MANHATTAN, NEW YORK CITY - COST IN DOLLARS PER LIVING UNIT (WINTER 1967 - 68 DOLLARS)

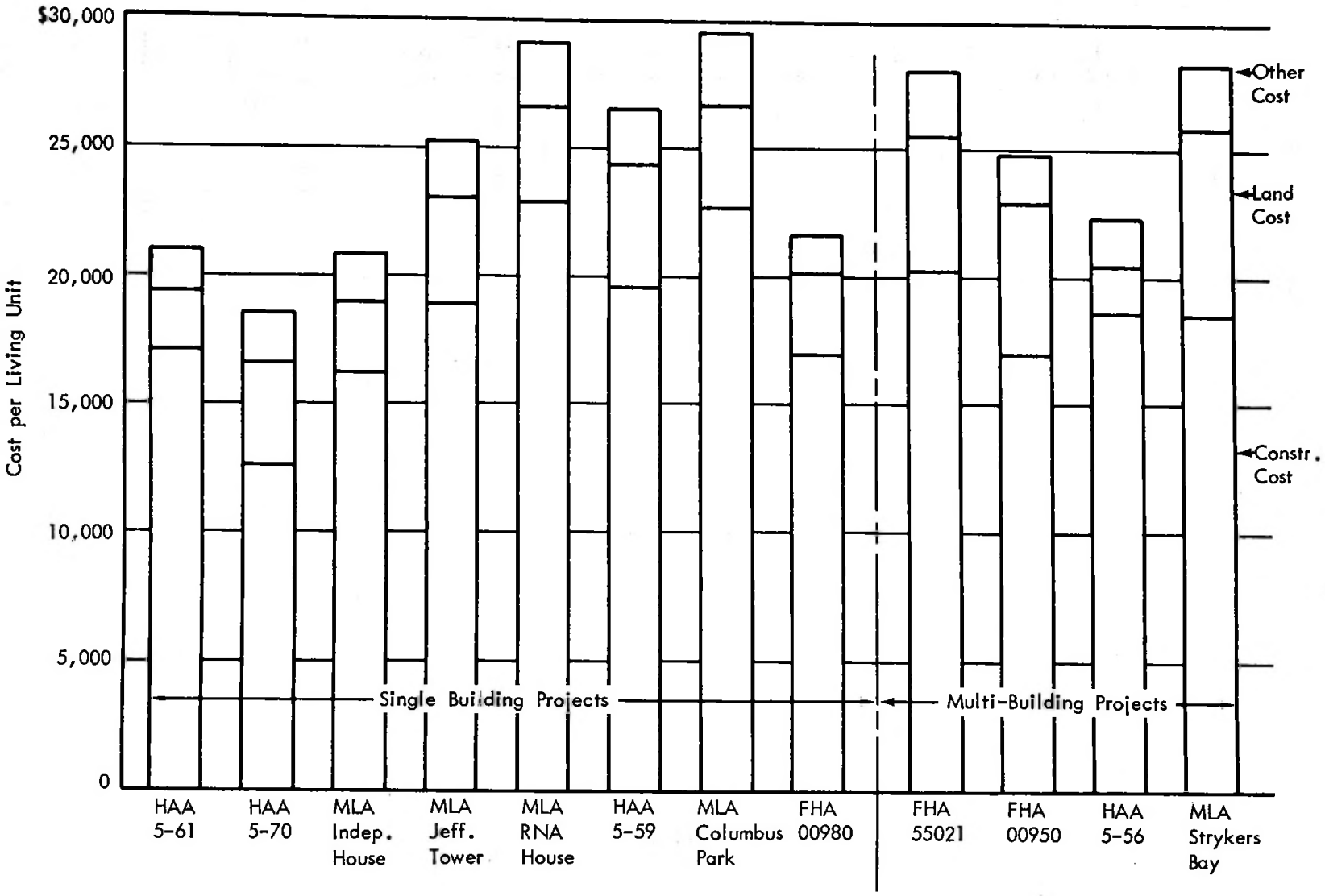


FIGURE II - MULTIFAMILY PROJECT DEVELOPMENT COSTS IN NEW YORK CITY, OUTSIDE OF MANHATTAN - COST IN DOLLARS PER LIVING UNIT (WINTER 1967 - 68 DOLLARS)

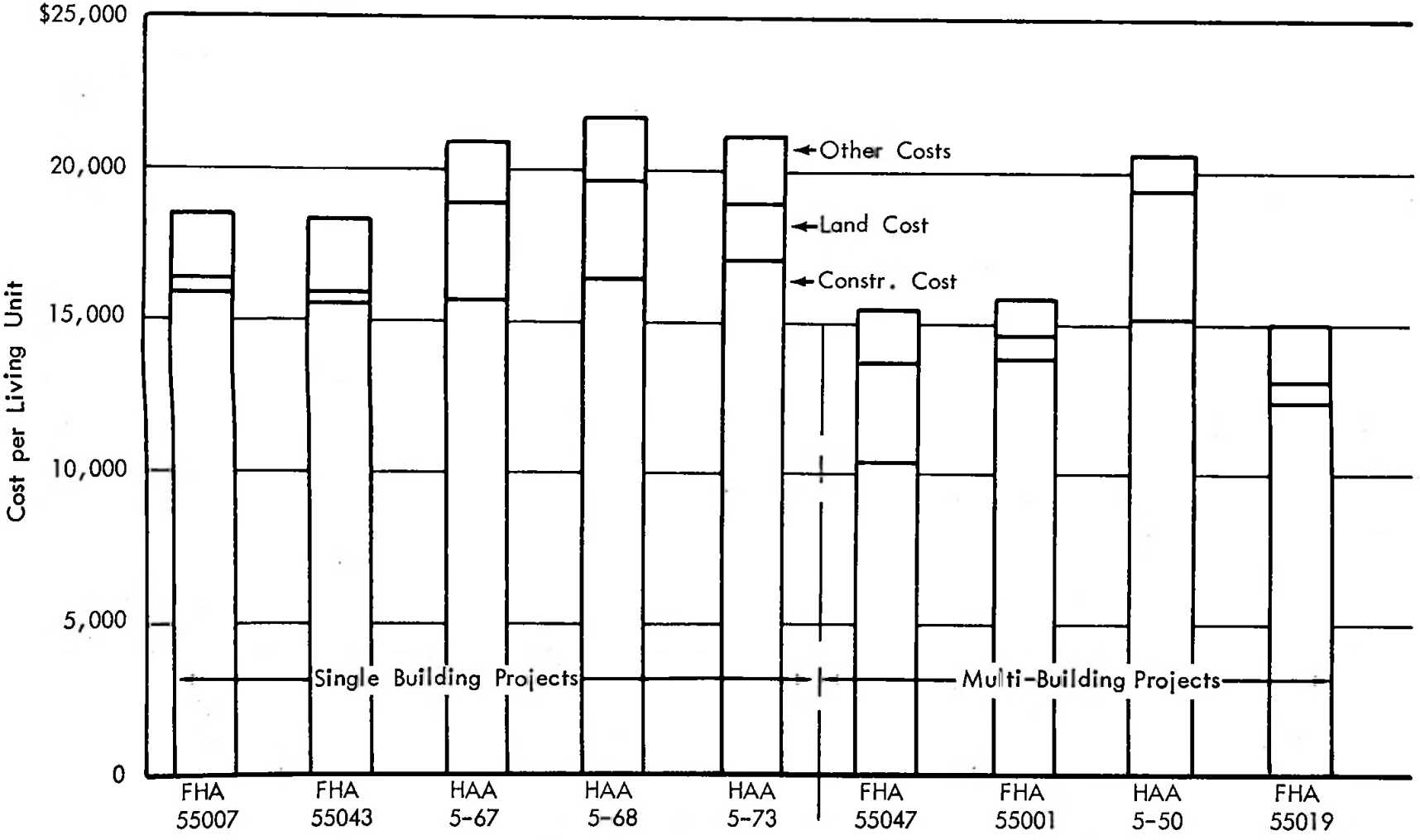


FIGURE III - MULTIFAMILY PROJECT DEVELOPMENT COSTS IN MANHATTAN, NEW YORK CITY IN DOLLARS PER NET SQUARE FOOT OF LIVING UNIT AREA (WINTER 1967 - 68 DOLLARS)

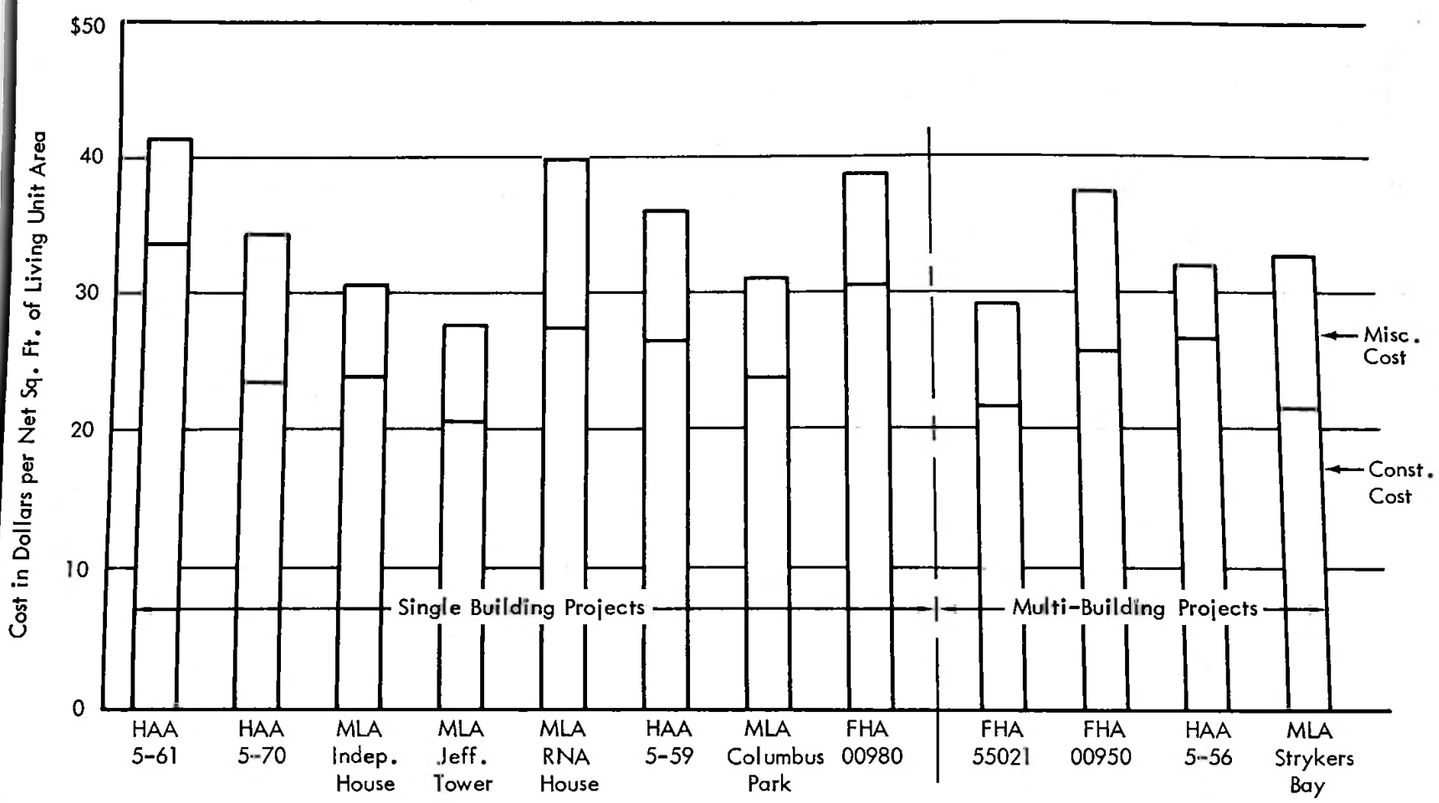
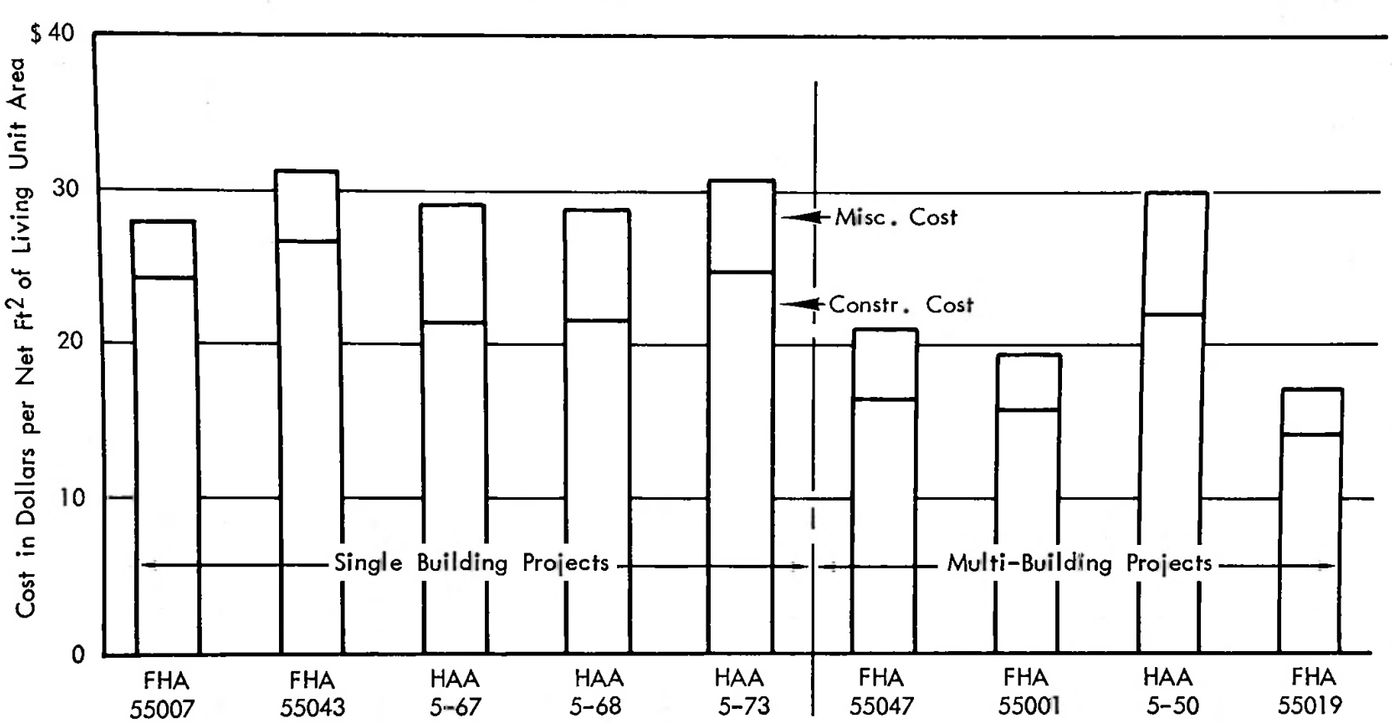


FIGURE IV - MULTIFAMILY PROJECT DEVELOPMENT COSTS IN NEW YORK CITY - OUTSIDE OF MANHATTAN IN DOLLARS PER NET SQUARE FOOT OF LIVING UNIT AREA (WINTER 1967-68 DOLLARS)



The same cost information is shown on Figures V and VI except that it is displayed in terms of dollars per gross square foot of living unit area. The gross square foot area value used here includes the areas devoted to stores, professional spaces, garages and other such spaces.

Another graphic comparison of development costs is presented in Figures VII and VIII. This time the costs are calculated in terms of dollars per person housed. As before, we have taken the average number of persons expected to be housed in living units containing various numbers of bedrooms. For projects having a den large enough to serve also as a bedroom, if desired, the den is considered to be a bedroom for these calculations.

This parameter, cost per person housed, like the parameter of cost per net square foot, reflects in a minor way the efficiency with which the overall building structure is used. But, most important, it reflects the number of bedrooms provided in the living units. Bath and kitchen facilities are more intensively used in units having four or five bedrooms. The cost of these facilities is more or less constant per unit; i.e., not an important function of the size of the living unit.

From these figures it is apparent that construction costs can be referred to in terms of dollars per living unit, dollars per net square foot, dollars per gross square foot, dollars per person housed, etc. No one of the parameters serves all purposes equally well; each is most useful in some particular "frame-of-reference," less so in others. (Ideally, a "Figure-of-Merit" should be available that would, among other things, provide a universal and useful measure of the "livability" or "quality" of housing.

FIGURE V - MULTIFAMILY PROJECT DEVELOPMENT COSTS IN MANHATTAN, NEW YORK CITY - IN DOLLARS PER GROSS SQUARE FOOT OF LIVING UNIT AREA (WINTER 1967-68 DOLLARS)

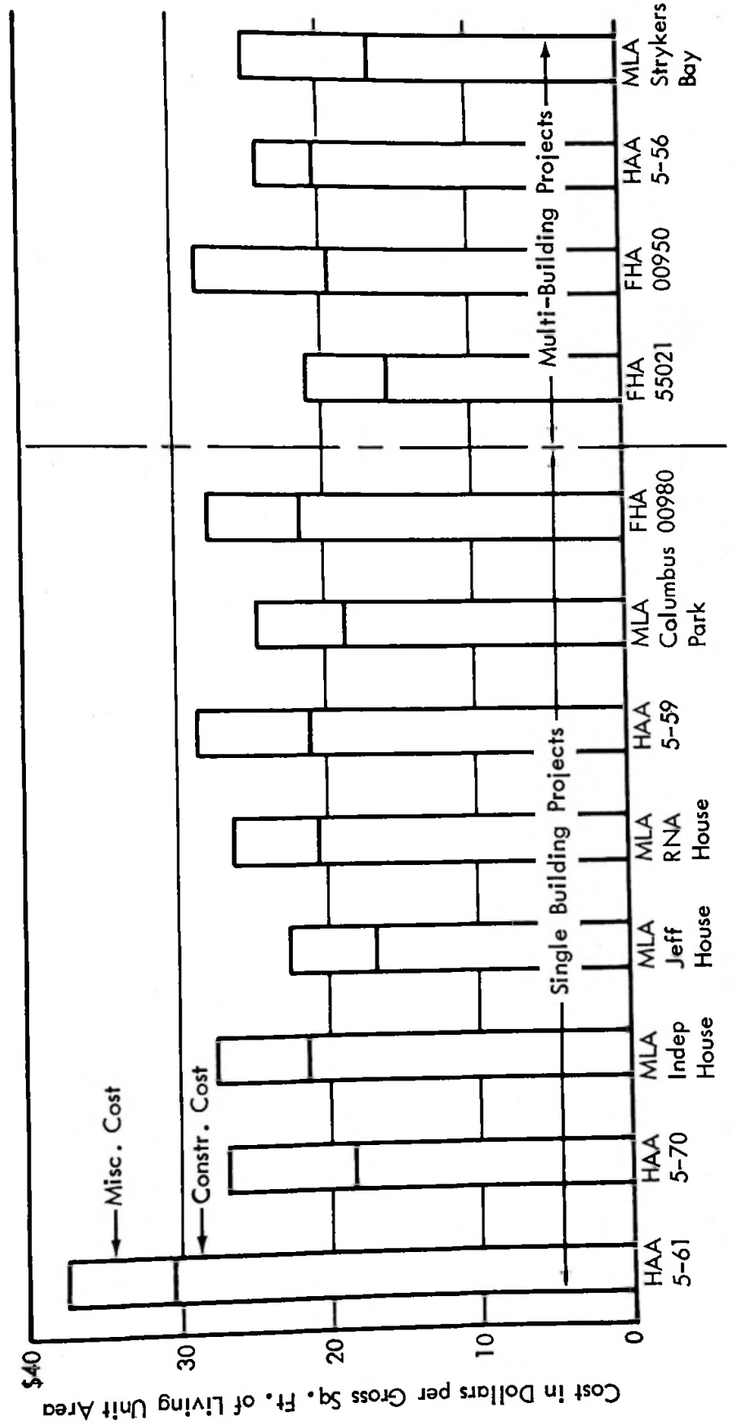


FIGURE VI - MULTIFAMILY PROJECT DEVELOPMENT COSTS IN NEW YORK CITY - OUTSIDE OF MANHATTAN IN DOLLARS PER GROSS SQUARE FOOT OF LIVING UNIT AREA (WINTER 1967-1968 DOLLARS)

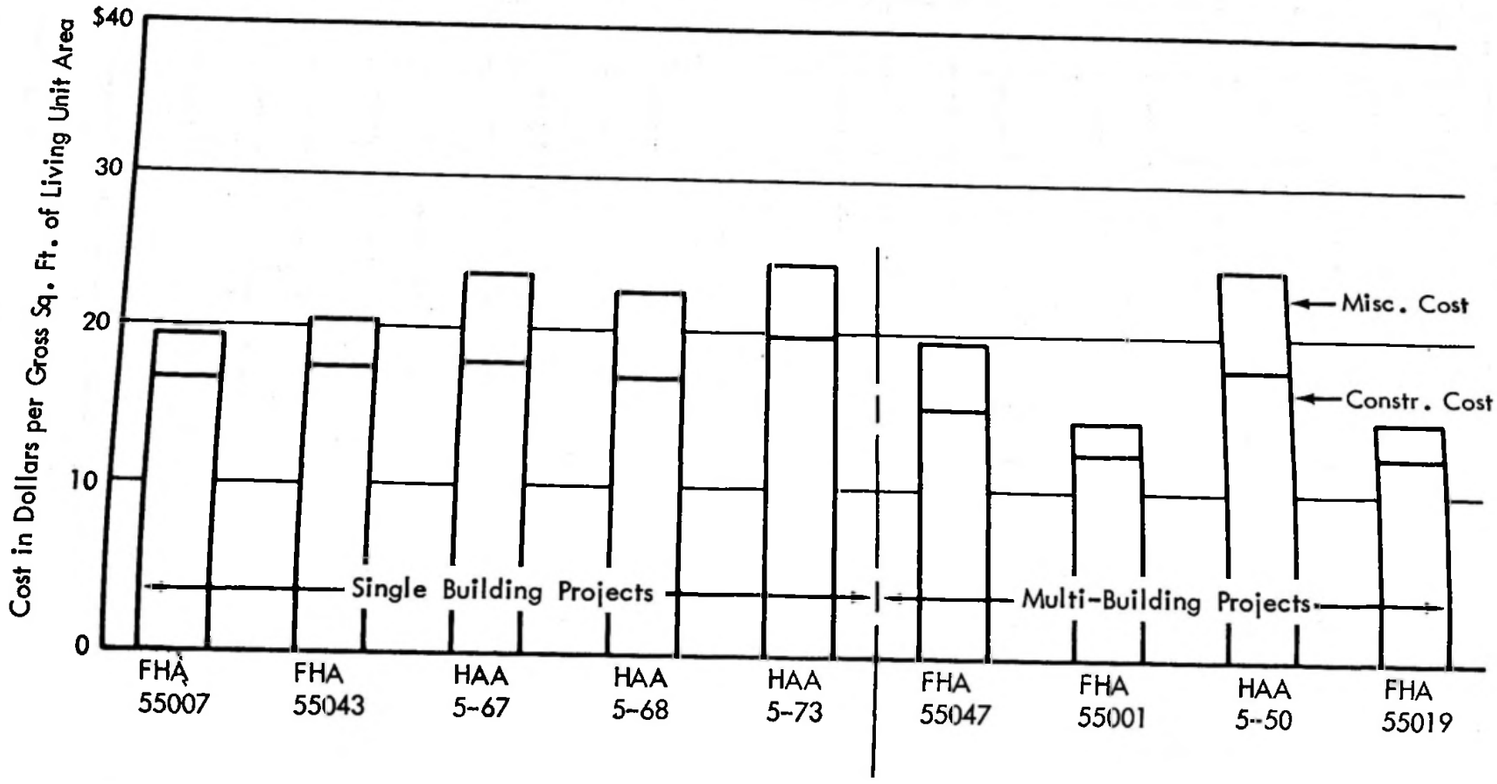
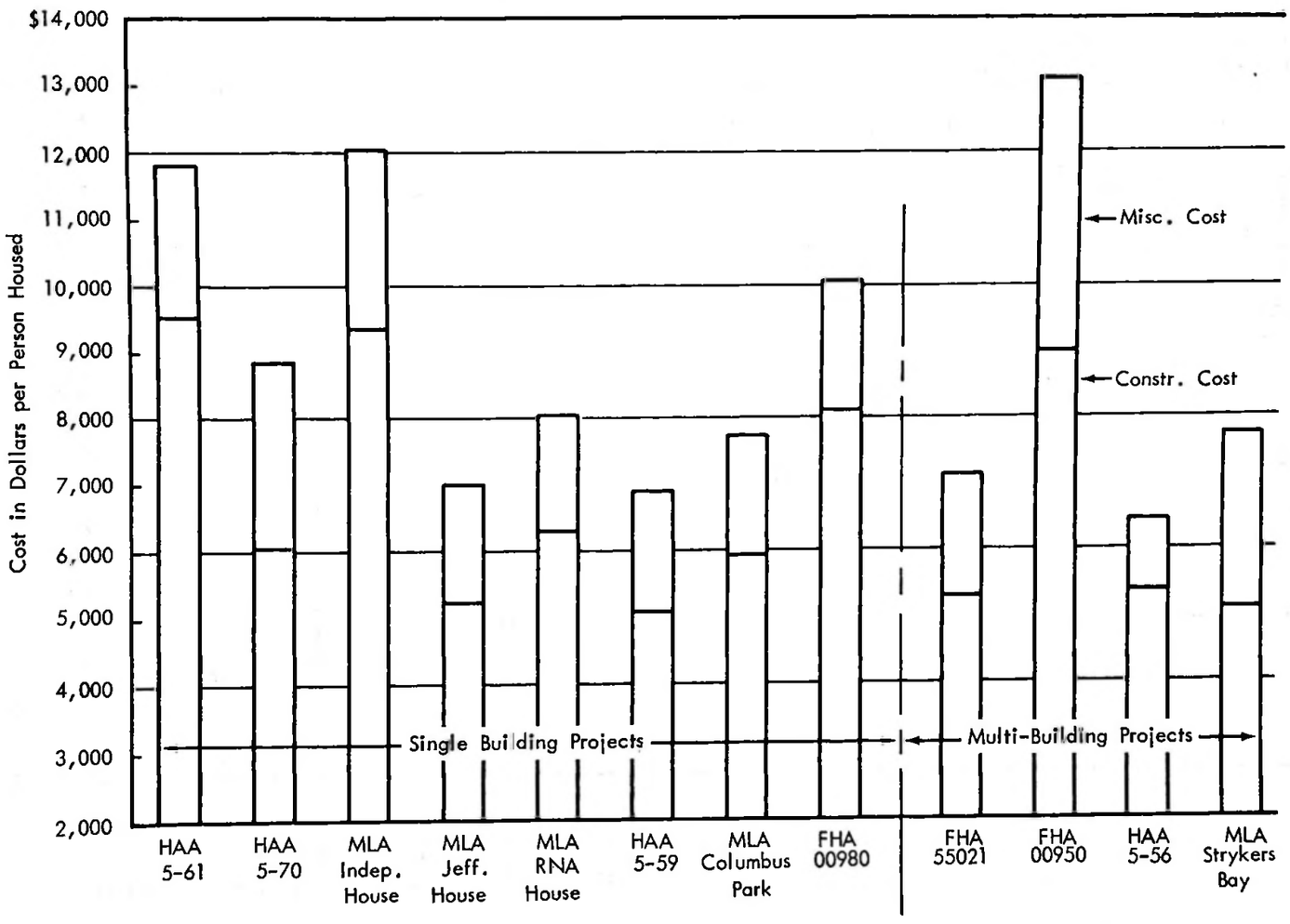


FIGURE VII - MULTIFAMILY PROJECT DEVELOPMENT COSTS IN MANHATTAN, NEW YORK CITY - IN DOLLARS PER PERSON HOUSED (WINTER 1967-68 DOLLARS)



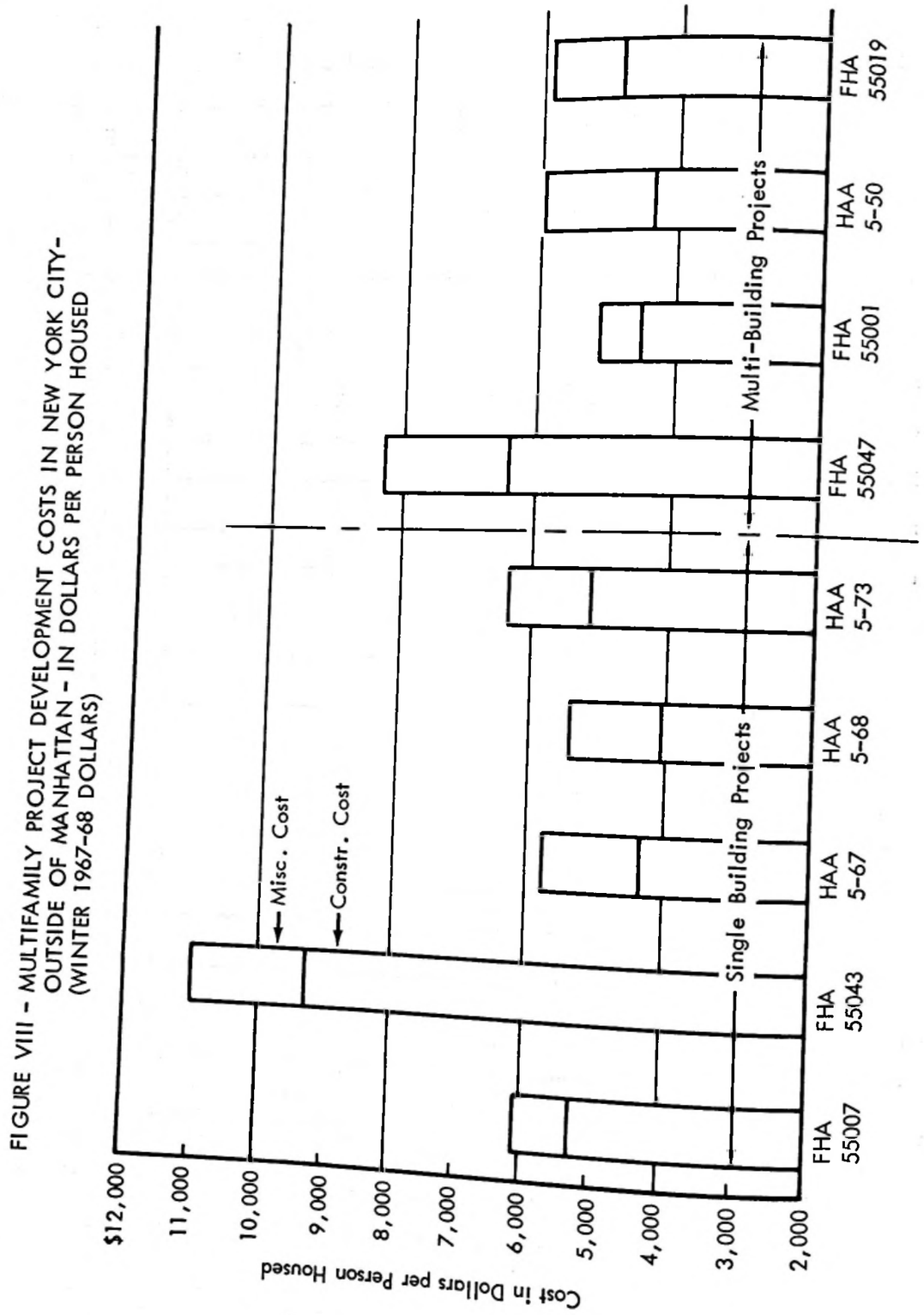


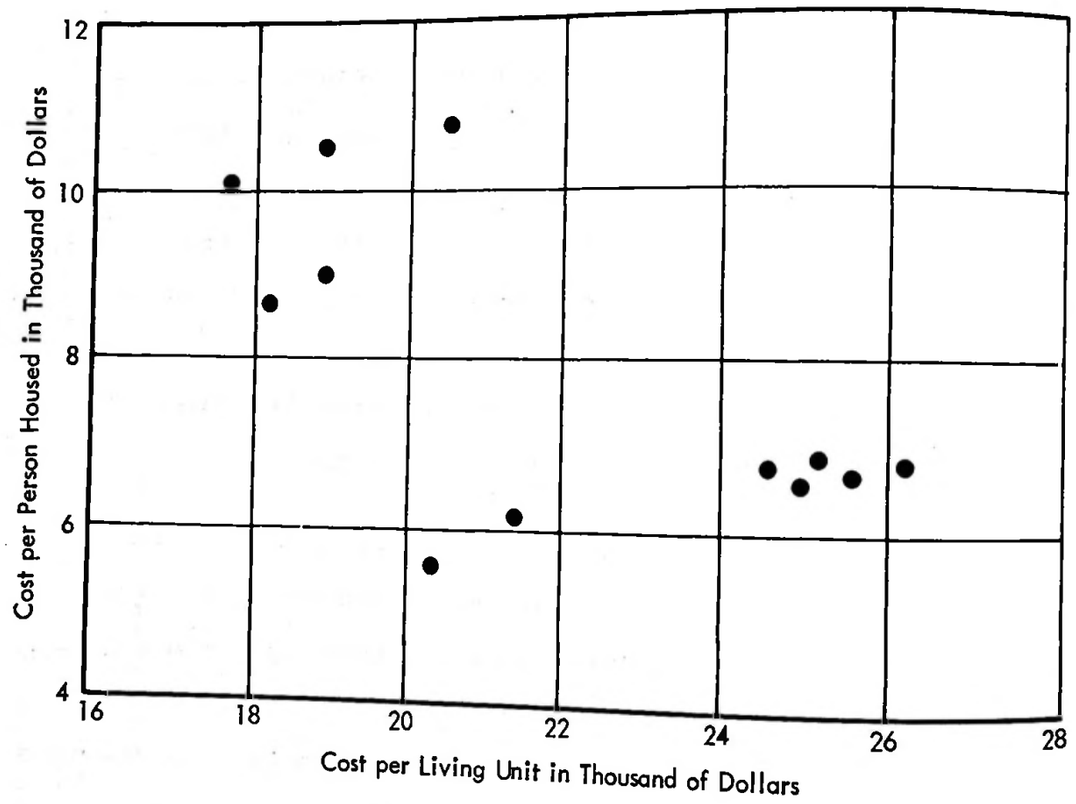
FIGURE VIII - MULTIFAMILY PROJECT DEVELOPMENT COSTS IN NEW YORK CITY-OUTSIDE OF MANHATTAN - IN DOLLARS PER PERSON HOUSED (WINTER 1967-68 DOLLARS)

If such a measure could be developed, it would permit one to compare project costs in terms of dollars per unit of "quality" and would, therefore, be more meaningful.)

We have found the parameter "dollars per person housed" to be particularly useful, since our goal is to house lower-income families decently at the lowest cost. In this regard we note that projects which have a high cost per living unit tend to have a low cost when expressed in terms of cost per person housed. Figure IX illustrates this relationship for the projects in Manhattan. The cost figures used for this figure are taken from Table IV. Notice that, for the 12 projects studied, of the 6 most costly as measured in terms of dollars per living unit, 5 are among the least costly in terms of dollars per person housed. The 6 "lower-cost" developments, as measured in terms of cost per living unit, cost an average of some $19,000 and housed persons at about $9,100 each -- while the 6 developments that cost the "most" cost an average of some $25,000 per living unit but housed people at about $6,700 each. This is a truly marked difference -- some $2,500 per person housed.

One of the most important housing goals is that of housing larger families -- those with large numbers of children and, perhaps, elderly relatives as well. This study suggests that this purpose might well be served by observing that, in fact, oftentimes we can house a larger number of these persons at a lower cost per person by constructing projects containing a large number of relatively large living units, even though the absolute cost of such living units is relatively high. The fundamental concern is to house those most in need, at the earliest time, and at the lowest total cost.

FIGURE IX - RELATIVE "FUNDAMENTAL HOUSING" DEVELOPMENT COST EXPRESSED IN TERMS OF DOLLARS PER LIVING UNIT AND IN TERMS OF DOLLARS PER PERSON HOUSED IN MANHATTAN, NEW YORK CITY
(WINTER 1967-68 DOLLARS)



HOUSING COST AND TOTAL PROJECT COSTS

Essentially all of the projects studied include features that may not be considered strictly essential for lower-cost housing, but that can be thought of as (so-called) "amenities" in a very broad sense of the word. Depending on the project, these items concern the design, construction, materials, equipment, and other things included in the housing project to the extent required by the program and/or the "market"; i.e., the user group for which the project is intended to serve. The estimated costs of these items have been studied for each project.

In an effort to make all projects more comparable for purposes of this analysis, and to arrive at an estimate of fundamental new multifamily housing costs, the project costs have been adjusted by deleting the cost of these items. To do so, the authors have drawn heavily on their own background knowledge and experience and that of others. No doubt other authors would make other selections and adjustments.*

The items for which costs were deleted included special or extensive site work, unusual foundations, unusually shaped exteriors, protruding balconies, extensive storage areas, "luxury" lobbies, roof gardens and promenades, stores, commercial areas, and parking facilities. The cost of providing items more closely related to the individual living units also were removed, such as: carpeting, special wood, and hard tile floors and glazed bricks. Such equipment as dishwashers, air conditioning, central TV antennas and TV security systems were removed as well as the added cost of "deluxe" cabinets, refrigerators and ranges.

*The authors wish to emphasize that, while this type of analysis is necessary to provide an insight into how certain variables affect housing costs in New York City, it does not follow that the authors necessarily advocate constructing projects at these cost levels or providing only fundamental new housing. This may not be, and probably would not be, desirable since it would seriously affect the "livability" of such projects.

Appropriate reductions were made in special architectural "eye appeal" items such as fenestration and special stone facings.

The land acquisition costs and other miscellaneous costs were assigned to "housing cost" or "non-housing cost" in proportion to the relationship between the two. These "other" costs included architectural fees, financing costs, legal and organizational expenses and relocation costs.

The result is an estimate of fundamental housing costs in New York City as shown in Tables IV through VIII. The twelve projects in Manhattan are shown in Tables IV and V, and the nine outside of Manhattan are presented in Tables VI and VII. Figure X shows the results of this analysis in graphical form for the projects in Manhattan.

Based on median figures, one can conclude that for these projects fundamental housing costs make up 97% of the cost of the H.U.D./H.A.A. projects, 85% of the cost of Mitchell-Lama projects and 89% of the H.U.D./F.H.A. projects. The two H.U.D./F.H.A. so-called "luxury" apartments in Manhattan have a fundamental housing cost that averages 86% of the total development cost. The difference between these and the H.U.D. low-rent housing points out that there there is only a 10% difference in cost between fundamental housing and so-called "luxury" housing.

In Manhattan the median fundamental housing development costs are about $21,000 ± $1,000 per living unit, $30 ± $3.5 per net sq. ft. and $6,900 ± ± $400 per person housed.

TABLE IV
FUNDAMENTAL HOUSING COSTS DEDUCED FROM PROJECT DEVELOPMENT COSTS OF NEW MULTIFAMILY BUILDINGS
IN THE BOROUGH OF MANHATTAN, NEW YORK CITY
(WINTER 1967-68 DOLLARS)

NOTE: These costs have been deduced from projects costs in order to provide an insight into the costs encountered in developing new multifamily housing in Manhattan, New York City. Only those costs directly related to housing are shown here. It should be realized that projects are not, nor should they, necessarily, be constructed to provide only "fundamental" housing since this may not be desirable from the viewpoint of project "livability".

	La Guardia Addition Project HAA 5-61	Bethune Project HAA 5-70	Independence House Mitchell-Lama	Tompkins Sq. N. Project FHA 012-55021	Grammercy East Project FHA 012-00980	Oxford East Project FHA 012-00950	Jefferson Towers Mitchell-Lama	RNA Houses Mitchell-Lama	West Side Development Project HAA 5-56	Stryker's Bay Apts. Mitchell-Lama	830 Amsterdam Ave. Project HAA 5-59	Columbus Park Mitchell-Lama	Estimated Possible Error in Data Percent
HOUSING CONSTRUCTION COST													
Per Living Unit	$15,500	$12,500	$14,000	$17,500	$15,000	$14,000	$15,000	$19,500	$18,000	$16,500	$19,000	$19,500	± 5
Per Room	4,650	3,450	3,750	3,700	4,100	4,000	3,350	4,250	4,100	3,850	4,200	4,300	± 6
Per Bedroom	19,500	12,500	22,000	8,650	16,000	15,000	7,550	9,850	9,550	8,450	9,300	9,350	± 6
Per Net Sq. Ft. Apartment Area	30	23	20	19	26	21	17	23	26	19	26	21	± 12
Per Gross Sq. Ft. Apartment Area	27	18	18	14	18	16	14	17	19	15	21	16	± 12
Per Person	8,550	5,850	8,000	4,650	4,200	7,500	4,200	5,250	5,200	4,500	5,000	5,150	± 6
MISCELLANEOUS HOUSING COST													
Per Living Unit	3,550	5,900	3,950	7,250	3,800	6,400	5,150	5,200	3,500	8,700	7,000	5,950	± 5
Per Net Sq. Ft. Apartment Area	7.0	11	5.8	7.7	6.8	9.7	5.6	6.2	5.0	10	9.4	6.2	± 12
Per Gross Sq. Ft. Apartment Area	6.3	8.6	5.2	5.6	4.9	7.4	4.6	4.7	3.8	7.8	7.5	4.9	± 12
Per Person	2,000	2,800	2,250	1,900	1,800	3,350	1,450	1,450	1,000	2,400	1,850	1,550	± 6

TABLE IV (CONTINUED)
FUNDAMENTAL HOUSING COSTS DEDUCED FROM PROJECT DEVELOPMENT COSTS OF NEW MULTIFAMILY BUILDINGS IN THE BOROUGH OF MANHATTAN, NEW YORK CITY
(WINTER 1967-68 DOLLARS)

NOTE: These costs have been deduced from projects costs in order to provide an insight into the costs encountered in developing new multifamily housing in Manhattan, New York City. Only those costs directly related to housing are shown here. It should be realized that projects are not, nor should they, necessarily, be be constructed to provide only "fundamental" housing since this may not be desirable from the viewpoint of project "livability".

	La Guardia Addition Project HAA 5-61	Bethune Project HAA 5-70	Independence House Mitchell-Lama	Tompkins Sq. N. Project FHA 012-55021	Grammercy East Project FHA 012-00980	Oxford East Project FHA 012-00950	Jefferson Towers Mitchell-Lama	RNA Houses Mitchell-Lama	West Side Development Project HAA 5-56	Strykers Bay Apts. Mitchell-Lama	830 Amsterdam Ave. Project HAA 5-59	Columbus Park Mitchell-Lama	Estimated Possible Error in Data Percent
"USING DEVELOPMENT COST													
er Living Unit	$19,000	$18,000	$17,500	$25,000	$19,000	$20,500	$20,500	$24,500	$21,500	$25,000	$26,000	$25,500	± 5
er Net Sq. Ft. Apartment Area	37	34	26	27	34	31	22	29	31	29	35	27	± 12
er Gross Sq. Ft. Apartment Area	34	26	23	19	24	23	18	22	23	22	28	21	± 12
er Person	10,500	8,650	10,000	6,600	9,000	11,000	5,650	6,800	6,200	6,950	6,800	6,700	± 6

TABLE V
"NON-HOUSING" COSTS DEDUCED FROM PROJECT DEVELOPMENT COSTS OF NEW MULTIFAMILY BUILDINGS IN THE BOROUGH OF MANHATTAN, NEW YORK CITY
(WINTER 1967-68 DOLLARS)

NOTE: These costs have been deduced from project costs in order to provide an insight into the costs encountered in developing new multifamily housing in the borough of Manhattan, New York City. Those costs not directly related to housing are shown here. It should be realized that projects are not, nor should they, necessarily, ever be constructed without including some or all of the items these costs represent from the viewpoint of project "livability".

	La Guardia Addition Project HAA 5-61	Bethune Project HAA 5-70	Independence House Mitchell-Lama	Tompkins Sq. N. Project FHA 012-55021	Grammercy East Project FHA 012-00980	Oxford East Project FHA 012-00950	Jefferson Towers Mitchell-Lama	RNA Houses Mitchell-Lama	West Side Development Project HAA 5-56	Strykers Bay Apts. Mitchell-Lama	830 Amsterdam Ave. Project HAA 5-59	Columbus Park Mitchell-Lama	Estimated Possible Error in Data Percent
"NON-HOUSING" CONSTRUCTION COST													
Per Living Unit	$ 1,800	$ 290	$ 2,400	$ 2,200	$ 2,150	$ 2,850	$ 3,700	$ 3,650	$ 705	$ 2,000	$ 240	$ 3,000	±5
Per Net Sq. Ft. Apartment Area	3.5	0.5	3.5	2.3	3.9	4.3	4.0	4.3	1.0	2.3	0.3	3.1	±12
Per Gross Sq. Ft. Apartment Area	3.4	0.4	3.1	2.1	3.4	3.5	3.3	3.3	0.8	1.8	0.3	3.5	±12
Per Person	1,000	140	1,400	580	1,050	1,500	1,050	1,050	200	550	60	785	±6
MISCELLANEOUS "NON-HOUSING" COST													
Per Living Unit	410	140	680	900	490	1,350	1,200	970	140	1,050	110	980	±5
"NON-HOUSING" DEVELOPMENT COST													
Per Living Unit	2,200	430	3,050	3,100	2,650	4,200	4,900	4,600	845	3,050	350	4,000	±5
Per Net Sq. Ft. Apartment Area	4.3	.80	4.5	3.3	4.7	6.4	5.3	5.5	1.2	3.5	.47	4.1	±12
Per Gross Sq. Ft. Apartment Area	3.9	.62	4.0	2.4	3.4	4.8	4.4	4.2	0.92	2.7	.38	3.3	±12
Per Person	1,250	205	1,750	820	1,250	2,250	1,350	1,300	245	840	92.00	1,050	±6

TABLE VI
FUNDAMENTAL HOUSING COSTS DEDUCED FROM PROJECT DEVELOPMENT COSTS OF NEW MULTIFAMILY BUILDINGS IN NEW YORK CITY, OUTSIDE OF MANHATTAN
(WINTER 1967-68 DOLLARS)

NOTE: These costs have been deduced from project costs, in order to provide an insight into the costs encountered in developing new multifamily housing in New York City, outside of Manhattan. Only those costs directly related to housing are shown here. It should be realized that projects are not, nor should they necessarily, ever be constructed to provide pare housing alone, since this may not be desirable from the viewpoint of project "livability".

	Stuyvisant Mnr. Herkiner & Schentrdy FHA 012-55007	Carter Comm. 112-25 167 St. FHA 012-55043	Tysen Park Mill Rd. & Tysens FHA 012-55047	Fox Hill Osgood & Vanderbilt FHA 012-55001	Hancock - Saratoga HAA 5-67	Mitchell HAA 5-50	Park Hill Park View Ave. FHA 012-55019	Summer-Myrtle HAA 5-68	71-15 Beach Chanel Dr. HAA 5-73	Estimated Possible Error in Data Percent
HOUSING CONSTRUCTION COST										
Per Living Unit	$15,500	$13,500	$11,000	$13,500	$15,500	$15,000	$12,500	$16,000	$16,500	± 5
Per Room	3,800	3,950	3,250	3,250	3,400	3,400	3,200	3,450	3,850	± 6
Per Net Sq. Ft. of Living Unit Area	24	23	15	17	21	22	14	21	24	± 12
Per Gross Sq. Ft. of Living Unit Area	17	19	14	15	17	18	12	17	19	± 12
Per Person	5,200	8,000	6,000	4,500	4,200	4,300	4,700	4,000	5,000	± 6
MISCELLANEOUS HOUSING COST										
Per Living Unit	2,500	2,400	3,500	2,000	5,150	5,400	2,500	5,300	4,000	± 5
Per Net Sq. Ft. of Living Unit Area	3.8	4.1	4.7	2.5	7.1	7.9	2.9	7.0	5.8	± 12
Per Gross Sq. Ft. of Living Unit Area	2.6	2.7	4.4	1.8	5.8	6.4	2.5	5.5	4.6	± 12
Per Person	380	1,400	1,900	650	1,400	1,600	970	1,300	1,200	± 6

TABLE VI (CONTINUED)
FUNDAMENTAL HOUSING COSTS DEDUCED FROM PROJECT DEVELOPMENT COSTS OF NEW MULTIFAMILY BUILDINGS IN NEW YORK CITY, OUTSIDE OF MANHATTAN
(WINTER 1967-68 DOLLARS)

NOTE: These costs have been deduced from project costs, in order to provide an insight into the costs encountered in developing new multifamily housing in New York City, outside of Manhattan. Only those costs directly related to housing are shown here. It should be realized that projects are not, nor should they necessarily, ever be constructed to provide pare housing alone, since this may not be desirable from the viewpoint of project "livability".

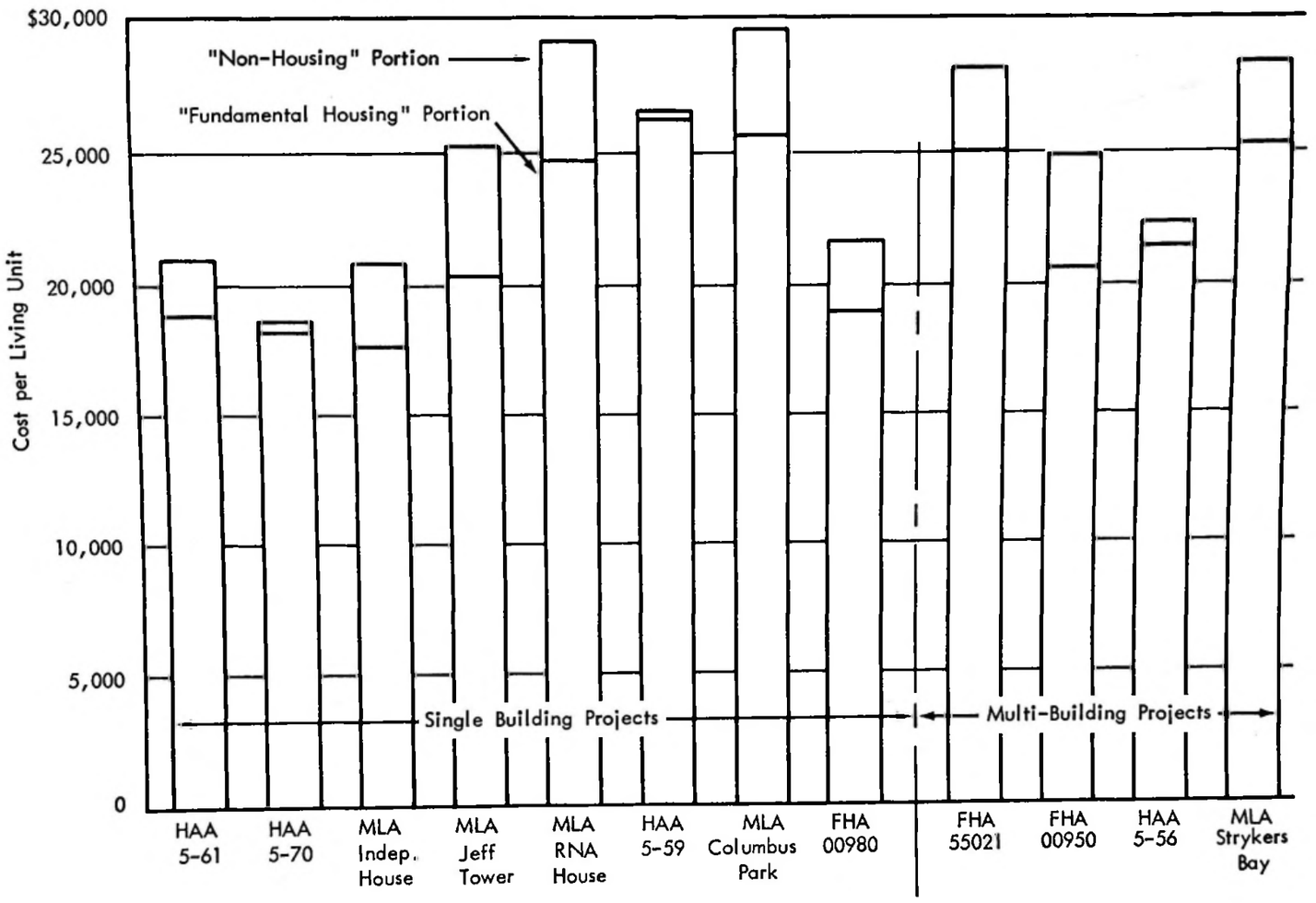
	Stuyvisant Mnr. Herkiner & Schentrdy FHA 012-55007	Carter Comm. 112-25 167 St. FHA 012-55043	Tysen Park Mill Rd. & Tysens FHA 012-55047	Fox Hill Osgood & Vanderbilt FHA 012-55001	Hancock - Saratoga HAA 5-67	Mitchell HAA 5-50	Park Hill Park View Ave. FHA 012-55019	Summer-Myrtle HAA 5-68	71-15 Beach Chanel Dr. HAA 5-73	Estimated Possible Error in Data Percent
HOUSING DEVELOPMENT COST										
Per Living Unit	$18,000	$16,000	$14,500	$15,500	$20,500	$20,500	$15,000	$21,500	$20,500	± 5
Per Net Sq. Ft. of Living Unit Area	27	27	20	19	29	30	17	28	30	± 12
Per Gross Sq. Ft. of Living Unit Area	19	17	19	14	23	24	15	22	24	± 12
Per Person	6,000	9,400	7,900	5,100	5,600	5,900	5,700	5,300	6,200	± 6

TABLE VII
"NON-HOUSING" COSTS DEDUCED FROM PROJECT DEVELOPMENT COSTS OF
NEW MULTIFAMILY BUILDINGS IN NEW YORK CITY, OUTSIDE OF MANHATTAN
(WINTER 1967-68 DOLLARS)

NOTE: These costs have been deduced from project costs in order to provide an insight into the costs encountered in developing new multifamily housing in New York City, outside of Manhattan. Those costs not directly related to housing are shown here. It should be realized that projects are not, nor should they necessarily, ever be constructed without including some or all of the items those costs represent from the viewpoint of project "livability".

	Stuyvisant Mnr. Herkiner & Schentrdy FHA 012-55007	Carter Comm. 112-25 167 St. FHA 012-55043	Tysen Park Mill Rd. & Tysens FHA 012-55047	Fox Hill Osgood & Vanderbilt FHA 012-55001	Hancock - Saratoga HAA 5-67	Mitchell HAA 5-50	Park Hill Park View Ave. FHA 012-55019	Summer-Myrtle HAA 5-68	71-15 Beach Chanel Dr. HAA 5-73	Estimated Possible Error in Data Percent
NON-HOUSING" CONSTRUCTION COST										
Per Living Unit	$310	$2,200	$610	$130	$280	$270	$200	$290	$550	± 5
Per Net Sq. Ft. of Living Unit Area	0.47	3.8	0.82	0.16	0.39	0.39	0.23	0.38	0.80	± 12
Per Gross Sq. Ft. of Living Unit Area	0.33	2.5	0.78	0.12	0.32	0.32	0.20	0.30	0.64	± 12
Per Person	100	1,350	330	42	78	78	78	71	170	± 6
ISCELLANEOUS "NON-HOUSING" COST										
Per Living Unit	50	400	190	30	60	10	40	70	150	± 5
ON-HOUSING" DEVELOPMENT COST										
er Living Unit	360	2,600	800	160	340	370	240	360	700	± 5
er Net Sq. Ft. of Living Unit Area	0.55	4.4	1.1	0.19	0.47	0.54	0.27	0.47	1.0	± 12
er Gross Sq. Ft. of Living Unit Area	0.38	2.9	1.0	0.14	0.39	0.44	0.24	0.37	0.81	± 12
er Person	120	1,550	430	52	93	110	93	89	210	± 6

FIGURE X - "FUNDAMENTAL HOUSING" & "NON-HOUSING" PORTIONS OF MANHATTAN MULTIFAMILY DEVELOPMENT COSTS IN PERCENT OF COST PER LIVING UNIT (WINTER 1967-68 DOLLARS)



COMPARISON OF SINGLE BUILDING AND MULTI-BUILDING PROJECTS

One might imagine that larger projects -- those with more than one building -- would provide some economy of scale and, therefore, single building projects would likely cost a little more to construct. To explore this hypothesis we have examined the construction costs of these projects with this relationship in mind. Data are taken from Tables IV and VI, since they allow a better comparison than is possible using the project development cost information presented in the earlier tables. (Again, it should be noted that these costs do not include the cost of any so-called "amenities.") The median values for four construction cost parameters, with a judgment of the accuracy of the information, is presented in Table VIII for multi-family housing in Manhattan, New York City. Comparison of these median values does not clearly show any economy of scale for multifamily building projects.

TABLE VIII

MEDIAN CONSTRUCTION COST OF NEW MULTIFAMILY BUILDINGS IN MANHATTAN, NEW YORK CITY

Construction Cost	Single Building	Multi-Building
per living unit	$15,000 ± $800	$17,000 ± $900
per net sq. ft.	23 ± 2.7	20 ± 2.4
per gross sq. ft.	18 ± 2.2	15 ± 1.8
per person housed	5,200 ± 310	4,900 ± 300

In order to make a judgment about any difference that might exist, a statistical test, the Mann-Whitney U Test, was applied to all the data for each cost parameter; i.e., per living unit, per net square foot, etc. The results imply that, based upon this data, there is probably no difference between the cost of constructing single building projects and multi-building projects in Manhattan as measured by these parameters.

Table IX presents the same information as before, but this time, for new multifamily buildings constructed outside of Manhattan. Application of the Mann-Whitney U Test to the full range of the data here implies that, for the parameters of dollars per living unit, dollars per net square foot and dollars per gross square foot, there is a difference between the costs of single and multi-buildings. Multi-building projects are less expensive, by about 10 - 25%, calculated from the medians of these three parameters. On the other hand, the parameter of cost per person housed doesn't show a significant difference between the costs of single and multi-building projects.

TABLE IX

MEDIAN CONSTRUCTION COSTS OF NEW MULTIFAMILY BUILDINGS IN NEW YORK CITY, OUTSIDE OF MANHATTAN

Construction Cost	Single Buildings	Multi-Buildings
per living unit	$16,000 ± $800	$14,000 ± $700
per net sq. ft.	23 ± 2.8	16 ± 1.9
per gross sq. ft.	18 ± 2.1	14 ± 1.7
per person housed	5,000 ± 300	4,600 ± 280

One can conclude from this rather conflicting conclusion that single building projects may cost slightly more than multi-building projects but the difference, if any, is not indicated nor confirmed by all parameters and may not be important relative to other variables involved in the projects.

THE INFLUENCE OF LIVING UNIT AREA ON CONSTRUCTION COST

While some construction costs, principally kitchen and bath facilities, heating and water heaters are mainly a function of the number of living units provided in any one project, other construction costs, such as floor, wall and ceiling surfaces are a function of both the number and size of the living units constructed in any one project. It follows, then, that one should expect larger living units to cost relatively less to construct per sq. ft. than smaller living units with comparable "livability" and facilities even though the larger the living unit area, the higher will be the absolute construction cost. Because of the many variables involved in constructing new housing, this relationship in cost inter-comparisons is often overlooked. Like other cost comparisons, sq. ft. construction costs appear to be a less than conclusive parameter upon which to base decisions unless the sizes of the living units are properly considered.

Such relationships are shown on Figure XI where the construction cost in dollars per net sq. ft. of living unit is graphed against the total net sq. ft. of living unit for both single building and multi-building projects in Manhattan. The data used for this figure are presented in Table IV. A best-fit least square linear slope was calculated using these data, and is shown on the graphs for each group of projects.

Note that the square foot cost of construction decreases rapidly with increasing sized units. This rate of reduction in construction cost is important. Note that the cost per net square foot is nearly 40% greater for a living unit of 500 net sq. ft. than it is for a living unit of 900 net sq. ft. The slope of the line indicates that the cost of constructing new multifamily housing is reduced 1.8 dollars per net sq. ft. for each 100 square foot increase in total area of the living unit over the range of 500-1000 net sq. ft., approximately.

One can conclude that square foot costs are an important function of living unit size. A cost system based upon square foot cost data not including an appropriate normalization for living unit size would obviously be inaccurate; - perhaps quite seriously so.

MULTIFAMILY PROJECT DEVELOPMENT COST BY PROGRAM

Information concerning the costs encountered in developing new multifamily housing in New York City was collected for projects using H.U.D./H.A.A., H.U.D./F.H.A. and the New York State Mitchell-Lama Programs.

Figure XII presents one display of the results separated by program. (Of course, other displays using other parameters for comparison may be made, and, as has been pointed out earlier, the selection of a single cost parameter for display and comparison can affect the conclusion markedly.) Data were taken from Tables I, IV and VI. No attempt is made to incorporate adjustments in these cost figures for the size, quality and livability characteristics unique to the housing constucted under each of the three programs. For this reason the authors caution against a conclusion arrived at from Figure XII that housing constructed under the H.U.D./F.H.A. costs

less than housing of comparable quality, livability and size constructed under either the H.U.D./H.A.A. or the Mitchell-Lama Programs; each of the three programs is used generally to produce housing for different user groups.

The results do show that the range of project development costs in Manhattan do not differ greatly between programs. In New York City, outside of Manhattan, the H.U.D./F.H.A. projects are substantially less on a dollar per living unit basis than H.U.D./H.A.A., - about $5,000 less.

TIME CHARACTERISTICS

Figure XIII summarizes the time characteristics presented in Tables I and II. The total time period involved in providing new multifamily housing in New York City has been divided into three sub-periods. These are: (1) Planning and processing time, (2) Construction time, and (3) Occupancy time. The times involved for projects built under the three housing programs are presented on Figure XIII. Maximum, minimum and median times for each characteristic sub-period are shown.

The planning and processing time has been taken as that period, in months, between the time when some early official record, such as an application for mortgage insurance, was established and the (later) time that construction began. Because of the important differences in processing procedures between the three programs, one should interpret the results shown on Figure XIII with caution. With H.U.D./F.H.A. procedures, for example, the initial contact with that insuring office has been taken here as the beginning of the planning and processing period, but a project sponsor could have been deeply involved in planning the project, finding land and making

other arrangements well before discussing the potential project with that office. The beginning of the planning period for the Mitchell-Lama and H.U.D./H.A.A. project, is better established, in general, in this regard since a governmental body is involved near the inception of the project.

Planning and processing time for these new multifamily housing projects in New York City varied between 7 and 45 months. Median planning and processing times for Mitchell-Lama projects are 25 months. Comparatively, H.U.D./H.A.A. projects have required 38 months, and H.U.D./F.H.A. projects have taken 19 months.

With this as background, the authors wish to caution against a conclusion that H.U.D./H.A.A. and Mitchell-Lama projects take a longer period of time for planning and processing than H.U.D./F.H.A. projects. The information collected for this study is not adequate to prove this, although it might be a fact, and perhaps warrants careful additional inquiry.

Time for construction of the projects varied between 12 and 26 months. Here, comparable information is available for the three programs. Little difference was noted between Mitchell-Lama and H.U.D./H.A.A. projects. However, H.U.D./F.H.A. projects took some 7 months less to construct, based on median times; typically, both Mitchell-Lama and H.U.D./H.A.A. projects took about 22 months to build and H.U.D./F.H.A. projects took about 15 months.

Time from initial occupancy to essentially complete occupancy took from less than one month to eight months. Low-rent projects became fully occupied rather quickly, in a matter of weeks. Longer initial occupancy periods were encountered for projects having higher rents, the H.U.D./F.H.A. "luxury" housing.

In gross summary, then, using the median figures for the three programs, one can conclude that the Mitchell-Lama Housing Program involves 4 years for planning, construction and occupancy of a new multifamily housing project in New York City. The comparable time for H.U.D./H.A.A. assisted housing is 5 years and for a H.U.D./F.H.A. project is 3 years.

LAND ACQUISITION COSTS

The cost of land was found to vary greatly. The variation in cost is related principally, to location differences. Figure XIV summarizes the information presented earlier in Tables I and II. Land was found to cost as little as $340 per living unit for a H.U.D./F.H.A. project outside of Manhattan; it ranged upward to $7,300 per living unit for a Mitchel-Lama project in Manhattan. As one would anticipate, projects in Manhattan had a higher land cost, $4,000 per living unit, than projects in other parts of the City, $1,800 per living unit.

Projects constructed under the H.U.D./F.H.A. programs had a median cost of about $1,500 per living unit. For the H.U.D./H.A.A. housing the median land cost was about $3,200 per living unit. Mitchel-Lama projects had a median $4,000 per unit cost, but all of these are located in Manhattan where land costs are much greater.

FIGURE XI - "FUNDAMENTAL HOUSING" CONSTRUCTION COST PER NET SQUARE FOOT AS A FUNCTION OF NET LIVING UNIT AREA FOR PROJECTS IN MANHATTAN, NEW YORK CITY (WINTER 1967-68 DOLLARS)

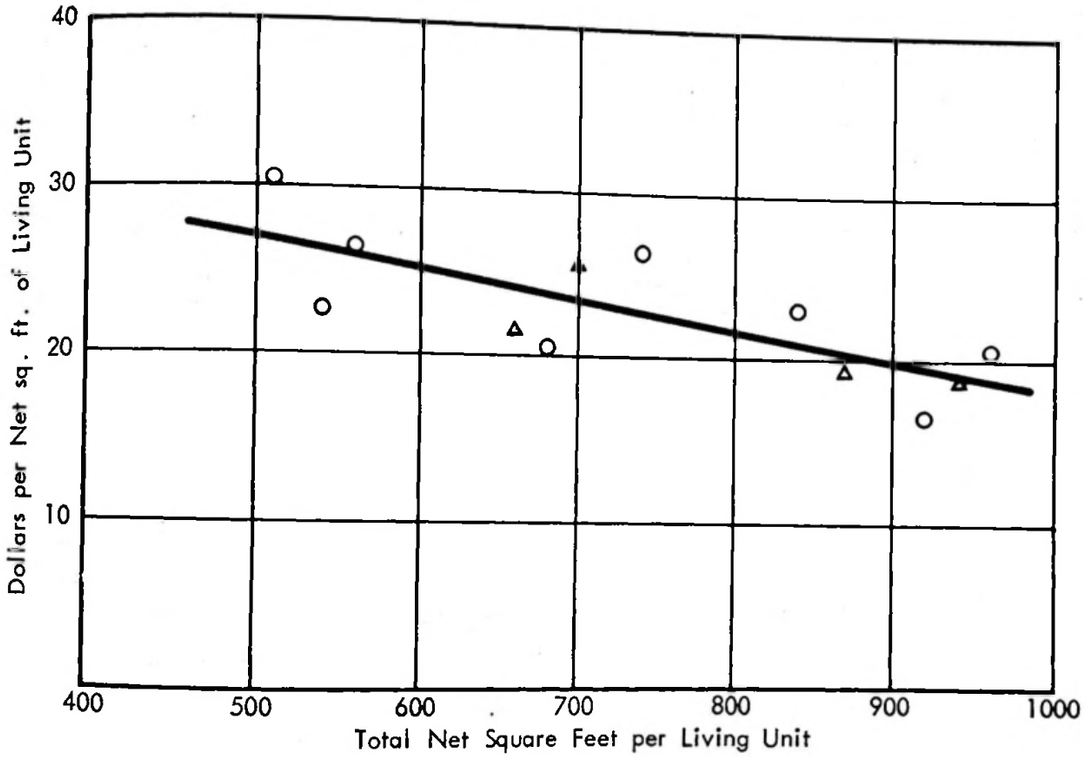


FIGURE XII - MULTIFAMILY PROJECT DEVELOPMENT COST BY PROGRAM IN NEW YORK CITY IN DOLLARS PER LIVING UNIT
(WINTER 1967-68 DOLLARS)

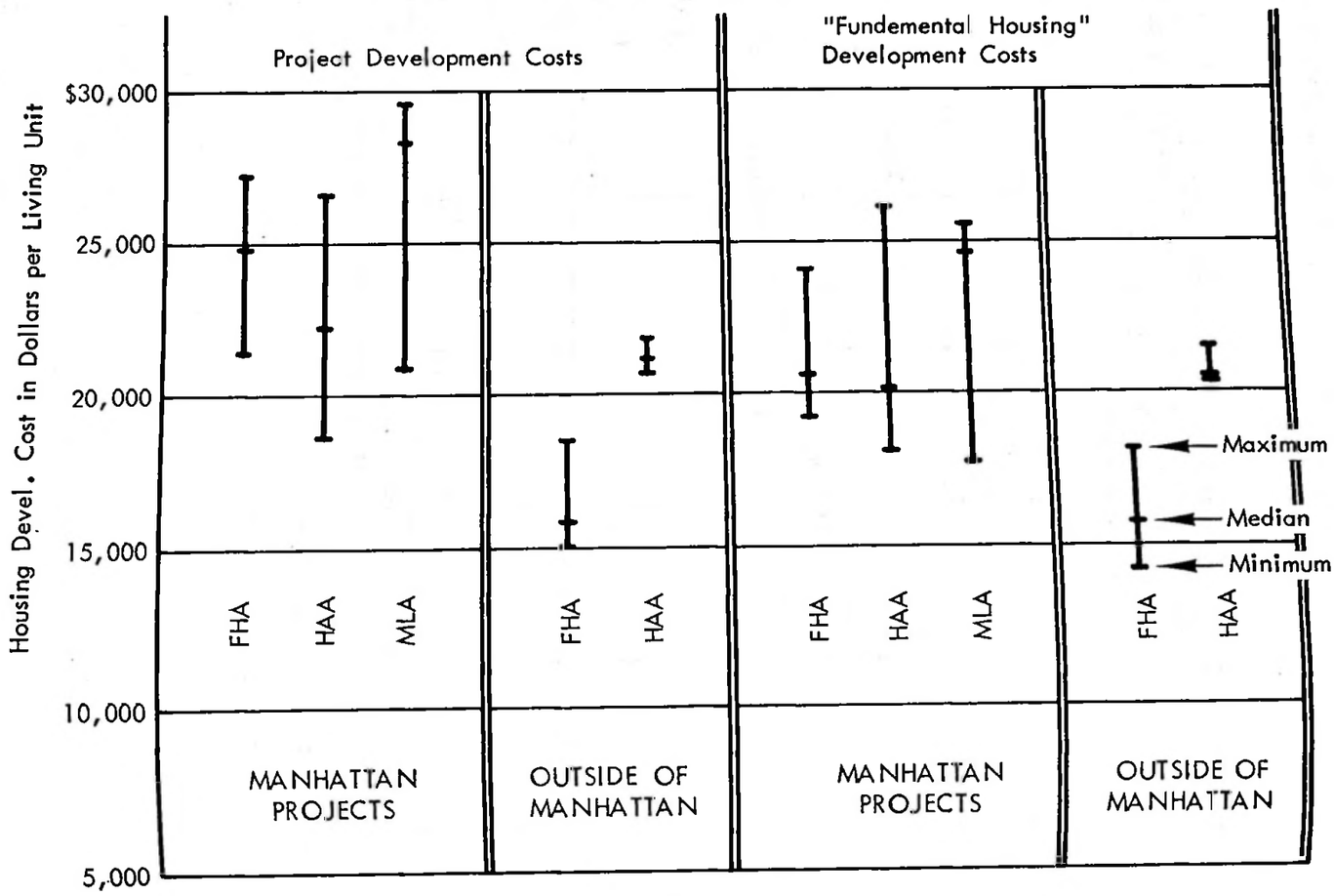
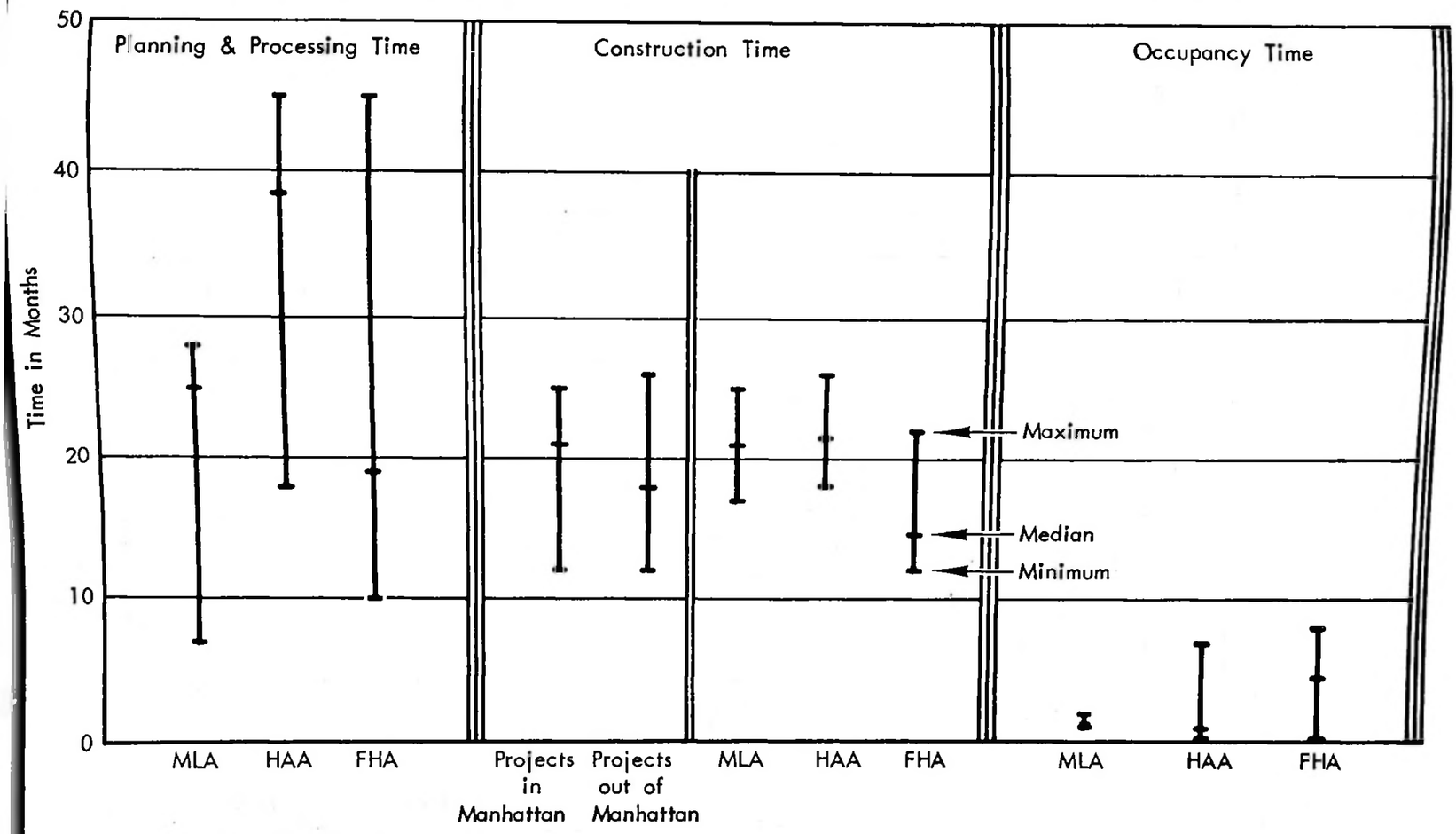


FIGURE XIII - MULTIFAMILY PROJECT DEVELOPMENT AND CONSTRUCTION TIME CHARACTERISTICS



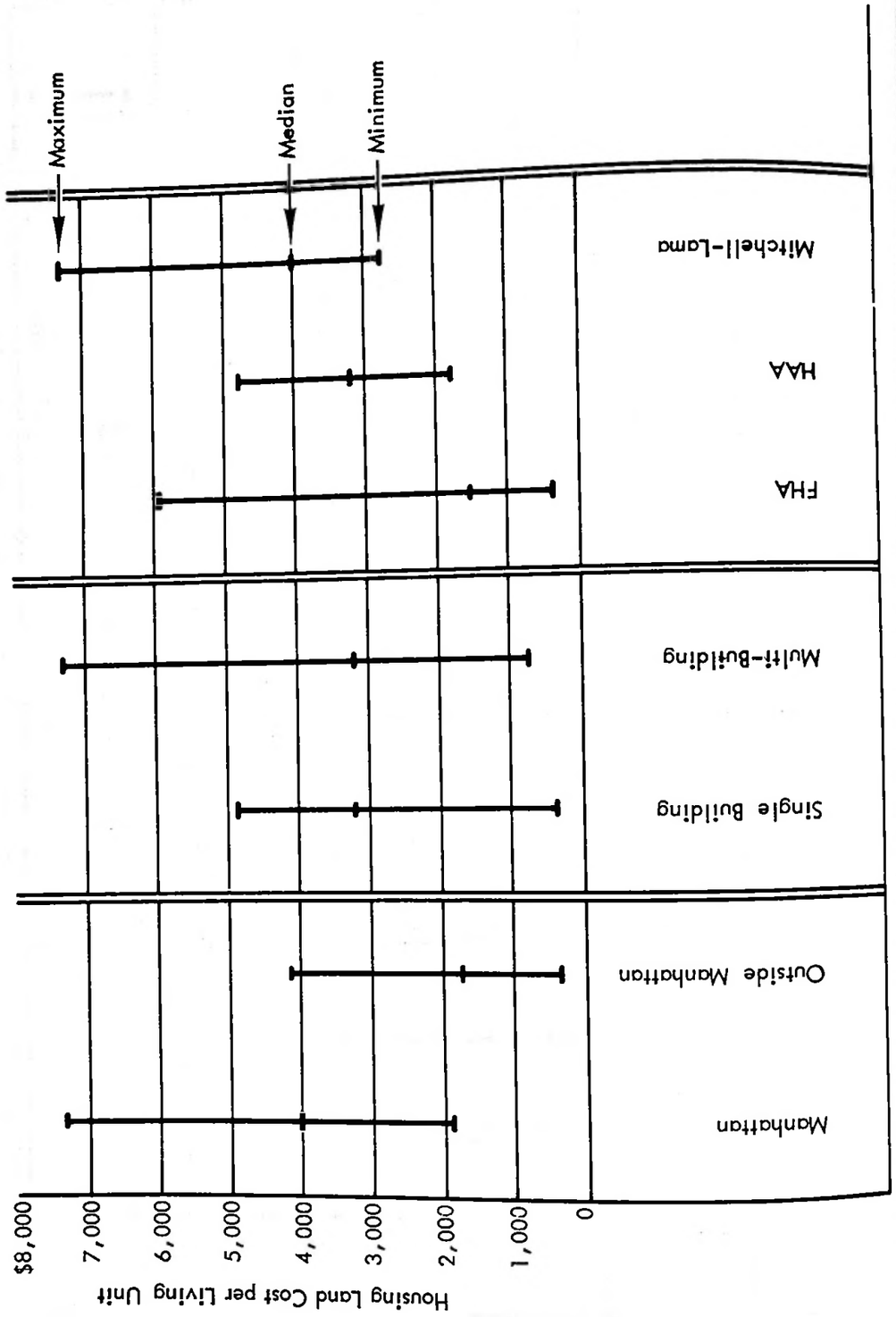


FIGURE XIV - MULTIFAMILY PROJECT LAND COST IN NEW YORK CITY
IN DOLLARS PER LIVING UNIT
(WINTER 1967 - 68 DOLLARS)

THE ESTIMATED EFFECTS OF CERTAIN CONSTRUCTION-RELATED CONSTRAINTS ON CONSTRUCTION COSTS

During preparation of the report it became evident that certain "constraints" were present that affect, importantly, the construction cost of new multi-family housing in New York City. To make an estimate of the additional cost that is related to such constraints; i.e., not using the most economical, technically suitable method and/or materials that are available (and used successfully elsewhere) we studied, briefly, the construction practices in New York City and compared these construction methods and materials with those used in locations where minimal state and local building code and other similiar constraints exist.

It was found that labor productivity in New York City compares well with those encountered in areas where restrictive practices are not important. Specialization within a trade category (such as carpenters who only apply trim in a project) is highly developed in New York, much more so than is typical for the country and, as a result, labor performs work with minimum waste motion and time.

Some restraining characteristics were noted, however. These do have the effect of measurably increasing cost, and involve codes, labor practices, and administrative procedures.

The constraints noted here are limited to those found and identified during this study; probably many others are operable but not observed. Their potential impact in terms of cost savings provide important insight into how the cost of constructing new multifamily buildings could be reduced materially if they were removed.

In an earlier report,* an estimate was made of the potential savings possible in rehabilitation construction by removal of similiar constraints. Those estimates were a great deal larger than the ones presented here for new multifamily housing construction. The difference, in part, may be related to the novel methods in rehabilitation construction employed.[2] The estimates presented for new housing in this report are probably conservative.

While the removal of constraints is not the concern of the authors of this paper (who, admittedly, cannot have the same appreciation of the difficulties attendant thereon as do the City, and other officials) they are mentioned here to allow careful study by all directly concerned with the lowering of housing costs - especially in New York City. Such removal, of course, would allow the housing of more lower-income families per dollar - and probably, therefore, sooner - and also encourage a larger volume of construction.

It is important to note that the potential savings from removal of these constraints would be almost immediate; they would not require the development of new technology, nor would they involve changing general construction methods now employed. Also while claims are often made about how costs can be reduced through industrialization and other techniques, an analysis of these claims is beyond the scope of this report. The constraints considered here are only those that effectively prevent the use of the most economical methods and materials in constructing the housing in the present "conventional" manner.

2. * They may also be biased by the much closer involvement the authors had with the experimental rehabilitation projects studied.

* See footnote (1)

Table X presents the estimated construction costs for a "hypothetical" multi-family building with and without certain constraints associated with the cost of new construction in Manhattan, New York City. The hypothetical building is fireproof (typical of those built in Manhattan) having 17 stories, about 135 living units and a construction cost of $2,200,000.

Study of this table shows that small reductions in each items should be readily obtainable. For finished floors, tile and terrazzo, and plumbing and hot water, the reductions could range up to 25%. We believe these are conservative estimates that do not require any radical or revolutionary change in construction methods or materials. Use of only those techniques, methods and work practices now being used sucessfully in other parts of the country for the same purpose are delineated here.

The items having the most important cost reduction potential on the <u>total</u> construction cost are reinforced concrete and plumbing work. It is foreseen that economies in those areas taken together could reduce total construction costs by about 5%.

Reduction of as much as 11% in the total construction cost, conservatively estimated, appears to be possible. For the example project used here costing $2,200,000, this savings would amount to approximately $240,000.

The same analysis has been made for another "hypothetical" - but typical - multifamily building, constructed within New York City but outside of Manhattan where land costs, zoning and other complex practicalities have the effect of encouraging less dense housing. The "hypothetical" building is

semi-fireproof with wood joints and wood partitions. It is a 6-story elevator type having about 125 units and costing some $1,300,000.

The results of this analysis closely parallel the results shown for the fireproof high-rise building presented above and, therefore, the details are not shown. The conservatively estimated total maximum reduction in cost foreseen by removing constraints is approximately 10%. The only important differences are for plumbing and rough carpentry. For plumbing in the semi-fireproof building a 3.1% reduction in total cost (28% reduction in plumbing cost) could be made, and for rough carpentry a 1.1% reduction in total cost seems possible.

TABLE NO. X

ESTIMATED CONSTRUCTION COSTS FOR "HYPOTHETICAL" BUILDING WITH AND WITHOUT CERTAIN "CONSTRAINTS" ASSOCIATED WITH NEW CONSTRUCTION IN NEW YORK CITY

NOTE: The hypothetical building is taken as one typical of those built in Manhattan, New York City. It uses fireproof construction, has 17 stories and about 135 living units. The total construction cost is about $2,200,000 in Winter 1967-68 dollars.

ITEM	COST PER BUILDING		
	Est. Percent of Total Building Cost the Item Represents	Est. Possible Saving in Percent of Item	Est. Max. Saving in Percent of Total Cost
Excavation This item can be reduced by the use of modern equipment such as large trucks where use presently conflicts with certain traffic restrictions. Also, such modern equipment does not appear to require the standby oilers and stationary engineers that are provided.	5.5%	3 - 12%	0.66%
Foundations and Waterproofing Fabrication and bending of reinforcing steel in a shop rather than at the construction site would reduce the cost of this item through higher productivity as well as permit more refined engineering design. Work rules require this to be done at the site.	2.6	5 - 10	0.26
Masonry Providing incentive work rules that would permit and encourage each mason to work more productively would enable a reduction in cost.	9.8	3 - 10	0.98

TABLE NO. X (CONT'D)

ITEM	COST PER BUILDING: Est. Percent of Total Building Cost the Item Represents	Est. Possible Saving in Percent of Item	Est. Max. Saving in Percent of Total Cost
Reinforced Concrete Shop bending and fabrication of reinforcing steel would reduce construction cost as well as assure a higher quality product. Cement finishers are maintained at the job site from the start of the concrete placing operation: this often involves excessive regular time and considerable overtime that could be eliminated.	24%	3 - 10%	2.40%
Rough Carpentry Use of heavy stationary equipment and precutting of material would make a cost reduction possible.	2	2 - 6	0.12
Finished Floors Substitution of less expensive floor materials, such as asphalt and vinyl asbestos, would result in a cost reduction.	3	25 - 25	1.05
Millwork, Doors, Windows and Frames Use of pre-hung doors and factory installed hardware would reduce costs. Wider use of power equipment could increase productivity. The requirement to use special higher cost locally produced fire doors of certain types could be eliminated.	5.3	2 - 8	0.42
Miscellaneous Iron and Steel Increased off-site shop fabrication such as cutting, welding, painting, etc. would effect economy.	2.0	1 - 6	0.12

TABLE NO. X (CONT'D)

ITEM	COST PER BUILDING: Est. Percent of Total Building Cost the Item Represents	Est. Possible Saving in Percent of Item	Est. Max. Saving in Percent of Total Cost
Lath, Plaster and/or Dry Wall Increased use of lower cost dry wall products is coming into general use. Presently, 5/8 inch thick board is required; it could be reduced to 1/2 inch in most instances without sacrificing quality.	9.2%	2 - 7%	0.64%
Insulation, Roofing and Sheet Metal Work Shop fabrication of sheet metal forms together with wider acceptance of substitute - but technically suitable - materials would contribute a saving. Plastic flashing materials and preformed insulation could also be used at lower cost.	1.1	2 - 5	0.06
Painting Use of spray and roller application of paint would decrease costs, as would prefinished elements such as doors.	1.7	2 - 7	0.12
Tile and Terrazzo Technically suitable new materials are available that are substantially less costly and which could be installed with less labor.	1.3	25 - 35	0.46
Equipment (i.e., refrigerators, ranges, etc.) Presently, skilled labor is used to perform unskilled tasks connected with installation of this equipment such as moving the equipment.	1.7	0 - 10	0.17

TABLE NO. X (CONT'D)

ITEM	COST PER BUILDING: Est. Percent of Total Building Cost the Item Represents	Est. Possible Saving in Percent of Item	Est. Max. Saving in Percent of Total Cost
Cabinets (Kitchen and Bath) Economies would be possible by avoiding the use of skilled labor to perform unskilled tasks connected with installation of cabinet-	1.6%	0 - 10%	0.16%
Plumbing and Hot Water Savings are possible in this item if the most modern technically suitable designs, methods, and materials, proven suitable in other parts of the country, were used in New York City.	9	10 - 25	2.30
Heating Use of prefabricated assemblages could provide savings if rules permitted it.	6.8	3 - 6	0.41
Electrical Modification of codes to permit use of non-metallic wiring systems and smaller wire sizes would provide savings. Use of outlet boxes and wiring devices equipped with friction cable connections also would contribute to savings.	8.5	3 - 8	0.68
Elevators Some modifications of the detailed requirements for elevators, such as automatic controls, seem justified and could provide economies. Also, prefabrication of elevator components should be considered.	3.5	2 - 5	0.18

TABLE NO. X (CONT'D)

ITEM	COST PER BUILDING: Est. Percent of Total Building Cost the Item Represents	Est. Possible Saving in Percent of Item	Est. Max. Saving in Percent of Total Cost
Miscellaneous Included here are many small items such as finish hardware, administrative costs, permit fees and other items. It is believed that economies are possible here, especially if the administrative burden on contractors were simplified.	5%	2 - 4%	0.02%
TOTALS	100%		11.2%

CONCLUSIONS

The conclusions arrived at in this study are:

1. New construction costs can be compared in terms of dollars per living unit, dollars per net square foot, dollars per gross square foot, or dollars per person housed. Each parameter is most meaningful in some "frame-of-reference," less so in others. None of these paramenters serves all purposes.

2. A "Figure-of-Merit" needs to be devised that would provide a useful measure of the "livability" or "quality" of housing. If such a measure could be developed, it would permit objective comparisons between project costs in terms of dollars per unit of quality and would, therefore, be more meaningful.

3. New lower-income multifamily housing development costs in New York City range from $15,000 to $30,000 (±5%) per living unit, $17 to $41 (± 12%) per net square foot $14 to $38 (±12%) per gross sq. ft. and $5,100 to $13,000 (±6%) per person housed - all in Winter 1967-68 dollars. New York City projects cost much more in Manhattan where the median values are $25,000 (±5%) per living unit, $34 (±12%) per net square foot and $7,900 (± 6%) per person housed, than they do outside of Manhattan where the median costs are $19,000 (± 5%) per living unit, $29 (±12%) per net square foot and $6,000 (±6%) per person housed. Projects in Manhattan cost more mainly because the land costs are higher there - about $2,000 per living unit higher - and all projects are of high-rise, "fireproof" construction which costs more than low-rise semi-fireproof construction.

4. After removing the cost of all elements of new multifamily projects that are considered not physically essential for minimum housing, it is found that, in Manhattan, the median development cost was about $21,000 (±5%) per living unit, $30 (±12%) per net square foot and $6,900 (±6%) per person housed. Elements not essential to such minimum physical housing increased the cost from 2 to 19% in Manhattan. (The authors wish to emphasize that they do not necessarily advocate constructing new housing at these bare minimum quality levels; they are presented here for cost comparison purposes only).

5. According to records of H.U.D. and New York City, it takes about 4 years for planning, processing, constructing and full occupancy of Mitchell-Lama housing project; the comparable period for H.U.D./H.A.A. assisted projects is about 5 years; and for H.U.D./F.H.A. assisted projects it is about 3 years.

6. Caution must be used in comparing the cost and time of projects built under different programs because each project or program has some unique characteristic usually related to the different user groups that they are intended to serve. For example, one cannot properly conclude from the cost figures that housing can be built at less expense under H.U.D./F.H.A. than H.U.D./H.A.A., nor that the Mitchell-Lama Housing costs more to build than either H.U.D./F.H.A. or H.U.D./H.A.A. There are reasons for these differences in terms of "quality," and "livability," and an adequate way to measure these factors objectively and quantitatively is not at hand. But, the observed differences in time and cost are curious, and suggest that a careful study of these differences could yield important additional conclusions.

7. The construction cost makes up some 60 to 80 percent of the total development cost, depending upon the location, program and circumstances.

8. Our analysis of these projects does not convincingly show any major "economy of scale"; i.e., single building projects do not cost more to construct. Specifically, the results imply that for the Manhattan projects there is probably no difference between the cost of constructing single building projects and multi-building projects; yet, for projects outside of Manhattan several of the parameters used for comparison imply a difference. The magnitude of the difference suggests that multi-building projects may be cheaper than single building projects by at least 10 percent outside of Manhattan.

9. Square foot construction costs, like living unit and persons housed cost, are an important function of living unit size. A cost comparison system that does not incorporate this relationship can prove to be misleading.

10. Land acquisition costs vary greatly, from about $340 to $7,300 per living unit. The cost is principally a function of location. The land cost of New York City projects is about $2,300 per living unit greater within Manhattan than outside of it. This difference in the cost of land accounts for approximately 40% of the increased living unit costs experienced in Manhattan as compared to similar projects located outside of Manhattan.

11. The parameter "dollars per person housed" was found to be a particularly useful one since it measures better than others the cost of providing housing for people; i.e., our ultimate goal. Most projects which are among the most expensive in terms of cost per living unit tend to be among the least expensive in terms of dollars per person housed.

12. If the most economical, technically suitable methods and materials now available were used, it is estimated that potential cost savings in the construction of multifamily housing in Manhattan could amount to at least 10 percent.

13. If a uniform system of recording, transmitting and presenting cost information was available at least within H.U.D., future needs for the type of information could be met with greater ease and accuracy.

APPENDIX

PROJECT DESCRIPTIONS

The projects selected for inclusion in this study are the most recent ones completed in New York City or ones where construction was well underway in the Fall of 1967. Twenty-one projects were studied; twelve of these are located in Manhattan. Eight H.U.D./H.A.A. projects are included as are eight H.U.D./F.H.A. projects and five New York State Mitchell-Lama projects. All of the Mitchell-Lama projects are in Manhattan.

Descriptions of the Manhattan projects are presented first. The others, located outside of Manhattan, but within the City, follow.

1. PROJECTS WITHIN MANHATTAN

La Guardia Houses Addition (NY 5-61)
Cherry Street, Manhattan, New York

This H.U.D./H.A.A. project, developed exclusively for lower-income elderly families, consists of 150 units. Thirty-one efficiency units are provided and rent for $43 to $50 per month. The 119 one-bedroom units rent for $58 to $66 per month. Larger units are not provided.

The project, located adjacent to the La Guardia Houses project which houses lower-income families, is in a once heavily populated and rapidly deteriorating area which has been redeveloped with several public and private large scale housing projects.

This project, like all other New York City Housing Authority projects, is construction using a reinforced concrete frame with flat plate

construction, 2 inch plastic partitions, cavity walls, brick facing, and block backup.

Community and recreational facilities are available, and there is on-site parking for 36 cars.

Mary McLeod Bethune Houses (NY 5-70)
1943-1947 Amsterdam Avenue
Manhattan, New York

This H.U.D./H.A.A. project consists of 210 units. The efficiency and one-bedroom units are occupied by elderly with a rent range of $44 to $50 per month for the 42 efficiency units and $56 to $66 per month for the 126 one-bedroom units. Forty-two two-bedroom units are also provided that rent for $70 to $76 per month.

The project is designed primarily for the elderly. It is well surrounded by community and recreational facilities, including a library and the Washington Heights Health Center. The project contains space for meetings and indoor recreation, and neighborhood parks are approximately three blocks away. There is on-site parking for 33 cars.

Independence House
Manhattan, New York

This project is a rental housing project built under the New York City Mitchell-Lama program. It is located on Amsterdam Avenue on the southeast corner of 94th Street in the West Side Urban Renewal Area in New York City.

This project consists of one 12-story apartment structure with 1,790 sq. ft. of store area and 705 sq. ft. of professional apartments on street level and two level garages (basement and street level) for 34 cars. The project was designed primarily for the elderly. The heating design temperature for such units was based on 80° in lieu of the normal 70°. The project also has community rooms with kitchen facilities and outdoor and indoor recreational areas. The income range of proposed tenants is from $3,500 to $12,000 per year. Units vary in size of the following anticipated rents:

33 - Efficiency bedroom renting from $80 to $91

87 - One bedroom renting from $118 to $136.

The basic construction of the structure is reinforced concrete and non-combustible elements with plaster and paint finish. Exterior walls are brick and block.

Tompkins Square

This is a H.U.D./F.H.A. insured project located in the Tompkins Square Urban Renewal Area. The project is unique in design and site development as it is spread over a "super city block," and includes four different apartment structures, one 26-story, one 15-story, one 10-story, one 2-story, plus a two level sub-surface parking garage with extensive planting, walks, and sitting area improvements developed on its roof to form a park-like atmosphere in the midst of the various structures.

This project is considered to be located in a low income area. Existing structures are predominately older multi-story residential with local retail uses. This project was designed for persons whose incomes range from $5,000 to $10,000 per year. Proposed rentals for the various size units as follows:

22 - 0 BR studio units in the 2-story structure at $90

78 - 1 BR units from $106 to $111

130 - 2 BR units at $131

141 - 3 BR units at $151

In addition to the above are 187 car spaces, 16,000 sq. ft. of stores and 3,948 sq. ft. professional unit space.

Items included in the project over and above minimum physical housing needs include: air conditioning sleeves and outlets, door buzzers, and lobby-apartment intercoms, ceramic tile in tub recesses on bathroom fixture walls.

The basic construction of the project is reinforced concrete. Partitions are all noncombustable with dry wall and paint finish. Foundations are pile caps and grade beams resting on friction piles. Exterior walls are brick and block.

Gramercy East
22nd Street and 2nd Avenue
Manhattan, New York

This is a H.U.D./F.H.A. insured project located on 22nd Street among other multi-story residential and local retail type structures. It consists of one 16-story fireproof elevator structure of reinforced concrete construction.

The project was designed for tenants with incomes of $10,000 - $12,000 plus, which is customary in the local neighborhood. It contains many features expected by this middle to higher income group; i.e., central air conditioning, master TV antenna system, telecom security system, hampers and dryers in bathrooms, quarry tile terraces, dishwashers in one-bedroom and larger units, wall ovens and counter top ranges throughout, carpeted halls, and other items of quality and quantity above that which is typical of projects designated for lower-income families.

Projected rents from $135 for efficiency living units to $325 per month for the largest three-bedroom unit. Basement parking for 41 cars renting at $40 per space, 1 professional apartment at $200 and four stories encompassing 7,123 sq. ft. also are included.

Construction is fireproof reinforced conrete structure with noncombustible partition framing with plaster and paint finish. Exterior walls are brick and block. Foundations rest on bedrock.

Oxford East
50th Street and 1st Avenue
Manhattan, New York

This H.U.D./F.H.A. insured project is located on the east side of Manhattan close to the United Nations complex, located among luxury residential high-rise structures. The project was designed for higher income professional & business tenants with small or no families, whose incomes exceed $15,000 per year. It is provided with features expected by a higher income group; i.e., central air conditioning, dishwashers, wall ovens & counter top ranges, prefinished wood block flooring, vanities with large mirrors, master T V antenna system, extra ½ baths in two-bedroom units, extra full bath in 3 bedroom units, quarry tile terraces, roof gardens, "luxury" lobby with doorman service, telecom security system, carpeted public halls and many other items of quality and quantity above that which is typical in projects developed for lower-income families.

The project consists of 2 tower type, fireproof, reinforced concrete structures projecting from a common basement which contains parking facilities for 28 cars. Foundations rest on bedrock and exterior walls are cavity wall-type construction, comprising of glazed brick and block. One common lobby is provided interconnected by a glass enclosed promenade connecting the 2 towers at the entrance level.

Rents are estimated to range from $150 for an efficiency apartment to $400 for the largest apartment containing 2 bedrooms plus a den . In addition to apartment rentals, other income is from parking spaces in the basement garage renting for $50 per space, plus 2 professional units (approx. 2,000 sq. ft.) with a combined rental of $650.

Jefferson Towers
West Side Urban Renewal Areas

Jefferson Towers is a cooperative housing project built under the New York Mitchell-Lama program. It is located on the west side of 49th Street in the West Side Urban Renewal Area of New York City.

This project consists of one 20-story elevator apartment structure with 12,300 sq. ft. of store area at street level and a basement garage for 82 cars. Income levels are expected to range from $5,000 to $18,500 per year. The monthly carrying charges for various size units are as follows:

38 - 1-bedroom apartments from: $114 to $133
113 - 2-bedroom apartments from: $122 to $158
38 - 3-bedroom apartments from: $165 to $184

The down payment is $571 per room.

Items included in the project over and above minimum physical housing requirements include air conditioning sleeves and electrical outlets, aluminum windows, master TV antenna system, door buzzers, lobby-apartment intercom system, dryers and hampers in bathrooms, extra baths in larger units, numerous balconies, large "luxurious" lobby, community room with kitchen facilities, 4 feet ceramic tile wainscoat in baths with 6 feet in tub recess, exterior finish of building is cast in place rubbed concrete. A very good quality face brick was used above and below the aluminum window over the full height of the structure.

The basic construction of the project is fireproof reinforced concrete superstructure and all non-combustible construction with plaster and paint interior finish.

RNA Houses
96th Street and Amsterdam Avenue
Manhattan, New York

RNA Houses is a cooperative housing project built under the New York City Mitchell-Lama program. It is located on the south side of 96th Street between Columbus and Amsterdam Avenue in the West Side Urban Renewal Area of New York City.

This project consists of one 14-story and basement structure. The project has an 83 parking space garage in the basement plus entrance level professional apartments containing approximately 1,700 sq. ft. of floor area. Income levels are expected to range from $4,000 to $22,000 per year and units vary in size with following monthly carrying charges:

52 - 1 bedroom units $96 - $144

103 - 2 bedroom units $120 - $155

52 - 3 bedroom units $166 - $221

Down payments average approximately $600 per room.

Items included in the project over and above minimum physical housing requirements include air conditioning sleeves and electrical outlets, aluminum windows, master TV antenna systems, lobby-apartment intercoms, extra baths in larger units, balconies, large "luxury" lobby, community room with kitchen facilities, 4 feet ceramic tile wainscoat in baths (6 feet high in tub recess), front and rear elevators, and dryers and hampers in bathrooms.

The basic construction of the project is fireproof reinforced concrete with non-combustible partition framing and plaster and paint finish. Exterior precast concrete panel curtain walls are used front and rear. The ends of the structure are brick with block cavity backup.

West Side Development Project NY 5-56
West Side Redevelopment Area

Project Address: Site A - 120 West 94th Street, New York, New York
Site B - 74 West 92nd Street, New York, New York
Site C - 589 Amsterdam Avenue, New York, New York

This is an H.U.D./H.A.A. project and is divided as follows:

Site A

Bedrooms	Units	Rental Range
0	5	$48
1	20	60-62
2	27	68-76
3	14	80-84
4	4	88

Site B

Bedrooms	Units	Rental Range
1	69	$49-61
2	57	64-72
3	36	75-81
4	6	85

Site C

Bedrooms	Units	Rental Range
1	60	$56-73
2	64	68-76
3	31	75-83
4	1	86
5	2	90-94

The project has adequate recreational and educational facilities in the neighborhood. Site A has no garage facilities. Site B has a garage accommodating 21 cars. Site C has a garage accommodating 20 cars and additional space outside for 4 cars.

Strykers Bay Apartments
93rd Street and Columbus Avenue
Manhattan, New York

This is a New York Mitchell-Lama cooperative project. It consists of 2 fireproof elevator structures, one 16-story and one 20-story with a subterranean garage for 116 cars and 11,000 sq. ft. of store area at entrance floor level. Income level of tenants is expected to range from about $3,000 to $16,800 per year.

Monthly carrying charges for the apartments are:

Bedroom	Cost
0	$ 63 - 81
1	80 - 97
2	103 - 122
3	140 - 157
4	160 - 171

Downpayments are $516 per room.

Items included in the project over and above minimum physical housing requirements include: air conditioning sleeves and electrical outlets, lobby apartment intercoms, master TV antenna system, clothes dryers and hampers in bathrooms, extra baths in large units, community room with kitchen facilities, aluminum windows, vinyl wall covering and quarry tile in large lobby, better quality face brick, ceramic tile - 4 feet on bath walls (6 feet at tub recess), and numerous balconies.

The basic construction of the project is fireproof reinforced concrete superstructure with non-combustible interior construction. Exterior walls are brick and block.

This project and other Mitchell-Lama's compare closely with H.U.D./F.H.A. Section 207 projects with respect to room sizes. They are superior in all respects to the 221(d)(3) projects with the possible exception of Tompkins Square.

830 Amsterdam Avenue
Project NY 5-59

The project consists of 159 units divided as follows:

Bedrooms	Units	Rental Range
0 (elderly)	2	$48-50
1 (elderly)	63	58-70
2 (elderly)	20	69-77
2	18	69-77
3	36	77-85
4	18	84-95
5	2	90-92

This H.U.D./H.A.A. project is part of the Bloomingdale Neighborhood Conservation Area. The general area is deteriorating because of age, obsolescence, delapidation and inadequate maintenance. The project may be considered an extension of the Douglas Project, New York State financed.

The project includes sitting areas and other community facilities. Adequate health, educational and recreational facilities are available. There is on-site parking provided for 19 cars.

Columbus Park
West Side Redevelopment Area

Columbus Park is a cooperative housing project built under the New York City Mitchell-Lama Program. It is located on the west side of Columbus Avenue between 93rd and 94th Streets in the West Side Urban Renewal Area.

The project consists of one 26-story elevator apartment structure with 12,000 sq.ft of store area at street level and a 65 car garage in the basement. The tenant income level is expected to range from $4,000 to $25,000 per year.

Carrying charges for various size units are:

1-bedroom apartments $92.50 - $125.00

2-bedroom apartments $120.50 - $149.50

3-bedroom apartments $154.50 - $192.50

4-bedroom apartments $240.00 - $262.00

The downpayments are $560 per room.

2. PROJECTS OUTSIDE OF MANHATTAN

Stuyvisant Manor

The H.U.D./F.H.A. project is located at 575 Herkermer Street, Brooklyn, New York in a lower-income area. The local surrounding structures are 2- and 3-story walk-up apartment structures.

This project consists of one 6-story and basement, elevator, semi-fireproof structure with exterior steel fire escapes. The tenant income range for which it was designed is $4,000 to $8,000 per year. The rental living units vary in size and consist of: twelve 1-bedroom units renting for $116 and twenty-four 2-bedroom units renting for $137. Also, one professional unit is rented for $175 and 5 on-site car spaces are rented for $15 each.

Items included in the project over and above minimum physical housing requirements are: wood flooring, air conditioning sleeves with electrical outlets, ½ screens, and lobby - apartment intercoms.

The basic construction of the project is brick and block solid masonry exterior and bearing walls supporting 3" x 12" wood joints. Partitions within living units are wood stud, rocklath and plaster. Public halls and stairs are of fireproof construction, masonry and concrete. The foundation consists of concrete walls and spread footings.

Carter Community

This H.U.D./F.H.A. project is located at 122-33 167th Street, Jamaica, Queens, New York. This is a lower-income area surrounded by single family frame structures.

This project, consisting of 65 rental living units and one janitor apartment, was originally designed for elderly persons, but during construction, was converted to one intended for small families whose incomes range from $5,000 to $8,000 per year. The proposed rentals for this project are: $90 for the twenty-two 0-bedroom and $110 for the forty-three 1-bedroom units. Items included in this project are a large chapel and multi-purpose room (approx. 3250 sq. ft.), community kitchen and dining area and public toilet facilities (approx. 1,100 sq. ft.), master TV antenna system, garage in basement for 25 cars, lobby-apartment intercoms, and wood flooring.

The structure is a six-story fireproof structure of masonry and steel frame with bar joists structural elements. Exterior wall is brick and block, cavity type. Interior partitions and framing are non-combustible with drywall and paint finish. Foundation walls are solid concrete resting on concrete spread footings.

Tysens Park, Section I

This H.U.D/F.H.A. project is located at 285 Mill Road and 655-675 Tysens Lane in Staten Island, New York. The local surroundings are garden apartments, one-family homes and small local retail establishments. The area is considered to be a middle-income neighborhood.

The project consists of three 6-story elevator semi-fireproof structures with exterior steel fire escapes. It was designed for tenants with incomes expected to range from $5,000 to $9,000 per year. The 0-bedroom units range in rent from $91 to $110, the 1-bedroom units range in rent from $111 to $130, and the 2-bedroom units range in rent from $130 to $150. In addition to the above, one professional apartment renting for $200 and on-site parking spaces for 324 cars is provided with a $10 per space rental.

Items included in project over and above minimum physical housing requirements are wood flooring, and air-conditioning sleeves with electrical outlets for them.

Fox Hill

This H.U.D./F.H.A. project is located on the southeast corner Vanderbilt and Osgood Avenues in Staten Island, New York. The local surroundings are mainly one family homes. The area is considered to be a middle-income neighborhood.

This project consists of three 6-story and basement elevator semi-fireproof structures with exterior steel fire escapes. The expected income range of tenants, for which the project was designed, is from $5,000 to $10,000. The rental living units vary in size with: 36 0-bedroom units renting for $95, 181 1-bedroom units renting for $104, 113 2-bedroom units ranging in rent from $115 to $121, and 36 3-bedroom units renting for $138. One custodian apartment is provided. In addition to the above, 6 professional spaces are provided with a monthly gross rental of $750. On-site parking spaces are provided for 194 cars at a cost of $7.50 rental per space.

Items included in the project over and above minimum physical housing requirements are wood flooring, air conditioning sleeves with electrical outlets, hampers, ½ screens, master TV antenna system, and lobby-apartment intercoms.

The basic construction of the project is brick and block solid masonry exterior and bearing wall with supplemental steel column and beam supports for 3" x 10" wood joints. Partitions within units are constructed using wood studs and drywall. Public halls and stairs are of fireproof construction, masonry and concrete. Foundations are concrete walls and spread footings.

Hancock-Saratoga, (NY-5-67)
33-35 Saratoga Avenue
Brooklyn, New York

This H.U.D./H.A.A. project consists of one building of 16 stories, 125 units, divided as follows:

Bedrooms	Units	Rental Range
0	1	$50
1	30 (elderly)	58-64
	1 (nonelderly)	
2	62	64-76
3	30	76-82
5	1	87

The neighborhood is predominantly residential, consisting of two-family and multifamily walk-ups in fair condition. The houses are well maintained. There are adequate community and recreational facilities as well as schools nearby. The project provides on-site parking for 46 cars. Approximate area per floor - 6,900 sq.ft.

John Purroy Mitchell (NY 5-50)
Lincoln Avenue, and East 138th Street
Bronx, New York

This H.U.D./H.A.A. project, developed for lower-income families, consists of 1,732 units as follows:

Bedrooms	Units	Rental Range
0 (elderly)	64	$42-48
1 (elderly)	405	48-58
1	259	48-58
2	541	57-67
3	385	67-75
4	63	74-80
5	15	82

The project is located in a heavily populated, rapidly deteriorating area; to the north are industrial and commercial structures, garages, and service stations. Northeast and east are generally residential 3-, 4-, and 5-story tenements, many converted to rooming houses.

It has community space and recreational areas available for its tenants. There is on-site parking available for approximately 478 cars.

Park Hill Apartments, Section I

This H.U.D./F.H.A. project is located on Park Hill Avenue between Osgood Avenue and Palma Drive on Staten Island, New York. The local surroundings are mainly 1-family homes, and the area is considered to be a middle-income type neighborhood.

The project consists of three - 6-story and basement elevator, semi-fireproof structures with exterior steel fire escapes. This project was designed by the same architect who did the Fox Hills Project, and the design and construction are similar, with variations to size of building and living unit composition. (See Fox Hills for construction notes and features included.)

The income range of tenants for which the project was designed is from $5,000 to $10,000. The 0-bedroom units rent from $90, the 1-bedroom units range in rent from $107 to $110, the 2-bedroom units range in rent from $128 to $130, and the 3-bedroom units rent for $149. In addition to rental living units, on-site parking for 260 cars is provided with a $8.00 per space rental charge.

Sumner-Myrtle (HAA 5-68)
303 Vernon Avenue
Brooklyn, New York

This H.U.D./H.A.A. project consists of 234 units in one 24-story building, divided as follows:

Bedrooms	Units	Rental Range
1 (elderly)	69	$50-58
2	71	58-70
3	71	68-80
4	23	80-84

The area is predominantly residential in character, although there are some commercial and industrial buildings. The surrounding residential units are two-family and multifamily walk-ups. The general area is part of the Residential and Renewal Development Area. There are on-site parking facilities for 82 cars and adequate community and playground facilities.

71-15 Beach Channel Drive (NY 5-73)
Queens, New York

This H.U.D./H.A.A. project consists of one building of 11 stories, 174 units as follows:

Bedrooms	Units	Rental Range
1 (elderly)	74	$56-64
2	70	67-76
3	20	77-84
4	9	85-87
5	1	88

The project is located in the Rockaway Beach area. The neighborhood is generally residential, with some commercial use. Single detached houses are located east and south of the project; commercial and manufacturing are located north across Beach Channel Drive. The Rockaway Health Center is two blocks east, beach and boardwalk two blocks south. There is on-site parking for 74 cars. The area per floor is about 14,000 sq.ft.

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