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MANAGEMENT PERFORMANCE IN PUBLIC HOUSING

Robert Sadacca
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SUMMARY

To identify effective management principles and practices in public housing, The Urban Institute, under contract to the Department of Housing and Urban Development, surveyed 120 Housing Authorities in 1973. Approximately 3,000 Authority staff and 6,000 residents were interviewed at 400 housing projects. The questionnaires elicited information about satisfaction levels, management practices, and building and neighborhood characteristics. Expense data were collected from HUD records.

The Authorities were divided into High and Low Performance Groups based on their scores on 24 criterion measures, e.g., levels of resident and staff satisfaction, management perceptions of building maintenance. In making the division, the study considered factors that affected Authority performance (for example, neighborhood conditions).

The results indicated that the High Performance Group, on the average, not only had higher levels of resident and staff satisfaction and better maintained buildings, but also had significantly lower total operating expenditures. Management practices were identified that were highly related to both high performance and lower operating costs. Practices characterizing high performance included firmness in enforcing rules and management responsiveness to tenant needs--both in provision of adequate housing services and in staff-resident personal interaction. The local operating conditions which most impacted Authority performance and expenses were identified. The pattern of relationships between operating conditions, management practices, Authority expenses and the performance criteria indicated that poorly-functioning Authorities should consider changes in management style in order to raise performance levels and lower expense levels.

I. INTRODUCTION

In the Fall of 1971, 72 Local Housing Authorities submitted proposals to The Department of Housing and Urban Development (HUD) for improving their housing management systems. The proposals had been invited by HUD as part of its Management Improvement Program, implemented to help Authorities meet the many challenges they currently face. The 72 responses indicated the willingness of LHAs to try new methods to solve their management problems.

The Management Improvement Program offers LHAs the opportunity to institute major changes in their management systems with special funding added to their normal operating budget. The management changes are being planned and implemented with the participation of public housing residents. The new management policies and procedures are being implemented over a three-year period, during which time the LHAs will be carefully monitored so that objective evaluations can be made of the effectiveness of the changes. Each new program will be evaluated in relation to its applicability to other LHAs as well as how successful it is at a particular Authority.

In June 1972, 13 Large LHAs were selected to take part in the Management Improvement Program. To evaluate the management innovations instituted by the 13 Authorities, HUD asked The Urban Institute to conduct a management study of the 13 Authorities, plus 27 randomly selected Large (1250 or more units under management) LHAs to serve as a control group.

Subsequently, HUD additionally requested that the Institute assist in the development of a prototype expense system.[1] Forty Medium-sized (500 - 1249 units) and forty Small (100 - 499 units) Authorities were then added to the study so that additional comparable data would be available on management practices and Authority expenses.

This report presents a preliminary analysis of data collected from almost 9,000 interviews with Authority staff and tenants of public housing projects at the 120 Housing Authorities during the Spring of 1973, as well as data collected from HUD records and several outside sources. In this preliminary analysis, comparisons are made only between Authorities. That is, all data has been aggregated to the Authority-level and the Authorities are compared within and between Size Groups. In later analyses, The Urban Institute will analyze the data at both the project level (determining high and low performance projects and comparing them within and between Authorities) and the household level.

This paper is divided into three major sections: the Methodology Section describes sampling, data collection, and analytic procedures; the Results Section discusses management practices that differentiate between Authorities that are performing well according to 24 measures of Authority performance and Authorities that are performing relatively poorly; and the Conclusions Section which summarizes the data and discusses the implications of the findings for Housing Authority policies and practices.

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1. The rationale and development of prototype expenses will be discussed in a future paper.

II. METHOD

A. SAMPLING

1. Housing Authority Sample

The total sample of 120 Housing Authorities was comprised of three subsamples of 40 Housing Authorities each:

(a) Large Housing Authorities having 1,250 or more units under management;

(b) Medium Housing Authorities having from 500 to 1,249 units under management;

(c) Small Housing Authorities having from 100 to 499 units under management.

The sample of Large Housing Authorities was made up of two groups: the 13 Housing Authorities[2] funded under HUD's Management Improvement Program to implement innovative management practices and an additional 27 Housing Authorities to serve as a control group. The 27 Housing Authorities were randomly selected[3] in a manner designed to make the number of Large Housing Authorities in each HUD Region in the sample proportional to the number of all Large Housing Authorities in each Region. The means and variance of sample Housing Authority characteristics (e.g., percent minority residents, percent elderly, total operating expenditures per

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2. Puerto Rico is one of the 13 funded Housing Authorities and was included in the data collection. However, due to the uniqueness of the Puerto Rico Housing Authority, the data has been excluded from this analysis. The data will, however, be analyzed at a later time.

3. New York City and the Virgin Islands were excluded from the Large Authority sample due to the uniqueness of these two Authorities.

unit month, etc.) were compared to the means and variance of characteristics of all Large Housing Authorities to insure that the sample was representative.

Housing Authorities in the Medium and Small size categories were selected at random,[4] again in proportion to the number of such Authorities in each HUD Region.

Table I lists the number of Housing Authorities in each size category by HUD Region.

TABLE I

HOUSING AUTHORITIES IN SAMPLE BY SIZE AND HUD REGION

HUD Region	Large 1,250+ Units	Medium 500-1,249 Units	Small 100-499 Units	Total
I	3	4	3	10
II	5	4	3	12
III	6*	6	3	15*
IV	10	11	14	35
V	7	7	6	20
VI	3	5	6	14
VII	1	0	1	2
VIII	0	0	1	1
IX	4	1	2	7
X	1	2	1	4
TOTAL	40*	40	40	120*

*Includes Puerto Rico

4. Alaska was excluded from the Medium sample due to the uniqueness of this Authority.

2. Housing Project Sample

Within each Housing Authority, a sample of housing projects was drawn based on the total number of projects in the Authority.[5] The sample size ranged from one to six (with the exception of Puerto Rico where the sample size was seven). The total housing project sample size for all Authorities was 401.

In order to select the sample of projects, data on each Authority project was obtained from the Executive Director (or other knowledgeable staff member). Because The Urban Institute defined a project as the total number of units managed as a single entity (which may be made up of several projects by HUD definition), the Executive Director was asked which projects with different Federal Project Numbers were, in fact, managed as one project. Projects that were entirely composed of scattered-site units and leased housing projects were excluded from the sample altogether. If a project was a mix of scattered-site and conventional units, the scattered sites were not considered in obtaining further data about the project.

After the list of projects (as defined by The Urban Institute) was compiled, data on the following six characteristics were collected on each project: the number of units in the project; whether the project included a high-rise building (five or more stories); whether there were 50% or more elderly tenants; whether there were 50% or more minority-group tenants; whether the turnover rate was 7% or more; and whether the vacancy rate was 3% or more. The name of the individual who managed each project was also noted.

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5. The number of projects drawn at each Authority depended upon the number of projects in the Authority--using the formula for sampling from a finite population, the standard error of the mean of the selected projects was made approximately equal for all Authorities. This principle was used in order to help make Authority-wide scores derived from project characteristics equally reliable across the 120 Authorities.

The requisite number of projects was then randomly drawn for the sample. No more than two projects managed by the same individual were included in the sample. If a third project managed by the same individual was drawn, that project was eliminated from the sample, and another project selected. (This procedure was implemented to keep the interview time required from any one individual from becoming too long.) However, in cases where it was impossible to obtain the requisite sample size following this rule, the rule was ignored and the full sample drawn. Special procedures (described in Appendix I) were used in these cases in administering the survey instruments.

To insure that the sample was representative of all the Authority's projects, the sample projects were compared with all the Authority projects on the six characteristics noted above. If the sample either over- or under-represented the population on any one of the six characteristics, a new sample was drawn until a representative sample was obtained.

3. Housing Authority Staff Sample

The Chairman of the Board of Commissioners and the Executive Director were interviewed for each Housing Authority in the sample. The project managers of all housing projects included in the sample were also interviewed.

Separate samples were drawn from each Authority's Central Office staff and the employees (other than the managers) who worked at the sample projects, as described below.

Central Office Staff Sample. Within each Housing Authority, a sample was drawn of Authority employees who worked at least eight hours a week on Housing Authority business and who worked primarily at the Central

or Management District Offices. A list of such employees was obtained from the Executive Director (or Personnel Director) and a sample, based on the total number of such employees, was drawn. If the total number of employees was 15 or less, all employees were included in the sample; if the total number of employees was more than 15, a random sample of 15 or more personnel was drawn. The maximum sample size was 25 (with the exception of Puerto Rico where the sample size was 30).

Project Staff Sample. At each project included in the sample, a sample of employees who worked at the project was drawn. The following information was obtained from the project manager: the number of full-time employees who worked at the project; the number of part-time employees; and the average number of hours worked each week by the part-time employees. Using this information, the number of full-time employees and part-time employees to be included in the sample was determined.[6] The sample size ranged from zero to five.

4. Household Sample

The number of households to be included in the sample at each project was determined by the total number of units in the project.[7] The household sample size ranged from five to eighteen.

Twice as many households as were required at a given project were randomly selected, and listed in the order of selection. Households from

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6. The same general principle that was used in determining the number of projects to be sampled in an Authority was used in determining the number of staff and households to be interviewed at a given project. The standard error of the mean of the selected employees or households was made approximately equal for all projects.

7. Same as 6.

the first half of the list were contacted first. Four contacts were attempted before designating a household as "unobtainable." After four contacts had been attempted, a replacement for that household was taken from the second half of the list. If the names on the list were exhausted before completing the required number of interviews, no further sampling was done because of the greater possibility of obtaining an unrepresentative sample, consisting mostly of people who are easily contacted.

5. HUD Area Offices

Each HUD Area Office which served a Housing Authority in the sample was visited and interviews conducted with the person or persons designated as the most knowledgeable in the day-to-day operations of the Housing Authorities in the sample. A total of 38 HUD Area Offices were visited.

6. Summary

Table II lists the sample sizes for each type of interview, broken down by size category of Housing Authority.

TABLE II

SAMPLE SIZE FOR EACH TYPE OF INTERVIEW

Size Group	Board Chairman	Executive Director	Central Office Staff	Project Manager	Project Staff	Household
Large	39*	40	714	178	640	2,989
Medium	40	40	291	125	257	1,907
Small	40	40	110	98	131	1,301
TOTAL	119	120	1,115	401	1,028	6,197

*One Board Chairman was unavailable and there was no suitable substitute.

B. THE SURVEY INSTRUMENTS

The major portion of the data collected for this survey was obtained using pre-structured questionnaires. Questionnaires were prepared for the following respondents: HUD Area Office personnel, Chairmen of the Housing Authority Board of Commissioners, Executive Directors, Authority Central Office staff, project managers, project staff, and residents of the housing projects. All questionnaires were administered by an interviewer, with the exception of the Central Office staff questionnaire which was designed to be self-administered.

The questionnaires were developed by The Urban Institute, with input from personnel at HUD, the National Association of Housing and Redevelopment Officials (NAHRO), and the National Tenants Organization (NTO). In the case of the project manager and household questionnaires, previous Urban Institute studies were the primary source of questionnaire content. Detailed analyses of questionnaire responses in these studies had shown which questions elicited data useful for evaluating management practices and which could be eliminated without losing pertinent information. Additional questions relating specifically to public housing were also included. Since questionnaires had not been developed previously for the other respondent types, these questionnaires were developed using the expertise of the Institute, HUD, NAHRO, and NTO staffs.

Four types of questions were used in all seven questionnaires: (1) factual questions (e.g., about the respondent, the Authority or the project); (2) questions asking for an evaluation (e.g., of the condition of the units, the performance of Authority employees, etc.); (3) questions asking for amount of satisfaction (e.g., with the employee's job, with the tenant's apartment, with the services offered by the Authority, etc.); and

(4) questions asking an opinion (e.g., how much the respondent agreed or disagreed with statements concerning the policies of the Authority, the behavior of the tenants, etc.).

The questions covered fourteen topical areas:

(1) Sample Characteristics: Personal data (e.g., age, sex, years of school, etc.), as well as questions about the respondent's relationship to the Authority (job title, salary, number of years with the Authority) and the respondent's attitude about his job.

(2) Authority Characteristics and Policies: Questions about Authority policies that concern Authority personnel as well as tenants, and general characteristics of the Authority (e.g., number of units, responsibilities of the Authority,etc.)

(3) Organizational Structure: Questions about general organizational structure, including the number of personnel in different areas, and budgeting.

(4) Management Process: Questions about the involvement of different employees and tenants in various Authority functions; the decision-making process; the employees' time spent on various activities, etc.

(5) Maintenance: Specific maintenance practices, e.g., response time to repair requests, as well as evaluations of the condition of buildings and units.

(6) Cleaning and Trash Removal: Specific practices, e.g., frequency of trash removal, and evaluations of the cleanliness of the projects.

(7) Security: Measures taken by tenants and management to improve security, evaluations of personal safety in the projects as well as the actual number of crimes at the project, cost of vandalism, etc.

(8) Social Services: Enumeration and evaluations of the social services available at the project, whether sponsored by the Authority or an outside group.

(9) Perception of Management: Evaluations of the Authority staff by both Authority employees and tenants.

(10) Authority Relations with HUD: Opinions concerning HUD practices, regulations and helpfulness in solving Authority problems.

(11) Neighborhood Characteristics and Outside Groups: Measures of the Authority's relations with groups outside the Authority as well as evaluations of general neighborhood conditions and services.

(12) Project Characteristics: Includes all general project characteristics, e.g., number of stories in highest building, and physical facilities such as elevators, laundry rooms and playgrounds.

(13) Tenant Participation in Management: Actual tenant participation in tenant organizations as well as attitudes about tenant participation.

(14) Perception of Tenants: The perception of tenants' characteristics, activities, etc., from the point of view of both management and the tenants.

Table III lists the percentage of each type of question for the seven questionnaires. The emphasis in the questionnaires was clearly on Management Process, Authority Characteristics and Policies and Sample Characteristics. This emphasis is consistent with the purpose of identifying areas in which public housing management can be improved.

In order to obtain broadly-based evaluations of Authority policy and operations, the same questions, when appropriate, were asked of different respondents within an Authority. Thereby, management and residents, for example, could be compared on their opinions concerning the amount of tenant participation in management that is desirable; or, the attitudes of the Executive Director and Board Chairman could be compared on such items as the number of new housing units needed by the Authority.

In order to quickly machine process the large volume of data collected (over 9,000 completed questionnaires), alternative responses to the questions were generally pre-coded in the questionnaires. For all respondents except the project staff and tenants, the pre-coded questions soliciting an opinion, evaluation, or the amount of satisfaction allowed for a range of four answers. (The project staff and tenant questionnaires provided a range of only two responses because of the difficulty these respondents had during pre-tests in choosing among four answers.)

TABLE III

QUESTIONNAIRE CONTENT BY TOPICAL AREA
(Shown in percent)

Topical Area	Board Chairman	Executive Director	Central Office	Project Manager	Project Staff	House-hold	Area Office
Sample Characteristics	5%	9%	40%	9%	44%	22%	0%
Authority Characteristics & Policy	12	20	7	3	6	1	14
Organization Structure	17	11	1	2	0	0	0
Management Process	33	32	38	27	20	11	0
Maintenance	0	3	1	17	3	10	0
Cleaning and Trash	0	2	0	3	3	4	0
Security	0	2	0	3	3	4	0
Social Services	4	9	0	6	1	11	0
Perception of Management	8	2	23	4	11	5	0
Authority Relations with HUD	8	3	4	1	3	0	76
Neighborhood Characteristics/Groups	8	4	1	3	0	9	10
Project Characteristics	0	0	0	12	0	13	0
Tenant Participation in Management	4	3	4	2	3	5	0
Perception of Tenants	1	1	1	6	1	5	0
Total Number of Questions:	N=101	N=299	N=78	N=370	N=66	N=315	N=21

The questionnaires were arranged so that the easier questions came at the beginning of the interview, leaving the sensitive or difficult questions for the latter part. Care was taken to vary the type of question to avoid response sets and to maintain the respondent's interest. In this regard, questions which allowed the respondents to express their ideas and feelings freely were interspersed among the pre-coded questions.

In addition to the questions asked of the respondent, the interviewer completed an Observation Sheet to collect data that was easily observed. The Observation Sheet for the tenants included information concerning the location of the unit in which the respondent lived, and an evaluation of the cooperativeness of the respondent. The Observation Sheet used with the Authority Staff interviews was limited to the sex and race of the respondent.

C. OTHER DATA SOURCES

In addition to the data collected through interviews with Housing Authority personnel and project residents, data were collected from the following HUD records:

HUD-52599--Low Rent Public Housing Statement of Operating Receipts and Expenditures. All the financial variables, such as operating receipts, administration expenses, etc., were collected from this form for the years 1970, 1971, and 1972.

HUD-51235--Low Rent Housing Program Report on Occupancy. All occupancy data, such as percent elderly, number of vacancies, etc., were collected from this form for the year 1971.

U.S. Census data were used for such items as population of the geographic area and whether the Authority was located in a SMSA. Other outside data sources provided information on such items as wage rates for local government employees and the average January temperature of the area.

D. FIELD DATA COLLECTION

1. Pre-Test

All questionnaires were pre-tested. The pre-tests were conducted at one Large Housing Authority and one Small Housing Authority, both of which were part of the sample.[8] Some minor changes were made in the instruments as a result of the pre-test, but the data obtained during the pre-test were suitable to include in the study. Additional data required as a result of the pre-test were collected on return visits to these two Housing Authorities.

2. Field Work

The 120 Housing Authorities and 38 Area Offices were notified in advance by HUD of the forthcoming visits by The Urban Institute. Prior to visiting a Housing Authority, the HUD Area Office servicing the Housing Authority was visited by Urban Institute personnel. The purpose and method of the study were explained, and a brief questionnaire administered to the personnel of the Area Office most knowledgeable about the day-to-day operations of the Housing Authorities in the sample.

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8. The household questionnaire was so similar to household questionnaires used in previous Urban Institute studies that a complete pre-test of this instrument was not considered necessary. Some of the questions were pre-tested by the National Opinion Research Corporation for a study of the effects of administering housing allowances to low-income households.

Following the visit to the Area Office, the Housing Authorities in that Area were visited by The Urban Institute. An average of a day and a half was required at each Housing Authority. The Institute representative interviewed the Chairman of the Board and the Executive Director, and drew the sample of projects.

An outside survey research firm was subcontracted to conduct the remaining interviews and to draw the sample of Authority staff and households. The subcontractor's field supervisors were trained at the Institute in the method of drawing the different samples and the administration of the questionnaires. Manuals explaining the sample procedures and administration of the project manager questionnaire were developed by the Institute for use in the field. The Institute also provided a manual to accompany the household questionnaire to be used when the field supervisor trained the local interviewers.

The subcontractor's field supervisor met with the Institute representative at each Housing Authority to insure the smooth continuation of data collection after The Urban Institute representative had departed. Any anticipated problems or unique characteristics of the Authority were discussed so that the subcontractor would know what to expect at each Authority.

The household respondents were paid $3 for their participation in the study. (No other respondents were paid since they were mostly interviewed during Housing Authority working hours.) The $3 was paid by money order so that the interviewers did not have to carry large sums of cash and in order to have some control over the distribution of the money.

All Housing Authorities were visited by The Urban Institute during the first six weeks of field work (except for two Authorities which

required special attention). An additional four weeks was required by the subcontractor to complete the data collection.

E. ANALYSIS

1. Definition of Variables

Two hundred-twenty-five variables were identified initially from the questionnaires and other data sources for inclusion in this first analysis. These variables were selected based on relationships found among variables in previous Urban Institute studies and on the judgment of Urban Institute and HUD staff members as to the importance of these variables. The 225 variables and their data sources are identified in Appendix II. The Appendix also gives the variables' units of measure, range of scores and sample means as well as the results of significance tests (described below.)

All variables for this preliminary analysis are defined at the Authority level. That is, responses to questions which were asked to more than one respondent in an Authority were averaged, and that average score assigned to the Authority. Therefore, some variable scores are the average of responses from similar respondents (e.g., the managers' evaluation of the condition of units is the average[9] of all project manager responses), some scores are the average of responses from different types of respondents (e.g., the evaluation of how well the Authority is meeting its objectives is the average of the responses from the Board Chairman, the Executive Director, and other

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9. For this particular variable and for many others including all variables derived from the household data, the Authority level scores were obtained through weighting project scores by the number of dwelling units in the projects.

Authority staff), while others are a single response (usually the Board Chairman or Executive Director). In later analyses, the data will be analyzed both at the project level (identifying high performance and low performance housing projects within and between Authorities) and at the household level (constructing typologies of households and comparing them between and within projects and Authorities).

The 225 variables defined for this analysis are divided into four categories--Criterion Variables, Control Variables, Income and Expense Variables and Management Variables.

Criterion Variables (Appendix II #001-024). Criterion Variables are the measures of the overall performance of the Authorities. The authors' belief that there is no single measure of Housing Authority success led to the specification of 24 Criterion Variables. Some examples of these 24 measures are: tenant satisfaction with their apartment, their safety and security, their neighbors, etc.; management evaluation of the condition of the project buildings and units; Authority employee satisfaction with their jobs, etc. These variables are derived from all seven types of respondents --from the HUD Area Office to the tenants of public housing projects. The particular variables used in the study were selected on the basis of earlier Urban Institute research on housing management and the judgment of HUD, NAHRO, NTO and Institute personnel.

The scores on these twenty-four variables were used to divide the Authorities into High Performance and Low Performance Groups. Before assigning a final score to the Authority on any one variable, the scores for each of these variables were adjusted using relevant Control Variables (discussed below).

Control Variables (Appendix II #025-074). Initially, fifty variables were defined as Control Variables. These variables measure environmental factors and Authority characteristics over which the Authority has little or no control, but which influence Authority operation, such as neighborhood conditions, age and number of projects, etc. These variables were used to adjust the Criterion Variable scores before dividing the Authorities into High and Low Performance Groups (see next section).

Income and Expense Variables (Appendix II #075-090). Sixteen Income and Expense Variables were defined which measure the actual income and expenses of the Authorities during the period 1970-1972.

Management Variables (Appendix II #091-225). One hundred-thirty-five variables were defined as Management Variables--those variables that describe management policies, decision-making procedures, and the specific practices and attitudes of Authority staff. Measures of tenant involvement in management are included in this category.

2. Division into High and Low Performance Groups

Using an iterative statistical process,[10] the Authorities were divided into High and Low Performance Groups within each size classification--Large, Medium and Small--based on their scores on the 24 Criterion Variables. Before carrying out the process that formed the High and Low Performance Groups, the scores on the Criterion Variables of each Authority were adjusted using different combinations of Control and Management Variables.

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10. A more detailed description of the analysis is provided in Appendix III.

Several methods[11] of adjusting the Criterion scores were tried out to determine which method resulted in the most clear differentiation of High and Low Performance Authorities. After testing five methods, the "Full Control" method was selected for dividing the Authorities into the Performance Groups. This method was considered superior to the other four methods for the following reasons:

(i) A larger number of Criterion Variables (23 out of the total 24) were significantly[12] different between the High and Low Performance Groups formed using the Full Control method than using any other method tested. That is, on each of 23 Criterion Variables, the High Group Authorities were significantly better than the Low Group Authorities.

(ii) The number of Control Variables that were significantly different between High and Low Groups formed by the Full Control method was less than in other methods. This is advantageous since these are the factors over which the Authorities have little or no control and the fewer the differences between Performance Groups on such factors, the more confidence that the differences in performance between the Groups may be attributed to factors over which the Authorities do have control.

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11. Appendix III also contains a description of the methods that were tested.

12. The means of the High and Low Performance Groups or Large, Medium and Small samples are "significantly" different if the differences among the means are so large that it is reasonable to infer that the differences did not arise by chance. The probability values in this report give the probability that differences as large as those obtained could have resulted by chance.

(iii) The Authorities were most evenly divided into High and Low Groups using the Full Control method. As shown in the table below, close to a fifty-fifty division was achieved in each Size Group. Moreover, the High and Low Performance Authorities were not disproportionately distributed across HUD Regions (a chi-square test indicated that the proportion of all Authorities in each Region assigned to each Performance Group was not significantly different across the Regions.)

Number of Authorities in High and Low Performance Groups by HUD Region

HUD Region*	Large		Medium		Small		Total	
	High	Low	High	Low	High	Low	High	Low
I & II	2	5	2	6	2	4	6	15
III	2	4	4	2	1	2	7	8
IV	6	4	6	5	7	7	19	16
V & VII	5	3	5	2	3	4	13	9
VI	2	1	1	4	3	3	6	8
VIII, IX, X	2	3	1	2	2	2	5	7
TOTAL	19	20	19	21	18	22	56	63

*Data for contiguous Regions were combined in order to avoid indicating the Performance Groups of particular Authorities.

3. Comparisons Among Performance Groups and Size Groups

After dividing the Authorities into the High and Low Performance Groups for each size classification, two by three analyses of variance were run

with the Performance Groups and Size Groups forming the rows and columns. These analyses were run to determine which variables had significantly different mean or average values among the Performance and the Size Groups. In addition, intercorrelations of all 225 variables were run within each size classification to obtain more insight concerning the impact or interrelationship of one area of Authority functioning with another. The results of these analyses are discussed in the Results Section.

III. RESULTS

A. CRITERION VARIABLES

The 24 Criterion Variables which measure the performance of the Authorities were used to divide the Authorities into High and Low Performance Groups after the Criterion scores were adjusted using the control Variables (see Appendix III). After division into High and Low Groups within each Size Group was accomplished, unadjusted means (or average scores) on each of the 24 Criterion Variables were compared between High and Low Groups. On 23 of the 24 variables, there was a significant difference in average scores between Performance Groups, and in every case the High Group average score was better than the Low Group average. (The only variable which was not significantly different between Performance Groups was "Ratio of delinquent rents to dwelling rent schedule.") In other words, the Authorities in the High Group are performing better on 23 measures than are Authorities in the Low Group, a clear indication of the relative strength of the Authorities placed in the High Performance Group.

The average scores on these 24 Criterion Variables were also compared among Size Groups--Large, Medium and Small. On 21 variables, there was a significant difference between the means of the three Size Groups, with the Large Authorities having the poorest scores on all 21 variables, and the Small Authorities having the best scores on 18 of the 21 variables. The strength of the smaller Authorities when compared with the Large Authorities is also demonstrated by the higher scores of the smaller Authorities.

Management Variables associated[13] with good management. (See Section III-D for a more detailed discussion of Management Variable differences.) In addition, the smaller Authorities had lower expenses Per Unit Month (PUM) than did the Large (see pages 37-40).

Although the 24 Criterion Variables measure different aspects of Authority performance or are assessments by different people (e.g., tenants, management, Area Office personnel), it should be noted that there are statistically significant ($P \leq .05$) relationships between many of these variables. When each Criterion Variable is related with all other Criterion Variables, there are a total of 276 correlation coefficients for each Size Group. In the Large Authorities, 146 of these 276 correlations were statistically significant, in the Medium Authorities 98, and in the Small 83.

These findings indicate that an Authority which has high performance in one respect tends to have high performance in many other respects (e.g., an Authority with high manager evaluation of the condition of the units will tend to have high tenant satisfaction levels, high evaluation of the Authority staff, etc.). This does not mean, however, that these relationships hold true for each individual Authority. In some Authorities, good

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13. Unless specifically noted to the contrary, association or correlations among the variables mentioned in the text are significantly different from zero ($P \leq .05$). A significant relationship between the two variables indicates that as one variable goes up in value or amount, the other variable likewise tends to vary either up (positive correlation) or down (negative correlation). The relationship is expressed by a "correlation coefficient," whose possible range is from -1.00 to +1.00 (both outer limits of the range indicating a perfect relationship between two variables). The relationships found in this study were never perfect, that is, there were always individual Authorities whose values did not follow the general trend. The reader should bear in mind that a significant correlation between two variables does <u>not</u> indicate that one variable is caused by the other. The significant relationships between two variables can, in fact, often be attributed to their mutual relationships with other variables.

evaluations by the manager, for example, may accompany poor evaluations by the Area Office or low levels of tenant satisfaction. Nonetheless, the fact that in general the Criterion Variables tend to be interrelated facilitates the statistical process of dividing the Authorities into Performance Groups and more importantly, points to the validity of the basic concept of dividing Authorities into performance groupings.

B. CONTROL VARIABLE DIFFERENCES

This section discusses the Control Variable differences between the High and Low Performance Group Authorities and between the Large, Medium and Small Size Groups, as well as significant relationships between Control Variables and Criterion Variables[14] within each Size Group. The discussion focuses on three kinds of Control Variables--project characteristics, tenant characteristics and neighborhood and locational factors. Of the three, neighborhood and locational factors have the greatest number of significant relationships with the Criterion Variables.

1. Comparison of High and Low Performance Authorities

Project Neighborhoods. The High Performance Group residents' evaluation of the neighborhoods surrounding their project was considerably more favorable than that of the Low Group Authority residents. This was especially true of the residents' evaluation of neighborhood social, recreational, and municipal services. In the Large and Medium Authorities, a good evaluation by residents of neighborhood social and recreational services is highly

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14. All relationships mentioned in the text between Criterion Variables and other variables refer to the correlation of unadjusted Criterion Variables.

correlated with almost all measures of tenant satisfaction with their project facilities and services. The managers in Large and Medium Authorities also rate the condition of the buildings and units significantly better in projects where these social services are rated highly. In the Large and Small Authorities there are fewer burglaries and other crimes against residents where the residents give higher ratings to neighborhood social and recreational services.

Resident evaluation of municipal services correlates even more highly with tenant satisfaction--on all seven measures of resident satisfaction in all three Size Groups satisfaction was higher where municipal services were rated highly by the residents.

In assessing whether the surrounding neighborhood had gotten better or worse or stayed about the same, the residents of the High Group Authority projects reported more frequently that the neighborhood was getting better. The average score for the High Group Authorities indicates that in general the neighborhoods are viewed as getting better whereas in the Low Group Authorities the neighborhoods are viewed as getting worse. When neighborhoods were seen as generally improving, resident satisfaction was higher in all three Size Groups (in the Large Group, satisfaction with safety and security was particularly higher).

Abandoned cars and empty lots filled with junk and litter present obvious safety hazards, especially for children, who find them interesting "playgrounds." The Low Authority residents considered junk and abandoned cars in the neighborhood to be more of a problem than did High Group Authority residents. In the Large and Medium Authorities, the existence of the problem of junk and abandoned cars was highly correlated with <u>all</u>

measures of tenant satisfaction and with most measures of manager satisfaction with the project--the bigger the problem, the more dissatisfaction. In Small Authorities the same relationships were true, but on fewer variables. The problem of junk and abandoned cars was also associated with high vandalism costs in all three Size Groups. In the Large and Medium Authorities, community acceptance of the projects was seen to be less where this problem existed.

Although the residents' perception of the surrounding neighborhood differed significantly between Performance Groups and those ratings were related to measures of Authority performance, the managers' perception of the neighborhood did not have these relationships. Three measures of the managers' evaluation of the neighborhood were not significantly different between Performance Groups--their evaluation of municipal services, their belief that the neighborhood caused them problems in managing their project, and that pests and litter from the neighborhood caused a problem at the project. There were very few significant correlations between the managers' perception of the neighborhood and the Criterion Variables.

However, the managers of Low Performance Group Authorities reported having had to remove significantly more abandoned cars from project property during the last year than did High Group Authority managers. The number of abandoned cars management had to remove from project property was strongly related to almost all Criterion Variables in the Large Authorities. In the Medium Authorities, six Criterion Variables and in the Small Authorities seven Criterion Variables were related to the number of cars removed. All relationships reflected poorer Authority performance levels where more cars had to be removed from the projects.

The findings suggest that the residents' perceptions of their neighborhood are considerably more related to Authority performance levels than managers' perception or opinions concerning the neighborhood. However, when managers are asked to give objective indexes concerning neighborhood problems they themselves must face (e.g., the number of abandoned cars they removed in the past year), the measures may be as related as the perceptions of people who must live in the neighborhood.

Location in Metropolitan Area. The High Performance Group Authorities are more frequently located in towns and counties outside metropolitan areas (the SMSA definition used by the Census Bureau was used in making this determination). There was, of course, no difference within the Large Group, since all these Authorities are located in SMSA's; this difference was obtained among the Medium and Small Authorities only.

Several Criterion Variables had significant correlations with SMSA location in the Medium and Small Groups. The ratio of delinquent rents to dwelling rent schedule (a higher ratio in the SMSA areas) was correlated in both Size Groups, and poor evaluations of how well the Authority was meeting its objectives (by the Authority staff in the Medium Group and by the Area Office in the Small) were associated with location in metropolitan area. In the Medium Group, high costs attributed to vandalism and a large number of burglaries and personal victimization of project residents were related to metropolitan location.

A locational variable that was not significantly different between Performance Groups was that of HUD Region. For this analysis, the ten HUD Regions were combined into three groups (I, II, III & IX; V, VII, VIII & X; and IV & VI) because of the similarity of expense levels of those

Regions. See the table on page 21 for a more detailed breakdown of Performance Groups by HUD Regions.

Project Building Characteristics. Neither the height of the highest project building nor the number of elevators in an average project were significantly different between the High and Low Groups. There was also no significant difference in the proportion of units having their own outdoor yard space.

The average age of the oldest project building is significantly greater for Authorities in the Low Performance Group--an average of 20.08 years for the Low Group vs. 15.60 years for the High Group. Especially in the Small and Medium Authorities, Authorities having older buildings tend to have lower levels of resident satisfaction and poorer management evaluations. In both these Size Groups, the strongest correlation between age and Criterion Variables is the correlation measuring the relationship of age to condition of units, as evaluated by the residents and by the manager (poorer evaluations as age increases).

The managers of the projects in the Low Performance Group Authorities reported that the original design of their projects caused them problems in the areas of security, maintenance, and cleaning and trash removal significantly more often than did the managers of High Group Authority projects. Examples of these problems are: difficulty in repairing pipes and plumbing because of inaccessibility, trash collection points poorly located, too much common space (hallways, stairways, etc.). However, there was no significant difference in their evaluation of the quality of materials, equipment, or workmanship used in the construction of the projects. Where managers of Large and Medium Authorities believed that the

original design of the project caused them management problems, the residents were more dissatisfied with the project in general, the cleanliness of the project and with the management of the project. In the Large and Small Authorities, the building systems, e.g., electrical and heating systems, were evaluated as being in worse condition when managers thought projects had poor design. In all three Size Groups, deferred maintenance was more of a problem at projects thought to be poorly designed.

Unit Density. While there were no significant differences in the average number of units under management, the number of projects or size of projects (number of units per project) between the High and Low Groups, the High Group Authorities had significantly less units per acre than did the Low. There are only five Criterion Variables which correlate with density--two in the Large and Small Authorities and one in the Medium. The relationships between density and other variables are obscured by high-rise elderly projects which have a large number of people per acre but which typically do not have the problems of the family high-rise projects with resultant resident dissatisfaction.

Unit Characteristics. The Authorities in the Low Performance Group had significantly more bedrooms per unit. However, significantly more tenants in the Low Group reported that they did not have enough bedrooms. As the number of bedrooms per unit in the Authority increased, tenant satisfaction tended to decrease.

In Large Authorities, poor evaluations of the Authority by Authority staff and the HUD Area Office were also related to increased number of bedrooms per unit. As would be expected, when residents believed they had enough bedrooms, they were more satisfied with their living conditions.

In each Size Group, all measures of tenant satisfaction correlated highly with residents feeling they had enough bedrooms.

Significantly more tenants in the High Group Authorities believed they had enough plumbing (i.e., toilet, sinks, tubs, and showers) than did those in the Low Group. A good evaluation by the residents of the condition of their unit was highly correlated in all three Size Groups with their belief that they had enough plumbing.

Tenant Characteristics. Eighteen of the 50 Control Variables were measures of tenant characteristics. Only three of these variables had significantly different means when the Low Performance Group Authorities were compared with the High Performance Group Authorities: the Low Group Authorities had significantly more tenants receiving payments from welfare, tenants who either have used social services or said they would use them if such services were available, and tenants who are members of a minority group. However, these tenant characteristics were associated with Authorities whose projects were located in neighborhoods with poor municipal services and more problem-causing junk and abandoned cars. These Authorities also tended to have more bedrooms per unit and more tenants who reported they did not have enough bedrooms and plumbing for their households.

Special analyses[15] were run to see if the proportion of welfare and minority group tenants and tenants who used social services was significantly different between the High and Low Group Authorities when these other factors were taken into consideration. The results indicated that the Low

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15. Analyses of covariance.

Performance Group Authorities did have significantly more tenants receiving payments from welfare even after taking into consideration the neighborhood and other factors. However, there were no significant differences between the High and Low Performance Group Authorities in the proportions of tenants who were members of a minority group or who used social services.

Other tenant characteristics which were not different between High and Low Group Authorities are:

(a) percent elderly;

(b) number of people per unit;

(c) number of children per adult;

(d) number of adults home between 9 a.m. and 6 p.m.;

(e) number of teenagers not in school;

(f) proportion of families paying zero rent;

(g) the proportion of families with only one parent;

(h) the proportion of families with personal problems that make managing more difficult;

(i) the proportion of families with health problems affecting their ability to work;

(j) the proportion of families with no adult who speaks English well enough to express their needs;

(k) the income level of households and variability of income;

(l) the education level of household adults and variability of education level of household adults;

(m) turnover rate.

Summary. The neighborhoods surrounding the Low Group Authority projects are viewed by the tenants as getting worse rather than better and not offering adequate municipal services. These neighborhood conditions are

related to all measures of Authority performance, especially tenant satisfaction levels. The findings underscore the problems of managing public housing projects in poorer neighborhoods.

The Low Performance Group Authorities also have older project buildings and higher density than do High Performance Group Authorities, with more problems attributed to the original design of the project. The residents in High Group Authority projects report more frequently that they have enough bedrooms and adequate plumbing facilities for their needs. A higher proportion of tenants in Low Group Authorities receive welfare payments.

Although Authorities have relatively little control over some of these factors, they nevertheless could act to improve most of them over a period of time. The success of the High Performance Group Authorities may rest not only on their better management on a day-to-day basis (see Section III-D), but on their ability to locate their projects in better neighborhoods, select better designs for their projects and prevent overcrowding in their projects.

2. Comparison of Large, Medium and Small Authorities

There are a greater number of Control Variable differences between the Size Groups than between the Performance Groups. Eliminating Control Variables that by definition will vary between Size Groups (e.g., number of units, location in metropolitan area, etc.), there are still 21 Control Variables that are significantly different between Size Groups compared to 15 significant differences between Performance Groups. On all of the measures which could be seen as disadvantages, the Large Authorities are in the least favorable position and the Small Authorities are in the best position.

Project Neighborhoods. The managers of Large Authorities report significantly more serious problems from the neighborhoods surrounding their projects--that the neighborhood causes a general problem in managing and that litter and pests from the surrounding neighborhood are a specific problem. The Small Authority managers perceive the least serious problems from the neighborhoods surrounding their projects.

The residents of Large Authority projects also evaluate the neighborhood as more of a problem than do residents in Medium and Small Authorities. Significantly larger proportions of residents in Large Authorities believe that junk and abandoned cars are a problem in their neighborhood, and in addition, believe their neighborhoods are, on the average, getting worse. The Small Authority residents view their neighborhoods as improving, while the Medium Authority residents generally see their neighborhoods as staying about the same. Both the medical services and neighborhood municipal services in the Large Authority neighborhoods are rated less favorably by significantly larger proportions of residents than in the Medium and Small Authorities. The managers in the three Size Groups, however, do not evaluate the municipal services differently.

Project Characteristics. The Large Authorities have significantly more older, larger projects with higher density. In addition, they have more high rise project buildings and more elevators. The comparisons of these variables between the Large, Medium and Small Groups are shown below.

Project Characteristics	Size Group		
	Large	Medium	Small
Average number of units per project	382.0	187.0	89.0
Average number of units per acre	39.0	27.0	16.0
Average age of oldest project building (in years)	22.0	19.0	13.0
Average height of highest project building (number of floors)	4.9	3.0	2.3
Number of elevators in average project	1.6	.5	.2

The Small Authorities have a significantly higher proportion of units which have their own outdoor yard space than do the Medium or Large. Significantly higher proportions of residents of the Small Authorities report that they have enough bedrooms.

The project managers in Large Authorities reported significantly more problems due to the design of the project; managers in Small Authorities reported the least number of design problems. However, there was no difference across Size Groups in their assessment of the quality of workmanship and materials used in the construction of the projects.

Tenant Characteristics. The Large Authorities have a significantly higher percentage of minority residents than do the Medium or Small (76% vs. 53% and 44% respectively) Authorities. The Large Authorities also have more children per adult. (These two variables are highly correlated in the Medium and Small Authorities, but not at all in the Large.) The Large Authorities have a significantly higher proportion of families receiving welfare, of families with only one parent, and families which, in the opinion

of the project manager, have personal problems that make managing more difficult. The comparison of these three variables is shown below.

Characteristics of Housing Project Families	Size Group		
	Large	Medium	Small
% families receiving welfare	55%	49%	41%
% families with only one parent	55	41	34
% families with personal problems	14	8	8

Summary. The Large Authorities have older, larger projects with higher density and with more problems attributed to the design of the project. Their projects are located in neighborhoods that cause the management more problems and, in the opinion of the residents, offer less adequate services. In addition, these neighborhoods are seen by residents to be declining rather than improving. The tenants of the Large Authorities are more likely to be receiving welfare and to have problems that may make managing more difficult. In all the above cited characteristics, the problems become less serious as the Authority size decreases.

The conditions under which Large Authorities operate obviously puts them at a disadvantage in any comparison with smaller Authorities. Further analyses are needed to determine the extent to which the difficult operating conditions of the Large Authorities reflect poor management decisions in the past and the extent to which the conditions were truly beyond the control of the Large Authorities.

C. INCOME AND EXPENSE VARIABLES

Sixteen variables were defined as Income and Expense Variables--three measured Authority income and the remaining thirteen measured Authority expenses. The data were collected from HUD records for the years 1970 and 1971 and the averages of two years' data became the Authority scores for the 16 variables.[16] In comparing the Income and Expense Variables for the High and Low Performance Groups, it is readily apparent that, on the average, the High Group Authorities are operating with lower expenses and less subsidy from HUD, but not significantly different income (other than subsidy). Of the 13 variables measuring expenses, eight are significantly different between Performance Groups and are discussed below.

That lower expenses are indeed related to better management performance can be seen by looking at the average expenses of the Performance Groups and at the relationships of some key Expense Variables to individual Criterion Variables. The reader is cautioned that the expenses of individual Authorities vary around these average values and that within each Size Group, some High Performance Group Authorities have higher expenses than some Low Performance Group Authorities.

1. Expense Variables

Total Operating Expenditures. The average Total Operating Expenditures[17] per unit month for the High and Low Performance Group Authorities

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16. 1972 expense data were not available in HUD files for a number of Authorities.

17. Total Operating Expenditures include Total Routine Expenses, Extraordinary Maintenance, Casualty Losses and Capital Expenditures.

in the Large, Medium and Small Authorities is shown below. The Low Performance Group Authorities clearly had significantly higher expenses, especially among the Large Authorities. It is also apparent that smaller Authorities had significantly lower Total Operating Expenditures.

Total Operating Expenditures PUM

Performance Group	Authority Size		
	Large	Medium	Small
High Group	$56.19	$48.46	$39.07
Low Group	66.76	51.80	43.45

The relationship between Total Operating Expenditures and level of tenant satisfaction are significant within all Size Groups, although the Large Authorities have the strongest relationships. In the Large Authorities, all seven measures of tenant satisfaction with the project and management (Variables 001-006, 008 in Appendix II) are significantly related to Total Operating Expenditures--the higher levels of satisfaction being associated with lower costs. In the Medium Authorities, two measures of tenant satisfaction are similarly related, and in the Small Authorities, four measures.

While the pattern of relationships of the other Criterion Variables with the Total Operating Expenditures is perhaps not as definite as that of tenant satisfaction, there are no Criterion Variables that relate to Total Operating Expenditures in the direction of better performance being associated with higher costs.

Total Routine Expenses. Total Routine Expenses PUM[18] were similar to Total Operating Expenditures--there was a significant difference between the Performance Groups and between the Size Groups in average expenses. These average expenses are summarized below.

Total Routine Expenses PUM

Performance Group	Size Group		
	Large	Medium	Small
High Group	$51.25	$43.51	$36.83
Low Group	61.53	45.30	38.63

Similar relationships occur between Criterion Variables and Routine Expenses as were found with Total Operating Expenditures. Higher Routine and Total Operating Expenditures are associated with less tenant satisfaction, with more problems stemming from deferred maintenance, higher vandalism costs, and with the Area Office giving a poorer evaluation to the Authority. These relationships are most pronounced in the Large Authorities.

Total Ordinary Maintenance and Operation Expense. Maintenance expenses followed the same pattern as Total Operating and Routine Expenses, i.e., the High Performance Group Authorities and the smaller Authorities have lower expense levels. Large High Performance Group Authorities spent approximately $6.00 PUM less on maintenance than Large Low Group Authorities.

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18. Total Routine Expenses include Total Administration Expense, Total Utilities, Total Ordinary Maintenance and Total General Expense.

In all Size Groups, lower levels of tenant satisfaction were associated with higher maintenance costs. In all three Size Groups, higher vandalism costs also were associated with higher maintenance expenses; and in the Large and Medium Authorities, more serious problems with deferred maintenance were associated with higher maintenance costs.

Other Expenses. The other Expense Variables that were significantly different between Performance Groups are Utilities Labor, Maintenance Labor, Employee Benefit Contributions, Total Routine Expenses Less Utility Expenses, and Total General Expense. Following the pattern of the Expense Variables discussed above, the High Performance Group Authorities had significantly lower expenses per unit month in these categories than did the Low, and the Large Authorities had the highest and the Small Authorities the lowest expenses in all five categories. In addition, the Criterion Variables also related to these Expense Variables in the same direction--lower expenses always being associated with better performance.

The Expense categories which were not significantly different between Performance Groups are: Non-technical Salaries, Technical Salaries, Total Administration Expenses, Total Tenant Services, and Total Utilities Expense. However, they all were significantly different between the Size Groups with the Small Authorities again having the lowest expenses per unit month.

2. Authority Income and Subsidies

The Total Operating Receipts Exclusive of HUD Contributions were not significantly different between Performance Groups, but there was a significant difference between Size Groups. The Large Authorities had the most income per unit month and the Small Authorities the least. The subsidies from HUD, however, were significantly different between Performance and

Size Groups. The High Performance Group Authorities received an average subsidy of $3.36 PUM compared to $5.39 PUM for Low Performance Authorities. The difference is more pronounced between Size Groups, with the Large Authorities averaging $10.14, the Medium $2.57 and the Small only $.73. In the Large Authority Group, six Authorities received no subsidies during the 1970 to 1971 period, in the Medium Group 23 Authorities, and in the Small Group 31 Authorities received no subsidies, another indication of the better financial condition of the smaller Authorities.

Higher subsidy levels were associated in the Large Authorities with decreased tenant satisfaction, with more serious problems stemming from deferred maintenance, higher vandalism costs and more burglaries and other crimes against residents, and a poor evaluation by the Area Office of how well the Authority is meeting its objectives. These relationships weakened in the Medium Authorities; and in the Small Authorities there were no significant correlations between any Criterion Variables and amount of HUD subsidy.

3. Control Variable Relationships

As discussed previously, the Control Variables measure factors over which the Authorities have relatively little control. These factors, however, are related to expense levels. The relationships between the Control and Expense Variables may help to explain some of the differences in expense levels among Authorities.

Since the pattern of relationships of the various Expense Variables with other variables is so similar, the following discussion deals primarily with the relationship between the Control Variables and Total Operating Expenditures.

Three Control Variables were found to be significantly related in all three Size Groups with higher expenses: HUD Region, average household income, and the average height of the tallest buildings in the projects surveyed. (It should be noted that HUD Region and household income are themselves significantly related in all three Size Groups, both variables reflecting the difference in living costs, wages and salaries and welfare payments in different areas of the country.) In general, Authorities located in HUD Regions I, II, III and IX (the Northeast and California, Nevada and Arizona) had the highest Total Operating Expenditures, with those in Regions IV and VI (the Southeast and South Central) the lowest.

The average household income of the tenants varies in the same direction in these areas (higher in the Northeast and Far West and lower in the Southeast and South Central), so it is not surprising that higher household income is significantly related to higher Total Operating Expenditures. Building height was also related to HUD Region with taller buildings more prevalent in high cost areas. In order to test whether household income and building height were significantly related to Total Operating Expenditures exclusive of their mutual relationships with HUD Region, the correlations of household income and building height with Authority Expenditures were computed with HUD Region partialled out. The relationships weakened but were positive in all three samples and were significantly greater than zero in the sample of Large Authorities.

Of the ten Control Variables that were significantly different between Performance Groups (see Section III-B-1), nine showed a relationship to Total Operating Expenditures in at least one Size Group. (The average number of bedrooms had no relationship to Total Operating Expenditures.)

The proportion of residents receiving welfare payments was related to expense only in the Small Group--the more tenants receiving welfare, the lower the expense level. This was the only Control Variable of the ten showing a relationship to expenses in the Small Authorities.

The Medium Authorities located in a metropolitan area (SMSA) had higher expenses than those outside such areas, and the number of abandoned cars management had to remove from project property also was associated with higher expenses.

In both Medium and Large Authorities, increased density (number of units per acre) and two neighborhood measures were correlated with higher expenses. In Authorities where neighborhood municipal services were evaluated as being poor by the residents, Total Operating Expenditures were higher.

In the Large Authorities, poor project design, residents believing they do not have enough bedrooms, and the residents' evaluation that junk and abandoned cars are a problem in the neighborhood were also associated with higher expense levels.

Three additional Control Variables which were significantly different between Size Groups, but not Performance Groups, are also associated with higher expense levels. These are: the average number of elevators in the Authorities' projects, the proportion of units with private outdoor yard space, and the Authority having a problem from civil service laws or political pressure. Large Authorities have the characteristics on these variables associated with higher expense levels--more elevators, fewer units with their own yard, and more of a problem from civil service laws and political pressure.

Summary. High management performance is associated with low operating expenses. This is especially true of management performance as measured through tenant satisfaction--high tenant satisfaction is associated with the need for less federal operating subsidy (High Performance Group Authorities have significantly lower expenses but approximately the same total operating receipts as Low Group Authorities). Size of Authority is also associated with expenses--Small Authorities have the lowest expenses PUM and Large Authorities the highest.

Authority operating expense levels are also related to factors over which they have relatively little control--location in high expense areas, poor neighborhood conditions, high unit density and tall buildings. Some of these factors are also related to Authority performance levels and, being characteristic of Large Authorities, place the Large Authorities in a disadvantageous position when compared with smaller Authorities.

D. MANAGEMENT VARIABLES

Examination of the Management Variables that were significantly different between the High and Low Performance Groups revealed that management style was more important than organizational structure in differentiating between High and Low Group managements. Perhaps the most important aspects of management style are the firmness of management in enforcing rules and the responsiveness of management to tenant needs. These two aspects of style are associated with high tenant satisfaction and low operating expenses.

The data discussed in this section indicate that increased tenant participation in management is associated with the Low Performance Group Authorities. Apparently, when management fails to respond adequately to

tenant needs, the tenants themselves take action. No conclusions concerning whether tenant participation is itself a good or bad aspect of management should be drawn from this data. Only by measuring over time the effects of changing the level of tenant participation can the value of tenant participation be assessed.

The data show that no particular organizational structure (i.e., the number of management districts, the way maintenance is organized, etc.) is associated with good management although High Performance Authorities had a larger proportion of staff at the project level, and this staff was more involved in policy decision-making. For any given Authority, of course, one structure may be more effective than another, but no pattern was found in this study that all Authorities need follow. However, effective management practices which can be implemented within different organizational structures have been identified.

1. Management Firmness

One of the most important aspects of management-tenant relationships is the firmness with which the tenants perceive management enforcing rules at the projects. The residents were asked whether they thought management was strict or not strict about nine items (e.g., paying the rent when it is due, keeping the grounds clean, noise from record playing and parties, etc.) and Authority staff were asked how strict they thought management should be. The residents' perception of management strictness varied significantly between Performance and Size Groups, with residents in High Performance Group Authorities reporting more frequently that they believed management was strict. The residents in Large Authorities rated management as being the least strict and in Small Authorities the most.

That strictness of management is highly related to good management performance in the eyes of the tenants can be seen in the table below which illustrates the strength of the correlations between strictness and the residents' satisfaction with the project. All the correlations are significant and positive--tenant satisfaction increases as the amount of strictness perceived by residents increases. (Figures in table are correlation coefficients.)

Size Group	Relationship of Residents' Perception of Management Strictness and Satisfaction with:						
	Project	Project Neighbors	Security/ Safety	Clean- liness	Mainte- nance	Manage- ment	Condition of Unit
Large	.73	.38	.63	.61	.74	.87	.53
Medium	.59	.60	.60	.67	.57	.81	.45
Small	.43	.41	.34	.61	.53	.56	.62

It can be observed from the table that the relationships between satisfaction and strictness is generally strongest in the Large Authorities. Strictness in the Large Authorities is also related to expense--in Authorities where residents believe management is strict, maintenance and Total Operating Expenditures are lower. A special analysis[19] indicated that the difference in total operating expenses for stricter Large Authorities averaged about $21 per unit month less than expenses for Large Authorities that were not perceived as strictly enforcing rules.

19. Average expenses of Authorities above the median level of perceived strictness were compared with average expenses of Authorities below the median level of strictness.

In Large Authorities there was no association between residents' perception of management strictness and those tenant characteristics that might be thought to relate to strictness, such as the number of teens who are not working or in school, the percent elderly, etc. The number of people per unit and the number of children per adult were related to the amount of strictness in Medium Authorities--management was perceived as being less strict where there were more people per unit and more children per adult. And in Small Authorities, less strictness was perceived where there were more one-parent families. Enforcing rules at projects with these characteristics is, undoubtedly, more difficult, but the data show (see table above) that management should not "give up" at such projects.

The Authority staff responses to the question, "How strict should management be . . . " did not differ significantly between Performance Groups. The scores indicate that Authority staff believed that management should be quite strict. However, there was no relationship in any Size Group between management's perception of how strictly rules should be enforced and the tenants perception of how strictly they actually were enforced. There also was no relationship between the measures of tenant satisfaction listed on the table above and management's perception of how strictly rules should be enforced. Evidently, the beliefs of Authority staffs concerning rule enforcement are often not reflected in tenant perceptions. The relationship of residents' perception of strictness to their satisfaction indicates that the policy of strict enforcement of rules should be implemented, not merely voiced.

Another measure of management's concern about rules was whether the tenants had been given a written list of behavior rules. This variable was

not significantly different between Performance Groups, with somewhat over 80 percent of the tenants in each Performance Size Group reporting they had been given rules. This was not a good indicator of management strictness in the Medium and Small Authorities, but in the Large Authorities residents who had been given a list of rules felt management was stricter. In Large Authorities, where there is less personal interaction between management and tenants, a list of rules may be more effective.

Responses to questions concerning how well the residents felt they were treated by Authority staff also have a high correlation with the residents' perception of strictness of management in the Large and Small Authorities. Tenants responding that they thought management was strict also reported that they thought they were treated well by management staff. In other words, the tenants did not look upon management as being too harsh because they enforced the rules strictly.

Another variable that measures an aspect of management firmness, though less directly, is a composite of the responses to two questions. The residents were asked whether they agreed or disagreed with these two statements: "Most of the people in this project have the same housekeeping standards that you, yourself have"; and "People in this project have the same ideas and rules about raising children that you, yourself have." Although management may not be able to directly change a tenant's housekeeping standards and rules for raising children, it is likely that pressure can be brought to bear on residents who are not in line with the standards of the majority. Tenants in High Performance Authorities agreed that their neighbors had similar rules and standards significantly more often than did tenants in the Low. Residents agreeing with these statements were also more

satisfied with all aspects of the project in all three Size Groups. And as was the case with strictness, Total Operating Expenditures are lower in Authorities where tenants believe their neighbors have similar ideas about rules and standards.

Another variable that is indicative of management firmness that was significantly different between Performance Groups is the number of months it takes an Authority to evict a tenant because of rent delinquency. The High Group Authorities averaged less than two months, while the Low Group average was almost two and one half months. In Large Authorities, increased Total Maintenance Costs and Total Operating Expenditures were associated with a longer time needed to evict residents for rent delinquency.

2. Management Responsiveness to Tenant Needs

Personal Responsiveness of Management. The quality of the personal interaction between tenants and management staff is an important ingredient of good management. Three variables measuring the amount and quality of such interaction were significantly different between the High and Low Performance Groups. One such measure is how many of the tenants the project manager knows by both name and sight. In the High Performance Authorities, the managers report knowing about three-quarters of their tenants by name and sight, while in the Low Performance Group Authorities the average is about two-thirds. This is an especially important factor in the Large Authorities, in that the more tenants the manager knows by name and sight, the more satisfied the tenants are with the project and with management.

An even stronger relationship exists in the Large Authorities between the manager knowing his tenants and the amount of strictness perceived by the residents. That tenants perceive more strictness when the manager knows

them by name and sight may be due to the tenants feeling that they will be held accountable for their actions. This is not to imply that fear is the controlling factor in enforcing rules but that a greater sense of responsibility develops when the tenant is recognized as an individual--not merely as a faceless, nameless, public housing tenant.

Within the Large Group, as the Authority size and project size increase, the number of households the manager knows decreases. These relationships do not hold up in the Medium and Small Groups, probably because of the significantly smaller size of projects--the Large Authority projects average 382 units compared to 187 for the Medium and 89 for the Small.

A related variable is whether the tenants know the name of the management person they should contact when they need repairs done. Again, a significantly greater proportion of tenants in the High Group Authorities knew the name of their contact in the management office although the averages were high in all Performance Size subgroups (ranging from 74 percent to 96 percent). The same pattern of relationships is found with this variable as with the number of tenants the managers know. Resident satisfaction with the project and management is higher when tenants know the name of their management contact. In addition, the amount of strictness perceived by tenants is greater in every Size Group where more tenants know the contact's name.

The size of the Housing Authority is related to the proportion of tenants knowing their contact's name in Large and Medium Authorities--the bigger the Authority, the less frequently tenants report knowing the contact's name. Average project size is similarly related in the Large Authority sample.

Whether the residents feel that the management staff treats them well is, of course, a measure of successful management-resident interaction. Residents were asked how well they thought they were treated by five categories of Authority staff and these scores were averaged and a composite score was obtained. Although there was a statistically significant difference between Performance Groups, the scores were extremely close (on a scale of 0 - 1, the High Group averaged .97 and the Low Group .96). There were only three Authorities where the average rating was below .90 and these three scores were in the .80's. Therefore, despite the statistically significant difference, the High and Low Authority residents evaluate their treatment by management essentially the same.

Two of these three variables--tenants knowing the name of their management contact, and resident evaluation of how well management staff treats them--correlate highly with measures of tenant satisfaction in all Size Groups and the third--project manager knowing their tenants by name and sight--is highly related in the Large and Small Authority Groups. Within the Large Authority Group, moreover, greater tenant-management personal interaction was associated with fewer burglaries and other crimes in the projects. Large Authorities are faced with the problem that their Authority size and the average size of their projects is so much greater than in the Medium and Small Authorities. Generally, within the Large Authority Group, the larger the Authority and the larger the average project size, the less personal management-resident interaction. Clearly, procedures for increasing management-tenant personal interactions, particularly at Large Authorities, should be explored and implemented.

Recreational Responsiveness. Only one measure of the responsiveness of management to the recreational needs of the tenants was employed in the initial data analysis. This measure, the number of recreational facilities per child, was significantly different between Performance Groups with the High Performance Group Authorities having significantly more recreational facilities per child than did the Low Group. The provision of these recreational facilities did not have many significant relationships with other measures, although higher levels of tenant satisfaction were associated with more recreational facilities in the Large Authorities.

Maintenance Responsiveness. An area of management responsiveness which is highly related to higher levels of tenant satisfaction with their living environment is the speed at which maintenance requests are answered. Two questions in the household questionnaire measured the response time to maintenance requests--how long it takes management to respond to routine requests and how long to respond to emergency requests. On both measures, the High Performance Authorities responded to requests in significantly less time. It takes the Low Performance Authorities about 20 days on the average to answer a routine request for maintenance, and about 12 days for the High Group. There is also a significant difference between Size Groups, with the Large Authorities averaging 21 days, versus 15 and 14 days for the Medium and Small Authorities respectively. There was somewhat less difference, although still significant, between the High and Low Groups in response time to emergency requests. The High Group Authorities averaged 11.5 hours and the Low Group about 15. There was a greater difference between Size Groups, with the Large Authorities averaging 21 hours, the Medium 12, and the Small 8.5 hours.

Both measures of maintenance responsiveness have a strong relationship to tenant satisfaction in every Size Group. As could be expected, tenants are less satisfied the longer it takes management to respond to their requests. In Large Authorities, a poor evaluation by both the manager and tenants of the condition of the units is also associated with longer response times to maintenance requests.

Maintenance response time has few relationships with the structure of the Authority. For example, whether maintenance is organized on an individual project basis or through a Central Office shows no relationship to response time. Only in the Small Authorities does the number of units per employee at the project show a relationship--response time to emergency requests is longer where there are more units per employee. In addition, only in the Small Authorities is there a significant relationship to whether the Authority is part of an agency having responsibility for programs other than public housing--where responsibility is spread over other programs, maintenance response time is slower.

The frequency with which management makes repairs measures both management responsiveness and the general condition of the buildings and units. There was a significant difference between Performance Groups in the frequency of making repairs on units and building systems. Managers in the Low Performance Authorities reported more often that above-normal numbers of repairs had to be made than did managers in the High Performance Authorities.

In Medium Size Authorities particularly, the frequency of repairs was a significant variable. There were significant relationships between tenant satisfaction and repair frequency on both units and building systems--less satisfaction was associated with more frequent repairs. Response time to

both routine and emergency requests was also significantly related to repair frequency (the longer the response time, the more frequent the repairs). In Large Authorities, tenants were less satisfied with maintenance and with the condition of their unit the more often repairs were made. Tenants in Large Authorities had done more of their own repairs in Authorities where repairs were made more often on the units by the Authority.

The project managers in all Size Groups thought the condition of the units and building systems was worse the more often repairs were made on them. When repairs were made more frequently, the managers tended to say that resident failure to maintain their apartments was more of a problem. However, in the Medium and Small Authorities the Authority staff was evaluated (by the staff themselves) as not doing their jobs as well at Authorities where repair frequency was greater.

Several tentative conclusions are possible from these relationships. Although more repairs are made in Low Performance Authorities (a measure of management responsiveness), the level of repairs needed may be so much higher that even more frequent repairs are required. (In Medium Authorities, older project buildings are associated with more frequent repairs and in Small Authorities increased problems of deferred maintenance are associated with more frequent repairs.) Poor project design was associated with more frequent repairs to the building systems (although not to the units) in both the Medium and Small Authorities.

If project managers are correct in assessing resident failure to maintain their apartments as a large problem in projects where repairs are made more frequently, then perhaps the Low Performance Authorities have difficulty keeping up with the damage caused by negligent residents. Alternatively, if

Authority staff are not performing their jobs well, the repairs may be made frequently, but not hold up due to poor workmanship. Resident negligence and poor repair workmanship, if combined, would of course present a serious maintenance problem for the Authority, especially if each induced more of the other.

Where management does not respond to tenant needs in maintenance, there is evidence that the tenants undertake to make some repairs themselves in their units. Significantly more residents in the Low Performance Group Authorities reported having made repairs themselves than in High Performance Authorities. That some of these repairs would not be authorized by management is indicated by the lack of a relationship between occupants making repairs and whether occupants are allowed to make repairs (according to the Executive Director and project managers). In the Large and Small Authorities, as the number of tenants making repairs increases, their satisfaction with the project decreases, again suggesting that tenants make repairs due to the failure of management to respond to their needs. The degree of dissatisfaction associated with tenants having made their own repairs is shown in the table below. (The negative correlation coefficients indicate decreased satisfaction as the number of tenants making repairs increases.) (Figures in table are correlation coefficients.)

Size Group	Relationship of Tenants Making Repairs and Satisfaction with:			
	Cleanliness	Maintenance	Management	Condition of Unit
Large	-.56	-.67	-.70	-.42
Medium	-.03	-.14	-.22	-.13
Small	-.38	-.54	-.52	-.45

In the Large Authorities, the longer the response time to both routine and emergency requests for repairs, the more tenants have made their own repairs. In the Small Authorities the same relationship holds for response time to routine requests but not for emergency requests.

Security Responsiveness. The need for management--or tenants--to take steps to improve security is, of course, an indication that security is viewed as a problem. The project managers were asked what measures they had taken in the past year to improve security, and residents were asked if they had changed or added locks to their own units. In both cases, the Low Group Authorities reported more actions taken to improve security.

The Managers in the Low Group Authority projects reported an average of 1.6 measures, while the High reported an average of 1.3 (out of a possible total of 5). The difference between Size Groups, however, was much more pronounced, with the Large Authorities reporting an average of 2.2, the Medium 1.6 and the Small Authorities only .5.

Relatively few tenants have added or changed locks on their apartment doors--an overall average of 15 percent. There was a significant difference between Performance Groups, 12 percent of the tenants in High Performance Authorities reporting they had added or changed locks and 17 percent in the Low. Again, the difference between Size Groups was more pronounced, with 22 percent of the tenants in Large Authorities, 14 percent in Medium, and only 8 percent in Small Authorities reporting taking such action.

There was no correspondence between the number of actions the manager took and the percentage of tenants changing locks in the Medium and Small Authorities, but in the Large there was a high relationship. Apparently management and tenants in Large Authorities viewed the security situation

in a similar manner because the more actions the management took, the more tenants had added locks. However, this relationship may indicate that the tenants felt management was not doing enough. In the Large Authorities, larger numbers of security actions taken by management and tenants were both significantly associated with dissatisfaction with management.

In all Size Groups, there was a relationship between satisfaction with neighbors and security, and tenants acting to improve their security. As dissatisfaction with neighbors and security increased, so did the number of tenants who had taken steps to improve their security. The neighborhood evaluation by residents in the Large and Medium Groups also shows a relationship to tenants taking security measures. Where neighborhoods are believed to be getting worse, where junk and abandoned cars are thought to be a problem, and particularly where vandalism costs are high, the percentage of tenants in Large and Medium Authorities taking security measures increases. (It will be recalled that, on the average, the tenants of Small Authorities viewed their neighborhoods as getting better.) In general, the data suggest that tenants in Large Authorities take security measures more in relation to their perception of the project neighborhood, whereas in Small Authorities security measures are taken more in relation to their neighbors who live at the project. (Figures in table are correlation coefficients.)

Relationship of Tenants Adding Locks and Related Variables

Size Group	Resident satisfaction with:			Neighborhood Seen as Improving	Junk and Cars Seen as Problem	Vandalism Costs
	Project Neighbors	Security	Management			
Large	-.34	-.74	-.66	-.56	.63	.59
Medium	-.47	-.39	-.20	-.34	.44	.59
Small	-.50	-.48	-.39	-.15	.22	.36

Additional Tenant Actions. Lack of an adequate response by management to tenant needs apparently leads to increased tenant participation in other areas of management besides maintenance and security. In the Low Performance Group Authorities a significantly greater proportion of tenants want to have more say in how the project is managed. One half of the tenants in the Low Performance Authorities would like more say in management, versus a little over a third in the High Performance Authorities. There is also a significant difference between Size Groups, with more tenants (53 percent) in Large Authorities wanting increased participation than in the Medium (42 percent) or Small (36 percent). There is a high correlation (in all Size Groups) between tenants wanting more say in the project management and their dissatisfaction with the project and its management.

The management staffs of Low Performance Group Authorities feel more strongly than High Performance Authority staffs that tenants should participate in management by having tenant organizations at each project and by being involved in questions of eviction. The average for both groups, however, indicated general approval of tenant participation in management. In Large Authorities, this approval was strongest, and in Small Authorities, the weakest.

Executive Directors and project managers were asked whether management or tenants should be most responsible for a list of seven project activities, such as stopping vandalism or organizing recreational activities. The overall average indicated that they thought such activities should be the shared responsibility of tenants and management, but with more emphasis on management responsibility. There was a significant difference between Performance

Groups, with management in Low Group Authorities feeling that tenants should have more responsibility than did management in High Group Authorities.

The tenants in the Low Performance Group Authorities actually have significantly more responsibilities in setting rules for the project and in Authority operations than do tenants in the High Authorities. For example, tenants in Low Performance Authorities were more involved in setting rules for tenant selection and eviction and in hiring project staff and setting project budgets. However, such involvement is limited in all Size Groups with the Low Authorities averaging something less than "a little" involvement.

Although Low Performance Group Authorities had more tenant participation in project activities and management felt they should have more responsibility than did High Authorities, these two variables do not show a relationship to each other. In other words, in Authorities where tenants do have more responsibilities, management may not approve.

Thus far in this discussion, increased amounts of tenant involvement in management have been associated with Low Performance Authorities. However, there is evidence that when tenants participate in project activities not to fill a gap left by management's inaction, but rather to supplement and support management action, tenant participation is indeed a positive factor.

Although the percentage of projects having tenant organizations increases as tenant dissatisfaction with their project increases, where the tenant organization is perceived by the residents as doing a good job, satisfaction is significantly higher. Also, where residents believe the tenant organization is doing a good job, the percentage of tenants who want more say in management of the project is significantly lower. In other words, the mere presence of a tenant organization is not sufficient to ensure

tenant satisfaction, but the presence of a tenant organization perceived by the residents to be doing a good job is associated with increased satisfaction.

Another positive measure of tenant participation in both project and neighborhood activities is whether the tenants do volunteer work. A significantly larger proportion of households in the High Group Authorities report that they do volunteer work at the project or in the neighborhood than in the Low Group Authorities. Tenant efforts to improve project and neighborhood conditions should apparently be encouraged when they are voluntary and not induced by management's failure to deliver satisfactory tenant services. Whether tenants should be encouraged to participate in management in cases where management is failing to provide satisfactory services is an open question which can best be answered through examining the effectiveness of such participation over time.[20]

3. Authority Responsiveness to Employees

The satisfaction of Authority employees with their jobs is an important measure of Authority performance, particularly because employee satisfaction levels are related to resident satisfaction levels. Just as residents were more satisfied when they felt management was responding to their needs, so too are Authority employees more satisfied when the Authority is responsive to them. Authority responsiveness to its employees includes both the interaction of the employees with their supervisors and the rewards offered to the employees for performing their jobs well.

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20. The Urban Institute is planning to resurvey the sampled Housing Authorities one and a half years after the initial survey. Analyses will be directed at this important question at that time.

Several variables measured Authority staff attitudes on salary and other benefits and rewards. Authority salaries and other benefits in general were viewed by Authority employees as being somewhat less than the salaries and benefits for similar jobs outside the Authority. There was no difference in this perception between Performance Groups, although there was a significant difference between Size Groups, with the Large Authority employees viewing their salaries as the most competitive, and Small Authority employees the least competitive.

The employees in the High Group Authorities thought it more likely that they would get an increase in salary for doing a good job than did employees in Low Group Authorities. There was no significant difference in High and Low Group Authorities in the belief that the employees would receive other rewards (e.g., job security, better working conditions, etc.) for doing a good job. As shown in the table below, the Authority employees thought it more likely that they would receive rewards other than a salary increase.

Likelihood of Getting Rewards for Doing a Good Job	Performance Group		
	High	Low	Total
Likelihood of getting a salary increase	1.81*	1.57*	1.68
Likelihood of getting other rewards	1.96	1.95	1.96

*Significant difference between Performance Group: $P \leq .05$

CODE: o = Very unlikely; 1 = Fairly unlikely; 2 = Fairly likley
3 = Very likely

The likelihood of getting a salary increase was significantly related to overall job satisfaction in the Medium and Small Authorities, but not in the Large. There was also no relationship between the perceived competitiveness of Authority salaries and job satisfaction in the Large Authorities. The variables that were related to job satisfaction of Large Authority employees were those that described the interrelationship of staff and supervisors. Job satisfaction was highest in Large Authorities when employees believed the following: that the supervisor understands the problem they have on their jobs, that the supervisor supports his staff, that the supervisor works with his staff as a team, and the employee can get answers to his questions quickly from his supervisor. In general, these variables did not relate significantly to job satisfaction in the Medium and Small Authorities. In Medium and Small Authorities, however, job satisfaction was related to the amount of influence the employees believe they have on their supervisors. This relationship did not occur in the Large Authorities.

4. Other Management Variables which Differentiated High and Low Performance Groups

Organizational Structure Needs Modification. Executive Directors were asked how much they agreed with the statement, "The organizational structure of this Authority needs to be modified to make it more efficient." The Low Performance Authority Directors agreed significantly more strongly with this statement than did High Performance Directors. In an attempt to determine if, in fact, certain types of organizational structure were related to Directors believing the Authority structure needed to be modified, numerous correlations were observed. No variable describing Authority structure as such (i.e., number of management districts, maintenance being organized on an

individual project basis, and others) were found to be related to this belief.

However, in all three Size Groups the Authority employees' job satisfaction was lower and the overall rating of how well Authority employees performed their jobs was also lower when the Executive Director agreed that the Authority structure needed modification. In addition, in the Large and Medium Authorities the Authority staff more frequently believed the Authority was not meeting its objectives the more the Executive Director agreed with the above statement.

Several variables measuring the Authority employees' feelings about their relationship to their supervisors were associated with the Executive Director's belief that the Authority structure needed to be modified to make it more efficient. In both the Large and Medium Authorities, when the Executive Director did not feel the structure needed modification, the employees were more likely to feel that their supervisors worked with them as a team. In addition, in Large Authorities, when the Director did not see a need for changing the structure, the employees felt that their supervisors understood the problems they had on their job.

Proportion of Staff in Central Office. The Low Performance Group Authorities have a significantly higher proportion of their staffs working in the Central Office. On the average, Low Group Authorities have slightly more than half their employees working in the Central Office, while the High Group has about 40 percent. (Both these figures are somewhat inflated due to Small Authorities where many employees work from a Central Office located at a project.) The increased proportion of employees at the Central Office in the Low Group Authorities means, of course, that there are relatively fewer

employees working at the project. And it is at the projects where management can be most responsive to tenants, both in terms of responding more quickly to tenant needs, and being able to interact with tenants on a personal basis.

Project Staff Involvement in Policy Decisions. The High Group Authorities were also found to have more involvement by the project staff in making policy decisions than did the Low Authorities. Because these staff members are in the best position to assess the needs of the tenants on a day-to-day basis, their input into policy decisions is of importance. In the Small Authorities there was a high relationship between the project staff involvement in policy decisions and the amount of tenant satisfaction --the more involvement, the higher the level of tenant satisfaction.

As can be seen in the table below which summarizes staff and tenants' involvement in making policy decisions, the Small Authority project staffs have considerably more involvement in decision-making than do the Medium and Large. In all three Size Groups, overall job satisfaction increased as the amount of project staff involvement increased.

Amount of Involvement in Making Policy Decisions by:	Performance Groups		Size Groups		
	High	Low	Large	Medium	Small
Central Office Staff	1.69	1.69	1.85	1.79	1.45
Project Staff*	2.10	1.91	1.86	1.94	2.46
Tenants	1.77	1.76	1.90	1.92	1.47

*Significant difference between Performance and Size Groups

CODE: 0 = No involvement; 1 = Involved a little; 2 = Involved a fair amount; 3 = Involved a lot

Number of Unions. The number of different unions representing Authority employees was significantly higher for the Low Performance Group Authorities. The average number of unions for the High Group Authorities is .3 and for the Low .9. This difference is especially pronounced in the Large Authorities where the average number of unions for the High and Low Groups are .7 and 2.4 respectively. However, the proportion of Authority staff who are members of unions does not differ significantly between Performance Groups. As would be expected, both the number of unions and the proportion of staff members who are union members differ significantly between Size Groups--the Small Authorities having the least unions and union members and the Large the most.

Employee unionism in the Large Authorities is associated with low tenant satisfaction, poor management, and high operating expenses.[21] As the number of unions and proportion of union employees increase, tenant satisfaction with the project and management tends downward. A significantly larger proportion of tenants report they receive poorer treatment by the management staff; they less often know the name of the management contact

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21. A special analysis was run to determine whether the relationship of number of unions to these factors remained significant after taking into consideration several Control Variables that were also related to number of unions in the Large Authority Group. These variables, average income of Authority households, number of elevators in average project, resident perception that junk and abandoned cars are a problem, average earnings per month of local government employees and HUD Region, were selected because they had significant correlations with both number of unions and operating expenses. Examination of the partial correlation coefficients of number of unions with the variables listed in the text above revealed the same general pattern of relationships as was obtained with the non-partialled correlations although not as many significant relationships were obtained. Specifically, the relationships of number of unions with perceived strictness of management, management contact's name is known and tenant satisfaction with the project and with management remained significant.

to call when repairs are needed. Management's response time to routine maintenance requests tends to be longer. Residents perceive that management enforces rules less strictly. Maintenance and Total Operating Expenditures tend to be higher. It would appear to be to the interest of unionism, Authority employees, and public housing tenants, to work toward reversing these negative associations.

Chairman of the Board. The amount of time the Chairman of the Board of Commissioners spends on Authority business differs significantly between Performance Groups. Chairmen of Low Group Authorities spend on the average 5.7 hours per week compared to 4.0 hours for the High Group. Several interpretations of this difference are possible, of course, but since the Chairmen spend more hours in the Low Performance Authorities, one likely explanation is that more hours are required to deal with Authority problems brought about by inefficient operations, tenant dissatisfaction, poor neighborhood conditions, and the like. (There is no relationship between the amount of the Chairman's involvement in policy decisions or Authority practices and procedures and the number of hours he spends on Authority business.)

Support from Outside Groups. The amount of support the Authority received from outside groups was assessed by the Chairman of the Board. The Chairman was asked how much support the Authority received from (a) local elected officials, (b) local service agencies, and (c) local newspapers and other media. Of these three, only the amount of support given by local elected officials varied significantly between Performance Groups, the High Performance Authorities receiving more support. As shown in the table below, in each group, the local service agencies are rated as giving the

least support, and the local elected officials the most.

Support Authority Receives from Outside Groups

Support Received from:	Performance Group		Size Group		
	High	Low	Large	Medium	Small
Elected Officials*	2.4	2.2	2.2	2.4	2.3
Newspapers/Media	2.0	1.8	1.8	2.1	1.8
Service Agencies	1.6	1.4	1.5	1.4	1.4

*Significant difference between Performance Groups

CODE: 0 = None; 1 = A little; 2 = A Fair amount; 3 = A lot

The amount of support received from these three sources does not appear to translate itself into tangible benefits for the Authority. There is no relationship between the amount of support the Authority receives from any of these sources and the number of governmental services (i.e., police patrolling on project property, maintenance of streets running through project property) the Authority receives or the number and adequacy of social services provided by outside agencies.

Services Provided by Outside Agencies. Although there was no significant difference in the number of social services received from outside groups between the Performance Groups, the number of governmental services (i.e., police patrolling on project property, maintenance of streets running through project property) received by the High and Low Performance Authorities does differ significantly, with the High Group receiving more such services. An increased number of governmental services was associated with increased tenant satisfaction with the project and with management in the

Large Authorities, but this relationship was not strong in the Medium or Small Authorities. In addition, in the Large Authorities, Total Maintenance and Total Routine Expenditures decreased as the level of these governmental services increased.

Modernization Funds. Significantly more Low Performance Group Authority projects had received Modernization Funds than had High Group projects. Until the data are analyzed on a project level basis, an interpretation of the relationships between receiving Modernization Funds and other variables is not clear. For example, there is no relationship between average age of projects and the number of projects receiving Modernization Funds; nor is there a relationship between the amount of deferred maintenance assessed by project managers and the receipt of Modernization Funds. However, the definition of these variables on an Authority level may be obscuring these relationships.

Summary. Management style rather than organizational structure has more relationship to Authority performance. Important components of management style are management firmness in enforcing rules and management responsiveness to tenants. These practices are not only associated with increased tenant satisfaction and better project conditions, but with lower costs as well. The greater tenant participation in management in Low Performance Authorities can be seen as a tenant response to management which does not provide satisfactory housing services to tenants.

Executive Directors judge their Authority to be more efficient and Authority employees are more satisfied when supervisors are responsive to the employees' perceived needs, and when employees feel their co-workers are performing their jobs well.

Higher proportions of staff at the project level and increased involvement by project staff are also associated with good performance, highlighting the importance of increased participation by those in a position to be responsive to tenant needs.

IV. CONCLUSIONS

Although this report has focused on the differences between High and Low Performance Group Authorities, it should be emphasized that the data presented herein indicate that, generally speaking, Housing Authorities are providing housing services in a manner which residents view favorably. Furthermore, Authority staff assessment of their supervisors and co-workers is, for the most part, good, and staff members in general report being satisfied in their job situation. These findings are in contrast to the somewhat popular belief that public housing is best exemplified by the "Pruitt-Igoe's."

However, there are problems in the management of some public housing projects as evidenced by tenant dissatisfaction, poor condition of project buildings, dissatisfaction of Authority employees and high operating costs. In part, these problems may be alleviated by changes in management style, although to the extent that they are caused by poor decisions in the past or by factors over which the Authorities have little control, the problems may be very difficult to solve.

Housing projects of Low Performance Group Authorities are more frequently located in neighborhoods which, in the opinion of the residents, are deteriorating and which do not supply adequate municipal services (street cleaning, police protection, etc.) or recreational and social services. Authorities can do little, if anything, to improve the neighborhood conditions and increased resources may be needed in housing projects located in poorer neighborhoods to help alleviate problems stemming from these neighborhoods.

Projects of Low Performance Group Authorities tend to have higher dwelling unit densities than do High Group Authorities. In addition, project managers in Low Group Authorities report more problems attributed to the original design of the project and a higher proportion of residents in Low Group Authorities believe they do not have adequate plumbing or bedrooms. These are all problems that are difficult to remedy without providing substitute housing for large families or major renovation of the housing stock (e.g. combining smaller apartments to allow for additional multi-bedroom apartments) and substantial cost. Many Authorities appear to have little flexibility in meeting the housing needs of large low-income families in their community.

On the other hand, there are a number of areas in which Authorities, by changing their management style, could probably raise their performance levels and at the same time lower their operating expenses. Two major aspects of management style have been identified as being particularly associated with well-managed housing projects--management firmness and management responsiveness to tenant housing needs.

The finding that residents are more satisfied when the rules for living in the housing project are strictly enforced is in keeping with findings from previous Institute studies.[22] Tenants tend to be more satisfied in an environment where their neighbors cooperate by keeping the grounds and buildings free from litter, by handling their trash and garbage in a

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22. Robert Sadacca, Morton Isler and Margaret Drury, "Housing Management: A Second Progress Report," The Urban Institute, Working Paper 209-01, December, 1971; and Robert Sadacca and Morton Isler, "Management Performance in Multi-Family Housing Developments," The Urban Institute, Working Paper 209-04, June 1972.

sanitary manner, by keeping noise levels down, and by taking other actions that contribute to harmonious living. A management that enforces this kind of behavior may help to develop standards which are accepted by project residents. Although Housing Authority staff say that they believe these rules should be enforced strictly, in many Housing Authorities there is no relationship between their opinion and the strictness with which rules are actually perceived by the residents to be enforced.

At the same time, however, the importance of developing effective personal interaction between project staff and project residents should also be stressed. Project managers should be encouraged to know their residents (undoubtedly a difficult task for managers with large projects), as should the other project staff. In Large Authorities, not only are tenants more satisfied with the project in general when there is increased management-tenant interaction, but the problems of vandalism and crimes against residents are less.

Management responsiveness to tenants' needs for housing services is strongly related to tenants' satisfaction with their housing. A quick response on the part of management to maintenance requests may have several desirable consequences. First, of course, the repairs would be completed more quickly, and the unit would be functioning as it should. In addition, however, the tenant may sense management's concern, both for the tenant's needs and for the condition of the housing unit. An interest in keeping up the condition of the buildings appears to be contagious. Conversely, if management seems to ignore maintenance requests, tenants may become negligent about their units or not bother to inform management of needed repairs until the condition has become more serious (and more costly to repair).

Housing Authorities should, therefore, attempt to create maintenance procedures that allow for a minimum of delay in responding to tenants' requests. Future HUD-Urban Institute studies of new management practices (including maintenance procedures) being demonstrated under the Management Improvement Program should be helpful in assessing what procedures can be most effectively implemented in existing projects.

No conclusions should be made as to the desirability of tenant participation in management until the relationship of participation and management effectiveness can be measured over time. Currently, tenant participation is greater in Authorities in the Low Performance Group. Tenants are understandably dissatisfied when they have had to act in place of management. However, tenant participation which is supported by the majority of residents and which is voluntarily undertaken by residents is apparently a positive factor in project management.

Housing Authority management should be aware of the importance to Authority employees of receiving a salary increase when they have performed their job well. This may be particularly relevant since Housing Authorities' salaries are generally rated by Authority employees as not being competitive with other organizations in their areas. However, given the financial conditions in many Authorities, this may be a difficult policy to implement.

No particular organizational structure is associated with high management performance. However, increased proportions of total Authority staff who work at the projects as well as increased project staff involvement in policy decisions have been shown to be associated with increased satisfaction of the employees and the residents. These practices allow stronger links between the Authority and the residents, since the concerns of the residents are most easily perceived by those in daily contact with them.

High Performance Group Authorities have, on the average, lower operating expenses than the Low Performance Group Authorities. In all Size Groups (and particularly in the Large Authorities) lower operating expenses are associated with higher levels of tenant satisfaction and both are associated with firm, responsive management.

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Although Authorities are beset by many problems, there is conclusive evidence that effective management can help make public housing a more desirable place to live and work at less cost to the nation.

APPENDIX I

SPECIAL SITUATIONS IN ADMINISTERING QUESTIONNAIRES

Two situations required some modification in the administering of the survey instruments to the Executive Directors and Project Managers. The first of these was Authorities where the Executive Directors managed one or more of the projects in the sample, thereby necessitating the Executive Director to be interviewed using both the Executive Director instrument and the project manager instrument(s). To minimize the time required of the Director, he was first interviewed using the Executive Director questionnaire. He was again interviewed using the project manager questionnaire, but omitting those questions which were similar to questions already asked in the first interview or questions inappropriate to this situation. These questions were starred on the project manager instrument to facilitate this process.

The second situation was where a project manager managed more than one project in the sample. Since the Manager questionnaire included some general questions (e.g., attitudes about the Authority, factual information about the manager himself) and some questions specific to the project, the manager was interviewed the first time using the entire questionnaire. When he was interviewed for the second project, only those questions specific to the project were asked. (These questions were also marked to facilitate this procedure.) The data for the general questions obtained in the first interview were entered in the second questionnaire. In those cases where it had been necessary to draw a sample of projects

that included three projects managed by the same individual (see page 6), the manager was asked only 14 key questions about the third project. While some data was obviously lost using this procedure, it did not seem feasible to expect any one individual to sit through three two-to-three-hour interviews.

APPENDIX II

DEFINITION, SOURCE, UNITS, MEANS AND RANGES OF THE 225 VARIABLES AND THE RESULTS OF SIGNIFICANCE TESTS OF MEAN DIFFERENCES

NOTES

SOURCE: Abbreviations refer to questionnaire:

BC--Board Chairman
ED--Executive Chairman
CO--Central Office Staff
PM--Project Manager
PS--Project Staff
HH--Household

UNITS: The highest and lowest units of measure only are indicated; intermediate scores are omitted (e.g., Variable #010: the complete scale is: 3 = very good; 2 = good; 1 = poor; 0 = very poor).

RANGE: The lowest and highest scores actually obtained for individual Authorities are given. This is not the possible range of responses.

RESULTS OF SIGNIFICANCE TESTS: (See footnote 12, page 20, for discussion of significance tests.)

The following abbreviations are used:

P. G. = Performance Group
Size = Size Group
P. G. x S. = Interaction between Performance and Size Groups
n. s. = not significant (i.e., no significant difference in means between the applicable groups).

Example: The Results of Significance Test for Variable 047 (page 89) means that there was a significant difference (at the 5% level) between the High and Low Performance Groups in the average number of units per acre; that the differences in averages were more pronounced (significant at the 1% level) between the three Size Groups; and that there was no significant interaction between Performance and Size Groups.

001--Residents' satisfaction with project

Source: HH--52,55,274,275,291
Units: 1 = satisfied; 0 = dissatisfied
Range: .50 - .94

	Large	Medium	Small	Total	Results of Significance Tests	
High	.71	.77	.83	.77	P.G.	1%
Low	.62	.68	.78	.70	Size	1%
Total	.67	.72	.80	.73	P.G. x S.	n.s.

002--Residents' satisfaction with neighbors

Source: HH--142,145,197,199
Units: 1 = satisfied; 0 = dissatisfied
Range: .49 - .99

	Large	Medium	Small	Total	Results of Significance Tests	
High	.77	.83	.91	.83	P.G.	1%
Low	.70	.75	.83	.76	Size	1%
Total	.74	.78	.86	.80	P.G. x S.	n.s.

003--Residents' satisfaction with safety and security

Source: HH--78,254,255,261
Units: 1 = satisfied; 0 = dissatisfied
Range: .39 - 1.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	.72	.82	.92	.82	P.G.	1%
Low	.61	.73	.85	.73	Size	1%
Total	.67	.77	.88	.77	P.G. x S.	n.s.

004--Residents' evaluation of cleanliness of buildings and grounds

Source: HH--126,127,129,131
Units: 1 = satisfied; 0 = dissatisfied
Range: .24 - 1.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	.66	.76	.87	.76	P.G.	1%
Low	.50	.57	.73	.60	Size	1%
Total	.58	.66	.80	.68	P.G. x S.	n.s.

005--Residents' satisfaction with maintenance

Source: HH--95,96,98,100
Units: 1 = satisfied; 0 = dissatisfied
Range: .33 - 1.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	.79	.88	.91	.86	P.G.	1%
Low	.68	.78	.83	.77	Size	1%
Total	.73	.83	.87	.81	P.G. x S.	n.s.

006--Residents' satisfaction with management

Source: HH--110-112,232,233,239
Units: 1 = satisfied; 0 = dissatisfied
Range: .36 - .99

	Large	Medium	Small	Total	Results of Significance Tests	
High	.80	.84	.88	.84	P.G.	1%
Low	.69	.73	.81	.75	Size	1%
Total	.74	.78	.84	.79	P.G. x S.	n.s.

007--Residents' perception of their present and future quality of life

Source: HH--267,268
Units: 12 = best life; 0 = worst life
Range: 5.92 - 10.66

	Large	Medium	Small	Total	Results of Significance Tests	
High	8.06	8.46	8.90	8.47	P.G.	1%
Low	7.29	7.84	8.17	7.78	Size	1%
Total	7.67	8.13	8.50	8.10	P.G. x S.	n.s.

008--Residents' evaluation of condition of unit

Source: HH--81-86,101-105
Units: 1 = good; 0 = poor
Range: .56 - .97

	Large	Medium	Small	Total	Results of Significance Tests	
High	.85	.87	.90	.87	P.G.	1%
Low	.80	.82	.84	.82	Size	1%
Total	.82	.84	.87	.84	P.G. x S.	n.s.

009--Residents' evaluation of neighborhood acceptance of project

Source: HH--195,196
Units: 1 = good; 0 = poor
Range: .45 - 1.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	.75	.81	.88	.81	P.G.	1%
Low	.70	.70	.79	.73	Size	1%
Total	.73	.75	.83	.77	P.G. x S.	n.s.

010--Manager's evaluation of condition of building systems

Source: PM--72,74,76,78,80,82,84,86
Units: 3 = very good; 0 = very poor
Range: .65 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.90	2.24	2.47	2.20	P.G.	5%
Low	1.86	2.12	2.07	2.02	Size	1%
Total	1.88	2.17	2.25	2.10	P.G. x S.	n.s.

011-- Manager's evaluation of condition of units

Source: PM--153,155,157,159,161,163,165,167,169
Units: 3 = very good; 0 = very poor Range: .75 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	2.01	2.21	2.39	2.20	P.G.	1%
Low	1.83	2.04	1.91	1.93	Size	5%
Total	1.92	2.12	2.13	2.05	P.G. x S.	n.s.

012--Manager's evaluation that resident failure to maintain unit is no problem

Source: PM--187
Units: 3 = no problem; 0 = big problem Range: 0.00 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.63	1.89	2.22	1.91	P.G.	1%
Low	1.22	1.50	2.02	1.59	Size	1%
Total	1.42	1.68	2.11	1.74	P.G. x S.	n.s.

013--Manager's evaluation of seriousness of effects of deferred maintenance

Source: PM--40-45,69
Units: 7 = very serious; 0 = no deferred maint. Range: 0.00 - 5.31

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.78	.45	.45	.90	P.G.	5%
Low	2.63	.41	.98	1.32	Size	1%
Total	2.22	.43	.74	1.12	P.G. x S.	n.s.

014--Authority's evaulation of Authority Staff

Source: ED--191-193;PM--35,37,102,103;CO--15-18;PS--30-32
Units: 3 = very good; 0 = very poor Range: 1.84 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	2.41	2.65	2.71	2.59	P.G.	1%
Low	2.24	2.54	2.51	2.43	Size	1%
Total	2.32	2.59	2.60	2.51	P.G. x S.	n.s.

015--Job satisfaction of Authority employees

Source: ED--88,177-180;PM--104-106,108,324;CO--34a-34d;PS--36-38
Units: 3 = very satisfied; 0 = very dissat. Range: 1.95 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	2.44	2.69	2.76	2.62	P.G.	5%
Low	2.34	2.65	2.61	2.54	Size	1%
Total	2.39	2.67	2.68	2.58	P.G. x S.	n.s.

016--Authority employees' evaluation of how well Authority is meeting its objectives

Source: BC--2,3,4;ED--24,25,26;PM--99,100,101
Units: 3 = very well; 0 = very poorly Range: .97 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	2.27	2.58	2.56	2.47	P.G.	1%
Low	2.01	2.25	2.22	2.17	Size	1%
Total	2.14	2.41	2.38	2.31	P.G. x S.	n.s.

017--Authority employees' evaluation of community acceptance

Source: BC--96;ED--146;PM--325
Units: 3 = very good; 0 = very poor Range: .67 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	2.15	2.49	2.69	2.44	P.G.	1%
Low	1.78	1.85	2.14	1.93	Size	1%
Total	1.96	2.15	2.39	2.17	P.G. x S.	n.s.

018--Occupancy rate

Source: HUD Records
Units: Percentage Range: 89.72% - 100%

	Large	Medium	Small	Total	Results of Significance Tests	
High	97%	99%	99%	99%	P.G.	5%
Low	98%	97%	98%	98%	Size	n.s.
Total	98%	98%	99%	98%	P.G. x S.	n.s.

019--Proportion of rent delinquent units

Source: ED--255
Units: Percentage Range: 0.00% - 67.0%

	Large	Medium	Small	Total	Results of Significance Tests	
High	12%	10%	4%	9%	P.G.	1%
Low	21%	10%	15%	15%	Size	5%
Total	16%	10%	10%	12%	P.G. x S.	n.s.

020--Ratio of delinquent rents to dwelling rent schedule

Source: HUD Records
Units: Percentage Range: 0.00% - 11.07%

	Large	Medium	Small	Total	Results of Significance Tests	
High	1%	0%	1%	1%	P.G.	n.s.
Low	1%	0%	1%	1%	Size	n.s.
Total	1%	0%	1%	1%	P.G. x S.	n.s.

021--Average vandalism cost per unit

Source: ED--199;PM--312
Units: Dollars per unit last year
Range: 0.00 - $115.87

	Large	Medium	Small	Total	Results of Significance Tests	
High	$ 7.59	$3.93	$1.38	$ 4.35	P.G.	1%
Low	26.66	9.22	3.80	12.86	Size	1%
Total	17.37	6.71	2.71	8.86	P.G. x S.	5%

022--Estimate of burglaries and personal victimization per unit

Source: PM--310,311
Units: Number per unit last year
Range: 0.00 - .85

	Large	Medium	Small	Total	Results of Significance Tests	
High	.06	.02	.01	.03	P.G.	1%
Low	.20	.06	.01	.09	Size	1%
Total	.13	.04	.01	.06	P.G. x S.	1%

023--Area Office evaluation of how well Authority is meeting its objectives

Source: Area Office--01,02,03
Units: 3 = very well; 0 = very poorly
Range: 0.00 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.96	2.37	2.20	2.18	P.G.	1%
Low	1.35	2.05	1.86	1.76	Size	1%
Total	1.65	2.20	2.02	1.96	P.G. x S.	n.s.

024--Area Office evaluation of how effectively Authority cooperates with other agencies

Source: Area Office--04,05,06
Units: 3 = very well; 0 = very poorly
Range: 0.00 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	2.53	2.47	2.07	2.36	P.G.	1%
Low	1.74	2.07	2.16	2.00	Size	n.s.
Total	2.12	2.26	2.12	2.17	P.G. x S.	1%

025--Percent elderly occupied units

Source: HUD Records
Units: Percentage
Range: 11.19% - 92.39%

	Large	Medium	Small	Total	Results of Significance Tests	
High	40%	52%	49%	47%	P.G.	n.s.
Low	41%	43%	41%	42%	Size	n.s.
Total	40%	48%	45%	44%	P.G. x S.	n.s.

026--Number of people per unit

Source: HH-1
Units: Number per unit
Range: 1.31 - 6.24

	Large	Medium	Small	Total	Results of Significance Tests	
High	3.08	3.10	2.84	3.01	P.G.	n.s.
Low	3.40	3.22	3.26	3.29	Size	n.s.
Total	3.25	3.16	3.07	3.16	P.G. x S.	n.s.

027--Number of children per adult

Source: HH--2,3,4 ÷ HH--5,6
Units: Child/adult ratio
Range: .07 - 2.78

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.61	1.28	1.16	1.35	P.G.	n.s.
Low	1.74	1.35	1.35	1.47	Size	1%
Total	1.67	1.32	1.26	1.42	P.G. x S.	n.s.

028--Number of adults home between 9 a.m. and 6 p.m.

Source: HH--44
Units: Number per unit
Range: .69 - 1.39

	Large	Medium	Small	Total	Results of Significance Tests	
High	.99	1.05	1.05	1.03	P.G.	n.s.
Low	1.07	1.03	1.05	1.05	Size	n.s.
Total	1.03	1.04	1.05	1.04	P.G. x S.	n.s.

029--Number of teenagers <u>not</u> in school

Source: HH--8-41
Units: Number per unit
Range: 0.00 - .60

	Large	Medium	Small	Total	Results of Significance Tests	
High	.12	.10	.10	.11	P.G.	n.s.
Low	.10	.12	.12	.11	Size	n.s.
Total	.11	.11	.11	.11	P.G. x S.	n.s.

030--Proportion of families receiving welfare

Source: ED--203
Units: Percentage
Range: 3.48% - 87.73%

	Large	Medium	Small	Total	Results of Significance Tests	
High	49%	32%	35%	39%	P.G.	1%
Low	60%	49%	41%	50%	Size	1%
Total	55%	41%	38%	44%	P.G. x S.	n.s.

031--Proportion of families paying zero rent

Source: ED--204
Units: Percentage
Range: 0.00 - 49.98%

	Large	Medium	Small	Total	Results of Significance Tests	
High	6%	1%	0%	2%	P.G.	n.s.
Low	1%	0%	4%	2%	Size	n.s.
Total	3%	1%	2%	2%	P.G. x S.	5%

032--Proportion of families with one parent

Source: PM--262 ÷ PM--2
Units: Percentage
Range: 4.67% - 91.55%

	Large	Medium	Small	Total	Results of Significance Tests	
High	53%	39%	28%	40%	P.G.	n.s.
Low	56%	44%	39%	46%	Size	1%
Total	55%	41%	34%	43%	P.G. x S.	n.s.

033--Proportion of families with personal problems making managing more difficult

Source: PM--261 ÷ PM--2
Units: Percentage
Range: 0.00 - 51.97%

	Large	Medium	Small	Total	Results of Significance Tests	
High	17%	7%	6%	10%	P.G.	n.s.
Low	11%	8%	10%	10%	Size	5%
Total	14%	8%	8%	10%	P.G. x S.	n.s.

034--Proportion of families with health problems affecting ability to work

Source: HH-42
Units: Percentage
Range: 20.72% - 94.44%

	Large	Medium	Small	Total	Results of Significance Tests	
High	52%	50%	53%	51%	P.G.	n.s.
Low	46%	44%	50%	47%	Size	n.s.
Total	49%	47%	51%	49%	P.G. x S.	n.s.

035--Proportion of families with no adult who speaks English well enough to express needs

Source: PM--263 ÷ PM--2
Units: Percentage
Range: 0.00 - 100%

	Large	Medium	Small	Total	Results of Significance Tests	
High	4%	3%	0%	2%	P.G.	n.s.
Low	3%	7%	6%	6%	Size	n.s.
Total	3%	5%	3%	4%	P.G. x S.	n.s.

036--Percent minority household

Source: HH-299
Units: Percentage
Range: 0.00 - 100%

	Large	Medium	Small	Total	Results of Significance Tests	
High	72%	43%	24%	47%	P.G.	5%
Low	76%	53%	44%	57%	Size	1%
Total	74%	48%	35%	52%	P.G. x S.	n.s.

037--Average income of Authority households

Source: HH--282
Units: Dollars
Range: $1,742 - $4,947

	Large	Medium	Small	Total	Results of Significance Tests	
High	$2,835	$3,216	$3,018	$3,023	P.G.	n.s.
Low	3,274	3,108	3,258	3,213	Size	n.s.
Total	3,060	3,159	3,150	3,124	P.G. x S.	n.s.

038--Variability of income within projects

Source: S.D. of HH--282 within project
Units: Standard deviation of income
Range: $736.79 - $2,537.96

	Large	Medium	Small	Total	Results of Significance Tests	
High	$1,391	$1,609	$1,561	$1,519	P.G.	n.s.
Low	1,518	1,478	1,591	1,530	Size	n.s.
Total	1,456	1,540	1,577	1,525	P.G. x S.	n.s.

039--Average educational level of the adults in household

Source: HH--9
Units: Years completed
Range: 5.7 - 11.0

	Large	Medium	Small	Total	Results of Significance Tests	
High	8.81	8.95	8.69	8.82	P.G.	n.s.
Low	9.03	8.61	8.35	8.65	Size	n.s.
Total	8.92	8.77	8.50	8.73	P.G. x S.	n.s.

040--Variability of education level within projects

Source: S.D. of HH--9 within project
Units: Standard deviation of years
Range: 1.5 - 4.4

	Large	Medium	Small	Total	Results of Significance Tests	
High	2.90	2.73	2.81	2.82	P.G.	n.s.
Low	2.84	2.93	2.87	2.88	Size	n.s.
Total	2.87	2.83	2.85	2.85	P.G. x S.	n.s.

041--Turnover rate

Source: HUD Records
Units: Percentage
Range: 0.00 - 27.19%

	Large	Medium	Small	Total	Results of Significance Tests	
High	8%	8%	9%	8%	P.G.	n.s.
Low	9%	11%	10%	10%	Size	n.s.
Total	9%	9%	9%	9%	P.G. x S.	n.s.

042--Number of social services which tenants either have used or say that that they would use if made available

Source: HH--149-155; (b + c)
Units: Number of services
Range: 1.0 - 6.2

	Large	Medium	Small	Total	Results of Significance Tests	
High	3.20	3.28	3.45	3.31	P.G.	5%
Low	3.34	3.66	3.99	3.67	Size	n.s.
Total	3.27	3.48	3.75	3.50	P.G. x S.	n.s.

043--Number of projects in Authority

Source: Survey Form L
Units: Number of projects
Range: 1 - 44

	Large	Medium	Small	Total	Results of Significance Tests	
High	12.63	6.32	4.06	7.73	P.G.	n.s.
Low	14.85	5.43	3.50	7.75	Size	1%
Total	13.77	5.85	3.75	7.74	P.G. x S.	n.s.

044--Total number of units in Authority

Source: HUD Records
Units: Number of Units
Range: 90 - 12,720

	Large	Medium	Small	Total	Results of Significance Tests	
High	3239.53	659.32	167.22	1376.57	P.G.	n.s.
Low	4872.37	762.10	212.64	1875.07	Size	1%
Total	4076.88	713.27	192.20	1640.48	P.G. x S.	n.s.

045--Average size of projects

Source: PM--2
Units: Number of Units
Range: 19.2 - 953.8

	Large	Medium	Small	Total	Results of Significance Tests	
High	347.42	204.52	79.64	212.86	P.G.	n.s.
Low	414.29	172.04	96.05	222.41	Size	1%
Total	381.71	187.47	88.66	217.92	P.G. x S.	n.s.

046--Weighted average age of oldest project building

Source: PM--4
Units: Number of years
Range: 1.2 - 33.5

	Large	Medium	Small	Total	Results of Significance Tests	
High	21.38	15.40	9.70	15.60	P.G.	1%
Low	23.15	21.63	15.81	20.08	Size	1%
Total	22.29	18.67	13.06	17.97	P.G. x S.	n.s.

047--Weighted average number of units per acre

Source: PM--2 ÷ PM--6
Units: Number of units per acre
Range: 1.95 - 118.85

	Large	Medium	Small	Total	Results of Significance Tests	
High	30.36	22.98	11.70	21.89	P.G.	5%
Low	45.93	30.27	19.54	31.91	Size	1%
Total	38.55	26.72	15.94	27.16	P.G. x S.	n.s.

048--Weighted average height of highest project building

Source: PM--5
Units: Number of stories
Range: 1.0 - 13.7

	Large	Medium	Small	Total	Results of Significance Tests	
High	4.83	3.06	1.82	3.26	P.G.	n.s.
Low	4.94	2.95	2.68	3.49	Size	1%
Total	4.89	3.00	2.29	3.38	P.G. x S.	n.s.

049--Number of elevators in average project

Source: PM--137
Units: Number of elevators
Range: 0.00 - 12.75

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.46	.63	.06	.73	P.G.	n.s.
Low	1.75	.45	.37	.84	Size	1%
Total	1.61	.54	.24	.79	P.G. x S.	n.s.

050--Proportion of units having own outdoor yard space

Source: PM--144 ÷ PM--2
Units: Percentage
Range: 0.00 - 100%

	Large	Medium	Small	Total	Results of Significance Tests	
High	59%	81%	81%	73%	P.G.	n.s.
Low	62%	77%	88%	76%	Size	1%
Total	61%	79%	84%	75%	P.G. x S.	n.s.

051--Average number of bedrooms per units

Source: HH--46
Units: Number of bedrooms per unit Range: .55 - 3.27

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.95	2.03	1.96	1.98	P.G.	5%
Low	2.08	2.18	2.14	2.13	Size	n.s.
Total	2.02	2.11	2.06	2.06	P.G. x S.	n.s.

052--Resident perception of having enough bedrooms

Source: HH--47
Units: 1 = enough; 0 = not enough Range: .61 - 1.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	.84	.84	.91	.86	P.G.	1%
Low	.78	.83	.85	.82	Size	1%
Total	.81	.84	.88	.84	P.G. x S.	n.s.

053--Resident perception of having enough plumbing for personal hygiene

Source: HH--67-70
Units: 1 = enough; 0 = not enough Range: .67 - 1.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	.88	.89	.90	.89	P.G.	5%
Low	.85	.85	.87	.86	Size	n.s.
Total	.86	.87	.88	.87	P.G. x S.	n.s.

054--Management problems attributed to design of project

Source: PM--53,55,57,59
Units: Number of problems Range: 0.00 - 3.77

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.90	1.44	1.01	1.46	P.G.	5%
Low	2.41	1.82	1.32	1.84	Size	1%
Total	2.16	1.64	1.18	1.66	P.G. x S.	n.s.

055--Manager satisfaction with quality of materials, equipment and workmanship used in construction of project

Source: PM--50-52
Units: 3 = very satis.; 0 = very dissatis. Range: .67 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	2.12	2.53	2.39	2.34	P.G.	n.s.
Low	2.21	2.10	2.24	2.18	Size	n.s.
Total	2.17	2.30	2.30	2.26	P.G. x S.	n.s.

056--Manager evaluation that litter and pests from the surrounding neighborhood are <u>not</u> a problem

Source: PM--174,175
Units: 3 = no problem; 0 = big problem Range: .66 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.77	2.39	2.41	2.18	P.G.	n.s.
Low	1.76	1.94	2.59	2.11	Size	1%
Total	1.76	2.15	2.51	2.14	P.G. x S.	5%

057--Manager evaluation that the surrounding neighborhood does <u>not</u> cause management problems

Source: PM--326
Units: 3 = no problem; 0 = big problem Range: .66 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	2.09	2.52	2.56	2.39	P.G.	n.s.
Low	1.94	2.36	2.75	2.36	Size	1%
Total	2.01	2.44	2.67	2.37	P.G. x S.	n.s.

058--Number of abandoned cars moved off site by management last year

Source: PM--321
Units: Number of cars Range: 0.00 - 44.75

	Large	Medium	Small	Total	Results of Significance Tests	
High	14.19	4.68	1.61	6.92	P.G.	5%
Low	19.09	8.43	2.69	9.81	Size	1%
Total	16.71	6.65	2.20	8.45	P.G. x S.	n.s.

059--Resident perception that junk and abandoned cars are a problem

Source: HH--192,193
Units: 1 = no problem; 0 = problem Range: 0.00 - .77

	Large	Medium	Small	Total	Results of Significance Tests	
High	.32	.21	.13	.22	P.G.	1%
Low	.43	.29	.19	.30	Size	1%
Total	.37	.25	.16	.26	P.G. x S.	n.s.

060--Resident evaluation that neighborhood has recently gotten better or worse

Source: HH-194
Units: 2 = better; 0 = worse Range: .43 - 1.56

	Large	Medium	Small	Total	Results of Significance Tests	
High	.99	1.12	1.20	1.10	P.G.	1%
Low	.77	.99	1.06	.95	Size	1%
Total	.88	1.05	1.12	1.02	P.G. x S.	n.s.

061 --Resident evaluation of neighborhood social and recreational services

Source: HH--162-164,181,189,190
Units: 1 = good; 0 = poor
Range: .09 - .79

	Large	Medium	Small	Total	Results of Significance Tests	
High	.55	.54	.57	.55	P.G.	5%
Low	.51	.45	.49	.48	Size	n.s.
Total	.53	.49	.53	.52	P.G. x S.	n.s.

062 --Resident evaluation of medical services

Source: HH--176,188
Units: 1 = good; 0 = poor
Range: .39 - .95

	Large	Medium	Small	Total	Results of Significance Tests	
High	.76	.77	.80	.78	P.G.	n.s.
Low	.73	.72	.80	.75	Size	5%
Total	.74	.74	.80	.76	P.G. x S.	n.s.

063--Resident evaluation of neighborhood municipal services

Source: HH--173,174,177,178,182-187
Units: 1 = good; 0 = poor
Range: .28 - .99

	Large	Medium	Small	Total	Results of Significance Tests	
High	.75	.79	.83	.79	P.G.	1%
Low	.68	.69	.80	.72	Size	1%
Total	.72	.73	.81	.75	P.G. x S.	n.s.

064--Manager evaluation of neighborhood municipal services

Source: PM--328-330,333
Units: 3 = very good; 0 = very poor
Range: 1.07 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	2.17	2.29	2.28	2.25	P.G.	n.s.
Low	2.10	2.24	2.20	2.18	Size	n.s.
Total	2.14	2.27	2.24	2.21	P.G. x S.	n.s.

065--Number of new public housing units needed to meet the needs of low-income population in community

Source: BC--9; ED--148
Units: Number of units
Range: 0 - 82,500

	Large	Medium	Small	Total	Results of Significance Tests	
High	8,494	534	201	3,030	P.G.	n.s.
Low	5,434	458	184	1,942	Size	1%
Total	6,883	494	192	2,449	P.G. x S.	n.s.

066--Number of new public housing applicants last year

Source: ED--210
Units: Number of applicants
Range: 25 - 8,500

	Large	Medium	Small	Total	Results of Significance Tests	
High	2,054	580	233	983	P.G.	n.s.
Low	2,749	687	278	1,164	Size	1%
Total	2,401	638	230	1,079	P.G. x S.	n.s.

067--Civil service laws and political pressure are not a problem in controlling Authority staff

Source: BC--50,51; ED--82
Units: 3 = no problem; 0 = big problem
Range: 0.00 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	2.57	2.46	2.85	2.62	P.G.	n.s.
Low	2.22	2.75	2.83	2.61	Size	1%
Total	2.39	2.61	2.84	2.61	P.G. x S.	n.s.

068--Average earnings per month of city employees

Source: Records
Units: Dollars
Range: $436.50 - $867.50

	Large	Medium	Small	Total	Results of Significance Tests	
High	$617.64	$648.93	$653.75	$628.43	P.G.	n.s.
Low	647.26	596.04	612.33	624.22	Size	n.s.
Total	632.85	614.55	622.69	625.97	P.G. x S.	n.s.

069--Central city or suburb

Source: Records
Units: 2 = suburban; 0 = city
Range: 0 - 2

	Large	Medium	Small	Total	Results of Significance Tests	
High	.16	.37	.22	.25	P.G.	n.s.
Low	.25	.33	.45	.35	Size	n.s.
Total	.21	.35	.35	.30	P.G. x S.	n.s.

070--SMSA or Non-SMSA

Source: U.S. Census
Units: 1 = non-SMSA; 0 = SMSA
Range: 0 - 1

	Large	Medium	Small	Total	Results of Significance Tests	
High	0	.47	.89	.45	P.G.	5%
Low	0	.29	.64	.32	Size	1%
Total	0	.38	.75	.38	P.G. x S.	n.s.

071--Population

Source: Records
Units: Population (in thousands) Range: 2 - 11,572

	Large	Medium	Small	Total	Results of Significance Tests	
High	882.95	774.63	676.83	779.95	P.G.	n.s.
Low	1629.45	572.05	184.23	772.30	Size	n.s.
Total	1265.77	668.27	405.90	775.90	P.G. x S.	n.s.

072--HUD Region

Source: I,II,III,IX=2; V,VII,VIII,X=1;IV,VI=0
Units: 2 = I,II,III,IX; 1 = V,VII,VIII,X; 0 = IV,VI Range: 0 - 2

	Large	Medium	Small	Total	Results of Significance Tests	
High	.84	.95	.61	.80	P.G.	n.s.
Low	1.35	1.00	.91	1.08	Size	n.s.
Total	1.10	.97	.77	.95	P.G. x S.	n.s.

073--Average January temperature

Source: Records
Units: Degrees Fahrenheit (Average of '70 & '71) Range: 1.5° - 73°

	Large	Medium	Small	Total	Results of Significance Tests	
High	35.00	31.55	32.58	33.05	P.G.	n.s.
Low	32.92	33.31	33.61	33.29	Size	n.s.
Total	33.94	32.47	33.15	33.18	P.G. x S.	n.s.

074--Time of submission of HUD Form 52599

Source: HUD Records
Units: Quarterly periods from 1970 (Av. of '70 & '71) Range: June 1971-Dec. 1972

	Large	Medium	Small	Total	Results of Significance Tests	
High	1971.24	1971.16	1971.14	1971.18	P.G.	n.s.
Low	1971.07	1971.12	1971.02	1971.07	Size	n.s.
Total	1971.15	1971.14	1971.08	1971.12	P.G. x S.	n.s.

075--Dwelling rental

Source: 3110*
Units: Dollars PUM (Average of '70 & '71) Range: $24.68 - $80.74

	Large	Medium	Small	Total	Results of Significance Tests	
High	$47.66	$47.35	$40.97	$45.40	P.G.	n.s.
Low	52.64	47.38	42.84	47.47	Size	1%
Total	50.22	47.37	42.00	46.50	P.G. x S.	n.s.

* Account Number on HUD Form 52599

076--Total operating receipts exclusive of HUD contributions

Source: 3110-3190; 3610-3690*
Units: Dollars PUM (Average of '70 & '71) Range: $26.97 - $84.22

	Large	Medium	Small	Total	Results of Significance Tests	
High	$51.12	$50.09	$43.98	$48.48	P.G.	n.s.
Low	55.86	50.63	45.84	50.62	Size	1%
Total	53.55	50.37	45.00	49.61	P.G. x S.	n.s.

077--Contributions earned for special subsidy, families, rental assistance, and existing operating deficit (includes operational subsidies)

Source: 8015,8020,8025*
Units: Dollars PUM (Average '70 & '71) Range: 0.00 - $28.75

	Large	Medium	Small	Total	Results of Significance Tests	
High	$ 7.22	$2.09	$ .63	$3.36	P.G.	1%
Low	12.91	3.01	.82	5.39	Size	1%
Total	10.14	2.57	.73	4.43	P.G. x S.	5%

078--Non-Technical salaries

Source: 4110*
Units: Dollars PUM (Average of '70 & '71) Range: 0.00 - $13.59

	Large	Medium	Small	Total	Results of Significance Tests	
High	$7.59	$6.18	$5.95	$6.59	P.G.	n.s.
Low	8.90	6.49	6.42	7.23	Size	1%
Total	8.26	6.34	6.21	6.93	P.G. x S.	n.s.

079--Technical salaries

Source: 4120*
Units: Dollars PUM (Average of '70 & '71) Range: 0.00 - $2.60

	Large	Medium	Small	Total	Results of Significance Tests	
High	$ .63	$ .28	$ 0.00	$ .31	P.G.	n.s.
Low	.59	.59	.03	.39	Size	1%
Total	.61	.45	.02	.35	P.G. x S.	n.s.

080--Total administration expenses

Source: 4110-4190*
Units: Dollars PUM (Average of '70 &'71) Range: $4.88 - $17.22

	Large	Medium	Small	Total	Results of Significance Tests	
High	$ 9.91	$ 8.00	$ 7.27	$ 8.41	P.G.	n.s.
Low	11.18	8.36	7.82	9.07	Size	1%
Total	10.56	8.19	7.57	8.76	P.G. x S.	n.s.

* Account Number on HUD Form 52599

081--Total tenant services expense

Source: 4210-4230*
Units: Dollars PUM (1971 only) Range: 0.00 - $3.23

	Large	Medium	Small	Total	Results of Significance Tests	
High	$ .88	$ .18	$ .06	$ .40	P.G.	n.s.
Low	.63	.50	.19	.43	Size	1%
Total	.76	.36	.13	.42	P.G. x S.	n.s.

082--Labor - Utilities

Source: 4350*
Units: Dollars PUM (Average of '70 & '71) Range: 0.00 - $7.18

	Large	Medium	Small	Total	Results of Significance Tests	
High	$ .70	$ .26	$ .06	$ .34	P.G.	5%
Low	1.26	.75	.23	.73	Size	1%
Total	.99	.52	.16	.55	P.G. x S.	n.s.

083--Total utilities expense

Source: 4310-4390*
Units: Dollars PUM (Average of '70 & '71) Range: $.66 - $26.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	$14.12	$15.38	$12.37	$13.98	P.G.	n.s.
Low	15.84	13.33	11.47	13.48	Size	5%
Total	15.00	14.31	11.87	13.72	P.G. x S.	n.s.

084--Labor, ordinary maintenance and operation

Source: 4410*
Units: Dollars PUM Range: $4.27 - $29.76

	Large	Medium	Small	Total	Results of Significance Tests	
High	$13.07	$8.92	$7.11	$ 9.75	P.G.	1%
Low	17.33	10.08	8.04	11.67	Size	1%
Total	15.25	9.53	7.62	10.76	P.G. x S.	n.s.

085--Total ordinary maintenance and operation

Source: 4410-4430*
Units: Dollars PUM Range: $7.56 - $48.04

	Large	Medium	Small	Total	Results of Significance Tests	
High	$ 19.09	$ 13.80	$ 11.48	$ 14.85	P.G.	1%
Low	25.07	15.50	13.00	17.66	Size	1%
Total	22.16	14.69	12.31	16.34	P.G. x S.	n.s.

* Account Number on HUD Form 52599

086--Employee benefit contributions

Source: 4540*
Units: Dollars PUM
Range: $.44 - $8.88

	Large	Medium	Small	Total	Results of Significance Tests	
High	$ 2.90	$ 1.82	$ 1.23	$ 2.00	P.G.	5%
Low	3.59	2.29	1.66	2.48	Size	1%
Total	3.25	2.07	1.46	2.25	P.G. x S.	n.s.

087--Total general expense

Source: 4510-4590*
Units: Dollars PUM
Range: $2.79 - $17.11

	Large	Medium	Small	Total	Results of Significance Tests	
High	$7.71	$6.24	$5.69	$6.56	P.G.	5%
Low	9.16	7.87	6.15	7.68	Size	1%
Total	8.45	7.09	5.95	7.15	P.G. x S.	n.s.

088--Total routine expense less utilities

Source: 4110-4190, 4350, 4410-4590*
Units: Dollars PUM
Range: $16.87 - $84.03

	Large	Medium	Small	Total	Results of Significance Tests	
High	$ 37.83	$ 28.38	$ 24.53	$ 30.35	P.G.	1%
Low	46.95	32.72	27.40	35.38	Size	1%
Total	42.51	30.66	26.11	33.01	P.G. x S.	n.s.

089--Total routine expense

Source: 4110-4590*
Units: Dollars PUM
Range: $20.18 - $100.76

	Large	Medium	Small	Total	Results of Significance Tests	
High	$ 51.25	$ 43.51	$ 36.83	$ 43.99	P.G.	5%
Low	61.53	45.30	38.63	48.12	Size	1%
Total	56.52	44.45	37.82	46.18	P.G. x S.	n.s.

090--Total operating expenditures

Source: 4110-7560
Units: Dollars PUM
Range: $20.99 - $103.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	$ 56.19	$ 48.46	$ 39.07	$ 48.06	P.G.	5%
Low	66.76	51.80	43.45	53.64	Size	1%
Total	61.61	50.21	41.48	51.01	P.G. x S.	n.s.

* Account Number on HUD Form 52599

091--Helpfulness of HUD Area Office in solving problems

Source: ED--47; CO--29
Units: 3 = very helpful; 0 = not at all help. Range: .50 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.96	2.41	2.50	2.28	P.G.	n.s.
Low	1.88	2.27	2.18	2.12	Size	1%
Total	1.92	2.33	2.32	2.20	P.G. x S.	n.s.

092--Belief that number of HUD Area Office Staff devoted to public housing matters should be increased

Source: ED--52; CO--28
Units: 2 = increased; 0 = decreased Range: .33 - 2.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.21	1.44	1.29	1.31	P.G.	n.s.
Low	1.26	1.33	1.25	1.28	Size	n.s.
Total	1.23	1.38	1.27	1.30	P.G. x S.	n.s.

093--Support given by HUD Area Office to Authority

Source: BC--8
Units: 3 = a lot; 0 = none at all Range: 0.00 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	2.33	2.50	2.28	2.37	P.G.	n.s.
Low	2.16	2.16	2.05	2.12	Size	n.s.
Total	2.24	2.32	2.15	2.24	P.G. x S.	n.s.

094--Proportion of projects which have received Modernization funds

Source: PM--7
Units: Percentage Range: 0 - 100%

	Large	Medium	Small	Total	Results of Significance Tests	
High	52%	41%	8%	34%	P.G.	5%
Low	66%	43%	40%	50%	Size	1%
Total	59%	42%	26%	42%	P.G. x S.	n.s.

095--HUD's involvement in making policy decisions

Source: BC--49; ED--61
Units: 3 = a lot; 0 - none at all Range: 0.00 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.82	2.18	2.33	2.11	P.G.	n.s.
Low	2.05	2.10	2.20	2.12	Size	n.s.
Total	1.94	2.14	2.26	2.11	P.G. x S.	n.s.

096--Involvement of HUD with specific Authority decisions

Source: BC--52+53+54+55+56+57
Units: Number of areas of involvement Range: 0 - 6

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.37	1.26	1.67	1.43	P.G.	n.s.
Low	1.89	1.81	1.76	1.82	Size	n.s.
Total	1.63	1.55	1.72	1.63	P.G. x S.	n.s.

097--Number of times HUD or Area Office personnel visited project in last two years
Source: PM--119
Units: Number of visits Range: 0 - 9

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.94	3.23	2.18	2.44	P.G.	n.s.
Low	1.95	2.61	3.37	2.65	Size	n.s.
Total	1.95	2.90	2.83	2.55	P.G. x S.	n.s.

098--Flexibility Executive Director feels he has under HUD regulations

Source: ED--87
Units: 3 = a lot; 0 = none at all Range: 0.00 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.79	2.21	2.11	2.04	P.G.	n.s.
Low	1.75	1.76	2.18	1.90	Size	n.s.
Total	1.77	1.97	2.15	1.97	P.G. x S.	n.s.

099--Extent manager feels he is restricted by HUD regulations

Source: PM-110
Units: 3 = a lot; 0 = none at all Range: 0.00 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.24	1.25	1.07	1.19	P.G.	n.s.
Low	1.39	1.31	.77	1.15	Size	5%
Total	1.32	1.28	.91	1.17	P.G. x S.	n.s.

100--Number of social services provided by other agencies to public housing residents

Source: ED--128-135
Units: Number of services Range: 0 - 8

	Large	Medium	Small	Total	Results of Significance Tests	
High	6.47	4.21	4.22	4.98	P.G.	n.s.
Low	6.35	5.24	3.86	5.11	Size	1%
Total	6.41	4.75	4.02	5.05	P.G. x S.	n.s.

101--Management's evaluation of adequacy of social services offered tenants by outside agencies

Source: ED--137
Units: 3 = very adequate; 0 = very inadequate Range: 0.00 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.44	1.75	2.00	1.71	P.G.	n.s.
Low	1.26	1.94	2.13	1.75	Size	1%
Total	1.35	1.85	2.07	1.73	P.G. x S.	n.s

102--Support given by local service agencies to Authority

Source: BC--7
Units: 3 = a lot; 0 = none at all Range: 0.00 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.56	1.44	1.65	1.55	P.G.	n.s.
Low	1.44	1.38	1.25	1.36	Size	n.s.
Total	1.50	1.41	1.43	1.45	P.G. x S.	n.s.

103--Amount of services provided on project property by local government

Source: ED--140-143
Units: 12 = 4 services provided to all projects; 0 = no services Range: 0.00 - 12.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	8.16	7.58	8.72	8.14	P.G.	1%
Low	5.53	5.33	7.64	6.21	Size	5%
Total	6.84	6.40	8.13	7.13	P.G. x S.	n.s.

104--Central Office's involvement with local government agencies

Source: ED--39a
Units: 3 = a lot; 0 = none at all Range: 0.00 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	3.00	2.79	2.82	2.87	P.G.	n.s.
Low	2.85	2.90	2.82	2.86	Size	n.s.
Total	2.92	2.85	2.82	2.86	P.G. x S.	n.s.

105--Local elected officials' involvement in making policy decisions

Source: BC--48; ED--60
Units: 3 = a lot; 0 = none at all Range: 0.00 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.58	1.16	1.19	1.31	P.G.	n.s.
Low	1.57	1.14	1.20	1.30	Size	5%
Total	1.58	1.15	1.20	1.31	P.G. x S.	n.s.

106--Support given by local elected officials

Source: BC--6
Units: 3 = a lot; 0 = none at all
Range: 0.00 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	2.32	2.53	2.44	2.43	P.G.	5%
Low	2.11	2.24	2.10	2.15	Size	n.s.
Total	2.21	2.38	2.26	2.28	P.G. x S.	n.s.

107--Special interest groups involvement in making policy decisions

Source: BC--47; ED--59
Units: 3 = a lot; 0 = none at all
Range: 0.00 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.16	1.11	.64	.97	P.G.	n.s.
Low	1.32	1.00	.73	1.01	Size	1%
Total	1.24	1.05	.69	.99	P.G. x S.	n.s.

108--Outside pressure groups are <u>not</u> a problem

Source: ED--83
Units: 3 = no problem; 0 = big problem
Range: 0.00 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	2.16	2.47	2.61	2.41	P.G.	n.s.
Low	1.95	2.33	2.55	2.29	Size	5%
Total	2.05	2.40	2.57	2.34	P.G. x S.	n.s.

109--Support given by local newspapers and other media

Source: BC--5; ED--32
Units: 3 = a lot; 0 = none at all
Range: 0.00 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.89	2.18	1.89	1.99	P.G.	n.s.
Low	1.75	1.95	1.73	1.81	Size	n.s.
Total	1.82	2.06	1.80	1.89	P.G. x S.	n.s.

110--Number of steps taken to improve community's acceptance of public hsng.

Source: ED--147
Units: Number of Steps
Range: 0 - 4

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.16	1.32	1.28	1.25	P.G.	n.s.
Low	2.50	1.29	.95	1.56	Size	5%
Total	1.85	1.30	1.10	1.41	P.G. x S.	1%

111--Authority is part of an agency that has responsibility for programs other than public housing

Source: ED--1
Units: 1 = yes; 0 = no
Range: 0 - 1

	Large	Medium	Small	Total	Results of Significance Tests	
High	.26	.37	.11	.25	P.G.	n.s.
Low	.35	.19	.14	.22	Size	n.s.
Total	.31	.27	.13	.24	P.G. x S.	n.s.

112--Number of management districts or areas in Authority

Source: ED--7
Units: Number of Districts
Range: 0 - 14

	Large	Medium	Small	Total	Results of Significance Tests	
High	.89	0.00	0.00	.33	P.G.	n.s.
Low	1.25	.05	.38	.57	Size	5%
Total	1.08	.03	.21	.46	P.G. x S.	n.s.

113--Number of unions involved with Authority

Source: ED--77
Units: Number of unions
Range: 0 - 9

	Large	Medium	Small	Total	Results of Significance Tests	
High	.67	.35	0.00	.34	P.G.	5%
Low	2.40	.42	.05	.93	Size	1%
Total	1.58	.39	.02	.66	P.G. x S.	1%

114--Maintenance organized on individual project basis

Source: ED--8
Units: 1 = yes; 0 = no
Range: 0 - 1

	Large	Medium	Small	Total	Results of Significance Tests	
High	.78	.37	.11	.42	P.G.	n.s.
Low	.60	.33	.19	.37	Size	1%
Total	.68	.35	.15	.39	P.G. x S.	n.s.

115--Number of units managed by manager

Source: PM--12
Units: Number of units
Range: 40 - 1668.67

	Large	Medium	Small	Total	Results of Significance Tests	
High	626	453	250	447	P.G.	n.s.
Low	581	415	256	412	Size	1%
Total	603	433	253	428	P.G. x S.	n.s.

116--Number of projects managed by managers

Source: PM--11
Units: Number of projects
Range: 1 - 20

	Large	Medium	Small	Total	Results of Significance Tests	
High	3.09	5.14	4.29	4.17	P.G.	n.s.
Low	2.16	3.64	3.64	3.17	Size	n.s.
Total	2.61	4.35	3.94	3.64	P.G. x S.	n.s.

117--Number of units per employee at project level

Source: PM--2÷ (PM--15 + PM--19 x PM--20/40)
Units: Number of units
Range: 15.00 - 166.67

	Large	Medium	Small	Total	Results of Significance Tests	
High	39.60	54.64	58.12	50.59	P.G.	n.s.
Low	41.52	59.51	56.43	52.60	Size	1%
Total	40.59	57.26	57.23	51.65	P.G. x S.	n.s.

118--Number of units per full time Authority employee

Source: Variable 044 ÷ ED--275
Units: Number of units
Range: 10.46 - 64.80

	Large	Medium	Small	Total	Results of Significance Tests	
High	22.19	32.02	37.02	30.48	P.G.	n.s.
Low	21.12	29.52	35.45	28.65	Size	1%
Total	21.63	30.89	36.19	29.55	P.G. x S.	n.s.

119--Percent of full-time Central Office staff to full-time Authority staff

Source: ED--277 ÷ ED--275
Units: Percentage
Range: 7.3% - 100%

	Large	Medium	Small	Total	Results of Significance Tests	
High	23%	34%	66%	41%	P.G.	5%
Low	26%	52%	79%	52%	Size	1%
Total	25%	42%	73%	47%	P.G. x S.	n.s.

120--Amt. of equipment & supplies ordered thru a central purchasing procedure

Source: ED--20
Units: 3 = all; 0 = none
Range: 0.00 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	2.84	2.79	2.78	2.80	P.G.	n.s.
Low	2.90	2.67	2.86	2.81	Size	n.s.
Total	2.87	2.72	2.82	2.81	P.G. x S.	n.s.

121--Executive Directors' estimate of upper limit of dollars he can spend without specific approval

Source: ED--21
Units: Dollars
Range: 0 - $99,999

	Large	Medium	Small	Total	Results of Significance Tests	
High	$ 7,255	$ 1,769	$13,733	$ 7,573	P.G.	n.s.
Low	15,963	11,235	6,021	10,990	Size	n.s.
Total	11,727	7,028	9,449	9,422	P.G. x S.	n.s.

122--Proportion of Authority staff who are members of a union

Source: PM--364; CO--9; PS--5
Units: Percentage
Range: 0 - 100%

	Large	Medium	Small	Total	Results of Significance Tests	
High	14%	11%	2%	9%	P.G.	n.s.
Low	24%	12%	5%	13%	Size	1%
Total	19%	11%	4%	11%	P.G. x S.	n.s.

123--Proportion of Authority staff who are tenants of public housing projects

Source: ED--282
Units: Percentage
Range: 0 - 50.0%

	Large	Medium	Small	Total	Results of Significance Tests	
High	10%	17%	18%	15%	P.G.	n.s.
Low	14%	18%	17%	16%	Size	n.s.
Total	12%	17%	17%	16%	P.G. x S.	n.s.

124--Proportion of project managers who are members of a minority group

Source: PM--374
Units: Percentage
Range: 0 - 100%

	Large	Medium	Small	Total	Results of Significance Tests	
High	54%	34%	3%	31%	P.G.	n.s.
Low	61%	40%	16%	38%	Size	1%
Total	57%	37%	10%	35%	P.G. x S.	n.s.

125--Proportion of Board Commissioners who are members of a minority group

Source: BC--(67 + 74) ÷ BC--63
Units: Percentage
Range: 0 - 100%

	Large	Medium	Small	Total	Results of Significance Tests	
High	31%	14%	11%	19%	P.G.	n.s.
Low	33%	19%	19%	23%	Size	1%
Total	32%	16%	15%	21%	P.G. x S.	n.s.

126--Proportion of managers who have received housing management training in the last two years

Source: PM--365
Units: Percentage
Range: 0 - 100%

	Large	Medium	Small	Total	Results of Significance Tests	
High	66%	63%	72%	67%	P.G.	n.s.
Low	62%	56%	52%	57%	Size	n.s.
Total	64%	59%	61%	62%	P.G. x S.	n.s.

127--Executive Director has attended training courses in last two years

Source: ED--166
Units: 1 = yes; 0 = no
Range: 0 -1

	Large	Medium	Small	Total	Results of Significance Tests	
High	.68	.95	.67	.77	P.G.	n.s.
Low	.65	.71	.64	.67	Size	n.s.
Total	.67	.82	.65	.71	P.G. x S.	n.s.

128--Executive Director's annual salary

Source: ED--172
Units: Dollars
Range: $4,500 - $39,650

	Large	Medium	Small	Total	Results of Significance Tests	
High	$24,884	$18,112	$11,535	$18,296	P.G.	n.s.
Low	28,157	17,100	10,869	18,456	Size	1%
Total	26,563	17,593	11,169	18,380	P.G. x S.	n.s.

129--Perceived competitiveness of Authority salaries and other benefits

Source: ED--167; CO--39; PM--356; PS--56
Units: 2 = higher; 0 = lower
Range: 0.00 - 1.21

	Large	Medium	Small	Total	Results of Significance Tests	
High	.83	.80	.72	.78	P.G.	n.s.
Low	.80	.74	.63	.72	Size	5%
Total	.81	.77	.67	.75	P.G. x S.	n.s.

130--Perceived likelihood of getting an increase in salary for doing a good job

Source: ED--168, CO--35a; PM--345; PS--44
Units: 3 = very likely; 0 = very unlikely
Range: 0.00 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.49	1.90	2.04	1.81	P.G.	5%
Low	1.45	1.71	1.55	1.57	Size	5%
Total	1.47	1.80	1.77	1.68	P.G. x S.	n.s.

131--Likelihood of receiving other rewards besides salary

Source: PM--346-351; PS--43,45-49; CO--35b-g
Units: 3 = very likely; 0 = very unlikely Range: .88 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.90	1.92	2.07	1.96	P.G.	n.s.
Low	1.91	1.99	1.96	1.95	Size	n.s.
Total	1.91	1.96	2.01	1.96	P.G. x S.	n.s.

132--Number of fringe benefits to employees

Source: ED--289-292
Units: Number of benefits Range: 0 - 4

	Large	Medium	Small	Total	Results of Significance Tests	
High	3.16	3.26	2.11	2.86	P.G.	n.s.
Low	3.60	3.05	2.59	3.06	Size	1%
Total	3.38	3.15	2.38	2.97	P.G. x S.	n.s.

133--Difficulty of hiring and keeping good Authority employees

Source: ED--187; PM--36,38
Units: 3 = very easy; 0 = very difficult Range: 0.00 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.78	2.08	1.55	1.81	P.G.	n.s.
Low	1.59	1.73	1.98	1.77	Size	n.s.
Total	1.68	1.90	1.79	1.79	P.G. x S.	n.s.

134--Supervisors do not understand the problems of Auth. staff members

Source: PM--122; CO--36e; PS--42
Units: 3 = agr. strongly; 0 = disagr. strongly Range: 0.00 - 2.18

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.08	.98	.75	.94	P.G.	n.s.
Low	1.10	.90	.40	.80	Size	1%
Total	1.09	.94	.56	.86	P.G. x S.	n.s.

135--Supervisor supports staff; supervisor asks staff for opinions

Source: PM--124,125; CO--36b,c; PS--39
Units: 3 = agr. strongly; 0 = disagr. strongly Range: 1.11 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	2.41	2.40	2.59	2.46	P.G.	n.s.
Low	2.38	2.40	2.69	2.49	Size	1%
Total	2.39	2.40	2.65	2.48	P.G. x S.	n.s.

136--During the last year, number of times supervisor evaluated work and reviewed performance

Source: PM--344; PS--50; CO--33
Units: Number of times
Range: 0.00 - 7.25

	Large	Medium	Small	Total	Results of Significance Tests	
High	2.45	2.80	2.61	2.62	P.G.	n.s.
Low	2.34	3.23	2.95	2.85	Size	n.s.
Total	2.40	3.03	2.80	2.74	P.G. x S.	n.s.

137--Amount of influence Authority staff has on decisions of superiors

Source: ED--86; CO--37; PM--109; PS--51
Units: 3 = a lot; 0 = none at all
Range: 1.00 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	2.04	2.07	2.33	2.14	P.G.	n.s.
Low	1.92	2.02	2.24	2.07	Size	1%
Total	1.98	2.04	2.28	2.10	P.G. x S.	n.s.

138--Authority staff feels supervisor works with them as a team

Source: PM--127; CO--36a; PS--40
Units: 3 = agr. strongly; 0 = disagr. strongly
Range: 1.00 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	2.39	2.57	2.62	2.53	P.G.	n.s.
Low	2.42	2.49	2.67	2.53	Size	5%
Total	2.41	2.53	2.65	2.53	P.G. x S.	n.s.

139-- Speed of getting answer on policy matters from supervisor

Source: PM--116
Units: 3 = very quickly; 0 = very slowly
Range: .67 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	2.21	2.54	2.81	2.40	P.G.	n.s.
Low	2.19	2.39	2.71	2.35	Size	1%
Total	2.20	2.46	2.75	2.37	P.G. x S.	n.s.

140--Evaluation of Executive Director's effectiveness by Board Chairman

Source: BC--35-41
Units: 3 = very effective; 0 = very ineff.
Range: .57 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	2.68	2.80	2.60	2.70	P.G.	n.s.
Low	2.57	2.67	2.68	2.65	Size	n.s.
Total	2.63	2.74	2.65	2.67	P.G. x S.	n.s.

141--Executive Director's time spent in dealing with HUD personnel

Source: ED--42
Units: 2 = most time; 0 = least time
Range: 0.00 - 2.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.06	.89	.78	.91	P.G.	n.s.
Low	.95	.33	.64	.63	Size	n.s.
Total	1.00	.60	.70	.76	P.G. x S.	n.s.

142--Exec. Director's time spent with Auth. Board and local officials

Source: Ed--43
Units: 2 = most time; 0 = least time
Range: 0.00 - 2.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.28	1.11	1.28	1.22	P.G.	n.s.
Low	1.30	1.29	1.23	1.27	Size	n.s.
Total	1.29	1.20	1.25	1.25	P.G. x S.	n.s.

143--Executive Director's time spent in meetings with community and citizen groups

Source: ED--46
Units: 2 = most time; 0 = least time
Range: 0.00 - 2.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	.72	.74	.39	.62	P.G.	n.s.
Low	.55	.67	.45	.56	Size	n.s.
Total	.63	.70	.42	.58	P.G. x S.	n.s.

144--Executive Director's time spent in dealing with tenants/tenant organizations

Source: ED--40
Units: 2 = most time; 0 = least time
Range: 0.00 - 2.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	.94	1.37	1.56	1.29	P.G.	n.s.
Low	1.05	1.43	1.36	1.29	Size	5%
Total	1.00	1.40	1.45	1.29	P.G. x S.	n.s.

145--Executive Director's time spent in field inspections and with project staff

Source: ED--45
Units: 2 = most time; 0 = least time
Range: 0.00 - 2.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	.89	1.05	.83	.93	P.G.	n.s.
Low	.65	1.05	1.23	.98	Size	n.s.
Total	.76	1.05	1.05	.96	P.G. x S.	n.s.

146--Executive Director time spent in budgeting and paper work

Source: ED--44
Units: 2 = most time; 0 = least time Range: 0.00 - 2.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	.89	1.05	1.44	1.13	P.G.	n.s.
Low	1.05	1.29	1.55	1.30	Size	5%
Total	.97	1.17	1.50	1.22	P.G. x S.	n.s.

147--Manager's time spent in dealing with tenants

Source: PM--94
Units: 2 = most time; 0 = least time Range: 0.00 - 2.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.66	1.45	1.31	1.48	P.G.	n.s.
Low	1.67	1.49	1.31	1.49	Size	1%
Total	1.66	1.47	1.31	1.48	P.G. x S.	n.s.

148--Manager's time spent in organizing and providing social services

Source: PM--93
Units: 2 = most time; 0 = least time Range: 0.00 - 2.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	.61	.66	.47	.58	P.G.	n.s.
Low	.63	.73	.27	.54	Size	1%
Total	.62	.70	.36	.56	P.G. x S.	n.s.

149--Manager's time spent in cleaning, maintenance, and inspecting grounds and units

Source: PM--88,89,90
Units: 5 = most time; 0 = least time Range: .50 - 5.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	2.07	2.08	2.35	2.17	P.G.	n.s.
Low	2.06	1.96	2.54	2.19	Size	n.s.
Total	2.07	2.02	2.45	2.18	P.G. x S.	n.s.

150--Manager's time spent in collecting rents and paper work

Source: PM--91,92
Units: 4 = most time; 0 = least time Range: 0.00 - 4.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	2.59	2.80	2.85	2.74	P.G.	n.s.
Low	2.65	2.80	2.79	2.75	Size	n.s.
Total	2.62	2.80	2.81	2.75	P.G. x S.	n.s.

151--The organizational structure of the Authority needs to be modified to make it more efficient

Source: ED--181
Units: 3 = agr. strongly; 0 = disagr. strongly Range: 0.00 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.22	.79	.72	.91	P.G.	5%
Low	1.40	1.29	1.50	1.40	Size	n.s.
Total	1.32	1.05	1.15	1.17	P.G. x S.	n.s.

152--Additional leased housing would be more successful than conventional public housing

Source: ED--149
Units: 1 = yes; 0 = no Range: 0.0 - 1.0

	Large	Medium	Small	Total	Results of Significance Tests	
High	.36	.28	.11	.24	P.G.	n.s.
Low	.24	.45	.20	.30	Size	n.s.
Total	.29	.37	.16	.27	P.G. x S.	n.s.

153--More services need to be supplied by Authority

Source: ED--124; PM--284
Units: 1 = yes; 0 = no Range: 0.0 - 1.0

	Large	Medium	Small	Total	Results of Significance Tests	
High	.58	.56	.53	.56	P.G.	n.s.
Low	.73	.62	.63	.66	Size	n.s.
Total	.66	.59	.58	.61	P.G. x S.	n.s.

154--More services need to be supplied by ouside agencies

Source: ED--138; PM--298
Units: 1 = yes; 0 = no Range: 0.0 - 1.0

	Large	Medium	Small	Total	Results of Significance Tests	
High	.60	.44	.49	.51	P.G.	n.s.
Low	.67	.44	.38	.50	Size	5%
Total	.64	.44	.43	.50	P.G. x S.	n.s.

155--The manager has to have enough authority to run his project in his own way.

Source: PM--120
Units: 3 = agr. strongly; 0 = disagr. strongly Range: 0.00 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	2.51	2.49	2.35	2.46	P.G.	n.s.
Low	2.53	2.36	2.43	2.44	Size	n.s.
Total	2.52	2.42	2.39	2.45	P.G. x S.	n.s.

156--Project manager's satisfaction with Authority's eviction policy

Source: PM--250
Units: 3 = very satis.; 0 = very dissatis. Range: 0.00 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.53	1.88	1.99	1.79	P.G.	n.s.
Low	1.24	1.32	1.86	1.49	Size	5%
Total	1.38	1.59	1.92	1.63	P.G. x S.	n.s.

157--Executive Director's agreement that problem families ought to be kept out of public housing

Source: ED--62
Units: 3 = agr. strongly; 0 = disagr. strongly Range: 0.00 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.37	1.26	1.61	1.41	P.G.	n.s.
Low	1.35	1.67	1.64	1.56	Size	n.s.
Total	1.36	1.47	1.63	1.49	P.G. x S.	n.s.

158--Current HUD regulations give tenants too much power

Source: ED-152; BC--59; PM--112
Units: 3 = agr. strongly; 0 = disagr. strongly Range: .33 - 2.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.25	1.19	1.35	1.26	P.G.	n.s.
Low	1.33	1.47	1.37	1.39	Size	n.s.
Total	1.29	1.34	1.36	1.33	P.G. x S.	n.s.

159--Executive Director's evaluation that tenant participation in management is workable

Source: ED--150
Units: 3 = very work.; 0 = very unwork. Range: 0.00 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.63	1.16	1.00	1.27	P.G.	n.s.
Low	1.74	1.43	1.43	1.52	Size	n.s.
Total	1.68	1.30	1.24	1.41	P.G. x S.	n.s.

160--Tenants should be responsible for carrying out project activities

Source: ED--90-96; PM--194-200
Units: 2 = tenants responsible
0 = management responsible Range: .36 - 1.60

	Large	Medium	Small	Total	Results of Significance Tests	
High	.80	.79	.77	.79	P.G.	5%
Low	.82	.87	.96	.89	Size	n.s.
Total	.81	.83	.87	.84	P.G. x S.	n.s.

161--Tenants should be trained and encouraged to do minor repairs

Source: ED--185; PM--183
Units: 3 = agr. strongly; 0 = disagr. strongly Range: 0.00 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	2.14	1.81	1.22	1.73	P.G.	n.s.
Low	1.98	1.47	1.56	1.67	Size	1%
Total	2.06	1.63	1.41	1.70	P.G. x S.	n.s.

162--Number of days after which rent is considered delinquent

Source: PM--240
Units: Number of days Range: 1 - 30

	Large	Medium	Small	Total	Results of Significance Tests	
High	6.79	7.16	7.61	7.18	P.G.	n.s.
Low	8.65	8.48	9.00	8.71	Size	n.s.
Total	7.74	7.85	8.37	7.99	P.G. x S.	n.s.

163--Authority adjusts rent due date, allows weekly or bi-weekly payments, and allows installments of delinquent rent

Source: ED--252,253,257
Units: Number of practices Range: 0 - 3

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.79	1.84	1.78	1.80	P.G.	n.s.
Low	1.63	2.00	2.14	1.94	Size	n.s.
Total	1.71	1.92	1.97	1.87	P.G. x S.	n.s.

164--Number of recreation facilities provided for children by mgt. per child

Source: PM--140-142; HH--2-4
Units: Number of facilities per child Range: 0.00 - .08

	Large	Medium	Small	Total	Results of Significance Tests	
High	.0097	.0063	.0219	.0124	P.G.	5%
Low	.0069	.0071	.0072	.0070	Size	1%
Total	.0082	.0067	.0136	.0095	P.G. x S.	5%

165--Number of social services provided by Authority using its own staff

Source: ED--114-121
Units: Number of services Range: 0 - 8

	Large	Medium	Small	Total	Results of Significance Tests	
High	4.00	3.53	1.78	3.13	P.G.	n.s.
Low	4.80	2.38	.77	2.59	Size	1%
Total	4.41	2.92	1.22	2.84	P.G. x S.	n.s.

166--All utilities included in rent

Source: PM--227
Units: 1 = yes; 0 = no
Range: 0.0 - 1.0

	Large	Medium	Small	Total	Results of Significance Tests	
High	.45	.51	.35	.44	P.G.	n.s.
Low	.65	.64	.32	.53	Size	5%
Total	.55	.58	.33	.49	P.G. x S.	n.s.

167--Rents are collected directly from welfare or other agencies

Source: ED--251
Units: 1= yes; 0 = no
Range: 0.0 - 1.0

	Large	Medium	Small	Total	Results of Significance Tests	
High	.11	.05	.22	.13	P.G.	n.s.
Low	.16	.19	.18	.18	Size	n.s.
Total	.13	.13	.20	.15	P.G. x S.	n.s.

168--Number of months to evict household for rent delinquency

Source: ED--262
Units: Number of months
Range: 0 - 6

	Large	Medium	Small	Total	Results of Significance Tests	
High	2.11	2.17	1.23	1.86	P.G.	5%
Low	2.63	2.40	2.21	2.41	Size	n.s.
Total	2.37	2.31	1.81	2.18	P.G. x S.	n.s.

169--Eviction rate for rent delinquency

Source: ED--261
Units: Percentage
Range: 0 - 15.23%

	Large	Medium	Small	Total	Results of Significance Tests	
High	1%	0%	1%	1%	P.G.	n.s.
Low	1%	1%	1%	1%	Size	n.s.
Total	1%	0%	1%	1%	P.G. x S.	n.s.

170--Number of months to evict household for behavior problems

Source: ED--265
Units: Number of months
Range: 0 - 60

	Large	Medium	Small	Total	Results of Significance Tests	
High	3.20	7.36	1.23	3.72	P.G.	n.s.
Low	3.88	2.67	2.40	3.00	Size	n.s.
Total	3.55	4.65	1.86	3.33	P.G. x S.	n.s.

171--Eviction rate for behavior problems

Source: ED--264
Units: Percentage
Range: 0.00 - 5.00%

	Large	Medium	Small	Total	Results of Significance Tests	
High	0%	0%	1%	0%	P.G.	n.s.
Low	0%	0%	0%	0%	Size	n.s.
Total	0%	0%	0%	0%	P.G. x S.	n.s.

172--Authority makes home visits and checks references of new applicants

Source: ED--214,215
Units: Number of practices
Range: 0 - 2

	Large	Medium	Small	Total	Results of Significance Tests	
High	.89	.84	.94	.89	P.G.	n.s.
Low	.70	.62	.86	.73	Size	n.s.
Total	.79	.72	.90	.81	P.G. x S.	n.s.

173--Number of months new applicants have to wait for a unit

Source: ED-211
Units: Number of months
Range: 0 - 60

	Large	Medium	Small	Total	Results of Significance Tests	
High	13.11	18.18	16.47	15.87	P.G.	n.s.
Low	15.90	9.95	11.00	12.28	Size	n.s.
Total	14.58	13.83	13.38	13.93	P.G. x S.	n.s.

174--Tenants perceive they are similar to their neighbors in regard to housekeeping standards and rules about raising children

Source: HH--119,165
Units: 1 = agree; 0 = disagree
Range: .23 - 1.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	.53	.62	.69	.61	P.G.	5%
Low	.46	.56	.66	.56	Size	1%
Total	.50	.59	.67	.59	P.G. x S.	n.s.

175--Proportion of projects receiving Modernization funds which used funds to reduce deferred maintenance

Source: PM--39 ÷ PM--7
Units: Percentage
Range: 0 - 100%

	Large	Medium	Small	Total	Results of Significance Tests	
High	58%	49%	67%	55%	P.G.	n.s.
Low	46%	61%	39%	50%	Size	n.s.
Total	52%	56%	45%	52%	P.G. x S.	n.s.

176--Size of inventory kept on site

Source: PM--71
Units: 3 = large; 0 = none
Range: 0.00 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.78	1.48	1.27	1.52	P.G.	n.s.
Low	1.63	1.64	1.48	1.58	Size	n.s.
Total	1.70	1.56	1.38	1.55	P.G. x S.	n.s.

177--Response time to emergency request for maintenance

Source: HH--97
Units: Number of hours
Range: .12 - 62.82

	Large	Medium	Small	Total	Results of Significance Tests	
High	17.58	9.58	7.34	11.57	P.G.	5%
Low	22.77	14.11	9.46	15.24	Size	1%
Total	20.24	11.96	8.51	13.51	P.G. x S.	n.s.

178--Response time to routine requests for maintenance

Source: HH--99
Units: Number of days
Range: .85 - 74.01

	Large	Medium	Small	Total	Results of Significance Tests	
High	16.26	9.11	12.45	12.61	P.G.	1%
Low	25.89	19.64	15.25	20.09	Size	5%
Total	21.20	14.64	13.99	16.57	P.G. x S.	n.s.

179--Manager's perception of repair frequency for building systems

Source: PM--73,75,77,79,81,83,85
Units: 2 = more than normal; 0 = less than normal
Range: 0 - 1.57

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.00	.67	.62	.77	P.G.	1%
Low	1.02	.89	.85	.92	Size	1%
Total	1.01	.79	.75	.85	P.G. x S.	n.s.

180--Manager's perception of repair frequency for units

Source: PM--154,156,158,160,162,164,166,168,170
Units: 2 = more than normal; 0 = less than normal
Range: 0 - 1.66

	Large	Medium	Small	Total	Results of Significance Tests	
High	.94	.71	.68	.78	P.G.	1%
Low	1.04	.90	1.01	.98	Size	5%
Total	.99	.81	.86	.89	P.G. x S.	n.s.

181--Number of days from vacancy of unit to unit being ready for occupancy

Source: PM--220-221
Units: Number of days
Range: 1.00 - 45.26

	Large	Medium	Small	Total	Results of Significance Tests	
High	8.67	5.56	5.04	6.45	P.G.	n.s.
Low	9.13	5.86	5.32	6.71	Size	1%
Total	8.90	5.72	5.19	6.58	P.G. x S.	n.s.

182--Proportion of occupants who have been charged for repairs

Source: HH--89
Units: Percentage
Range: 0 - 83.05%

	Large	Medium	Small	Total	Results of Significance Tests	
High	47%	36%	25%	36%	P.G.	n.s.
Low	50%	41%	36%	42%	Size	1%
Total	49%	39%	31%	39%	P.G. x S.	n.s.

183--Residents are allowed to paint and make repairs

Source: ED--197; PM--27
Units: 1 = both; 0 = neither
Range: 0.00 - 1.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	.44	.52	.46	.47	P.G.	n.s.
Low	.44	.44	.55	.48	Size	n.s.
Total	.44	.48	.51	.48	P.G. x S.	n.s.

184--Proportion of occupants who have made repairs themselves

Source: HH--91
Units: Percentage
Range: 0 - 68.50%

	Large	Medium	Small	Total	Results of Significance Tests	
High	20%	29%	17%	22%	P.G.	5%
Low	31%	25%	27%	28%	Size	n.s.
Total	26%	27%	23%	25%	P.G. x S.	5%

185--Residents' belief that they should pay for accidental damage

Source: HH--122
Units: 1 = agree; 0 = disagree
Range: .37 - 1.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	.74	.81	.80	.78	P.G.	n.s.
Low	.76	.71	.82	.76	Size	n.s.
Total	.75	.76	.81	.77	P.G. x S.	n.s.

186--Residents belief that they should help clean and keep building in good condition

Source: HH--128
Units: 1 = agree; 0 = disagree
Range: .47 - 1.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	.87	.94	.93	.92	P.G.	n.s.
Low	.89	.92	.93	.91	Size	5%
Total	.88	.93	.93	.91	P.G. x S.	n.s.

187--Number of times per month management picks up trash and litter

Source: PM--180,181
Units: Number of times
Range: 0.00 - 20.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	12.83	11.02	5.51	9.90	P.G.	n.s.
Low	14.73	11.25	9.01	11.57	Size	1%
Total	13.81	11.15	7.48	10.81	P.G. x S.	n.s.

188--Number of times per week garbage is hauled away

Source: PM--179
Units: Number of times
Range: 1.00 - 5.59

	Large	Medium	Small	Total	Results of Significance Tests	
High	2.30	1.68	1.81	1.94	P.G.	n.s.
Low	2.52	1.86	1.89	2.08	Size	1%
Total	2.41	1.77	1.85	2.01	P.G. x S.	n.s.

189--Number of measures taken by management to improve security

Source: PM--304-308
Units: Number of measures
Range: 0.00 - 4.43

	Large	Medium	Small	Total	Results of Significance Tests	
High	2.07	1.45	.23	1.27	P.G.	5%
Low	2.32	1.75	.75	1.58	Size	1%
Total	2.20	1.61	.52	1.43	P.G. x S.	n.s.

190--Residents have added or changed locks on their apartment doors

Source: HH-262
Units: 1 = yes; 0 = no
Range: 0.00 - .73

	Large	Medium	Small	Total	Results of Significance Tests	
High	.17	.12	.05	.12	P.G.	1%
Low	.26	.16	.11	.17	Size	1%
Total	.22	.14	.08	.15	P.G. x S.	n.s.

191--Residents' perception of strictness of management

Source: HH--240-248
Units: 1 = strict; 0 = not strict Range: .14 - .92

	Large	Medium	Small	Total	Results of Significance Tests	
High	.65	.67	.75	.69	P.G.	1%
Low	.50	.59	.64	.58	Size	1%
Total	.57	.63	.69	.63	P.G. x S.	n.s.

192--Residents report being given written behavior rules

Source: HH--108
Units: 1 = yes; 0 = no Range: .39 - 1.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	.87	.84	.86	.86	P.G.	n.s.
Low	.83	.82	.84	.83	Size	n.s.
Total	.85	.83	.85	.84	P.G. x S.	n.s.

193--Management's perception of how strictly rules should be enforced

Source: BC--26-34; ED--97-105; PM--209-217
Units: 3 = very strict; 0 = not at all strict Range: 1.73 - 2.81

	Large	Medium	Small	Total	Results of Significance Tests	
High	2.33	2.36	2.42	2.37	P.G.	n.s.
Low	2.41	2.32	2.42	2.38	Size	n.s.
Total	2.37	2.34	2.42	2.38	P.G. x S.	n.s.

194--Residents' perception of their treatment by management

Source: HH--249-253
Units: 1 = good; 0 = poor Range: .81 - 1.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	.96	.98	.98	.97	P.G.	1%
Low	.95	.95	.97	.96	Size	1%
Total	.96	.96	.98	.97	P.G. x S.	n.s.

195--Residents' satisfaction with the way inspection is carried out

Source: HH--114
Units: 1 = satisfied; 0 = dissatisfied Range: .59 - 1.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	.90	.92	.90	.91	P.G.	n.s.
Low	.87	.87	.94	.90	Size	n.s.
Total	.89	.89	.93	.90	P.G. x S.	n.s.

196--Management contact's name known by residents

Source: HH--93
Units: 1 = yes; 0 = no Range: .45 - 1.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	.80	.89	.96	.88	P.G.	1%
Low	.74	.77	.89	.80	Size	1%
Total	.77	.82	.92	.84	P.G. x S.	n.s.

197--Proportion of households manager knows by both name and sight

Source: PM--265
Units: Percentage Range: 4.83% - 100%

	Large	Medium	Small	Total	Results of Significance Tests	
High	61%	73%	94%	75%	P.G.	5%
Low	56%	63%	78%	66%	Size	1%
Total	59%	68%	85%	70%	P.G. x S.	n.s.

198--Percent of projects having a tenant organization

Source: PM--270
Units: Percentage Range: 0 - 100%

	Large	Medium	Small	Total	Results of Significance Tests	
High	78%	56%	19%	52%	P.G.	n.s.
Low	86%	59%	33%	58%	Size	1%
Total	82%	57%	27%	55%	P.G. x S.	n.s.

199--Tenants believe tenant organization is doing a good job (in projects where there is a tenant organization)

Source: HH--218
Units: 1 = yes; 0 = no Range: 0.00 - 1.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	.71	.88	.76	.78	P.G.	5%
Low	.66	.73	.60	.67	Size	n.s.
Total	.68	.80	.67	.72	P.G. x S.	n.s.

200--Average tenant participation in tenant meetings

Source: HH--222
Units: Number of meetings attended last year Range: 0 - 13.32

	Large	Medium	Small	Total	Results of Significance Tests	
High	3.47	3.40	1.74	3.05	P.G.	n.s.
Low	3.99	3.31	3.84	3.70	Size	n.s.
Total	3.74	3.35	2.89	3.40	P.G. x S.	n.s.

201--Tenants want more say in how project is managed

Source: HH--223
Units: 1 = yes; 0 = no Range: .06 - .88

	Large	Medium	Small	Total	Results of Significance Tests	
High	.49	.33	.28	.37	P.G.	1%
Low	.57	.50	.43	.50	Size	1%
Total	.53	.42	.36	.44	P.G. x S.	n.s.

202--Proportion of Bd. meetings at which residents voiced their opinion

Source: BC--85 ÷ BC--84
Units: Percentage Range: 0 - 100%

	Large	Medium	Small	Total	Results of Significance Tests	
High	51%	11%	15%	26%	P.G.	n.s.
Low	47%	31%	26%	34%	Size	1%
Total	48%	22%	21%	30%	P.G. x S.	n.s.

203--Management's agreement that tenant representatives should participate in management

Source: BC--24,25; ED--158,159; PM--257,275
Units: 3 = agr. strongly; 0 = disagr. strongly Range: 0.00 - 2.93

	Large	Medium	Small	Total	Results of Significance Tests	
High	2.05	1.67	1.15	1.63	P.G.	1%
Low	2.33	2.01	1.60	1.96	Size	1%
Total	2.19	1.84	1.40	1.81	P.G. x S.	n.s.

204--Board involvement in making policy decisions

Source: BC--46; ED--58
Units: 3 = a lot; 0 = none at all Range: 1.00 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	2.84	2.79	2.64	2.76	P.G.	n.s.
Low	2.55	2.64	2.70	2.63	Size	n.s.
Total	2.69	2.71	2.67	2.69	P.G. x S.	n.s.

205--Board Chairman's involvement with Authority practices and procedures

Source: BC--10-17
Units: 3 = a lot; 0 = none at all Range: .13 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	2.01	1.90	2.18	2.03	P.G.	n.s.
Low	1.79	2.22	2.19	2.08	Size	n.s
Total	1.90	2.07	2.19	2.05	P.G. x S.	n.s.

206--Number of hours per week Board Chairman spends on Authority business

Source: BC--89
Units: Number of hours
Range: 0 - 25

	Large	Medium	Small	Total	Results of Significance Tests	
High	5.58	3.26	3.28	4.05	P.G.	5%
Low	8.79	4.81	4.00	5.74	Size	1%
Total	7.18	4.07	3.67	4.94	P.G. x S.	n.s.

207--Executive Director's involvement in making policy decisions

Source: BC--44; ED--55
Units: 3 = a lot; 0 = none at all
Range: 1.50 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	2.74	2.87	2.69	2.77	P.G.	n.s.
Low	2.85	2.81	2.68	2.78	Size	n.s.
Total	2.79	2.84	2.69	2.77	P.G. x S.	n.s.

208--Executive Director's involvement with Authority practices & procedures

Source: ED--67-76
Units: 3 = a lot; 0 = none at all
Range: 1.10 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	2.21	2.68	2.52	2.47	P.G.	n.s.
Low	2.39	2.63	2.67	2.57	Size	1%
Total	2.30	2.65	2.60	2.52	P.G. x S.	n.s.

209--Other Auth. Office personnel's involvement in making policy decisions

Source: BC--45; ED--56; CO--14d
Units: 3 = a lot; 0 = none at all
Range: 0.00 - 2.89

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.77	1.90	1.40	1.69	P.G.	n.s.
Low	1.92	1.69	1.49	1.69	Size	1%
Total	1.85	1.79	1.45	1.69	P.G. x S.	n.s.

210--Central Office Staff's involvement in setting rules

Source: PM--150a,230a,231a,232a,233a,237a; ED--37a,106a,107a,108a,109a,113a
Units: 3 = a lot; 0 = none at all
Range: .50 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	2.67	2.73	2.68	2.70	P.G.	n.s.
Low	2.69	2.77	2.74	2.73	Size	n.s.
Total	2.68	2.75	2.71	2.72	P.G. x S.	n.s.

211--Central Office Staff's involvement in investigating complaints

Source: PM--234a,235a,236a; ED--110a,111a,112a
Units: 3 = a lot; 0 = none at all
Range: .64 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.80	2.37	2.66	2.27	P.G.	n.s.
Low	2.00	2.45	2.67	2.38	Size	1%
Total	1.90	2.41	2.67	2.33	P.G. x S.	n.s.

212--Central Office Staff's involvement in Authority operations

Source: PM--146a,147a,148a,149a; ED--33a,34a,35a,36a
Units: 3 = a lot; 0 = none at all
Range: 1.75 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	2.75	2.90	2.88	2.84	P.G.	n.s.
Low	2.83	2.85	2.87	2.85	Size	n.s.
Total	2.79	2.87	2.88	2.85	P.G. x S.	n.s.

213--On-site staff's involvement in making policy decisions

Source: BC--43; ED--54; PM--129
Units: 3 = a lot; 0 = none at all
Range: .33 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.87	1.99	2.77	2.10	P.G.	5%
Low	1.85	1.89	2.11	1.91	Size	1%
Total	1.86	1.94	2.46	2.01	P.G. x S.	5%

214--On-site staff's involvement in setting rules

Source: ED--37b,106b,107b,108b,109b,113b; PM--150b,230b,231b,232b,233b,237b
Units: 3 = a lot; 0 = none at all
Range: 0.00 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.86	1.55	1.56	1.68	P.G.	n.s.
Low	1.95	1.84	1.42	1.78	Size	n.s.
Total	1.91	1.70	1.49	1.74	P.G. x S.	n.s.

215--On-site staff's involvement in investigating complaints

Source: ED--110b,111b,112b; PM--234b,235b,236b
Units: 3 = a lot; 0 = none at all
Range: 0.00 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	2.79	2.26	2.00	2.44	P.G.	n.s.
Low	2.67	2.30	1.93	2.37	Size	1%
Total	2.73	2.28	1.96	2.40	P.G. x S.	n.s.

216--On-site staff's involvement in Authority operations

Source: ED--33b,34b,35b,36b; PM--146b,147b,148b,149b
Units: 3 = a lot; 0 = none at all
Range: 0.00 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.56	1.01	1.35	1.31	P.G.	n.s.
Low	1.44	1.04	1.26	1.25	Size	1%
Total	1.50	1.03	1.30	1.28	P.G. x S.	n.s.

217--Jobs done by on-site employees

Source: PM--21-26
Units: Number of jobs
Range: 0.00 - 6.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	3.96	3.75	2.06	3.28	P.G.	n.s.
Low	4.14	3.42	2.27	3.25	Size	1%
Total	4.05	3.57	2.18	3.26	P.G. x S.	n.s.

218--Jobs done by pooled employees

Source: PM--21-26
Units: Number of jobs
Range: 0.00 - 6.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	2.05	1.69	3.26	2.32	P.G.	n.s.
Low	2.11	1.94	2.64	2.24	Size	5%
Total	2.08	1.82	2.92	2.27	P.G. x S.	n.s.

219--Jobs done by subcontractors

Source: PM--21-26
Units: Number of jobs
Range: 0.00 - 5.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	.92	1.38	1.16	1.16	P.G.	n.s.
Low	.85	.94	1.29	1.03	Size	n.s.
Total	.88	1.15	1.23	1.09	P.G. x S.	n.s.

220--Jobs done by tenants

Source: PM--21-26
Units: Number of jobs
Range: 0.00 - 4.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.38	1.28	1.34	1.33	P.G.	n.s.
Low	1.01	1.28	1.77	1.37	Size	n.s.
Total	1.19	1.28	1.58	1.35	P.G. x S.	n.s.

221--Tenant involvement in making policy decisions

Source: BC--42; ED--53
Units: 3 = a lot; 0 = none at all
Range: .50 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.95	1.95	1.39	1.77	P.G.	n.s.
Low	1.85	1.90	1.55	1.76	Size	1%
Total	1.90	1.92	1.47	1.76	P.G. x S.	n.s.

222--Tenant involvement in setting rules

Source: ED--37c,106c,107c,108c,109c,113c
PM--150c,230c,231c,232c,233c,237c
Units: 3 = a lot; 0 = none at all
Range: 0.00 - 2.03

	Large	Medium	Small	Total	Results of Significance Tests	
High	.98	.67	.43	.70	P.G.	5%
Low	1.23	.88	.53	.87	Size	1%
Total	1.11	.78	.48	.79	P.G. x S.	n.s.

223--Tenant involvement in investigating complaints

Source: ED--110c,111c,112c; PM--234c,235c,236c
Units: 3 = a lot; 0 = none at all
Range: 0.00 - 3.00

	Large	Medium	Small	Total	Results of Significance Tests	
High	1.28	.95	.88	1.04	P.G.	n.s.
Low	1.41	1.14	.96	1.17	Size	5%
Total	1.35	1.05	.92	1.11	P.G. x S.	n.s.

224--Tenant involvement in Authority operations

Source: ED--33c,34c,35c,36c; PM--146c,147c,148c,149
Units: 3 = a lot; 0 = none at all
Range: 0.00 - 1.50

	Large	Medium	Small	Total	Results of Significance Tests	
High	.72	.52	.32	.52	P.G.	5%
Low	.81	.73	.51	.68	Size	1%
Total	.76	.63	.43	.60	P.G. x S.	n.s.

225--Household members do volunteer work in project and neighborhood

Source: HH--225,227
Units: 2 = both; 0 = neither
Range: 0.00 - .97

	Large	Medium	Small	Total	Results of Significance Tests	
High	.41	.38	.36	.38	P.G.	5%
Low	.30	.32	.32	.31	Size	n.s.
Total	.36	.35	.34	.35	P.G. x S.	n.s.

APPENDIX III

THE DIVISION OF AUTHORITIES INTO HIGH AND LOW PERFORMANCE GROUPS

GENERAL PROCEDURE

Authorities were divided into High and Low Performance Groups within each size classification on the basis of their scores on the 24 Criterion Variables. Three basic steps were followed in forming the groups:

First, it was determined for each Authority whether the Authority was above or below the sample mean of each of the 24 Criterion Variables.

Second, those Authorities which were above the mean on a large number of Criterion Variables were placed in the "High" Performance Group; those Authorities which were below the mean on a large number of Criterion Variables were placed in the "Low" Group. The Authorities which had about half their Criterion scores above the sample means and about half below, were placed in the High or Low Group depending upon the extent[23] to which their scores were above or below the means.

In the third step, the initial groupings obtained in the second step were subjected to successive discriminant function analyses[24] until each

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[23] Extent was measured in terms of the standard deviation of the Criterion Variables, that is, "z" scores were obtained, where:

$$z = \frac{\text{Authority Performance - Sample Mean}}{\text{Sample Standard Deviation}}$$

[24] Biomedical program BMDO5M was used. This program computed a set of linear functions for use in classifying individual cases into groups. The probability of each individual case belonging in each group was computed on the basis of the closeness of the Authority's Criterion scores to the Criterion means of all cases assigned to the group. Cases were assigned to the group in which they most probably belonged. The program was used iteratively until each case was classified in the same group at the end of the computer run as it had been at the beginning of the run. See BMD Biomedical Computer Programs, W.J. Dixon, Editor, University of California Press, Berkeley, 1970, pp. 196.206 .

Authority was placed into the group for which the analyses indicated it most probably belonged. When an Authority's probability was not very high that it belonged in the Performance Group to which it was assigned, the discriminant function analyses was repeated with the Authority tentatively assigned to the other group in order to see which assignment resulted in the largest probabilities and D-Square statistic.[25]

Using Criterion scores adjusted by the Full Control Method (see explanation below), the mean probability that the Authorities belonged in the Performance Group to which they were assigned was almost 100%, a value which indicates that the placement of the Authorities in the groups was quite stable.

ADJUSTMENT OF CRITERION VARIABLE SCORES

Before the general procedure outlined above was followed, the question of adjusting the Housing Authorities' scores on the 24 Criterion Variables was addressed. The intercorrelations between the Criterion and Control Variables indicated that there were many significant relationships between the Criterion and Control Variables. (See Section III-B.) Therefore, if an Authority had low Criterion scores it could well be owing to conditions, e.g., poor neighborhoods, over which the Authority had relatively little control. Conversely, an Authority operating under very favorable conditions could have high Criterion scores even if its management was

[25] Computer Program, BMDO5M, also computes a generalized Mahlanobis' D-Square statistic which was used to test the hypothesis that the set of 24 Criterion means was the same in the Performance Groups. This value, which averaged 410.4 in the three samples when the Full Control assignment process was completed, was significant at the .001 level in all three samples, indicating that the Performance Groups were distinctly different in their mean Criterion performance.

relatively poor. It was decided, therefore, to adjust the Criterion scores for Control Variable differences prior to dividing the Authorities into High and Low Performance Groups.

Two problems in making these adjustments were immediately apparent. Firstly, not only were Control Variables related to the Criterion scores, but Management Variables were also related to the Criteria, and many Management Variables were related to the Control Variables (see Section D of Results). Unless the management differences among Authorities were also considered in the adjustments, it was likely that the adjustment of the Criterion scores for Control Variable differences would eliminate differences that were a function of management differences.

Secondly, in some cases, the division between Control and Management Variables is not distinct. It could be argued that some variables classified as Control Variables could be identified as Management Variables and vice versa. Control Variables that could be considered Management Variables are those that measure conditions in the Authority which Authority policy could alter, but only over a period of time. Examples of this type of variable are number of children per adult, number of people per unit, and the like. Similarly, variables originally defined as Management Variables which could be considered Control Variables are those variables that measure aspects of management which may be difficult to control, for example, the number of unions involved with the Authority, the repair frequency for project units and building systems.

In order to overcome both these problems, the following procedure was employed to obtain adjusted Criterion Variable scores:

(1) Fifty Management Variables having high correlations with the Criterion Variables were initially selected through an examination of the intercorrelations among the variables when data from all 119 Authorities were combined.

(2) A multiple regression-equation was computed for each of the 24 Criterion Variables in each of the three size samples (72 equations in all) using the 50 Management Variables as the independent variables.[26]

(3) Management Variables which appeared in the 72 equations fewer than two times were eliminated as it was felt that on a purely chance basis a variable had slightly better than a 50-50 chance of getting into at least one equation and the use of the two times rule would eliminate a number of variables appearing in the equations by chance. Twenty-three of the 50 Management Variables were thereby eliminated.

(4) Steps 2 and 3 above were repeated for the 50 Control Variables. Twenty-four Control Variables were thereby eliminated.

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[26] Biomed program BMD02R was used in selecting the variables comprising the equations. This program adds variables to the equation one variable at a time. The variable added is the variable which can most increase the multiple correlation of the equation composite with the criterion (in this case, one of the 24 Criterion Variables). A statistical test is provided which allows determination of whether the addition of each variable significantly increases the composite's relationship with the criterion. The .01 significance level was used. See BMD Biomedical Computer Programs, op. cit., pp. 233-247.

(5) The 53 remaining Control and Management Variables were then individually examined by HUD and Urban Institute personnel and a decision was made as to which variables should be considered only as Control Variables, which should be considered only as Management Variables, and which could be considered either Control or Management Variables. These variables were classified in a dual or "Swing" Variable category.

(6) Step 2 above was then repeated using the 53 Control, Management and Swing Variables. Seventy-two equations of the following general form were thereby obtained:

$$P = C + M + S + (R + e) + K$$

Where: P is the unadjusted performance score on any one Criterion Variable

C is a component of the Criterion score attributable to Control Variable differences*

M is a component of the Criterion score attributable to Management Variable differences*

S is a component of the Criterion score attributable to Swing Variable differences*

R is a component of the Criterion score not attributable to the 53 variables used in the generation of the equations

e is an unpredictable component of the Criterion score attributable to measurement error(using available data it is inseparable from R)

and K is an equation constant related to the average level of public housing performance.

*The C,M, and S components consist of the sum of the products formed by multiplying the selected variable scores by their respective regression weights.

(7) Four different ways of adjusting the Criterion scores were then tried out:

(a) Part Control--The Authority Criterion scores were adjusted by subtracting out the component attributable to Control Variable differences:

$$P_{adjusted} = P - C$$

(b) Full Control--The Authority Criterion scores were adjusted by subtracting out the components attributable to Control and Swing Variable differences:

$$P_{adjusted} = P - C - S$$

(c) Part Management--Only that portion of the Authority scores that could be accounted for by Management Variable differences was left in the Criterion Scores:

$$P_{adjusted} = P - C - S - (R + e) - K = M$$

(d) Full Management--Those portions of the Authority scores that could be accounted for by Management and Swing Variable differences were left in the Criterion scores:

$$P_{adjusted} = P - C - (R + e) - K = M + S$$

A fifth method, using the unadjusted Criterion scores, was also tried out. That is, the general procedure for dividing Authorities into High and Low Performance Groups was conducted five times, each time using a different set of adjusted (and unadjusted) Criterion Variable scores for each Authority.

The Full Control Method, for the reasons outlined on page 20, effected the best separation into High and Low Performance Groups, and was subsequently used as the basis of further data analyses.

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