Housing Allowance Demand Experiment

Housing Improvements and Upgrading in the Housing Allowance Demand Experiment

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HOUSING IMPROVEMENTS AND UPGRADING IN THE HOUSING ALLOWANCE DEMAND EXPERIMENT

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ABSTRACT

This report analyzes the housing improvements of households enrolled in the Housing Allowance Demand Experiment. The analysis focuses first on changes in units to meet the housing requirements tested in the experiment and second on general maintenance, repair, and remodeling activity. The first analysis is based mostly on housing evaluations conducted by program staff; the second relies on household interviews.

Households enrolled in the Housing Gap allowance plans received allowance payments if they met certain housing requirements. Two types of housing requirements were tested. Minimum Standards households were required to live in housing that met specific physical and occupancy requirements. Households in the Minimum Rent plans could choose whatever housing characteristics they wished but were required to spend at least a specified minimum amount for rent.

Households that did not meet requirements at enrollment could move to a unit that did meet requirements or arrange to meet them in the enrollment unit. This report focuses primarily on the latter group. Minimum Standards households could upgrade by repairing the Minimum Standards components failed. Minimum Rent households could meet in place by negotiating or accepting a rent increase sufficient to meet the requirement. The overall findings are that the allowance induced Minimum Standards households to upgrade more frequently than Control households and to repair units that were originally in somewhat worse condition than upgraded Control units. Most upgrading appears to result either from normal maintenance or additional household efforts, and is not accompanied by any above-normal increase in rent. In contrast, the effect of the experiment on Minimum Rent households that did not meet requirements in the enrollment unit was, at most, very limited. While there is some evidence that some Minimum Rent households were induced to meet Minimum Rent requirements in place, there is no evidence of above-normal rent increases for this group. In general, meeting Minimum Rent requirements in place appears to reflect normal changes in unit rents not immediately tied to any change in unit quality.

In addition, this report assesses data on unit improvement collected through Periodic Interviews with enrolled households. The data describe the frequency and extent of improvements, the specific types of improvements, whether the improvements were made by the household or landlord, and the costs to the household of improvements. Maintenance and repair of the housing stock appears to be a substantial and ongoing process; however, the experiment appears to have had little additional effect on the incidence or type of improvement.

ACKNOWLEDGEMENTS

We wish to thank the people that made a considerable contribution to this report. The initial analyses of Minimum Standards upgrading, meeting Minimum Rent in place, and households repair and improvement data were done by Darrel Drury and in many instances these early analyses form the basis of the present report. Stephen Kennedy, Project Director, has provided detailed comments throughout the analysis and was instrumental in shaping the final report. Walter Stellwagen, principal quality control reviewer for the Demand Experiment, provided valuable comments, and James Wallace, Director of Design and Analysis, guided all the earlier drafts. Kristina Varenais helped prepare the data base and carry out analysis for the earlier drafts, especially analyses of the Minimum Rent allowance plan.

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SUMMARY

This report is one of a series of technical reports on the final results of housing programs tested in the Housing Allowance Demand Experiment. The Demand Experiment, authorized by Congress in the Housing Act of 1970, was designed to test the concept of providing direct cash assistance to low-income households to enable them to rent suitable housing. The experiment focused on the ways in which low-income renter households use housing allowances. It tested a variety of allowance plans involving approximately 1,200 Experimental households (offered a housing allowance payment) and 500 Control households (offered only a token cooperation payment) at two sites: Allegheny County, Pennsylvania (Pittsburgh) and Maricopa County, Arizona (Phoenix), from 1973 to 1977. Each household enrolled in the experiment was offered allowance payments for three years. Analysis is based on data from the first two years.

This report concerns improvements to units occupied by households enrolled in the Demand Experiment. The analysis focuses first on the housing requirements tested in the experimental Housing Gap allowance plans and second on general maintenance and repair activity. The first analysis is based primarily on data from housing evaluations conducted by trained housing evaluators; the second on data from household interviews.

Under a Housing Gap allowance, eligible households receive payments designed to make up the gap between the cost of modest, existing, standard housing and the fraction of household income which might reasonably be devoted to housing. These payments are tied to housing by housing requirements; households receive allowance payments only if the housing that they rent meets particular housing requirements. Two kinds of housing requirements were tested in the Demand Experiment. Minimum Standards requirements specify minimum physical quality and occupancy standards. Minimum Rent requirements specify a minimum amount that households must spend for housing but leave the exact type of housing up to the recipient. (Two levels of Minimum Rent, termed Minimum Rent High and Minimum Rent Low, were tested in the Demand Experiment.)

Some households began receiving allowance payments as soon as they enrolled, because they already met their housing requirements. Households that did not already meet requirements at enrollment could either move to a unit that met requirements or attempt to meet requirements in their enrollment units. The primary focus of this report is on the latter group--households that met requirements after enrollment without moving from their original units. Minimum Standards households could meet the Minimum Standards requirements without moving if they upgraded their enrollment units to correct deficiencies. Minimum Rent households could meet Minimum Rent requirements without moving if the unit's rent increased to the required level.

Several measures are used to describe the housing of households that met requirements without moving, including descriptions of the number and type of Minimum Standards components failed by the unit, hedonic indices of housing services, the housing evaluator's overall rating of the unit, and a measure of physical housing deprivation. These measures are all based on data from housing evaluations, designed for the experiment and conducted by trained housing evaluators.

Additional information concerning dwelling unit improvements was provided by households in three interviews conducted 6, 12, and 24 months after they enrolled. Households were asked about improvements to their units such as general remodeling, installing plumbing or heating fixtures, and interior painting and papering. They were also asked to estimate the cost to the household of the repairs and to indicate whether the improvements were made by the household or the landlord. These data are used to provide general information on repair and maintenance activity not specifically tied to items included in the housing evaluations.

The major conclusions of the analyses of Minimum Standards and Minimum Rent households that met requirements without moving and of improvements reported by households are listed below. All results refer to households that did not meet requirements at enrollment.

1. Upgrading was an important way of meeting Minimum Standards requirements and thus qualifying for allowance payments. This was especially true in Pittsburgh.

Among the households that met the Minimum Standards requirements at two years, 39 percent had already met the requirements when they enrolled. Of those households that had not met Minimum Standards requirements at enrollment but did meet them after two years, about two-thirds met by moving to a different unit (64 percent) and about one-third upgraded their enrollment unit (36 percent).

Upgrading was especially important in Pittsburgh--45 percent of the households that met requirements after enrollment did so by upgrading as compared with 30 percent in Phoenix.

The difference between the two sites in the importance of upgrading appears to reflect higher mobility rates and a looser housing market in Phoenix. About the same proportion of enrolled households (79 percent) failed to meet the Minimum Standards requirements at enrollment in both sites, and of these, about the same proportion (13 percent) upgraded. In addition, however, more households in Phoenix moved, and more of those that moved obtained housing that met the Minimum Standards requirements.

2. Overall, upgrading by Minimum Standards households involved only a modest extension of the normal process of maintenance and repair. The housing allowance offer does appear to have induced some additional households to upgrade units that were in moderately worse condition than those normally upgraded. This additional upgrading all occurred in the first year after enrollment.

   About 8 percent of the Control households that did not meet the Minimum Standards requirements at enrollment upgraded their units during the two years of the experiment. The rate for Minimum Standards households was 5 percentage points higher, 13 percent. This finding was confirmed by estimates taking account of a variety of demographic and housing condition variables.

   On average, units upgraded by Minimum Standards households were initially of somewhat lower overall quality than those upgraded by Control households. Corresponding to this, Minimum Standards households that upgraded corrected a larger average number of

deficiencies and increased overall unit quality more than Control households that upgraded. The differences are modest, however; the overall value of the hedonic index for units upgraded by Minimum Standards households increased by about 7 percent, compared with 3 percent for units upgraded by Control households.

The percentages of Minimum Standards and Control households that upgraded were only different in the first year after enrollment (11 percent of households not meeting requirements at enrollment for Minimum Standards households as compared to 7 percent for Control households). In the second year, the percentages were the same (4 percent of the households that did not meet requirements at the end of the first year for both groups). Thus, after the first year, households met Minimum Standards by upgrading only through the process of normal maintenance and repair.

3. Even with the additional upgrading induced by the housing allowance, upgrading was generally concentrated in better quality units and usually involved small changes to the unit, with no above-normal increase in rent.

Although, as indicated above, Minimum Standards households upgraded units that were initially in somewhat worse condition than those upgraded by Control households, the units upgraded by both groups tended to be of higher initial quality than those of households that stayed in their enrollment units without upgrading. Upgraded units were on average higher-priced units that offered a higher initial level of housing services, failed fewer Minimum Standards components, were less crowded, and received better overall ratings from the housing evaluators.

On average, the repairs involved in upgrading were relatively modest. Indeed, Control upgraders show no greater change in overall unit quality, as measured by the hedonic index, than other Control households that stayed in the same unit without meeting requirements; they simply started in better quality units that were closer to meeting the Minimum Standards require-

ments. (Minimum Standards households did show a larger change in the hedonic index value, reflecting the modest additional improvements by these households.)

Furthermore, upgrading did not on average lead to any additional increase in rent over the two years. Control and Minimum Standards households that stayed in their enrollment units all showed about a 10 percent increase in rent over the two years, regardless of whether they upgraded. This increase appears to reflect normal inflation and again suggests that upgrading involved normal maintenance or, in the case of Minimum Standards households, additional efforts by the household rather than the landlord.

4. Meeting Minimum Rent requirements without moving was important only for households in Pittsburgh.

Almost all households that met Minimum Rent requirements without moving were in Pittsburgh. Among households that did not meet the Minimum Rent requirements at enrollment in Pittsburgh, 28 percent of Minimum Rent Low households and 11 percent of Minimum Rent High households later met the requirements without moving from their enrollment units. Comparable figures for Phoenix were only 6 percent for Minimum Rent Low households and 1 percent for Minimum Rent High households. The difference between the sites is apparently due to three factors. First, the mobility rate was lower in Pittsburgh, so that more households stayed in their enrollment units. Second, the rate of rent inflation was higher in Pittsburgh, so that households were more likely to have rents increased enough to exceed the Minimum Rent levels. Third, Pittsburgh households were generally closer to meeting Minimum Rent levels at enrollment so that a given change in rent brought more households above the Minimum Rent requirement.

In Pittsburgh, 46 percent of all the households that met Minimum Rent Low requirements after enrollment and 35 percent of all households that met Minimum Rent High requirements after enrollment did so without moving from their enrollment units. Thus, in Pittsburgh, meeting requirements in place was about as important for Minimum Rent households as upgrading was for Minimum

Standards households (45 percent of the Minimum Standards households in Pittsburgh that met requirements after enrollment did so by upgrading). In Phoenix, however, only 10 percent of households that met Minimum Rent Low requirements after enrollment and 3 percent of all households that met Minimum Rent High requirements after enrollment did so without moving, well below the comparable figure of 30 percent for Minimum Standards households.

5. There is no evidence that Minimum Rent households that met requirements without moving either negotiated or accepted substantially larger rent increases than would have been expected in the absence of the allowance offer.

Minimum Rent Low households in Pittsburgh that did not meet requirements at enrollment were more likely to meet them subsequently without moving than similar Control households (28 percent as opposed to 14 percent). This finding is confirmed by multivariate analysis and, as was the case with Minimum Standards, is evident only in the first year after enrollment. (There is no significant difference between Control and Experimental rates for Minimum Rent High requirements in Pittsburgh or for either Minimum Rent requirement in Phoenix.)

At the same time, the Minimum Rent Low households in Pittsburgh that met requirements without moving show no evidence of unusual increases in rent. Their rents increased by about the same percentage as those of Control households that met requirements without moving and Minimum Rent households that stayed in their enrollment units without meeting requirements. This suggests that the difference in the proportion of Minimum Rent and Control households that met requirements without moving reflects some underlying difference in initial circumstances not adequately controlled for in the analysis, rather than any substantial tendency to negotiate or accept unusually large increases in rent.

6. Overall, meeting Minimum Rent requirements without moving appears to reflect normal rent changes. These changes are not associated with any changes in unit quality.

   Households that met Minimum Rent requirements sometime after enrollment without moving were on average closer to meeting the required level when they enrolled than households that stayed in their enrollment units without meeting requirements. Thus, households that met the requirements without moving were to some extent simply households that were more likely to reach the required rent levels under normal inflation.

   Neither the households that met Minimum Rent requirements in place nor those that stayed in their enrollment units without meeting the requirements show evidence of any overall change in dwelling unit quality. The change in dwelling unit quality was measured by hedonic indices of housing quality, Minimum Standards components, a measure of physical housing deprivation, and the housing evaluator's overall rating of the unit. In each case the pattern was the same. Thus, rent increases for households meeting Minimum Rent requirements without moving apparently represent inflation, changing tenure relationships or a lagged adjustment of rent to some prior change in housing.

7. Substantial and frequent maintenance and repair of the rental housing stock is undertaken by both households and landlords.

   Almost all households reported that some improvement activity had occurred during the two years of the Demand Experiment. Households reported that their landlords made an average of 2.7 improvements during the two years after enrollment while the households themselves made an average of 2.8 improvements and spent about $90.

   As might be expected, while the mean number of repairs was the same for households and landlords, the types of repairs undertaken were different. Households more often made improvements such as interior painting or papering and repairs to floors or installation of carpets. Landlords more often installed or repaired plumbing, heating, or air conditioning equipment and added landscaping. Overall, the most frequently reported repairs and

improvements were general repairs and interior painting or papering. The least common were installation of major kitchen appliances, modernizing kitchens or bathrooms, general remodeling, and exterior painting.

8. Based on data reported by the households, the various allowance offers had no apparent effect on the overall level of either household or landlord maintenance and repair activity. Even among Minimum Standards upgraders, it is possible that the additional upgrading found for Minimum Standards households represents a refocusing of household repairs rather than a general increase in the level of repair activity, though this cannot be determined with certainty.

   The percentage of households reporting repairs, the mean number of repairs, and the reported household cost were all essentially the same for Experimental and Control households. This type of evidence does not necessarily contradict the experimental findings regarding Minimum Standards upgraders, however. The data reported by the households represent a very broad series of improvements ranging from simple repairs to modernization. Generally, the interview items are not closely related to the components of Minimum Standards nor are they specific enough to describe bringing a unit "up to code." Thus, it is possible that Minimum Standards upgrading represents a refocusing or that the interview questions are too general to detect actual differences in the amount of repairs being performed.

SOURCES OF STATEMENTS

The sources of summary statements are indicated below.

1. The overall rate of upgrading is given in Table 2-2. The proportion of participants that were upgraders is shown in Table 2-3. For a discussion of site differences, see Tables 2-3 and 2-4 and associated text and Figures IV-1 and IV-2.

2. Comparisons of Experimental and Control rates of upgrading are shown in Table 2-2 and further analyzed in Section 2.4 (Table 2-14). Comparisons of units upgraded are shown in Tables 2-6 and 2-7, and comparisons of changes to units in Tables 2-8 through 2-11. First- and second-year rates are compared in Table 2-5.

3. Comparisons of units upgraded with those not upgraded are shown in Tables 2-6 and 2-7. Changes are presented in Tables 2-8 through 2-11.

4. The rate of meeting in place and the proportion of recipients meeting in place are given in Tables 3-2 and 3-5 (comparable figures for Minimum Standards are shown in Tables 2-2 and 2-3). Differences between the sites are shown in Tables 3-2 and 3-5 and discussed further in Section 3.2 (Table 3-6).

5. Rates of meeting in place are presented in Tables 3-2, 3-3, and 3-4. Logit results are presented in Tables 3-9 and 3-10. Expenditure changes are shown in Table 3-11. The finding of no effect on expenditures for in-place meeters is also confirmed by more elaborate analysis in Joseph Friedman and Daniel H. Weinberg, Housing Consumption Under a Constrained Income Transfer: Evidence From a Housing Gap Housing Allowance, Cambridge, Mass., Abt Associates Inc., April 1979 (revised June 1980).

6. Initial distance from meeting requirements is shown in Table 3-6. Changes in rent and various measures of housing quality are presented in Tables 3-11 through 3-16. Comparisons with estimated normal rents are shown in Table 3-8.

7. The incidence and mean number of improvements, as well as reported household costs, are shown in Tables 4-1 and 4-2. The types of improvements made by households, by landlords, and overall are shown in Tables 4-3 through 4-5.

8. Overall Experimental/Control comparisons are presented in Tables 4-1 through 4-5. Comparisons of Minimum Standards and Control households that did not meet requirements at enrollment are shown in Tables 4-6 and 4-7. For a discussion of figures for Minimum Standards upgraders see Tables 4-8 and 2-10 and associated text. Similar comparisons for Minimum Rent households are given in Tables 4-9 through 4-14.

CHAPTER 1

INTRODUCTION

This is one of a series of final technical reports on the Housing Allowance Demand Experiment. The Demand Experiment was designed to provide information on how low-income households use housing allowance payments. The experiment offered monthly allowance payments to approximately 1,200 low-income households selected at random in two sites: Pittsburgh (Allegheny County), Pennsylvania and Phoenix (Maricopa County), Arizona. Several different allowance plans were tested involving different payment formulas and housing requirements. In addition, a Control group of approximately 500 low-income households was enrolled at each site. Households remained in the experiment and received payments for three years after they enrolled. The calendar period covered by the experiment was roughly from late 1973 to early 1977. Evaluation is based on the first two years of household observation.

Households in Housing Gap plans were offered payments designed to bridge all or part of the gap between the cost of modest, existing, standard housing and a reasonable fraction of household income. Thus, the Housing Gap payment was determined by

$$P = C - bY \tag{1}$$

where

P = the amount of the allowance payment

C = the basic payment schedule, proportional to the estimated cost of modest, existing, standard housing (which varied by household size and site)[1]

b = the benefit reduction rate (the rate at which the allowance is reduced as income increases) and

Y = household income.

[1] These costs were estimated by a panel of experts in each site.

The Housing Gap allowance payment was linked to participants' housing by housing requirements--households received an allowance only if they occupied units that met specific requirements. Two types of housing requirements were tested: Minimum Standards and Minimum Rent.

Minimum Standards households were required to live in housing that met specific physical and occupancy requirements. The physical requirements established standards for 15 attributes of the dwelling unit (such as adequate plumbing and kitchen facilities and minimum requirements for the surface and structural quality of walls and floors). The occupancy requirement specified that there be no more than two persons per adequate bedroom (where adequate was defined with regard to some of the physical standards). Compliance with Minimum Standards requirements was determined by housing evaluations, conducted by site office staff. The Minimum Standards plan thus combined an income-conditioned payment with a set of normative standards designed to ensure adequate housing. In this respect it is similar to existing housing programs such as Section 23 and Section 8.

Households in the Minimum Rent program, in contrast, could choose whatever dwelling unit characteristics they wished, but were required to pay at least a specified minimum amount for rent. Two levels of Minimum Rent were tested, set at 70 percent (Minimum Rent Low) and 90 percent (Minimum Rent High) of the estimated cost of modest, existing, standard housing in each site.[1] Minimum Rent is an alternative to Minimum Standards. The presumption is that, on average, units meeting Minimum Rent will offer an adequate level of housing services while allowing the household even more freedom of choice than the Minimum Standards requirement. Furthermore, a Minimum Rent allowance program might be less costly to administer, since it does not require housing evaluations.

The households of primary interest in this report are Minimum Standards and Minimum Rent households that did not meet requirements at enrollment and that did not move during the Demand Experiment. Housing requirement status at enrollment has been shown to be an important determinant of the use of the housing allowance (see Friedman and Weinberg, 1979).

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[1] This was the same cost schedule used in determining payments.

Households that already met requirements when they enrolled began to receive allowance payments immediately. Households that did not meet requirements did not receive payments until they either moved to units that met requirements or stayed and remedied the deficiencies in their enrollment units.

This report focuses on households that stayed and met requirements in their enrollment units.[1] For Minimum Standards households, this involved upgrading --that is, correcting the specific Minimum Standards requirements failed. Minimum Rent households could meet in place by negotiating or accepting a rent increase sufficient to meet the rent requirement, presumably in exchange for additional housing services or improvements.

Dwelling unit repairs and rent increases both occur in the absence of the experiment. The first major issue, therefore, is whether the Minimum Standards requirement encouraged households to make more repairs or repair their units more frequently than they would have done otherwise and whether the Minimum Rent requirement encouraged households to accept or negotiate greater rent increases than they would have done normally. This is done by comparing the rates of Minimum Standards upgrading and meeting Minimum Rent in place for Experimental and Control households.

For both Minimum Standards and Minimum Rent, a rather large proportion of households that did not meet requirements at enrollment and remained in their enrollment units never did meet requirements. Thus, a second major issue is to assess what characteristics appear to differentiate those that upgraded or met in place from households that stayed and did not meet requirements. Special attention is paid to the extent to which households that met in place tended to start out in better housing or in units that required smaller repairs or changes in rent to meet requirements.

A third issue is what kinds of changes in unit quality and rent in fact accompanied upgrading to meet Minimum Standards or meeting Minimum Rent in place. Upgrading at least involved correcting the specific deficiencies which caused the unit to fail Minimum Standards. These may or may not have been accompanied by other improvements. Likewise, they may have involved accepting substantial increases in rent or may have been relatively small

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[1] See Friedman and Weinberg (1979) for a detailed analysis of all the households in the Housing Gap allowance plans.

repairs with correspondingly small impact on the unit's overall quality or rent. Meeting Minimum Rent in place necessarily involved increases in rent. Again, these increases may have been large or small and may or may not have been accompanied by discernible improvements to dwelling units.

Upgrading to meet Minimum Standards obviously entailed a rather specific and limited type of repair and maintenance of the housing stock. The Demand Experiment can also provide some information on the extent to which low-income rental units are maintained and improved in the absence of extraordinary code enforcement or rehabilitation programs. The rate at which Control households that did not move passed Minimum Standards or increased their level of housing services is one approach to measuring normal maintenance. The measures of housing used in the analysis may measure only some aspects of maintenance, however. The Minimum Standards components, for example, are not designed to detect general remodeling. And while the hedonic index provides a good overall measure of housing quality, it will not detect many specific repairs or improvements.[1]

Periodic Interviews with enrolled households collected data directly related to the frequency and extent of repairs, improvements, and general remodeling. Households were asked whether they or their landlords had repaired or improved particular aspects of the unit and what the total cost had been to the household. A broad range of improvements was listed and may provide better understanding both of normal repair and maintenance activity and of the effect of the housing allowance.

The analysis of Minimum Standards upgrading is presented in Chapter 2. Chapter 3 analyzes Minimum Rent households that met requirements in place and assesses the effect of the experiment on the rate of meeting in place, the increase in rent, and the increase in housing services. Finally, Chapter 4 describes the repair and maintenance activity reported by Experimental and Control households. The data are presented first for all the Demand Experiment allowance plans and then in detail for Minimum Standards upgraders and Minimum Rent households that met in place.

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[1] The strength of the hedonic index rests on the fact that overall unit quality can be adequately described in terms of a relatively small number of unit and neighborhood attributes. In effect, units which score well on these attributes also tend to score well on other attributes. Normal maintenance, however, may involve a large variety of individual changes which would not be captured by the items used in the index.

REFERENCES

Budding, David W., Housing Deprivation Among Enrollees in the Housing Allowance Demand Experiment, Cambridge, Mass., Abt Associates Inc., November 1978 (revised June 1980).

Friedman, Joseph and Daniel H. Weinberg, Housing Consumption Under a Constrained Income Transfer: Evidence From a Housing Gap Housing Allowance, Cambridge, Mass., Abt Associates Inc., April 1979 (revised June 1980).

CHAPTER 2

MINIMUM STANDARDS UPGRADING

The Minimum Standards requirements included physical requirements covering 15 attributes of the dwelling unit (such as adequacy of light and ventilation, complete plumbing, and surface and structural quality) and an occupancy requirement of no more than two persons per adequate bedroom. A dwelling unit's ratings for these and other attributes were recorded during periodic housing evaluations. A brief description of the requirements is given in Table 2-1. The standards were based in part on the American Public Health Association - Public Health Service's Recommended Housing Maintenance and Occupancy Ordinance (revised 1971) code, and are similar to the standards set for the Section 8 program.[1]

Although the dwelling units of all households enrolled in the Demand Experiment were evaluated periodically, housing evaluations were used operationally only for households assigned to the Minimum Standards housing allowance plan. These households received a housing allowance payment only if they lived in units that passed the Minimum Standards requirements. Minimum Standards households living in units that did not pass the requirements received monthly $10 cooperation payments for providing data but were not eligible for full payments until they lived in units which passed the requirements.

About 80 percent of the Minimum Standards households did not meet the Minimum Standards requirements when they first enrolled in the Demand Experiment. Those Minimum Standards households that already met requirements began to receive housing allowance payments immediately. Other households received payments only if they either remedied the deficiencies in their current units or moved to units that did meet the requirements.

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[1] Refer to Appendix II for a complete description of the Minimum Standards requirements. Bakeman et al. (1979) discusses the operational content of Minimum Standards in terms of the extent to which the standards accurately identified inadequate housing and the ways in which the various components contributed to the overall failure rate.

Table 2-1

MINIMUM STANDARDS REQUIREMENTS

REQUIREMENT	DESCRIPTION
PHYSICAL REQUIREMENTS	
Complete plumbing	Private bathroom facilities must be present and in working condition
Complete kitchen facilities	A refrigerator, cooking facilities, and kitchen sink must be present and in working condition
Core rooms	A bathroom, kitchen, and living room must be present
Light fixtures	Working ceiling or wall-type fixtures must be present in the bathroom and kitchen
Electrical	At least one operable electric outlet must be present in the kitchen and living room. The living room must also have an additional outlet, wall switch, or pull-chain light switch
Heating equipment	Acceptable working heating equipment must be present
Room structure	Ceiling and wall structure for all rooms must not need replacement (such as leaning or severe buckling)
Room surface	Ceiling and wall surface for all rooms must not need replacement (such as large holes, loose material or other evidence of severe damage)
Floor structure	Floor structure for all rooms must not need replacement (such as severe buckling)
Floor surface	Floor surface for all rooms must not need replacement (such as large holes or missing parts)
Exterior walls	Exterior wall structure and surface must not need replacement (such as leaning, buckling or excessive cracks and holes)
Light and ventilation	At least one openable window or working vent must be present in the bathroom and kitchen, at least one openable window must be present in the living room; and the ratio of window area to floor area in these rooms must be at least 10 percent
Ceiling height	The ceiling height in the living room, bathroom, and kitchen must be at least 7' high for at least half the room area
Adequate exits	For multi-family buildings, there must be at least 2 exits leading to safe and open space on the ground, or other indications that fire safety is met
Roof structure	The roof structure must be firm (not sagging or buckling)
OCCUPANCY REQUIREMENT	
Occupancy	There should be no more than two persons per adequate bedroom. An adequate bedroom is a room able to be closed off from other rooms and which passes Minimum Standards requirements for electrical, ceiling height, light and ventilation, room structure and surface, floor structure and surface.

As illustrated in Figure 2-1, the housing allowance offer provided an effective incentive for households that did not already meet requirements: after two years in the experiment, households not initially meeting requirements passed the requirements at almost twice the rate for similar Control households.[1] Thus, 36 percent of the Minimum Standards households in Pittsburgh and Phoenix that lived in units that failed Minimum Standards at enrollment succeeded in meeting Minimum Standards within two years of enrollment, compared with 19 percent of Control households.[2]

This chapter concerns households that met the requirements by upgrading their enrollment units rather than by moving to other units. Section 2.1 compares the rates of upgrading for Minimum Standards and Control households in order to determine how much upgrading was undertaken in response to the allowance offer or simply reflected the normal process of maintenance and repair. Section 2.2 discusses the extent to which households that upgraded started out in better units with relatively few deficiencies. Section 2.3 examines the actual changes made to upgraded units--both in terms of the specific Minimum Standards deficiencies remedied and in terms of other measures of overall housing quality. Finally, Section 2.4 combines the results of the previous sections to develop logit estimates of the experimental impact on upgrading, controlling for initial housing condition as well as various demographic factors.

For the purposes of this analysis, upgrading is specifically defined in terms of the items included in the Minimum Standards requirements and does not reflect other repairs or improvements that may have occurred at the same time. Thus, Minimum Standards upgraders are defined as households whose units

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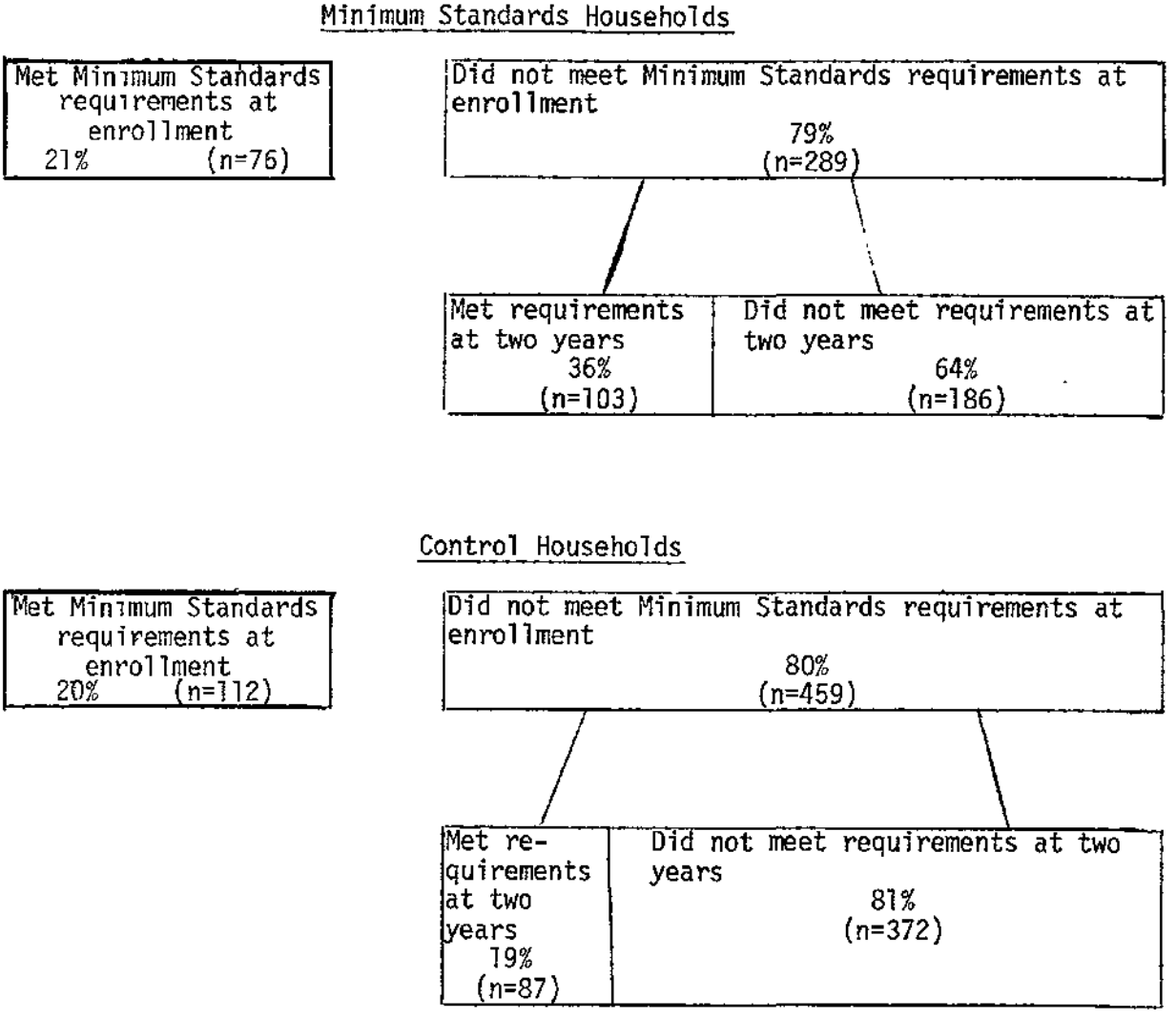
[1] See Kennedy and MacMillan (1979) for a more complete analysis of the probability of participating in the experiment and Friedman and Weinberg (1979) for an analysis of change in expenditures and housing quality for Housing Gap households.

[2] The overall rates of meeting requirements differed somewhat between the sites, as shown in Appendix IV, Figures IV-1 and IV-2. Of the households that failed requirements at enrollment, 46 percent in Phoenix and 27 percent in Pittsburgh were living in units that met requirements within two years of enrollment. Nevertheless, in both sites the rate at which Minimum Standards households passed the requirement after two years was higher than the rate at which similar Control households passed (12 percent in Pittsburgh and 26 percent in Phoenix).

Figure 2-1

MINIMUM STANDARDS REQUIREMENT STATUS AT ENROLLMENT AND AT TWO YEARS: PITTSBURGH AND PHOENIX



SAMPLE: Minimum Standards and Control households active at two years after enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms and Housing Evaluation Forms.

failed Minimum Standards at enrollment, that never moved during their two years of program participation, and whose units passed Minimum Standards based on the periodic housing evaluations completed at the end of the first and second years of the experiment. This definition permits comparison analysis of Minimum Standards and Control households, although it differs somewhat from actual program operations.[1]

2.1 UPGRADING TO MEET MINIMUM STANDARDS

As indicated above, among households not meeting the Minimum Standards requirements at enrollment, almost twice as many Minimum Standards as Control households eventually lived in units that passed the requirements. These households met Minimum Standards either by upgrading their enrollment units or by moving to units that passed the requirements. As shown in Table 2-2, a significant experimental effect exists for both upgrading and moving. Approximately 13 percent of Minimum Standards households upgraded, while 8 percent of Control households did so. Both the rates of upgrading and the differences in rates between Minimum Standards and Control households are almost identical in the two sites.

[1]The actual program operations allowed a Minimum Standards household that had repaired its unit to call the site program office in any month during its participation in the program and request that an Upgrade Housing Evaluation be performed on its dwelling unit in order to determine whether it met Minimum Standards. Control households did not have to meet Minimum Standards and thus did not call the site office. To permit valid comparison of Minimum Standards and Control households, the presence of an Upgrade Evaluation is not the criterion upon which the upgrading sample is defined. Rather, households that failed to meet requirements at enrollment and stayed in their enrollment units are defined as upgraders if they subsequently met requirements at either the First or Second Annual Housing Evaluations, which were routinely scheduled for all households.

Once a household met requirements in a unit, it qualified for payments as long as it remained in that unit. Thus, some Minimum Standards upgraders could fail to meet requirements at both the First and Second Annual Housing Evaluations. In actual practice, the two definitions give almost identical results. Among Minimum Standards households that stayed in their enrollment units, 14 upgraded simply by meeting requirements during the routine Annual Housing Evaluations and are captured by both the operational and analytic definitions. Another 28 households requested and passed an Upgrade Evaluation; 23 of these also passed requirements at one of the annual evaluations. Thus the analytic definition appears to capture most upgrading. Another consistent definition of upgrading across Minimum Standards and Control households can be obtained by defining upgrading in terms of the way in which households first met the Minimum Standards requirements (regardless of whether or not they subsequently moved). Figures for this definition, applied to all enrolled households, are presented in Appendix III.

Table 2-2

MINIMUM STANDARDS REQUIREMENTS AND MOBILITY STATUS
AT TWO YEARS FOR HOUSEHOLDS NOT MEETING MINIMUM STANDARDS AT ENROLLMENT

OUTCOMES	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC
	COMBINED SITES		
Upgraded	13%	8%	2.247*
Moved and passed	23	11	4.292***
Stayed and failed	37	49	3.057**
Moved and failed	27	32	1.508
(Sample size)	(289)	(459)	
	PITTSBURGH		
Upgraded	12%	8%	1.60
Moved and passed	15	5	3.35***
Stayed and failed	44	57	2.39*
Moved and failed	28	31	0.49
(Sample size)	(155)	(241)	
	PHOENIX		
Upgraded	13%	8%	1.53
Moved and passed	32	18	3.06**
Stayed and failed	29	40	2.05*
Moved and failed	25	34	1.68†
(Sample size)	(134)	(218)	

SAMPLE: Minimum Standards and Control households active at two years after enrollment whose units failed the Minimum Standards requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms and Housing Evaluation Forms.

NOTE: Percentages do not add to 100 due to rounding.

† t-statistic significant at the 0.10 level.
* t-statistic significant at the 0.05 level.
** t-statistic significant at the 0.01 level.
*** t-statistic significant at the 0.001 level.

Three issues of interpretation should be addressed at the outset. First, the Control rate of upgrading estimates the normal probability that housing attributes related to the Minimum Standards requirements will be repaired or improved. However, upgrading by Control households does not necessarily reflect any general trend in the quality of Control units. Improvements in the condition of units not initially meeting requirements may be partly offset by deterioration among units that did meet. In addition, there is undoubtedly some measurement error that changes the categorization of units under successive evaluations. In fact, the overall rate at which Control households that stayed in the same unit met requirements did not change materially during the experimental period.[1]

Second, comparison of Experimental and Control households could be biased if, among other reasons, Experimental households that met requirements and received allowance payments were less likely to drop out of the experiment than comparable Control households. This problem is not investigated here. However, analysis of meeting requirements in general indicates that biases due to differential attrition are probably small (see Kennedy and MacMillan, 1979).

Finally, it is in fact almost impossible to determine exactly how many households were induced by the allowance to upgrade. If some Minimum Standards households that would normally have upgraded were induced to move, for example, then the difference between Experimental and Control rates of upgrading would understate the proportion of Experimental upgraders that were

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[1]The percentages of all Control households that did not move that met Minimum Standards at enrollment and at the end of two years are

	Enrollment	Two Years	t-Statistic	Sample Size
Combined sites	22% (73)	22% (73)	0	(336)
Pittsburgh	23 (46)	19 (38)	1.16	(203)
Phoenix	20 (27)	26 (35)	1.39	(133)

SAMPLE: Control households active at two years after enrollment that did not move, excluding those with enrollment incomes over the eligibility limits, those living in their own homes or in subsidized housing, and those with a missing value at either enrollment or two years.

induced to upgrade. What Experimental/Control comparisons yield are estimates of the net effect of the allowance on the rate of upgrading. The stories developed about individual household decisions based on these net effects are necessarily conjectures.

Although the number of Minimum Standards households that upgraded is relatively modest--37 households or about 13 percent of all Minimum Standards households that failed Minimum Standards at enrollment--the importance of upgrading as a means of meeting Minimum Standards should not be underestimated. As shown in Table 2-3, over one-third of the Minimum Standards households that did not meet requirements initially but were living in acceptable units by the end of the experiment, met the standards by upgrading. Overall, about one-fifth of all the recipients at the end of two years--including those that met the requirements initially--were households that met by upgrading their enrollment units.

Although upgraders account for about the same proportion of all recipients in both sites, upgrading plays a much greater role in Pittsburgh than in Phoenix for households that initially failed the requirements. Approximately 45 percent of Pittsburgh households that initially failed and then later met requirements did so by upgrading, as compared with 30 percent in Phoenix. Table 2-2 shows that about the same proportion of Experimental and Control households that did not meet requirements initially upgraded in both sites. More households met requirements by moving in Phoenix, however, so that upgrades accounted for a smaller proportion of all households that later met requirements in that site. This difference apparently reflects both a high mobility rate and a generally looser housing market in Phoenix.

As shown in Table 2-4, Experimental households in both sites moved somewhat more often than Control households. Mobility rates were, however, generally higher in Phoenix.[1] In addition, however, Phoenix households were also more likely to meet requirements, especially if they moved. In both sites, Experimental households were more likely to meet requirements than Control households, whether they moved or stayed. As with mobility, however, the rate of meeting requirements was generally higher in Phoenix. This may be due to a tighter rental market in Pittsburgh. In 1974, for example, rental

[1]For a detailed analysis of mobility, see MacMillan (1978).

Table 2-3

HOUSEHOLDS MEETING MINIMUM STANDARDS AT TWO YEARS:
HOW THE REQUIREMENT WAS MET

MINIMUM STANDARDS STATUS	COMBINED SITES		PITTSBURGH		PHOENIX	
	PERCENTAGE OF THOSE MEETING AT TWO YEARS	PERCENTAGE MEETING REQUIREMENTS AFTER ENROLLMENT	PERCENTAGE OF THOSE MEETING AT TWO YEARS	PERCENTAGE MEETING REQUIREMENTS AFTER ENROLLMENT	PERCENTAGE OF THOSE MEETING AT TWO YEARS	PERCENTAGE MEETING REQUIREMENTS AFTER ENROLLMENT
Met Minimum Standards requirements at enrollment	39%	--%	48%	--%	30%	--%
Did not meet Minimum Standards requirements at enrollment	61	100	52	100	70	100
Upgraded	22	36	24	45	21	30
Moved and met Minimum Standards in the two-year dwelling unit	39	64	28	55	49	70
Total population meeting Minimum Standards at two years	(168)		(81)		(87)	

SAMPLE: Minimum Standards households active at two years after enrollment whose units passed the Minimum Standards requirements at two years after enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms and Housing Evaluation Forms.

Table 2-4

MEETING MINIMUM STANDARDS REQUIREMENTS IN PITTSBURGH AND PHOENIX FOR HOUSEHOLDS THAT DID NOT MEET AT ENROLLMENT

	PITTSBURGH		PHOENIX	
	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS
Percentage of those not meeting requirements at enrollment that moved	43%	36%	57%	52%
(Sample size)	(155)	(241)	(134)	(218)
Percentage of movers that met requirements	34	14	56	34
(Sample size)	(67)	(86)	(77)	(113)
Percentage of stayers that met requirements	22	12	32	17
(Sample size)	(88)	(155)	(57)	(105)

SAMPLE: Minimum Standards and Control households active at two years after enrollment whose units failed the Minimum Standards requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms and Housing Evaluation Forms.

vacancy rates averaged 5.1 percent in Pittsburgh and 14.4 percent in Phoenix (U.S. Department of Commerce, 1976). Thus, it may have been more difficult for Pittsburgh households to move to units that would meet Minimum Standards.

Given the small number of upgraders, most of the remaining tables in the chapter are presented for the combined sites. Separate tables for the sites appear in Appendix IV.

Evidence of an overall experimental impact on the rate of upgrading is corroborated by separate analysis for the first and second years of the experiment. As shown in Table 2-5, the rate of upgrading during the first year after enrollment is significantly higher for Minimum Standards households than for Control households--11 percent compared to 7 percent. In the second year, however, the rate of upgrading for Minimum Standards households declined sharply, and was almost identical to that of Control households.[1,2] Thus, it appears that the additional upgrading induced by the allowance was, as might be expected, concentrated in the first year after enrollment. Thereafter, households met Minimum Standards by upgrading only through the process of normal repair and maintenance. (Minimum Standards households continued to move and meet requirements at a significantly higher rate than Control households, however.)

2.2 MINIMUM STANDARDS UPGRADING AND INITIAL HOUSING QUALITY

The previous section suggested that the housing allowance offer enhanced an ongoing process of maintenance and repair; although there was no special incentive for Control households to upgrade their units, a number of them did so, and Minimum Standards households, with the extra incentive of the allowance payment, were more likely to upgrade than Control households. It seems likely that housing changes engendered by normal maintenance and repair (or measurement error) would often be relatively small. Thus, on

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[1]This effect was also evidenced in the frequency in which Upgrade Housing Evaluations were requested by Minimum Standards households. The rate of requests for these evaluations was over twice as high in the first year as it was in the second year.

[2]A similar pattern occurred in both Pittsburgh and Phoenix (see Appendix IV, Tables IV-1 and IV-2).

Table 2-5

UPGRADING DURING THE FIRST AND SECOND YEARS AFTER ENROLLMENT

OUTCOMES	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC
	DURING THE FIRST YEAR		
Upgraded	11%	7%	2.251*
Moved and passed	14	7	2.922**
Stayed and failed	53	61	-2.056*
Moved and failed	22	25	-1.130
(Sample size)	(289)	(466)	
	DURING THE SECOND YEAR		
Upgraded	4%	4%	0.122
Moved and passed	13	4	3.815**
Stayed and failed	66	73	-1.817†
Moved and failed	17	18	-0.469
(Sample size)	(220)	(409)	

FIRST YEAR SAMPLE: Minimum Standards and Control households active at two years after enrollment whose units failed the Minimum Standards requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

SECOND YEAR SAMPLE: Minimum Standards and Control households active at two years after enrollment whose units failed the Minimum Standards requirements at one year after enrollment, excluding those with incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms and Housing Evaluation Forms.

† t-statistic significant at the 0.10 level.

* t-statistic significant at the 0.05 level.

** t-statistic significant at the 0.01 level.

average, Control upgraders would be expected to come from better units --that is, units that are closer to meeting the Minimum Standards requirements--than those that did not upgrade. Likewise, it seems reasonable to suppose that the initial condition of the unit might affect in two ways Minimum Standards households that upgraded. First, Minimum Standards households would be more likely to choose upgrading as a method of meeting requirements and would be more able to implement the repairs if their housing was in relatively good condition and relatively close to meeting the Minimum Standards requirements. Second, the fact that some Minimum Standards households were induced to upgrade suggests that some households may have undertaken to upgrade units that were further from meeting Minimum Standards or otherwise in less good condition than units upgraded by Control households.

This section compares the initial housing of Minimum Standards and Control households that did and did not upgrade, using a variety of measures. In nearly every case, the pattern is the same. Both Minimum Standards and Control upgraders started in significantly better housing than households that did not upgrade. The difference appears to be somewhat larger for Control households, however. Minimum Standards households, though starting in significantly better housing than households that stayed and did not upgrade, appeared to be in slightly worse housing than Control upgraders. This result conforms to the pattern suggested by the findings in Section 2.2--more effort was required of Minimum Standards households induced to upgrade.

Six different measures of housing quality have been used to help assess the initial quality of units that were upgraded--rent, hedonic indices, the number of physical Minimum Standards components failed, persons per adequate bedroom, a measure of physical housing deprivation, and the evaluator's overall rating of the unit. Rent is used, since better units would on average be expected to cost more. At the same time, rent is also determined by a variety of factors not related to quality, including inflation, tenure conditions, and price heterogeneity in the market. Hedonic indices

of housing services attempt to sort out these factors to provide an overall measure of housing.[1]

Both persons per adequate bedroom and number of components failed can be used to indicate how difficult it was to upgrade the unit. The mean number of persons per adequate bedroom indicates the extent of crowding in the unit, as defined by the Minimum Standards. The number of Minimum Standards components failed provides a measure of the distance of the unit from meeting physical requirements. These measures are only approximate, however. While overcrowding would be relatively difficult to remedy without moving if the household required additional rooms, it could also involve relatively simple repairs to make an existing, inadequate bedroom adequate. Likewise, units that fail fewer Minimum Standards components are likely to be easier to upgrade. The relationship is weakened, however, because deficiencies differ in feasibility and cost of repair.

Two additional measures of the severity of housing deficiencies are a housing deprivation measure and the evaluator's overall rating. Budding (1978) proposed a measure of physical housing deprivation which divides units into three classes: (1) minimally adequate, (2) ambiguous, and (3) clearly inadequate. A typical unit rated as clearly inadequate requires major repairs or renovations and fails components such as complete plumbing facilities, adequate heating equipment, complete kitchen facilities, or adequate room and floor surfaces. The majority of units rated as clearly inadequate failed a number of requirements. Thus, there is a strong presumption that clearly inadequate units were more difficult to upgrade than other units.[2]

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[1] See Merrill (1977). Inflation, by definition, raises the dollar value of rent without changing quality. Long-established tenants may pay lower rents because they are known to the landlord as good tenants. Racial discrimination may force minorities to pay more for units of the same quality. Individual households may simply obtain better deals, paying less than others for a given unit. Hedonic indices provide a way of sorting out quality and nonquality factors in determining the market values of units.

[2] A typical unit rated as minimally adequate passed window condition requirements, was rated by the evaluator as being in good condition or requiring only minor repairs, and passed the 15 physical requirements for Minimum Standards (but did not necessarily pass the occupancy requirement). A unit was rated as ambiguous if it had only a few undesirable features or deficiencies that, depending on what was exactly involved in the deficiency could cause the unit to be regarded as either minimally adequate or clearly inadequate. See Budding (1978) for details.

Finally, the housing evaluator's overall rating of the unit provides another measure of the severity of defects present. At the conclusion of each housing evaluation, the evaluator was instructed to summarize in one overall rating the condition of the dwelling unit's interior, the building structure, and its immediate neighborhood. The dwelling unit was rated on a four-point scale:

0 = Good condition; only ordinary maintenance needed
1 = Basically sound, but some minor repairs needed
2 = Basically sound, but some major repairs/renovations needed
3 = Unsound; hazardous or unfit for human habitation.

This measure enhances the objective measures by providing an overall subjective rating, by a trained observer, of the unit's overall quality and of the extent of repairs required.

The average values of the six measures are presented in Table 2-6. The data show that upgraders--both Minimum Standards and Control households--tended to live in higher-priced units that failed fewer Minimum Standards components, were less crowded, had a higher initial level of housing services, and had better overall ratings based on either the physical deprivation measure or the evaluator's overall rating.

Units that were later upgraded were on average 16 to 36 percent more expensive to begin with and offered substantially (20 to 35 percent) higher levels of housing services than units that were not upgraded. Units that were later upgraded were also initially closer to meeting the physical Minimum Standards requirements, failing only half as many components as units that were never upgraded. Also, the occupancy requirement (no more than two persons per adequate bedroom) was met more frequently in units that were later upgraded.

The distribution of households across the physical housing deprivation and overall evaluator rating categories in Table 2-7 confirms this result. In terms of physical deprivation, upgraders were generally living in units that had fewer serious deficiencies than the units of households that stayed and did not upgrade. Over half of the Minimum Standards and Control households that stayed and failed Minimum Standards were living in units defined as clearly inadequate, as compared to only 27 percent

Table 2-6

INDICATORS OF DWELLING UNIT QUALITY AT ENROLLMENT

INDICATORS	UPGRADED			STAYED AND FAILED			ADDITIONAL t-STATISTICS (upgraded vs. stayed/failed)	
	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS
Mean rent	$ 118 59	$ 146 70	-2 70**	$ 101 89	$ 107 64	-1.41	2 26*	4.66***
	(37)	(34)		(106)	(223)			
Mean housing services index[a]	126.42	139.45	-1 63	104 25	111 59	-2.17*	4 36***	3.97***
	(36)	(30)		(102)	(204)			
Mean number of physical components failed	1 11	0 80	1 94+	2 29	2 28	0.01	-6 35***	-7.63***
	(37)	(36)		(108)	(224)			
Mean number of persons per adequate bedroom	2.97	3.91	-1.25	4 91	5.63	-1.76†	-3.26***	-2.80**
	(37)	(36)		(108)	(224)			
Mean overall evaluator rating[b]	0 95	0.72	1.44	1.44	1.39	0.65	-3.86***	-5.47***
	(37)	(36)		(108)	(224)			
Mean housing deprivation measure[c]	2.03	1 86	0.95	2.56	2 44	1.44	-3.91***	-4 29***
	(37)	(36)		(108)	(224)			

SAMPLE Minimum Standards and Control households active at two years after enrollment whose units failed the Minimum Standards requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES Initial and monthly Household Report Forms, Housing Evaluation Forms, and Baseline and Periodic Interviews.

NOTE. Sample sizes are in parentheses.

a. The sample for this mean excludes households with extreme values for predicted rent (used in the derivation of the housing services index).

b. The evaluator rating is measured on a four-point scale, from 0, indicating good condition, to 3 indicating the unit is unfit for habitation.

c The measure is a three-point scale, 1 indicating a minimally adequate unit and 3 indicating a clearly inadequate unit.

† t-statistic significant at the 0.10 level.

* t-statistic significant at the 0.05 level.

** t-statistic significant at the 0.01 level.

*** t-statistic significant at the 0.001 level.

Table 2-7

HOUSING DEPRIVATION MEASURE AND EVALUATOR'S
OVERALL RATING OF ENROLLMENT UNIT BY TWO-YEAR OUTCOMES

HOUSING DEPRIVATION MEASURE	OUTCOMES: UPGRADED	OUTCOMES: STAYED AND FAILED	t-STATISTIC (upgraded vs. stayed/failed)
MINIMALLY ADEQUATE			
Minimum Standards households	24% (9)	9% (10)	2.332*
Control households	36 (13)	12 (27)	3.701***
t-statistic	1.099	-0.758	--
AMBIGUOUS			
Minimum Standards households	49 (18)	26 (28)	2.561*
Control households	42 (15)	32 (71)	1.184
t-statistic	0.592	-1.082	--
CLEARLY INADEQUATE			
Minimum Standards households	27 (10)	65 (70)	-3.990***
Control households	22 (8)	56 (126)	-3.778***
t-statistic	0.476	1.476	

SAMPLE: Minimum Standards and Control households active at two years after enrollment whose units failed the Minimum Standards requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms and Housing Evaluation Forms.

NOTE: Sample sizes are in parentheses.

* t-statistic significant at the 0.05 level.

*** t-statistic significant at the 0.001 level.

Table 2-7 (continued)

HOUSING DEPRIVATION MEASURE AND EVALUATOR'S
OVERALL RATING OF ENROLLMENT UNIT BY TWO-YEAR OUTCOMES

EVALUATOR'S RATING	OUTCOMES: UPGRADED	OUTCOMES: STAYED AND FAILED	t-STATISTIC (upgraded vs. stayed/failed)
GOOD CONDITION			
Minimum Standards households	24% (9)	7% (8)	2.759**
Control households	39 (14)	11 (25)	4.316***
t-statistic	-1.343	-1.083	
BASICALLY SOUND, MINOR REPAIRS NEEDED			
Minimum Standards households	57 (21)	46 (50)	1.103
Control households	50 (18)	46 (104)	0.402
t-statistic	0.582	-0.017	
BASICALLY SOUND, MAJOR REPAIRS OR RENOVATIONS NEEDED			
Minimum Standards households	19 (7)	41 (44)	-2.397*
Control households	11 (4)	35 (78)	-2.841**
t-statistic	0.932	1.045	
UNSOUND, UNFIT FOR HUMAN HABITATION			
Minimum Standards households	0 (0)	6 (6)	-1.470
Control households	0 (0)	8 (17)	-1.711
t-statistic	-	-0.671	

SAMPLE Minimum Standards and Control households active at two years after enrollment whose units failed the Minimum Standards requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES. Initial and monthly Household Report Forms and Housing Evaluation Forms.

NOTE Sample sizes are in parentheses.

* t-statistic significant at the 0.05 level.

** t-statistic significant at the 0.01 level.

*** t-statistic significant at the 0.001 level.

of the Minimum Standards households and 22 percent of Control households that stayed and upgraded. (These differences were significant at the 0.001 level.) Likewise, in terms of the evaluator's overall rating, over 80 percent of the Minimum Standards and Control households that later upgraded were living in units that were rated in good condition or as needing only minor repairs, compared to roughly 55 percent of the Minimum Standards and Control households that stayed and did not upgrade.

At the same time, the allowance appears to have induced Minimum Standards households to upgrade units that were initially of somewhat lower quality than those upgraded by Control households. In comparison to Control upgraders, Minimum Standards households upgraded units that were significantly less expensive and offered somewhat lower levels of housing services. With respect to the Minimum Standards requirements, Minimum Standards upgraders failed significantly more components of the physical requirements, but showed no significant difference in terms of occupancy (the mean number of persons per adequate bedroom is not significantly different). This is not unreasonable, since occupancy requirements might in general be difficult to meet by upgrading. Indeed, as pointed out above, both Control and Minimum Standards upgraders met the occupancy requirement on average before they upgraded.[1] Likewise, both Budding's physical housing deprivation classification and the overall evaluator's rating suggest that Minimum Standards households upgraded housing that was in moderately worse condition than that upgraded by Control households, though the differences are not significant.

2.3 THE CHANGES IN HOUSING FOR UPGRADED UNITS

The previous section suggested that upgrading may generally have involved units that could be brought into compliance with Minimum Standards requirements with relatively minor repairs. Units that were later upgraded were originally better quality units that were already closer to meeting the requirements. At the same time, Minimum Standards households apparently undertook to upgrade units of somewhat lower initial quality than Control

[1] It was possible to meet the occupancy requirement in some cases by repairs that made an inadequate bedroom adequate. This is discussed further in Section 2.3 below.

households. Thus, Minimum Standards upgraders would be expected to show somewhat larger housing changes than Control upgraders. Direct examination of the changes in upgraded units confirms this suggestion. Changes are described in this section in three ways--in terms of rent, the hedonic index of housing services, and the specific repairs involved in making the unit meet the Minimum Standards requirements. Other repairs not directly involved in meeting Minimum Standards are discussed in Chapter 4.

Tables 2-8 and 2-9 show the changes in rent and housing services for both Minimum Standards and Control households that upgraded and those that stayed in their enrollment units and did not upgrade. Households that upgraded in order to meet Minimum Standards requirements did not incur greater rent changes than Control households or than households that stayed in their units and continued to fail Minimum Standards.[1] Upgrading appears to have had no systematic effect on the cost of the unit. This suggests that upgrading generally involved relatively minor repairs that were either carried out by the tenant or were part of normal landlord maintenance. In any case, they were not on average extensive enough to lead landlords to propose (or tenants to accept) larger increases in rents than those experienced by all households that stayed in their enrollment units.

In terms of the overall hedonic index of housing services, Control upgraders show no greater increase than Control households that did not upgrade. This is consistent with the patterns observed in the previous sections. Changes in the units of all Control households were part of the process of normal maintenance and repair (as well as deterioration). Some of these repairs were made in units of sufficiently high quality (and included enough of the right repairs) to move the households from failing to passing the Minimum Standards requirements. Other repairs, of the same modest type, were made in poorer units with more deficiencies and so did not result in the unit passing Minimum Standards, even though they involved a similar level of housing change.

Minimum Standards households that upgraded did show a significantly greater increase in housing services than either Control upgraders or Minimum

[1] This finding is corroborated by the analysis of the Housing Gap housing allowance plan (see Friedman and Weinberg, 1979, Chapter 7).

Table 2-8

PERCENTAGE CHANGE IN RENT OVER TWO YEARS

	OUTCOMES		
	UPGRADED	STAYED AND FAILED	SAMPLE SIZE
MEAN RENT AT ENROLLMENT			
Minimum Standards households	$118.59 (37)	$101.89 (106)	(143)
Control	146.70 (34)	107.64 (223)	(257)
MEAN RENT AT TWO YEARS			
Minimum Standards households	127.03 (37)	110.87 (107)	(144)
Control	159.03 (36)	117.47 (222)	(258)
MEAN PERCENTAGE CHANGE			
Minimum Standards households	9.1% (37)	10.3% (105)	(142)
Control	11.3 (34)	10.5 (221)	(255)
t-STATISTIC FOR MEAN PERCENTAGE CHANGE			
Minimum Standards households versus Control households	-0.47	0.13	
Upgraded versus stayed and failed Minimum Standards households	0.32		
Upgraded versus stayed and failed Control households	-0.20		

SAMPLE: Minimum Standards and Control households active at two years after enrollment whose units failed the Minimum Standards requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms and Housing Evaluation Forms.

NOTE: Sample sizes are in parentheses.

Table 2-9

PERCENTAGE CHANGE IN HOUSING SERVICES
OVER TWO YEARS

	OUTCOMES		
	UPGRADED	STAYED AND FAILED	SAMPLE SIZE
MEAN HOUSING SERVICES AT ENROLLMENT			
Minimum Standards households	127.32 (34)	104.60 (100)	(134)
Control households	139.45 (30)	111.62 (202)	(232)
MEAN HOUSING SERVICES AT TWO YEARS			
Minimum Standards households	135.74 (34)	107.28 (100)	(134)
Control households	142.48 (30)	114.67 (202)	(232)
MEAN [AND MEDIAN] PERCENTAGE CHANGE			
Minimum Standards households	6.9% [6.6] (34)	3.9% [2.4] (100)	(134)
Control households	2.6 [0.1] (30)	3.4 [2.3] (202)	(232)
t-STATISTIC FOR MEAN PERCENTAGE CHANGE			
Minimum Standards households versus Control households	2.39*	0.30	
Upgraded versus stayed and failed Minimum Standards households	1.69†		
Upgraded versus stayed and failed Control households	0.51		

SAMPLE: Minimum Standards and Control households active at two years after enrollment whose units failed the Minimum Standards requirements at enrollment, excluding those with enrollment incomes over the eligibility limits, those living in their own homes or in subsidized housing, and those with extreme values or missing values for the hedonic residual.

DATA SOURCES: Initial and monthly Household Report Forms, Housing Evaluation Forms, and Baseline and Periodic Interviews.

NOTE: Sample sizes are in parentheses.

† t-statistic significant at the 0.10 level.

* t-statistic significant at the 0.05 level.

Standards households that did not upgrade. The difference is modest--only 3 or 4 percentage points--but still significant.[1] This again confirms the impression that Minimum Standards upgraders undertook modestly larger repairs than Control upgraders.[2] The fact that this increase in housing services was not accompanied by any additional increase in rent may indicate that the repairs involved were undertaken by the households themselves rather than their landlords. Some evidence of this is reflected in household reports of repairs by themselves and their landlords, collected as part of three periodic interviews conducted 6, 12, and 24 months after enrollment. These data are described further in Chapter 4.

Table 2-10 shows the mean number of repairs which households reported as having been made by their landlords and by the households themselves, as well as the household's estimated spending for repairs for the two years after enrollment. As can be seen from the table, the mean number of reported landlord repairs is approximately the same for households that upgraded and households that stayed in their enrollment unit without upgrading. Control households that upgraded, however, reported significantly fewer repairs by the household and significantly lower household spending on repairs than Control households that stayed in their enrollment units without upgrading. This may reflect the fact that upgraded units were generally in better condition than units that were not upgraded, as discussed in Section 2.2 above.

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[1] Again, a more elaborate analysis of the change in housing services controlling for income and demographic characteristics confirms this finding (Friedman and Weinberg, 1979, Appendix X).

[2] It should be noted that variables representing a few of the Minimum Standards components are included in the hedonic housing services index. Thus, even if no other attributes of housing changed, the index might increase for upgraders. This aspect of the construction of the index should not bias estimates of Experimental and Control differences, however, since there is no evidence that Minimum Standards and Control households initially failed <u>different</u> Minimum Standards components. However, Control households initially failed somewhat fewer Minimum Standards components. A case-by-case examination of all upgraders indicates that many housing attributes change; so there is no way to determine whether the results are due to Minimum Standards components alone. Table 2-9 is based on the linear hedonic equation. The semilog equation, which contains a slightly different set of variables, shows the same pattern. The semilog results are given in Appendix IV, Tables IV-9 and IV-10.

Table 2-10

MEAN NUMBER OF REPORTED IMPROVEMENTS

	OUTCOMES		
	UPGRADED	STAYED AND FAILED	t-STATISTIC (upgraded vs. stayed/failed)
MEAN NUMBER OF IMPROVEMENTS MADE BY LANDLORD			
Minimum Standards households	2.68 (37)	2.28 (108)	0.88
Control households	2.75 (36)	2.33 (224)	0.90
t-statistic	-0.13	-0.20	--
MEAN NUMBER OF IMPROVEMENTS MADE BY HOUSEHOLD			
Minimum Standards households	3.57 (37)	3.44 (108)	0.15
Control households	1.86 (36)	3.41 (224)	3.39***
t-statistic	2.03*	0.05	--
MEAN HOUSEHOLD COST OF REPAIRS			
Minimum Standards households	$132.38 (34)	$83.34 (107)	1.26
Control households	41.89 (36)	94.78 (224)	3.09**
t-statistic	2.36*	-0.61	--

SAMPLE: Minimum Standards and Control households active at two years after enrollment whose units failed the Minimum Standards requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms, Housing Evaluation Forms, and Periodic Interviews.

NOTE: Sample sizes in parentheses.

* Significant at the 0.05 level.

** Significant at the 0.01 level.

*** Significant at the 0.001 level.

Minimum Standards households that upgraded, on the other hand, reported a significantly larger number of repairs made by the household and a significantly higher level of household spending than Control upgraders, and even above reported levels for households that stayed in their enrollment unit without upgrading (though these differences are not significant). Thus it appears that the additional upgrading induced by the allowance offer may have largely been the result of additional efforts by the household rather than the landlord.[1]

A comparison of the types of Minimum Standards components initially failed by upgraders and by other households provides further evidence supporting the finding that upgrading generally involved only modest repairs to the unit. Table 2-11 contains a breakdown of specific Minimum Standards components failed. The first two columns show the number and percentages of Minimum Standards and Control households failing each item at enrollment. The next two columns show the percentages of households failing the item that was upgraded. For example, 25 percent of all Minimum Standards households that failed requirements at enrollment were living in units that failed the plumbing requirement. However, only 4 percent of the households initially failing plumbing were upgraders. Since the overall rate of upgrading for Minimum Standards households is 13 percent, the data suggest that repairing a plumbing deficiency was a relatively less likely form of upgrading.[2]

The sample sizes involved in Table 2-11 are too small to permit very firm conclusions. The distribution of 37 upgraders across 15 component failures is difficult to interpret clearly. Nevertheless, some general impressions can be drawn. First, it should be noted that the rate of upgrading for households failing each category is generally at or below the overall average. This reflects the fact that many households failed more than one item and that, in general, households were more likely to upgrade if they failed fewer requirements. Second, units failing requirements presumably

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[1]Since these data are based on household reports, there is no information on landlord spending for maintenance and repair.

[2]Companion tables to Table 2-11 are contained in Appendix IV, Tables IV-12 to IV-14. The tables present similar data for households that moved and for those that stayed and failed.

Table 2-11

MINIMUM STANDARDS COMPONENTS FAILED

COMPONENT	PERCENTAGE OF HOUSEHOLDS FAILING MINIMUM STANDARDS AT ENROLLMENT THAT FAILED EACH COMPONENT		PERCENTAGE OF HOUSEHOLDS FAILING EACH COMPONENT THAT UPGRADED	
	Minimum Standards	Control	Minimum Standards	Control
MINIMUM STANDARDS PHYSICAL COMPONENTS				
Adequate exits	5%	5%	14%	-
Ceiling height	12	13	-	5
Core rooms	7	4	-	-
Electricity	9	8	8	-
Floor structure	6	6	-	-
Floor surface	15	14	4	-
Heating equipment	17	15	2	-
Kitchen facilities	6	5	-	4
Light fixtures	9	7	-	-
Light and ventilation	76	74	13	6
Plumbing	25	21	4	-
Room structure	5	8	-	-
Room surface	21	21	5	3
Roof structure	3	4	-	6
Exterior walls	4	6	-	-
MINIMUM STANDARDS OCCUPANCY COMPONENT				
Occupancy	66	72	7	5
Fail occupancy only	9	14	15	17
SAMPLE SIZE	(289)	(459)	(37)	(36)
PERCENTAGE OF SAMPLE	100%	100%	13%	8%

SAMPLE: Minimum Standards and Control households active at two years after enrollment whose units failed the Minimum Standards requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms and Housing Evaluation Forms.

involving the structural condition of the unit--floor structure, room structure, roof structure, and exterior walls--were almost never upgraded.[1] Third, the highest rates of upgrading were observed for households that failed the requirements for adequate exits, electricity, light and ventilation, and occupancy. The actual number of households involved is, however, trivial except for those failing light and ventilation and occupancy.

These repairs are not obviously minor. Unfortunately, the available data do not always indicate the exact nature of the repair involved. Attempts to determine the exact nature of the repairs, however, at least indicate that they could often have been relatively modest.

The two components most frequently repaired by upgraders were the occupancy requirements and the light and ventilation requirements. As described in Table 2-1, the occupancy standard set a maximum of two persons per adequate bedroom, and required that an adequate bedroom be a private room in good condition (specifically, a room that could be completely closed off from other rooms and that met housing standards for adequate ceiling height, light and ventilation, electrical services, room surface and structure, and floor surface and structure). Households failing the occupancy standard had to convert rooms into bedrooms, upgrade existing bedrooms to make them adequate, or decrease the number of residents in the unit. Almost all households that upgraded this requirement did so by upgrading bedrooms to make them adequate. This could have involved installing a door or even hanging a curtain across a doorway to make the room private from other rooms, as well as making more substantial repairs.

The light and ventilation standard required that there be a 10 percent ratio of window area to floor area, and at least one openable window[2] in the living room, bathroom, and kitchen. Kitchens or bathrooms with mechanical vents could have unopenable windows. Half of the households upgrading this component remedied the adequacy of the ratio of window area to floor area, sometimes simply by unblocking a window. The other two types of repairs involved repairing a window so that it was openable

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[1] Many of the households failing these requirements moved in order to meet; see Appendix IV, Tables IV-12 to IV-14.

[2] An openable window was defined as a window that could be opened and that would remain open without having to be propped.

(often by fixing sash cords or chains) or by installing or fixing vents in the kitchen and bathroom.

While these details are hardly conclusive with respect to the actual repairs involved, they are at least consistent with the impression, based on changes in rent and the overall hedonic index, that the changes were modest.

2.4 LOGIT ESTIMATES OF THE PROBABILITY OF UPGRADING TO MEET MINIMUM STANDARDS

The previous sections of this chapter have discussed the experimental effect on the rate of upgrading and examined the initial quality of the units upgraded and the types of repairs most frequently made by upgraders. Many factors influence the decision to move from or stay in a unit and the ability to upgrade a unit with a particular set of deficiencies. Since Control households may differ from Experimental households--for example, in their demographic characteristics or enrollment unit quality--it may be important to control for these factors to differentiate experimental incentives from the normal probability of upgrading Minimum Standards housing attributes. This section presents logit estimates of the probability of upgrading controlling for three major types of independent variables: initial unit quality and "distance" from meeting Minimum Standards, demographic variables related to the decision to move, and expressed satisfaction and other variables presumed to indicate attachment to the unit.

Comparison of the initial housing condition of households that did and did not upgrade in Section 2.2 indicated that upgraders started off with significantly better housing than households that did not upgrade. Thus, the initial quality of a unit appears to affect the likelihood of upgrading. In addition, Control upgraders had somewhat higher initial housing quality than Minimum Standards upgraders, and this difference should be taken into account. Two variables are used in the equation to describe the unit --quality per room,[1] where quality is measured by the hedonic index, and the number of Minimum Standards components failed. As discussed above, the latter is only a crude proxy for "distance" from meeting Minimum

[1] Quality per room is simply the hedonic index (housing services) divided by the total number of rooms. This variable was included because a measure of unit quality independent of unit size was desired.

Standards, since it does not adequately control for the types of repairs implied by the deficiency.

The independent variables also include expressed household satisfaction with the unit and the neighborhood[1] and expressed preferences for moving or staying. More satisfied households might be expected to live in better units and hence be more likely to upgrade. In addition, however, households would be expected to choose upgrading more often to the extent that they are committed to staying in their current unit. This is strongly suggested by the data describing household preferences for moving or staying in the enrollment unit and satisfaction with the enrollment unit.

The Baseline Interview, which was administered to households prior to enrollment and before they had knowledge of the experiment, provides data for examining initial preferences. Households were asked what they would do if they had $50 or more to spend on rent. As shown in Table 2-12, both Control and Minimum Standards households that later upgraded showed a fairly strong preference for staying in their unit as opposed to moving. Likewise, households that in fact moved during the experiment showed a strong preference for moving. Households that stayed in their enrollment unit and did not upgrade were more evenly divided between moving and staying.

The attachment of eventual upgraders to their enrollment dwelling unit is also evident in their reported satisfaction with the unit. As part of the Baseline Interview, households were asked how satisfied they were with their current dwelling unit. As shown in Table 2-13, there is a strong relationship between satisfaction with the current dwelling unit and whether a household later chose to stay and upgrade.

Finally, the independent variables also include a group of life-cycle descriptors and other household characteristics which may be associated with mobility or with unit quality. Many of the variables are drawn from the analysis of mobility prior to and during the experiment (see MacMillan, 1978). The number of moves in the three years prior to the Demand Experiment

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[1]The Baseline Interview included separate questions for satisfaction with the unit and with the neighborhood. Both variables are four-point scales and the ratings for dwelling unit and neighborhood were simply added to form an index of overall satisfaction for the logit estimates.

Table 2-12

HOUSEHOLD PREFERENCES FOR MOVING OR STAYING BY TWO-YEAR OUTCOME

EXPRESSED PREFERENCE	UPGRADED	STAYED AND FAILED	MOVED AND PASSED	MOVED AND FAILED
	MINIMUM STANDARDS HOUSEHOLDS (Chi-squared = 21.74**)			
Move	35%	45%	77%	59%
Stay in unit[a]	62	50	21	40
Other[b]	3	6	2	2
(Sample size)	(37)	(101)	(56)	(68)
	CONTROL HOUSEHOLDS (Chi-squared = 37.00***)			
Move	34%	53%	59%	75%
Stay in unit[a]	56	46	33	24
Other[b]	9	2	8	1
(Sample size)	(32)	(208)	(49)	(140)

SAMPLE: Minimum Standards and Control households active at two years after enrollment whose units failed the Minimum Standards requirements at enrollment and that did not move between the Baseline Interview and enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms, Housing Evaluation Forms, and Baseline Interviews.

NOTE: Percentages do not add to 100 due to rounding.

a. Aggregated responses to: stay and improve, stay and buy, stay but no improvements necessary, stay and do not know whether or not improvements are necessary.

b. Aggregated responses to: would use the money for something else, other.

** Significant at the 0.01 level.

*** Significant at the 0.001 level.

Table 2-13

HOUSEHOLD SATISFACTION WITH DWELLING UNIT BY TWO-YEAR OUTCOME

EXPRESSED SATISFACTION	UPGRADED	STAYED AND FAILED	MOVED AND PASSED	MOVED AND FAILED
	MINIMUM STANDARDS HOUSEHOLDS (Chi-squared = 35.89***)			
Very satisfied	70%	45%	30%	19%
Somewhat satisfied	14	31	37	35
Somewhat dissatisfied	11	15	16	19
Very dissatisfied	5	9	18	26
(Sample size)	(37)	(105)	(57)	(68)
	CONTROL HOUSEHOLDS (Chi-squared = 24.64**)			
Very satisfied	69%	35%	31%	29%
Somewhat satisfied	19	35	37	31
Somewhat dissatisfied	9	16	22	18
Very dissatisfied	3	15	10	22
(Sample size)	(32)	(211)	(49)	(142)

SAMPLE: Minimum Standards and Control households active at two years after enrollment whose units failed the Minimum Standards requirements at enrollment and that did not move between the Baseline Interview and enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms, Housing Evaluation Forms, and Baseline Interviews.

NOTE: Percentages do not add to 100 due to rounding.

** Significant at the 0.01 level.

*** Significant at the 0.001 level.

is used as a measure of mobility. Households that move less frequently are expected to be more likely to stay and upgrade. The elderly, who have substantially lower mobility than other households, are also expected to be more likely to upgrade. Households with higher income may be more likely to upgrade because of the association of higher income and better quality units. Minority households, on the other hand, fail more Minimum Standards components than nonminority households and thus may find it more difficult to upgrade. Finally, households with a greater number of persons per room, because they may be more likely to fail the occupancy requirement, are also expected to be less likely to upgrade.

Table 2-14 presents estimates of the probability of upgrading for the combined sites.[1] The sample used for estimation is substantially the same as the sample used throughout this analysis, that is, households not meeting Minimum Standards requirements at enrollment.[2] The results indicate a rather substantial experimental effect: the estimated Experimental rate of upgrading exceeds the Control rate by 10 percentage points in the combined equation, or about twice the difference indicated by the tabular comparison presented in Table 2-2.

Other expectations are borne out as well. Higher quality units and less crowded units are more likely to be upgraded. Households that have moved less often in the past and households that are more satisfied with their unit and neighborhood are more likely to upgrade. Demographic variables and income appear to have no independent effect on upgrading when the influence of initial housing quality, distance from meeting Minimum Standards, and attachment to the unit are taken into consideration.

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[1] Separate estimates for Pittsburgh and Phoenix are presented in Appendix IV, Tables IV-19 and 20. A likelihood ratio test of site homogeneity rejected the hypothesis that the two sites could be pooled. The difference in twice the log likelihood for the pooled and unpooled estimates was 36.94 which was not significant at the 0.01 level. The pattern of results for the separate estimates are not, however, materially different from the pooled estimates shown here.

[2] Since income level is controlled for in the equation, the over-income enrollment cutoff was not used.

Table 2-14

LOGIT ESTIMATE OF THE PROBABILITY OF UPGRADING TO MEET MINIMUM STANDARDS

INDEPENDENT VARIABLES	COEFFICIENT	ASYMPTOTIC t-STATISTIC	PARTIAL DERIVATIVE
Age of head of household (decades)	-0.087	0.92	0.008
Black head of household	0.009	0.02	0.008
Spanish American head of household	-0.467	-0.74	-0.042
Annual net income (thousands)	0.036	0.53	0.003
Female head of household	-0.238	-0.94	-0.022
Education of head of household	0.015	0.33	0.001
Number of moves in previous three years	-0.275*	-2.33*	-0.025
Unit and neighborhood satisfaction	0.175†	1.75†	0.016
Persons per room	-1.567**	-3.51**	-0.143
Distance from meeting requirements (number of physical components failed)	-0.881**	-4.95**	-0.080
Quality per room	0.069**	2.93**	0.006
Experimental household (Housing Gap Minimum Standards)	1.141**	4.84**	0.104
CONSTANT	-3.510**	-2.69**	NA
Likelihood ratio (significance)		109.003**	
Mean of dependent variable		0.101	
Coefficient of determination		0.244	
Sample size		(680)	

SAMPLE: Minimum Standards and Control households active at two years after enrollment whose units failed the Minimum Standards requirements at enrollment, excluding those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms, Housing Evaluation Forms, and Baseline Interviews.

† t-statistic significant at the 0.10 level.

* t-statistic significant at the 0.05 level.

** t-statistic significant at the 0.01 level.

2.5 CONCLUSIONS

Upgrading to meet the Minimum Standards requirements appears to be part of an ongoing process of repair and maintenance. Thus, about 8 percent of the Control households in Pittsburgh and Phoenix upgraded their enrollment units to meet Minimum Standards. A significantly higher proportion, 13 percent, of the Minimum Standards households upgraded, however, and all the available evidence suggests that the experiment had a clear effect on upgrading.

Almost all additional upgrading by Minimum Standards households occurred in the first year of the experiment; the rate of upgrading for Minimum Standards households was significantly greater than the Control rate during the first year but almost identical during the second year.

The initial housing quality of upgraders was significantly better than that of households that stayed and did not meet requirements. This was true for both Control and Minimum Standards households. On average, upgraders lived in higher-priced units that had a higher initial level of housing services, failed fewer Minimum Standards components, were less crowded, and had a better overall rating based on either physical deprivation or the housing evaluator's overall rating of the unit.

In addition, it appears that Control households that upgraded had better housing at enrollment than Minimum Standards upgraders. Thus, while upgrading involved modest changes for both groups, Minimum Standards upgrading did require extra effort. This is confirmed by assessing the two-year change in the housing services index; the increase was larger for Minimum Standards than for Control upgraders. No above-normal increase in rent occurred, however, which supports the impression that the required repairs were relatively minor.

Logit estimates of the probability of upgrading confirm the findings concerning experimental effect, the impact of initial unit quality on upgrading, and the importance of attachment to the unit in predicting upgrading. Thus, the estimated Experimental rate of upgrading exceeds the Control rate by a rather substantial amount--10 percentage points. Higher quality units, less crowded units, and units that failed fewer requirements were more likely to be upgraded. Finally, households that moved less or were more satisfied with their unit and neighborhood were also more likely to upgrade.

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CHAPTER 3

MEETING MINIMUM RENT REQUIREMENTS IN PLACE

Rather than being required to live in housing that meets the Minimum Standards requirements, households assigned to the Minimum Rent allowance plans were required to spend at least a specified minimum amount on housing in order to receive payments. Thus, the Minimum Rent plans allowed the household to obtain whatever housing the market provided above the Minimum Rent level. The required Minimum Rent levels were based on the estimated cost of modest, existing, standard housing (C*), which varied by household size and site.[1] Because housing evaluations are not required, a Minimum Rent requirement is administratively simpler and less costly than Minimum Standards. At the same time, it is less clearly tied to specific housing quality criteria. The hypothesis was that paying rent close to C* would, on average, assure modest, adequate housing, while allowing individual households considerable freedom of choice. As discussed below, however, many factors can contribute to increased rent with no corresponding increase in quality.

Two Minimum Rent levels were used in the Demand Experiment. Households assigned to the Minimum Rent Low allowance plan were required to live in units whose rents were at least 70 percent of C*; households assigned to the Minimum Rent High allowance plan were required to live in units whose rents were at least 90 percent of C*.[2] The estimated cost of modest, existing, standard housing (C*) and the resulting Minimum Rent levels are shown in Table 3-1.

About 62 percent of the Minimum Rent Low households in Pittsburgh already met the Minimum Rent requirement when they enrolled (see Figure 3-1). As would be expected, a much smaller proportion (30 percent) of enrolled households met Minimum Rent High. The pattern is the same in Phoenix, though the proportions that met initially are smaller for both requirements--48 percent

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[1] Refer to Appendix I for a description of the treatments in the Demand Experiment. C* is also a parameter in the Housing Gap subsidy formula.

[2] Rent is defined here as the monthly cost of an unfurnished dwelling unit, including basic utilities (electricity, heat, gas, water, and garbage collection). See Appendix II for further detail.

Table 3-1

MINIMUM RENT LEVELS AND THE ESTIMATED COST OF MODEST STANDARD HOUSING

	ORIGINAL VALUES Household Size					REVISED VALUES[a] Household Size				
LEVELS	1	2	3,4	5,6	7+	1	2	3,4	5,6	7+
				PITTSBURGH						
Minimum Rent Low (0.7C*)	$74	$84	$98	$112	$133	$81	$91	$105	$119	$144
Minimum Rent High (0.9C*)	95	108	126	144	171	104	117	135	153	185
Estimated cost of modest standard housing (C*)	105	120	140	160	190	115	130	150	170	205
				PHOENIX						
Minimum Rent Low (0.7C*)	$88	$109	$126	$154	$186	$95	$116	$133	$165	$196
Minimum Rent High (0.9C*)	113	140	162	198	239	122	149	171	212	252
Estimated cost of modest standard housing (C*)	125	155	180	220	265	135	165	190	235	280

a. In February 1975 the Minimum Rent levels were increased to reflect increases due to inflation.

Figure 3-1

MINIMUM RENT REQUIREMENT STATUS AT ENROLLMENT AND AT TWO YEARS

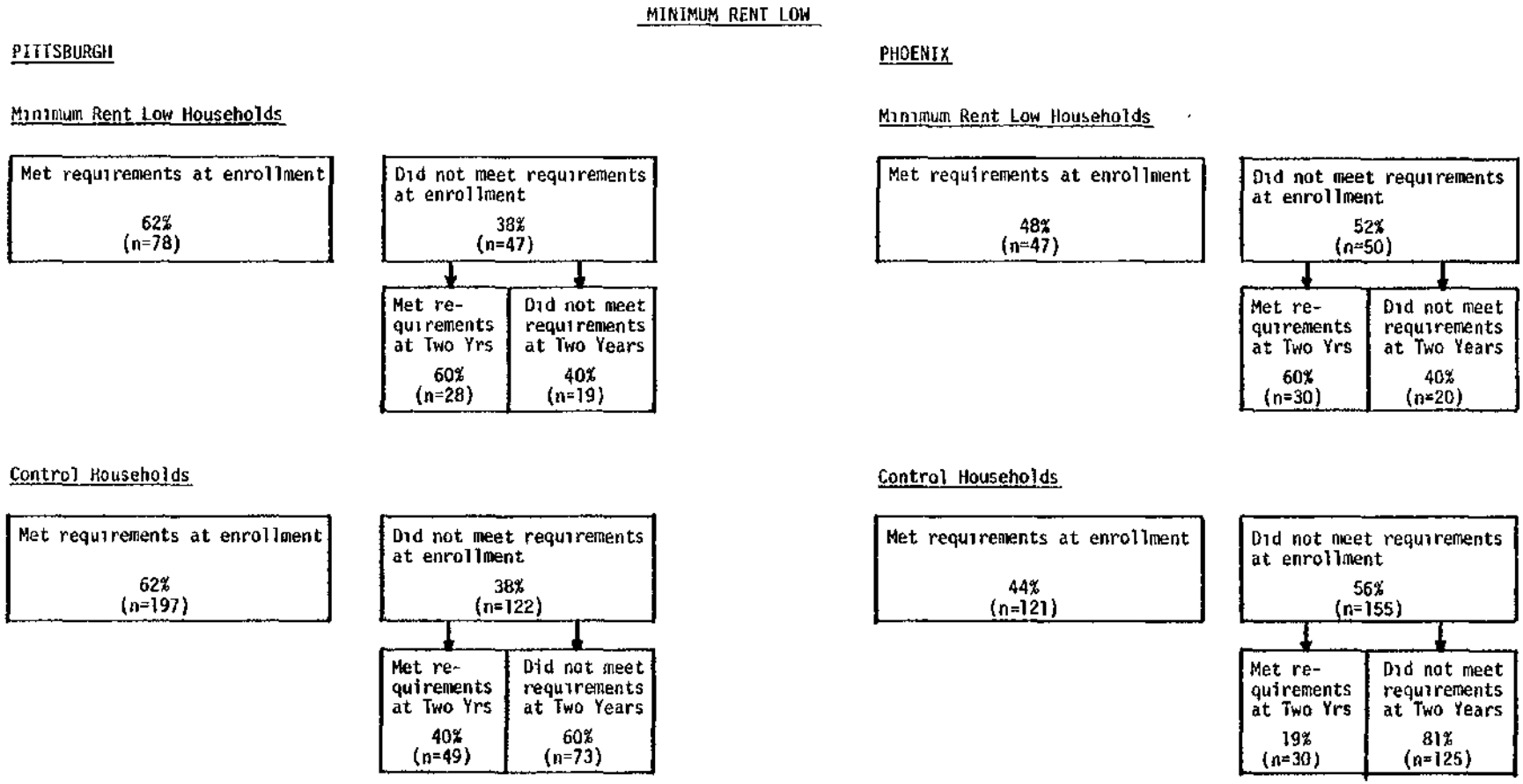
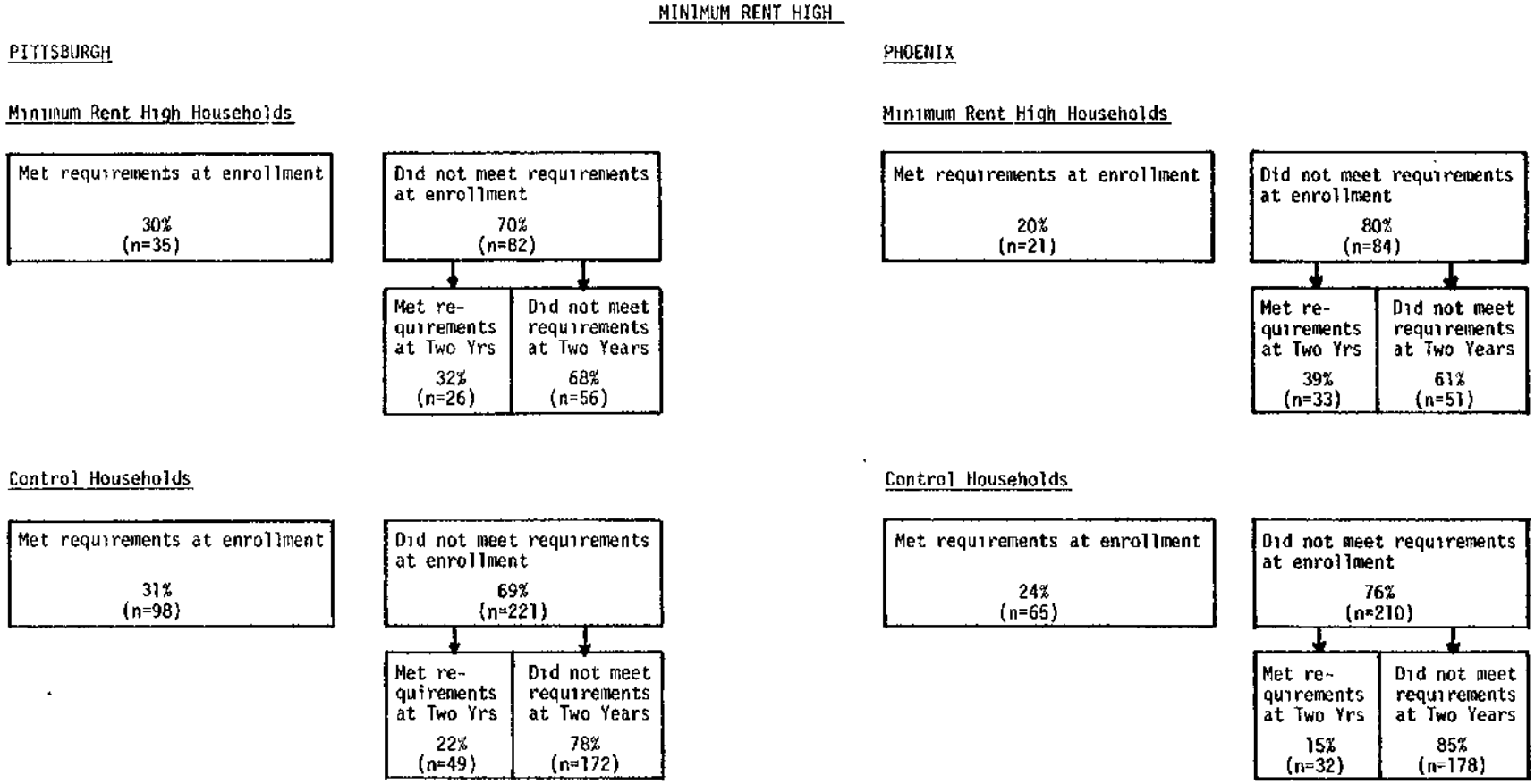


Figure 3-1 (continued)



SAMPLE. Minimum Rent and Control households active at two years after enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES. Initial and monthly Household Report Forms

for Minimum Rent Low and 20 percent for Minimum Rent High. The figures for Control households are similar to those for Experimental households in both sites.

Experimental households residing in units that met their Minimum Rent requirement were immediately eligible for full housing allowance payments. Households residing in units with rents below their Minimum Rent requirement could meet their Minimum Rent requirement by moving to units with rents above the Minimum Rent level or by negotiating with their landlords to raise the rent in their current units--presumably in exchange for additional housing services, repairs, or improvements. In addition, normal inflation may have raised rents sufficiently to meet the requirement.[1]

This chapter is primarily concerned with households that did not meet the Minimum Rent requirement when they enrolled, but later met without moving. There are two major issues. The first issue is whether the allowance offer induced some additional households to meet the Minimum Rent requirement in place. In-place meeting could simply result from normal periodic rent increases due to inflation or improvements to the unit. In this case, Minimum Rent households would be expected to meet in place at about the same rate as Control households. Alternatively, in-place meeting could also reflect either direct negotiation with the landlord or tenant willingness to accept larger rent increases than they normally would.

Section 3.1 compares the rates at which Control and Minimum Rent households met Minimum Rent requirements in place. Section 3.2 relates meeting in place to various measures of initial housing condition. Finally, Section 3.3 presents estimates of the experimental effect on in-place meeting based on a logit analysis taking account of the household's initial housing and various demographic characteristics.

The second issue addressed in this chapter is whether the rent increases involved in in-place meeting were accompanied by any real changes in housing. This is particularly important if the allowance induced some households to meet requirements in place (and thus, apparently, to pay higher rents than they would otherwise). Section 3.4 examines changes in the housing and rents of both Experimental and Control households that did and did not meet requirements in place.

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[1] C* was adjusted in 1975 to reflect the estimated rate of rent inflation in both sites.

As was the case with Minimum Standards, households are defined as meeting Minimum Rent in place if they failed to meet the requirement at enrollment, did not move during the two years of the experiment, but met the Minimum Rent requirement based on data collected at 6, 12, and 24 months after enrollment. This is done to permit comparison with Control households, though it differs somewhat from actual program operation.[1]

3.1 MEETING MINIMUM RENT IN PLACE

Relatively few households met Minimum Rent requirements in place, as is evident from Table 3-2. For Minimum Rent Low households, a total of 16 percent stayed in their enrollment units and met the requirements, while for Minimum Rent High households, only 6 percent did so. An experimental effect on meeting in place, as evidenced by substantial or significant differences between the rates of Control and Experimental households, is apparent only for Minimum Rent Low and then only in Pittsburgh. Among households not meeting Minimum Rent Low requirements at enrollment in Pittsburgh, 28 percent of the Minimum Rent Low households later met requirements in their enrollment units while only 14 percent of Control households did so.

[1]All households enrolled in the experiment reported their rent each month and submitted rent receipts. Thus, Minimum Rent households met requirements whenever their monthly rent went above the minimum level. As with Minimum Standards, once having met requirements, households were considered to continue to meet thereafter as long as they stayed in the same unit. This was done primarily to avoid undue hardship. Thus, for example, Minimum Rent levels were adjusted after one year to reflect inflation in the two sites. It did not seem appropriate, however, to suddenly stop payments to households that had already met the requirements simply because their units' rents had not risen as much as the average. An ongoing program would, however, have to deal with this problem.

Although monthly information was collected for all households, the central analytic data base used in the Demand Experiment analysis considers only rents at four cross-sectional points--enrollment, and 6, 12, and 24 months after enrollment. This is done to allow monthly data to be matched with other information from interviews and housing evaluations conducted at these intervals. As a result, in-place meeting has been defined for this analysis in terms of meeting requirements at these four analytic cross sections. In fact, among households that did not move during the two years of the experiment, the results based on the analytic cross section are almost identical to those obtained by considering monthly data (see Appendix II).

As with Minimum Standards upgrading, an alternative definition of meeting in place can be defined in terms of how households first met Minimum Rent requirements, regardless of whether they subsequently moved. Tabulations for this definition--applied to all enrolled households--are presented in Appendix III.

Table 3-2

MINIMUM RENT REQUIREMENTS AND MOBILITY STATUS AT
TWO YEARS FOR HOUSEHOLDS NOT MEETING MINIMUM RENT AT ENROLLMENT

MINIMUM RENT LOW

	COMBINED SITES			PITTSBURGH			PHOENIX		
OUTCOMES	MINIMUM RENT LOW HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT LOW HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT LOW HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC
Stayed and passed	16%	8%	2.25*	28%	14%	2.13*	6%	3%	0.82
Stayed and failed	31	50	-3.24***	36	51	-1.75†	26	50	-2.41**
Moved and passed	43	21	4.21***	32	26	0.78	54	17	4.41***
Moved and failed	9	21	2.65**	4	9	-1.10	14	31	-1.89†
SAMPLE SIZE	(97)	(277)		(47)	(122)		(50)	(155)	

MINIMUM RENT HIGH

	COMBINED SITES			PITTSBURGH			PHOENIX		
OUTCOMES	MINIMUM RENT HIGH HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT HIGH HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT HIGH HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC
Stayed and passed	6%	6%	--	11%	9%	0.53	1%	3%	-1.01
Stayed and failed	44	52	-1.75†	55	59	-0.63	33	45	-1.89†
Moved and passed	30	13	4.87***	21	14	2.64**	38	12	5.09***
Moved and failed	20	29	-2.23*	13	19	-1.22	27	40	-2.09*
SAMPLE SIZE	(166)	(431)		(82)	(221)		(84)	(210)	

SAMPLE: Minimum Rent and Control households active at two years after enrollment that failed the Minimum Rent requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCE: Initial and monthly Household Report Forms.

† t-statistic significant at the 0.10 level.

* t-statistic significant at the 0.05 level.

** t-statistic significant at the 0.01 level.

*** t-statistic significant at the 0.001 level.

Evidence of an experimental effect in Pittsburgh on the rate of meeting Minimum Rent Low in place is corroborated when the rates are examined separately for the first and second years after enrollment (see Table 3-3). The experimental effect observed for Minimum Rent Low households in Pittsburgh only occurred during the first year after enrollment. This is identical to the pattern observed for Minimum Standards households in Chapter 2. During the first year, 32 percent of Pittsburgh Minimum Rent Low households not meeting requirements at enrollment met Minimum Rent Low in place, while only 11 percent of the Control households did so.[1] During the second year, almost no households met in place. The Minimum Rent High group in Pittsburgh showed a similar pattern. A significant difference is evident in the first year after enrollment: 13 percent of the Pittsburgh Minimum Rent High households met requirements, compared to 6 percent of the Control households. During the second year, however, only one Minimum Rent High household met in place, and when the two years are combined the difference in rates is not significant. No effect is apparent in Phoenix for either Minimum Rent Low or High in either year, as shown in Table 3-4.

Table 3-5 indicates the ways in which Minimum Rent households met requirements during the experiment--by meeting at enrollment or by meeting after enrollment either in place or by moving. In-place meeting is much less important for Minimum Rent than for Minimum Standards households. For both Minimum Rent Low and Minimum Rent High, only 9 percent of the total population that eventually met the Minimum Rent requirement met in place. This was particularly evident in Phoenix, where a total of four experimental households met either Minimum Rent requirement in place. Meeting in place was more important in Pittsburgh, and in some ways comparable to the experience for Minimum Standards households. Forty-six percent of the Minimum Rent Low households that met after enrollment and 35 percent of the Minimum Rent High households that met after enrollment, met in place (as compared to 45 percent for Minimum Standards). Overall, 12 percent of all Minimum Rent Low and 15 percent of all Minimum Rent High recipients in Pittsburgh met in place, as compared with 24 percent of Minimum

[1] The rate of in-place meeting is higher in the first year than for the two years combined because some households that met in place later moved.

Table 3-3

EXPERIMENTAL EFFECTS FOR IN-PLACE MEETING
DURING THE FIRST AND SECOND YEARS AFTER ENROLLMENT PITTSBURGH

(MINIMUM RENT LOW)

OUTCOMES	FIRST YEAR MINIMUM RENT LOW HOUSEHOLDS	FIRST YEAR CONTROL HOUSEHOLDS	FIRST YEAR t-STATISTIC	SECOND YEAR MINIMUM RENT LOW HOUSEHOLDS	SECOND YEAR CONTROL HOUSEHOLDS	SECOND YEAR t-STATISTIC
Stayed and passed	32%	11%	3.319***	4%	6%	-0.407
Stayed and failed	43	66	-2.827**	79	77	0.271
Moved and passed	17	16	0.222	17	12	0.656
Moved and failed	8	7	0.240	--	5	-1.152
SAMPLE SIZE	(47)	(122)		(24)	(94)	

(MINIMUM RENT HIGH)

OUTCOMES	FIRST YEAR MINIMUM RENT HIGH HOUSEHOLDS	FIRST YEAR CONTROL HOUSEHOLDS	FIRST YEAR t-STATISTIC	SECOND YEAR MINIMUM RENT HIGH HOUSEHOLDS	SECOND YEAR CONTROL HOUSEHOLDS	SECOND YEAR t-STATISTIC
Stayed and passed	13%	6%	1.999*	2%	6%	-1.370
Stayed and failed	66	72	-1.104	85	80	0.808
Moved and passed	15	7	1.980*	8	5	0.972
Moved and failed	6	14	-1.890†	5	9	0.906
SAMPLE SIZE	(82)	(221)		(59)	(195)	

FIRST YEAR SAMPLE Minimum Rent and Control households active at two years after enrollment that failed the Minimum Rent requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

SECOND YEAR SAMPLE Minimum Rent and Control households active at two years after enrollment that failed the Minimum Rent requirements at one year, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCE Initial and monthly Household Report Forms.

† t-statistic significant at the 0.10 level.

* t-statistic significant at the 0.05 level.

** t-statistic significant at the 0.01 level.

*** t-statistic significant at the 0.001 level.

Table 3-4

EXPERIMENTAL EFFECTS FOR IN-PLACE MEETING
DURING THE FIRST AND SECOND YEARS AFTER ENROLLMENT: PHOENIX

(MINIMUM RENT LOW)

OUTCOMES	FIRST YEAR MINIMUM RENT LOW HOUSEHOLDS	FIRST YEAR CONTROL HOUSEHOLDS	FIRST YEAR t-STATISTIC	SECOND YEAR MINIMUM RENT LOW HOUSEHOLDS	SECOND YEAR CONTROL HOUSEHOLDS	SECOND YEAR t-STATISTIC
Stayed and passed	6%	3%	0.893	7%	4%	0.599
Stayed and failed	40	57	-2.060*	52	70	-1.881†
Moved and passed	42	12	4.664***	24	6	2.935**
Moved and failed	12	28	-2.303*	17	19	-0.275
SAMPLE SIZE	(50)	(157)		(29)	(139)	

(MINIMUM RENT HIGH)

OUTCOMES	FIRST YEAR MINIMUM RENT HIGH HOUSEHOLDS	FIRST YEAR CONTROL HOUSEHOLDS	FIRST YEAR t-STATISTIC	SECOND YEAR MINIMUM RENT HIGH HOUSEHOLDS	SECOND YEAR CONTROL HOUSEHOLDS	SECOND YEAR t-STATISTIC
Stayed and passed	--%	5%	-2.021*	2%	1%	0.409
Stayed and failed	40	53	-1.876†	69	68	0.168
Moved and passed	33	7	5.758***	14	5	2.478*
Moved and failed	26	36	-1.535	14	26	-1.798†
SAMPLE SIZE	(84)	(211)		(55)	(187)	

FIRST YEAR SAMPLE Minimum Rent and Control households active at two years after enrollment that failed the Minimum Rent requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

SECOND YEAR SAMPLE Minimum Rent and Control households active at two years after enrollment that failed the Minimum Rent requirements at one year, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCE: Initial and monthly Household Report Forms.

† t-statistic significant at the 0.10 level.
* t-statistic significant at the 0.05 level.
** t-statistic significant at the 0.01 level.
*** t-statistic significant at the 0.001 level.

Table 3-5

HOUSEHOLDS MEETING MINIMUM RENT AT TWO YEARS:
HOW THE REQUIREMENT WAS MET

STATUS	COMBINED SITES		PITTSBURGH		PHOENIX	
	PERCENTAGE OF THOSE MEETING AT TWO YEARS	PERCENTAGE MEETING REQUIREMENTS AFTER ENROLLMENT	PERCENTAGE OF THOSE MEETING AT TWO YEARS	PERCENTAGE MEETING REQUIREMENTS AFTER ENROLLMENT	PERCENTAGE OF THOSE MEETING AT TWO YEARS	PERCENTAGE MEETING REQUIREMENTS AFTER ENROLLMENT
MINIMUM RENT LOW						
Met Minimum Rent Low requirement at enrollment	68%		74%		60%	
Did not meet Minimum Rent Low requirement at enrollment	32	100%	26	100%	40	100%
Met in place	9	28	12	46	4	10
Moved and met Minimum Rent in the two-year unit	23	72	14	54	36	90
Total population meeting Minimum Rent Low at two years	(181)		(106)		(75)	
MINIMUM RENT HIGH						
Met Minimum Rent High requirement at enrollment	48%		57%		38%	
Did not meet Minimum Rent High requirement at enrollment	52	100%	43	100%	62	100%
Met in place	9	17	15	35	2	3
Moved and met Minimum Rent in the two-year unit	43	83	28	65	60	97
Total population meeting Minimum Rent High at two years	(114)		(61)		(53)	

SAMPLE. Minimum Rent households active and meeting Minimum Rent requirements at two years after enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCE: Initial and monthly Household Report Forms.

Standards recipients (the differences primarily seem to reflect differences in the proportion of households that met the requirements at enrollment).

The following section discusses why some households met Minimum Rent in place, why Minimum Rent Low households met in place more frequently than Minimum Rent High households, and why Pittsburgh households did so more frequently than Phoenix households.

3.2 FACTORS AFFECTING MEETING MINIMUM RENT IN PLACE

Several factors help to explain the differences in outcomes for Pittsburgh and Phoenix and for the two levels of Minimum Rent. Site differences in rates of inflation and normal mobility help to explain differences in the rates of meeting Minimum Rent in place. In addition, differences in the "stringency" of the Minimum Rent requirements help to explain both site differences and differences between the two Minimum Rent levels.

As mentioned in the previous chapters, households were normally much more mobile in Phoenix than in Pittsburgh.[1] Higher Phoenix mobility rates are clearly reflected in the mobility of the Minimum Rent households: 60 percent of Phoenix Minimum Rent Low households not meeting requirements at enrollment moved, compared with only 36 percent in Pittsburgh.

In addition, there is evidence that the rate of inflation in rental payments for households that did not move was higher in Pittsburgh than in Phoenix. Based on calculations made for the sample of Control nonmover households the difference in inflation rates between the sites is about 5 percent.[2] Thus, for households not having an excessively large gap between enrollment rent and the Minimum Rent requirement, the probability of meeting the requirement via normal changes in rent should be greater in Pittsburgh.

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[1] The reasons for this are not clear but seem to reflect a general difference between the Northeast and Southwest (see MacMillan, 1978).

[2] The estimated inflation rates are 14.8 percent and 10.0 percent (over two years) in Pittsburgh and Phoenix, as measured by the change in rent for Control nonmovers. An alternative estimate, the mean difference between actual rent at two years and the rent predicted by the hedonic equation yields inflation rates of 13 percent and 7.3 percent in Pittsburgh and Phoenix, respectively (see Merrill, 1977, Table 4-16).

The distance from meeting requirements, as measured by the difference between rent at enrollment and rent needed to meet Minimum Rent may be the most crucial aspect affecting whether a household met Minimum Rent in place. As was discussed in Chapter 2, distance from meeting Minimum Standards, as measured by the initial condition of the unit, was an important determinant of whether a household ultimately met Minimum Standards in place. The fewer Minimum Standards components the unit failed and the higher its initial quality, the more likely it was to meet Minimum Standards through upgrading. Similarly, households living in enrollment units with rents close to the Minimum Rent level should have had a greater chance of meeting the requirements without moving than households that were living in units with rents very much lower than the required level.

As shown in Table 3-6, households that ultimately succeeded in meeting Minimum Rent in place were initially much closer to meeting Minimum Rent than the households that never met the requirement.[1] It is also evident from the table that Minimum Rent Low households were closer to meeting their requirements than Minimum Rent High households, as would be expected. The overall mean distance for Minimum Rent Low households in Pittsburgh was $16 as compared with $28 for Minimum Rent High households. The corresponding figures for Phoenix Minimum Rent households are $36 and $64. Clearly, Pittsburgh households were closer to meeting than Phoenix households. For both Minimum Rent Low and Minimum Rent High, the overall mean distances of Pittsburgh households were less than half those of Phoenix households.[2,3]

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[1]Households that met the Minimum Rent requirements by moving were also closer to meeting initially than households that never met, though generally farther away than those that met in place.

[2]Investigation of differences in the initial distribution of Experimental and Control distances and of interactions between the experimental effect and distance did not reveal any new results. An experimental effect on meeting Minimum Rent in place continues to be apparent only for Minimum Rent Low households in Pittsburgh. The effect was only apparent for households within $25 of meeting the requirement initially. Since 82 percent of the Minimum Rent Low and Control households in Pittsburgh were within this range, however, the finding that induced meeting was limited to this range is not strong. See Appendix VII for details.

[3]Figures on distance from meeting as a percentage of initial rent are given in Appendix VII.

Table 3-6

MEAN CHANGE IN RENT NEEDED TO MEET
MINIMUM RENT REQUIREMENTS AT ENROLLMENT

	MINIMUM RENT LOW				MINIMUM RENT HIGH			
	PITTSBURGH		PHOENIX		PITTSBURGH		PHOENIX	
OUTCOMES	MINIMUM RENT LOW HOUSEHOLDS	CONTROL HOUSEHOLDS	MINIMUM RENT LOW HOUSEHOLDS	CONTROL HOUSEHOLDS	MINIMUM RENT HIGH HOUSEHOLDS	CONTROL HOUSEHOLDS	MINIMUM RENT HIGH HOUSEHOLDS	CONTROL HOUSEHOLDS
Stayed and passed	$10 (13)	$12 (17)	$14 (3)	$21 (4)	$13 (9)	$15 (19)	$14 (1)	$31 (6)
Stayed and failed	24 (17)	16 (62)	38 (13)	40 (77)	30 (45)	32 (131)	77 (28)	68 (94)
Moved and passed	11 (15)	13 (32)	31 (27)	28 (26)	25 (17)	28 (30)	45 (32)	41 (26)
Moved and failed	31 (2)	16 (11)	61 (7)	40 (48)	34 (11)	36 (41)	78 (23)	63 (84)
Overall mean distance	$16 (47)	$15 (122)	$36 (50)	$38 (155)	$28 (82)	$31 (221)	$64 (84)	$62 (210)

SAMPLE Minimum Rent and Control households active at two years after enrollment that failed the Minimum Rent requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES Initial and monthly Household Report Forms.

Initial distance can also be measured in terms of the allowance offer. Table 3-7 shows the difference between enrollment rent and the Minimum Rent requirement as a percentage of the allowance payment that the household would receive once it met requirements. Households that met Minimum Rent in place only needed to add about 20 percent of their allowance payment to the rent they were already paying in order to meet the Minimum Rent requirement. For no other group did the gap represent so little of the eligible subsidy. Thus, households that stayed without meeting requirements would, on average, have had to use well over half of their allowance payment to make up the difference between the rent they were already paying at enrollment and the higher rent they needed to pay to meet requirements.[1]

The notion of distance from meeting Minimum Rent requirements should also take into consideration price heterogeneity in the housing market. It is apparent that similar units may rent for different amounts. Thus some units may be better deals than others in the sense that they cost less than the market average for similar units. In general, households with exceptionally good deals would be expected to pay lower rents and thus more often fail to meet a Minimum Rent requirement. Likewise, such households may be less willing to give up their good deals in order to meet requirements. On the other hand, good deals at enrollment may indicate units that have overdue rent increases and would therefore be more likely to have increases large enough to exceed the Minimum Rent requirement.

The concept of good and bad deals may be measured using the hedonic residual, which provides a comparison of actual rent and its estimated normal market rent. If the estimated rent is greater than the actual rent, the household is said to have a "good deal," living in a unit whose estimated normal cost is greater than the actual rent the housing is paying. Likewise, if the actual rent is much greater than the estimated rent, the household has a "bad deal."[2]

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[1]The Minimum Rent High requirement involved particularly large changes for households in Phoenix. On average, households that stayed without meeting (or moved and did not meet) would have had to use all of their subsidy plus additional household income to meet Minimum Rent High.

[2]See Merrill (1977), Kennedy and Merrill (1979), and Friedman and Weinberg (1978) for a discussion of hedonic equations, and the interpretation of hedonic residuals. The ability to make the "good deal" interpretation of hedonic residuals clearly depends on assumptions about the con-
(continued)

Table 3-7

MEAN [AND MEDIAN] INITIAL DISTANCE FROM
MEETING REQUIREMENTS AS A PERCENTAGE OF FULL SUBSIDY

OUTCOMES	PITTSBURGH				PHOENIX			
	MINIMUM RENT LOW HOUSEHOLDS	SAMPLE SIZE	MINIMUM RENT HIGH HOUSEHOLDS	SAMPLE SIZE	MINIMUM RENT LOW HOUSEHOLDS	SAMPLE SIZE	MINIMUM RENT HIGH HOUSEHOLDS	SAMPLE SIZE
Stayed and passed	16% [12]	(13)	20% [18]	(9)	20% [13]	(3)	14% [14]	(1)
Stayed and failed	50 [44]	(17)	86 [59]	(44)	63 [58]	(13)	134 [111]	(28)
Moved and passed	40 [12]	(15)	74 [32]	(17)	48 [24]	(27)	61 [53]	(32)
Moved and failed	92 [92]	(2)	53 [42]	(11)	69 [54]	(7)	156 [101]	(23)
Overall mean	39%	(47)	72%	(81)	53%	(50)	111%	(84)

SAMPLE: Minimum Rent and Control households active at two years after enrollment that failed the Minimum Rent requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report forms.

Table 3-8 shows the hedonic residuals at enrollment for Minimum Rent and Control households. Few strong patterns are evident. On average, households that failed to meet either Minimum Rent requirement tended to have better deals (the mean value of the residual was more negative). For Minimum Rent High, Control households that met in place had significantly worse deals than those that stayed and failed (and indeed were the only group with positive residuals). There is, however, no significant difference for Control households that met Minimum Rent Low in place. Small sample sizes hinder comparisons for Experimental households. Minimum Rent Low households in Pittsburgh--the only group that showed evidence of increased in-place meeting due to the housing allowance--do have significantly worse deals than Minimum Rent households that stayed and failed.

3.3 LOGIT ESTIMATES OF MEETING MINIMUM RENT IN PLACE

This section presents estimates of the probability of meeting Minimum Rent in place based on a logit analysis that controls for demographic characteristics and the initial housing position. The approach is similar to that for Minimum Standards described in Chapter 2. Again, the sample is Experimental and Control households that did not meet their Minimum Rent requirements at enrollment. Equations are estimated only for Pittsburgh. Using multivariate analysis to characterize the seven Phoenix households that met each Minimum Rent requirement in place does not seem reasonable.

The independent variables include the dollar distance from meeting requirements, household satisfaction with the unit and neighborhood, income, and demographic characteristics. As discussed above, the gap between enrollment rent and the Minimum Rent requirement appears to be an important determinant of whether households meet in place: as would be expected, the smaller the distance the more likely households are to meet requirements in place. Secondly, as was shown in the analysis of Minimum Standards upgrading, households having a strong commitment to their units, that is, households that are satisifed with their enrollment units and have expressed a

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(footnote continued)

tent of the residual. In particular, the hedonic residual may reflect the value of unit attributes not captured by the variables included in the hedonic equation as well as differences in price. In fact, the evidence suggests that almost all of the residual variance in Phoenix and about half of that in Pittsburgh represent price differentials.

Table 3-8

MEAN LINEAR HEDONIC RESIDUAL[a]

OUTCOMES	MINIMUM RENT LOW				MINIMUM RENT HIGH			
	PITTSBURGH		PHOENIX		PITTSBURGH		PHOENIX	
	MINIMUM RENT LOW HOUSEHOLDS	CONTROL HOUSEHOLDS	MINIMUM RENT LOW HOUSEHOLDS	CONTROL HOUSEHOLDS	MINIMUM RENT HIGH HOUSEHOLDS	CONTROL HOUSEHOLDS	MINIMUM RENT HIGH HOUSEHOLDS	CONTROL HOUSEHOLDS
Stayed and passed	-7.14 (11)	-13.54 (15)	-5.66 (2)	3.38 (3)	-6.35 (8)	4.56 (19)	-- (0)	6.36 (5)
Stayed and failed	-19.73 (15)	-11.34 (57)	-7.02 (12)	-9.03 (69)	-4.93 (38)	-7.52 (115)	-16.10 (25)	-8.13 (86)
Moved and passed	-8.12 (12)	-13.26 (29)	-13.15 (18)	-5.38 (24)	-5.25 (17)	-8.94 (23)	-5.07 (25)	-1.90 (17)
Moved and failed	-8.15 (2)	-7.41 (8)	-7.36 (3)	-5.89 (40)	-9.35 (10)	-5.62 (37)	-11.81 (17)	-5.39 (70)
Overall mean residual	-12.21 (40)	-11.87 (109)	-10.12 (35)	-7.19 (136)	-5.77 (73)	-6.14 (194)	-10.90 (67)	-6.05 (178)
t-STATISTIC (stayed/passed vs. stayed/failed)	2.02*	0.45	0.10	-1.16	0.28	2.65**	--	-1.97†

SAMPLE. Minimum Rent and Control households active at two years after enrollment that failed the Minimum Rent requirements at enrollment, excluding those with enrollment incomes over the eligibility limits, those living in their own homes or in subsidized housing, and those with extreme values for the hedonic residual.

DATA SOURCES: Initial and monthly Household Report Forms.

a. The residual is defined as (actual rent-predicted rent).

† t-statistic significant at the 0.10 level.

* t-statistic significant at the 0.05 level.

** t-statistic significant at the 0.01 level.

preference to remain in them, are more likely to meet requirements in place. These same measures were examined for Minimum Rent households but no obvious relationships were observed in the tabular results.[1] However, satisfaction and mobility may be correlated with demographic or other variables, so it may be useful to include them in a multivariate estimate. Finally, the independent variables include income, household size, age and sex of household head, education, and race or ethnicity. Since these variables may affect mobility, rent level, and the distance from meeting Minimum Rent, it is desirable to control for differences between Minimum Rent and Control households.

The results, presented in Tables 3-9 and 3-10, confirm the findings discussed in previous sections of this chapter. Minimum Rent Low households in Pittsburgh were about 15 percentage points more likely to meet requirements in place than Control households. This estimate is very close to the 14 percentage point difference observed in the frequencies in Table 3-2. No significant experimental effect was observed for Minimum Rent High households, which corroborates the results presented in Section 3.1.

The size of the gap between enrollment rent and the Minimum Rent requirement is negatively associated with meeting requirements for both Minimum Rent Low and High. The equations described in Tables 3-9 and 3-10 are specified on the assumption that the same experimental effect on the probability of meeting in place exists for all sizes of the gap. This may not be the case; it is plausible that at smaller gaps the induced effect is greater than at very large gaps. In order to test for this possibility, an interaction term for distance and Experimental household was included in the equations for Minimum Rent Low and High households in Pittsburgh. Although the interaction variable has the hypothesized sign, it is not significant, so the simpler model is assumed to be appropriate. (The alternative equations are contained in Appendix V, Tables V-9 and V-10.)

The equation for Minimum Rent Low households in Pittsburgh also indicates that a number of demographic variables affect meeting Minimum Rent in place Thus, the probability of meeting requirements in place increases with income, education, and the age of the head of household, and is also larger for

[1] See Appendix V, Tables V-1 through V-8.

Table 3-9

LOGIT ESTIMATE OF THE PROBABILITY OF MEETING MINIMUM RENT LOW IN PLACE: PITTSBURGH MINIMUM RENT LOW AND CONTROL HOUSEHOLDS

INDEPENDENT VARIABLES	COEFFICIENT	ASYMPTOTIC t-STATISTIC	PARTIAL DERIVATIVE
Age of head of household (decades)	0.501**	2.74	0.075
Black head of household	-0.761	-1.52	-0.114
Household size	0.228	1.59	0.034
Annual net income (thousands)	0.371*	2.39*	0.054
Female head of household	1.639**	3.08**	0.245
Education of head of household	0.264*	2.31*	0.039
Number of moves in previous three years	-0.303	-1.24	-0.045
Unit and neighborhood satisfaction	0.065	0.49	0.010
Distance from meeting requirements (dollar gap)	-0.066**	-2.76**	-0.010
Experimental household (Housing Gap Minimum Rent Low)	1.026*	2.06*	0.153
CONSTANT	-9.361**	-4.21**	NA
Likelihood ratio (significance)		35.57**	
Mean of dependent variable		0.183	
Coefficient of determination		0.228	
Sample size		(164)	

SAMPLE: Minimum Rent and Control households active at two years after enrollment that failed the Minimum Rent requirements at enrollment, excluding those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms and Baseline Interviews.

* t-statistic significant at the 0.05 level.

** t-statistic significant at the 0.01 level.

*** t-statistic significant at the 0.001 level.

Table 3-10

LOGIT ESTIMATE OF THE PROBABILITY OF MEETING MINIMUM RENT HIGH IN PLACE: PITTSBURGH MINIMUM RENT HIGH AND CONTROL HOUSEHOLDS

INDEPENDENT VARIABLES	COEFFICIENT	ASYMPTOTIC t-STATISTIC	PARTIAL DERIVATIVE
Age of head of household (decades)	-0.296†	1.65†	-0.027
Black head of household	0.520	0.98	0.047
Household size	-0.179	-0.93	-0.016
Annual net income (thousands)	0.155	1.08	0.014
Female head of household	0.927†	1.81†	0.084
Education of head of household	0.178	1.45	0.016
Number of moves in previous three years	-0.697*	-2.48*	-0.063
Unit and neighborhood satisfaction	0.458**	2.99**	0.042
Distance from meeting requirements (dollar gap)	-0.093**	-4.91**	-0.008
Experimental household (Housing Gap Minimum Rent Low)	-0.119	-0.22	-0.011
CONSTANT	-4.053†	-1.94†	NA
Likelihood ratio (significance)		58.13**	
Mean of dependent variable		0.101	
Coefficient of determination		0.299	
Sample size		(296)	

SAMPLE: Minimum Rent and Control households active at two years after enrollment that failed the Minimum Rent requirements at enrollment, excluding those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms and Baseline Interviews.

† t-statistic significant at the 0.10 level.

* t-statistic significant at the 0.05 level.

** t-statistic significant at the 0.01 level.

female-headed households. These findings may reflect the association of these variables with either higher rent level (and therefore lower gaps) or with mobility. For example, numerous studies have found female-headed households spend more on rent (Mayo, 1978). Also, elderly households in Pittsburgh are more likely to meet in place, perhaps because they move less frequently (MacMillan, 1978).

3.4 THE CHANGE IN HOUSING FOR MINIMUM RENT HOUSEHOLDS THAT STAYED IN THEIR ENROLLMENT UNITS

Meeting Minimum Rent requirements in the enrollment unit could result from normal rent increases due to improved housing services, normal inflation, direct negotiation by the tenant with the landlord to increase the rent, or willingness by the tenant to accept a larger rent increase than would be the case in the absence of the experiment. An experimental effect for Minimum Rent Low households in Pittsburgh has been shown in the frequencies presented in Section 3.1 and in the logit estimations in Section 3.3. Thus, Minimum Rent households that met in place would be expected to have a larger rent increase than Control households that met in place. In addition, households that met in place may have larger rent increases than households that stayed but did not meet, but this is not necessary. As discussed in Section 3.2, these households were initially closer to meeting the Minimum Rent requirements, so that they may not have needed larger increases.

The increase in rent for Minimum Rent Low households in Pittsburgh is shown in Table 3-11. Since the number of households that met in place is very small for Minimum Rent households in Phoenix and Minimum Rent High in Pittsburgh, the analysis is based on Pittsburgh Minimum Rent Low households only.[1] The results do not support the expected outcomes. The percent change in rent from enrollment to two years is the same not only for Minimum Rent Low and Control households that met in place but also for Minimum Rent households that stayed and did not meet requirements. (Control households that met in place did have larger increases in expenditures than Control

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[1] Comparison tables for the groups not in the text are given in Appendix V, Tables V-11 and V-12.

Table 3-11

CHANGE IN MEAN RENT OVER TWO YEARS:
PITTSBURGH MINIMUM RENT LOW AND CONTROL HOUSEHOLDS

	OUTCOMES		
	STAYED AND PASSED	STAYED AND FAILED	SAMPLE SIZE
MEAN RENT AT ENROLLMENT			
Minimum Rent Low households	$ 100 (12)	$ 73 (17)	(29)
Control households	93 (16)	84 (60)	(76)
MEAN RENT AT TWO YEARS			
Minimum Rent Low households	119 (12)	85 (17)	(29)
Control households	110 (16)	94 (60)	(76)
MEAN PERCENTAGE CHANGE			
Minimum Rent Low households	20.9% (12)	20.0% (17)	(29)
Control households	20.6 (16)	12.8 (60)	(76)
t-STATISTIC FOR MEAN PERCENTAGE CHANGE			
Minimum Rent Low households versus Control households	0.05	1.53	
Stayed/passed vs. failed Minimum Rent Low households	0.15		
Stayed/passed vs. failed Control households	1.35		

SAMPLE: Minimum Rent and Control households active at two years after enrollment that failed the Minimum Rent requirements at enrollment, excluding those with enrollment incomes over the eligibility limits, those living in their own homes or in subsidized housing, and those with a missing value at either enrollment or two years.

DATA SOURCES: Initial and monthly Household Report Forms.

households that stayed and did not meet.)[1] All in all, these results are rather puzzling and seem at odds with the evidence of an induced rate of meeting. Since the change in rent for the Minimum Rent Low households that met in place did not exceed the change in rent for either Control or Minimum Rent households that stayed and failed, there appears to be no induced rent increase.[2]

This finding also alters expectations concerning an induced increase in housing quality. It was hoped that households meeting requirements under the Minimum Rent housing allowance plan would experience an increase in housing corresponding to the increase in expenditures. Since rent is assumed to be closely related to quality this assumption is, in general, appropriate. It should be noted, however, that normal increases in rent may not be accompanied by an increase in housing. For example, inflation, changing tenure relationships, or simply a lagged adjustment of rent to prior housing change, could increase rent independently of quality.

In any event, since no change in rent was induced for Minimum Rent households that met in place there is no reason to assume any induced change in housing services. Also, there is no reason to assume that housing quality increased more for Minimum Rent households that met requirements in place than for households that stayed and did not meet. Four measures of housing were used to assess changes in housing quality--hedonic indices, the evaluator's overall rating, the number of physical Minimum Standards components failed, and a measure of physical housing deprivation. The results for Minimum Rent Low households in Pittsburgh, which are shown in Tables 3-12

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[1]The rent used in this analysis is analytic rent. The rent defined for program operations is slightly different (see Appendix II). The results using program rent, however, do not differ from the results based on analytic rent.

[2]Comparisons between different groups are difficult to interpret clearly because the experiment induced households to shift from one category to another (and in particular induced some households to move). Nevertheless, there seems to be no obvious reason why this should have biased the rent increases of Minimum Rent households that stayed without meeting requirements upward. Furthermore, the finding of no induced rent increase is confirmed by Friedman and Weinberg (1979). They find that, taking account of demographic characteristics, Minimum Rent households that met in place showed no significant increase in rent beyond that of Control households that did not meet the requirements at enrollment.

through 3-15, in fact indicate that no change in housing was observed for households that met requirements in place.[1]

Table 3-12 shows the increase in housing services for households that met in place and that stayed and did not meet requirements. Comparison of the percentage changes in housing services indicates that no significant differences exist between Minimum Rent and Control households or between Minimum Rent households that did and did not meet requirements. For all groups there was very little change in housing. These results also concur with results presented in Friedman and Weinberg (1979), which are based on estimated differences between Experimental and Control households, taking into account income and demographic characteristics.

The absence of induced quality change is also evident when the change in the evaluator's overall rating is assessed. As discussed in the previous chapter, the evaluator rating is a summary judgment regarding unit soundness and the extent of required repairs. In theory, improvements in both housing services and in normative housing standards could be reflected in this rating. As shown in Table 3-13, the evaluator rating did not change materially for any group and was essentially the same for Minimum Rent and Control households that met in place or that remained in the unit without meeting requirements.[2]

Finally, changes over two years in the number of Minimum Standards components failed and in the housing deprivation measure corroborate the finding of insignificant housing quality change. Although the units of Pittsburgh Minimum Rent Low households that met in place showed slightly greater improvement than Control households and Minimum Rent households that did not meet with respect to the drop in number of Minimum Standards components failed, the differences were not statistically significant (see Table 3-14). The change in the housing deprivation measure shows similar results. As shown in Table 3-15, there is no significant difference between Minimum

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[1] Refer to Appendix V for corresponding tables for Minimum Rent High households in Pittsburgh and Minimum Rent Low and High households in Phoenix.

[2] The distribution of households across the four-point rating at enrollment and at two years is given in Appendix V, Tables V-17 through V-20.

Table 3-12

CHANGE IN MEAN HOUSING SERVICES OVER TWO YEARS:
PITTSBURGH MINIMUM RENT LOW AND CONTROL HOUSEHOLDS

	OUTCOMES		
	STAYED AND PASSED	STAYED AND FAILED	SAMPLE SIZE
MEAN HOUSING SERVICES AT ENROLLMENT			
Minimum Rent Low households	112.97 (11)	99.09 (14)	(25)
Control households	110.29 (14)	98.01 (57)	(71)
MEAN HOUSING SERVICES AT ENROLLMENT			
Minimum Rent Low households	111.30 (11)	98.85 (14)	(25)
Control households	112.02 (14)	98.96 (57)	(71)
MEAN PERCENTAGE CHANGE			
Minimum Rent Low households	-1.2% (11)	-0.32% (14)	(25)
Control households	-1.6 (14)	-1.2 (57)	(71)
t-STATISTIC FOR MEAN PERCENTAGE CHANGE			
Minimum Rent Low households versus Control households	0.76	0.28	
Stayed/passed vs. failed Minimum Rent Low households	-0.41		
Stayed/passed vs. failed Control households	0.12		

SAMPLE: Minimum Rent and Control households active at two years after enrollment that failed the Minimum Rent requirements at enrollment, excluding those with enrollment incomes over the eligibility limits, those living in their own homes or in subsidized housing, those with extreme values for the hedonic residual, and those with a missing value at either enrollment or two years.

DATA SOURCES: Initial and monthly Household Report Forms, Housing Evaluation Forms, and Baseline and Periodic Interviews.

Table 3-13

HOUSING EVALUATOR OVERALL RATING OF THE DWELLING UNIT:
PITTSBURGH MINIMUM RENT LOW AND CONTROL HOUSEHOLDS

	OUTCOMES		
	STAYED AND PASSED	STAYED AND FAILED	SAMPLE SIZE
MEAN RATING AT ENROLLMENT			
Minimum Rent Low households	1.15 (13)	1.53 (17)	(30)
Control households	1.25 (16)	1.45 (60)	(76)
MEAN RATING AT TWO YEARS			
Minimum Rent Low households	1.08 (13)	1.24 (17)	(30)
Control households	1.00 (16)	1.40 (60)	(76)
MEAN CHANGE			
Minimum Rent Low households	0.08 (13)	0.29 (17)	(30)
Control households	0.25 (16)	0.05 (60)	(76)
t-STATISTIC FOR MEAN CHANGE			
Minimum Rent Low households versus Control households	-0.98	1.31	
Stayed/passed vs. failed Minimum Rent Low households	1.01		
Stayed/passed vs. failed Control households	1.43		

SAMPLE: Minimum Rent and Control households active at two years after enrollment that failed the Minimum Rent requirements at enrollment, excluding those with enrollment incomes over the eligibility limits, those living in their own homes or in subsidized housing, and those with a missing value at either enrollment or two years.

DATA SOURCES: Initial and monthly Household Report Forms, and Housing Evaluation Forms.

NOTE: The evaluator rating is measured on a four-point scale, from 0, indicating the unit is in good condition, to 3, indicating the unit is unfit for habitation.

Table 3-14

MEAN NUMBER OF MINIMUM STANDARD PHYSICAL COMPONENTS FAILED: PITTSBURGH MINIMUM RENT LOW AND CONTROL HOUSEHOLDS

	OUTCOMES		
	STAYED AND PASSED	STAYED AND FAILED	SAMPLE SIZE
MEAN NUMBER OF COMPONENTS FAILED AT ENROLLMENT			
Minimum Rent Low households	1.62 (13)	2.06 (17)	(30)
Control households	1.44 (16)	1.88 (60)	(76)
MEAN NUMBER OF COMPONENTS FAILED AT TWO YEARS			
Minimum Rent Low households	1.15 (13)	1.82 (17)	(30)
Control households	1.38 (16)	2.10 (60)	(76)
MEAN CHANGE			
Minimum Rent Low households	0.46 (13)	0.24 (17)	(30)
Control households	0.06 (16)	-0.22 (60)	(76)
t-STATISTIC FOR MEAN CHANGE			
Minimum Rent Low households versus Control households	1.32	1.31	
Stayed/passed vs. failed Minimum Rent Low households	0.59		
Stayed/passed vs. failed Control households	1.09		

SAMPLE: Minimum Rent and Control households active at two years after enrollment that failed the Minimum Rent requirements at enrollment, excluding those with enrollment incomes over the eligibility limits, those living in their own homes or in subsidized housing, and those with a missing value at either enrollment or two years.

DATA SOURCES: Initial and monthly Household Report Forms and Housing Evaluation Forms.

Table 3-15

MEAN HOUSING DEPRIVATION MEASURE:
PITTSBURGH MINIMUM RENT LOW AND CONTROL HOUSEHOLDS

	OUTCOMES		
	STAYED AND PASSED	STAYED AND FAILED	SAMPLE SIZE
MEAN DEPRIVATION MEASURE AT ENROLLMENT			
Minimum Rent Low households	2.46 (13)	2.71 (17)	(30)
Control households	2.25 (16)	2.57 (60)	(76)
MEAN DEPRIVATION MEASURE AT TWO YEARS			
Minimum Rent Low households	2.15 (13)	2.41 (17)	(30)
Control households	2.25 (16)	2.53 (60)	(76)
MEAN CHANGE			
Minimum Rent Low households	0.31 (13)	0.29 (17)	(30)
Control households	0.00 (16)	0.03 (60)	(76)
t-STATISTIC FOR MEAN CHANGE			
Minimum Rent Low households versus Control households	1.31	1.60	
Stayed/passed vs. failed Minimum Rent Low households	-0.06		
Stayed/passed vs. failed Control households	0.19		

SAMPLE: Minimum Rent and Control households active at two years after enrollment that failed the Minimum Rent requirements at enrollment, excluding those with enrollment incomes over the eligibility limits, those living in their own homes or in subsidized housing, and those with a missing value at either enrollment or two years.

DATA SOURCES: Initial and monthly Household Report Forms and Housing Evaluation Forms.

NOTE: The measure is a three-point scale, 1 indicating a minimally adequate unit and 3 indicating a clearly inadequate unit.

Rent Low households and comparable Control households. Furthermore, the figures for households that met in place are almost identical to those for households that remained in their units but did not meet.

Thus, it appears that no real housing improvement occurred in units that met Minimum Rent requirements in place, despite the fact that both Minimum Rent and Control households that met in place experienced a rent increase of about 20 percent. This suggests that these households were simply households that for one reason or another experienced larger rent increases. This is no doubt partly due to inflation. It may also partly reflect the fact that these units were lower-rent units that offered better than average deals to begin with. Thus, some increase in rent may simply have represented the landlord catching up to normal market levels.

In particular, there is no evidence that Minimum Rent households that met in place did so through deliberate collusion with their landlord, negotiating to increase rent to the level that would meet their rent requirement, or, indeed, that they even accepted larger increases than other tenants. In this case, no change in housing would be expected to occur. However, since the same rent increase occurred for Control and Minimum Rent households that did and did not meet requirements, a collusion hypothesis is not supported.[1] This is further confirmed by the relationship between rent and estimated rent (the hedonic residual). If experimental households that met Minimum Rent in place did so through collusion with their landlords, then there should be a significant difference in the change in their residuals over two years and the change in residuals of Control households that also met Minimum Rent. If collusion occurred, the residuals of Minimum Rent households that met in place should become relatively more positive than the residuals for Control households. In fact, as shown in Table 3-16, the mean changes in residuals were nearly identical for Control and Minimum Rent households that met in place.

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[1]The collusion hypothesis might be supported if it were assumed that Minimum Rent households that met requirements in place increased their rent just enough to meet the requirement, so that, on average, their rent change was no greater than that for Control households that met in place and Minimum Rent households that stayed and did not meet. Testing this hypothesis would require comparing the distributions of rent change for these groups of households which is not feasible for these sample sizes.

Table 3-16

MEAN LINEAR AND SEMILOG HEDONIC RESIDUALS:
PITTSBURGH MINIMUM RENT LOW AND CONTROL HOUSEHOLDS

	LINEAR			SEMILOG		
	OUTCOMES			OUTCOMES		
	STAYED AND PASSED	STAYED AND FAILED	SAMPLE SIZE	STAYED AND PASSED	STAYED AND FAILED	SAMPLE SIZE
MEAN HEDONIC RESIDUALS AT ENROLLMENT						
Minimum Rent Low households	-8.15 (10)	-20.91 (14)	(24)	-0.07 (10)	-0.25 (14)	(24)
Control households	-14.15 (14)	-11.34 (57)	(71)	-0.12 (14)	-0.12 (56)	(70)
MEAN HEDONIC RESIDUALS AT TWO YEARS						
Minimum Rent Low households	10.50 (10)	-8.56 (14)	(24)	0.11 (10)	0.10 (14)	(24)
Control households	4.08 (14)	-3.65 (57)	(71)	0.05 (14)	-0.04 (56)	(70)
MEAN CHANGE						
Minimum Rent Low households	18.64 (10)	12.35 (14)	(24)	0.18 (10)	0.15 (14)	(24)
Control households	18.23 (14)	7.69 (57)	(71)	0.18 (14)	0.08 (56)	(70)
t-STATISTIC FOR MEAN CHANGE						
Minimum Rent Low households versus Control households	-0.06	-1.16		-0.08	-1.25	
Stayed/passed vs. failed Minimum Rent Low households	0.85			0.47		
Stayed/passed vs. failed Control households	-2.61*			2.54*		

SAMPLE Minimum Rent and Control households active at two years after enrollment that failed the Minimum Rent requirements at enrollment, excluding those with enrollment incomes over the eligibility limits, those living in their own homes or in subsidized housing, those with extreme values for the hedonic residual, and those with a missing value at either enrollment or two years.

DATA SOURCES. Initial and monthly Household Report Forms, Housing Evaluation Forms, and Baseline and Periodic Interviews.

NOTE Residuals are defined as (actual rent-predicted rent).

* t-statistic significant at the 0.05 level.

The previous sections presented evidence that additional Minimum Rent Low households in Pittsburgh were induced to meet requirements in place. This is not, however, reflected in any apparent difference in rent or housing change between either Minimum Rent households that met in place and those that stayed without meeting or between Minimum Rent and Control households. Given the apparent lack of any real difference in behavior, the finding of induced meeting may reflect some distributional anomaly or sampling artifact not adequately accounted for.

3.5 CONCLUSIONS

Meeting requirements in place was less important for Minimum Rent households than for Minimum Standards households that did not meet requirements at enrollment. Relatively few households met Minimum Rent in place and nearly all of these households were in Pittsburgh. A significant experimental effect occurs only for Minimum Rent Low households in Pittsburgh: 28 percent of Minimum Rent Low households met in place as compared with 14 percent of the Control households not meeting requirements at enrollment. As would be expected, this induced meeting took place in the first year of the experiment.

Several factors help explain the differences in outcomes in Pittsburgh and Phoenix and for the two levels of Minimum Rent. Normal mobility rates are higher in Phoenix so that households were generally less likely to remain in their enrollment units. At the same time, the rate of inflation for nonmovers was higher in Pittsburgh during the experimental period, so that those households that did stay in their enrollment units were likely to have larger rent increases in Pittsburgh than in Phoenix. Also, the dollar gap between enrollment rent and the Minimum Rent requirements for households that did not meet requirements initially was higher in Phoenix than in Pittsburgh and, as would be expected, higher for Minimum Rent High than for Minimum Rent Low. Thus, a given rent increase would be expected to bring more Minimum Rent Low households and more households in Pittsburgh into compliance with the requirement. In terms of the allowance offer, the gap represented about 20 percent of the potential allowance for households that met in place and over 50 percent for households that stayed and did not meet.

Meeting Minimum Rent in place did not result in any induced increase in expenditures. The percentage increase in rent for Minimum Rent and Control households that met in place and for Minimum Rent households that stayed and did not meet were nearly identical. No improvements in housing services occurred for either Minimum Rent or Control households that met in place. These findings are in accord with the analysis in Friedman and Weinberg (1979), and suggest that meeting Minimum Rent in place was essentially a matter of normal market processes for both Minimum Rent and Control households, despite the finding of induced meeting in place for Minimum Rent Low households in Pittsburgh.

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CHAPTER 4

DWELLING UNIT IMPROVEMENTS REPORTED BY HOUSEHOLDS DURING THE DEMAND EXPERIMENT

Chapters 2 and 3 discussed housing change in terms of meeting program requirements--physical and occupancy standards for Minimum Standards households, and rent levels for Minimum Rent households. This chapter describes a much broader concept of maintenance and upgrading. In addition to the housing evaluations conducted by site office staff, households were asked about the extent and frequency of repairs, improvements, and general remodeling as part of the Periodic Interviews conducted six months, one year, and two years after enrollment. These data are the subject of this chapter.

General dwelling unit repair and improvement activities are part of the ongoing process of housing maintenance. Some of the repairs are minor --worn out sash cords are replaced or faucets repaired--and other improvements are more extensive--rooms are repainted or wallpapered or bathrooms are modernized. Some repairs are made by households, others are made by landlords, and presumably some are made jointly. Prior to the Experimental Housing Allowance Program (EHAP), only limited data on repairs were available. Frequently, the data were collected in connection with rehabilitation or code enforcement programs.[1] Repair and improvement data collected during EHAP offer an opportunity to examine the frequency and extent of many types of general improvement activities. Extensive housing repair data has been collected from both households and landlords in the Supply Experiment. The Demand Experiment collected repair and improvement data from households and, in addition, provides an opportunity to compare the responses of Experimental and Control households.

The interview data on repairs and improvements are not specifically tied to the Minimum Standards requirements or to other measures of housing used in the analyses in Chapters 2 and 3. The data were collected for all

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[1] It should be noted that currently the Annual Housing Survey collects some data on repairs and upgrading and associated costs from interviewed households.

households in the Demand Experiment and describe improvements that are both more general and more comprehensive than those included in the Minimum Standards components. The Minimum Standards are intended to reflect minimum requirements and would not, for example, detect general remodeling or modernization of a (working) bathroom. Households were asked whether they or their landlords had made improvements in the following items, which were listed by the interviewer:

> General remodeling, such as adding or remodeling rooms or lowering ceilings
>
> Work on floors or floor covering, such as sanding, refinishing, installing new tiles, or installing new carpeting
>
> Electrical work, such as installing new outlets
>
> Installing new plumbing or heating fixtures
>
> Additions to or replacement of the heating or air conditioning systems
>
> Interior or exterior carpentry work such as shelves, closets, cabinets, room dividers, planing doors, patching walls or woodwork
>
> Planting a garden or trees
>
> General fixing and repairing things, such as faucets, electrical outlets, wall switches, or broken windows
>
> Interior painting or papering
>
> Exterior painting
>
> Plastering interior walls, ceilings
>
> Modernizing bath or kitchen facilities
>
> Additions of major new kitchen appliances like stoves and refrigerators
>
> Other improvements to the dwelling unit or grounds.

Four variables are used to assess the extent and type of improvement activity: the proportion of households and landlords carrying out improve-

ments; the mean number of improvements made by landlords and by households, the incidence of specific types of improvements; and the household's total out-of-pocket expenditures for improvements.[1] These variables are measured for the entire two-year period and indicate the total improvement effort that occurred in the units occupied by Experimental and Control households. Thus, improvement activity is recorded for every unit in which the household lived during the two years. A household that reports two improvements to its enrollment unit and one improvement to a new unit, for example, is regarded as having made a total of three improvements during the experiment.

Section 4.1 examines the overall level of improvement activity and, through comparison with Control households, assesses the effect of the experimental allowance programs on the rate and type of improvements and on household outlays. Households in all allowance plans--Housing Gap, Percent of Rent, Unconstrained, and Control--are included in the analysis in this section.[2] Section 4.2 assesses improvement activity for the sample of Minimum Standards and Minimum Rent households analyzed in Chapters 2 and 3--that is, households that did not meet housing requirements at enrollment. It is expected that households that did not meet requirements in their enrollment units, particularly Minimum Standards households, would have had the greatest incentive to carry out additional improvements in response to the allowance offer.

All of the tables in this chapter are presented for the combined sites. Separate tables for each site appear in Appendix V.

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[1]The cost data provide a general indication of the dollar cost to the household of improvements. However, the costs cannot be directly linked to specific improvements. Nor should they be regarded as an accurate estimate of the total costs involved. There are four reasons for this. First, data on individual improvement costs are not available--only a total cost is collected, and this could refer to all or only some of the improvements carried out by the household. Second, since only households were interviewed, data on landlord expenses are not available. Therefore, it is impossible to determine the actual total costs of improvements. Third, there is no way to determine whether the household and/or landlord contributed labor to the effort, and if so, the value of that labor. Fourth, interpreting the value of household costs across all units is difficult, since some household improvements may have been performed in lieu of rent.

[2]Refer to Appendix I for a discussion of the experimental design.

4.1 IMPROVEMENTS REPORTED BY ALL HOUSEHOLDS IN THE DEMAND EXPERIMENT

Table 4-1 presents an overview of the reported improvement activity that occurred for Demand Experiment households during the two years of the experiment.[1] The extent of improvement activity is impressive: over 93 percent of all households reported some improvement activity. Over half of all households reported that improvements were made both by them and their landlords. This reflects both different improvements made by each party as well as joint improvement efforts (where, for example, the landlord may furnish materials and the household supply the labor, or both work together). Almost one-fifth of the households reported no maintenance or repair by their landlords during the two years.[2] In addition to the 6 percent that reported no improvements at all, another 13 to 15 percent reported that improvements were made only by the household. (Cases in which all improvements were made by landlords were somewhat more common than those in which all improvements were made by households, accounting for about one-fourth of the sample.)

Comparison of the figures for Experimental and Control households in Table 4-1 suggests that neither Experimental households nor their landlords made more improvements than they would have in the absence of the experiment.[3] The percentage of households reporting improvements by households is almost identical for the two groups. This is confirmed by more detailed examination of improvement activity.

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[1] The sample is all households that remained active at two years after enrollment, excluding those with enrollment incomes above eligibility limits and those in their own homes or in subsidized housing (see Appendix II). It thus includes some Housing Gap households that never met requirements and hence never received an allowance payment.

[2] Recall, however, that the household may have occupied several units during this time.

[3] Note again that all Housing Gap households are included in this sample. This may dilute the estimated effects of the allowance program on participants, since the sample includes some households that never participated. Estimates based on participants alone would, however, be potentially biased. (See, for example, Friedman and Weinberg, 1979.)

The possibility that the housing requirement status of Minimum Standards and Minimum Rent households affects improvement activity is assessed below in Section 4.2.

Table 4-1

HOUSING IMPROVEMENTS REPORTED BY EXPERIMENTAL AND CONTROL HOUSEHOLDS
(PITTSBURGH AND PHOENIX)

APPROACH TO IMPROVEMENT	ALL EXPERIMENTAL HOUSEHOLDS	ALL CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM STANDARDS HOUSEHOLDS	MINIMUM RENT LOW HOUSEHOLDS	MINIMUM RENT HIGH HOUSEHOLDS	UNCONSTRAINED HOUSEHOLDS	PERCENT OF RENT HOUSEHOLDS
Improvements made only by landlord	24%	25%	-0.439	22%	27%	26%	30%	23%
Improvements made only by household	13	15	-1.365	12	10	13	15	14
Improvements made by both landlord and household	56	54	1.099	60	56	52	52	57
No improvements reported	7	6	0.427	7	7	9	4	6
Percentage of households reporting any improvements made by landlord	81	79	0.898	81	83	78	82	81
Percentage of households reporting any improvements made by household	69	69	0.227	71	66	65	66	71
SAMPLE SIZE	(1,638)	(603)		(378)	(226)	(226)	(103)	(705)

SAMPLE. All households active at two years after enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES. Periodic Interviews.

Table 4-2 indicates the average number of improvements reported and their average cost to the household. Little difference is apparent between Experimental and Control households with respect either to the number of improvements made by households or landlords or to the total cost of improvements borne by the household. However, the improvement activity undertaken by all households is striking. Households undertook about the same mean number of improvements as landlords at an average cost to the household over the two years of about $90 ($130 for those that made improvements).[1]

As might be expected, however, different types of improvements tend to be undertaken by households and landlords. As shown in Tables 4-3 and 4-4, households more often performed improvements such as interior painting or wallpapering, and working on the floors or floor coverings. Landlords more often installed new plumbing or heating fixtures, or added to or replaced the heating or air conditioning equipment, tasks that involved either investment in the rental property or general upkeep of its quality. Nevertheless, many types of improvement activity were engaged in by both groups. Little evidence of experimentally induced behavior is apparent.[2]

The separate tables of landlord and household improvements are combined in Table 4-5 to show the overall incidence of each type of improvement (regardless of who performed it).[3] The results indicate a pattern of improvement that was relatively unaffected by the experiment. The most

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[1]This average cost does not reflect two Experimental households that reported extremely high household costs (above $3,000). The average including those households was $96.17 for Experimental households.

[2]As indicated in Table 4-2, the mean number of repairs is the same for Experimental and Control households. The rates for a few specific types of repairs appear to differ. Significantly more Housing Gap and Percent of Rent households reported adding major kitchen appliances than did Control households (11 percent versus 7 percent), and reported that their landlords performed more interior painting or papering (23 percent versus 18 percent). In contrast, Control households significantly more often reported installing new plumbing or heating fixtures, or performing carpentry work. The causes for these differences are not readily apparent and may result from chance.

[3]Some of the repairs reported by households were also performed by the landlord and are thus counted in both tables.

Table 4-2

REPORTED IMPROVEMENT ACTIVITY:
EXPERIMENTAL AND CONTROL HOUSEHOLDS
(PITTSBURGH AND PHOENIX)

IMPROVEMENTS	EXPERIMENTAL HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC
TOTAL LANDLORD IMPROVEMENTS			
Mean number of improvements	2.73	2.59	1.14
(Standard deviation)	(2.70)	(2.46)	
(Sample size)	(1,638)	(603)	
TOTAL HOUSEHOLDS IMPROVEMENTS			
Mean number of improvements	2.74	2.95	-1.27
(Standard deviation)	(3.18)	(3.59)	
(Sample size)	(1,638)	(603)	
TOTAL IMPROVEMENTS[a]			
Mean number of improvements	5.46	5.54	-0.35
(Standard deviation)	(4.22)	(4.34)	
(Sample size)	(1,638)	(603)	
COST OF IMPROVEMENTS[b]			
Mean cost of improvements	$91.54	$89.89	0.17
[Median cost of improvement]	[$16.88]	[$16.08]	
(Standard deviation)	(202.05)	(202.84)	
(Sample size)	(1,594)	(595)	

SAMPLE: All households active at two years after enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCE: Periodic Interviews.

a. Sum of improvements made by landlords and households.

b. Total costs paid for by household; does not include costs paid for by landlord.

Table 4-3

TYPES OF IMPROVEMENTS MADE BY HOUSEHOLDS

TYPES OF IMPROVEMENTS	ALL EXPERIMENTAL HOUSEHOLDS	ALL CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM STANDARDS HOUSEHOLDS	MINIMUM RENT LOW HOUSEHOLDS	MINIMUM RENT HIGH HOUSEHOLDS	UNCONSTRAINED HOUSEHOLDS	PERCENT OF RENT HOUSEHOLDS
General remodeling	5%	6%	-0.76	6%	7%	5%	3%	5%
Work on floors or floor coverings	28	29	-0.39	28	24	27	34	29
Electrical work	13	16	-1.93†	13	16	14	7	12
Install new plumbing or heating fixtures	17	23	-2.81**	14	17	20	24	17
Add to or replace heating or air conditioning system	8	11	-1.90†	7	9	10	6	8
Interior or exterior carpentry work	22	28	-2.33*	24	26	23	13	21
Plant garden or trees	26	30	-1.53	26	26	20	31	26
General fixing or repairing	41	44	-0.85	39	40	38	38	44
Interior painting or papering	72	70	1.04	73	73	73	81	70
Exterior painting	8	10	-1.31	9	6	6	3	9
Plaster interior walls or ceilings	14	16	-0.83	12	17	16	13	15
Modernize bath or kitchen facilities	8	10	-1.34	10	7	3	3	8
Add major new kitchen appliances	11	7	2.33*	12	11	10	13	10
Other improvements	16	14	0.48	14	16	16	10	16
SAMPLE SIZE	(1,132)	(414)		(269)	(149)	(146)	(68)	(500)

SAMPLE All households active at two after enrollment that reported improvements made by the household, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES Periodic Interviews

† t-statistic significant at the 0.10 level.

* t-statistic significant at the 0.05 level.

** t-statistic significant at the 0.01 level.

Table 4-4

TYPES OF IMPROVEMENTS MADE BY LANDLORDS

TYPES OF IMPROVEMENTS	ALL EXPERIMENTAL HOUSEHOLDS	ALL CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM STANDARDS HOUSEHOLDS	MINIMUM RENT LOW HOUSEHOLDS	MINIMUM RENT HIGH HOUSEHOLDS	UNCONSTRAINED HOUSEHOLDS	PERCENT OF RENT HOUSEHOLDS
General remodeling	7%	6%	0.520	8%	6%	7%	6%	7%
Work on floors or floor coverings	13	12	0.612	14	11	12	12	14
Electrical work	13	12	0.338	15	13	11	14	12
Install new plumbing or heating fixtures	41	43	-0.570	43	46	38	39	40
Add to or replace heating or air conditioning system	21	22	-0.274	20	20	20	19	22
Interior or exterior carpentry work	20	21	-0.704	19	20	20	24	19
Plant garden or trees	5	5	0.166	4	8	8	0	5
General fixing or repairing	56	59	-1.020	57	54	59	50	56
Interior painting or papering	23	18	2.373*	23	22	20	26	23
Exterior painting	15	14	0.320	16	14	12	16	15
Plaster interior walls or ceilings	15	13	0.957	17	13	15	13	15
Modernize bath or kitchen facilities	10	9	0.253	10	10	11	11	9
Add major new kitchen appliances	5	3	1.589	6	5	7	7	4
Other improvements	29	29	-0.165	31	32	32	25	27
SAMPLE SIZE	(1,323)	(477)		(307)	(187)	(176)	(84)	(569)

SAMPLE All households active at two years after enrollment that reported improvements made by their landlords, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES Periodic Interviews

* t-statistic significant at the 0.05 level.

Table 4-5

TYPES OF IMPROVEMENTS MADE BY HOUSEHOLDS OR LANDLORDS, COMBINED

TYPES OF IMPROVEMENTS	ALL EXPERIMENTAL HOUSEHOLDS	ALL CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM STANDARDS HOUSEHOLDS	MINIMUM RENT LOW HOUSEHOLDS	MINIMUM RENT HIGH HOUSEHOLDS	UNCONSTRAINED HOUSEHOLDS	PERCENT OF RENT HOUSEHOLDS
General remodeling	9%	9%	0	10%	9%	9%	7%	8%
Work on floors or floor coverings	30	30	0	30	24	28	28	32
Electrical work	19	20	-0.562	22	20	18	17	18
Install new plumbing or heating fixtures	44	47	-1.062	45	50	42	48	43
Add to or replace heating or air conditioning system	23	24	-0.482	23	24	24	19	23
Interior or exterior carpentry work	31	35	-1.831†	32	32	31	29	30
Plant garden or trees	22	24	-0.918	22	22	20	21	24
General fixing or repairing	66	69	-1.206	67	64	68	62	66
Interior painting or papering	64	59	2.141*	67	62	62	69	63
Exterior painting	18	19	-0.686	20	16	15	15	18
Plaster interior walls or ceilings	21	21	0.348	22	22	20	18	22
Modernize bath or kitchen facilities	13	14	-0.594	16	13	12	10	13
Add major new kitchen appliances	12	8	2.778**	14	12	13	14	11
Other improvements	34	32	0.647	36	36	38	27	32
SAMPLE SIZE	(1,530)	(566)		(351)	(210)	(205)	(99)	(665)

SAMPLE. All households active at two years after enrollment that reported improvements, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES. Periodic Interviews.

† t-statistic significant at the 0.10 level.

* t-statistic significant at the 0.05 level.

** t-statistic significant at the 0.01 level.

common types of improvements were those that may have been relatively simple to perform: general fixing or repairing, reported by roughly 66 percent of all households, and interior painting or papering, reported by over 60 percent of all households. The least common type of improvements were those that potentially involved the highest cost: the addition of major kitchen appliances, modernizing the kitchen or bathroom, general remodeling, and exterior painting. Nevertheless, over 40 percent of all households reported that new plumbing or heating fixtures had been installed, and about 30 percent reported work on floors and interior or exterior carpentry.

In summary, improvement activity occurred frequently for all households and was not strongly affected by the Demand Experiment. Households in all allowance plans tended to report similar improvement activity and in no case was one allowance plan consistently the most or least active with regard to improvement activity. These results are based on all Experimental households, including some Housing Gap households that never met requirements (and hence never received an allowance). The following section examines reported improvement activity for households likely to have a strong incentive for improvement activity--Minimum Standards and Minimum Rent households that failed the requirements at enrollment.

4.2 IMPROVEMENTS REPORTED BY MINIMUM STANDARDS AND MINIMUM RENT HOUSEHOLDS NOT MEETING REQUIREMENTS AT ENROLLMENT

The analysis in this section focuses on improvement activity reported by the households analyzed in Chapters 2 and 3: households in the Housing Gap allowance plans that initially failed to meet their housing requirements. It is plausible that these households had the greatest incentive (from the allowance) to make additional improvements. In particular, households that upgraded their enrollment units to meet Minimum Standards or that met Minimum Rent in place may report more improvement activity or different types of activity than their Control counterparts.

Table 4-6 describes improvement activity for Minimum Standards and Control households. In general, the patterns seen in Table 4-1 are repeated here.

Table 4-6

REPORTED IMPROVEMENT ACTIVITY FOR MINIMUM STANDARDS AND CONTROL HOUSEHOLDS THAT DID NOT MEET REQUIREMENTS AT ENROLLMENT

IMPROVEMENTS	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC
TOTAL LANDLORD IMPROVEMENTS			
Mean number of improvements	2.71	2.50	1.02
(Standard deviation)	(2.92)	(2.43)	
Percentage of households reporting any landlord improvements	79%	78%	0.362
(Sample size)	(297)	(478)	
TOTAL HOUSEHOLD IMPROVEMENTS			
Mean number of improvements	2.94	3.07	-0.48
(Standard deviation)	(3.69)	(3.79)	
Percentage of households reporting any household improvements	71%	69%	0.617
(Sample size)	(297)	(478)	
TOTAL IMPROVEMENTS[a]			
Mean number of improvements	5.64	5.57	0.22
(Standard deviation)	(4.72)	(4.47)	
Percentage of households reporting any improvements	91%	94%	-1.420
(Sample size)	(297)	(478)	
COST OF IMPROVEMENTS[b]			
Mean cost of improvements	$98.41	$96.39	0.13
[Median cost of improvements]	[$19.00]	[$18.75]	
(Standard deviation)	(213.50)	(215.09)	
(Sample size)	(286)	(472)	

SAMPLE: Minimum Standards and Control households active at two years after enrollment that failed the Minimum Standards requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms, Housing Evaluation Forms, and Periodic Interviews.

a. Sum of improvements made by landlords and households.

b. Total costs paid for by household; does not include costs paid for by landlord.

The incidence and mean number of landlord, household, and total improvements is the same for both groups. Thus, there is again no evidence of any experimental effect on improvement activity.

Nor do the types of improvements made seem to differ materially for Minimum Standards and Control households that failed the Minimum Standards requirements at enrollment. As shown in Table 4-7, the bulk of households reporting repairs reported general repairs and interior painting or wallpapering. Other categories were still substantial, however. Over a quarter reported repairs to floors, installation of new plumbing, and general carpentry. No category was reported by less than 11 percent of the households. The only significant difference between Minimum Standards and Control households were in the incidence of interior painting or papering and purchase of major kitchen appliances. Given the number of categories involved, these may well have arisen by chance.

The lack of any apparent difference between Minimum Standards and Control households that failed requirements at enrollment is especially interesting, since the results of Chapter 2 suggested that Minimum Standards upgraders, at least, were induced to make additional improvements. This is confirmed by Table 4-8 which shows the mean number of improvements and household costs, broken by whether households ever met Minimum Standards requirements and by whether they moved or stayed in their enrollment units. There are significant differences between Minimum Standards and Control upgraders in both the mean number of household improvements and the average household spending for improvements. These are offset in the sample of all households not meeting requirements by the fact that Minimum Standards households that failed to meet requirements (and especially those that moved and failed to meet requirements) had somewhat fewer household improvements with a lower mean cost.

While conjectures about the flows among the different categories shown in Table 4-8 are necessarily speculative, this pattern at least suggests that the Minimum Standards allowance offer may have led some households that would have moved to stay and improve their enrollment units instead, changing the focus rather than the overall level of household improvement

Table 4-7

TYPES OF IMPROVEMENTS MADE BY MINIMUM STANDARDS AND CONTROL HOUSEHOLDS THAT DID NOT MEET REQUIREMENTS AT ENROLLMENT (COMBINED LANDLORD AND HOUSEHOLD IMPROVEMENTS)

TYPES OF IMPROVEMENTS	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC
General remodeling	11%	9%	0.998
Work on floors or floor coverings	30	30	-0.028
Electrical work	23	20	0.854
Install new plumbing or heating fixtures	45	49	-1.041
Add to or replace heating or air conditioning system	20	23	-1.193
Interior or exterior carpentry work	33	35	-0.711
Plant garden or trees	24	23	0.245
General fixing or repairing	66	69	-0.668
Interior painting or papering	66	58	2.262*
Exterior painting	21	17	1.328
Plaster interior walls or ceilings	22	22	0.283
Modernize bath or kitchen facilities	16	15	0.036
Add major new kitchen appliances	14	9	2.229*
Other improvements	36	32	1.212
SAMPLE SIZE	(271)	(449)	

SAMPLE: Minimum Standards and Control households active at two years after enrollment that failed the Minimum Standards requirements at enrollment and reported improvements, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms, Housing Evaluation Forms, and Periodic Interviews.

* t-statistic significant at the 0.05 level.

Table 4-8

REPORTED IMPROVEMENT ACTIVITY FOR MINIMUM STANDARDS AND CONTROL HOUSEHOLDS
THAT DID NOT MEET REQUIREMENTS AT ENROLLMENT BY TWO-YEAR OUTCOME

	STAYED AND PASSED			STAYED AND FAILED			MOVED AND PASSED			MOVED AND FAILED		
IMPROVEMENTS	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC
TOTAL LANDLORD IMPROVEMENTS												
Mean number of improvements	2.68	2.75	-0.13	2 28	2.33	-0.20	3 91	2.33	1.21	3.09	2.82	0 54
(Standard deviation)	(2.33)	(2 60)		(2.46)	(2.40)		(2 48)	(2.61)		(3.94)	(2 40)	
Percentage of households reporting any landlord improvements	78%	75%	0.344	75%	76%	-0.179	83%	71%	1 638	81%	86%	-1.127
(Sample size)	(37)	(36)		(108)	(224)		(66)	(51)		(78)	(148)	
TOTAL HOUSEHOLD IMPROVEMENTS												
Mean number of improvements	3 57	1 86	2 03*	3 44	3 41	0 05	2.39	1.94	0.87	2.42	3.27	-1 86†
(Standard deviation)	(4.65)	(2,13)		(4.26)	(4.31)		(2.67)	(2 89)		(3 06)	(3.58)	
Percentage of households reporting any household improvements	70%	56%	1 301	70%	74%	-0 632	73%	51%	2.414*	69%	70%	-0.062
(Sample size)	(37)	(36)		(108)	(224)		(66)	(51)		(78)	(148)	
TOTAL IMPROVEMENTS[a]												
Mean number of improvements	6.24	4 61	1.57	5.71	5.74	-0.06	5.30	4.27	1.47	5.51	6.09	-0.83
(Standard deviation)	(5.24)	(3,48)		(4 86)	(4.71)		(3.40)	(4 00)		(5.29)	(4 49)	
Percentage of households reporting any improvements	86%	89%	-0.312	91%	98%	-3.244**	100%	80%	3 761***	87%	99%	-3 788***
(Sample size)	(37)	(36)		(108)	(224)		(66)	(51)		(78)	(148)	
COST OF IMPROVEMENTS[b]												
Mean cost of improvements	$132.38	$41.89	2.36*	$83.34	$94.78	-0.61	$111.14	$42.69	2 00*	$86.44	$130.05	
(Median cost of improvements)	($20.50)	($2.50)		($29.75)	($23 50)		($17.00)	($1.00)		($5.38)	($20.50)	
(Standard deviation)	($210.58)	($77.66)		($153.86)	($168.00)		($248.80)	($104.28)		($243.98)	($309.27)	
(Sample size)	(34)	(36)		(107)	(224)		(65)	(49)		(73)	(146)	

SAMPLE: Minimum Standards and Control households active at two years after enrollment that failed the Minimum Standards requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms, Housing Evaluation Forms, and Periodic Interviews.

a Sum of improvements made by landlords and households.

b The costs paid for by household; does not include costs paid for by landlord.

† t-statistic significant at the 0.10 level
* t-statistic significant at the 0.05 level
** t-statistic significant at the 0 01 level.
*** t-statistic significant at the 0.001 level.

activity.[1] It is also, of course, possible that a small effect for upgraders is simply lost in the larger sample of all households that failed to meet requirements at enrollment.

Tables 4-9 and 4-10 present improvement data for Minimum Rent and Control households that failed the Minimum Rent requirement at enrollment.[2] The incidence of improvements is not significantly different. Both groups of Minimum Rent households, however, show a mean number of household improvements significantly lower than that for comparable Control households. Why this should be the case is not clear. Details of differences for each type of improvement shown in Tables 4-11 and 4-12 are not significant. (Only one of the 28 comparisons in the two tables is significant at the 5 percent level, a result that could well arise just by chance.)

Comparison for subgroups of households defined by whether they eventually met Minimum Rent requirements and whether they moved are equally uninformative. (See Tables 4-13 and 4-14.) In each group, the Minimum Rent households have a lower mean number of improvements made by households than do Control households. The differences are only significant, however, for Minimum Rent households that never met the Minimum Rent requirements (and hence never received an allowance payment). In any case, it seems clear that the Minimum Rent offer did not induce additional improvements and may even have reduced them somewhat.

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[1] As commented in Chapter 2, Control households that did not meet requirements generally show more household repairs than those that upgraded or those that moved and met requirements. This pattern is reversed for Minimum Standards households. What the allowance may have done in shifting households from either the "stay/fail" or "move/fail" category into "stay/pass" (upgrading) was simply to focus the activities of households that would normally have made a fairly large number of repairs. In particular, the pattern of Table 4-8 would suggest that households that would have moved (and hence spread improvements over two or more units) were encouraged instead to stay in their enrollment unit and repair the Minimum Standards deficiencies there. This sort of interpretation is highly speculative, however.

[2] Site separate data are contained in Appendix VI.

Table 4-9

REPORTED IMPROVEMENT ACTIVITY FOR MINIMUM RENT LOW AND CONTROL HOUSEHOLDS THAT DID NOT MEET REQUIREMENTS AT ENROLLMENT

IMPROVEMENTS	MINIMUM RENT LOW HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC
TOTAL LANDLORD IMPROVEMENTS			
Mean number of improvements	2.50	2.29	0.82
(Standard deviation)	(2.18)	(2.24)	
Percentage of households reporting any landlord improvements	80%	76%	0.889
(Sample size)	(97)	(279)	
TOTAL HOUSEHOLD IMPROVEMENTS			
Mean number of improvements	1.79	2.78	-2.85**
(Standard deviation)	(2.49)	(3.93)	
Percentage of households reporting any household improvements	58%	64%	-1.139
(Sample size)	(97)	(279)	
TOTAL IMPROVEMENTS[a]			
Mean number of improvements	4.30	5.07	-1.90†
(Standard deviation)	(3.03)	(4.45)	
Percentage of households reporting any improvements	93%	92%	0.098
(Sample size)	(97)	(279)	
COST OF IMPROVEMENTS[b]			
Mean cost of improvements	$53.88	$71.04	-1.06
[Median cost of improvements]	[$5.00]	[$10.25]	
(Standard deviation)	(126.51)	(155.84)	
(Sample size)	(93)	(277)	

SAMPLE: Minimum Rent Low and Control households active at two years after enrollment that failed the Minimum Rent Low requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms and Periodic Interviews.

a. Sum of improvements made by landlords and households.

b. Total costs paid for by household; does not include costs paid for by landlord.

† t-statistic significant at the 0.10 level.

** t-statistic significant at the 0.01 level.

Table 4-10

REPORTED IMPROVEMENT ACTIVITY FOR MINIMUM RENT HIGH AND CONTROL HOUSEHOLDS THAT DID NOT MEET REQUIREMENTS AT ENROLLMENT

IMPROVEMENTS	MINIMUM RENT HIGH HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC
TOTAL LANDLORD IMPROVEMENTS			
Mean number of improvements	2.67	2.51	0.66
(Standard deviation)	(2.78)	(2.42)	
Percentage of households reporting any landlord improvements	77%	79%	-0.561
(Sample size)	(168)	(436)	
TOTAL HOUSEHOLD IMPROVEMENTS			
Mean number of improvements	2.51	3.06	-1.88†
(Standard deviation)	(2.92)	(3.78)	
Percentage of households reporting any household improvements	64%	70%	-1.277
(Sample size)	(168)	(436)	
TOTAL IMPROVEMENTS[a]			
Mean number of improvements	5.18	5.57	-1.01
(Standard deviation)	(4.07)	(4.43)	
Percentage of households reporting any improvements	90%	94%	-1.667†
(Sample size)	(168)	(436)	
COST OF IMPROVEMENTS[b]			
Mean cost of improvements	$82.51	$96.41	-0.82
[Median cost of improvements]	[$21.00]	[$19.50]	
(Standard deviation)	(169.36)	(219.60)	
(Sample size)	(164)	(430)	

SAMPLE: Minimum Rent High and Control households active at two years after enrollment that failed the Minimum Rent High requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms and Periodic Interviews.

a. Sum of improvements made by landlords and households.

b. Total costs paid for by household; does not include costs paid for by landlord.

† t-statistic significant at the 0.10 level.

Table 4-11

TYPES OF IMPROVEMENTS MADE BY MINIMUM RENT LOW AND CONTROL HOUSEHOLDS THAT DID NOT MEET REQUIREMENTS AT ENROLLMENT (COMBINED LANDLORD AND HOUSEHOLD IMPROVEMENTS)

TYPES OF IMPROVEMENTS	MINIMUM RENT LOW HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC
General remodeling	9%	10%	-0.330
Work on floors or floor coverings	18	26	-1.501
Electrical work	18	18	-0.085
Install new plumbing or heating fixtures	44	46	-0.279
Add to or replace heating or air conditioning system	24	23	0.231
Interior or exterior carpentry work	29	35	-1.106
Plant garden or trees	7	18	-2.544*
General fixing or repairing	60	68	-1.343
Interior painting or papering	53	53	0.066
Exterior painting	13	14	-0.166
Plaster interior walls or ceilings	19	20	-0.185
Modernize bath or kitchen facilities	12	17	-1.076
Add major new kitchen appliances	11	8	0.862
Other improvements	32	29	0.553
SAMPLE SIZE	(90)	(258)	

SAMPLE: Minimum Rent Low and Control households active at two years after enrollment that failed the Minimum Rent Low requirements at enrollment and reported improvements, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms and Periodic Interviews.

* t-statistic significant at the 0.05 level.

Table 4-12

TYPES OF IMPROVEMENTS MADE BY MINIMUM RENT HIGH AND CONTROL HOUSEHOLDS THAT DID NOT MEET REQUIREMENTS AT ENROLLMENT (COMBINED LANDLORD AND HOUSEHOLD IMPROVEMENTS)

TYPES OF IMPROVEMENTS	MINIMUM RENT HIGH HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC
General remodeling	10%	10%	-0.035
Work on floors or floor coverings	27	29	-0.467
Electrical work	20	21	-0.389
Install new plumbing or heating fixtures	42	48	-1.330
Add to or replace heating or air conditioning system	24	24	-0.148
Interior or exterior carpentry work	30	36	-1.420
Plant garden or trees	18	21	-0.656
General fixing or repairing	70	69	0.182
Interior painting or papering	59	57	0.298
Exterior painting	19	18	0.244
Plaster interior walls or ceilings	21	21	-0.052
Modernize bath or kitchen facilities	14	15	-0.299
Add major new kitchen appliances	11	9	0.787
Other improvements	38	32	1.337
SAMPLE SIZE	(152)	(411)	

SAMPLE: Minimum Rent High and Control households active at two years after enrollment that failed the Minimum Rent High requirements at enrollment and reported improvements, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms and Periodic Interviews.

Table 4-13

REPORTED IMPROVEMENT ACTIVITY FOR MINIMUM RENT LOW AND CONTROL HOUSEHOLDS
THAT DID NOT MEET REQUIREMENTS AT ENROLLMENT BY TWO-YEAR OUTCOMES

IMPROVEMENTS	STAYED AND PASSED			STAYED AND FAILED			MOVED AND PASSED			MOVED AND FAILED		
	MINIMUM RENT LOW HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT LOW HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT LOW HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT LOW HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC
TOTAL LANDLORD IMPROVEMENTS												
Mean number of improvements	3 00	2 33	0.88	2 03	2.17	-0.36	2 76	2.71	0.12	2.00	2.22	-0 32
(Standard deviation)	(2.39)	(2 15)		(1,88)	(2.19)		(2,34)	(2,36)		(1,87)	(2.31)	
Percentage of households reporting any landlord improvements	88%	76%	0.870	73%	75%	-0.171	83%	81%	0.295	78%	75%	0.207
(Sample size)	(16)	(21)		(30)	(139)		(42)	(58)		(9)	(59)	
TOTAL HOUSEHOLD IMPROVEMENTS												
Mean number of improvements	1.94	3 05	-1.16	1.73	2 72	-2.10*	2.05	2 78	-1.18	0.56	2.42	-3 33**
(Standard deviation)	(2.24)	(3.56)		(2.29)	(4 51)		(2,68)	(3 26)		(1.13)	(3.20)	
Percentage of households reporting any household improvements	69%	81%	-0.858	57%	63%	-0 676	62%	66%	-0.370	22%	59%	-2.082*
(Sample size)	(16)	(21)		(30)	(139)		(42)	(58)		(9)	(59)	
TOTAL IMPROVEMENTS[a]												
Mean number of improvements	4.94	5 38	-0.39	3 77	5 09	-2 20*	4 81	5.48	-0.85	2 56	4.64	-2 84**
(Standard deviation)	(3.24)	(3 72)		(2 42)	(4.84)		(3,42)	(4.48)		(1.67)	(3.71)	
Percentage of households reporting any improvements	94%	100%	-1,157	93%	94%	-0 040	93%	90%	0.550	89%	90%	-0 092
(Sample size)	(16)	(21)		(30)	(139)		(42)	(58)		(9)	(59)	
COST OF IMPROVEMENTS[b]												
Mean cost of improvements	$54 12	$100.52	-1.11	$65.37	$70 39	-0.18	$54,82	$95 58	-1.12	$5 75	$40 66	-3.40
[Median cost of improvements]	[$20.50]	[$32,00]		[$1.50]	[$10 50]		[$3,00]	[$15.00]		[$1,00]	[$1 29]	
(Standard deviation)	(84.65)	(165.68)		(130.04)	(156,92)		(149,63)	(206,49)		(14.00)	(69.02)	
(Sample size)	(16)	(21)		(30)	(138)		(39)	(57)		(8)	(59)	

SAMPLE: Minimum Rent Low and Control households active at two years after enrollment that failed the Minimum Rent Low requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms and Periodic Interviews.

a Sum of improvements made by landlords and households.

b. Total costs paid for by household; does not include costs paid for by landlord

* t-statistic significant at the 0.05 level

** t-statistic significant at the 0.01 level.

Table 4-14

REPORTED IMPROVEMENT ACTIVITY FOR MINIMUM RENT HIGH AND CONTROL HOUSEHOLDS
THAT DID NOT MEET REQUIREMENTS AT ENROLLMENT BY TWO-YEAR OUTCOMES

IMPROVEMENTS	STAYED AND PASSED			STAYED AND FAILED			MOVED AND PASSED			MOVED AND FAILED		
	MINIMUM RENT HIGH HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT HIGH HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT HIGH HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT HIGH HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC
TOTAL LANDLORD IMPROVEMENTS												
Mean number of improvements	2 80	3 36	-0 42	2 27	2 29	-0 05	3 73	2 55	2 12*	2 03	2.75	-1.73†
(Standard deviation)	(3 80)	(2 75)		(2 32)	(2 38)		(3 40)	(2 04)		(2.04)	(2 56)	
Percentage of households reporting any landlord improvements	50%	92%	-2 806**	70%	75%	-0 791	92%	80%	1 666†	76%	83%	-0 897
(Sample size)	(10)	(25)		(73)	(225)		(49)	(56)		(34)	(125)	
TOTAL HOUSEHOLD IMPROVEMENTS												
Mean number of improvements	1 80	3 68	-1 71	2 44	3 19	-1.75†	3.04	3 20	-0 23	2.26	2 71	-0 92
(Standard deviation)	(2 86)	(3 10)		(2 77)	(4 22)		(3 51)	(3 30)		(2 27)	(3 29)	
Percentage of households reporting any household improvements	50%	92%	-2 806**	67%	69%	-0 352	65%	71%	-0 672	65%	66%	-0 098
(Sample size)	(10)	(25)		(73)	(225)		(49)	(56)		(34)	(125)	
TOTAL IMPROVEMENTS[a]												
Mean number of improvements	4 60	7 04	-1 32	4 71	5 48	-1 55	6.78	5 75	1 12	4.29	5 46	-1 73†
(Standard deviation)	(5 34)	(3 78)		(3,32)	(4 62)		(4.93)	(4.38)		(3.26)	(4 28)	
Percentage of households reporting any improvements	70%	100%	-2 864**	89%	95%	-0 837	98%	91%	1.524	88%	94%	-1.056
(Sample size)	(10)	(25)		(73)	(225)		(49)	(56)		(34)	(125)	
COST OF IMPROVEMENTS[b]												
Mean cost of improvements	$87 60	$118 28	-0.52	$64.62	$87 86	-1 39	$130 30	$159.89	-0 44	$56.72	$84.07	-1.09
(Median cost of improvements)	($14 00)	($50.75)		($20 25)	($20 00)		($22 00)	($29 00)		($22.50)	($10 00)	
(Standard deviation)	(140.49)	(189 93)		(108.46)	(162 93)		(264 60)	(394 59)		(91 51)	(211 98)	
(Sample size)	(10)	(25)		(73)	(223)		(47)	(53)		(32)	(124)	

SAMPLE: Minimum Rent High and Control households active at two years after enrollment that failed the Minimum Rent High requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing

DATA SOURCES Initial and monthly Household Report Forms and Periodic Intorviews

a Sum of improvements made by landlords and households

b. Total costs paid for by household; does not include costs paid for by landlord

† t-statistic significant at the 0 10 level

* t-statistic significant at the 0 05 level.

** t-statistic significant at the 0 01 level

4.3 SUMMARY

The housing allowance did not induce Experimental households to engage in more improvement activity than they otherwise would have. However, given that the sample is low-income renter households, the extent of reported improvement activity is striking. Almost all households reported some activity, most of it undertaken by both the households and landlords. The level of household effort involved is also impressive: over two-thirds of the households participated in improvement activity and contributed an average of $132 in out-of-pocket expenditures.

Minimum Standards and Minimum Rent households that initially failed the requirements also do not appear to have been induced to increase their normal improvement activity. There is some evidence that Minimum Standards upgraders did undertake more improvements than similar Control households. Given the lack of any overall effects for Minimum Standards households, however, this may reflect focusing normal repair efforts on Minimum Standards deficiencies, rather than an increase in the overall level of improvement activity. Minimum Rent households that did not meet requirements appear, if anything, to have reduced their improvement activity.

REFERENCES

Friedman, Joseph and Daniel H. Weinberg, Housing Consumption Under a Constrained Income Transfer: Evidence From a Housing Gap Housing Allowance, Cambridge, Mass., Abt Associates Inc., April 1979 (revised June 1980).

APPENDIX I

DESIGN OF THE DEMAND EXPERIMENT

This appendix presents a brief overview of the Demand Experiment's purpose, data collection procedures, experimental design, and sample allocation.

I.1 PURPOSE OF THE DEMAND EXPERIMENT

The Demand Experiment is one of three experiments established by the U.S. Department of Housing and Urban Development (HUD) as part of the Experimental Housing Allowance Program.[1] The purpose of these experiments is to test and refine the concept of housing allowances.

Under a housing allowance program, money is given directly to individual low-income households to assist them in obtaining adequate housing. The allowance may be linked to housing either by making the amount of the allowance depend on the amount of rent paid or by requiring that households meet certain housing requirements in order to receive the allowance payment. The initiative in using the allowance and the burden of meeting housing requirements are therefore placed upon households rather than upon developers, landlords, or the government.

The housing allowance experiments are intended to assess the desirability, feasibility, and appropriate structure of a housing allowance program. Housing allowances could be less expensive than some other kinds of housing programs. Allowances permit fuller utilization of existing sound housing because they are not tied to new construction. Housing allowances may also be more equitable. The amount of the allowance can be adjusted to changes in income without forcing the household to change units. Households may also, if they desire, use their own resources (either by paying higher rent or by searching carefully) to obtain better housing than is required to qualify for the allowance. As long as program requirements are met, housing allowances offer households considerable choice in selecting housing most appropriate to their needs--for example, where they live (opportunity to locate near schools, near work, near friends

[1] The other two experiments are the Housing Allowance Supply Experiment and the Administrative Agency Experiment.

or relatives, or to break out of racial and socioeconomic segregation) or the type of unit they live in (single-family or multifamily). Finally, housing allowances may be less costly to administer. Program requirements need not involve every detail of participant housing. The burden of obtaining housing that meets essential requirements is shifted from program administrators to participants.

These potential advantages have not gone unquestioned. Critics of the housing allowance concept have suggested that low-income households may lack the expertise necessary to make effective use of allowances; that the increased supply of housing needed for special groups such as the elderly will not be provided without direct intervention; and that an increase in the demand for housing without direct support for the construction of new units could lead to a substantial inflation of housing costs.[1]

If housing allowances prove desirable, they could be implemented through a wide range of possible allowance formulas, housing requirements, nonfinancial support (such as counseling), and administrative practices. The choice of program structure could substantially affect both the program's costs and impact.

The Demand Experiment addresses issues of feasibility, desirability, and appropriate structure by measuring how individual households (as opposed to the housing market or administrative agencies) react to various allowance formulas and housing standards requirements. The analysis and reports are designed to answer six policy questions:

1. Participation

   Who participates in a housing allowance program? How does the form of the allowance affect the extent of participation for various households?

2. Housing Improvements

   Do households that receive housing allowances improve the quality of their housing? At what cost? How do households

[1]The issue of inflation is being addressed directly as part of the Housing Allowance Supply Experiment.

that receive a housing allowance seek to improve their housing--by moving, by rehabilitation? With what success?

3. Locational Choice

For participants who move, how does their locational choice compare with existing residential patterns? Are there non-financial barriers to the effective use of a housing allowance?

4. Administrative Issues

What administrative issues and costs are involved in the implementation of a housing allowance program?

5. Form of Allowance

How do the different forms of housing allowance compare in terms of participation, housing quality achieved, locational choice, costs (including administrative costs), and equity?

6. Comparison with Other Programs

How do housing allowances compare with other housing programs and with income maintenance in terms of participation, housing quality achieved, locational choice, costs (including administrative costs), and equity?

The Demand Experiment tests alternative housing allowance programs to provide information on these policy issues. While the experiment is focused on household behavior, it also offers data on program administration to supplement information gained through the Administrative Agency Experiment. Finally, the Demand Experiment gathers direct information on participants and housing conditions for a sample of households in conventional HUD-assisted housing programs at the two experimental sites for comparison with allowance recipients.

I.2 DATA COLLECTION

The Demand Experiment was conducted at two sites--Allegheny County, Pennsylvania (Pittsburgh), and Maricopa County, Arizona (Phoenix). HUD selected these two sites from among 31 Standard Metropolitan Statistical Areas (SMSAs) on the basis of their growth rates, rental

vacancy rates, degree of racial concentration and housing costs. Pittsburgh and Phoenix were chosen to provide contrasts between an older, more slowly growing Eastern metropolitan area and a newer, relatively rapidly growing Western metropolitan area. In addition, Pittsburgh has a substantial black minority and Phoenix a substantial Spanish American minority population.

Most of the information on participating households was collected from:

Baseline Interviews, conducted by an independent survey operation before households were offered enrollment;

Initial Household Report Forms and monthly Household Report Forms, completed by participating households during and after enrollment, which provided operating and analytic data on household size and income and on housing expenditures.

Supplements to the Household Report Forms, completed annually by participating households after enrollment, which provide data on assets, income from assets, actual taxes paid, income from self-employment, and extraordinary medical expenses;

Payments and status data on each household maintained by the site offices;

Housing Evaluation Forms, completed by site office evaluators at least once each year for every dwelling unit occupied by participants, which provide information on housing quality;

Periodic Interviews, conducted approximately six, twelve, and twenty-four months after enrollment by an independent survey operation; and

Exit Interviews, conducted by an independent survey operation for a sample of households that declined the enrollment offer or dropped out of the program.

Surveys and housing evaluations were also administered to a sample of participants in other housing programs: Public Housing, Section 23/8 Leased Housing, and Section 236 Interest Subsidy Housing.

Since households were enrolled throughout the first ten months of operations, the operational phase of the experiment extended over nearly four years in total. Analysis will be based on data collected from households during their first two years after enrollment in the experiment. The experimental programs were continued for a third year

in order to avoid confusion between participants' reactions to the experimental offers and their adjustment to the phaseout of the experiment. During their last year in the experiment eligible and interested households were aided in entering other housing programs.

I.3 ALLOWANCE PLANS USED IN THE DEMAND EXPERIMENT

The Demand Experiment tested a number of combinations of payment formulas and housing requirements and several variations within each of these combinations. These variations allow some possible program designs to be tested directly. More importantly, they allow estimation of key responses such as participation rates and changes in participant housing in terms of basic program parameters such as the level of allowances; the level and type of housing requirements; the minimum fraction of its own income that a household can be expected to contribute toward housing; and the way in which allowances vary with household income and rent. These response estimates can be used to address the policy questions for a larger set of candidate program plans, beyond the plans directly tested.[1]

Payment Formulas

Two payment formulas were used in the Demand Experiment--Housing Gap and Percent of Rent.

Under the Housing Gap formula, payments to households constitute the difference between a basic payment level, C, and some reasonable fraction of family income. The payment formula is:

$$P = C - bY$$

where P is the payment amount, C is the basic payment level, "b" is the rate at which the allowance is reduced as income increases, and Y is

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[1]The basic design and analysis approach, as approved by the HUD Office of Policy Development and Research, is presented in Abt Associates Inc., Experimental Design and Analysis Plan of the Demand Experiment, Cambridge, Mass., August 1973, and in Abt Associates Inc., Summary Evaluation Design, Cambridge, Mass., June 1973. Details of the operating rules of the Demand Experiment are contained in Abt Associates Inc., Site Operating Procedures Handbook, Cambridge, Mass., April 1973.

the net family income.[1] The basic payment level, C, varies with household size, and is proportional to C*, the estimated cost of modest existing standard housing at each site.[2] Thus, payment under the Housing Gap formula can be interpreted as making up the difference between the cost of decent housing and the amount of its own income that a household should be expected to pay for housing.[3]

Under the Percent of Rent formula, the payment is a percentage of the household's rent. The payment formula is:

$$P = aR$$

where R is rent and "a" is the fraction of rent paid by the allowance. In the Demand Experiment the value of "a" remained constant once a household had been enrolled.[4]

Housing Requirements

The Percent of Rent payment formula is tied directly to rent: a household's allowance payment is proportional to the total rent. Under the Housing Gap formula, however, specific housing requirements are needed to tie the allowance to housing. Two types of housing requirement were used: Minimum Standards and Minimum Rent.

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[1] In addition, whatever the payment calculated by the formula, the actual payment cannot exceed the rent paid.

[2] The housing cost parameter, C*, was established from estimates given by a panel of qualified housing experts in Pittsburgh and Phoenix. For more detailed discussion regarding the derivation of C*, refer to Abt Associates Inc., Working Paper on Early Findings, Cambridge, Mass., January 1975, Appendix II.

[3] As long as their housing met certain requirements (discussed below), Housing Gap households could spend more or less than C* for housing, as they desired, and hence contribute more or less than "b" of their own income. This is in contrast to other housing programs, such as Section 8 (Existing).

[4] Five values of "a" were used in the Demand Experiment. Once a family had been assigned its "a" value, the value generally stayed constant in order to aid experimental analysis. In a national Percent of Rent program, "a" would probably vary with income and/or rent. Even in the experiment, if a family's income rose beyond a certain point, the value of "a" dropped rapidly to zero. Similarly, the payment under Percent of Rent could not exceed C* (the maximum payment under the modal Housing Gap plan), which effectively limited the rents subsidized to less than C*/a.

Under the Minimum Standards requirement, participants received the allowance payment only if they occupied dwellings that met certain physical and occupancy standards. Participants occupying units that did not meet these standards either had to move or arrange to improve their current units to meet the standards. Participants already living in housing that met standards could use the allowance to pay for better housing or to reduce their rent burden (the fraction of income spent on rent) in their present units.

If housing quality is broadly defined to include all residential services, and if rent levels are highly correlated with the level of services, then a straightforward housing requirement (one that is relatively inexpensive to administer) would be that recipients spend some minimum amount on rent. Minimum Rent was considered as an alternative to Minimum Standards in the Demand Experiment, in order to observe differences in response and cost and to assess the relative merits of the two types of requirements. Although the design of the experiment used a fixed minimum rent for each household size, a direct cash assistance program could employ more flexible structures. For example, some features of the Percent of Rent formula could be combined with the Minimum Rent requirement. Instead of receiving a zero allowance if their rent is less than the Minimum Rent, households might be paid a fraction of their allowance depending on the fraction of Minimum Rent paid.

Allowance Plans Tested

The three combinations of payment formulas and housing requirements used in the Demand Experiment were Housing Gap Minimum Standards, Housing Gap Minimum Rent, and Percent of Rent. A total of 17 allowance plans were tested.

The twelve Housing Gap allowance plans are shown in Table I-1. The first nine plans include three variations in the basic payment level, C (1.2C*, C*, and 0.8C*) and three variations in housing requirements (Minimum Standards, Minimum Rent Low (0.7C*), and Minimum Rent High (0.9C*)). The value of "b"--the rate at which the allowance is reduced as income increases--is 0.25 for each of these plans. The next two

plans have the same level of C (C*) and use the Minimum Standards Housing Requirement, but use different values of "b". In the tenth plan the value of "b" is 0.15, and in the eleventh plan, 0.35. Finally, the twelfth plan is unconstrained, that is, it has no housing requirement. This unconstrained plan allows a direct comparison with a general income-transfer program.

Eligible households that did not meet the housing requirement were still able to enroll. They received full payments whenever they met the requirements during the three years of the experiment. Even before meeting the housing requirements, such households received a cooperation payment of $10 per month as long as they completed all reporting and interview requirements.

Within the Housing Gap design, the average effects of changes in the allowance level or housing requirements can be estimated for all the major responses. In addition, interactions between the allowance level and the housing requirement can be assessed. Responses to variations in the allowance/income schedule (changes in "b") can be estimated for the basic combination of the Minimum Standards housing requirement and payments level of C*.

The Percent of Rent allowance plans consist of five variations in "a" (the proportion of rent paid to the household), as shown in Table I-1.[1] A demand function for housing is estimated primarily from the Percent of Rent observations. Demand functions describe the way in which the amount people will spend on housing is related to their income, the relative price of housing and other goods, and various demographic characteristics. Such functions may be used to simulate response to a variety of possible rent subsidy programs not directly tested within the Demand Experiment. Together with estimates of supply response, they may also be used to simulate the change in market prices and housing expenditures over time due to shifts in housing demand or costs.

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[1] Designation of multiple plans for the same "a" value reflects an early assignment convention and does not indicate that the households in these plans were treated differently for either payment purposes or analysis.

Table I-1
ALLOWANCE PLANS TESTED

HOUSING GAP* (P = C - bY, where C is a multiple of C*)

b VALUE	C LEVEL	HOUSING REQUIREMENTS			
		Minimum Standards	Minimum Rent Low = 0.7C*	Minimum Rent High = 0.9C*	No Requirement
b = 0.15	C*	Plan 10			
b = 0.25	1.2C*	Plan 1	Plan 4	Plan 7	
	C*	Plan 2	Plan 5	Plan 8	Plan 12
	0.8C*	Plan 3	Plan 6	Plan 9	
b = 0.35	C*	Plan 11			

Symbols: b = Rate at which the allowance decreases as the income increases.
C* = Basic payment level (varied by family size and also by site)

PERCENT OF RENT (P = aR) .

a = 0.6	a = 0.5	a = 0.4	a = 0.3	a = 0.2
Plan 13	Plans 14 - 16	Plans 17 - 19	Plans 20 - 22	Plan 23

CONTROL:

With Housing Information	Without Housing Information
Plan 24	Plan 25

Control Groups

In addition to the various allowance plans, control groups were necessary in order to establish a reference level for responses, since a number of uncontrolled factors could also induce changes in family behavior during the course of the experiment. Control households received a cooperation-payment of $10 per month. They reported the same information as families that received allowance payments, including household composition and income; they permitted housing evaluations; and they completed the Baseline Interview and the three Periodic Interviews. (Control families were paid an additional $25 fee for each Periodic Interview.)

Two control groups were used in the Demand Experiment. Members of one group (Plan 24) were offered a Housing Information Program when they joined the experiment and were paid $10 for each of five sessions attended. (This program was also offered to households enrolled in the experimental allowance plans but they were not paid for their attendance.) The other control group (Plan 25) was not offered the Housing Information Program.

All the households in the various allowance plans had to meet a basic income eligibility requirement. This limit was approximately the income level at which the household would receive no payment under the Housing Gap formula:

$$\text{Income Eligibility Limit} = \frac{C^*}{0.25}$$

In addition, households in plans with lower payment levels (Plans 3, 6, 9 and 11) had to have incomes low enough at enrollment to receive payment under these plans. Finally, only households with incomes in the lower third of the eligible population were eligible for enrollment in Plan 13, and only those in the upper two-thirds were eligible for Plan 23.

I.4 FINAL SAMPLE

Final analysis of the impact of the housing allowance will be based on the first two years of experimental data. Thus, the key sample size

Table I-2

SAMPLE SIZE AFTER TWO YEARS

HOUSING GAP: (P = C - bY, where C is a multiple of C*)

b VALUE	C LEVEL	HOUSING REQUIREMENTS			
		Minimum Standards	Minimum Rent Low = 0.7C*	Minimum Rent High = 0.9C*	No Requirement
b = 0.15	C*	Plan 10 PIT = 45 PHX = 36			
b = 0.25	1.2C*	Plan 1 PIT = 33 PHX = 30	Plan 4 PIT = 34 PHX = 24	Plan 7 PIT = 30 PHX = 30	
	C*	Plan 2 PIT = 42 PHX = 35	Plan 5 PIT = 50 PHX = 39	Plan 8 PIT = 44 PHX = 44	Plan 12 PIT = 63 PHX = 40
	0.8C*	Plan 3 PIT = 43 PHX = 39	Plan 6 PIT = 44 PHX = 35	Plan 9 PIT = 43 PHX = 35	
b = 0.35	C*	Plan 11 PIT = 41 PHX = 34			

Total Housing Gap 512 households in Pittsburgh, 421 households in Phoenix.

Symbols: b = Rate at which the allowance decreases as the income increases.
C* = Basic payment level (varied by family size and also by site)

PERCENT OF RENT (P = aR)

a = 0.6	a = 0.5	a = 0.4	a = 0.3	a = 0.2
Plan 13 PIT = 28 PHX = 21	Plans 14 - 16 PIT = 109 PHX = 81	Plans 17 - 19 PIT = 113 PHX = 66	Plans 20 - 22 PIT = 92 PHX = 84	Plan 23 PIT = 65 PHX = 46

Total Percent of Rent: 407 households in Pittsburgh, 298 households in Phoenix.

CONTROLS.

With Housing Information	Without Housing Information
Plan 24 PIT = 159 PHX = 137	Plan 25 PIT = 162 PHX = 145

Total Controls: 321 households in Pittsburgh, 282 households in Phoenix.

NOTE: This sample includes households that were active, although not necessarily receiving payments, after two years of enrollment. Households whose enrollment income was above the eligibility limits or that moved into subsidized housing or their own homes are excluded. While data on the excluded households may be useful for special analyses, particular analyses may also require the use of a still more restricted sample than the one shown here.

for this report and the other reports in this series is the number of households in the experiment at the end of the first two years. The two-year sample size is shown in Table I-2, and comprises households that were still active, in the sense that they were continuing to fulfill reporting requirements. The sample size for a particular analysis may be smaller. For example, analysis of the housing expenditures of movers uses only those households that moved during the first two years after enrollment.

APPENDIX II

SAMPLES AND DATA USED IN THE ANALYSIS

This appendix describes the samples and data used in this report. Section II.1 describes the samples used in most of the analyses. Section II.2 discusses the derivation of the analytic measures of the Minimum Standards and Minimum Rent requirements, and how these compare to those used in actual program operations. Section II.3 describes other major variables used in the analysis. Section II.4 indicates the data sources used for the variables defined in Section II.3. Finally, Section II.5 describes the development of the Minimum Standards physical and occupancy requirements.

II.1 SAMPLE DESCRIPTION

The standard sample for analysis consists of all enrolled households that remained active in the experiment for two years after enrollment, excluding households with enrollment incomes above the eligibility limits[1] and households living in their own homes or in subsidized housing at two years.[2]

Much of the analysis in Chapters 2 and 3 uses a subset of this sample: all households in the standard sample that at enrollment failed the derived Minimum Standards or Minimum Rent requirements.[3] For the Minimum Standards requirements, this sample comprises about 80 percent of the Minimum Standards and Control households included in the standard sample.[4] For Minimum Rent Low requirements, it comprises 38 percent of Pittsburgh and 55 percent of Phoenix Minimum Rent Low and Control households included in the standard sample. For Minimum Rent High requirements, it comprises 70 percent and 77 percent, respectively.[5]

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[1] See Section II.3 for documentation of income eligibility status at enrollment.

[2] See Table I-2 for the number of households in each treatment group and at each site.

[3] See Section II.2 for a discussion of the derived measures of passing or failing requirements.

[4] See Figure 2-1, Chapter 2.

[5] See Figure 3-1, Chapter 3.

II.2 ANALYTIC MEASURES OF PASSING THE MINIMUM STANDARDS OR MINIMUM RENT REQUIREMENTS

The analytic measures of passing the Minimum Standards or Minimum Requirements are the key variables used in this report. These measures closely approximate those used in actual program operations; modifications have been made, however, to allow Experimental/Control comparisons.

Analytically, passing Minimum Standards requirements is measured at three cross sections: enrollment, and at one year and two years after enrollment. Data collected on the Housing Evaluation Forms and on the Initial and monthly Household Report Forms are linked to these three points and are examined to determine whether a household passes the Minimum Standards physical and occupancy requirements. Passing Minimum Rent requirements is measured at four cross sections: enrollment, and at six months, one year, and two years after enrollment. Data collected on the Initial and monthly Household Report Forms are used to derive program rent, which is compared to the required Minimum Rent level.

These analytic measures simulate actual program operations as much as possible. Operationally, once a household passed requirements in a unit, it qualified for payments as long as it remained in that unit. The two-year outcome measures derived for this report (indicating whether a household passed or failed requirements at two years after enrollment, and whether it moved or stayed in the enrollment unit) indicates whether the household ever passed the requirements in the two-year unit, based on data at the cross sections.

During actual program operations monthly data were used to determine whether requirements were met. However, the analytic measures use only the cross sections where comparable data are available for Control

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[1] Although Control households were not under the Minimum Rent requirement, Minimum Rent High and Low level have been calculated for them, based on their household size. All Control households are used in both the Minimum Rent High and Minimum Rent Low analysis.

households.[1,2] For example, actual program operations allowed a Minimum Standards household that had repaired its unit to call the site office in any month during its participation and request that an Upgrade Housing Evaluation be performed to determine whether the unit passed the Minimum Standards. To permit valid comparison of Minimum Standards and Control households, the presence of an Upgrade Evaluation is not a criterion upon which the analytic measure is defined.[3] The analytic measures do not take account of Minimum Standards or Minimum Rent households that passed requirements in months between the cross sections but not at any of the cross sections. In fact, the measures very closely approximate actual program records. Tables II-1 to II-3 compare these measures for the sample of households used in most of the analysis. As shown in Table II-1, 251 of the 263 Minimum Rent Low and High households, or 95 percent, have identical outcomes using the analytic and operational definitions. All of the households analytically defined as passing Minimum Rent Low or High in place were also treated as passing in actual program operations.

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[1]Household Report Form data were collected monthly for all Control households as for Experimental households. However, these data are very costly to access. Therefore, only cross-sectional data are used. As discussed below, use of cross-sectional data does not cause the analytic measures to differ greatly from actual program outcomes.

[2]The six month cross section is omitted in the analytic measure of passing Minimum Standards, since the Housing Evaluations linked to this point are not necessarily comparable for Minimum Standards and Control households. The Housing Evaluation linked to this point is defined as the "most current" evaluation on record. For Control households, the most current evaluation is usually the initial evaluation. For Minimum Standards households, the most current evaluation is either the initial evaluation or an evaluation completed for an upgrade or move that occurred after enrollment. This does not effect the derived outcomes: only one Minimum Standards household upgraded at the six month cross section and at no other time.

[3]For Minimum Standards households, the presence of Upgrade Housing Evaluations and data from the six-month cross section are used in some other reports which include these in analytic measures of passing Minimum Standards requirements.

Table II-1

COMPARISON OF ANALYTIC AND OPERATIONAL
MEASURES OF MEETING MINIMUM RENT AT TWO YEARS

OPERATIONAL MEASURE	ANALYTIC MEASURE: STAYED AND PASSED	STAYED AND FAILED	MOVED AND PASSED	MOVED AND FAILED
	MINIMUM RENT LOW			
Households eligible for full payments--have passed requirements	16	1[a]	39	1[c]
Households not eligible for full payments--have never passed requirements	0	29	3[b]	8
SAMPLE SIZE	(16)	(30)	(42)	(9)
	MINIMUM RENT HIGH			
Households eligible for full payments--have passed requirements	10	3[d]	49	4[e]
Households not eligible for payments--have never passed requirements	0	70	0	30
SAMPLE SIZE	(10)	(73)	(49)	(34)

SAMPLE: Minimum Rent households active at two years after enrollment that failed the Minimum Rent requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCE: Initial and monthly Household Report Forms.

a. This household passed requirements only at month between the cross sections.

b. Two of these households were mistakenly regarded as passing requirements (due to an administrative error). The remaining discrepancy is due to differences in data bases.

c. and d. The causes for these discrepancies are due to differences in data bases.

e. One of these households passed requirements only at months between the cross sections. The causes for the remaining households are due to differences in data bases.

For Minimum Standards households, the analytic measure and program records are identical for 268 out of 289 households, or 93 percent, as shown in Table II-2. Of the 37 households defined analytically as upgraders, 34 were treated as passing requirements in actual program operations.

Table II-3 contains a comparison of the analytic definition of upgrading to the actual incidence of Upgrade Housing Evaluations; 23 percent of the 37 households defined as upgraders called the site office and had an Upgrade Housing Evaluation performed on their unit. These households by definition also passed Minimum Standards at a cross section. The remaining 14 households passed the requirements and never requested an Upgrade Evaluation. Six of the households that requested an Upgrade Evaluation never passed requirements at a cross section. For households that moved it is not possible to directly compare the analytic definition and the occurrence of an Upgrade Evaluation, since the Upgrade Evaluation did not necessarily occur in the two year unit, on which the analytic definition is based.

II.3 MAJOR VARIABLES

Key variables in this report include rent, program variables, household characteristics, and measures of housing. Definitions of the variables are discussed below.

Rent

Rent is broadly defined as the monthly cost of an unfurnished dwelling unit including basic utilities. Two variations of rent are used in this report: program rent (used in determining whether Minimum Rent requirements are met and in calculating payments) and analytic rent. Operationally, program rent is designed to use only information that is easily measured and documented. Analytic rent is designed to measure the overall cost to a household occupying a given dwelling unit, and involves more detailed information.

For both definitions two basic adjustments are made to monthly contract rent so that derived rent values are equivalent across households: The addition of the estimated additional cost of utilities and the deduction of the estimated cost of furnishings provided with the unit. (These

Table II-2

COMPARISON OF ANALYTIC AND OPERATIONAL
MEASURES OF MEETING MINIMUM STANDARDS AT TWO YEARS

OPERATIONAL MEASURE	ANALYTIC MEASURE			
	STAYED AND PASSED	STAYED AND FAILED	MOVED AND PASSED	MOVED AND FAILED
Households eligible for full payments--have passed requirements	34	6[b]	65	11[d]
Households not eligible for full payments--have never passed requirements	3[a]	102	1[c]	67
SAMPLE SIZE	(37)	(108)	(66)	(78)

SAMPLE: Minimum Standards households active at two years after enrollment that failed the Minimum Standards requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms, Housing Evaluation Forms, and payments file.

a. and c. Discrepancies in these cases were due to the linking of data at the cross sections. In the month designated as the cross section, the household failed Minimum Standards. However, the Annual Housing Evaluation that was completed after that month and was later matched to that month indicated that the household had passed the requirements. (All of these households later were eligible for full payments, after the completion of the Housing Evaluation.)

b. Of these cases, four households passed requirements only at months between the cross sections, and two households were mistakenly regarded as passing requirements (due to an administrative error).

d. Of these cases, nine households passed requirements only at months between the cross sections, and one households was mistakenly regarded as passing requirements (due to an administrative error). The cause for the one remaining discrepancy is due to differences in data bases.

Table II-3

COMPARISON OF ANALYTIC DEFINITIONS OF UPGRADING TO HOUSEHOLDS FOR WHICH UPGRADE HOUSING EVALUATIONS WERE PERFORMED

PROGRAM OPERATIONS	ANALYTIC DEFINITION			
	UPGRADED	STAYED AND FAILED	MOVED AND PASSED	MOVED AND FAILED
Upgrade Housing Evaluation performed	23	6	26	9
No Upgrade Housing Evaluation performed	14	102	40	69
SAMPLE SIZE	(37)	(108)	(66)	(78)

SAMPLE: Minimum Standards households active at two years after enrollment that failed the Minimum Standards requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms and Housing Evaluation Forms.

adjustments are summarized below.) Analytic rent also includes additional adjustments, adding to monthly rent the reported rent reductions granted because a household works for or is related to the landlord.

Utilities adjustments. Adjustments are made via site-specific tables for electricity, gas, heat, water, and trash collection if these are not included in contract rent. No adjustment is made for any other utilities or services, such as parking. The estimated cost of utilities is based on dwelling unit size (analytic rent) or household size (program rent). The utility adjustment schedules were updated in February, 1975, to reflect increases due to inflation. The original and revised schedules are contained in Table II-4.

Furnishings adjustments. For furnished units, a deduction for the cost of furnishings is made. For analytic rent, an adjustment is made equal to 11.5 percent of monthly contract rent adjusted for utilities. For program rent, the value of monthly contract rent adjusted for utilities was reduced by an amount dependent on the number of furnished rooms and the rent (see Table II-5) prior to February, 1975; thereafter, it was reduced by 13 percent.

Additional adjustments. Amounts by which contract rent is reduced by landlord because the household works in lieu of rent or is related to the landlord are added to contract rent.

Missing rent data. If reported contract rent is zero, the analytic rent variable is missing. (For program rent, if reported contract rent is zero, the cost of utilities is added to zero.) External program rent or analytic rent values greater than $400 are recoded to missing values.

Income

The income variable used in this report is annual net analytic income, a measure of disposable household income. Net analytic income approximates the number of dollars available to a household for consumption, summing the income received by all household members age 18 or over net of taxes and alimony paid. This differs from the census definition of income (gross income) and the program definition of income used to determine eligibility and calculate payments. A comparison of analytic, census, and program definitions of income is contained in Table II-6. (In the equations in Chapters 2 and 3, income is measured in thousands of dollars.)

Table II-4

UTILITY COST TABLES

(Dollar increment to contract rent per reported utility by size of dwelling unit)

	ORIGINAL SCHEDULES[a]					REVISED SCHEDULES[b]				
NUMBER OF ROOMS IN DWELLING UNIT[c] (Analysis Definition)	1,2	3	4	5	6+	1,2	3	4	5	6+
NUMBER OF HOUSEHOLD MEMBERS (Payments Definition)	1	2	3,4	5,6	7+	1	2	3,4	5,6	7+
PITTSBURGH										
Electricity	$ 5	6	7	9	11	$ 5	9	10	12	14
Gas	2	2	3	3	4	2	3	3	4	5
Heating Fuel	10	12	15	18	20	10	15	18	21	23
Garbage Collection	3	3	3	3	3	3	3	3	3	3
Water	3	4	6	7	8	3	4	6	7	8
PHOENIX										
Electricity	$ 11	16	20	24	29	$ 13	18	23	28	33
Gas	5	6	7	11	15	6	7	8	12	17
Heating Fuel	0	0	0	0	0	0	0	0	0	0
Garbage Collection	3	3	3	3	3	3	3	3	3	3
Water	4	4	5	6	9	4	4	5	6	9

SOURCE: Local service and utility companies and public officials.

NOTE: All refrigeration and air-conditioning costs are reflected in the tables entries for electricity and gas.

a. Effective through month of January 1975; used to determine enrollment rent.

b. Effective from February 1975 forward; used to determine rent at two years.

c. Number of rooms is defined as number of rooms useable as living space (excluding bathrooms, half-rooms, unfinished basements or attics).

Table II-5

COST OF FURNISHINGS SCHEDULES USED IN DERIVING PAYMENTS RENT

NUMBER OF FURNISHED ROOMS	PITTSBURGH		PHOENIX	
	GROSS RENT	DOLLAR AMOUNT OF REDUCTION	GROSS RENT	DOLLAR AMOUNT OF REDUCTION
1	up to $95	$12	up to $111	$12
	$96 or more	15	$112 or more	15
2	up to $119	24	up to $147	24
	$120 or more	30	$148 or more	30
3	up to $147	36	up to $175	32
	$148 or more	45	$176 or more	40
4	up to $171	48	up to $219	44
	$172 or more	60	$220 or more	55
5+	up to $211	60	up to $267	56
	$212 or more	75	$268 or more	70

NOTE: Gross rent equals reported monthly contract rent plus estimated additional cost of utilities.

Table II-6

COMPONENTS INCLUDED IN THE DEFINITION OF NET INCOME FOR ANALYSIS AND COMPARISON WITH CENSUS AND PROGRAM ELIGIBILITY DEFINITIONS

COMPONENTS	NET INCOME FOR ELIGIBILITY	NET INCOME FOR ANALYSIS	CENSUS (GROSS INCOME)
I GROSS INCOME			
A. Earned Income			
1 Wages and Salaries	X	X	X
2. Net Business Income	X	X	X
B Income-Conditioned Transfers			
1 Aid for Dependent Children	X	X	X
2. General Assistance	X	X	X
3 Other Welfare	X	X	X
4. Food Stamps Subsidy	-	X*	-
C. Other Transfers			
1 Supplemental Security Income (Old Age Assistance, Aid to the Blind, Aid to the Disabled)	X	X	X
2. Social Security	X	X	X
3 Unemployment Compensation	X	X	X
4. Workmen's Compensation	X	X	X
5. Government Pensions	X	X	X
6. Private Pensions	X	X	X
7 Veterans Pensions	X	X	X
D Other Income			
1. Education Grants	X	X	X
2 Regular Cash Payments	X	X	X
3 Other Regular Income	X	X	X
4. Alimony Received	X	X	X
5 Asset Income	X*	X*	X*
6. Income from Roomers and Boarders	-	-	X
II. GROSS EXPENSES			
A. Taxes			
1. Federal Tax Withheld	X*	X*	-
2. State Tax Withheld	X*	X*	-
3. FICA Tax Withheld	X*	X*	-
B. Work-Conditioned Expenses			
1. Child Care Expenses	X	-	-
2. Care of Sick at Home	X	-	-
3. Work Related Expenses	X*	-	-
C. Other Expenses			
1 Alimony Paid Out	X	X	-
2. Major Medical Expenses	X	-	-

*The amounts of these income and expense items are derived using data reported by the household All other amounts are included in the income variables exactly as reported by the household.

Program Variables

Income eligibility status at enrollment. The value of this variable indicates whether the household was enrolled within the income eligibility limits for its assigned treatment group (Experimental households) or within the modal eligibility limit (Control households). For most of the enrollment period, an Experimental household was not allowed to enroll unless its reported income was completely verified and a net income for eligibility was calculated as being within the eligibility limit for the household's treatment group (See Table II-7 for the site- and household size-specific tables used for eligibility limits). Toward the end of the enrollment period, however, some households were enrolled on the basis of reported income. If a household's income was later verified as over the eligibility limits, the household was regarded as overincome. Control households were coded as overincome if their income exceeded the modal eligibility limits (even though the actual limits applied to them during enrollment were higher). This variable therefore identified higher-income households that might cause a bias in the initial income distribution of enrolled households.

Data were collected in several ways. Experimental households that were verified as overincome were identified by the site offices. Control households with incomes above modal eligibility limits were identified from Household Event List data.[1]

Minimum Standards physical and occupancy requirements. The values of these variables indicate whether the Minimum Standards physical and occupancy requirements have been met. See Section II.5 for a discussion of these requirements.

Minimum Rent requirements. Minimum Rent requirements were based on the estimated cost of modest, existing standard housing (C^*), which varied by household size and site. The C^* values were developed by a panel of experts at each site as estimates of the rent for standard dwelling units with a specified number of bedrooms. These estimates are related to household size by adopting the standard that there should be no more than

[1] The Household Events List was the data source used to track households through the stages of enrollment.

Table II-7

INCOME ELIGIBILITY LIMITS AT ENROLLMENT

DESIGN POINT	HOUSEHOLD SIZE 1	2	3,4	5,6	7+
			PITTSBURGH		
Modal Income Eligibility Limits[a]	$5,050	$5,800	$6,750	$7,700	$9,150
TG 3,6,9	4,050	4,650	5,400	6,150	7,300
TG 11	3,750	4,250	4,950	5,650	6,650
TG 13	3,002	3,600	4,537	5,060	5,257
TG 24, 25[b]	12,500	12,500	12,500	12,500	12,500
			PHOENIX		
Modal Income Eligibility Limits[a]	$6,000	$7,450	$8,650	$10,600	$12,750
TG 3,6,9	4,800	5,950	6,950	8,450	10,200
TG 11	4,450	5,450	6,350	7,700	9,250
TG 13	2,700	4,100	4,500	4,700	5,400
TG 24, 25[b]	15,500	15,500	15,500	15,500	15,000

NOTE: TG = assigned treatment group. Indicated amounts are $500 greater than formal eligibility limits. A $500 margin of error is allowed. Only households with incomes more than $500 above the formal limits are considered to be overincome.

a. The following treatment groups are assessed in relation to these figures: TG = 1, 2, 4, 5, 7, 8, 10, 12, 14-23. Refer to the summary experimental design in Appendix I for identication of these groups.

b. These amounts were used as criteria in the actual enrollment process. Note, however, that households in these treatment groups are considered to be overincome for this income eligibility status at enrollment if their income is greater than the Modal Income Eligibility Limits.

two household members per bedroom. The estimates are given in Table II-8. In order to be eligible for a housing allowance, Minimum Rent Low households were required to live in units whose rents were at least 0.7 C*; Minimum Rent High households were required to live in units whose rents were at least 0.90 C*.[1]

Distance from meeting Minimum Rent. Distance is defined as the household's assigned Minimum Rent level (see above) minus the actual (program) rent paid.

Distance from meeting Minimum Rent as a percent of the allowance payment. This variable is defined as distance divided by the housing allowance the household would receive once the Minimum Rent requirements were met.

Household Characteristics

Female head of household. (A dummy variable, equal to one if the head of household is female, zero if head is male). The census convention was used to determine the head of household: unless the household has a single female head, it is classified as having a male head. To establish the census head of household, the sex and relationship of each household member to the designated head were checked. If the designated head was female and a male spouse was present, the census head of household was considered male.

Age of head of household. Age is derived from date of birth information for the individual identified as the census head of household.

Elderly household. A dummy variable, equal to one if the age of the census head of household is greater than 61 years and zero if the age is 61 years or less.

Education of head of household. Education of head of household is derived from data reported by the individual identified as the census head of household. The variable is a continuous measure, indicating the highest level of education attained by the census head. Years of education beyond high school (i.e., greater than 12) refer exclusively to college credit received by individuals with a high school diploma. Vocational or business school training are not counted.

[1] See Appendix I for further discussion of the design of the Demand Experiment.

Table II-8

ESTIMATED COST OF STANDARD HOUSING (C*)

SITES	HOUSEHOLD SIZE									
	ORIGINAL VALUES					REVISED VALUES[a]				
	1	2	3,4	5,6	7+	1	2	3,4	5,6	7+
Pittsburgh	$105	$120	$140	$160	$190	$115	$130	$150	$170	$205
Phoenix	$125	$155	$180	$220	$265	$135	$165	$190	$235	$280

a. In February 1975 the C* values were increased to reflect increases due to inflation.

Black of Spanish household. Dummy variables, equal to one if household is black or Spanish, and zero if not. Race of the household is based on interviewer observations of the main respondent to the Baseline Interview. The observations were modified according to census conventions: a household was designated as Spanish American based on surname.

Household size. This variable simulates the Census definition of household size, counting all members of the household, including roomers and boarders. It is used in determining whether a household meets the occupancy requirement of Minimum Standards.

Number of moves in the previous three years. The number of moves in the previous three years is taken directly from the Baseline Interview, Question 83:

> How many times have you yourself moved in the last three years--since (MONTH) 1970?

Household Attitudes and Preferences

Unit and neighborhood satisfaction. Separate responses to two questions on the Baseline Interview were added to form an index of overall satisfaction:

The first two questions asked during the Baseline Interview were:

1. In general, how satisfied or dissatisfied are you with this neighborhood as a place to live--would you say: very satisfied, somewhat satisfied, somewhat dissatisfied, or very dissatisfied?

2. In general, how satisfied are you with the (house/apartment) you now live in--would you say very satisfied, somewhat satisfied, somewhat dissatisfied, or very dissatisfied?

Respondents answers were recorded from 4 to 1 (4 indicating very satisfied, 1 indicating very dissatisfied) and the two responses were added together.

Expressed preference. During the Baseline Interview, households were asked to indicate their preferences for moving or remaining in their current unit, assuming that they had additional money to spend on rent (at the time of the Baseline Interview, households were unaware that they were being considered for the Housing Allowance Program; their responses to this question provide an indication of their future behavior if they received a housing allowance):

(Baseline Question 77) If you had $50 more to spend on rent every month, would you move from (house/apartment) or have the landlord improve this (house/apartment) for a higher rent?

The verbatim response was recorded and coded into the following categories:

Move from this unit

Have landlord improve this unit

Would continue to rent this unit, no improvements necessary

Would try to buy this unit

Other.

These responses were then grouped into preferences for moving, for staying in the unit, or other.

Housing Characteristics

Housing services index. The index is a summary measure of housing based on a hedonic model of housing. Hedonic indices relate to rent to measures of housing characteristics, attempting to sort out the influence of quality and non-quality factors (such as inflation, tenure conditions or racial discrimination). The housing services index is a continuous variable, indicating the estimated total value of quality factors present in a dwelling unit. A separate index has been developed for each site.[1]

Quality per room. Quality per room is derived by dividing the housing services index by the total number of rooms in the dwelling unit (including bathrooms, half-rooms, unfinished basements, or attics).

Hedonic residual. The hedonic residual provides a comparison of actual rent to the value of the unit estimated in linear and semilog hedonic questions. It is defined as actual rent minus predicted rent. Households with extreme differences between actual and predicted rents are excluded from analyses involving the housing services index and the residuals.

---

[1] See Merrill (1977).

[2] See Merrill (1977), Kennedy and Merrill (1979) and Friedman and Weinberg (1979) for a discussion of hedonic equations and the interpretation of hedonic residuals.

Overall evaluator rating. At the end of each housing evaluation, the housing evaluator was instructed to rate the physical condition of the unit and immediate surroundings on the following scale:

0 = good condition; only ordinary maintenance needed

1 = basically sound; some minor repairs needed

2 = basically sound; some major repairs/renovation needed

3 = unsound, hazardous, or unfit for human habitation

This rating was recorded on the Housing Evaluation Form.

Housing deprivation measure. The housing deprivation measure was derived from a number of items contained in the Minimum Standards components and additional items from the Housing Evaluation Form. The measure divides housing attributes into four basic groups: structure and surface conditions, safety hazards, basic housing services (such as plumbing, kitchen facilities, heating and electrical services) and other attributes (such as adequate light and ventilation and the condition of windows).[1] A unit is rated on a 3-point scale:

1 = minimally adequate

2 = ambiguous--unit could either be minimally adequate or clearly inadequate, depending on interpretation of an "adequate" unit

3 = clearly inadequate.

Number of physical Minimum Standards components failed. The measure counts the number of physical components failed. Its values range from 0 to 15.

Persons per room. Persons per room is defined as the number of census household members (including roomers) per room usable as living space (i.e., excluding all bathrooms and storage rooms with floor areas less than or equal to 70 square feet).

Persons per adequate bedroom. Persons per adequate bedroom is defined as the number of census household members (including roomers) per adequate

[1] See Budding (1978) for a complete discussion of the measure.

bedroom. An adequate bedroom is a room which can be completely closed off from other rooms and which passes Minimum Standards requirements regarding structural and surface characteristics of the floor and walls, electrical equipment, light and ventilation, and ceiling height. If there are no adequate bedrooms present, or if the number of census household members is unknown, the variable is treated as missing. If the number of persons per adequate bedroom is greater than two, or if there are no adequate bedrooms present, the household fails the Minimum Standards occupancy requirement.

Reported Improvements Data

Improvements made by households. During each Periodic Interview, households were given a list of improvements and asked if they had participated in any of them:

> Here is a list of improvements people sometimes make to their houses and apartments. In the last (6 months/ 12 months), that is since _____, have you or anyone in your household made or paid to have made, any of these improvements? Please count only those improvements where you paid some or all of the costs or did some or all of the work.[1]

The types of improvements are listed below. The number of improvements cited by households was summed over the three interviews to produce a total number of improvement actions that occurred over two years. (e.g., a household performing the same type of improvement at two different times is counted as having made two improvements.)

Improvements made by landlords. During each Periodic Interview, households were asked whether the landlord had made improvements:

> Did the landlord actually make any repairs or improvements to this place in the last (6 months/12 months), that is, since _____, whether or not you talked to him about it?[2]

---

[1] First Periodic, Question 126; Second Periodic, Question 128; Third Periodic, Question 161.

[2] First Periodic, Question 122, Second Periodic, Question 123; Third Periodic, Question 156.

Households responding affirmatively were given a list of improvements (identical to those listed for household improvements) and were asked to point out the improvements that the landlord made (see below for the specific types of improvements). The number of improvements cited was summed in the same manner as for household improvements, to produce a total number of improvement actions made by the landlord during two years.

Total improvements. Total improvements indicate the total number of improvement actions that occurred over two years. The total number of landlord and household improvements are summed. The variable does not differentiate between single actions and those carried out jointly by the household and landlord. (It was impossible to determine whether households and landlords that performed the same type of improvement worked jointly on one improvement or worked separately on two improvements of the same type.)

Cost to the household. As they listed the improvements they had participated in, households were asked how much they had spent on each improvement. The costs were then summed and a total figure was recorded on the interview. The totals were summed across the three interviews to produce a total cost to the household of improvements over two years. Total costs greater than $3,000 were treated as extreme cases and omitted from the analysis (there were two such cases in the sample used in this report).

As noted in Chapter 4, the cost data provide a general indication of the dollar cost to the household. However, they cannot be directly linked to specific improvements or used as an indicator of the value of those improvements, since individual improvement costs, landlord costs, in-kind transfers of labor, and improvements in lieu of rent are not detailed.

Type of improvements. The types were listed identically for household and landlord improvements:

> General remodeling, such as adding or remodeling rooms or lowering ceilings
>
> Work on floors or floor covering, such as sanding, refinishing, installing new tiles, or installing new carpeting
>
> Electrical work, such as installing new outlets
>
> Installing new plumbing or heating fixtures
>
> Additions to or replacement of the heating or air conditioning systems

Interior or exterior carpentry work such as shelves, closets, cabinets, room dividers, planing doors, patching walls or woodwork

Planting a garden or trees

General fixing and repairing things, such as faucets, electrical outlets, wall switches, or broken windows

Interior painting or papering

Exterior painting

Plastering interior walls, ceilings

Modernizing bath or kitchen facilities

Additions of major new kitchen appliances like stoves and refrigerators

Other improvements to the dwelling unit or grounds.

II.4 DATA SOURCES

Table II-9 indicates the data sources used for each variable defined in Section II.1. Major data sources are described below.

Initial Household Report Form

All households were required to fill in these forms prior to enrollment, generally during the enrollment interview. Initial Household Report Forms were completed between April 1973 and February 1974. Detailed information was collected on each household's composition, housing expenditures (e.g., rent, utilities, furnishings) and asset holdings (e.g., savings bonds, stocks) as of the time of the interview. Income data were collected for each of the previous 12 months for each type of income (e.g., wages, Social Security, welfare) for each household member 18 years of age or over. Household expenses (e.g., alimony, child care, medical) were also collected for the 12 most current months. The data were used to determine whether initial eligibility requirements were met, and to derive annual net analytic and eligibility incomes.

Monthly Household Report Forms

After households were enrolled, they were required to complete monthly Household Report Forms which collected detailed information on the

Table II-9

DATA SOURCES

VARIABLE	DATA SOURCE
RENT	Initial and monthly Household Report Forms, Baseline and Periodic Interviews
INCOME	Initial and monthly Household Report Forms, Special Supplement
PROGRAM STANDARDS	
Income eligibility status at enrollment	Initial Household Report Form, Household Events List
Minimum Standards physical requirements	Housing Evaluation Forms
Minimum Standards occupancy requirements	Initial and monthly Household Report Forms, Housing Evaluation Forms
Minimum Rent requirements	Initial and monthly Household Report Forms
Distance from meeting Minimum Rent	Initial and monthly Household Report Forms
Distance from meeting Minimum Rent as a percentage of the allowance payment	Initial and monthly Household Report Forms
HOUSEHOLD CHARACTERISTICS	
Female head of household	Initial and monthly Household Report Forms
Age of head of household	Initial and monthly Household Report Forms
Elderly household	Initial and monthly Household Report Forms
Education of head of household	Baseline and Periodic Interviews
Spanish household	Baseline Interviews
Black household	Baseline Interviews
Household size	Initial and monthly Household Report Forms
Number of moves in previous three years	Baseline Interviews
HOUSEHOLD ATTITUDES AND PREFERENCES	
Unit and neighborhood satisfaction	Baseline Interviews
Expressed preference	Baseline Interviews
HOUSING CHARACTERISTICS	
Housing services index	Housing Evaluation Forms, Baseline and Periodic Interviews, Census data
Quality per room	Housing Evaluation Forms, Baseline and Periodic Interviews, Census data
Hedonic residual	Housing Evaluation Forms, Baseline and Periodic Interviews, Census data
Overall evaluator rating	Housing Evaluation Forms
Housing deprivation measure	Housing Evaluation Forms
Number of physical Minimum Standards components failed	Housing Evaluation Forms
Persons per room	Initial and monthly Household Report Forms, Housing Evaluation Forms
Persons per adequate bedroom	Initial and monthly Household Report Forms, Housing Evaluation Forms
REPORTED IMPROVEMENTS DATA	
Improvements made by households	Periodic Interviews
Improvements made by landlords	Periodic Interviews
Cost to the household	Periodic Interviews
Type of improvements	Periodic Interviews

household's composition, expenditures, rent, and income for the previous month. The information was similar to that collected on the Initial Household Report Form and was used to determine the household's monthly payment and to derive annual net analytic and eligibility incomes during the household's participation. In addition, the information was used to deter-determine whether Minimum Rent households met requirements and whether Minimum Standards households passed the occupancy requirement.

Baseline Interview

Baseline Interviews[1] were administered to all households before offers to enroll in the program occurred, and were completed between March 1973 and January 1974. Data were collected in the following general categories: housing expenditures and consumption; location and housing search; neighborhood and housing preferences and satisfaction; maintenance and upgrading; household composition; household assets, income, and expenses; and participation in other government programs. The interviews provided measures of the household's position prior to the experiment.

Periodic Interviews

Periodic Interviews were administered to all enrolled households at approximately six months, one year, and two years after enrollment. Data were collected on a number of subjects included in the Baseline Interview, such as: housing expenditures and consumption; location and housing search; preferences and satisfaction; maintenance and upgrading; and participation in other government programs.

Housing Evaluation Form

The Housing Evaluation Form was used to record information obtained during a housing evaluation. Each evaluation took an average of over one hour to perform and was conducted by a trained housing evaluator who recorded data on the Housing Evaluation Form. Data were collected evaluating the interior and exterior of the unit, measuring the condition of basic housing systems

[1]This interview, as well as the First, Second, and Third Periodic Interviews, was designed by Abt Associates Inc. and administered in the field by the National Opinion Research Center.

(such as plumbing and electricity) and the presence of health and safety hazards.

Housing Evaluation Forms were administered for all households at enrollment and at least annually thereafter, and whenever a household moved. In addition, for Minimum Standards households, housing evaluations were scheduled whenever an upgrade was reported and whenever a move was planned.

II.5 MINIMUM STANDARDS PHYSICAL AND OCCUPANCY REQUIREMENTS

This section describes the physical and occupancy requirements used in Minimum Standards.[1] The derivation of the physical Minimum Standards requirements is first discussed, with special attention to its relationship to the American Public Health Association (APHA) code. Next, the various components of the Minimum Standards requirements including both physical requirements of the dwelling unit and occupancy requirements are described.

There being no specific, generally accepted definition of standard housing, the program definition of minimum standards, which includes housing and occupancy standards, was not predetermined and thus had to be developed. The American Public Health Association-Public Health Service (APHA-PHA) Recommended Housing Maintenance and Occupancy Ordinance (revised 1971) code and the Urban Institute's modification of it[2] served as the basic model for defining the standards. Table II-10 shows the relationship between this model and the program standards. The table compares the elements of the APHA code, the Urban Institute's modification, and the Minimum Standards requirement. An element is indicated as comparable if the general meaning is similar, even though it may not be treated identically by all three.

A list of the 15 physical Minimum Standards components is contained in Table II-11. The occupancy requirement is separate from the physical requirements listed in the table. However, the requirements for light-ventilation, ceiling height, and electrical service are applied to bed rooms in determining the number of adequate bedrooms for the program occupancy requirement as explained below.

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[1] The Minimum Rent requirements are summarizes in Section II.3.

[2] Urban Institute Working Paper No. 205-8, April 28, 1972.

Table II-10

POTENTIAL ELEMENTS FOR HOUSING STANDARDS

	APHA[1] CODE	APHA/CODE MODIFIED BY UI[2]	MINIMUM STANDARDS PROGRAM DEFINITION
OCCUPANCY			
Space per Occupant			
Total space	X	X	(3)
Max # persons per room or per bedroom	X	X	X
INTERIOR STRUCTURE			
Closet space	X	X	(1)
Exits	X	X	X[3]
Walls and Ceilings	X	X	X
Ceiling Height	X	X	X
Floors	X	X	X
Stairways	X	X	(1)
Ext. doors, skylights	X	X	(4)
Windows	X	X	Included under Ventilation
HEATING, ELECTRICITY, VENTILATION			
Electrical outlets	X	X	X
Heating	X	X	X
Venting (of heating)	X	X	X
Ventilation (windows)	X	X	X
OTHER STRUCTURAL REQUIREMENTS			
Handrails	X	X	(1)
Rat proofing	X	X	(3)
Screens on low windows	X		(3) (1)
Rat proofing, ext. doors, openings	X		(3)
Concrete basement floor	X		(3)
Rat proof basement walls	X		(3)
OUTSIDE CONDITIONS			
Trash and refuse	X	X	(1)

Key

Reasons for not including element in Minimum Standards Program Definition:

(1) Too stringent
(2) Too infrequent
(3) Too complicated or time consuming to evaluate
(4) Subsumed by other measure

1. American Public Health Association
2. Urban Institute
3. Removed as requirement effective November, 1973.

Table II-10 (continued)

	APHA[1] CODE	APHA/CODE MODIFIED BY UI[2]	MINIMUM STANDARDS PROGRAM DEFINITION
EXTERIOR			
Fences	X		(2)
Accessory structures	X		(2)
Foundation	X		(3)
Roof structure	X		X
Stairs/Porches	X		(1)
Plumbing & Installation	X		Plumbing facilities rated instead of installation
Chimneys and flues	X		(1)
Fire proof const. (local ordinance)	X		(3)
Wall structure			X
Wall surfaces			X
KITCHEN			
Stove	X	X	X
Refrigerator	X	X	X
Sink w/hot & cold water	X	X	X[3]
Counter & Cabinets	X	X	(1)
Complete kitchen facilities			X
Ceiling or wall-type light fixture	X		X
BATHROOM			
Flush toilet	X	X	X
Bathroom sink	X	X	X
Shower/tub	X	X	X
Ventilation	X	X	X
Bathroom door	X	X	(4)
Drug storage facility	X	X	(1)
Ceiling or wall-type light fixture	X	X	X

Key

Reasons for not including element in Minimum Standards Program Definition:

(1) Too stringent
(2) Too infrequent
(3) Too complicated or time consuming to evaluate
(4) Subsumed by other measure

1. American Public Health Association
2. Urban Institute
3. Removed as requirement effective November, 1973.

Table II-11

COMPONENTS OF MINIMUM STANDARDS
(Program Definition)

1 COMPLETE PLUMBING

Private toilet facilities, a shower or tub with hot and cold running water, and a washbasin with hot and cold running water will be present and in working condition.

2. COMPLETE KITCHEN FACILITIES

A cooking stove or range, refrigerator, and kitchen sink with hot and cold running water will be present and in working condition.

3. LIVING ROOM, BATHROOM, KITCHEN PRESENCE

A living room, bathroom, and kitchen will be present. (This represents the dwelling unit "core," which corresponds to an efficiency unit.)

4. LIGHT FIXTURES

A ceiling or wall-type fixture will be present and working in the bathroom and kitchen.

5 ELECTRICAL

At least one electric outlet will be present and operable in both the living room and kitchen. A working wall switch, pull-chain light switch, or additional electrical outlet will be present in the living room.[a]

6 HEATING EQUIPMENT

Units with no heating equipment, with unvented room heaters which burn gas, oil, or kerosene, or which are heated mainly with portable electric room heaters will be unacceptable.

7. ADEQUATE EXITS

There will be at least two exits from the dwelling unit leading to safe and open space at ground level (for multifamily building only) Effective November, 1973 (retroactive to program inception) this requirement was modified to permit override on case-by-case basis where it appears that fire safety is met despite lack of a second exit.

8. ROOM STRUCTURE

Ceiling structure or wall structure for all rooms must not be in condition requiring replacement (such as severe buckling or leaning).

9 ROOM SURFACE

Ceiling surface or wall surface for all rooms must not be in condition requiring replacement such as surface material that is loose, containing large holes, or severely damaged).

10 CEILING HEIGHT

Living room, bathroom, and kitchen ceilings must be 7 feet (or higher) in at least one-half of the room area.[a]

11. FLOOR STRUCTURE

Floor structure for all rooms must not be in condition requiring replacement (such as large holes or missing parts).

12 FLOOR SURFACE

Floor surface for all rooms must not be in condition requiring replacement (such as large holes or missing parts)

13 ROOF STRUCTURE

The roof structure must be firm

14 EXTERIOR WALLS

The exterior wall structure or exterior wall surface must not need replacement. (For structure this would include such conditions as severe leaning, buckling, or sagging, and for surface conditions such as excessive cracks or holes)

15. LIGHT/VENTILATION

The unit will have a 10 percent ratio of window area to floor area and at least one openable window in the living room, bathroom, and kitchen or the equivalent in the case of properly vented kitchens and/or bathrooms.[a]

a. This housing standard is applied to bedrooms in determining the number of adequate bedrooms for the program occupancy standard.

The occupancy requirement sets a maximum of two persons for every adequate bedroom, regardless of age.[1] (A studio or efficiency apartment is counted as a bedroom for occupancy standards.) An adequate bedroom is a room that can be completely closed off from other rooms and that meets the following program housing standards: ceiling height, light-ventilation, and electrical services. In addition, the room must meet the housing standards for the condition of room structure, room surface, floor structure, and floor surface.

[1] Roomers and boarders are added to household size when determining whether a household meets occupancy standards.

REFERENCES

Friedman, Joseph and Daniel H. Weinberg, Housing Consumption Under a Constrained Income Transfer: Evidence From a Housing Gap Housing Allowance, Cambridge, Mass., Abt Associates Inc., April 1979 (revised June 1980).

Kennedy, Stephen D. and Sally R. Merrill, "The Use of Hedonic Indices to Distinguish Changes in Housing and Housing Expenditures: Evidence From the Housing Allowance Demand Experiment," paper presented at the Research Conference on the Housing Choices of Low-Income Families, Washington, D.C., March 1979.

Merrill, Sally R., Hedonic Indices as a Measure of Housing Quality, Cambridge, Mass., Abt Associates Inc., December 1977 (revised June 1980).

Urban Institute Working Paper No. 205-8, Washington, D.C., The Urban Institute, April 28, 1972.

APPENDIX III

AN ALTERNATIVE DEFINITION OF UPGRADING APPLIED TO ALL ENROLLED HOUSEHOLDS

The sample primarily used throughout the report is households that were still actively enrolled in the experiment two years after enrollment (and were not enrolled over income). An alternative sample is all enrolled households (not enrolled over income), regardless of how long they remained enrolled. This Appendix examines experimental outcomes for the sample of all enrolled households using a slightly modified definition of upgrading.

In conjunction with the expanded sample, the definition of meeting requirements used here has been modified to indicate how a household "first met" requirements. Thus, a household that did not meet requirements at enrollment could have first met requirements by upgrading regardless of whether they subsequently moved or became inactive. Specifically, first met upgraders are defined as households that did not meet requirements at enrollment and subsequently met requirements in their enrollment unit, or after moving to a unit that did not meet requirements when they first moved in, subsequently met in this unit.[1,2] In contrast, the definition of upgrade used in the report includes only households that did not move during the experiment and met requirements in their enrollment unit (at either one or two years after enrollment).

Tables III-1 and III-2 indicate Minimum Standards requirement status for all enrolled households (Table III-1) and for households active at two years (Table III-2). Tables III-3 and III-4 are similar but exclude households that already met at enrollment. Minimum Standards households upgraded at a significantly higher rate than Control households, and these differences are significant in the sample comprised of all enrolled households as well as for

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[1] As in the rest of the report, requirement status if measured only at enrollment and one and two years after enrollment for Minimum Standards and at enrollment and 6, 12, and 24 months after enrollment for Minimum Rent.

[2] Inclusion of households that moved and then upgraded has little effect on the incidence of "first met" upgrading (or "first met" meeting Minimum Rent requirements in place). This is in part because requirement status is only measured at 2 or 3 cross-sections after enrollment.

Table III-1

MINIMUM STANDARDS REQUIREMENTS AND AN ALTERNATIVE DEFINITION OF UPGRADING
ALL ENROLLED HOUSEHOLDS

	COMBINED SITES			PITTSBURGH			PHOENIX		
REQUIREMENTS STATUS	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC
Met at enrollment	20.0%	19.7%	0.1225	21.2%	19 3%	0.5584	18 5%	20 2%	-0 4826
Did not meet at enrollment first met by upgrading	9.9	7.1	1.6638†	9 7	6.8	1 2630	10.2	7 5	1.0882
Did not meet at enrollment first met by moving	22.0	17 5	4.2030***	12.8	7 0	2.3552*	32.2	18.3	3.6849***
Never met requirements	48.0	60 7	-4 1642***	56.2	66 9	-2 6036**	39 0	53.9	-3.3570***
SAMPLE SIZE	(431)	(689)		(226)	(357)		(205)	(332)	

SAMPLE All enrolled Minimum Standards and Control households excluding those with enrollment incomes over the eligibility limits.
DATA SOURCES Initial and monthly Household Report Forms and Housing Evaluation Forms
† t-statistic significant at the 0 10 level
* t-statistic significant at the 0.05 level
** t-statistic significant at the 0 01 level.
*** t-statistic significant at the 0.001 level.

Table III-2

MINIMUM STANDARDS REQUIREMENTS AND AN ALTERNATIVE DEFINITION OF UPGRADING
HOUSEHOLDS ACTIVE AT TWO YEARS

	COMBINED SITES			PITTSBURGH			PHOENIX		
REQUIREMENTS STATUS	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC
Met at enrollment	20.8%	19.6%	0 4471	21 7%	20 5%	0.1351	19 8%	18.7%	0 2837
Did not meet at enrollment first met by upgrading	11 3	7.6	1.9251†	10 6	7 0	1 4185	12.0	8 2	1.3048
Did not meet at enrollment first met by moving	18.6	9 0	4.2959***	11 7	3 6	3.5206***	27.0	14 9	3.0951**
Never met requirements	49.3	63.9	-4.4171***	56 1	69.0	-2 9392**	41.3	58.2	-3.4305***
SAMPLE SIZE	(365)	(571)		(198)	(303)		(167)	(268)	

SAMPLE All enrolled Minimum Standards and Control households active at two years excluding those with enrollment incomes over the eligibility limits.

DATA SOURCES Initial and monthly Household Report Forms and Housing Evaluation Forms

† t-statistic significant at the 0.10 level.

** t-statistic significant at the 0 01 level

*** t-statistic significant at the 0.001 level.

Table III-3

MINIMUM STANDARDS REQUIREMENTS AND AN ALTERNATIVE DEFINITION OF UPGRADING
ALL ENROLLED HOUSEHOLDS NOT MEETING REQUIREMENTS AT ENROLLMENT

	COMBINED SITES			PITTSBURGH			PHOENIX		
REQUIREMENTS STATUS	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC
Did not meet at enrollment first met by upgrading	12.5%	8.9%	1.7276†	12.3%	8.3%	1.4093	12.6%	9.4%	1.0505
Did not meet at enrollment first met by moving	27.5	15.6	4.3225***	16.3	8.7	2.4890*	39.5	23.0	3.6664***
Never met requirements	60.0	75.6	-4.9436***	71.3	83.0	-2.9886**	47.9	67.5	-4.0481***
SAMPLE SIZE	(345)	(553)		(178)	(288)		(167)	(265)	

SAMPLE: All enrolled Minimum Standards and Control households that did not meet requirements at enrollment excluding those with enrollment incomes over the eligibility limits

DATA SOURCES: Initial and monthly Household Report Forms and Housing Evaluation Forms.

† t-statistic significant at the 0.10 level

* t-statistic significant at the 0.05 level.

** t-statistic significant at the 0.01 level

*** t-statistic significant at the 0.001 level.

Table III-4

MINIMUM STANDARDS REQUIREMENTS AND AN ALTERNATIVE DEFINITION OF UPGRADING
HOUSEHOLDS ACTIVE AT TWO YEARS NOT MEETING REQUIREMENTS AT ENROLLMENT

	COMBINED SITES			PITTSBURGH			PHOENIX		
REQUIREMENTS STATUS	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC
Did not meet at enrollment· first met by upgrading	14 2%	9 4%	2 0226*	13 5%	8.7%	1 5158	14.9%	10 1%	1 3491
Did not meet at enrollment first met by moving	23.5	11.1	4 5160***	14 8	4 6	3 5349***	33 6	18.3	3.2578**
Never met requirements	62 3	79 5	-5.1506***	71 6	86 7	-3 7227***	51 5	71 6	-3 8135***
SAMPLE SIZE	(289)	(459)		(155)	(241)		(134)	(218)	

SAMPLE· All enrolled Minimum Standards and Control households active at two years that did not meet requirements at enrollment excluding those with enrollment incomes over the eligibility limits.

DATA SOURCES Initial and monthly Household Report Forms and Housing Evaluation Forms

† t-statistic significant at the 0 10 level
* t-statistic significant at the 0 05 level
** t-statistic significant at the 0.01 level.
*** t-statistic significant at the 0.001 level

households active at two years.[1]

In addition, a comparison of Table 2-2 in Chapter 2 with Table III-4 indicates that the two definitions of upgrade yield quite similar results for households active at the end of two years; 14.2 percent of the experimental households and 9.4 percent of the Control households "first met" by upgrading, as compared with 13 percent and 8 percent, respectively, under the definition used in Chapter 2 (that is, never moved from the enrollment unit).

The remaining tables present corresponding information for Minimum Rent Low and Minimum Rent High households. Tables III-5 through III-8 present figures for the proportion of Minimum Rent Low and Control households that first met the Minimum Rent Low requirement in place. The combined site experimental/Control differences are significant in all the samples. This is due to a significant impact in Pittsburgh only; the effect in Phoenix is small and not significant. Similarly, for Minimum Rent High (Tables III-9 through III-12), the proportions of households that first met in place are similar for the samples of all enrolled households and those active at two years and in no case is an experimental effect evident.

In contrast to Minimum Standards, however, the change in definition to "first met" does have an impact on the proportion of households defined as upgraders, particularly for Minimum Rent Low households. Thus, comparing Tables 3-2 (Chapter 3) and III-8, 23.7 percent of the Minimum Rent Low households "first met" in place as compared with 16 percent that met in place and never moved from the enrollment unit. Again, the difference involves households that met in place and then moved or that first moved to a unit not meeting requirements that subsequently met.

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[1] As would be expected, upgrading rates are somewhat higher for the sample active at two years. In addition, experimental control differences are somewhat larger for this sample. This suggests that some modest part of the experimental effect found in Chapter 2 could reflect differential attrition between Control and Minimum Standards households.

Table III-5

MINIMUM RENT LOW HOUSEHOLDS AND AN ALTERNATIVE DEFINITION OF UPGRADING
ALL ENROLLED HOUSEHOLDS

	COMBINED SITES			PITTSBURGH			PHOENIX		
REQUIREMENTS STATUS	MINIMUM RENT LOW HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT LOW HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT LOW HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC
Met at enrollment	57.8%	53.9%	1.0760	62 8%	61 2%	0 3279	52 1%	46.2%	1.1150
Did not meet at enrollment. first met by upgrading	9.0	4 8	2.4407*	12 4	6.1	2.3366*	5 0	3.6	0 6769
Did not meet at enrollment first met by moving	17.1	10.0	3 0086**	10.2	9 4	0 2704	24.8	10.7	3.7891***
Never met requirements	16 3	31 2	-4.5974***	14 6	23 3	-2.1321*	18.2	39 6	-4.2656***
SAMPLE SIZE	(258)	(699)		(137)	(361)		(121)	(338)	

SAMPLE All enrolled Minimum Rent Low and Control households excluding those with enrollment incomes over the eligibility limits.
DATA SOURCE: Initial and monthly Household Report Forms
* t-statistic significant at the 0.05 level.
** t-statistic significant at the 0 01 level
*** t-statistic significant at the 0 001 level.

Table III-6

MINIMUM RENT LOW HOUSEHOLDS AND AN ALTERNATIVE DEFINITION OF UPGRADING HOUSEHOLDS ACTIVE AT TWO YEARS

	COMBINED SITES			PITTSBURGH			PHOENIX		
REQUIREMENTS STATUS	MINIMUM RENT LOW HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT LOW HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT LOW HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC
Met at enrollment	56.3%	53 4%	0 7401	62.4%	61 0%	0 1171	48.5%	43 8%	0 8003
Did not meet at enrollment first met by upgrading	10.4	5 0	7 7917**	13 6	6.3	2 5001*	6.2	3 6	1.0887
Did not meet at enrollment first met by moving	17.2	9 5	3.0583**	8 8	9 1	-0.0993	27 8	9.7	4 3668***
Never met requirements	16.2	32.1	-4.5137***	15.2	22.9	-1.8000†	17 5	42 8	-4.4595***
SAMPLE SIZE	(222)	(595)		(125)	(319)		(97)	(276)	

SAMPLE All enrolled Minimum Rent Low and Control households active at two years excluding those with enrollment incomes over the eligibility limits.

DATA SOURCE Initial and monthly Household Report Forms

† t-statistic significant at the 0 10 level

* t-statistic significant at the 0 05 level

** t-statistic significant at the 0.01 level.

*** t-statistic significant at the 0.001 level

Table III-7

MINIMUM RENT LOW HOUSEHOLDS AND AN ALTERNATIVE DEFINITION OF UPGRADING
ALL ENROLLED HOUSEHOLDS NOT MEETING REQUIREMENTS AT ENROLLMENT

	COMBINED SITES			PITTSBURGH			PHOENIX		
REQUIREMENTS STATUS	MINIMUM RENT LOW HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT LOW HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT LOW HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC
Did not meet at enrollment first met by upgrading	21.1%	10 6%	2 7943**	33.3%	15 7%	2 6704**	10.3%	6.6%	0.9320
Did not meet at enrollment first met by moving	40 4	21.7	3 8769***	27.4	24.3	0 4370	51.7	19.8	4 7376***
Never met requirements	38.5	67 7	-5 3859***	39.2	60 0	-2.5536*	37.9	73 6	-4.9630***
SAMPLE SIZE	(109)	(322)		(51)	(140)		(58)	(182)	

SAMPLE All enrolled Minimum Rent Low and Control households that did not meet requirements at enrollment excluding those with enrollment incomes over the eligibility limits.

DATA SOURCE Initial and monthly Household Report Forms

* t-statistic significant at the 0 05 level

** t-statistic significant at the 0.01 level.

*** t-statistic significant at the 0.001 level.

Table III-8

MINIMUM RENT LOW HOUSEHOLDS AND AN ALTERNATIVE DEFINITION OF UPGRADING
HOUSEHOLDS ACTIVE AT TWO YEARS NOT MEETING REQUIREMENTS AT ENROLLMENT

	COMBINED SITES			PITTSBURGH			PHOENIX		
REQUIREMENTS STATUS	MINIMUM RENT LOW HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT LOW HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT LOW HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC
Did not meet at enrollment first met by upgrading	23 7%	10 8%	3 1375**	36.2%	16 4%	2 7884**	12 0%	6.5%	1.2580
Did not meet at enrollment: first met by moving	39 2	20.2	3.7128***	23.4	23.8	-0.0548	54.0	17 4	5.1098***
Never met requirements	37.1	69.0	-5.5366***	40.4	59.8	-2.2689*	34.0	76.1	-5.4579***
SAMPLE SIZE	(97)	(277)		(47)	(122)		(50)	(155)	

SAMPLE: All enrolled Minimum Rent Low and Control households active at two years that did not meet requirements at enrollment excluding those with enrollment incomes over the eligibility limits.

DATA SOURCE: Initial and monthly Household Report Forms

* t-statistic significant at the 0 05 level

** t-statistic significant at the 0.01 level.

*** t-statistic significant at the 0.001 level.

Table III-9

MINIMUM RENT HIGH HOUSEHOLDS AND AN ALTERNATIVE DEFINITION OF UPGRADING
ALL ENROLLED HOUSEHOLDS

	COMBINED SITES			PITTSBURGH			PHOENIX		
REQUIREMENTS STATUS	MINIMUM RENT HIGH HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT HIGH HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT HIGH HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC
Met at enrollment	27.5%	28.0%	-0 1554	29 9%	30.7%	-0 1732	25.0%	25.1%	-0.0225
Did not meet at enrollment· first met by upgrading	6.6	6 5	0 0564	9.5	8.4	0.3889	3.8	4.4	-0 2904
Did not meet at enrollment· first met by moving	20.4	8 9	4.9153***	13 8	8 3	1 8424†	27.3	9.5	4 9256***
Never met requirements	45 4	56.7	-3.1578**	46 7	52 6	-1 1762	43.9	60 9	-3 3378***
SAMPLE SIZE	(269)	(699)		(137)	(361)		(132)	(338)	

SAMPLE· All enrolled Minimum Rent High and Control households excluding those with enrollment incomes over the eligibility limits
DATA SOURCE Initial and monthly Household Report Forms
† t-statistic significant at the 0 10 level.
** t-statistic significant at the 0.01 level.
*** t-statistic significant at the 0.001 level.

Table III-10

MINIMUM RENT HIGH HOUSEHOLDS AND AN ALTERNATIVE DEFINITION OF UPGRADING
HOUSEHOLDS ACTIVE AT TWO YEARS

	COMBINED SITES			PITTSBURGH			PHOENIX		
REQUIREMENTS STATUS	MINIMUM RENT HIGH HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT HIGH HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT HIGH HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC
Met at enrollment	25 2%	27.4%	-0.6314	29.9%	30 7%	-0.1608	20 0%	23.6%	-0 7503
Did not meet at enrollment first met by upgrading	6 8	7.1	-0.1493	10 3	8 8	0 4801	2 9	5.2	-0.9606
Did not meet at enrollment first met by moving	23.0	8.5	5.5942***	14 6	7 5	2.2504*	32 4	9 5	5.4691***
Never met requirements	45.0	57.1	-3.0853**	45.3	53 0	-1.4251	44.8	61.8	-2 9942**
SAMPLE SIZE	(222)	(594)		(117)	(319)		(105)	(275)	

SAMPLE All enrolled Minimum Rent High and Control households active at two years excluding those with enrollment incomes over the eligibility limits.

DATA SOURCE Initial and monthly Household Report Forms

* t-statistic significant at the 0.05 level.

** t-statistic significant at the 0 01 level

*** t-statistic significant at the 0 001 level.

Table III-11

MINIMUM RENT HIGH HOUSEHOLDS AND AN ALTERNATIVE DEFINITION OF UPGRADING:
ALL ENROLLED HOUSEHOLDS NOT MEETING REQUIREMENTS AT ENROLLMENT

	COMBINED SITES			PITTSBURGH			PHOENIX		
REQUIREMENTS STATUS	MINIMUM RENT HIGH HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT HIGH HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT HIGH HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC
Did not meet at enrollment: first met by upgrading	9.2%	8.9%	0.1244	13.5%	12.0%	0.3788	5.1%	5.9%	-0.2917
Did not meet at enrollment first met by moving	28.2	12.3	5.0484***	19.8	12.0	1.8631†	36.4	12.6	5.0877***
Never met requirements	62.6	78.7	-4.3621***	66.7	76.0	-1.7533†	58.6	81.4	-4.4409***
SAMPLE SIZE	(195)	(503)		(96)	(250)		(99)	(253)	

SAMPLE: All enrolled Minimum Rent High and Control households that did not meet requirements at enrollment excluding those with enrollment incomes over the eligibility limits.

DATA SOURCE: Initial and monthly Household Report Forms.

† t-statistic significant at the 0.10 level.

*** t-statistic significant at the 0.001 level.

Table III-12

MINIMUM RENT HIGH HOUSEHOLDS AND AN ALTERNATIVE DEFINITION OF UPGRADING HOUSEHOLDS ACTIVE AT TWO YEARS NOT MEETING REQUIREMENTS AT ENROLLMENT

	COMBINED SITES			PITTSBURGH			PHOENIX		
REQUIREMENTS STATUS	MINIMUM RENT HIGH HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT HIGH HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT HIGH HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC
Did not meet at enrollment-first met by upgrading	9.0%	9.7%	-0.2613	14 6%	12 7%	0.4339	3.6	6.7	-1.0261
Did not meet at enrollment-first met by moving	30 7	11.6	5.5781***	20.7	10.9	2 2143*	40 5	12 4	5.3986***
Never met requirements	60.2	78.7	-4.5920***	64.6	76 5	-2.0798*	56 0	81.0	-4.4070***
SAMPLE SIZE	(166)	(431)		(82)	(221)		(84)	(210)	

SAMPLE: All enrolled Minimum Rent High and Control households active at two years that did not meet requirements at enrollment excluding those with enrollment incomes over the eligibility limits

DATA SOURCE Initial and monthly Household Report Forms

* t-statistic significant at the 0.05 level.

*** t-statistic significant at the 0.001 level

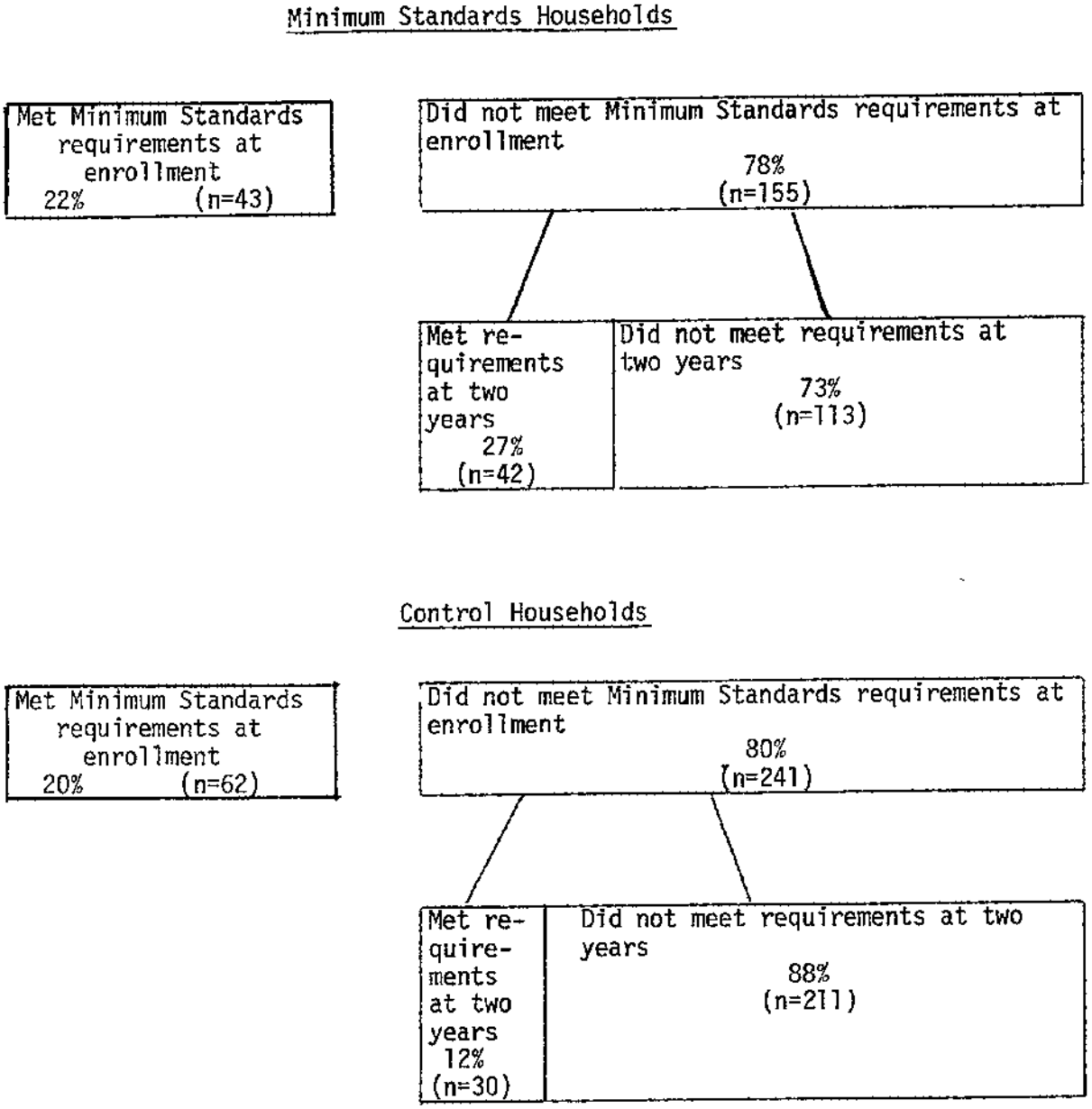
APPENDIX IV

MINIMUM STANDARDS UPGRADING: SEPARATE SITE TABLES

This appendix contains separate Pittsburgh and Phoenix tables as companions to all combined site tables contained in Chapter 2. The tables are presented in identical order to those in Chapter 2.

Figure IV-1

MINIMUM STANDARDS REQUIREMENT STATUS AT ENROLLMENT AND AT TWO YEARS: PITTSBURGH

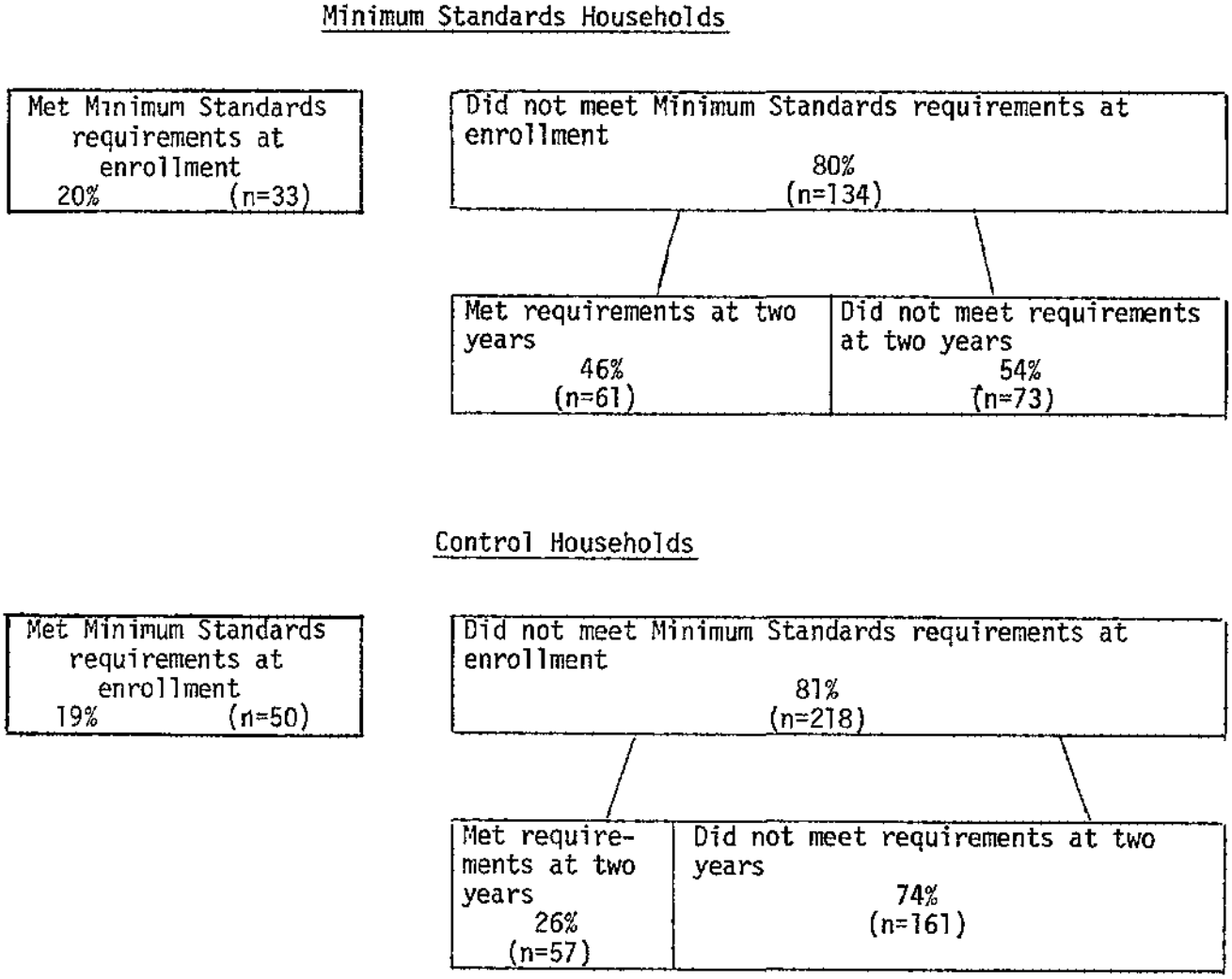


SAMPLE: Minimum Standards and Control households active at two years after enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms and Housing Evaluation Forms.

Figure IV-2

MINIMUM STANDARDS REQUIREMENT STATUS AT ENROLLMENT AND AT TWO YEARS: PHOENIX



SAMPLE: Minimum Standards and Control households active at two years after enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms and Housing Evaluation Forms.

Table IV-1

UPGRADING DURING THE FIRST AND SECOND YEARS
AFTER ENROLLMENT: PITTSBURGH

OUTCOMES	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC
	DURING THE FIRST YEAR		
Upgraded	11.5%	6.4%	1.806†
Stayed and failed	60.9	68.8	-1.632
Moved and passed	7.7	3.2	2.037**
Moved and failed	19.9	21.6	-0.409
(Sample size)	(156)	(250)	
	DURING THE SECOND YEAR		
Upgraded	2.4%	3.6%	-0.615
Stayed and failed	73.0	82.1	-2.000*
Moved and passed	7.9	0.9	3.459***
Moved and failed	16.7	13.4	0.840
(Sample size)	(126)	(224)	

FIRST YEAR SAMPLE: Minimum Standards and Control households active at two years after enrollment whose units failed the Minimum Standards requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

SECOND YEAR SAMPLE: Minimum Standards and Control households active at two years after enrollment whose units failed the Minimum Standards requirements at one year after enrollment, excluding those with incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms and Housing Evaluation Forms.

† t-statistic significant at the 0.10 level.
* t-statistic significant at the 0.05 level.
** t-statistic significant at the 0.01 level.
*** t-statistic significant at the 0.001 level.

Table IV-2

UPGRADING DURING THE FIRST AND SECOND YEARS AFTER ENROLLMENT: PHOENIX

OUTCOMES	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC
	DURING THE FIRST YEAR		
Upgraded	11.3%	6.9%	1.426
Stayed and failed	44.4	51.9	-1.361
Moved and passed	21.1	12.0	2.283*
Moved and failed	23.3	29.2	-1.206
(Sample size)	(133)	(216)	
	DURING THE SECOND YEAR		
Upgraded	6.4%	4.3%	0.760
Stayed and failed	57.4	62.7	-0.858
Moved and passed	19.1	8.6	2.538*
Moved and failed	17.0	24.3	-1.395
(Sample size)	(94)	(185)	

FIRST YEAR SAMPLE: Minimum Standards and Control households active at two years after enrollment whose units failed the Minimum Standards requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

SECOND YEAR SAMPLE: Minimum Standards and Control households active at two years after enrollment whose units failed the Minimum Standards requirements at one year after enrollment, excluding those with incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms and Housing Evaluation Forms.

* t-statistic significant at the 0.05 level.

Table IV-3

MEASURES OF DWELLING UNIT QUALITY AT ENROLLMENT
(PITTSBURGH)

INDICATORS	UPGRADED			STAYED AND FAILED			ADDITIONAL t-STATISTICS (upgraded vs stayed/failed)	
	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS
Mean rent	$114.53 (19)	$132.12 (17)	-1.31	$98.46 (67)	$104.43 (136)	-1.37	-1.71†	-2.63*
Mean housing services index[a]	114.98 (18)	127.77 (16)	1.41	102.02 (66)	107.35 (124)	1.52	2.63*	2.44*
Mean number of physical components failed	1.00 (19)	0.94 (18)	0.23	1.83 (69)	1.55 (137)	1.51	4.10***	2.69*
Mean number of persons per adequate bedroom	2.87 (19)	3.37 (18)	-0.52	4.37 (69)	5.02 (137)	-1.31	2.01*	2.09*
Mean overall evaluator rating[b]	1.00 (19)	0.83 (18)	0.74	1.42 (69)	1.28 (137)	1.45	2.46*	2.57*
Mean housing deprivation measure[c]	2.16 (19)	1.94 (18)	0.97	2.55 (69)	2.37 (137)	1.92†	2.49*	2.32*

SAMPLE Minimum Standards and Control households active at two years after enrollment whose units failed the Minimum Standards requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES- Initial and monthly Household Report Forms, Housing Evaluation Forms, and Baseline and Periodic Interviews.

NOTE: Sample sizes are in parentheses.

a. The sample for this mean excludes households with extreme values for predicted rent (used in the derivation of the housing services index).

b. The evaluator rating is measured on a four-point scale, from 0, indicating good condition, to 3 indicating the unit is unfit for habitation.

c. The measure is a three-point scale, 1 indicating a minimally adequate unit and 3 indicating a clearly inadequate unit

† t-statistic significant at the 0.10 level.

* t-statistic significant at the 0.05 level.

** t-statistic significant at the 0.01 level.

*** t-statistic significant at the 0.001 level.

Table IV-4

MEASURES OF DWELLING UNIT QUALITY AT ENROLLMENT
(PHOENIX)

INDICATORS	UPGRADED			STAYED AND FAILED			ADDITIONAL t-STATISTICS (upgraded vs stayed/failed)	
	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS
Mean rent	122.89 (18)	161.29 (17)	-2.49*	107.77 (39)	112.67 (87)	-0.61	-1.25	-3.87***
Mean housing services index[a]	137.85 (18)	152.80 (14)	1.23	108.35 (36)	118.16 (80)	1.43	3.37**	3.18**
Mean number of physical components failed	1.22 (18)	0.67 (18)	2.92**	3.10 (39)	3.44 (87)	-0.75	5.48***	8.05***
Mean number of persons per adequate bedroom	3.09 (18)	4.45 (18)	-1.17	5.87 (39)	6.58 (87)	-1.06	2.88**	2.27*
Mean overall evaluator rating[b]	0.89 (18)	0.61 (18)	1.30	1.49 (39)	1.55 (87)	-0.38	2.85**	5.35***
Mean housing deprivation measure[c]	1.89 (18)	1 78 (18)	0.41	2.56 (39)	2.56 (87)	0.01	2.97**	3.85***

SAMPLE. Minimum Standards and Control households active at two years after enrollment whose units failed the Minimum Standards requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES Initial and monthly Household Report Forms, Housing Evaluation Forms, and Baseline and Periodic Interviews.

NOTE Sample sizes are in parentheses.

a. The sample for this mean excludes households with extreme values for predicted rent (used in the derivation of the housing services index)

b. The evaluator rating is measured on a four-point scale, from 0, indicating good condition, to 3 indicating the unit is unfit for habitation

c. The measure is a three-point scale, 1 indicating a minimally adequate unit and 3 indicating a clearly inadequate unit.

† t-statistic significant at the 0 10 level

* t-statistic significant at the 0.05 level.

** t-statistic significant at the 0.01 level.

*** t-statistic significant at the 0.001 level.

Table IV-5

HOUSING DEPRIVATION MEASURE AND EVALUATOR'S OVERALL RATING BY TWO-YEAR OUTCOME--PITTSBURGH

HOUSING DEPRIVATION MEASURE	OUTCOMES: UPGRADED	OUTCOMES: STAYED AND FAILED	t-STATISTIC (upgraded vs. stayed/failed)
MINIMALLY ADEQUATE			
Minimum Standards households	10% (2)	7% (5)	0.472
Control households	28 (5)	13 (18)	1.651
t-statistic	-1.343	-1.271	--
AMBIGUOUS			
Minimum Standards households	63 (12)	30 (21)	2.615*
Control households	50 (9)	37 (51)	1.048
t-statistic	0.810	-0.966	--
CLEARLY INADEQUATE			
Minimum Standards households	26 (5)	62 (43)	-2.790**
Control households	22 (4)	50 (68)	-2.191
t-statistic	0.291	1.726†	--

SAMPLE: Minimum Standards and Control households active at two years after enrollment whose units failed the Minimum Standards requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms and Housing Evaluation Forms.

NOTE: Sample sizes are in parentheses.

† t-statistic significant at the 0.10 level.

* t-statistic significant at the 0.05 level.

** t-statistic significant at the 0.01 level.

Table IV-5 (continued)

HOUSING DEPRIVATION MEASURE AND EVALUATOR'S
OVERALL RATING BY TWO-YEAR OUTCOMES--PITTSBURGH

EVALUATOR'S RATING	OUTCOMES: UPGRADED	OUTCOMES: STAYED AND FAILED	t-STATISTIC (upgraded vs. Stayed/failed)
GOOD CONDITION			
Minimum Standards households	4 (3)	21 (4)	2.400*
Control households	9 (12)	33 (6)	3.047**
t-statistic	-1.172	-0.835	
BASICALLY SOUND, MINOR REPAIRS NEEDED			
Minimum Standards households	52 (36)	58 (11)	0.441
Control households	56 (76)	50 (9)	-0.441
t-statistic	-0.449	0.482	
BASICALLY SOUND, MAJOR REPAIRS OR RENOVATIONS NEEDED			
Minimum Standards households	41 (28)	21 (4)	-1.564
Control households	34 (47)	17 (3)	-1.502
t-statistic	0.887	0.341	
UNSOUND, UNFIT FOR HUMAN HABITATION			
Minimum Standards households	3 (2)	0 (0)	-0.751
Control households	2 (2)	0 (0)	-0.523
t-statistic	0.683	-	

SAMPLE Minimum Standards and Control households active at two years after enrollment whose units failed the Minimum Standards requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES Initial and monthly Household Report Forms and Housing Evaluation Forms.

NOTE- Sample sizes are in parentheses.

* t-statistic significant at the 0.05 level.

** t-statistic significant at the 0.01 level.

Table IV-6

HOUSING DEPRIVATION MEASURE AND EVALUATOR'S OVERALL RATING BY TWO-YEAR OUTCOME--PHOENIX

HOUSING DEPRIVATION MEASURE	OUTCOMES		t-STATISTIC (upgraded vs. stayed/failed)
	UPGRADED	STAYED AND FAILED	
MINIMALLY ADEQUATE			
Minimum Standards households	39% (7)	13% (5)	2.247*
Control households	44 (8)	10 (9)	3.579
t-statistic	-0.335	0.413	--
AMBIGUOUS			
Minimum Standards households	33 (6)	18 (7)	1.289
Control households	33 (6)	23 (20)	0.922
t-statistic	0.000	-0.645	--
CLEARLY INADEQUATE			
Minimum Standards households	28 (5)	69 (27)	-2.928**
Control households	22 (4)	67 (58)	-3.495***
t-statistic	0.388	0.277	

SAMPLE: Minimum Standards and Control households active at two years after enrollment whose units failed the Minimum Standards requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms and Housing Evaluation Forms.

NOTE: Sample sizes are in parentheses.

* t-statistic significant at the 0.05 level.

** t-statistic significant at the 0.01 level.

*** t-statistic significant at the 0.001 level.

Table IV-6 (continued)

HOUSING DEPRIVATION MEASURE AND EVALUATOR'S OVERALL RATING BY TWO-YEAR OUTCOME--PHOENIX

EVALUATOR'S RATING	OUTCOMES: UPGRADED	OUTCOMES: STAYED AND FAILED	t-STATISTIC (stayed/passed vs. stayed/failed)
GOOD CONDITION			
Minimum Standards households	28% (5)	13% (5)	1.384
Control households	44 (8)	15 (13)	2.850**
t-statistic	-1.037	-0.312	
BASICALLY SOUND, MINOR REPAIRS NEEDED			
Minimum Standards households	56 (10)	36 (14)	1.400
Control households	50 (9)	32 (28)	1.439
t-statistic	0.336	0.407	
BASICALLY SOUND, MAJOR REPAIRS OR RENOVATIONS NEEDED			
Minimum Standards households	17 (3)	41 (16)	-1.809†
Control households	6 (1)	36 (31)	-2.511*
t-statistic	1.058	0.580	
UNSOUND, UNFIT FOR HUMAN HABITATION			
Minimum Standards households	-- (0)	10 (4)	-1.412
Control households	-- (0)	17 (15)	-1.900†
t-statistic	--	-1.001	

SAMPLE: Minimum Standards and Control households active at two years after enrollment whose units failed the Minimum Standards requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms and Housing Evaluation Forms.

NOTE Sample sizes are in parentheses.

† t-statistic significant at the 0.10 level.

* t-statistic significant at the 0.05 level.

** t-statistic significant at the 0.01 level.

Table IV-7

PERCENTAGE CHANGE IN RENT OVER TWO YEARS

	PITTSBURGH			PHOENIX		
	OUTCOMES			OUTCOMES		
	UPGRADED	STAYED AND FAILED	SAMPLE SIZE	UPGRADED	STAYED AND FAILED	SAMPLE SIZE
MEAN RENT AT ENROLLMENT						
Minimum Standards households	$114.53 (19)	$98.46 (67)	(86)	$122.89 (18)	$107.77 (39)	(57)
Control	132.12 (17)	104.43 (136)	(153)	161.29 (17)	112.67 (87)	(104)
MEAN RENT AT TWO YEARS						
Minimum Standards households	126.68 (19)	108.24 (68)	(87)	127.39 (18)	115.46 (39)	(57)
Control	152.89 (18)	116.17 (137)	(155)	165.17 (18)	119.56 (85)	(103)
MEAN PERCENTAGE CHANGE						
Minimum Standards households	14.2% (19)	11.3% (66)	(85)	3.8% (18)	8.5 (39)	(57)
Control	21.0 (17)	12.4 (136)	(153)	1.6 (17)	7.6 (85)	(102)
t-STATISTIC FOR MEAN PERCENTAGE CHANGE						
Minimum Standards households versus Control households	-0.88	0.50		0.70	0.24	
Upgraded versus stayed and failed Minimum Standards households	0.54			1.06		
Upgraded versus stayed and failed Control households	1.44			2.23*		

SAMPLE Minimum Standards and Control households active at two years after enrollment whose units failed the Minimum Standards requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES Initial and monthly Household Report Forms and Housing Evaluation Forms.

NOTE. Sample sizes are in parentheses.

Table IV-8

PERCENTAGE CHANGE IN HOUSING SERVICES
OVER TWO YEARS (LINEAR EQUATION)

	PITTSBURGH			PHOENIX		
	OUTCOMES			OUTCOMES		
	UPGRADED	STAYED AND FAILED	SAMPLE SIZE	UPGRADED	STAYED AND FAILED	SAMPLE SIZE
MEAN HOUSING SERVICES AT ENROLLMENT						
Minimum Standards households	115.48 (16)	101.80 (65)	(81)	137.85 (18)	109.79 (35)	(53)
Control households	127.77 (16)	107.33 (122)	(138)	152.80 (14)	118.16 (80)	(94)
MEAN HOUSING SERVICES AT TWO YEARS						
Minimum Standards households	124.18 (16)	102.65 (65)	(81)	146.02 (18)	115.88 (35)	(53)
Control households	126.85 (16)	109.57 (122)	(138)	160.34 (14)	122.46 (80)	(94)
MEAN [AND MEDIAN] PERCENTAGE CHANGE						
Minimum Standards households	7.4% [7.3] (16)	2.3% [1.8] (65)	(81)	6.5% [6.6] (18)	6.9% [3.8] (35)	(53)
Control households	-0.5 [0.7] (16)	2.2 [2.0] (122)	(138)	6.2 [6.1] (14)	5.2 [3.9] (80)	(94)
t-STATISTIC FOR THE MEAN PERCENTAGE CHANGE						
Minimum Standards households versus Control households	3.31**	0.02		0.12	0.60	
Upgraded versus stayed and failed Minimum Standards households	2.04*			-0.17		
Upgraded versus stayed and failed Control households	-1.67			-0.34		

SAMPLE: Minimum Standards and Control households active at two years after enrollment whose units failed the Minimum Standards requirements at enrollment, excluding those with enrollment incomes over the eligibility limits, those living in their own homes or in subsidized housing, and those with extreme values or missing values for the hedonic residual.

DATA SOURCES Initial and monthly Household Report Forms, Housing Evaluation Forms, and Baseline and Periodic Interviews.

NOTE: Sample sizes are in parentheses.

* t-statistic significant at the 0.05 level.

** t-statistic significant at the 0.01 level.

Table IV-9

PERCENTAGE CHANGE IN HOUSING SERVICES
OVER TWO YEARS (SEMILOG EQUATION)
(COMBINED SITES)

	OUTCOMES		
	UPGRADED	STAYED AND FAILED	SAMPLE SIZE
MEAN HOUSING SERVICES AT ENROLLMENT			
Minimum Standards households	4.79 (34)	4.59 (100)	(134)
Control households	4.90 (28)	4.66 (200)	(228)
MEAN HOUSING SERVICES AT TWO YEARS			
Minimum Standards households	4.85 (34)	4.62 (100)	(134)
Control households	4.92 (28)	4.68 (200)	(228)
MEAN [AND MEDIAN] PERCENTAGE CHANGE			
Minimum Standards households	1.33% [0.9] (34)	0.54% [0.3] (100)	(134)
Control households	0.45 [0.0] (28)	0.58 [0.5] (200)	(228)
t-STATISTIC FOR MEAN PERCENTAGE CHANGE			
Minimum Standards households versus Control households	2.25*	-0.16	
Upgraded versus stayed and failed Minimum Standards households	-2.38*		
Upgraded versus stayed and failed Control households	0.40		

SAMPLE: Minimum Standards and Control households active at two years after enrollment whose units failed the Minimum Standards requirements at enrollment, excluding those with enrollment incomes over the eligibility limits, those living in their own homes or in subsidized housing, and those with extreme values or missing values for the hedonic residual.

DATA SOURCES: Initial and monthly Household Report Forms, Housing Evaluation Forms, and Baseline and Periodic Interviews.

NOTE: Sample sizes are in parentheses.

* t-statistic significant at the 0.05 level.

Table IV-10

PERCENTAGE CHANGE IN HOUSING SERVICES
OVER TWO YEARS (SEMILOG EQUATION)

	PITTSBURGH			PHOENIX		
	OUTCOMES			OUTCOMES		
	UPGRADED	STAYED AND FAILED	SAMPLE SIZE	UPGRADED	STAYED AND FAILED	SAMPLE SIZE
MEAN HOUSING SERVICES AT ENROLLMENT						
Minimum Standards households	4.71 (16)	4.57 (65)	(81)	4.87 (18)	4.63 (35)	(53)
Control households	4.81 (14)	4.62 (120)	(134)	4.99 (14)	4 70 (80)	(94)
MEAN HOUSING SERVICES AT TWO YEARS						
Minimum Standards households	4.79 (16)	4.58 (65)	(81)	4.92 (18)	4.67 (35)	(53)
Control households	4.80 (14)	4.65 (120)	(134)	5.04 (14)	4.73 (80)	(94)
MEAN [AND MEDIAN] PERCENTAGE CHANGE						
Minimum Standards households	1.63% [1.2] (16)	0.27% [0.2] (65)	(81)	1.07% [0.8] (18)	1.04% [0.6] (35)	(53)
Control households	-0.22 [-0.6] (14)	0.49 [0.4] (120)	(134)	1.12 [0.4] (14)	0.70 [0.6] (80)	(94)
t-STATISTIC FOR MEAN PERCENTAGE CHANGE						
Minimum Standards households versus Control households	3.68***	-0.74		0.08	0.87	
Upgraded versus stayed and failed Minimum Standards households	2.84**			0.07		
Upgraded versus stayed and failed Control households	2.11*			0.86		

SAMPLE. Minimum Standards and Control households active at two years after enrollment whose units failed the Minimum Standards requirements at enrollment, excluding those with enrollment incomes over the eligibility limits, those living in their own homes or in subsidized housing, and those with extreme values or missing values for the hedonic residual.

DATA SOURCES Initial and monthly Household Report Forms, Housing Evaluation Forms, and Baseline and Periodic Interviews.

* t-statistic significant at the 0.05 level.

** t-statistic significant at the 0.01 level.

*** t-statistic significant at the 0.001 level.

Table IV-11

MEAN NUMBER OF REPORTED IMPROVEMENTS

	PITTSBURGH			PHOENIX		
	OUTCOMES			OUTCOMES		
	UPGRADED	STAYED AND FAILED	t-STATISTIC (upgraded vs. stayed/failed)	UPGRADED	STAYED AND FAILED	t-STATISTIC (upgraded vs. stayed/failed)
MEAN NUMBER OF IMPROVEMENTS MADE BY LANDLORD						
Minimum Standards households	2.58 (19)	2.22 (69)	0.72	2.78 (18)	2.38 (39)	0.48
Control households	2.28 (18)	2.12 (137)	-0.28	3.22 (18)	2.68 (87)	0.74
t-statistic	0.43	0.33	--	-0.47	-0.51	--
MEAN NUMBER OF IMPROVEMENTS MADE BY HOUSEHOLD						
Minimum Standards households	5.05 (19)	3.56 (69)	1.12	2.00 (18)	3.20 (39)	1.11
Control households	2.11 (18)	3.60 (137)	-2.14*	1.61 (18)	3.10 (87)	-2.36*
t-statistic	2.11*	-0 07	--	0.49	0.11	--
MEAN HOUSEHOLD COSTS						
Minimum Standards households	$217.65 (17)	$83.56 (68)	2.08*	$47.12 (17)	$82.97 (39)	0.95
Control households	53.72 (18)	111.80 (137)	-2.10*	30.06 (18)	67.99 (87)	-1.98*
t-statistic	2.47*	-1.23	--	0.63	0.46	--

SAMPLE: Minimum Standards and Control households active at two years after enrollment whose units failed the Minimum Standards requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms, Housing Evaluation Forms, and Periodic Interviews.

NOTE: Sample sizes are in parentheses.

* Significant at the 0.05 level.

Table IV-12

MINIMUM STANDARDS COMPONENTS FAILED
(SITES COMBINED)

COMPONENT	PERCENTAGE OF HOUSEHOLDS FAILING MINIMUM STANDARDS AT ENROLLMENT THAT FAILED EACH COMPONENT		PERCENTAGE OF HOUSEHOLDS FAILING EACH COMPONENT THAT UPGRADED		PERCENTAGE OF HOUSEHOLDS FAILING EACH COMPONENT THAT MOVED AND PASSED		PERCENTAGE OF HOUSEHOLDS FAILING EACH COMPONENT THAT STAYED AND FAILED		PERCENTAGE OF HOUSEHOLDS FAILING EACH COMPONENT THAT MOVED AND FAILED	
	Minimum Standards	Control	Minimum Standards	Control	Minimum Standards	Control	Minimum Standards	Control	Minimum Standards	Control
MINIMUM STANDARDS PHYSICAL COMPONENTS										
Adequate exits	4.8%	4.8%	14.3%	--	7.1%	4.5%	42.9%	59.1%	35.7%	36.4%
Ceiling height	12.1	12.6	--	5.2	25.7	5.2	40.0	62.1	34.3	27.6
Core rooms	7.3	3.5	--	--	4.8	12.5	61.9	81.3	33.3	6.3
Electricity	9.0	8.3	7.7	--	23.1	15.8	19.2	63.2	50.0	21.1
Floor structure	5.5	5.9	--	--	31.3	14.8	25.0	66.7	43.8	18.5
Floor surface	15.2	14.4	4.5	--	25.0	16.7	25.0	56.1	45.5	27.3
Heating equipment	17.0	14.6	2.0	--	26.5	17.9	38.8	52.2	32.7	29.9
Kitchen facilities	5.9	5.0	--	4.3	11.8	17.4	41.2	52.2	47.1	26.1
Light fixtures	9.0	6.7	--	--	15.4	6.1	53.8	41.9	30 8	41.9
Light and ventilation	75.8	74.3	12.8	6.2	20.5	10.6	40.2	48.7	26.5	34.6
Plumbing	24.6	20.9	4.2	--	8.5	11.5	47.9	54.2	39.4	34.4
Room structure	5.2	8.5	--	--	26.7	20.5	26.7	53.8	46.7	25.6
Room surface	20.8	21.4	5.0	3.1	26.7	14.3	33.3	44.9	35.0	37.8
Roof structure	3.1	3.5	--	6.3	22.2	25.0	33.3	68.8	44.4	--
Exterior walls	4.5	6.3	--	--	15.4	17.2	38.5	58.6	46.2	24.1
MINIMUM STANDARDS OCCUPANCY COMPONENT										
Occupancy	66.4	71.5	7.3	4.6	26.6	11.0	34.4	49.7	31.8	34.8
Fail occupancy only	9.0	13.9	15.4	17.2	42.3	14.1	23.1	39.1	19.2	29.7
SAMPLE SIZE	(289)	(459)	(37)	(36)	(66)	(51)	(108)	(224)	(78)	(148)
PERCENTAGE OF SAMPLE	100%	100%	12.8%	7.8%	22.8%	11.1%	37.4%	48.8%	27.0%	32.2%

SAMPLE: Minimum Standards and Control households active at two years after enrollment whose units failed the Minimum Standards requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES Initial and monthly Household Report Forms and Housing Evaluation Forms.

Table IV-13

MINIMUM STANDARDS COMPONENTS FAILED
(PITTSBURGH)

COMPONENT	PERCENTAGE OF HOUSEHOLDS FAILING MINIMUM STANDARDS AT ENROLLMENT THAT FAILED EACH COMPONENT		PERCENTAGE OF HOUSEHOLDS FAILING EACH COMPONENT THAT UPGRADED		PERCENTAGE OF HOUSEHOLDS FAILING EACH COMPONENT THAT MOVED AND PASSED		PERCENTAGE OF HOUSEHOLDS FAILING EACH COMPONENT THAT STAYED AND FAILED		PERCENTAGE OF HOUSEHOLDS FAILING EACH COMPONENT THAT MOVED AND FAILED	
	Minimum Standards	Control	Minimum Standards	Control	Minimum Standards	Control	Minimum Standards	Control	Minimum Standards	Control
MINIMUM STANDARDS PHYSICAL COMPONENTS										
Adequate exits	8.4%	8.3%	15.4%	-	-	5.0%	46.2%	60.0%	38.5%	35.0%
Ceiling height	7.7	12.4	-	10.0%	8.3%	3.3	50.0	50.0	41.7	36.7
Core rooms	9.0	5.4	-	-	7.1	7.7	78.6	84.6	14.3	7.7
Electricity	10.3	7.9	12.5	-	18.8	5.3	25.0	68.4	43.8	26.3
Floor structure	2.6	2.1	-	-	4.3	-	-	80.0	75.0	20.0
Floor surface	5.2	1.7	12.5	-	12.5	-	25.0	75.0	50.0	25.0
Heating equipment	5.2	5.0	-	-	25.0	8.3	50.0	58.3	25.0	33.3
Kitchen facilities	3.2	3.7	-	-	-	-	40.0	55.6	60.0	44.4
Light fixtures	10.3	3.7	-	-	12 5	11.1	50.0	44.4	37.5	44.4
Light and ventilation	72.9	71.4	10.6	7.0	15.0	4.7	47.8	55.2	26.5	33.1
Plumbing	22.6	19.5	2.9	-	5.7	4.3	60.0	61.7	31.4	34.0
Room structure	1.3	0.8	-	-	50.0	-	50.0	50.0	-	50.0
Room surface	11.6	10.0	5.6	4.2	22.2	8.3	38.9	45.8	33.3	41.7
Roof structure	0.6	1.7	-	25.0	-	-	-	75.0	100.0	-
Exterior walls	-	0.4	-	-	-	100.0	-	-	-	-
MINIMUM STANDARDS OCCUPANCY COMPONENT										
Occupancy	61.9	67.2	8.3	3.7	15.6	4.9	41.7	56.8	34.4	34.6
Fail occupancy only	10.3	16.2	18.8	10.3	18.8	5.1	31.3	48.7	31.3	35.9
SAMPLE SIZE	(155)	(241)	(19)	(18)	(23)	(12)	(69)	(137)	(44)	(74)
PERCENTAGE OF SAMPLE	100%	100%	12.2%	7.5%	14.8%	5%	44.5%	56.8%	28.4%	30.7%

SAMPLE: Minimum Standards and Control households active at two years after enrollment whose units failed the Minimum Standards requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms and Housing Evaluation Forms.

Table IV-14

MINIMUM STANDARDS COMPONENTS FAILED
(PHOENIX)

COMPONENT	PERCENTAGE OF HOUSEHOLDS FAILING MINIMUM STANDARDS AT ENROLLMENT THAT FAILED EACH COMPONENT		PERCENTAGE OF HOUSEHOLDS FAILING EACH COMPONENT THAT UPGRADED		PERCENTAGE OF HOUSEHOLDS FAILING EACH COMPONENT THAT MOVED AND PASSED		PERCENTAGE OF HOUSEHOLDS FAILING EACH COMPONENT THAT STAYED AND FAILED		PERCENTAGE OF HOUSEHOLDS FAILING EACH COMPONENT THAT MOVED AND FAILED	
	Minimum Standards	Control	Minimum Standards	Control	Minimum Standards	Control	Minimum Standards	Control	Minimum Standards	Control
MINIMUM STANDARDS PHYSICAL COMPONENTS										
Adequate exits	0.7%	0.9%	--	--	100.0%	--	--	50.0%	--	50.0%
Ceiling height	17.2	12.8	--	--	34.8	7.1%	34.8%	75.0	30.4%	17.9
Core rooms	5.2	1.4	--	--	--	33.3	28.6	66.7	71.4	--
Electricity	7.5	8.7	--	--	30.0	26.3	10.0	57.9	60.0	15.8
Floor structure	7.0	10.1	--	--	33.3	18.2	33.3	63.6	33.3	18.2
Floor surface	26.9	28.4	2.8%	--	27.8	17.7	25.0	54.8	44.4	27.4
Heating equipment	30.6	25.2	2.4	--	26.8	20.0	36.6	50.9	34.1	29.1
Kitchen facilities	9.0	6.4	--	7.1%	16.7	28.6	41.7	50.0	41.7	14.3
Light fixtures	7.5	10.1	--	--	20.0	18.2	60.0	40.9	20.0	40.9
Light and ventilation	79.1	77.5	15.1	5.3	26.4	16.6	32.1	42.0	26.4	36.1
Plumbing	26.9	22.5	5.6	--	11.1	18.4	36.1	46.9	47.2	34.7
Room structure	9.7	17.0	--	--	23.1	21.6	23.1	54.1	53.8	24.3
Room surface	31.3	33.0	4.8	2.7	28.6	16.2	31.0	44.6	35.7	36.5
Roof structure	6.0	5.5	--	--	25.0	33.3	37.5	66.7	37.5	--
Exterior walls	9.7	12.8	--	--	15.4	14.3	38.5	60.7	46.2	25.0
MINIMUM STANDARDS OCCUPANCY COMPONENT										
Occupancy	71.6	76.1	6.3	5.4	37.5	16.9	27.1	42.8	29.2	34.9
Fail occupancy only	7.5	11.5	10.0	28.0	80.0	28.0	10.0	24.0	--	20.0
SAMPLE SIZE	(134)	(218)	(18)	(18)	(43)	(39)	(39)	(87)	(34)	(74)
PERCENTAGE OF SAMPLE	100%	100%	13.4%	8.3%	32.1%	17.9%	29.1%	39.9%	25.4%	33.9%

SAMPLE Minimum Standards and Control households active at two years after enrollment whose units failed the Minimum Standards requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms and Housing Evaluation Forms.

Table IV-15

HOUSEHOLD PREFERENCES FOR MOVING
OR STAYING BY TWO-YEAR OUTCOME -- PITTSBURGH

EXPRESSED PREFERENCE	UPGRADED	STAYED AND FAILED	MOVED AND PASSED	MOVED AND FAILED
	MINIMUM STANDARDS HOUSEHOLDS (Chi-squared = 22.769***)			
Move	32%	42%	91%	61%
Stay in unit[a]	63	55	9	39
Other[b]	5	3	0	0
(Sample size)	(19)	(65)	(23)	(41)
	CONTROL HOUSEHOLDS (Chi-squared = 16.327**)			
Move	28%	59%	67%	75%
Stay in unit[a]	67	40	33	24
Other[b]	6	1	0	1
(Sample size)	(18)	(127)	(12)	(71)

SAMPLE: Minimum Standards and Control households active at two years after enrollment whose units failed the Minimum Standards requirements at enrollment and that did not move between the Baseline Interview and enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms, Housing Evaluation Forms, and Baseline Interviews.

NOTE: Percentages do not add to 100 due to rounding.

a. Aggregated responses to: stay and improve, stay and buy, stay but no improvements necessary, stay and do not know whether or not improvements are necessary.

b. Aggregated responses to: would use the money for something else, other.

** Significant at the 0.01 level.

*** Significant at the 0.001 level.

Table IV-16

HOUSEHOLD PREFERENCES FOR MOVING
OR STAYING BY TWO-YEAR OUTCOME -- PHOENIX

EXPRESSED PREFERENCE	UPGRADED	STAYED AND FAILED	MOVED AND PASSED	MOVED AND FAILED
	MINIMUM STANDARDS HOUSEHOLDS (Chi-squared = 8.336)			
Move	39%	50%	67%	56%
Stay in unit[a]	61	39	30	41
Other[b]	0	11	3	4
(Sample size)	(18)	(36)	(33)	(27)
	CONTROL HOUSEHOLDS (Chi-squared = 25.582***)			
Move	43%	43%	57%	75%
Stay in unit[a]	43	54	32	23
Other[b]	14	2	11	1
(Sample size)	(14)	(81)	(37)	(69)

SAMPLE: Minimum Standards and Control households active at two years after enrollment whose units failed the Minimum Standards requirements at enrollment and that did not move between the Baseline Interview and enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms, Housing Evaluation Forms, and Baseline Interviews.

NOTE: Percentages do not add to 100 due to rounding.

a. Aggregated responses to: stay and improve, stay and buy, stay but no improvements necessary, stay and do not know whether or not improvements are necessary.

b. Aggregated responses to: would use the money for something else, other.

*** Significant at the 0.001 level.

Table IV-17

HOUSEHOLD SATISFACTION WITH DWELLING UNIT BY TWO-YEAR OUTCOME -- PITTSBURGH

EXPRESSED SATISFACTION	UPGRADED	STAYED AND FAILED	MOVED AND PASSED	MOVED AND FAILED
	MINIMUM STANDARDS HOUSEHOLDS (Chi-squared = 24.507**)			
Very satisfied	74%	44%	26%	22%
Somewhat satisfied	10	37	39	32
Somewhat dissatisfied	10	12	17	17
Very dissatisfied	5	7	17	29
(Sample size)	(19)	(68)	(23)	(41)
	CONTROL HOUSEHOLDS (Chi-squared = 23.116**)			
Very satisfied	78%	31%	42%	25%
Somewhat satisfied	11	36	17	30
Somewhat dissatisfied	6	16	17	18
Very dissatisfied	6	17	25	27
(Sample size)	(18)	(129)	(12)	(73)

SAMPLE: Minimum Standards and Control households active at two years after enrollment whose units failed the Minimum Standards requirements at enrollment and that did not move between the Baseline Interview and enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms, Housing Evaluation Forms, and Baseline Interviews.

NOTE: Percentages do not add to 100 due to rounding.

** Significant at the 0.01 level.

Table IV-18

HOUSEHOLD SATISFACTION WITH DWELLING UNIT BY TWO-YEAR OUTCOME -- PHOENIX

EXPRESSED SATISFACTION	UPGRADED	STAYED AND FAILED	MOVED AND PASSED	MOVED AND FAILED
	MINIMUM STANDARDS HOUSEHOLDS (Chi-squared = 15.836†)			
Very satisfied	67%	46%	32%	15%
Somewhat satisfied	17	22	35	41
Somewhat dissatisfied	11	22	15	22
Very dissatisfied	6	11	18	22
(Sample size)	(18)	(37)	(34)	(27)
	CONTROL HOUSEHOLDS (Chi-squared = 9.508)			
Very satisfied	57%	40%	27%	33%
Somewhat satisfied	29	32	43	32
Somewhat dissatisfied	14	16	24	19
Very dissatisfied	0	12	51	16
(Sample size)	(14)	(82)	(37)	(69)

SAMPLE: Minimum Standards and Control households active at two years after enrollment whose units failed the Minimum Standards requirements at enrollment and that did not move between the Baseline Interview and enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms, Housing Evaluation Forms, and Baseline Interviews.

NOTE: Percentages do not add to 100 due to rounding.

† Significant at the 0.10 level.

Table IV-19

LOGIT ESTIMATE OF THE PROBABILITY OF UPGRADING TO MEET MINIMUM STANDARDS--PITTSBURGH

INDEPENDENT VARIABLES	COEFFICIENT	ASYMPTOTIC t-STATISTIC	PARTIAL DERIVATIVE
Age of head of household (decades)	0.039	-0.29	-0.004
Black head of household	0.385	0.75	0.034
Annual net income (thousands)	0.049	0.42	0.004
Female head of household	-0.237	-0.63	-0.021
Education of head of household	0.047	0.57	0.004
Number of moves in previous three years	-0.093	-0.52	-0.008
Unit and neighborhood satisfaction	0.282*	1.98*	0.025
Persons per room	-1.741*	-2.26*	-0.153
Distance from meeting requirements (number of physical components failed)	-0.806**	2.99**	-0.071
Quality per room	0.123**	3.19**	0.011
Experimental household (Housing Gap Minimum Standards)	1.048**	2.65**	0.092
CONSTANT	-5.426**	-2.77**	NA
Likelihood ratio (significance)		49.33**	
Mean of dependent variable		0.097	
Coefficient of determination		0.209	
Sample size		(370)	

SAMPLE: Minimum Standards and Control households active at two years after enrollment whose units failed the Minimum Standards requirements at enrollment, excluding those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms, Housing Evaluation Forms, and Baseline Interviews.

* t-statistic significant at the 0.05 level.

** t-statistic significant at the 0.01 level.

Table IV-20

LOGIT ESTIMATE OF THE PROBABILITY OF UPGRADING TO MEET MINIMUM STANDARDS--PHOENIX

INDEPENDENT VARIABLES	COEFFICIENT	ASYMPTOTIC t-STATISTIC	PARTIAL DERIVATIVE
Age of head of household (decades)	0.200	1.37	0.002
Black head of household	0.318	0.31	0.030
Spanish American head of household	-0.818	-1.21	-0.078
Annual net income (thousands)	0.142	1.34	0.014
Female head of household	-0.172	-0.41	-0.016
Education of head of household	-0.031	-0.43	-0.003
Number of moves in previous three years	-0.542**	-2.80**	-0.052
Unit and neighborhood satisfaction	0.025	0.15	0.002
Persons per room	-1.828†	-1.92†	-0.174
Distance from meeting requirements (number of physical components failed)	1.493**	4.14**	-0.142
Quality per room	-0.014	-0.34	-0.001
Experimental household (Housing Gap Minimum Standards)	1.587**	3.85**	0.151
CONSTANT	0.278	0.13	NA
Likelihood ratio (significance)		76.46**	
Mean of dependent variable		0.106	
Coefficient of determination		0.364	
Sample size		(310)	

SAMPLE: Minimum Standards and Control households active at two years after enrollment whose units failed the Minimum Standards requirements at enrollment, excluding those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms, Housing Evaluation Forms, and Baseline Interviews.

† t-statistic significant at the 0.10 level.

* t-statistic significant at the 0.05 level.

** t-statistic significant at the 0.01 level.

APPENDIX V

MEETING MINIMUM RENT REQUIREMENTS IN PLACE: COMPANION TABLES TO CHAPTER 3

This appendix contains companion tables to the tables presented in Chapter 3. Tables for Minimum Rent High households and for Minimum Rent Low households in Phoenix are presented here, as well as other tables referenced in the text. All the tables are presented parallel to the order of occurrence in Chapter 3.

Table V-1

HOUSEHOLD PREFERENCES FOR MOVING OR STAYING BY TWO-YEAR OUTCOME: PITTSBURGH MINIMUM RENT LOW

EXPRESSED PREFERENCE	STAYED AND PASSED	STAYED AND FAILED	MOVED AND PASSED	MOVED AND FAILED
	MINIMUM RENT LOW HOUSEHOLDS (Chi-squared = 3.84)			
Move	36%	35%	54%	100%
Stay in unit[a]	64	65	46	0
Other[b]	0	0	0	0
(Sample size)	(11)	(17)	(13)	(2)
	CONTROL HOUSEHOLDS (Chi-squared = 11.93†)			
Move	71%	52%	87%	70%
Stay in unit[a]	29	44	13	30
Other[b]	0	3	0	0
(Sample size)	(17)	(59)	(31)	(10)

SAMPLE: Minimum Rent Low and Control households active at two years after enrollment whose units failed the Minimum Rent Low requirement at enrollment and that did not move between the Baseline Interview and enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms and Baseline Interviews.

NOTES: Percentages do not add to 100 due to rounding.

a. Aggregated responses to: stay and improve, stay and buy, stay but no improvements necessary, stay and do not know whether or not improvements are necessary.

b. Aggregated responses to: would use the money for something else, other.

† Significant at the 0.10 level.

Table V-2

HOUSEHOLD PREFERENCES FOR MOVING OR STAYING BY TWO YEAR OUTCOME: PHOENIX MINIMUM RENT LOW

EXPRESSED PREFERENCE	STAYED AND PASSED	STAYED AND FAILED	MOVED AND PASSED	MOVED AND FAILED
	MINIMUM RENT LOW HOUSEHOLDS (Chi-squared = 9.666)			
Move	0%	31%	61%	33%
Stay in unit[a]	50	54	35	67
Other[b]	50	15	4	0
(Sample size)	(2)	(13)	(23)	(6)
	CONTROL HOUSEHOLDS (Chi-squared = 10.464)			
Move	67%	44%	67%	71%
Stay in unit[a]	33	55	33	29
Other[b]	0	1	0	0
(Sample size)	(3)	(71)	(24)	(48)

SAMPLE: Minimum Rent Low and Control households active at two years after enrollment whose units failed the Minimum Rent Low requirement at enrollment and that did not move between the Baseline Interview and enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms and Baseline Interviews.

NOTES: Percentages do not add to 100 due to rounding.

a. Aggregated responses to: stay and improve, stay and buy, stay but no improvements necessary, stay and do not know whether or not improvements are necessary.

b. Aggregated responses to: would use the money for something else, other.

Table V-3

HOUSEHOLD PREFERENCES FOR MOVING OR STAYING BY TWO-YEAR OUTCOME: PITTSBURGH MINIMUM RENT HIGH

EXPRESSED PREFERENCE	STAYED AND PASSED	STAYED AND FAILED	MOVED AND PASSED	MOVED AND FAILED
	MINIMUM RENT HIGH HOUSEHOLDS (Chi-squared = 10.558†)			
Move	22%	61%	71%	82%
Stay in unit[a]	78	37	24	18
Other[b]	0	2	6	0
(Sample size)	(9)	(41)	(17)	(11)
	CONTROL HOUSEHOLDS (Chi-squared = 11.060†)			
Move	68%	54%	69%	80%
Stay in unit[a]	32	44	31	18
Other[b]	0	2	0	2
(Sample size)	(19)	(126)	(29)	(40)

SAMPLE: Minimum Rent High and Control households active at two years after enrollment whose units failed the Minimum Rent High requirement at enrollment and that did not move between the Baseline Interview and enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms and Baseline Interviews.

NOTES: Percentages do not add to 100 due to rounding.

a. Aggregated responses to: stay and improve, stay and buy, stay but no improvements necessary, stay and do not know whether or not improvements are necessary.

b. Aggregated responses to: would use the money for something else, other.

† Significant at the 0.10 level.

Table V-4

HOUSEHOLD PREFERENCES FOR MOVING OR STAYING BY TWO-YEAR OUTCOME: PHOENIX MINIMUM RENT HIGH

EXPRESSED PREFERENCE	STAYED AND PASSED	STAYED AND FAILED	MOVED AND PASSED	MOVED AND FAILED
	MINIMUM RENT HIGH HOUSEHOLDS (Chi-squared = 6.264†)			
Move	100%	37%	67%	61%
Stay in unit[a]	0	63	33	39
Other[b]	0	0	0	0
(Sample size)	(1)	(27)	(30)	(18)
	CONTROL HOUSEHOLDS (Chi-squared = 19.714**)			
Move	67%	45%	71%	72%
Stay in unit[a]	33	53	19	26
Other[b]	0	2	10	2
(Sample size)	(6)	(87)	(21)	(82)

SAMPLE: Minimum Rent High and Control households active at two years after enrollment whose units failed the Minimum Rent High requirement at enrollment and that did not move between the Baseline Interview and enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms and Baseline Interviews.

NOTES: Percentages do not add to 100 due to rounding.

a. Aggregated responses to: stay and improve, stay and buy, stay but no improvements necessary, stay and do not know whether or not improvements are necessary.

b. Aggregated responses to: would use the money for something else, other.

† Significant at the 0.10 level.

** Significant at the 0.01 level.

Table V-5

HOUSEHOLD SATISFACTION WITH DWELLING UNIT BY TWO-YEAR OUTCOME: PITTSBURGH MINIMUM RENT LOW

EXPRESSED SATISFACTION	STAYED AND PASSED	STAYED AND FAILED	MOVED AND PASSED	MOVED AND FAILED
	MINIMUM RENT LOW HOUSEHOLDS (Chi-squared = 13.34)			
Very satisfied	36%	53%	14%	0%
Somewhat satisfied	54	35	43	50
Somewhat dissatisfied	9	12	21	50
Very dissatisfied	0	0	21	0
(Sample size)	(11)	(17)	(14)	(2)
	CONTROL HOUSEHOLDS (Chi-squared = 3.19)			
Very satisfied	29%	30%	25%	36%
Somewhat satisfied	35	37	28	27
Somewhat dissatisfied	18	15	16	9
Very dissatisfied	18	18	31	27
(Sample size)	(17)	(60)	(32)	(11)

SAMPLE: Minimum Rent Low and Control households active at two years after enrollment whose units failed the Minimum Rent Low requirement at enrollment and that did not move between the Baseline Interview and enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms and Baseline Interviews.

NOTE: Percentages may not add to 100 due to rounding.

Table V-6

HOUSEHOLD SATISFACTION WITH DWELLING UNIT BY TWO-YEAR OUTCOME: PHOENIX MINIMUM RENT LOW

EXPRESSED SATISFACTION	STAYED AND PASSED	STAYED AND FAILED	MOVED AND PASSED	MOVED AND FAILED
	MINIMUM RENT LOW HOUSEHOLDS (Chi-squared = 17.158*)			
Very satisfied	100%	54%	13%	17%
Somewhat satisfied	0	38	35	67
Somewhat dissatisfied	0	8	44	17
Very dissatisfied	0	0	9	0
(Sample size)	(2)	(13)	(23)	(6)
	CONTROL HOUSEHOLDS (Chi-squared = 9.838)			
Very satisfied	0%	38%	21%	25%
Somewhat satisfied	25	35	42	31
Somewhat dissatisfied	25	15	21	27
Very dissatisfied	50	12	17	17
(Sample size)	(4)	(72)	(24)	(48)

SAMPLE: Minimum Rent Low and Control households active at two years after enrollment whose units failed the Minimum Rent Low requirement at enrollment and that did not move between the Baseline Interview and enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms and Baseline Interviews.

NOTE: Percentages may not add to 100 due to rounding.

* Significant at the 0.05 level.

Table V-7

HOUSEHOLD SATISFACTION WITH DWELLING UNIT BY TWO-YEAR OUTCOME: PITTSBURGH MINIMUM RENT HIGH

EXPRESSED SATISFACTION	STAYED AND PASSED	STAYED AND FAILED	MOVED AND PASSED	MOVED AND FAILED
	MINIMUM RENT HIGH HOUSEHOLDS (Chi-squared = 10.762)			
Very satisfied	67%	33%	24%	36%
Somewhat satisfied	33	33	18	18
Somewhat dissatisfied	0	21	35	27
Very dissatisfied	0	12	24	18
(Sample size)	(9)	(42)	(17)	(11)
	CONTROL HOUSEHOLDS (Chi-squared = 7.738)			
Very satisfied	42%	32%	27%	27%
Somewhat satisfied	37	35	23	34
Somewhat dissatisfied	10	15	13	15
Very dissatisfied	10	18	37	24
(Sample size)	(19)	(127)	(30)	(41)

SAMPLE: Minimum Rent High and Control households active at two years after enrollment whose units failed the Minimum Rent High requirement at enrollment and that did not move between the Baseline Interview and enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms and Baseline Interviews.

NOTE: Percentages may not add to 100 due to rounding.

Table V-8

HOUSEHOLD SATISFACTION WITH DWELLING UNIT BY TWO-YEAR OUTCOME: PHOENIX MINIMUM RENT HIGH

EXPRESSED SATISFACTION	STAYED AND PASSED	STAYED AND FAILED	MOVED AND PASSED	MOVED AND FAILED
	MINIMUM RENT HIGH HOUSEHOLDS (Chi-squared = 4.656)			
Very satisfied	100%	37%	33%	42%
Somewhat satisfied	0	37	30	26
Somewhat dissatisfied	0	22	23	16
Very dissatisfied	0	4	13	16
(Sample size)	(1)	(27)	(30)	(19)
	CONTROL HOUSEHOLDS (Chi-squared = 5.9112)			
Very satisfied	17%	37%	24%	30%
Somewhat satisfied	50	34	43	34
Somewhat dissatisfied	17	18	29	18
Very dissatisfied	17	11	5	17
(Sample size)	(6)	(89)	(21)	(82)

SAMPLE: Minimum Rent High and Control households active at two years after enrollment whose units failed the Minimum Rent High requirement at enrollment and that did not move between the Baseline Interview and enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms and Baseline Interviews.

NOTE: Percentages may not add to 100 due to rounding.

Table V-9

LOGIT ESTIMATE OF THE PROBABILITY OF MEETING MINIMUM RENT LOW IN PLACE: PITTSBURGH MINIMUM RENT LOW AND CONTROL HOUSEHOLDS (INTERACTION MODEL)

INDEPENDENT VARIABLES	COEFFICIENT	ASYMPTOTIC t-STATISTIC	PARTIAL DERIVATIVE
Age of head of household (decades)	0.495**	3.15**	0.072
Black head of household	-0.727	-1.74	-0.106
Household size	0.250*	2.37**	0.036
Annual net income (thousands)	-0.313*	2.18*	0.005
Female head of household	1.592**	3.10**	0.231
Education of head of household	0.266*	2.42*	-0.039
Number of moves in previous three years	-0.210	-0.98	-0.030
Unit and neighborhood satisfaction	0.065	0.47	0.009
Distance from meeting requirements (dollar gap)	-0.044	-1.55	-0.006
Experimental household (Housing Gap Minimum Rent Low)	1.520*	2.24*	0.220
Minimum Rent household x distance	-0.046	-1.10	0.007
CONSTANT	-9.454**	4.38**	-1.372
Likelihood ratio (significance)		32.22**	
Mean of dependent variable		0.176	
Coefficient of determination		0.218	
Sample size		(159)	

SAMPLE: Minimum Rent and Control households active at two years after enrollment that failed the Minimum Rent requirements at enrollment, excluding those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms and Baseline Interviews.

* t-statistic significant at the 0.05 level.

** t-statistic significant at the 0.01 level.

Table V-10

LOGIT ESTIMATE OF THE PROBABILITY OF MEETING MINIMUM RENT HIGH IN PLACE: PITTSBURGH MINIMUM RENT HIGH AND CONTROL HOUSEHOLDS (INTERACTION MODEL)

INDEPENDENT VARIABLES	COEFFICIENT	ASYMPTOTIC t-STATISTIC	PARTIAL DERIVATIVE
Age of head of household (decades)	-0.339*	-1.98*	-0.030
Black head of household	0.682	1.35	0.061
Household size	-0.150	-0.83	-0.013
Annual net income (thousands)	0.132	0.93	0.010
Female head of household	0.836	1.67	0.074
Education of head of household	0.205	1.70	0.018
Number of moves in previous three years	-0.744	-2.64**	-0.066
Unit and neighborhood satisfaction	0.488	3.18**	0.044
Distance from meeting requirements (dollar gap)	-0.088**	-4.76**	-0.008
Experimental household (Housing Gap Minimum Rent Low)	0.388	0.52	0.035
Minimum Rent household x distance	-0.040	-1.21	-0.004
CONSTANT	-4.383*	-2.13	-0.391
Likelihood ratio (significance)		59.30**	
Mean of dependent variable		0.099	
Coefficient of determination		0.313	
Sample size		(293)	

SAMPLE: Minimum Rent and Control households active at two years after enrollment that failed the Minimum Rent requirements at enrollment, excluding those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms and Baseline Interviews.

* t-statistic significant at the 0.05 level.

** t-statistic significant at the 0.01 level.

Table V-11

CHANGE IN MEAN RENT OVER TWO YEARS
MINIMUM RENT LOW AND CONTROL HOUSEHOLDS

	PITTSBURGH			PHOENIX		
	OUTCOMES			OUTCOMES		
	STAYED AND PASSED	STAYED AND FAILED	SAMPLE SIZE	STAYED AND PASSED	STAYED AND FAILED	SAMPLE SIZE
MEAN RENT AT ENROLLMENT						
Minimum Rent Low households	$100 (12)	$ 73 (17)	(29)	$114 (3)	$ 77 (13)	(16)
Control households	93 (16)	84 (60)	(76)	115 (3)	91 (75)	(78)
MEAN RENT AT TWO YEARS						
Minimum Rent Low households	119 (12)	85 (17)	(29)	135 (3)	86 (13)	(16)
Control households	110 (16)	94 (60)	(76)	128 (3)	98 (75)	(78)
MEAN PERCENTAGE CHANGE						
Minimum Rent Low households	20.9% (12)	20.0% (17)	(29)	22.4% (3)	12.0% (75)	(16)
Control households	20.6 (16)	12.8 (60)	(76)	9.7 (3)	9.2 (75)	(78)
t-STATISTIC FOR MEAN PERCENTAGE CHANGE						
Minimum Rent Low households versus Control households	0.05	1.53		0.97	0.42	
Stayed/passed vs. failed Minimum Rent Low households	0.15			0.81		
Stayed/passed vs. failed Control households	1.35			0.09		

SAMPLE. Minimum Rent and Control households active at two years after enrollment that failed the Minimum Rent requirements at enrollment, excluding those with enrollment incomes over the eligibility limits, those living in their own homes or in subsidized housing, and those with a missing value at either enrollment or two years.

DATA SOURCES Initial and monthly Household Report Forms.

Table V-12

CHANGE IN MEAN RENT OVER TWO YEARS
MINIMUM RENT HIGH AND CONTROL HOUSEHOLDS

	PITTSBURGH			PHOENIX		
	OUTCOMES			OUTCOMES		
	STAYED AND PASSED	STAYED AND FAILED	SAMPLE SIZE	STAYED AND PASSED	STAYED AND FAILED	SAMPLE SIZE
MEAN RENT AT ENROLLMENT						
Minimum Rent High households	$102 (9)	$ 96 (43)	(52)	-- (0)	$ 93 (25)	(25)
Control households	119 (19)	96 (125)	(144)	151 (5)	99 (92)	(97)
MEAN RENT AT TWO YEARS						
Minimum Rent High households	139 (9)	107 (43)	(52)	-- (0)	105 (25)	(25)
Control households	150 (19)	108 (125)	(144)	162 (5)	106 (92)	(97)
MEAN PERCENTAGE CHANGE						
Minimum Rent High households	35.2% (9)	12.2% (43)	(52)	-- (0)	11.3% (25)	(25)
Control households	25.6 (19)	13.0 (125)	(144)	7.4 (5)	8.9 (92)	(97)
t-STATISTIC FOR MEAN PERCENTAGE CHANGE						
Minimum Rent High households versus Control households	1.26	-0.26		--	0.53	
Stayed/passed vs. failed Minimum Rent High households	3.47**			--		
Stayed/passed vs. failed Control households	2.88**			-0.44		

SAMPLE. Minimum Rent and Control households active at two years after enrollment that failed the Minimum Rent requirements at enrollment, excluding those with enrollment incomes over the eligibility limits, those living in their own homes or in subsidized housing, and those with a missing value at either enrollment or two years.

DATA SOURCES Initial and Monthly Household Report Forms.

** Significant at the 0.01 level.

Table V-13

CHANGE IN MEAN HOUSING SERVICES OVER TWO YEARS.
MINIMUM RENT LOW AND CONTROL HOUSEHOLDS

	PITTSBURGH			PHOENIX		
	OUTCOMES			OUTCOMES		
	STAYED AND PASSED	STAYED AND FAILED	SAMPLE SIZE	STAYED AND PASSED	STAYED AND FAILED	SAMPLE SIZE
MEAN HOUSING SERVICES AT ENROLLMENT						
Minimum Rent Low households	112.97 (11)	99.09 (14)	(25)	106.29 (2)	94.34 (12)	(14)
Control households	110.29 (14)	98.01 (57)	(71)	110.79 (3)	107.16 (69)	(72)
MEAN HOUSING SERVICES AT TWO YEARS						
Minimum Rent Low households	111.30 (11)	98.85 (14)	(25)	115.28 (2)	103.20 (12)	(14)
Control households	112.02 (14)	98.96 (57)	(71)	116.19 (3)	112.23 (69)	(72)
MEAN PERCENTAGE CHANGE						
Minimum Rent Low households	-1.2% (11)	-0.3% (14)	(25)	-8.4% (2)	-11.7% (12)	(14)
Control households	-1.6 (14)	-1.2 (57)	(71)	4.6 (3)	-6.4 (69)	(72)
t-STATISTIC FOR MEAN PERCENTAGE CHANGE						
Minimum Rent Low households versus Control households	0.76	0.28		0.51	0.98	
Stayed/passed vs. failed Minimum Rent Low households	-0.41			0.37		
Stayed/passed vs. failed Control households	0.12			0.66		

SAMPLE Minimum Rent and Control households active at two years after enrollment that failed the Minimum Rent requirements at enrollment, excluding those with enrollment incomes over the eligibility limits, those living in their own homes or in subsidized housing, and those with extreme values for the hedonic residual.

DATA SOURCES Initial and monthly Household Report Forms, Housing Evaluation Forms, and Baseline and Periodic Interviews.

Table V-14

CHANGE IN MEAN HOUSING SERVICES OVER TWO YEARS:
MINIMUM RENT HIGH AND CONTROL HOUSEHOLDS

	PITTSBURGH			PHOENIX		
	OUTCOMES			OUTCOMES		
	STAYED AND PASSED	STAYED AND FAILED	SAMPLE SIZE	STAYED AND PASSED	STAYED AND FAILED	SAMPLE SIZE
MEAN HOUSING SERVICES AT ENROLLMENT						
Minimum Rent High households	113.48 (8)	100.95 (38)	(46)	-- (0)	119.79 (24)	(24)
Control households	120.34 (18)	104.83 (113)	(131)	150.98 (5)	113.54 (86)	(91)
MEAN HOUSING SERVICES AT TWO YEARS						
Minimum Rent High households	114.74 (8)	104.26 (38)	(46)	-- (0)	128.38 (24)	(24)
Control households	125.65 (18)	106.23 (113)	(131)	150.36 (5)	118.06 (86)	(91)
MEAN PERCENTAGE CHANGE						
Minimum Rent High households	0.69% (8)	4.2% (38)	(46)	-- (0)	8.8% (24)	(24)
Control households	4.9 (18)	1.4 (113)	(131)	0.35 (5)	5.5 (86)	(91)
t-STATISTIC FOR MEAN PERCENTAGE CHANGE						
Minimum Rent High households versus Control households	-1.20	1.39		--	0.98	
Stayed/passed vs. failed Minimum Rent High households	-1.28			--		
Stayed/passed vs. failed Control households	1.17			2.17*		

SAMPLE Minimum Rent and Control households active at two years after enrollment that failed the Minimum Rent requirements at enrollment, excluding those with enrollment incomes over the eligibility limits, those living in their own homes or in subsidized housing, and those with extreme values for the hedonic residual.

DATA SOURCES. Initial and monthly Household Report Forms, Housing Evaluation Forms, and Baseline and Periodic Interviews.

* Significant at the 0.05 level.

Table V-15

HOUSING EVALUATOR OVERALL RATING OF DWELLING UNIT
MINIMUM RENT LOW AND CONTROL HOUSEHOLDS

	PITTSBURGH			PHOENIX		
	OUTCOMES			OUTCOMES		
	STAYED AND PASSED	STAYED AND FAILED	SAMPLE SIZE	STAYED AND PASSED	STAYED AND FAILED	SAMPLE SIZE
MEAN RATING AT ENROLLMENT						
Minimum Rent Low households	1.15 (13)	1.53 (17)	(30)	1.00 (3)	1.77 (13)	(16)
Control households	1.25 (16)	1.45 (60)	(76)	1.67 (3)	1.57 (77)	(80)
MEAN RATING AT TWO YEARS						
Minimum Rent Low households	1.08 (13)	1.24 (17)	(30)	1.33 (3)	1.54 (13)	(16)
Control households	1.00 (16)	1.40 (60)	(76)	2.00 (3)	1.56 (77)	(80)
MEAN CHANGE						
Minimum Rent Low households	0.08 (13)	0.29 (17)	(30)	-0.33 (3)	0.23 (13)	(16)
Control households	0.25 (16)	0.05 (60)	(76)	-0.33 (3)	0.01 (77)	(80)
t-STATISTIC FOR MEAN CHANGE						
Minimum Rent Low households versus Control households	-0.98	1.31		0.00	1.14	
Stayed/passed vs. failed Minimum Rent Low households	1.01			1.51		
Stayed/passed vs. failed Control households	1.43			1.00		

SAMPLE. Minimum Rent and Control households active at two years after enrollment that failed the Minimum Rent requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES Initial and monthly Household Report Forms and Housing Evaluation Forms.

NOTE The evaluator rating is measured on a four-point scale, from 0, indicating the unit is in good condition, to 3, indicating the unit is unfit for habitation.

Table V-16

HOUSING EVALUATOR OVERALL RATING OF DWELLING UNIT.
MINIMUM RENT HIGH AND CONTROL HOUSEHOLDS

	PITTSBURGH			PHOENIX		
	OUTCOMES			OUTCOMES		
	STAYED AND PASSED	STAYED AND FAILED	SAMPLE SIZE	STAYED AND PASSED	STAYED AND FAILED	SAMPLE SIZE
MEAN RATING AT ENROLLMENT						
Minimum Rent High households	1.22 (9)	1.40 (43)	(52)	-- (0)	1.63 (27)	(27)
Control households	1.16 (19)	1.29 (125)	(144)	0.40 (5)	1.48 (94)	(99)
MEAN RATING AT TWO YEARS						
Minimum Rent High households	1.00 (9)	1.33 (43)	(52)	-- (0)	1.37 (27)	(27)
Control households	1.21 (19)	1.22 (125)	(144)	0.40 (5)	1.47 (94)	(99)
MEAN CHANGE						
Minimum Rent High households	0.22 (9)	0.07 (43)	(52)	-- (0)	0.26 (27)	(27)
Control households	-0.05 (19)	0.07 (125)	(144)	0 (5)	0.01 (94)	(99)
t-STATISTIC FOR MEAN CHANGE						
Minimum Rent High households versus Control households	1.26	-0.02		--	1.56	
Stayed/passed vs. failed Minimum Rent High households	0.90			--		
Stayed/passed vs. failed Control households	0.73			0.03		

SAMPLE Minimum Rent and Control households active at two years after enrollment that failed the Minimum Rent requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES. Initial and monthly Household Report Forms and Housing Evaluation Forms.

NOTE: The evaluator rating is measured on a four-point scale, from 0, indicating the unit is in good condition, to 3, indicating the unit is unfit for habitation.

Table V-17

HOUSING EVALUATOR OVERALL RATING OF DWELLING UNIT
PITTSBURGH MINIMUM RENT LOW AND CONTROL HOUSEHOLDS

	ENROLLMENT			TWO YEARS		
	OUTCOMES		t-STATISTIC	OUTCOMES		t-STATISTIC
	STAYED AND PASSED	STAYED AND FAILED	(stayed/passed v. stayed/failed)	STAYED AND PASSED	STAYED AND FAILED	(stayed/passed v. stayed/failed)
GOOD CONDITION						
Minimum Rent Low households	8% (1)	--% (0)	1.164	--% (0)	--% (0)	--
Control households	6 (1)	8 (4)	-0.057	12 (2)	2 (1)	1.970†
t-statistic	0.148	-1.100		-1.320	-0.541	
BASICALLY SOUND, MINOR REPAIRS NEEDED						
Minimum Rent Low households	69 (9)	53 (9)	0.903	92 (12)	76 (13)	1.150
Control households	62 (10)	45 (27)	1.240	75 (12)	58 (35)	1.220
t-statistic	0.378	0.576		1.226	1.367	
BASICALLY SOUND, MAJOR REPAIRS OR RENOVATIONS NEEDED						
Minimum Rent Low households	23 (3)	41 (7)	-1.042	8 (1)	24 (4)	-1.150
Control households	31 (5)	45 (27)	-0.986	12 (2)	38 (23)	-1.950†
t-statistic	-0.491	-0.275		-0.422	-1.129	
UNSOUND, UNFIT FOR HUMAN HABITATION						
Minimum Rent Low households	-- (0)	6 (1)	-0.891	-- (0)	-- (0)	--
Control households	-- (0)	3 (2)	-0.736	-- (0)	2 (1)	-0.525
t-statistic	--	0.490		--	-0.541	

SAMPLE Minimum Rent and Control households active at two years after enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES Initial and monthly Household Report Forms and Housing Evaluation Forms.

† t-statistic significant at the 0.10 level.

Table V-18

HOUSING EVALUATOR OVERALL RATING OF DWELLING UNIT:
PHOENIX MINIMUM RENT LOW AND CONTROL HOUSEHOLDS

	ENROLLMENT			TWO YEARS		
	OUTCOMES		t-STATISTIC	OUTCOMES		t-STATISTIC
	STAYED AND PASSED	STAYED AND FAILED	(stayed/passed v. stayed/failed)	STAYED AND PASSED	STAYED AND FAILED	(stayed/passed v. stayed/failed)
GOOD CONDITION						
Minimum Rent Low households	--% (0)	--% (0)	--	--% (0)	--% (0)	--
Control households	-- (0)	16 (12)	-0.742	-- (0)	6 (5)	-0.456
t-statistic	--	-1.530		--	-0.946	
BASICALLY SOUND, MINOR REPAIRS NEEDED						
Minimum Rent Low households	100 (3)	31 (4)	2.178*	67 (2)	46 (6)	0.640
Control households	33 (1)	31 (24)	0.077	0 (0)	38 (29)	-1.332
t-statistic	1.733	-0.029		1.733	0.581	
BASICALLY SOUND, MAJOR REPAIRS OR RENOVATIONS NEEDED						
Minimum Rent Low households	-- (0)	62 (8)	-1.920†	33 (1)	54 (7)	-0.640
Control households	67 (2)	34 (26)	1.172	100 (3)	49 (38)	1.720†
t-statistic	-1.733	1.905†		-1.733	0.294	
UNSOUND, UNFIT FOR HUMAN HABITATION						
Minimum Rent Low households	-- (0)	8 (1)	-0.496	-- (0)	-- (0)	--
Control households	-- (0)	20 (15)	-0.849	-- (0)	6 (5)	-0.946
t-statistic	--	-1.029		--	-0.946	

SAMPLE Minimum Rent and Control households active at two years after enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES Initial and monthly Household Report Forms and Housing Evaluation Forms.

† t-statistic significant at the 0.10 level.

* t-statistic significant at the 0.05 level.

Table V-19

HOUSING EVALUATOR OVERALL RATING OF DWELLING UNIT.
PITTSBURGH MINIMUM RENT HIGH AND CONTROL HOUSEHOLDS

	ENROLLMENT OUTCOMES		t-STATISTIC	TWO YEARS OUTCOMES		t-STATISTIC
	STAYED AND PASSED	STAYED AND FAILED	(stayed/passed v stayed/failed)	STAYED AND PASSED	STAYED AND FAILED	(stayed/passed v. stayed/failed)
GOOD CONDITION						
Minimum Rent High households	--% (0)	5% (2)	-.0663	--% (0)	5% (2)	-0.663
Control households	21 (4)	9 (11)	1.635	10 (2)	5 (6)	1.011
t-statistic	-1.489	-0.867		-1.009	-0.027	
BASICALLY SOUND, MINOR REPAIRS NEEDED						
Minimum Rent High households	78 (7)	54 (23)	1.342	100 (9)	58 (25)	2.402
Control households	42 (8)	55 (69)	-1.067	58 (11)	70 (87)	-1.019
t-statistic	1.769†	-0.193		2.303*	-1.380	
BASICALLY SOUND, MAJOR REPAIRS OR RENOVATIONS NEEDED						
Minimum Rent High households	22 (2)	40 (17)	-0.980	-- (0)	37 (16)	-2.199*
Control households	37 (7)	34 (43)	0.205	32 (6)	25 (31)	0.632
t-statistic	-0.773	0.602		-1.903†	1.563	
UNSOUND, UNFIT FOR HUMAN HABITATION						
Minimum Rent High households	-- (0)	2 (1)	-0.459	-- (0)	-- (0)	--
Control households	-- (0)	2 (2)	-0.555	-- (0)	1 (1)	-0.391
t-statistic	--	0.300		--	-0.588	

SAMPLE. Minimum Rent and Control households active at two years after enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES Initial and monthly Household Report Forms and Housing Evaluation Forms.

† t-statistic significant at the 0.10 level.

* t-statistic significant at the 0.05 level.

Table V-20

HOUSING EVALUATOR OVERALL RATING OF DWELLING UNIT.
PHOENIX MINIMUM RENT HIGH AND CONTROL HOUSEHOLDS

	ENROLLMENT			TWO YEARS		
	OUTCOMES		t-STATISTIC	OUTCOMES		t-STATISTIC
	STAYED AND PASSED	STAYED AND FAILED	(stayed/passed v. stayed/failed)	STAYED AND PASSED	STAYED AND FAILED	(stayed/passed v. stayed/failed)
GOOD CONDITION						
Minimum Rent High households	--% (0)	18 (5)	--	--% (0)	15 (4)	--
Control households	60 (5)	16 (15)	2.484*	60 (3)	10 (9)	3.362**
t-statistic	-- (0)	0.308		-- (0)	0.768	
BASICALLY SOUND, MINOR REPAIRS NEEDED						
Minimum Rent High households	-- (0)	22 (6)	--	-- (0)	37 (10)	--
Control households	40 (2)	36 (34)	0.172	40 (2)	39 (37)	0.027
t-statistic	--	-1.363		--	-0.226	
BASICALLY SOUND, MAJOR REPAIRS OR RENOVATIONS NEEDED						
Minimum Rent High households	-- (0)	37 (10)	--	-- (0)	44 (12)	--
Control households	-- (0)	32 (30)	-2.012*	-- (0)	46 (43)	-2.009*
t-statistic	--	0.497		--	-0.120	
UNSOUND, UNFIT FOR HUMAN HABITATION						
Minimum Rent High households	-- (0)	22 (6)	--	-- (0)	4 (1)	--
Control households	-- (0)	16 (15)	-0.971	-- (0)	5 (5)	-0.528
t-statistic	--	0.749		--	-0.338	

SAMPLE Minimum Rent and Control households active at two years after enrollment, excluding those with enrollment incomes over the elgibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES Initial and monthly Household Report Forms and Housing Evaluation Forms.

* t-statistic significant at the 0.05 level.

** t-statistic significant at the 0.01 level.

Table V-21

MEAN NUMBER OF MINIMUM STANDARDS PHYSICAL COMPONENTS FAILED
MINIMUM RENT LOW AND CONTROL HOUSEHOLDS

	PITTSBURGH			PHOENIX		
	OUTCOMES			OUTCOMES		
	STAYED AND PASSED	STAYED AND FAILED	SAMPLE SIZE	STAYED AND PASSED	STAYED AND FAILED	SAMPLE SIZE
MEAN NUMBER OF COMPONENTS FAILED AT ENROLLMENT						
Minimum Rent Low households	1.62 (13)	2.06 (17)	(30)	0.67 (3)	2.62 (13)	(16)
Control households	1.44 (16)	1.88 (60)	(76)	3.00 (3)	3.56 (77)	(80)
MEAN NUMBER OF COMPONENTS FAILED AT TWO YEARS						
Minimum Rent Low households	1.15 (13)	1.82 (17)	(30)	0.33 (3)	2.23 (13)	(16)
Control households	1.38 (16)	2.10 (60)	(76)	2.67 (3)	3.46 (77)	(80)
MEAN CHANGE						
Minimum Rent Low households	0.46 (13)	0.24 (17)	(30)	0.33 (3)	0.38 (13)	(16)
Control households	0.06 (16)	-0.22 (60)	(76)	0.33 (3)	0.10 (77)	(80)
t-STATISTIC FOR MEAN CHANGE						
Minimum Rent Low households versus Control households	1.32	1.31		0.00	0.54	
Stayed/passed vs. failed Minimum Rent Low households	0.59			-0.09		
Stayed/passed vs. failed Control households	1.09			0.19		

SAMPLE Minimum Rent and Control households active at two years after enrollment that failed the Minimum Rent requirements at enrollment, excluding those with enrollment incomes over the eligibility limits, those living in their own homes or in subsidized housing, and those with a missing value at either enrollment or two years.

DATA SOURCES Initial and monthly Household Report Forms and Housing Evaluation Forms.

Table V-22

MEAN NUMBER OF MINIMUM STANDARDS PHYSICAL COMPONENTS FAILED:
MINIMUM RENT HIGH AND CONTROL HOUSEHOLDS

	PITTSBURGH			PHOENIX		
	OUTCOMES			OUTCOMES		
	STAYED AND PASSED	STAYED AND FAILED	SAMPLE SIZE	STAYED AND PASSED	STAYED AND FAILED	SAMPLE SIZE
MEAN NUMBER OF COMPONENTS FAILED AT ENROLLMENT						
Minimum Rent High households	1.22 (9)	1.60 (43)	(52)	-- (0)	3.52 (27)	(27)
Control households	1.05 (19)	1.46 (125)	(144)	0.80 (5)	3.11 (94)	(27)
MEAN NUMBER OF COMPONENTS FAILED AT TWO YEARS						
Minimum Rent High households	1.11 (9)	1.79 (43)	(52)	-- (0)	2.73 (26)	(27)
Control households	1.05 (19)	1.65 (125)	(144)	0.60 (5)	3.05 (94)	(99)
MEAN CHANGE						
Minimum Rent High households	0.11 (9)	-0.19 (43)	(52)	-- (0)	0.67 (27)	(27)
Control households	-- (19)	-0.18 (125)	(144)	0.20 (5)	0.05 (94)	(99)
t-STATISTIC FOR MEAN CHANGE						
Minimum Rent High households versus Control households	0.27	-0.01		--	1.64	
Stayed/passed vs. failed Minimum Rent High households	-0.79			--		
Stayed/passed vs. failed Control households	-0.79			0.57		

SAMPLE Minimum Rent and Control households active at two years after enrollment that failed the Minimum Rent requirements at enrollment, excluding those with enrollment incomes over the eligibility limits, those living in their own homes or in subsidized housing, and those with a missing value at either enrollment or two years.

DATA SOURCES Initial and monthly Household Report Forms and Housing Evaluation Forms.

Table V-23

MEAN HOUSING DEPRIVATION MEASURE
MINIMUM RENT LOW AND CONTROL HOUSEHOLDS

	PITTSBURGH			PHOENIX		
	OUTCOMES			OUTCOMES		
	STAYED AND PASSED	STAYED AND FAILED	SAMPLE SIZE	STAYED AND PASSED	STAYED AND FAILED	SAMPLE SIZE
MEAN DEPRIVATION MEASURE AT ENROLLMENT						
Minimum Rent Low households	2.46 (13)	2.71 (17)	(30)	1.00 (3)	2.69 (13)	(16)
Control households	2.25 (16)	2.57 (60)	(76)	3.00 (3)	2.57 (77)	(80)
MEAN DEPRIVATION MEASURE AT TWO YEARS						
Minimum Rent Low households	2.15 (13)	2.41 (17)	(30)	1.67 (3)	2.69 (13)	(16)
Control households	2.25 (16)	2.53 (60)	(76)	3.00 (3)	2.62 (77)	(80)
MEAN CHANGE						
Minimum Rent Low households	0.31 (13)	0.29 (17)	(30)	0.67 (3)	0.00 (13)	(16)
Control households	0.00 (16)	-0.03 (60)	(30)	0.00 (3)	-0.05 (77)	(80)
t-STATISTIC FOR MEAN CHANGE						
Minimum Rent Low households versus Control households	1.31	1.60		-2.00	0.41	
Stayed/passed vs. failed Minimum Rent Low households	-0.06			1.89		
Stayed/passed vs. failed Control households	0.19			-0.89		

SAMPLE Minimum Rent and Control households active at two years after enrollment that failed the Minimum Rent requirements at enrollment, excluding those with enrollment incomes over the eligibility limits, those living in their own homes or in subsidized housing, and those with a missing value at either enrollment or two years.

DATA SOURCES Initial and monthly Household Report Forms and Housing Evaluation Forms.

NOTE The measure is a three-point scale, 1 indicating a minimally adequate unit and 3 indicating a clearly inadequate unit.

Table V-24

MEAN HOUSING DEPRIVATION MEASURE:
MINIMUM RENT HIGH AND CONTROL HOUSEHOLDS

	PITTSBURGH			PHOENIX		
	OUTCOMES			OUTCOMES		
	STAYED AND PASSED	STAYED AND FAILED	SAMPLE SIZE	STAYED AND PASSED	STAYED AND FAILED	SAMPLE SIZE
MEAN DEPRIVATION MEASURE AT ENROLLMENT						
Minimum Rent High households	2.11 (9)	2.26 (43)	(52)	-- (0)	2.56 (27)	(27)
Control households	2.10 (19)	2.31 (125)	(144)	1.40 (5)	2.45 (94)	(99)
MEAN DEPRIVATION MEASURE AT TWO YEARS						
Minimum Rent High households	2.22 (9)	2.44 (43)	(52)	-- (0)	2.48 (27)	(27)
Control households	2.21 (19)	2.33 (125)	(144)	1.60 (5)	2.55 (94)	(99)
MEAN CHANGE						
Minimum Rent High households	-0.11 (9)	-0.19 (43)	(52)	-- (0)	0.07 (27)	(27)
Control households	-0.10 (19)	-0.02 (125)	(144)	-0.20 (5)	-0.11 (94)	(99)
t-STATISTIC FOR MEAN CHANGE						
Minimum Rent High households versus Control households	-0.02	-1.35		--	1.19	
Stayed/passed vs. failed Minimum Rent High households	-0.23			--		
Stayed/passed vs. failed Control households	0.43			0.45		

SAMPLE Minimum Rent and Control households active at two years after enrollment that failed the Minimum Rent requirements at enrollment, excluding those with enrollment incomes over the eligibility limits, those living in their own homes or in subsidized housing, and those with a missing value at either enrollment or two years.

DATA SOURCES Initial and monthly Household Report Forms and Housing Evaluation Forms.

NOTE: The measure is a three-point scale, 1 indicating a minimally adequate unit and 3 indicating a clearly inadequate unit.

Table V-25

MEAN LINEAR AND SEMILOG HEDONIC RESIDUALS·
PHOENIX MINIMUM RENT LOW AND CONTROL HOUSEHOLDS

	LINEAR			SEMILOG		
	OUTCOMES			OUTCOMES		
	STAYED AND PASSED	STAYED AND FAILED	SAMPLE SIZE	STAYED AND PASSED	STAYED AND FAILED	SAMPLE SIZE
MEAN HEDONIC RESIDUALS AT ENROLLMENT						
Minimum Rent Low households	-5.66 (2)	-7.02 (12)	(14)	-0.05 (2)	-0.09 (12)	(14)
Control households	3.38 (3)	-8.94 (67)	(70)	0.10 (3)	-0.08 (67)	(70)
MEAN HEDONIC RESIDUALS AT TWO YEARS						
Minimum Rent Low households	14.02 (2)	-3.01 (12)	(14)	0.17 (2)	-0.02 (12)	(14)
Control households	22.96 (3)	-5.56 (67)	(70)	0.26 (3)	-0.04 (67)	(70)
MEAN CHANGE						
Minimum Rent Low households	-19.68 (2)	-4.00 (12)	(14)	-0.21 (2)	-0.07 (12)	(14)
Control households	-19.59 (3)	-3.37 (67)	(70)	-0.16 (3)	-0.04 (67)	(70)
t-STATISTIC FOR MEAN CHANGE						
Minimum Rent Low households versus Control households	0.00	0.15		0.29	0.71	
Stayed/passed vs. failed Minimum Rent Low households	0.90			0.82		
Stayed/passed vs. failed Control households	1.61			1.19		

SAMPLE Minimum Rent and Control households active at two years after enrollment that failed the Minimum Rent requirements at enrollment, excluding those with enrollment incomes over the eligibility limits, those living in their own homes or in subsidized housing, those with extreme values for the hedonic residual, and those with a missing value at either enrollment or two years.

DATA SOURCES: Initial and monthly Household Report Forms, Housing Evaluation Forms, and Baseline and Periodic Interviews.

NOTE Residuals are defined as (actual rent-predicted rent).

Table V-26

MEAN LINEAR AND SEMILOG HEDONIC RESIDUALS:
PITTSBURGH MINIMUM RENT HIGH AND CONTROL HOUSEHOLDS

	LINEAR			SEMILOG		
	OUTCOMES			OUTCOMES		
	STAYED AND PASSED	STAYED AND FAILED	SAMPLE SIZE	STAYED AND PASSED	STAYED AND FAILED	SAMPLE SIZE
MEAN HEDONIC RESIDUALS AT ENROLLMENT						
Minimum Rent High households	-6.35 (8)	-4.93 (38)	(46)	-0.03 (8)	-0.04 (37)	(45)
Control households	5.09 (18)	-7.51 (113)	(131)	0.06 (18)	-0.07 (110)	(128)
MEAN HEDONIC RESIDUALS AT TWO YEARS						
Minimum Rent High households	23.58 (8)	2.16 (38)	(46)	0.24 (8)	0.02 (37)	(45)
Control households	18.62 (18)	0.25 (113)	(131)	0.17 (18)	0.01 (110)	(128)
MEAN CHANGE						
Minimum Rent High households	-29.93 (8)	-7.08 (38)	(46)	-0.26 (8)	-0.07 (37)	(45)
Control households	-13.53 (18)	-7.76 (113)	(131)	-0.11 (18)	-0.08 (110)	(128)
t-STATISTIC FOR MEAN CHANGE						
Minimum Rent High households versus Control households	2.29*	0.27		2.43*	0.45	
Stayed/passed vs. failed Minimum Rent High households	4.00**			3.83**		
Stayed/passed vs. failed Control households	1.15			0.68		

SAMPLE: Minimum Rent and Control households active at two years after enrollment that failed the Minimum Rent requirements at enrollment, excluding those with enrollment incomes over the eligibility limits, those living in their own homes or in subsidized housing, those with extreme values for the hedonic residual, and those with a missing value at either enrollment or two years.

DATA SOURCES Initial and monthly Household Report Forms, Housing Evaluation Forms, and Baseline and Periodic Interviews.

NOTE Residuals are defined as (actual rent-predicted rent).

* t-statistic significant at the 0.05 level.

** t-statistic significant at the 0.01 level.

Table V-27

MEAN LINEAR AND SEMILOG HEDONIC RESIDUALS:
PHOENIX MINIMUM RENT HIGH AND CONTROL HOUSEHOLDS

	LINEAR			SEMILOG		
	OUTCOMES			OUTCOMES		
	STAYED AND PASSED	STAYED AND FAILED	SAMPLE SIZE	STAYED AND PASSED	STAYED AND FAILED	SAMPLE SIZE
MEAN HEDONIC RESIDUALS AT ENROLLMENT						
Minimum Rent High households	-- (0)	-18.39 (22)	(22)	-- (0)	-0.14 (22)	(22)
Control households	6.36 (5)	-8.03 (84)	(89)	0.08 (5)	-0.06 (84)	(89)
MEAN HEDONIC RESIDUALS AT TWO YEARS						
Minimum Rent High households	-- (0)	-14.24 (22)	(22)	-- (0)	-0.10 (22)	(22)
Control households	18.95 (5)	-2.98 (84)	(89)	0.17 (5)	-0.01 (84)	(89)
MEAN CHANGE						
Minimum Rent High households	-- (0)	-4.15 (22)	(22)	-- (0)	-0.04 (22)	(22)
Control households	-12.59 (5)	-5.05 (84)	(89)	-0.10 (5)	-0.05 (84)	(89)
t-STATISTIC FOR MEAN CHANGE						
Minimum Rent High households versus Control households	--	0.16		--	0.05	
Stayed/passed vs. failed Minimum Rent High households	--			--		
Stayed/passed vs. failed Control households	1.84			1.55		

SAMPLE Minimum Rent and Control households active at two years after enrollment that failed the Minimum Rent requirements at enrollment, excluding those with enrollment incomes over the eligibility limits, those living in their own homes or in subsidized housing, those with extreme values for the hedonic residual, and those with a missing value at either enrollment or two years.

DATA SOURCES. Initial and monthly Household Report Forms, Housing Evaluation Forms, and Baseline and Periodic Interviews.

NOTE Residuals are defined as (actual rent-predicted rent).

APPENDIX VI

DWELLING UNIT IMPROVEMENTS REPORTED BY HOUSEHOLDS DURING THE DEMAND EXPERIMENT: SEPARATE SITE TABLES

This appendix contains separate Pittsburgh and Phoenix tables as companions to all combined site tables contained in Chapter 4. The tables are presented in identical order to those in Chapter 4.

Table VI-1

HOUSING IMPROVEMENTS REPORTED BY EXPERIMENTAL AND CONTROL HOUSEHOLDS
(PITTSBURGH)

APPROACH TO IMPROVEMENT	ALL EXPERIMENTAL HOUSEHOLDS	ALL CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM STANDARDS HOUSEHOLDS	MINIMUM RENT LOW HOUSEHOLDS	MINIMUM RENT HIGH HOUSEHOLDS	UNCONSTRAINED HOUSEHOLDS	PERCENT OF RENT HOUSEHOLDS
Improvements made only by landlord	17%	21%	-1.555	13%	18%	19%	32%	16%
Improvements made only by household	14	18	-2.130	12	12	11	11	16
Improvements made by both landlord and household	63	57	2.028	68	65	64	54	61
No improvements reported	6	4	1.627	6	6	6	3	7
Percentage of households reporting any improvements made by landlord	80	78	0.960	81	83	83	86	78
Percentage of households reporting any improvements made by household	77	75	0.543	80	77	75	65	77
SAMPLE SIZE	(919)	(321)		(204)	(128)	(117)	(63)	(407)

SAMPLE: All households active at two years after enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES Periodic Interviews.

Table VI-2

HOUSING IMPROVEMENTS REPORTED BY EXPERIMENTAL AND CONTROL HOUSEHOLDS
(PHOENIX)

APPROACH TO IMPROVEMENT	ALL EXPERIMENTAL HOUSEHOLDS	ALL CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM STANDARDS HOUSEHOLDS	MINIMUM RENT LOW HOUSEHOLDS	MINIMUM RENT HIGH HOUSEHOLDS	UNCONSTRAINED HOUSEHOLDS	PERCENT OF RENT HOUSEHOLDS
Improvements made only by landlord	33%	30%	1.035	32%	39%	34%	28%	33%
Improvements made only by household	12	11	0.405	11	8	15	20	11
Improvements made by both landlord and household	48	51	-0.769	49	44	38	48	52
No improvements reported	7	9	-0.909	8	9	13	5	4
Percentage of households reporting any improvements made by landlord	81	80	0.254	81	83	72	75	85
Percentage of households reporting any improvements made by household	60	61	-0.522	60	52	53	68	63
SAMPLE SIZE	(719)	(282)		(174)	(98)	(109)	(40)	(298)

SAMPLE: All households active at two years after enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.
DATA SOURCES: Periodic Interviews.

Table VI-3

REPORTED IMPROVEMENT ACTIVITY
EXPERIMENTAL AND CONTROL HOUSEHOLDS

IMPROVEMENTS	PITTSBURGH EXPERIMENTAL HOUSEHOLDS	PITTSBURGH CONTROL HOUSEHOLDS	PITTSBURGH t-STATISTIC	PHOENIX EXPERIMENTAL HOUSEHOLDS	PHOENIX CONTROL HOUSEHOLDS	PHOENIX t-STATISTIC
TOTAL LANDLORD IMPROVEMENTS						
Mean number of improvements	2.67	2.56	0.69	2.80	2.63	0.98
(Standard deviation)	(2.73)	(2.46)		(2.66)	(2.48)	
(Sample size)	(919)	(321)		(719)	(282)	
TOTAL HOUSEHOLD IMPROVEMENTS						
Mean number of improvements	3.16	3.47	-1 34	2.19	3.55	-0.69
(Standard deviation)	(3.25)	(3 55)		(3.01)	(2.35)	
(Sample size)	(919)	(321)		(719)	(282)	
TOTAL IMPROVEMENTS[a]						
Mean number of improvements	5.84	6.02	-0.68	4.99	4.98	0.03
(Standard deviation)	(4.42)	(4.27)		(3.92)	(4.37)	
(Sample size)	(919)	(321)		(719)	(282)	
COST OF IMPROVEMENTS[b]						
Mean cost of improvements	$123.13	$114.73	0.59	$50.66	$61.56	-0.87
[Median cost of improvements]	[$37.38]	[$44.75]		[$2.08]	[$2.33]	
(Standard deviation)	(240.22)	(208.42)		(126.78)	(192.79)	
(Sample size)	(899)	(317)		(695)	(278)	

SAMPLE: All households active at two years after enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCE: Periodic Interviews

a. Sum of landlord and household improvements.

b. Total costs paid for by household; does not include costs paid for by landlord.

Table VI-4

TYPES OF IMPROVEMENTS MADE BY HOUSEHOLDS PITTSBURGH

TYPES OF IMPROVEMENTS	ALL EXPERIMENTAL HOUSEHOLDS	ALL CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM STANDARDS HOUSEHOLDS	MINIMUM RENT LOW HOUSEHOLDS	MINIMUM RENT HIGH HOUSEHOLDS	UNCONSTRAINED HOUSEHOLDS	PERCENT OF RENT HOUSEHOLDS
General remodeling	6%	8%	-1.003	6%	10%	6%	2%	5%
Work on floors or floor coverings	31	34	-0.861	32	26	30	34	33
Electrical work	14	20	-2.208*	15	15	12	5	14
Install new plumbing or heating fixtures	16	24	-2.846**	15	16	20	17	14
Add to or replace heating or air conditioning system	4	6	-1.476	4	7	1	5	3
Interior or exterior carpentry work	21	28	-2.333*	24	26	17	10	20
Plant garden or trees	23	29	-1.779†	25	21	19	20	24
General fixing or repairing	36	42	-1.551	35	40	36	24	36
Interior painting or papering	85	80	1.662†	88	79	86	93	83
Exterior painting	7	12	-2.192*	8	6	3	0	9
Plaster interior walls or ceilings	18	19	-0.311	15	21	19	17	18
Modernize bath or kitchen facilities	7	10	-1.692†	8	8	2	2	8
Add major new kitchen appliances	10	8	1.356	12	10	11	17	9
Other improvements	12	12	-0.167	12	13	7	5	13
SAMPLE SIZE	(704)	(241)		(164)	(98)	(88)	(41)	(313)

SAMPLE: All households active at two years after enrollment that reported improvements made by the household, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES Periodic Interviews

† t-statistic significant at the 0.10 level.

* t-statistic significant at the 0.05 level.

** t-statistic significant at the 0.01 level.

Table VI-5

TYPES OF IMPROVEMENTS MADE BY HOUSEHOLDS· PHOENIX

TYPES OF IMPROVEMENTS	ALL EXPERIMENTAL HOUSEHOLDS	ALL CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM STANDARDS HOUSEHOLDS	MINIMUM RENT LOW HOUSEHOLDS	MINIMUM RENT HIGH HOUSEHOLDS	UNCONSTRAINED HOUSEHOLDS	PERCENT OF RENT HOUSEHOLDS
General remodeling	5%	5%	0.053	7%	2%	3%	4%	5%
Work on floors or floor coverings	22	21	0.268	22	20	22	33	22
Electrical work	11	12	-0.385	10	18	17	11	8
Install new plumbing or heating fixtures	20	23	-0.960	13	20	21	33	21
Add to or replace heating or air conditioning system	15	18	-0.932	12	14	24	7	16
Interior or exterior carpentry work	24	28	-0.816	25	28	33	18	22
Plant garden or trees	31	31	-0.144	28	35	22	48	31
General fixing or repairing	50	47	0.710	46	41	41	59	56
Interior painting or papering	52	55	-0.623	50	63	53	63	49
Exterior painting	9	8	0.466	10	6	10	7	10
Plaster interior walls or ceilings	8	12	-1.403	6	10	12	7	9
Modernize bath or kitchen facilities	9	9	-0.040	11	6	5	4	10
Add major new kitchen appliances	12	6	1.946†	13	12	9	7	12
Other improvements	22	18	1.121	18	22	31	18	22
SAMPLE SIZE	(428)	(173)		(105)	(51)	(58)	(27)	(187)

SAMPLE All households active at two years after enrollment that reported improvements made by the household, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES· Periodic Interviews

† t-statistic significant at the 0.10 level.

Table VI-6

TYPES OF IMPROVEMENTS MADE BY LANDLORDS· PITTSBURGH

TYPES OF IMPROVEMENTS	ALL EXPERIMENTAL HOUSEHOLDS	ALL CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM STANDARDS HOUSEHOLDS	MINIMUM RENT LOW HOUSEHOLDS	MINIMUM RENT HIGH HOUSEHOLDS	UNCONSTRAINED HOUSEHOLDS	PERCENT OF RENT HOUSEHOLDS
General remodeling	9%	8%	0.343	10%	7%	11%	7%	8%
Work on floors or floor coverings	13	11	0,624	11	14	13	13	13
Electrical work	15	15	-0.231	18	17	13	17	12
Install new plumbing or heating fixtures	45	54	-2.601**	47	50	41	41	44
Add to or replace heating or air conditioning system	10	11	-0.408	10	8	8	9	11
Interior or exterior carpentry work	21	21	-0.134	20	21	30	26	18
Plant garden or trees	4	1	2.438*	2	6	6	0	4
General fixing or repairing	51	56	-1.478	52	46	59	41	51
Interior painting or papering	22	17	1.660†	21	22	20	26	22
Exterior painting	14	14	0.275	15	14	10	17	15
Plaster interior walls or ceilings	20	19	0.274	20	20	23	15	20
Modernize bath or kitchen facilities	12	10	0.992	13	11	14	15	10
Add major new kitchen appliances	2	0	2.012*	2	1	4	0	1
Other improvements	31	35	-1.114	35	30	33	26	29
SAMPLE SIZE	(739)	(250)		(166)	(106)	(97)	(54)	(316)

SAMPLE· All households active at two years after enrollment that reported improvements made by their landlords, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES Periodic Interviews

† t-statistic significant at the 0.10 level.

* t-statistic significant at the 0.05 level.

** t-statistic significant at the 0.01 level.

Table VI-7

TYPES OF IMPROVEMENTS MADE BY LANDLORDS PHOENIX

TYPES OF IMPROVEMENTS	ALL EXPERIMENTAL HOUSEHOLDS	ALL CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM STANDARDS HOUSEHOLDS	MINIMUM RENT LOW HOUSEHOLDS	MINIMUM RENT HIGH HOUSEHOLDS	UNCONSTRAINED HOUSEHOLDS	PERCENT OF RENT HOUSEHOLDS
General remodeling	5%	4%	0.358	6%	5%	2%	3%	5%
Work on floors or floor coverings	14	13	0.297	17	6	11	10	16
Electrical work	11	9	0.764	11	9	8	10	12
Install new plumbing or heating fixtures	37	30	1.772†	38	41	33	37	36
Add to or replace heating or air conditioning system	36	34	0.455	33	36	35	37	37
Interior or exterior carpentry work	18	21	-0.953	17	18	9	20	21
Plant garden or trees	7	10	-1.366	5	11	11	0	7
General fixing or repairing	63	62	0.290	64	65	60	67	62
Interior painting or papering	24	18	1.714†	25	22	20	27	25
Exterior painting	15	14	0.144	16	14	15	13	15
Plaster interior walls or ceilings	9	7	0.940	13	5	5	10	8
Modernize bath or kitchen facilities	7	9	-1.002	6	9	8	3	8
Add major new kitchen appliances	10	7	1.250	11	11	10	20	8
Other improvements	26	23	0.937	26	35	30	23	23
SAMPLE SIZE	(584)	(227)		(141)	(81)	(79)	(30)	(253)

SAMPLE: All households active at two years after enrollment that reported improvements made by their landlords, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES Periodic Interviews

† t-statistic significant at the 0.10 level.

Table VI-8

TYPES OF IMPROVEMENTS MADE BY HOUSEHOLDS OR LANDLORDS COMBINED· PITTSBURGH

TYPES OF IMPROVEMENTS	ALL EXPERIMENTAL HOUSEHOLDS	ALL CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM STANDARDS HOUSEHOLDS	MINIMUM RENT LOW HOUSEHOLDS	MINIMUM RENT HIGH HOUSEHOLDS	UNCONSTRAINED HOUSEHOLDS	PERCENT OF RENT HOUSEHOLDS
General remodeling	11%	12%	-0.576	13%	12%	13%	8%	9%
Work on floors or floor coverings	33	35	-0,415	32	30	33	30	36
Electrical work	23	26	-1.032	28	25	21	18	21
Install new plumbing or heating fixtures	47	55	-2.505*	49	52	46	46	44
Add to or replace heating or air conditioning system	11	12	-0.569	13	12	8	12	11
Interior or exterior carpentry work	31	37	-1.766	34	34	34	30	29
Plant garden or trees	21	23	-0 550	23	21	18	13	23
General fixing or repairing	60	68	-2.241*	62	57	70	49	60
Interior painting or papering	77	68	2.906**	82	75	76	77	74
Exterior painting	18	20	-0.862	20	17	12	15	18
Plaster interior walls or ceilings	28	26	0.741	28	31	30	23	28
Modernize bath or kitchen facilities	15	16	-0.296	18	15	14	13	14
Add major new kitchen appliances	10	6	2.090*	11	9	12	12	8
Other improvements	33	34	-0.288	39	34	33	25	32
SAMPLE SIZE	(863)	(309)		(191)	(121)	(110)	(61)	(380)

SAMPLE: All households active at two years after enrollment that reported improvements, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Periodic Interviews

* t-statistic significant at the 0.05 level.

** t-statistic significant at the 0.01 level.

Table VI-9

TYPES OF IMPROVEMENTS MADE BY HOUSEHOLDS OR LANDLORDS COMBINED PHOENIX

TYPES OF IMPROVEMENTS	ALL EXPERIMENTAL HOUSEHOLDS	ALL CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM STANDARDS HOUSEHOLDS	MINIMUM RENT LOW HOUSEHOLDS	MINIMUM RENT HIGH HOUSEHOLDS	UNCONSTRAINED HOUSEHOLDS	PERCENT OF RENT HOUSEHOLDS
General remodeling	7%	5%	0.674	8%	6%	4%	5%	7%
Work on floors or floor coverings	25	23	0.444	28	17	22	26	26
Electrical work	15	14	0.268	16	15	16	16	15
Install new plumbing or heating fixtures	42	37	1.138	41	46	37	50	41
Add to or replace heating or air conditioning system	38	38	0.112	35	39	42	32	39
Interior or exterior carpentry work	30	33	-0.797	30	30	26	29	31
Plant garden or trees	24	26	-0.757	21	25	22	34	25
General fixing or repairing	73	70	0.939	73	73	65	82	74
Interior painting or papering	47	48	-0.082	48	45	45	55	47
Exterior painting	18	18	-0.071	21	15	18	16	18
Plaster interior walls or ceilings	12	14	-0.694	15	10	10	10	13
Modernize bath or kitchen facilities	11	13	-0.679	13	11	8	5	12
Add major new kitchen appliances	16	10	1.991†	18	16	14	18	15
Other improvements	34	30	1.301	32	38	43	32	32
SAMPLE SIZE	(667)	(257)		(160)	(89)	(95)	(38)	(285)

SAMPLE All households active at two years after enrollment that reported improvements, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES Periodic Interviews.

† t-statistic significant at the 0.10 level.

Table VI-10

REPORTED IMPROVEMENT ACTIVITY FOR MINIMUM STANDARDS
AND CONTROL HOUSEHOLDS THAT DID NOT MEET REQUIREMENTS AT ENROLLMENT

IMPROVEMENTS	PITTSBURGH			PHOENIX		
	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC
TOTAL LANDLORD IMPROVEMENTS						
Mean number of improvements	2.67	2.49	0.66	2.75	2.52	0.79
(Standard deviation)	(3.03)	(2.35)		(2.80)	(2.52)	
Percentage of households reporting any landlord improvements	80%	77%	0.672	78%	79%	-0.135
(Sample size)	(159)	(255)		(138)	(223)	
TOTAL HOUSEHOLD IMPROVEMENTS						
Mean number of improvements	3.43	3.52	-0.24	2.36	2.55	-0.47
(Standard deviation)	(3.76)	(3.70)		(3.53)	(3.84)	
Percentage of households reporting any household improvements	79%	74%	1.094	61%	62%	-0.190
(Sample size)	(159)	(255)		(138)	(223)	
TOTAL IMPROVEMENTS[a]						
Mean number of improvements	6.11	6.01	0.20	5.11	5.06	0.09
(Standard deviation)	(4.97)	(4.27)		(4.38)	(4.65)	
Percentage of households reporting any improvements	92%	96%	-1.849†	90%	91%	-0.379
(Sample size)	(159)	(255)		(138)	(223)	
COST OF IMPROVEMENTS[b]						
Mean cost of improvements	$124.12	$121.44	0.11	$70.06	$67.69	0.12
[Median cost of improvements]	[$36.50]	[$44.90]		[$1.70]	[$3.50]	
(Standard deviation)	(246.28)	(222.40)		(166.56)	(203.14)	
(Sample size)	(150)	(252)		(136)	(220)	

SAMPLE Minimum Standards and Control households active at two years after enrollment that failed the Minimum Standards requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES Initial and monthly Household Report Forms, Housing Evaluation Forms, and Periodic Interviews.

a. Sum of improvements made by landlords and households.

b. Total costs paid for by household, does not include costs paid for by landlord.

† t-statistic significant at the 0.10 level.

Table VI-11

TYPES OF IMPROVEMENTS MADE BY MINIMUM STANDARDS AND CONTROL HOUSEHOLDS THAT DID NOT MEET REQUIREMENTS AT ENROLLMENT (COMBINED LANDLORD AND HOUSEHOLD IMPROVEMENTS)

TYPES OF IMPROVEMENTS	PITTSBURGH			PHOENIX		
	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC
General remodeling	14%	11%	0.768	9%	7%	0.660
Work on floors or floor coverings	31	36	-1.054	30	24	1.241
Electrical work	27	25	0.527	18	15	0.756
Install new plumbing or heating fixtures	48	55	-1.479	42	40	0.268
Add to or replace heating or air conditioning system	11	12	-0.388	30	37	-1.313
Interior or exterior carpentry work	36	38	-0.436	29	32	-0.570
Plant garden or trees	26	21	1.170	22	26	-0.878
General fixing or repairing	61	68	-1.268	73	70	0.426
Interior painting or papering	81	66	3.210**	48	47	0.193
Exterior painting	22	18	0.846	21	16	1.096
Plaster interior walls or ceilings	28	28	0.064	16	14	0.442
Modernize bath or kitchen facilities	16	16	0.000	14	14	0.050
Add major new kitchen appliances	10	6	1.481	18	12	1.677†
Other improvements	38	32	1.129	34	31	0.545
SAMPLE SIZE	(147)	(246)		(124)	(203)	

SAMPLE: Minimum Standards and Control households active at two years after enrollment that failed the Minimum Standards requirements at enrollment and reported improvements, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms, Housing Evaluation Forms, and Periodic Interviews.

† t-statistic significant at the 0.10 level.

** t-statistic significant at the 0.01 level.

Table VI-12

REPORTED IMPROVEMENT ACTIVITY FOR MINIMUM STANDARDS AND CONTROL HOUSEHOLDS THAT DID NOT MEET REQUIREMENTS AT ENROLLMENT BY TWO-YEAR OUTCOME: PITTSBURGH

	STAYED AND PASSED			STAYED AND FAILED			MOVED AND PASSED			MOVED AND FAILED		
IMPROVEMENTS	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC
TOTAL LANDLORD IMPROVEMENTS												
Mean number of improvements	2 58	2 28	0 43	2,22	2 12	0,33	2 56	2,00	0 63	3 48	3 42	0.08
(Standard deviation)	(1 92)	(2 27)		(2 04)	(2 15)		(2 13)	(2,70)		(4,66)	(2 46)	
Percentage of households reporting any landlord improvements	84%	72%	0 886	75%	75%	0,031	83%	58%	1,561	84%	89%	-0 804
(Sample size)	(19)	(18)		(69)	(137)		(23)	(12)		(44)	(74)	
TOTAL HOUSEHOLD IMPROVEMENTS												
Mean number of improvements	5,05	2 11	2 11*	3 56	3,60	-0,07	3,48	3 67	-0 15	2,52	3 81	-2 02*
(Standard deviation)	(5 47)	(2.59)		(3.72)	(3 99)		(3,06)	(3 68)		(3,18)	(3 60)	
Percentage of households reporting any household improvements	84%	34%	3 085**	78%	66%	1 380†	87%	52%	2,28*	75%	70%	0.573
(Sample size)	(19)	(18)		(69)	(137)		(23)	(12)		(44)	(74)	
TOTAL IMPROVEMENTS[a]												
Mean number of improvements	7 63	4,39	2 00†	5,78	5 72	0.09	6,04	5 67	0,25	6,00	7.23	-1,17
(Standard deviation)	(5 89)	(3,82)		(4 44)	(4,10)		(3 20)	(4,60)		(6 03)	(4,55)	
Percentage of households reporting any improvements	95%	89%	0 646	90%	98%	-2.492*	100%	92%	1,402	93%	97%	-1 070
(Sample size)	(19)	(18)		(69)	(137)		(23)	(12)		(44)	(74)	
COST OF IMPROVEMENTS[b]												
Mean cost of improvements	$217,65	$53,72	2 47*	$83 56	$111 80	-1 23	$188.41	$59,17	1.78†	$102,38	$175,52	-2 22
[Median cost of improvements]	[$155.00]	[$0,50]		[$41 50]	[$45.00]		[$64 00]	[$32 50]		[$10.00]	[$48,25]	
(Standard deviation)	(257 35)	(96,57)		(137,13)	(184,16)		(322 18)	(83 04)		(300 91)	(314,61)	
(Sample size)	(17)	(10)		(68)	(133)		(22)	(12)		(40)	(73)	

SAMPLE: Minimum Standards and Control households active at two years after enrollment that failed the Minimum Standards requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing

DATA SOURCES: Initial and monthly Household Report Forms, Housing Evaluation Forms, and Periodic Interviews.

a Sum of improvements made by landlords and households

b The costs paid for by household; does not include costs paid for by landlord

† t-statistic significant at the 0 10 level.

* t-statistic significant at the 0 05 level.

** t-statistic significant at the 0.01 level.

*** t-statistic significant at the 0 001 level.

Table VI-13

REPORTED IMPROVEMENT ACTIVITY FOR MINIMUM STANDARDS AND CONTROL HOUSEHOLDS THAT DID NOT MEET REQUIREMENTS AT ENROLLMENT BY TWO-YEAR OUTCOME: PHOENIX

	STAYED AND PASSED			STAYED AND FAILED			MOVED AND PASSED			MOVED AND FAILED		
IMPROVEMENTS	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM STANDARDS HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC
TOTAL LANDLORD IMPROVEMENTS												
Mean number of improvements	2.78	3 22	-0 47	2 38	2 58	-0.51	3 09	2.44	1.13	2 59	2 23	0 67
(Standard deviation)	(2.76)	(2 88)		(3 11)	(2.72)		(2.65)	(2.61)		(2 73)	(2 19)	
Percentage of households reporting any landlord improvements	72%	78%	-0.388	74%	77%	-0.317	84%	74%	1.038	76%	84%	-0.919
(Sample size)	(18)	(18)		(39)	(87)		(43)	(39)		(34)	(74)	
TOTAL HOUSEHOLD IMPROVEMENTS												
Mean number of improvements	2 06	1 61	0.49	3.20	3.10	0 11	1.81	1.41	0.78	2 29	2 73	-0 67
(Standard deviation)	(2 99)	(1.58)		(5.13)	(4.77)		(2 27)	(2.41)		(2.93)	(3 51)	
Percentage of households reporting any household improvements	56%	61%	-0 335	56%	71%	-1.629	65%	41%	2 177*	62%	64%	-0.190
(Sample size)	(18)	(18)		(39)	(87)		(43)	(39)		(34)	(74)	
TOTAL IMPROVEMENTS[a]												
Mean number of improvements	4.78	4.83	-0.05	5.59	5 78	-0.18	4 91	3 85	1.32	4 88	4 96	-0.09
(Standard deviation)	(4 12)	(3 20)		(5 57)	(5.56)		(3 48)	(3 77)		(4 15)	(4.16)	
Percentage of households reporting any improvements	78%	89%	-0 894	92%	94%	-0.427	100%	77%	3 340**	79%	96%	-2.743**
(Sample size)	(18)	(18)		(39)	(87)		(43)	(39)		(34)	(74)	
COST OF IMPROVEMENTS[b]												
Mean cost of improvements	$47.12	$30.06	0.63	$82.97	$67.99	0.46	$71.60	$37.35	0 99	$67.12	$84.58	-0 40
(Median cost of improvements)	($0 75)	($4 50)		($1.33)	($11 00)		($4 00)	($0 34)		($1 75)	($1 38)	
(Standard deviation)	(98 92)	(52 87)		(181 34)	(135 52)		(194.16)	(110.78)		(151 26)	(299.08)	
(Sample size)	(17)	(18)		(39)	(87)		(43)	(37)		(33)	(73)	

SAMPLE: Minimum Standards and Control households active at two years after enrollment that failed the Minimum Standards requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms, Housing Evaluation Forms, and Periodic Interviews.

a Sum of improvements made by landlords and households

b. The costs paid for by household; does not include costs paid for by landlord.

* t-statistic significant at the 0 05 level

** t-statistic significant at the 0.01 level.

Table VI-14

REPORTED IMPROVEMENT ACTIVITY FOR MINIMUM RENT LOW
AND CONTROL HOUSEHOLDS THAT DID NOT MEET REQUIREMENTS AT ENROLLMENT

IMPROVEMENTS	PITTSBURGH			PHOENIX		
	MINIMUM RENT LOW HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT LOW HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC
TOTAL LANDLORD IMPROVEMENTS						
Mean number of improvements	2 25	2.30	-0.13	2.74	2.29	1.21
(Standard deviation)	(2.04)	(2.20)		(2.30)	(2.29)	
Percentage of households reporting any landlord improvements	79%	78%	0.113	82%	74%	1.086
(Sample size)	(47)	(122)		(50)	(157)	
TOTAL HOUSEHOLD IMPROVEMENTS						
Mean number of improvements	2.32	3.17	-1.71†	1.30	2.47	-2.53*
(Standard deviation)	(2.61)	(3.56)		(2.28)	(4.18)	
Percentage of households reporting any household improvements	70%	74%	-0.471	46%	57%	-1.322
(Sample size)	(47)	(122)		(50)	(157)	
TOTAL IMPROVEMENTS[a]						
Mean number of improvements	4.57	5.48	-1.55	4.04	4.76	-1.27
(Standard deviation)	(3.11)	(4.01)		(2.96)	(4.76)	
Percentage of households reporting any improvements	94%	97%	-0.904	92%	89%	0.572
(Sample size)	(47)	(122)		(50)	(157)	
COST OF IMPROVEMENTS[b]						
Mean cost of improvements	$76.28	$104.20	-1.06	$31.96	$45.31	-0.68
[Median cost of improvements]	[$21.50]	[$33.00]		[$0.40]	[$1.27]	
(Standard deviation)	(128.74)	(201.81)		(121.68)	(100 95)	
(Sample size)	(46)	(121)		(47)	(156)	

SAMPLE Minimum Rent Low and Control households active at two years after enrollment that failed the Minimum Rent Low requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms and Periodic Interviews.

a. Sum of improvements made by landlords and households.

b. Total costs paid for by household, does not include costs paid for by landlord.

† t-statistic significant at the 0.10 level.

* t-statistic significant at the 0.05 level.

Table VI-15

REPORTED IMPROVEMENT ACTIVITY FOR MINIMUM RENT HIGH
AND CONTROL HOUSEHOLDS THAT DID NOT MEET REQUIREMENTS AT ENROLLMENT

IMPROVEMENTS	PITTSBURGH			PHOENIX		
	MINIMUM RENT HIGH HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT HIGH HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC
TOTAL LANDLORD IMPROVEMENTS						
Mean number of improvements	3.15	2.50	1.70†	2.22	2.52	-0.98
(Standard deviation)	(3.12)	(2.34)		(2.35)	(2.50)	
Percentage of households reporting any landlord improvements	82%	79%	0.575	72%	79%	-1.306
(Sample size)	(82)	(221)		(86)	(215)	
TOTAL HOUSEHOLD IMPROVEMENTS						
Mean number of improvements	2.90	3.67	-1.99*	2.14	3.79	-0.67
(Standard deviation)	(2.72)	(3.68)		(3.06)	(2.42)	
Percentage of households reporting any household improvements	77%	78%	-0.185	52%	61%	-1.449
(Sample size)	(82)	(221)		(86)	(215)	
TOTAL IMPROVEMENTS[a]						
Mean number of improvements	6.05	6.18	-0.23	4.36	4.94	-1.13
(Standard deviation)	(4.20)	(4.25)		(3.78)	(4.54)	
Percentage of households reporting any improvements	94%	97%	-1.408	87%	91%	-1.048
(Sample size)	(82)	(225)		(86)	(215)	
COST OF IMPROVEMENTS[b]						
Mean cost of improvements	$107.45	$129.43	-0.83	$57.57	$62.13	-0.22
[Median cost of improvements]	[$46.50]	[$47.00]		[$1.50]	[$2.12]	
(Standard deviation)	(191.11)	(234.32)		(141.22)	(198.00)	
(Sample size)	(82)	(219)		(82)	(211)	

SAMPLE. Minimum Rent High and Control households active at two years after enrollment that failed the Minimum Rent High requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES. Initial and monthly Household Report Forms and Periodic Interviews.

a. Sum of improvements made by landlords and households.

b. Total costs paid for by household, does not include costs paid for by landlord.

† t-statistic significant at the 0.10 level.

* t-statistic significant at the 0.05 level.

Table VI-16

TYPES OF IMPROVEMENTS MADE BY MINIMUM RENT LOW AND CONTROL HOUSEHOLDS THAT DID NOT MEET REQUIREMENTS AT ENROLLMENT (COMBINED LANDLORD AND HOUSEHOLD IMPROVEMENTS)

TYPES OF IMPROVEMENTS	PITTSBURGH			PHOENIX		
	MINIMUM RENT LOW HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT LOW HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC
General remodeling	9%	12%	-0.504	9%	9%	0.021
Work on floors or floor coverings	23	29	-0.777	13	23	-1.432
Electrical work	18	20	-0.299	17	16	0.158
Install new plumbing or heating fixtures	50	52	-0.192	39	41	-0.275
Add to or replace heating or air conditioning system	9	10	-0.208	39	34	0.590
Interior or exterior carpentry work	27	38	-1.280	30	33	-0.302
Plant garden or trees	9	12	-0.504	11	23	-1.755†
General fixing or repairing	50	69	-2.188*	70	67	0.315
Interior painting or papering	73	64	1.088	35	44	-1.133
Exterior painting	14	12	0.292	13	16	-0.444
Plaster interior walls or ceilings	25	28	-0.382	13	13	0.035
Modernize bath or kitchen facilities	14	20	-0.977	11	14	-0.586
Add major new kitchen appliances	7	5	0.447	15	11	0.820
Other improvements	30	31	-0.233	35	27	0.998
SAMPLE SIZE	(44)	(118)		(46)	(110	

SAMPLE. Minimum Rent Low and Control households active at two years after enrollment that failed the Minimum Rent Low requirements at enrollment and reported improvements, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES. Initial and monthly Household Report Forms and Periodic Interviews.

† t-statistic significant at the 0.10 level.

* t-statistic significant at the 0.05 level.

Table VI-17

TYPES OF IMPROVEMENTS MADE BY MINIMUM RENT HIGH AND CONTROL HOUSEHOLDS THAT DID NOT MEET REQUIREMENTS AT ENROLLMENT (COMBINED LANDLORD AND HOUSEHOLD IMPROVEMENTS)

TYPES OF IMPROVEMENTS	PITTSBURGH			PHOENIX		
	MINIMUM RENT HIGH HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT HIGH HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC
General remodeling	17%	13%	0.941	3%	7%	-1.377
Work on floors or floor coverings	31	35	-0.588	23	22	0.053
Electrical work	21	26	-0.991	19	15	0.679
Install new plumbing or heating fixtures	48	55	-1.102	36	41	-0.723
Add to or replace heating or air conditioning system	5	13	-1.806†	43	37	0.832
Interior or exterior carpentry work	35	40	-0.681	24	32	-1.304
Plant garden or trees	16	20	-0.937	21	21	-0.018
General fixing or repairing	71	69	0.345	68	68	-0.063
Interior painting or papering	75	68	1.214	41	45	-0.608
Exterior painting	16	18	-0.496	23	18	0.798
Plaster interior walls or ceilings	31	28	0.549	11	14	-0.680
Modernize bath or kitchen facilities	18	17	0.300	9	13	-0.798
Add major new kitchen appliances	12	6	1.454	11	12	-0.232
Other improvements	32	34	-0.239	44	30	2.162*
SAMPLE SIZE	(77)	(215)		(75)	(196)	

SAMPLE: Minimum Rent High and Control households active at two years after enrollment that failed the Minimum Rent High requirements at enrollment and reported improvements, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms and Periodic Interviews.

† t-statistic significant at the 0.10 level.

* t-statistic significant at the 0.05 level.

Table VI-18

REPORTED IMPROVEMENT ACTIVITY FOR MINIMUM RENT LOW AND CONTROL HOUSEHOLDS
THAT DID NOT MEET REQUIREMENTS AT ENROLLMENT BY TWO-YEAR OUTCOMES: PITTSBURGH

	STAYED AND PASSED			STAYED AND FAILED			MOVED AND PASSED			MOVED AND FAILED		
IMPROVEMENTS	MINIMUM RENT LOW HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT LOW HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT LOW HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT LOW HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC
TOTAL LANDLORD IMPROVEMENTS												
Mean number of improvements	2.62	2 53	0.11	1 76	1.85	-0.16	2.47	3.00	-0.74	2.50	2 45	0.03
(Standard deviation)	(1 98)	(2.29)		(2.08)	(1.91)		(2.13)	(2.64)		(2 12)	(1.81)	
Percentage of households reporting any landlord improvements	85%	75%	0.556	65%	74%	-0.774	87%	84%	0.207	100%	82%	0.656
(Sample size)	(13)	(17)		(17)	(62)		(15)	(32)		(2)	(11)	
TOTAL HOUSEHOLD IMPROVEMENTS												
Mean number of improvements	2 23	2 59	-0.33	2.29	3.16	-1.13	2.60	3.28	-0.68	1 00	3.82	-1.99
(Standard deviation)	(2.35)	(3 50)		(2.42)	(3.90)		(3.25)	(3.08)		(1.41)	(3 31)	
Percentage of households reporting any household improvements	77%	76%	0.032	71%	69%	0 095	67%	78%	-0.835	100%	82%	0.656
(Sample size)	(13)	(17)		(17)	(62)		(15)	(32)		(2)	(11)	
TOTAL IMPROVEMENTS[a]												
Mean number of improvements	4 65	5.12	-0.21	4 06	5.02	-1.21	5 07	6 28	-0.97	3.50	6.27	-2.12†
(Standard deviation)	(3.31)	(3.84)		(2.59)	(3 79)		(3.73)	(4.50)		(0.71)	(4.00)	
Percentage of households reporting any improvements	92%	100%	-1.164	94%	95%	-0 184	93%	100%	-1.480	100%	91%	0.444
(Sample size)	(13)	(17)		(17)	(62)		(15)	(32)		(2)	(11)	
COST OF IMPROVEMENTS[b]												
Mean cost of improvements	$65.00	$81 35	-0.38	$87.59	$103 14	-0 36	$81.07	$126 74	-0.75	$20 00	$81.91	-2.00†
(Median cost of improvements)	($21.75)	($23.00)		($13.00)	($27.50)		($24 00)	($36.00)		($20.00)	($60.00)	
(Standard deviation)	(90 83)	(145.96)		(141 13)	(207.52)		(156 12)	(246.82)		(28.28)	(78 60)	
(Sample size)	(13)	(17)		(17)	(62)		(14)	(31)		(2)	(11)	

SAMPLE: Minimum Rent Low and Control households active at two years after enrollment that failed the Minimum Rent Low requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms and Periodic Interviews

a. Sum of improvements made by landlords and households

b. Total costs paid for by household; does not include costs paid for by landlord.

† t-statistic significant at the 0.10 level

Table VI-19

REPORTED IMPROVEMENT ACTIVITY FOR MINIMUM RENT LOW AND CONTROL HOUSEHOLDS
THAT DID NOT MEET REQUIREMENTS AT ENROLLMENT BY TWO-YEAR OUTCOMES: PHOENIX

	STAYED AND PASSED			STAYED AND FAILED			MOVED AND PASSED			MOVED AND FAILED		
IMPROVEMENTS	MINIMUM RENT LOW HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT LOW HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT LOW HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT LOW HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC
TOTAL LANDLORD IMPROVEMENTS												
Mean number of improvements	4.67	1.50	1 39	2 38	2 43	-0 08	2 93	2.35	0.95	1 86	2.17	-0.38
(Standard deviation)	(3 79)	(1.29)		(1 61)	(2 37)		(2.46)	(1 96)		(1 95)	(2 43)	
Percentage of households reporting any landlord improvements	100%	75%	01935	85%	75%	0.726	81%	77%	0.404	71%	73%	=0 083
(Sample size)	(3)	(4)		(13)	(77)		(27)	(26)		(7)	(48)	
TOTAL HOUSEHOLD IMPROVEMENTS												
Mean number of improvements	0 67	5.00	-2.28†	1 00	2.73	-2 20*	1 74	2 15	-0.48	0 43	2 10	-2 69**
(Standard deviation)	(1 16)	(3.56)		(1 96)	(4.97)		(2.67)	(3.47)		(1 13)	(3 12)	
Percentage of households reporting any household improvements	33%	100%	-1 933†	38%	58%	-1.342	59%	50%	0 673	14%	54%	-1 973†
(Sample size)	(3)	(4)		(13)	(77)		(27)	(26)		(7)	(48)	
TOTAL IMPROVEMENTS[a]												
Mean number of improvements	5 33	6.50	-0 44	3.38	5.16	-2.00*	4.67	4.50	0 16	2 28	4 27	-2 32*
(Standard deviation)	(3 51)	(3.42)		(2 22)	(5 57)		(3.29)	(4.35)		(1.80)	(3 58)	
Percentage of households reporting any improvements	100%	100%	0 00	92%	92%	0.012	93%	77%	1.596	86%	90%	-0.309
(Sample size)	(3)	(4)		(13)	(77)		(27)	(26)		(7)	(48)	
COST OF IMPROVEMENTS[b]												
Mean cost of improvements	$7.00	$182 00	-1 45	$36 31	$43 67	-0.22	$40 12	$58 42	-0.45	$1.00	$31 21	-3.26**
(Median cost of improvements)	($5 25)	($55.00)		($0.31)	($2 50)		($1.75)	($0.50)		($0.60)	($0.83)	
(Standard deviation)	(12.12)	(241 78)		(112 67)	(91 35)		(147 03)	(140.59)		(2 45)	(63.84)	
(Sample size)	(3)	(4)		(13)	(76)		(25)	(26)		(6)	(48)	

SAMPLE: Minimum Rent Low and Control households active at two years after enrollment that failed the Minimum Rent Low requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing

DATA SOURCES: Initial and monthly Household Report Forms and Periodic Interviews.

a. Sum of improvements made by landlords and households.

b. Total costs paid for by household; does not include costs paid for by landlord.

† t-statistic significant at the 0 10 level.

* t-statistic significant at the 0.05 level

** t-statistic significant at the 0 01 level.

Table VI-20

REPORTED IMPROVEMENT ACTIVITY FOR MINIMUM RENT HIGH AND CONTROL HOUSEHOLDS THAT DID NOT MEET REQUIREMENTS AT ENROLLMENT BY TWO-YEAR OUTCOMES: PITTSBURGH

	STAYED AND PASSED			STAYED AND FAILED			MOVED AND PASSED			MOVED AND FAILED		
IMPROVEMENTS	MINIMUM RENT HIGH HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT HIGH HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT HIGH HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT HIGH HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC
TOTAL LANDLORD IMPROVEMENTS												
Mean number of improvements	3 11	3 37	-0 18	2 80	2 03	1.86†	4 18	2.97	1.07	3 00	3 27	-0.32
(Standard deviation)	(3 89)	(2 89)		(2 52)	(2.09)		(4.33)	(2 28)		(2.49)	(2 56)	
Percentage of households reporting any landlord improvements	56%	89%	-2 039†	80%	73%	0.908	94%	83%	1.076	91%	86%	0 286
(Sample size)	(9)	(19)		(45)	(131)		(17)	(30)		(11)	(41)	
TOTAL HOUSEHOLD IMPROVEMENTS												
Mean number of improvements	2.00	3.89	-1 52	2.47	3.53	-2.11*	3.94	3.63	0.32	3 82	4 07	-0 29
(Standard deviation)	(2 96)	(3.30)		(2.46)	(3 91)		(3 23)	(3 14)		(2 23)	(3 51)	
Percentage of households reporting any household improvements	56%	89%	-2 039†	71%	74%	-0.379	88%	80%	0 728	100%	83%	1 470
(Sample size)	(9)	(19)		(45)	(131)		(17)	(30)		(11)	(41)	
TOTAL IMPROVEMENTS[a]												
Mean number of improvements	5 11	7 26	-1 06	5 27	5.56	-0.48	8 12	6.60	0.95	6 82	7.34	-0.46
(Standard deviation)	(5 40)	(4 08)		(3.28)	(4.06)		(5.69)	(4 34)		(2.96)	(4 60)	
Percentage of households reporting any improvements	78%	100%	-2 131†	93%	96%	-0.806	100%	100%	0.00	100%	98%	0.919
(Sample size)	(9)	(19)		(45)	(131)		(17)	(30)		(11)	(41)	
COST OF IMPROVEMENTS[b]												
Mean cost of improvements	$97.33	$131 58	-0.50	$78.98	$111 32	-1 30	$183 59	$146 97	0.37	$114 54	$173 49	-0.94
(Median cost of improvements)	($42.00)	($51.00)		($36 00)	($40.50)		($93 00)	($38.00)		($82.00)	($53.00)	
(Standard deviation)	(145.40)	(213.11)		(125.78)	(185.67)		(334.38)	(308 66)		(129.43)	(312 48)	
(Sample size)	(9)	(19)		(45)	(130)		(17)	(29)		(11)	(41)	

SAMPLE Minimum Rent High and Control households active at two years after enrollment that failed the Minimum Rent High requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES Initial and monthly Household Report Forms and Periodic Interviews

a. Sum of improvements made by landlords and households

b Total costs paid for by household; does not include costs paid for by landlord

† t-statistic significant at the 0.10 level

* t-statistic significant at the 0 05 level

Table VI-21

REPORTED IMPROVEMENT ACTIVITY FOR MINIMUM RENT HIGH AND CONTROL HOUSEHOLDS THAT DID NOT MEET REQUIREMENTS AT ENROLLMENT BY TWO-YEAR OUTCOMES: PHOENIX

IMPROVEMENTS	STAYED AND PASSED			STAYED AND FAILED			MOVED AND PASSED			MOVED AND FAILED		
	MINIMUM RENT HIGH HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT HIGH HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT HIGH HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC	MINIMUM RENT HIGH HOUSEHOLDS	CONTROL HOUSEHOLDS	t-STATISTIC
TOTAL LANDLORD IMPROVEMENTS												
Mean number of improvements	0	3.33	-3.26*	1.43	2.65	-2.88**	3.50	2.08	2.39*	1.56	2.50	-2.12*
(Standard deviation)	(0)	(2.50)		(1.69)	(2.70)		(2.83)	(1.65)		(1.65)	(2.53)	
Percentage of households reporting any landlord improvements	0%	100%	-2.646†	54%	77%	-2.372*	91%	77%	1.445	70%	81%	-1.168
(Sample size)	(1)	(6)		(28)	(94)		(32)	(26)		(23)	(84)	
TOTAL HOUSEHOLD IMPROVEMENTS												
Mean number of improvements	0	3.00	-2.90*	2.39	2.72	-0.43	2.56	2.69	-0.14	1.52	2.05	-1.02
(Standard deviation)	(0)	(2.53)		(3.25)	(4.59)		(3.60)	(3.48)		(1.93)	(2.98)	
Percentage of households reporting any household improvements	0%	100%	-2.646*	61%	63%	-0.201	53%	62%	-0.635	48%	57%	-0.794
(Sample size)	(1)	(6)		(28)	(94)		(32)	(26)		(23)	(84)	
TOTAL IMPROVEMENTS[a]												
Mean number of improvements	0	6.33	-5.84**	3.82	5.37	-1.89†	6.06	4.77	1.13	3.09	4.55	-2.09*
(Standard deviation)	(0)	(2.66)		(3.24)	(5.31)		(4.40)	(4.29)		(2.70)	(3.81)	
Percentage of households reporting any improvements	0%	100%	-2.646*	82%	93%	-1.640	97%	81%	2.005*	83%	92%	-1.275
(Sample size)	(1)	(6)		(28)	(94)		(32)	(26)		(23)	(84)	
COST OF IMPROVEMENTS[b]												
Mean cost of improvements	0	$76.17	-2.25†	$41.54	$55.08	-0.76	$100.10	$175.50	-0.71	$26.43	$39.90	-0.85
[Median cost of improvements]	[0]	[$26.50]		[$2.50]	[$5.75]		[$1.50]	[$5.50]		[$4.00]	[$7.09]	
(Standard deviation)	0	(82.74)		(68.49)	(117.71)		(216.62)	(485.37)		(42.45)	(117.47)	
[Sample size]	(1)	(6)		(28)	(93)		(30)	(24)		(21)	(83)	

SAMPLE: Minimum Rent High and Control households active at two years after enrollment that failed the Minimum Rent High requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCES: Initial and monthly Household Report Forms and Periodic Interviews

a. Sum of improvements made by landlords and households

b. Total costs paid for by household; does not include costs paid for by landlord

† t-statistic significant at the 0.10 level

* t-statistic significant at the 0.05 level.

** t-statistic significant at the 0.01 level.

APPENDIX VII

THE DIFFERENCE BETWEEN ENROLLMENT RENT AND MINIMUM RENT REQUIREMENTS FOR HOUSEHOLDS NOT MEETING MINIMUM RENT AT ENROLLMENT

As indicated in Chapter 3, the probability that households not meeting Minimum Rent requirements at enrollment later met them in place is related to their distance from meeting requirements (the difference between their initial rents and the level set by the requirements). This can be seen in Table VII-1, which shows the difference between required and enrollment rent as a percentage of the enrollment rents. On average, households that later met Minimum Rent requirements needed smaller percentage increases in enrollment rent in order to meet requirements than households that never met the requirements. This was true regardless of whether or not the household moved.

This suggests that the experimental effect on in-place meeting observed for Minimum Rent Low households in Pittsburgh (or the absence of any apparent effect for other groups) could reflect differences in the initial distribution of households in terms of distance from meeting requirements. Table 3-6 in Chapter 3 indicated that mean differences were similar. Table VII-2 expands on this by presenting the distribution of households across three distance categories--those with enrollment rents within $25 of meeting requirements, those between $26 and $50 from meeting requirements, and those more than $50 from meeting requirements. There are some apparent differences, but they only confirm the results of Chapter 3; the Experimental households which showed no experimental effect (Minimum Rent High households in Pittsburgh and both Minimum Rent groups in Phoenix) were, if anything, closer to meeting at enrollment than Control households (and thus more likely to meet normally). The one group for which an effect was found--Minimum Rent Low households in Pittsburgh--were if anything somewhat further from meeting than Control households (and thus less likely to meet requirements normally).

This is confirmed by Table VII-3, which compares the percentages of Experimental and Control households meeting requirements in place for each distance category. The only significant effect on meeting requirements

Table VII-1

PERCENTAGE INCREASE IN ENROLLMENT RENT
NEEDED TO MEET THE MINIMUM RENT REQUIREMENT

MINIMUM RENT LOW

	PITTSBURGH		PHOENIX	
STATUS	MINIMUM RENT LOW HOUSEHOLDS	CONTROL HOUSEHOLDS	MINIMUM RENT LOW HOUSEHOLDS	CONTROL HOUSEHOLDS
Stayed and passed	12%	14%	18%	16%
Stayed and failed	43	23	56	54
Moved and passed	12	17	45	37
Moved and failed	69	27	68	47
SAMPLE SIZE	(47)	(122)	(50)	(155)

MINIMUM RENT HIGH

	PITTSBURGH		PHOENIX	
STATUS	MINIMUM RENT HIGH HOUSEHOLDS	CONTROL HOUSEHOLDS	MINIMUM RENT HIGH HOUSEHOLDS	CONTROL HOUSEHOLDS
Stayed and passed	13%	15%	14%	23%
Stayed and failed	38	39	101	85
Moved and passed	27	33	42	45
Moved and failed	37	44	97	67
SAMPLE SIZE	(82)	(221)	(84)	(210)

SAMPLE: Minimum Rent and Control households active at two years after enrollment that failed the Minimum Rent requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or subsidized housing.

DATA SOURCE: Initial and monthly Household Report Forms.

Table VII-2

DISTRIBUTION OF INITIAL DISTANCE
FROM MEETING MINIMUM RENT

SITE AND TREATMENT GROUP	SAMPLE SIZE	DISTRIBUTION OF DISTANCE $1-$25	$26-$50	>$50
		PITTSBURGH		
Minimum Rent Low households	(47)	70% (33)	30% (14)	0 (0)
Control households	(122)	86 (105)	12 (15)	2 (2)
Minimum Rent High households	(82)	52 (43)	37 (30)	11 (9)
Control households	(221)	43 (94)	46 (101)	12 (26)
		PHOENIX		
Minimum Rent Low households	(50)	42% (21)	30% (15)	28% (14)
Control households	(155)	34 (52)	37 (57)	30 (46)
Minimum Rent High households	(84)	17 (14)	27 (23)	56 (47)
Control households	(210)	13 (28)	28 (58)	59 (124)

SAMPLE: Minimum Rent and Control households active at two years after enrollment that failed the Minimum Rent requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCE: Initial and monthly Household Report Forms.

Table VII-3

MINIMUM RENT REQUIREMENT AND MOVE STATUS
BY INITIAL DISTANCE FROM MEETING MINIMUM RENT
(MINIMUM RENT LOW)

INITIAL DISTANCE FROM MEETING	MOVE STATUS: STAYED AND PASSED	STAYED AND FAILED	MOVED AND PASSED	MOVED AND FAILED	SAMPLE SIZE
		PITTSBURGH			
$1 to $25					
Minimum Rent households	36%	21%	39%	3%	(33)
Control households	15	50	27	9	(105)
t-statistic	2.642**	-2.867**	1.392	-1.081	
$26 to $50					
Minimum Rent households	7	71	14	7	(14)
Control households	7	60	27	7	(15)
t-statistic	0.042	0.645	-0.823	0.042	
More than $50					
Minimum Rent households	0	0	0	0	(0)
Control households	0	50	0	50	(2)
t-statistic	--	--	--	--	
		PHOENIX			
$1 to $25					
Minimum Rent households	10%	14%	76%	0%	(21)
Control households	4	38	29	29	(52)
t-statistic	0.972	-2.014*	3.709***	-2.758**	
$26 to $50					
Minimum Rent households	7	53	27	13	(15)
Control households	4	56	10	30	(57)
t-statistic	0.552	-0.194	1.615	-1.290	
More than $50					
Minimum Rent households	0	14	50	36	(14)
Control households	0	54	11	35	(46)
t-statistic	0	-2.634*	3.201**	0.062	

SAMPLE. Minimum Rent and Control households active at two years after enrollment that failed the Minimum Rent requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCE: Initial and monthly Household Report Forms.

* t-statistic significant at the 0.05 level.

** t-statistic significant at the 0.01 level.

*** t-statistic significant at the 0.001 level.

Table VII-3 (continued)

MINIMUM RENT REQUIREMENT AND MOVE STATUS
BY INITIAL DISTANCE FROM MEETING MINIMUM RENT
(MINIMUM RENT HIGH)

INITIAL DISTANCE FROM MEETING	MOVE STATUS: STAYED AND PASSED	STAYED AND FAILED	MOVED AND PASSED	MOVED AND FAILED	SAMPLE SIZE
		PITTSBURGH			
$1 to $25					
Minimum Rent households	21%	44%	28%	7%	(43)
Control households	16	58	15	11	(94)
t-statistic	0.700	-1.558	1.801†	-0.668	
$26 to $50					
Minimum Rent households	0	70	10	20	(30)
Control households	3	58	14	25	(101)
t-statistic	-0.960	1.144	-.0558	-0.543	
More than $50					
Minimum Rent households	0	56	22	22	(9)
Control households	4	65	8	23	(26)
t-statistic	-0.593	-0.524	1.178	-0.055	
		PHOENIX			
$1 to $25					
Minimum Rent households	7%	14%	57%	21%	(14)
Control households	11	18	25	46	(28)
t-statistic	-0.375	-0.287	2.047*	-1.573	
$26 to $50					
Minimum Rent households	0	22	61	17	(23)
Control households	3	41	21	34	(58)
t-statistic	-0.895	-1.668	3.494***	-1.520	
More than $50					
Minimum Rent households	0	45	21	34	(47)
Control households	1	52	6	41	(124)
t-statistic	-0.615	-0.899	3.067**	-0.884	

SAMPLE Minimum Rent and Control households active at two years after enrollment that failed the Minimum Rent requirements at enrollment, excluding those with enrollment incomes over the eligibility limits and those living in their own homes or in subsidized housing.

DATA SOURCE: Initial and monthly Household Report Forms.

† t-statistic significant at the 0.10 level.

* t-statistic significant at the 0.05 level.

** t-statistic significant at the 0.01 level.

*** t-statistic significant at the 0.001 level.

in place is again found for Minimum Rent Low households in Pittsburgh. This result was also confirmed by the logit analysis of Chapter 3, which showed a significant effect for Minimum Rent Low households in Pittsburgh, even though distance was included in the estimation.[1]

[1] In addition, as noted in Chapter 3, estimates with an interaction between experimental effect and distance continued to show a significant experimental effect (see Appendix V, Tables V-9 and V-10).