Assessment of the HUD-Insured Multifamily Housing Stock Final Report

Volume I

Current Status of HUD-Insured (Or Held) Multifamily Rental Housing

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ACKNOWLEDGMENTS

FOREWORD

For decades HUD has offered mortgage insurance to lenders to encourage the production of affordable multifamily rental housing. Today the more than 13,000 properties with mortgages insured under these programs are an important part of our nation's affordable housing stock, serving nearly 1 5 million predominantly low-income households.

This report, the first volume of HUD's *Assessment of the HUD-Insured Multifamily Housing Stock*, profiles the current status of these properties It finds that while most HUD-insured properties continue to provide good housing, a significant portion are beset by physical or financial problems that threaten their viability as well as residents' quality of life. Continued deterioration of these distressed properties will lead to increased demand for public remedial assistance and increased rates of failure, resulting in public costs for insurance claims by lenders and potential losses from the affordable stock of low-cost housing.

Recognizing that accurate data about the HUD-insured stock are key to formulating effective policy responses, Congress directed HUD to study the physical renovation needs of distressed housing insured through several of its programs. This study, which goes beyond the mandate, provides the first comprehensive and authoritative information on the condition of the HUD-insured multifamily stock and indicates the nature and scope of the challenges facing owners, HUD, and residents alike The second volume of the study will report on a computer simulation model that estimates the future impact of various Federal policies on the HUD-insured multifamily housing stock, its residents, and HUD budgets.

Current Status of HUD-insured (or Held) Multifamily Rental Housing offers no solutions to the complex and costly problems experienced by many of these properties It does provide insights for improving national strategies for monitoring the stock, providing remedial assistance, and disposing of failed properties, thereby helping to preserve this affordable housing resource and restore its physical and financial health

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OVERVIEW

Over 13,000 multifamily rental properties have mortgages insured (or held) by the U.S. Department of Housing and Urban Development (HUD). On the one hand, these mortgages represent a major contingent Federal liability, with most of the original $34 billion insured principal still outstanding. On the other hand, these privately owned, managed, and financed properties are a major housing asset, providing homes for nearly 1.5 million families, most of whom have low incomes.

This study reports on the physical and financial condition of these multifamily rental properties, with particular attention focused on the portion of these properties that are distressed. A distressed property is one whose combined physical and financial problems are severe enough to jeopardize tenant well-being, impair sound operations, and (if not corrected) lead to financial failure of the property. Distressed properties are of national concern for two reasons. First, physical or financial distress may result in poor housing for residents. Second, distress may cause owners to seek additional Federal financial assistance or to default on their mortgages. Default, in turn, results in HUD's paying insurance claims to lenders and possibly providing additional subsidies to protect affected tenants.

Over the years HUD has administered many different mortgage insurance and subsidy assistance programs. To simplify presentation, this report discusses findings in terms of the following categories of insured multifamily properties:

> *Unassisted properties* are properties insured under any HUD mortgage insurance program that receive no HUD subsidy (no rental assistance and no mortgage interest subsidy). This category includes *3,080 properties housing some 452,000 families.* Although there are no rent or income requirements in unassisted properties, 22 percent of these families were very-low income (below 50 percent of local median income), and 37 percent had low incomes (between 50 and 80 percent of local median income). Most unassisted properties have mortgages insured under the Section 221(d)(4) program.

> *Older assisted properties* are properties insured under any HUD mortgage insurance program that receive either *mortgage interest subsidies* (under the Section 236 or 221(d)(3) Below Market Interest Rate insurance programs) or *rental assistance* under the Section 8 Loan Management Set Aside, Rent Supplement, Rental Assistance Payment, or Section 8 Property Disposition programs. (Most of the properties

receiving rental assistance are insured under the Section 221(d)(3) Market Interest Rate program). Older assisted properties include *6,037 properties housing some 674,000 families.* Nearly all residents in these properties had incomes below 80 percent of the local median. Seventy-seven percent had incomes below 50 percent of the median and another 17 percent had incomes between 50 and 80 percent of median. These properties were generally insured between the late 1960s and mid-1970s (prior to the 1974 Housing Act), and many are in need of repair.

Newer assisted properties are properties insured under any HUD mortgage insurance program that receive rental assistance under one of the following Section 8 programs: New Construction, Substantial Rehabilitation, or Moderate Rehabilitation. (Most of these properties have mortgages insured under the Section 221(d)(4) program.) Newer assisted properties include *4,154 properties housing some 362,000 families.* Most residents (90 percent) had very low incomes and another 8 percent had low incomes. Newer assisted properties (insured after the 1974 Housing Act) have the highest mortgages and interest rates (because they were built at late 1970s and early 1980s prices and interest rates), but the newest physical systems.

Capital Needs Study Properties. Special attention is also given to a subset of assisted properties—Capital Needs Study properties. These are properties assisted under Section 236, 221(d)(3) Below Market Interest Rate and 221(d)(3) Market Interest Rate receiving Section 8 assistance, for which HUD needed separate estimates of capital needs. Capital Study Properties include *5,891 properties housing some 636,000 families.* This group of properties is nearly synonymous with the older assisted category. Ninety-six percent of the Capital Needs Study properties are older assisted, and 4 percent are newer assisted. Conversely, Capital Needs Study properties account for 94 percent of Older Assisted properties and 5 percent of Newer Assisted properties.

As *mortgage insurer,* HUD protects lenders against loss resulting from borrowers' (owners') default. This encourages lenders to make housing loans, increasing housing availability and affordability by reducing the "risk premium" portion of interest rates. As *assistance provider,* HUD subsidizes interest rates or pays the owner a portion of tenants' monthly rents. Subsidy assistance helps tenants by lowering their rents and helps owners by keeping properties' revenues high enough to cover sound operations. As a condition of these Federal benefits to lenders, tenants, and owners, HUD may regulate any or all of the following: rents, occupancy, property management, financial reporting, profit distributions, property re-sale, or mortgage prepayment.

STUDY FINDINGS

The study's principal findings are presented below. They cover the full stock of multifamily rental housing with mortgages that are insured by HUD, or held by HUD after assignment from the original lender. Findings are organized around the following topics: (1) properties' need for repairs and replacements, (2) properties' ability to cover operations, mortgage payments, and future capital needs from their rental income; (3) properties' ability to cover their repairs and replacements using internal funds; and (4) distressed properties' characteristics and physical needs (presented first for the entire multifamily stock and then for Capital Needs Study properties).

These findings are based on a combination of primary and secondary data collected for a representative national sample of 570 multifamily properties. Data were extracted from HUD's computerized databases whenever possible. These data were supplemented with primary data collected from HUD field offices, on-site physical inspection, telephone surveys with property owners and managers, and a series of telephone surveys aimed at assessing the unrestricted market value of each property. All physical needs and financial resources are expressed in 1989 dollars per 2-bedroom equivalent dwelling unit.[1]

1) Properties' need for repairs and replacements—*Total Backlog of Physical Needs.*

Each property was inspected to assess its *total backlog of physical needs,* which is defined as the cost of repairs and replacements required, beyond ordinary maintenance, to restore a property to original working condition. Physical needs were determined through a series of inspections of a sample of 1,089 buildings and 1,520 units in the study's 570 properties.

- The mean backlog was $1,520 per unit.

- Over 60 percent of the mean backlog consisted of a mixture of cosmetic items (wall and ceiling surfaces, interior doors), kitchen fixtures (appliances, counters, cabinets), and neglected exterior painting or failed insulation. These deficiencies

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[1]In order to compare costs across properties having different numbers of units, and different sized units, all property costs were normalized on the basis of each property's "2-bedroom equivalent" units. The number of 2-bedroom equivalent units was calculated by dividing the total square footage of living space in the property by the national average square footage of a 2-bedroom/1-bath unit (844 square feet).

reduce the quality of the units and properties' market appeal, but generally do not impair structural soundness.

- About a fourth of the mean backlog reflected problems in systems more likely to impair health and safety, including heating and cooling systems, electrical systems, bathroom fixtures, and interior unit construction.

- Most properties were keeping up with repairs and replacements, having backlogs of less than $1,000 per unit. (On average, a property will need about $832 in new repairs and replacements per year, so that a backlog of less than this amount indicates little or no carryover from prior years.) Half of all properties had backlogs below $654 (median)

- More than a fifth of properties had serious backlogs of from $2,500 to over $7,500 per unit.

- Serious backlogs were particularly prevalent among older assisted properties.

  - Older assisted properties had a mean backlog of $2,115, more than double that of newer assisted or unassisted properties.

  - Thirty percent of older assisted properties had serious backlogs of over $2,500 per unit. This was more than twice the proportion of unassisted or newer assisted properties with serious backlogs.

  - While older assisted properties had worse problems (on average) for all systems their backlogs were distributed in the same proportions across physical systems as the newer assisted and unassisted properties.

2)   **Properties' ability to cover their operations, mortgage payments, and allocations to reserves from their rental income—*Net Cash Flow***

The study computed each property's annual *net cash flow*, defined as total annual income less annual expenses to cover operations and maintenance, mortgage payments, and deposits to current or required reserves. (A weighted average over three years was used to eliminate year-to-year fluctuations.) A *breakeven* net cash flow would indicate that a property could cover its current needs as well as put aside some funds for future replacements and overhauls of physical systems. A *positive* net cash flow would mean that, in addition, a property could take on a portion of any unfunded backlog of needs.

- Annual net cash flow averaged $330 per unit, with most properties (68 percent) having positive net cash flow. Median net cash flow was $184.

- Newer assisted properties had the highest net cash flow, with a mean of $665. Eighty-seven percent had positive net cash flow and few had large deficits.

- Unassisted properties and older assisted properties had similar proportions of positive net cash flow (60 percent and 59 percent, respectively). Nevertheless, the distribution of cash flow across the two groups differed markedly, probably reflecting the differences in relative risks and rewards between subsidized and market operations:

  - On the low end of the scale, 19 percent of unassisted properties had large cash flow *deficits* exceeding $500 (i.e., minus $500), compared with only 10 percent of older assisted properties.

  - On the high end of the scale, 36 percent of unassisted properties had large *positive* cash flows exceeding $500, compared with only 11 percent of older assisted properties.

The study also examined several components of net cash flow—items that contribute to income or to expense.

- A property's vacancy loss is the amount by which its annual collected rents fall short of its maximum potential rent. Vacancy losses were (on average) much higher for unassisted properties (8.2 percent) than for either older assisted properties (3.4 percent) or newer assisted properties (1.3 percent). This reflected, in part, the ability of subsidy programs to maintain occupancy levels, compensating for weak markets or properties' competitive disadvantages.

- Newer assisted properties had higher operating and maintenance expenses than did either older assisted or unassisted properties.

- There were large differences in mortgage debt service expenses across assistance categories: older assisted properties paid $1,318 per unit (after interest subsidy), unassisted properties paid $2,670, and newer assisted properties paid $3,443 (which reflects the high nominal construction costs and interest rates of the late 1970s and early 1980s).

3)   **Properties' ability to cover their backlog and future repairs and replacements using internal funds—***Backlog Coverage Ratio, Unfunded Backlog of Needs, and Unfunded Accrual.*

Properties generally have internal funds that may be used to cover physical backlog needs. These funds may be in any or all of the following accounts: (i) each insured property is required to maintain a *reserve for replacements* account to cover physical needs; (ii) some properties maintain *other reserve* accounts for special purposes, such as painting reserves; (iii)

some properties with non-profit owners and or with for-profit owners who are restricted by HUD as to the amount of dividends (profits) that can be distributed, are required to put non-distributable profits (surplus cash) into *residual receipts* accounts which, although not intended as repair funds, may be used for that purpose.

For each property, the study computed two measures of the adequacy of these internal funds to cover physical needs backlogs—the *backlog coverage ratio* and the *unfunded backlog of needs*. These measures are defined and discussed below.

The *backlog coverage ratio* was computed as the total of all internal funds (reserves plus residual receipts) divided by the physical needs backlog. A ratio of 1 or more would indicate that internal resources were sufficient to cover fully all backlog needs.

- Fifty-five percent of all properties had insufficient resources to cover their backlogs (backlog coverage ratios below 1).

- Older assisted properties fared worse than other categories, with 65 percent having insufficient resources (backlog coverage ratios below 1).

The *unfunded backlog of physical needs* was computed by subtracting the total of internal funds from the physical needs backlog. This is the amount of backlog needs for which a property would have to seek funds from: cash flow, increases in rent and occupancy, loans, cash advances from owners, grants from local or state programs, or remedial assistance from HUD's programs.

- Most of the physical needs backlog was unfunded—the mean unfunded backlog of physical needs was $1,214 per unit, only slightly smaller than the mean total backlog (which was $1,520).

- Older assisted properties were worse off than other groups, with a mean unfunded backlog of $1,726 (two and a half times that of newer assisted properties, and nearly double that of unassisted properties). This is largely a result of the higher backlogs found in the older assisted properties, rather than lower resources.

- Thirty-two percent of older assisted properties had high unfunded backlogs (exceeding $2,000), compared with only 13 percent of newer assisted properties and 14 percent of unassisted properties.

Apart from any current backlog of physical needs, properties will require future capital repairs, above and beyond normal maintenance. Given the current age and condition of a property and the expected useful lives of various building systems, we have estimated its average

annual accruals over the next 20 years. The internal funds that may be used to cover the ongoing physical needs include: (1) annual deposits to the reserve for replacement account and (2) positive net cash flow.

The study computed a measure of adequacy of these internal funds—*unfunded accrual of physical needs*. The annual unfunded accrual equals the average annual accrual reduced by the available internal funds.

- On average, properties are expected to lack $394 per unit per year in resources to cover ongoing needs.

- Older assisted properties are expected to lack more per unit ($525) compared with newer assisted ($227) or unassisted ($361) properties.

While not immediately a threat to properties, unfunded accruals indicate a future need for resources beyond the level currently generated by the property. These levels of unfunded accruals and the associated risk to the properties may be reduced to the extent that property owners raise additional revenues either through rent increases or through additional HUD funds.

4) Distressed properties' characteristics and physical needs

Using the concepts of physical and financial condition explored above, the study computed a *Distress Index*—a combined indicator encompassing both a property's net cash flow and unfunded backlog of physical needs. The purpose of the Distress Index was to identify properties that apparently lack the financial resources to make needed repairs and meet normal operating and maintenance expense. The Distress Index was computed as a modified net cash flow as follows:

' *Net Cash Flow* (3-year weighted average)

Minus Amortized cost of remedying Unfunded Backlog of Physical Needs

Plus Added income from reducing Vacancy Losses

This computation relies on two concepts that require further explanation—amortizing the unfunded backlog and reducing vacancy losses.

Amortizing the Unfunded Backlog of Physical Needs. One would not normally expect a property that had accumulated a backlog of physical needs over a number of years, to pay for a repair program all at once. The Distress Index computation

amortizes the backlog by assuming that owners take out a 9 percent interest loan over 20 years to cover unfunded repairs. This is equivalent to paying annually an amount equal to 10.8 percent of the backlog for 20 years, since 10.8 percent is the debt service factor on a 9 percent, 20-year loan. This loan amortization is meant to simulate the *combination of ways* in which an owner might spread remedial repair costs over time, such as:

- Staging repairs and replacements over time, beginning with highest priority items;

- "Borrowing" from creditors by deferring full payment of the property's obligations (especially those to firms related to the owner such as identity-of-interest property management, accounting, legal, or plumbing firms);

- Deferring a portion of mortgage debt service (with HUD's approval);

- Providing advances to the property from the owner's own funds (or from loans secured by the owner and not the property); and, finally, by actually

- Taking out a loan secured by the property.

Reducing Vacancy Losses. This adjustment applies only to high-vacancy properties. The Distress Index computation assumes that, as a result of improvements in physical condition or operations, properties whose vacancies rank in the highest 25 percent for their assistance category are able to reduce them to that of the 75th percentile of vacancies; and properties that already have vacancies below this level (but are above the median for their assistance category) are able to reduce them to the median.

The resulting Distress Index would be highly negative (a deficit) for properties having very high unfunded physical needs backlogs, very high negative net cash flows, or some combination of the two. To facilitate presenting findings, the report names three ranges of the Distress Index as follows:

Sound Properties—Distress Index Breakeven or Positive (no deficit). These properties apparently have sufficient resources to cover operations, debt service, deposits to reserves for replacement, and amortization of the current physical needs backlog.

Stressed Properties—Distress Index *deficit* up to $250 (moderately negative index values). These properties seem likely to develop serious problems in the absence of improved income or operations. Properties assisted through Section 8 may be able to obtain rent increases to close the gap. Other properties may be able to survive shortfalls of this magnitude in the short run by juggling payment of obligations and cutting corners.

Distressed Properties—Distress Index *deficit* **exceeding $250** (large negative index values). These properties would face a severe resource shortfall and be at risk of failing to remedy critical backlog items, fund essential operations, or pay full mortgage debt service. The $250 deficit threshold (by no means a unique level) would be equivalent to any of the following conditions: having to amortize a $2,300 unfunded backlog, being short on cash flow by 9 percent of average operating expenses, or needing monthly rent increases of more than $21 per unit (which is over a 9 percent increase in tenant paid rents in assisted properties). Any of these conditions are likely to constitute a major problem.

The findings below are reported first for the entire multifamily rental stock, and second for Capital Needs Study properties (which are primarily older assisted properties).

Findings on the Entire Multifamily Rental Stock

Nearly a quarter of all properties were distressed—over 3,100 properties housing over 380,000 households.

- Overall, 24 percent of properties were distressed, 14 percent were stressed, and the remaining 62 percent were sound.

- Thirty-one percent of older assisted properties and 30 percent of unassisted properties were distressed, compared with only 9 percent of newer assisted properties.

- Twenty-one percent of older assisted properties were stressed, compared with only 10 percent of unassisted properties and 6 percent of newer assisted properties.

- The Distress Index shows the degree to which a property can meet its physical needs and financial obligations, with negative values showing that properties have inadequate resources. The mean Distress Index value was positive $276 per unit, showing that overall, properties' financial resources exceeded their obligations. The mean Distress Index values by assistance category were $625 for newer assisted properties, $293 for unassisted properties, and only $28 for older assisted properties.

- As one would expect, distressed properties had much higher backlogs of physical needs than did stressed or sound properties. Distressed properties had a mean unfunded backlog of $2,999 per unit, more than double that of stressed properties and close to six times that of sound properties.

- Many distressed properties were nevertheless providing good housing to residents, at least for the moment:

- Thirty-two percent of distressed properties had unfunded backlogs of under $500 per unit. Their high cash flow deficits rather than current repair needs made them distressed.

- The study's inspectors rated 68 percent of distressed and 88 percent of stressed properties as being of excellent or good overall quality (compared with 94 percent of sound properties). Looming backlogs were not necessarily influencing perceived current quality.

• Nine percent of sound properties had high unfunded needs backlogs exceeding $2,000. These properties were candidates for comprehensive loan servicing by HUD because they apparently had available (but were not using) positive cash flow to cover their unfunded backlogs.

The 3,168 distressed properties in the entire multifamily rental stock had a combined unfunded backlog of physical needs of $898 million (in 1989 dollars). An additional 1,816 stressed properties had a combined unfunded backlog of $286 million. The unfunded backlog for all distressed and stressed properties in the multifamily rental stock taken together was $1.2 billion.

Among assisted properties (newer and older assisted combined), there were over 2,200 distressed assisted properties (housing over 229,000 families) with a combined unfunded backlog of physical needs of $708 million. There were an additional 1,494 stressed assisted properties (housing nearly 163,000 families) with a combined unfunded backlog of $247 million. The unfunded backlog for all distressed and stressed assisted properties taken together was $955 million.

These unfunded backlogs represent the upper limit on the amount of additional Federal resources these distressed and stressed properties would need to restore all physical systems to sound condition. A portion of these backlogs could be covered from cash flow, increases in rent and occupancy, loans, cash advances from owners, and grants from local or state programs.

Findings on Capital Needs Study properties

Capital Needs Study properties, as noted previously, are a subset of assisted properties that includes 5,663 older assisted properties and 228 newer assisted properties.

• Over 1,600 Capital Needs Study properties housing over 159,000 families were distressed.

- Overall, 27 percent of Capital Needs Study properties were distressed, 22 percent stressed, and 50 percent sound.

- The mean Distress Index value was positive $84 per unit. This is marginally better than the value for older assisted properties (discussed above) because Capital Needs Study properties include a small number of newer assisted properties.

- As one would expect, distressed Capital Needs Study properties had much higher backlogs of physical needs than did stressed or sound properties. Distressed properties had a mean unfunded backlog of $3,882 per unit, more than two and a half times that of stressed properties and nearly seven times that of sound properties.

- Many distressed Capital Needs Study properties were nevertheless providing good housing to residents, at least for the moment.

  - Eighteen percent of distressed properties had low unfunded backlogs of under $500 per unit. Their high cash flow deficits rather than current repair needs made them distressed.

  - The study's inspectors rated 53 percent of distressed and 88 percent of stressed properties as being of excellent or good overall quality (compared with 89 percent of sound properties).

- Ten percent of sound properties Capital Needs Study Properties had high unfunded backlogs exceeding $2,000. These properties were candidates for comprehensive loan servicing by HUD because they apparently had available (but were not using) positive cash flow to cover their unfunded backlogs.

The 1,646 distressed Capital Needs Study properties had a combined unfunded backlog of physical needs of over $564 million (in 1989 dollars). An additional 1,266 stressed properties had a combined unfunded backlog of $215 million. The unfunded backlog for all distressed and stressed Capital Needs Study properties taken together was $779 million.

CHAPTER ONE

OVERVIEW OF THE STUDY

The Department of Housing and Urban Development (HUD) insures mortgages for over 13,000 multifamily rental properties, which together include over 1.5 million units. This HUD-insured inventory accounts for nearly 13 percent of the nation's privately owned multifamily rental housing. HUD provides subsidies to nearly 80 percent of these properties to keep units affordable to lower-income households. HUD's interest in the status of the stock results from two key facts:

1. HUD is responsible for managing this substantial portfolio of insured mortgages as part of its broad mission to make decent housing more accessible and affordable to lower-income families.

2. HUD is also responsible for protecting the FHA insurance fund, for which this portfolio of mortgages represents a contingent liability in excess of $34 billion.

Clearly, these two concerns are closely linked Failure to maintain acceptable housing quality not only undermines the goal of providing decent housing, but is also likely to lead to high vacancies, financial difficulties, and claims on the FHA mortgage insurance fund. Similarly, properties that suffer financial failure may require substantial additional financial injections and management direction from HUD to prevent their being lost from the stock of housing available to low-income households.

An accurate picture of the current status of the stock is important both for its implications regarding present housing concerns and its implications for the likely future uses of the stock, their impacts on tenants, and costs to HUD of providing housing to low- and moderate-income households. This report should help policy makers assess the extent to which the HUD-insured inventory is providing decent, affordable housing to low- and moderate-income households, while at the same time protecting the FHA insurance fund from mortgage defaults.

Prior to this study, HUD did not have an accurate, comprehensive set of information on the condition of the multifamily inventory. Some data sources are very detailed, but cover only a small number of properties and are collected only when special circumstances arise. Other data sources are available for the entire inventory (such as certain computer files), but do not contain sufficient detail to characterize the condition of the stock. Collection of detailed,

consistent information on a representative sample of properties permits assessment of the status of the stock as a whole. This comprehensive data on the current condition of the stock also provides basic material for HUD to prepare its Congressionally mandated study on the capital needs of distressed older properties (Section 204(c)(1) of the Department of Housing and Urban Development Reform Act of 1989, as amended by Section 583 of the National Affordable Housing Act of 1990).

This report describes the current status of the HUD-insured multifamily rental housing stock, with particular attention paid to properties that are distressed, or are likely to become distressed unless remedial actions are taken. A distressed property is one whose combined physical and financial problems are severe enough to jeopardize tenant well-being, impair sound operations, and (if not corrected) lead to financial failure of the property.

The remaining portion of this chapter describes the study sample (Section 1.1) and the data collected for the study (Section 1.2) and provides a brief description of the study's research agenda (Section 1.3). Chapter 2 describes the current status of the stock, with sections on its occupants, its physical and financial condition, remedial assistance received by insured properties, neighborhood characteristics, and prepayment and preservation status. In Chapter 3 we present a definition of distress and characterize properties that are distressed. Chapter 3 also presents the characteristics of those distressed and sound properties that are part of the Capital Needs Study sample. Several appendices follow the main text: Appendix A on Sampling; Appendix B on Data Collection; Appendix C on Costing Methodology; Appendix D with Supplementary Tables; and Appendix E with a glossary of terms used in the study.

1.1 Sample

Study Coverage—Insured and Held Multifamily Rental Stock (Universe)

This study of the HUD-insured multifamily rental stock covers 13,271 rental housing properties that have mortgages either insured or held by HUD. The original principal value of these mortgages exceeded $34 billion. While this study includes the overwhelming majority of insured multifamily rental properties, the study excludes the following mortgage programs, geographic areas, or property uses: properties outside the contiguous states or in remote rural areas (necessary to reduce data collection costs); non-residential, non-rental, or single-family properties such as nursing homes, condominiums, most cooperatives, hospitals, and mobile

homes; uninsured properties, such as Section 202 direct loans for elderly or disabled households, or state-financed uninsured properties receiving subsidies under Section 236 or Section 8; properties owned by public bodies; properties insured as war housing or veterans housing under Sections 608 or 803; co-insured (or formerly co-insured) properties; and HUD-acquired properties, for which HUD is the temporary owner pending sale. For purposes of sampling and analysis, the multifamily rental stock has been divided into three groups based on whether or not a property receives HUD assistance, and, if so, the type of assistance: Unassisted Properties, Older Assisted Properties, and Newer Assisted Properties. These assistance categories are defined in Exhibit 1.1.[1]

Study Sample[2]

The study sample was selected by drawing 1,000 properties from the universe of 13,271 insured properties described above. This sample, referred to as the "Monitoring Sample," is intended for use by HUD in monitoring the insured stock. Data collection for this sample was limited to information that was readily available from HUD records and data bases in the Central Office and Field Offices, and included basic property characteristics, mortgage information, income and loss reports, neighborhood demographics, and basic tenant characteristics.

The Analysis Sample, for which additional, more costly information was collected, is the primary basis for most of this study's analyses and for the financial operations model that the study uses to project the future status of the multifamily stock. For the Analysis Sample, primary data were collected (in addition to the HUD records discussed above), including on-site physical assessments of properties by specially trained architects and engineers, market assessments based on surveys of local real estate experts coupled with limited on-site observations, and surveys of owners/managers for additional information about finances and characteristics of owners and tenants.

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[1]Throughout this report, the "Older Assisted" category provides a good estimate of the characteristics of properties about which Congress expressed special concern in Section 204(c) of the HUD Reform Act of 1989. In Chapter 3 of this report, special exhibits are provided that focus specifically on the needs of the latter group of properties, which will be called the "Capital Needs Study" properties.

[2]The sample was drawn from the mid-1989 universe of insured and held properties. Full details on sampling are presented in Appendix A

Exhibit 1.1

MULTIFAMILY RENTAL HOUSING—DEFINITIONS
OF ASSISTANCE CATEGORIES USED IN THIS REPORT

UNASSISTED PROPERTIES. Unassisted properties receive no HUD assistance beyond the original mortgage insurance. They are of interest because of HUD's contingent mortgage insurance liability and because many of their residents have low incomes. (About 60 percent of tenants have incomes below 80 percent of the local median income, including about 23 percent who are below 50 percent of local median income.) This category includes properties with no rental assistance insured under any of the following programs:

- Section 207 Multifamily Housing
- Section 220 Urban Renewal
- Section 231 Elderly
- Section 221(d)(3) Market Interest Rate (MR)
- Section 221(d)(4) Multifamily Rental Housing

OLDER ASSISTED PROPERTIES. Older assisted properties are of particular interest because they are more likely to be distressed since they have older physical plants and shallower subsidies. This group includes most of the properties of interest to Congress for this "Capital Needs Assessment" and most properties covered by the Low-Income Housing Preservation and Resident Homeownership Act of 1990. This category includes the following insurance and assistance programs:

- Section 221(d)(3) Below Market Interest Rate (BMIR), officially Section 221(d)(5)
- Section 236 Interest Supplement on Rental and Coop Housing
- Other HUD-insured (or held) properties having one of the following types of rental assistance:

  - Loan Management Set Aside (LMSA) Section 8
  - Rent Supplement or Rental Assistance Payment (RAP)
  - Property Disposition Section 8

NEWER ASSISTED PROPERTIES. Newer assisted properties are expected to be in good physical and financial condition, based on their age and relatively high subsidy levels. Some, however, may be at risk for opt-outs—owners in high rent markets may choose to terminate Section 8 contracts in order to convert their properties to market rate rentals or condominiums. Although dominated by Section 221(d)(4), this category includes any multifamily insurance program with one of the following types of Section 8 assistance:

- Section 8 New Construction
- Section 8 Substantial Rehabilitation
- Section 8 Moderate Rehabilitation

Exhibit 1.2 compares the universe, monitoring sample, and analysis sample. It presents total counts as well as counts for each of the three assistance categories. The exhibit shows the original samples (as initially drawn) as well as the final samples (properties remaining at the conclusion of data collection). Preliminary data collection with Field Office staff revealed that 24 properties in the original monitoring sample were ineligible for the study either because the property was no longer insured or held (n=19) or because it was a nursing home (n=5). Two additional properties were determined to be ineligible during the on-site inspections, leaving a final monitoring sample of 974 properties. Of the 24 properties originally determined to be ineligible, 12 were in the analysis sample. These analysis sample properties were replaced with other properties in the same assistance category and PSU, leaving an original analysis sample of 600 properties. Data collection was successfully completed on 570 of these properties. Some properties were not inspected due to refusals on the part of the owner or manager or difficulty scheduling an inspection (n=28). Two properties were inspected, but were later determined to be ineligible for the study.[3]

The actual sampling was conducted in two stages—first selecting a sample of geographic areas, then selecting specific properties within each of these areas. By clustering the sample properties by geographic area (rather than scattering them over the entire nation), the study was able to reduce travel and other data collection costs.[4] In simplified form, sample selection proceeded as follows:

First Stage Sampling—Choose Areas. The contiguous 48 states and District of Columbia were divided into 217 geographic areas ("Primary Sampling Units" or PSUs), each composed of a Metropolitan Statistical Area (MSA) together with its contiguous nonmetropolitan counties. From these 217 geographic areas (PSUs), 53 were selected for the sample. Each PSU had a probability of being selected that was proportional to its share of the nation's insured multifamily stock.

Second Stage Sampling—Choose Properties. Actual properties were selected from within each of the 53 PSUs selected in the first stage. The properties within the 53 areas were stratified by the three assistance categories to assure that a pre-determined

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[3]All data and analyses that project from the sample to the universe incorporate appropriate weights to restore the proper relation among the categories of properties.

[4]The number of clusters was large enough, however, to assure that the sample would be well representative of the national stock of multifamily insured properties.

Exhibit 1.2

PROPERTIES BY ASSISTANCE CATEGORY

	Unassisted	Older Assisted	Newer Assisted
Universe (13,271)	3080 (23%)	6037 (45%)	4154 (31%)
Original Monitoring (1,000)	205 (21%)	540 (54%)	255 (26%)
Final Monitoring (974)	189 (19%)	532 (54%)	253 (26%)
Financial Data (930)	168 (18%)	513 (53%)	249 (27%)
Original Analysis (600)	123 (21%)	324 (54%)	153 (26%)
Final Analysis (570)	115 (20%)	309 (54%)	146 (26%)

portion of properties would be Unassisted, Older Assisted, and Newer Assisted properties.[5] Within these categories, properties were selected randomly.

1.2 Data Collection

The data used to describe the current status of the HUD-insured multifamily housing stock and to model its future status were drawn from a variety of secondary and primary sources. Abt, along with five subcontractors, collected the necessary data over a one-year period, between July 1990 and June 1991.[6] Data sources and key data elements include:

1. **HUD Computerized Data**—Multifamily Insured and Direct Loan Information System (MIDLIS), Section 8 Management Information System (MIS), Multifamily Information and Processing System (MIPS), F47 Payment Database, MARS Database on HUD-held properties, Civil Rights Tenant Characteristics/Occupancy Report (Form 949), Addresses and Site Codes of Multifamily HUD-assisted Housing (Form 951), Section 8 Fair Market Rents and Annual Adjustment Factors, HUD Prepayment Database:

   - Basic project descriptors (Section of the Act, occupancy type, total units, production method, mortgage status, mortgage start year)

   - Financial data (mortgage amount, balance, term and interest rate; property expenses and income; Section 8 information; other remedial assistance including flexible subsidies, rent supplement or other assistance)

2. **HUD Field Office Loan Management Records**—Mail/Phone Surveys:

   - Verification/correction of key data from HUD computer files.

   - Financial data not available on computer files (replacement reserves and other reserves—balance and recent withdrawals, residual receipts).

   - Transfers of Physical Assets (TPAs), Section 8 Contracts.

3. **Property Owners/Managers**—Mail/Phone Surveys:

   - Ownership structure information.

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[5]The selection procedure purposely "oversampled" older assisted properties, particularly older assisted properties with large average size units. This allows more precise analyses of these properties, which are of special policy concern.

[6]Appendix B provides further details on data collection and data cleaning.

- Tenant characteristics (copies of HUD Form 50059s where available, otherwise owner/manager estimates).

- Financial information not available from other sources (such as additional mortgages and trust notes).

4. **Physical Inspections** (on-site inspection of units, buildings and site and a windshield survey of the neighborhood):

- Current physical condition, backlog of maintenance and repair needs.

- Conversion potential (from a physical perspective) to moderate market, high-end market, or condominium use.

- Overview of neighborhood condition.

5. **Market Value Data Collection**

   a. HUD Field Office Economists—Mail Survey:

   - Market trends.

   - List of competitive properties and local market contacts.

   b. Physical Inspectors on site:

   - Neighborhood windshield survey and photographs.

   - Photographs of subject property.

   - List of competitive properties and local market contacts.

   c. Telephone survey of public officials, realtors, and competitive building owners/managers):

   - Market rents (unassisted) and value of the property in its "as is" condition, and at its highest and best use.

   - Neighborhood condition and recent trends.

1.3   Study Research Agenda

The research agenda for this portion of the study relates to the current status of the HUD-insured multifamily housing stock. Issues regarding the future of the HUD-insured

multifamily stock are addressed through a computer simulation model. The model relates current financial status, property characteristics, unassisted market value, and HUD program rules and alternative actions to the actions owners will be likely to undertake, and the resulting impact on the status of the housing stock and its occupants. The model will enable policy makers to assess the impacts on tenants and HUD budgets of alternative policies, such as new loan management tools or the HOPE II program for providing homeownership opportunities using multifamily properties that are HUD-owned or have mortgages that are HUD-held or HUD-insured. A full description of the model and the results of the simulation are presented in a companion report, *Modeling the Future Status of HUD-Insured (Or held) Multifamily Rental Housing.*

Chapter 2 focuses on the current status of the stock, detailing tenant characteristics, physical condition, financial status, receipt of remedial assistance from HUD, description of local neighborhoods and markets, and prepayment and preservation status. Chapter 3 defines an overall distress index that combines the financial and physical needs of a property. The chapter then compares characteristics of distressed properties with those of sound properties. Finally, the chapter also provides details on the Capital Needs Study properties. Major categories of policy concern about the HUD-insured multifamily rental housing stock are indicated below with the sections indicated where the category is addressed in the report.

Tenant Characteristics. Tenants are among the intended beneficiaries of HUD's insurance and subsidy programs. Tenant characteristics both identify who is served and can provide an indication of possible impacts of various HUD policies and regulations. For example, household income levels provide an indication of what levels of rent can be paid without over-burdening tenants, or the feasibility of a resident ownership program such as HOPE II or portions of the 1990 Preservation Act. Household type—e.g., elderly, large family, handicapped—may provide an indication of tenants' special needs. Section 2.2 provides a description of the households residing in HUD-insured properties.

Physical Condition. The physical condition is of concern both in how it affects the current quality of housing provided to tenants, as well as in its potential impact on the financial viability of the property and its potential demand for HUD assistance. For this study physical condition is characterized by the backlog of physical needs, defined as the cost of repairs and replacements required to restore all property systems to their original working condition.

Section 2.3 presents the methodology used to measure physical condition, and describes the condition of the HUD-insured stock.

Financial Condition. The current financial situation is particularly relevant in assessing whether a property is at risk of defaulting on its mortgage. Properties with insufficient financial resources also are at risk of undermaintaining the property in the short run or missing payments to the reserve accounts, which may put the property at risk in the long run. Section 2.4 provides three measures of financial condition: (1) net cash flow; (2) ability to cover backlog of needs from available reserve balances, and (3) ability to cover annual accrual of needs from ongoing deposits to the reserve for replacement account.

Remedial Program Assistance. Assisted properties experiencing financial difficulties may be eligible for remedial assistance from HUD. This assistance, in the form of Section 8 Loan Management Set Aside (LMSA) or Flexible Subsidy loans, provides troubled properties with additional resources necessary to operate and maintain the property. Section 2.5 describes the remedial assistance programs available to insured properties, and provides details on the extent to which these programs are used. Use of the Section 8 New Construction Program and Transfers of Physical Assets, are also described in this section.

Local Markets. Conditions in the neighborhood of an insured property are an element of the quality of housing provided to tenants. Local market conditions also are important determinants of properties' future operations, including whether the owners of some assisted properties are likely to convert them to market use, and whether tenants in assisted properties could afford market-rate units in their local markets. Section 2.6 describes the neighborhoods where insured properties are located, compares property rent and vacancy characteristics with those in the surrounding neighborhoods, and presents the unrestricted market potential for these properties.

Prepayment and Preservation Status. The continued role of the HUD-insured stock as a source of housing for low-income households is challenged in several ways. Certain assisted properties may be eligible, on their twentieth mortgage anniversary, to convert the property to market use or to receive financial incentives to remain in low-income occupancy. A second group of properties assisted under the Section 8 program, have the right to renew or opt out of their Section 8 contracts periodically (every 5, 15, or 20 years). A third group of properties, particularly those with non-profit owners, are required to maintain the low-income

nature of the property for the full mortgage term (usually 40 years). The remaining, mostly unassisted properties, have no use restrictions and can prepay their mortgages at any time. Section 2.7 describes the timing of the eligibility to prepay and number of properties and units affected, for each category of properties.

Predicting Physical Condition Using Existing Data. The process of conducting on-site inspections used to assess the physical condition of the stock is very costly, whereas other kinds of data are more readily available from existing HUD databases. Section 2.8 attempts to use the existing data to predict physical condition. If we were to find a set of variables that predicted a property's physical condition, HUD would be able to use these data to easily assess the condition of monitoring sample and other properties.

Distress in the HUD-Insured Multifamily Stock. Section 3.1 defines an overall financial measure called the distress index, which combines a property's cash flow with the resources needed to address the backlog of physical needs. Properties with positive values of the distress index have sufficient resources to meet current physical and financial obligations and are considered *sound*. Properties with very low values of the distress index are properties that have high deficits in resources that jeopardize ongoing operations and are considered *distressed*. Properties with moderate negative values of the distress index are considered *stressed*. These properties may be getting by in the short run by juggling payments and cutting corners on maintenance but they are at risk of becoming distressed because they are experiencing shortfalls in resources. Section 3.2 describes distress in the full insured stock and Section 3.3 characterizes properties based on their overall distress status.

Capital Assessment of Distressed Older Assisted Properties. Under Title II of the 1989 HUD Reform Act, Congress has expressed particular concern about the capital needs of a certain group of assisted properties. The Capital Needs Study properties are those insured and assisted under Sections 236 or 221(d)(3)BMIR, or insured under Section 221(d)(3) and assisted under Section 8 or Rent Supplement. Section 3.4 describes these properties, and the extent to which they are distressed. Section 3.5 summarizes the backlog of repair needs and the unfunded portion of the backlog for all distressed and stressed properties in the stock as a whole and for the Capital Needs Study properties in particular.

CHAPTER TWO

CURRENT STATUS OF THE HUD-INSURED STOCK

This chapter describes the current status of the stock of multifamily rental housing with HUD-insured or HUD-held mortgages. Section 2.1 gives some basic information on the properties and Section 2.2 describes some characteristics of their occupants. Section 2.3 describes the physical condition of the stock, focusing on the current backlog and future annual accruals of repair needs Section 2.4 describes its financial condition, focusing on net cash flow and ability to cover repair needs. Section 2.5 provides details on receipt of remedial assistance by HUD-insured properties. Section 2.6 describes the neighborhoods in which insured properties are located, and how insured properties compare with other properties in their neighborhoods. Section 2.7 provides information on prepayment eligibility and potential timing of prepayments. Finally, Section 2.8 provides a discussion of a multivariate analysis that uses property characteristics to predict physical condition.

2.1   Introduction

A major objective of this study is to provide HUD with an accurate, comprehensive picture of the current status of the HUD-insured and HUD-held multifamily stock. This study covers the universe of 13,271 HUD-insured properties as identified in the previous chapter.[1] Exhibit 2.1 shows some basic descriptors of the stock, and of the policy domains relevant to the study.

- Overall, 77 percent of insured properties received some sort of assistance beyond their insured mortgages. Of the assisted properties, 41 percent are considered newer assisted; they were all assisted through the Section 8 New Construction and Substantial Rehabilitation programs. Fifty-nine percent of the assisted properties were assisted through older programs, in particular Section 236, Section 221(d)(3)BMIR, and loan management assistance.

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[1]The study universe excludes properties outside the contiguous states or in remote rural areas; nursing homes, student housing, condominiums, most cooperatives, hospitals, and mobile homes; Section 202 direct loans for elderly or disabled households, or uninsured properties receiving subsidies under Section 236 or Section 8; properties owned by public bodies, various categories of war housing or veterans housing; and HUD-acquired properties.

Exhibit 2.1

ATTRIBUTES OF THE HUD-INSURED MULTIFAMILY HOUSING STOCK

Characteristic	Total	Total		Assisted	
		Unassisted	Assisted	Older Assisted	Newer Assisted
Number of properties	13,271	3,080	10,191	6,037	4,154
Percent of total properties	100%	23%	77%	59%[1]	41%[1]
Number of units	1,487,812	451,703	1,036,109	674,227	361,882
Percent of total units	100%	30%	70%	65%[1]	35%[1]
Total Units					
<50	19%	10%	21%	18%	25%
50-99	34%	29%	35%	32%	40%
100-199	35%	42%	34%	36%	29%
≥200	12%	19%	10%	14%	5%
Average Number of Units	112	147	102	112	87
Median Number of Units	96	120	84	99	75
Unit Size					
<2.25 BR	80%	95%	76%	73%	81%
≥2.25 BR	20%	5%	24%	27%	19%
Average unit size	1 7	1 6	1.8	1.8	1 6
Occupancy Type					
Family	76%	90%	72%	81%	59%
Elderly/Handicap (Part or Full)	24%	10%	28%	19%	41%
Sponsor Type					
Non-Profit/Coop	18%	3%	22%	36%	3%
Limited Dividend	37%	4%	46%	60%	27%
For Profit	45%	92%	31%	4%	71%
Production Method					
New Construction/Sub Rehab	85%	81%	86%	90%	81%
Existing (incl refinance reinsure)	15%	19%	14%	10%	19%

Exhibit 2.1

ATTRIBUTES OF THE HUD-INSURED MULTIFAMILY HOUSING STOCK

Characteristic	Total	Total		Assisted	
		Unassisted	Assisted	Older Assisted	Newer Assisted
Building Type					
High Rise	28%	29%	28%	21%	40%
Walk-up	44%	54%	40%	46%	33%
Single-Family Attached	28%	17%	31%	34%	26%
Single-Family Detached	0%	0%	1%	0%	1%
Mortgage Start Year					
Pre-1970	6%	8%	5%	9%	0%
1970-1979	54%	43%	57%	86%	14%
1980 or later	40%	48%	38%	5%	86%

[1] Percentages in the older and newer assisted categories total 100% of the total assisted category's 77%   Older assisted properties comprise 45% of the universe, and newer assisted properties comprise 31%.

Table based on 570-property analysis sample.

Data Sources: HUD MIDLIS data base, HUD Field Office data collection forms, inspectors.

Note: Column sums may not add up to 100% due to rounding.

- *Property Size:* The unassisted stock tends to consist of larger properties, with an average of 147 units; 19 percent have 200 or more units, and only 10 percent have fewer than 50 units. The newer assisted properties are smaller, with 87 units on average; only 5 percent have 200 or more units and 25 percent have fewer than 50 units. Older assisted properties are between these extremes, with 112 units on average.

- *Unit Size:* The units in unassisted properties tend to be smaller than those in assisted properties. Ninety-five percent of unassisted properties have an average unit size of under 2.25 bedrooms, and the overall average unit size is 1.6 bedrooms. Newer assisted properties have the same overall average size of 1.6 bedrooms, and 81 percent of properties have average unit sizes of below 2.25 bedrooms. Older assisted properties have larger units on average (1.8 bedrooms) and more properties with an average size of at least 2.25 bedrooms (27 percent).

- *Occupancy:* The newer assisted stock has the highest concentration of elderly/ handicapped occupancy, with 41 percent of properties being at least partially elderly or handicapped tenants. Nineteen percent of older assisted properties were at least partially reserved for elderly or handicapped as were ten percent of the unassisted properties.

- *Ownership:* Nearly all of the unassisted and newer assisted properties have profit-motivated or limited-dividend owners. Over 30 percent of the older assisted stock is owned by non-profit entities.

- *Building Type:* The predominant building type is walk-up. Forty-four percent of the properties consist of walk-ups, ranging from 33 percent of newer assisted to 54 percent of -unassisted properties. Overall, 28 percent of the properties have predominantly high-rise buildings. Newer assisted properties tend to be high-rises (40 percent). Single-family attached properties account for 28 percent of the stock.

- *Mortgage Start Year:* Nearly all (86 percent) of the older assisted properties have mortgages that were originated between 1970 and 1979. The unassisted mortgages are roughly equally spread across the 1970s and 1980s. The newer assisted mortgages—those insured in conjunction with property-based Section 8 assistance—date primarily from 1980 onward (86 percent).

2.2   Tenant Characteristics

Exhibit 2.2 presents characteristics of tenants by assistance category.[2] Overall, 58 percent of households in the insured stock were headed by whites, 32 percent by blacks, 5 percent by Hispanics regardless of race, and 5 percent by other racial groups.[3]

- Unassisted and newer assisted properties had higher proportions of white heads of household (68 percent and 63 percent respectively) compared with older assisted properties (50 percent of households were headed by whites).

- Older assisted properties had the highest proportion of households headed by blacks—39 percent. Twenty-one percent of households in unassisted properties, and 29 percent in newer assisted, were headed by blacks.

- The proportion of Hispanics and other minorities were similar across assistance categories.

The majority of units in the insured stock are occupied by one- or two-person households (68 percent), with an average household size of 2.1 people.

- Unassisted and newer assisted properties tended to serve smaller households compared with older assisted properties. Eighty percent of households in unassisted properties, 71 percent of households in newer assisted properties, and 60 percent of households in older assisted properties had one or two members.

- In the newer assisted properties, the concentration of one-person households was matched by a high concentration of households headed by elderly individuals. Forty-seven percent of households in newer assisted properties were elderly. This is significantly higher than the 30 percent elderly headship in older assisted properties, and 19 percent in unassisted properties.

The insured stock serves mostly very low- and low-income households. Sixty-eight percent of households were very low-income, with incomes below 50 percent of the local area

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[2]Data on tenant characteristics were obtained primarily from property owners and managers However, data were provided for only about half of the properties. This owner/manager data were supplemented with other data from HUD's prepayment database and the NHP study data, but data were still missing on about 40 percent of properties. Missing data were imputed based on available information from "similar" properties Full details on imputation procedures are in the Data Documentation companion report.

[3]For the study properties, Hispanics were reported as a separate group. Therefore, in each property the sum of the proportions of households across racial groups is 100 percent The Census reports Hispanics as being white or black *and* Hispanic, so that the exact racial/ethnic composition of Census tracts cannot be determined. See Exhibit 2.25 below.

Exhibit 2.2

TENANT CHARACTERISTICS

	Total	Total		Assisted	
	Total	Unassisted	Assisted	Older	Newer
Total Properties	13,271	3,080	10,191	6,037	4,154
Percent of Properties	100%	23%	77%	59% [1]	41% [1]
Race/Ethnicity					
White	58%	68% **	55%	50% **	63%
Black	32%	21% **	35%	39% **	29%
Hispanic	5%	3%	6%	6%	4%
Other	5%	8% *	4%	5%	3%
Household Size					
1 Person	41%	44%	40%	34% **	50%
2 People	27%	36% **	24%	26%	21%
3 People	16%	11%	17%	19%	14%
4 People	10%	6%	11%	14%	8%
5 People	3%	1%	4%	5%	3%
≥6 People	3%	1%	3%	2%	4%
Average Household Size	2.1	1.8	2.2	2.4	2 1
Elderly Head of Household					
Percent	33%	19% **	37%	30% **	47%
Household Income					
<50% of Median	68%	22% **	82%	77% **	90%
50-80% of Median	19%	37% **	13%	17% **	8%
80-100% of Median	8%	23% **	3%	4%	2%
≥100% of Median	6%	18% **	2%	3%	1%

** Signifies that the differences in proportions between the unassisted and assisted or older assisted and newer assisted properties are statistically significant at the 95% level

* Signifies that the differences in proportions between the unassisted and assisted or older assisted and newer assisted properties are statistically significant at the 90% level

Data Source: Owner/Manager Survey, HUD 50059s provided by property owners/managers, HUD Prepayment data base, NHP study

[1] Percentages in the older and newer assisted categories total 100% of the total assisted category's 77%. Older assisted properties comprise 45% of the universe, and newer assisted properties comprise 31%.

median (adjusted for household size),[4] and another 19 percent were low-income, with incomes between 50 and 80 percent of the median.

- While the concentration of very low-income tenants was highest in the assisted properties (82 percent). Even in the unassisted properties 22 percent of households were very low-income.

- In addition to the 22 percent very low-income households in unassisted properties, another 37 percent of households were low-income, with incomes below 80 percent of median.

- Newer assisted properties had the highest concentration of very low-income households. Ninety percent of households in these properties had incomes below 50 percent of the local area median for their household size.

2.3 Physical Condition of HUD-Insured and Held Properties

One objective of this study was to assess the *physical condition* of the stock of multifamily rental housing with HUD-insured or held mortgages. A property's *current physical condition (physical needs backlog)* is measured by the cost of repairs and replacements beyond ordinary maintenance required to restore a property to original working condition. *Future physical needs (physical needs accruals)* are measured by the projected cost of replacing or overhauling components that will fail over time. Throughout this chapter, "physical needs" refers to all required repairs and replacements above and beyond routine maintenance.[5]

Physical condition is important because it affects tenants' living standards and, in the case of serious deficiencies, may indicate demand for HUD financial assistance through HUD's remedial assistance programs. It may also contribute to claims against HUD's insurance funds. This section presents

- The study's procedures for estimating physical needs,

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[4]Incomes were obtained separately for small and large households in each property. The income distributions across household size were very similar

[5]In this study, our assessment of physical needs excludes three categories of expenditures that many owners will be required to make   modifications for handicapped accessibility, as required by Section 504 of the Rehabilitation Act of 1973, as amended; measures taken solely to mitigate hazards of lead paint or asbestos; and improvements for increasing energy efficiency The only exception to this is that replacement of, for example, a heating system or appliance, assumes installing a standard quality replacement according to *current practice,* and not simply replicating the old system.

- The current backlog of physical needs, including systems associated with health and safety, and

- The projected future physical needs accruals.

Procedures for Estimating Physical Needs

Physical needs were assessed using the Observable System Method, which combines on-site inspection and rating of a property's condition with a computerized costing system based on a consistent set of repair/replacement costs (that are adjusted for regional price differences) [6] The inspectors, a group of architects and engineers trained in the Observable System Method, made on-site inspections using standardized forms and procedures. They inspected each of the study's 570 sample properties, including direct inspections of a sample of 1,089 buildings and 1,520 units.

At each site, 116 mechanical, electrical, and architectural systems were observed and assessed. Exhibit 2.3 lists most of these key systems, organized by major property elements (site, building, or unit) and by 17 system groups. For each system, inspectors determined and recorded the level of remedial action needed to restore it to its original working condition. The action levels ranged from "No Action" through stages of repair to "Replacement." The "No Action" level indicated an inspector's judgment that any minor problems noted were within the routine maintenance covered by a normal annual operating budget. Other action levels indicated needs for non-routine maintenance and repairs. "Replacement" of a system was recorded as the action level when a system was worn out or non-functioning beyond repair. Further details on the inspection process are provided in Appendix B on data collection.

The backlog of physical needs was computed using a standardized set of unit costs which were multiplied by the quantity and action level appropriate to a particular property—e.g., the number of windows in the property that the inspector determined needed replacement was multiplied by the cost of replacing a window (of the appropriate type and size). Property costs were then multiplied by location-specific adjustment factors in order to obtain the local cost of

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[6]Dixon Bain et al., Abt Associates, Inc , *Study of the Modernization Needs of the Public and Indian Housing Stock* (Washington, DC HUD Office of Policy Development and Research, March 1988). This inspection method proved sufficiently effective that it has subsequently been adapted and used by commercial inspection firms

Exhibit 2.3

SYSTEM GROUPS AND KEY SYSTEMS INSPECTED

Site Areas—landscaping, property-owned roadways, parking areas, paved pedestrian walkways, curbing, fencing, retaining walls, site drainage, pole-mounted site lights

Site Amenities—site furniture, yards, dumpsters, pools, tennis and basketball courts.

Site Distribution Systems—electrical and heating water distribution, domestic hot and cold water lines, main water service, gas lines, sanitary lines, septic system, sewage ejectors, hydrants.

Building Mechanical & Electrical—heating risers, building gas distribution, building domestic water sanitary distribution, fire suppression systems, sump pumps, compactors, switchgear, emergency lights, communication system, emergency call alarm systems, master TV antenna, closed circuit TV

Building Heating & Cooling—central ventilation system, central air conditioning, furnaces, boilers, boiler room piping and peripherals, domestic hot water generation.

Building Elevators—shaftways, shaftway doors, cabs, controller/dispatcher, machinery.

Building Exterior Closure—foundation or slab, exterior walls and insulation

Building Roofs—roofs and roof systems such as parapet walls, chimneys, roof hatches, skylights, penthouses, roof drainage systems

Building Windows & Doors—all windows, exterior common doors, unit entry and screen doors.

Building Exterior Features—canopies, exterior stairs, building mounted site lights, fire escapes, porches and decks, attached storage sheds

Building Common Areas—vestibules, corridors, stairs, interior lights in common areas, building mail facilities, laundry rooms, laundry equipment, common rooms.

Unit Interior Construction—wall and ceiling partitions (excluding kitchen and bath), floors and sub-bases (all rooms)

Unit Interior Finishes—wall and ceiling surfaces (all rooms), kitchen and bathroom wall and ceiling partitions, floor coverings, interior doors and frames.

Unit Kitchen Fixtures—cabinets, counters, sinks, ranges, refrigerators, garbage disposals, dishwasher, microwaves, trash compactors.

Unit Bathroom Fixtures—fixtures, accessories, vanities.

Unit Heating & Cooling—HVAC units, radiation systems, unit boilers, unit furnaces, unit level domestic hot and cold water generation, temperature controls, wall air conditioners.

Unit Electrical—electric panel, wiring, bell/intercom system, unit closed circuit TV, unit emergency call alarm system, smoke/fire detection equipment.

repair needs for each property.[7] Appendix C explains the procedures used in constructing the cost files, computing costs, imputing costs for uninspected buildings, and adjusting property level costs for regional price differences.

In order to compare costs across properties having different *numbers of units*, each property's costs were expressed on a "per-unit basis." Furthermore, in order to permit comparisons across properties having different *sized units* (since a property of predominantly efficiency units will have lower costs per unit than an otherwise identical property of 3-bedroom units), all property-level costs were normalized on the basis of each property's "2-bedroom equivalent units" (henceforth referred to as "2BR units") rather than its actual number of units.[8]

In the tables that follow, the costs for the 570 inspected properties were weighted to reflect the universe of 13,271 insured properties in order to provide estimates of the physical needs of the entire stock of HUD-insured properties.

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[7]A set of procedures were established to construct standardized cost files, compute costs for observed systems, and impute standardized costs for uninspected buildings and units, in order to arrive at standardized property-level costs. All standardized costs were based on current costs for the Washington, DC area. R.S. Means "City Cost Indexes" were applied to all standardized costs to obtain location-specific costs. See Appendix C for details

[8]Standardizing by square footage is not a perfect normalization, because some items such as kitchen fixtures are based on units rather than square footage. The number of 2BR units per property was calculated by dividing the total square footage of living space in the property by the national average square footage of a 2 bedroom/1 bath unit (844 square feet). The table below compares the actual number of units and 2BR equivalent units

Assistance Category	Actual Units	2BR Equivalent Units
Unassisted	451,703	427,278
Older assisted	674,227	660,426
Newer assisted	361,882	332,886
Total	1,487,812	1,420,591

The number of 2BR equivalent units is smaller than the actual number, indicating that, on average, actual units are smaller than 844 square feet

Current Backlog of Physical Needs

Exhibit 2.4 shows backlogs of physical needs for the full multifamily housing stock by assistance category. For ease of reference, the level of physical needs backlog has been divided into four categories. Twenty percent of the properties had virtually *no backlog*—the current backlog of physical needs was less than $10 per 2BR equivalent unit. Another 38 percent of properties had repair needs that can be considered *normal backlog*—$10 to $1,000 per 2BR unit—which is within the range of slightly more than one year's worth of average accrual of repair needs. (As discussed later in this chapter, average annual accrual of physical needs was $832 per 2BR unit.) This level of physical need does not seem problematic, since it is within the normal cycle of accumulation of physical repair needs in a property. Twenty-one percent of the properties had *moderate backlog*—$1,000 to $2,500 per 2BR unit—the equivalent of about one to three years' worth of average accrual needs. This level of backlog may be a cause of concern, since it appears to exceed a normal annual accumulation of need. Twenty-one percent of properties had *serious backlog* needs—over $2,500 per 2BR unit. This is at least three years' worth of accrual of needs, and seems likely to indicate problems that will affect tenants and the marketability of the property, and may ultimately threaten the financial viability of the property.

As the exhibit shows, and as can be seen graphically in Exhibit 2.5, the incidence of physical needs backlogs differs across assistance categories, with older assisted properties being in far worse condition than other properties:

- Far fewer older assisted properties had no backlog (10 percent) than did newer assisted (25 percent) or unassisted properties (32 percent). Similarly, relatively few older assisted properties had normal backlogs (34 percent) than did newer assisted (41 percent) or unassisted (39 percent).[9]

- Conversely, far more older assisted properties had serious backlogs of over $2,500 per unit (30 percent) than did either newer assisted or unassisted (14 percent each).

The mean physical need backlogs reinforce these findings. Older assisted properties had mean backlogs of $2,115 per 2BR unit, about double those of newer assisted properties ($1,003) or unassisted properties ($1,052).

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[9]While the levels of physical needs are similar in unassisted and newer assisted properties, it is important to note that unassisted properties are generally older than newer assisted properties, with over half being placed in service by 1980.

Exhibit 2.4

DISTRIBUTION OF BACKLOG OF PHYSICAL NEEDS
BY ASSISTANCE CATEGORY
(Per 2BR Equivalent)

	Total	Total		Total Assisted	
		Unassisted	Assisted	Older Assisted	Newer Assisted
Total Properties	13,271	3,080	'10,191	6,037	4,154
Percent of Properties	100%	23%	77%	59% [1]	41% [1]
Backlog Per 2BR Unit					
No Backlog	20%	32% **	16%	10% **	25%
<$10	20%	32%	16%	10%	25%
Normal Backlog	38%	39%	37%	34%	41%
$10 to <$500	25%	25%	25%	20%	31%
$500 to <$1,000	13%	14%	12%	14%	10%
Moderate Backlog	21%	15%	24%	26%	20%
$1,000 to <$1,500	9%	5%	11%	11%	10%
$1,500 to <$2,000	8%	8%	8%	8%	8%
$2,000 to <$2,500	4%	2%	5%	7%	2%
Serious Backlog	21%	14% **	24%	30% **	14%
$2,500 to <$3,000	4%	3%	4%	5%	4%
$3,000 to <$4,000	6%	3%	8%	8%	6%
$4,000 to <$5,000	4%	3%	4%	6%	1%
$5,000 to <$7,500	5%	3%	5%	7%	2%
≥$7,500	2%	2%	3%	4%	1%
Statistics on Backlog of Physical Needs					
Mean	$1,520	$1,052 **	$1,662	$2,115 **	$1,003
Standard Error	$ 92	$ 163	$ 108	$ 149	$ 125
Median	$ 654	$ 193	$829	$1,219	$ 322

Data Source: Physical inspections, costing program.
Note· Column sums may not add to 100% due to rounding.
** Signifies that the assisted/unassisted or older assisted/new assisted difference is statistically significant at the 95% confidence level
[1] Percentages in the older and newer assisted categories total 100% of the total assisted category's 77%. Older assisted properties comprise 45% of the universe, and newer assisted properties comprise 31%.

Exhibit 2.5

Backlog of Physical Needs by Assistance Category
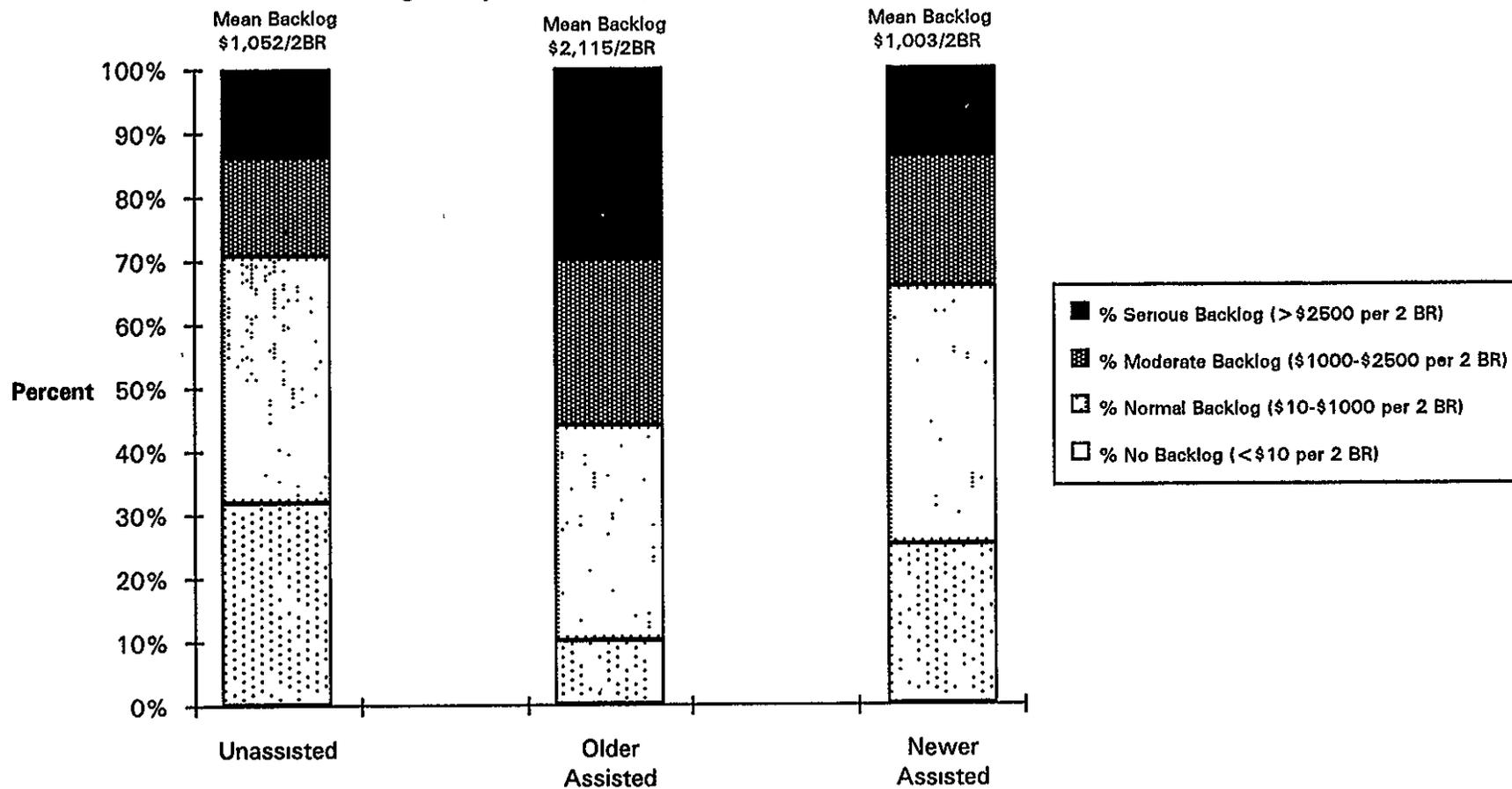
Source: Inspections and Costing Programs

The medians for the backlog of physical needs were far lower than the means, which indicates that some properties had extremely high backlogs. The median for older assisted properties was $1,219—much lower than the mean, but still indicating that half of these properties have moderate or serious backlogs of nearly one and a half year's average accrual of physical needs. In comparison, the medians for newer assisted properties ($322) and unassisted properties ($193) were well below half of an average year's accrual. Appendix D provides details on the tenant characteristics, property characteristics, and financial condition of properties with high backlogs of physical needs.[10]

Most of the repair costs (59 percent overall) were attributed to unit-level systems (Exhibit 2.6). Building systems were the next largest component of physical needs backlog, accounting for 31 percent of needs overall. The smallest costs were those associated with sites, accounting for only 10 percent of all physical needs. Although there is some variation, the proportion of physical needs was similar across all assistance categories.[11]

Exhibit 2.7 provides a more detailed breakdown of the backlog by system groups.

- Unit Interior Finishes alone accounted for 37 percent of the mean physical need backlog—$564 of the $1,520 mean repair cost per 2BR unit. Interior finishes are largely cosmetic elements such as wall and ceiling surfaces and interior doors. These elements are subject to a high level of tenant use and generally wear out more quickly than most systems.

- The second largest component of need was Kitchen Fixtures (14 percent of total backlog costs), which includes items such as cabinets, counters, ranges, and refrigerators. Kitchen Fixtures are also subject to a high level of tenant use and wear out more quickly than most other systems.

- The third largest component of backlog need was Building Exterior Closure (10 percent of backlog costs). This system group includes foundations, slabs, exterior walls, and insulation. While Building Exterior Closure includes important structural systems, most of the backlog in this category was generally due to neglected painting and caulking (which can remain cosmetic problems for quite a

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[10]Appendix Table D.1 provides a breakdown of costs for older assisted properties, presenting costs separately for properties with large and small average size units. Appendix Exhibit D.2 provides the cost breakdown for high backlog properties. Exhibits D 3 through D.6 provide tenant, physical, and financial characteristics of high versus low backlog properties.

[11]Fifty-one percent of costs were attributed to unit-level systems in unassisted properties, as were 61 percent of costs in assisted properties. This difference is statistically significant at the 90 percent confidence level.

Exhibit 2.6

**BACKLOG OF PHYSICAL NEEDS BY
MAJOR PROPERTY ELEMENT OF BACKLOG
(Per 2BR Equivalent)**

| | | Total | | Total Assisted | |
	Total	Unassisted	Assisted	Older Assisted	Newer Assisted
Total Properties Percent of Properties	13,271 100%	3,080 23%	10,191 77%	6,037 59%[1]	4,154 41%[1]
Property Element					
Site Costs	10%	13%	9%	9%	8%
Building Costs	31%	35%	30%	30%	32%
Unit Costs	59%	51%	61%	61%	61%
Overall Mean per 2BR Equivalent	$1,520	$1,052	$1,662	$2,115	$1,003

Data Source: Physical inspections, costing program.

Note: Column sums may not add to 100% due to rounding.

[1] Percentages in the older and newer assisted categories total 100% of the total assisted category's 77%. Older assisted properties comprise 45% of the universe, and newer assisted properties comprise 31%.

Exhibit 2.7

BACKLOG OF PHYSICAL NEEDS BY SYSTEM GROUP (PER 2BR EQUIVALENT)
(Percent of Total Backlog)

Systems	Total	Total		Total Assisted	
		Unassisted	Assisted	Older Assisted	Newer Assisted
Total Properties	13,271	3,080	10,191	6,037	4,154
Percent of Properties	100%	23%	77%	59%[1]	41%[1]
Mean Site Costs	10%	13%	9%	9%	8%
Site Areas	8%	9%	7%	8%	6%
Site Amenities	2%	4%	2%	1%	2%
Site Distribution	0%[2]	0%[2]	0%[2]	0%[2]	0%[2]
Mean Building Costs	31%	35%	30%	30%	32%
Mechanical & Electrical	1%	1%	1%	2%	1%
Heating & Cooling	6%	6%	6%	5%	8%
Elevators	0%[2]	1%	0%[2]	0%[2]	0%[2]
Exterior Closure	10%	10%	10%	10%	11%
Roofs	3%	4%	3%	3%	3%
Windows and Doors	6%	10%	5%	6%	5%
Exterior Features	1%	2%	1%	1%	0%[2]
Common Areas	3%	3%	3%	3%	3%
Mean Unit Costs	59%	51%	61%	61%	61%
Interior Construction	1%	0%[2]	1%	1%	0%[2]
Interior Finishes	37%	29%	39%	37%	43%
Kitchen Fixtures	14%	17%	13%	15%	10%
Bath Fixtures	4%	4%	4%	4%	3%
Unit Heating & Cooling	1%	1%	1%	1%	2%
Electrical	2%	0%[2]	3%	2%	4%
Total	100%	100%	100%	100%	100%
Mean Backlog Cost per 2BR Unit	$1,520	$1,052	$1,662	$2,115	$1,003

Data Source Physical inspections, costing program

Note   Column sums may not add to 100% due to rounding.

[1]   Percentages in the older and newer assisted categories total 100% of the total assisted category's 77%. Older assisted properties comprise 45% of the universe, and newer assisted properties comprise 31%.

[2]   Percentage cost of 0 indicates a backlog cost of less than one half of one percent per 2-BR equivalent.

while before causing structural damage), and insulation needing replacement (which can be costly).

While the *level* of repair needs was much higher in older assisted properties than in either unassisted or newer assisted properties, the *distribution* of costs by system group was similar across assistance categories.

Costs Associated with Health and Safety Systems

The effect of a given backlog of physical needs depends on the types of systems affected and the repairs and replacements that are required. Backlogs that are in systems that directly affect tenant health and safety—such as interior construction, heating and cooling, and building mechanical systems—are of special concern. The immediate threat to tenant safety is diminished to the extent that the needed repairs are in systems that are more cosmetic, such as site amenities or interior finishes. Cosmetic defects, such as leaking windows and holed or peeling walls, while not life-threatening, substantially affect the quality of housing provided to tenants and may impair a property's income by increasing vacancies and thereby lowering rents collected.[12] Likewise, other repair needs such as roofs or gutters may not pose immediate threats to tenants but may eventually damage buildings, create financial burdens for the property, and contribute to vacancies.

For purposes of this study, a subset of the 17 systems groups was identified as most relevant to health and safety:[13]

- Unit Interior Construction

- Unit Bathroom Fixtures

- Unit Heating and Cooling

- Unit Electrical

- Building Heating and Cooling

- Building Mechanical and Electrical

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[12]This is most likely to be the case for unassisted properties and assisted properties in markets offering alternative housing that is reasonably attractive and affordable.

[13]See Exhibit 2 3 for the list of key systems included in these system groups.

- Building Elevators

- Site Distribution Systems.

The mean costs for these Health and Safety Systems are shown in Exhibit 2.8. For all properties, 25 percent of all physical needs (an average of $377 and a median of $23 per 2BR unit) were in Health and Safety Systems. This percentage was relatively constant across assistance categories, but as with other repair costs, older assisted properties had much higher Health and Safety Systems needs (mean of $515 and median of $109 per 2BR unit) Most unassisted and newer assisted properties had no backlogs needs in Health and Safety Systems. (The median for these assistance categories was $0.)

Projected Future Physical Needs—Physical Needs Accrual Costs

A property's physical needs accruals are estimates of the average annual costs needed to cover expected repairs and replacements for all systems over each of the next 20 years. As with backlog costs, accrual costs were computed based upon inspectors' examination of each Observable System. For each system a set of standardized costs was applied (for major repairs and system replacements), incorporating timing information based on systems' remaining useful life (or required action interval in the case of systems, such as interior walls, which need periodic refurbishment rather than replacement of framing and plasterboard). Estimates of future accrual needs indicate properties' expected need for resources in the future.

Each system was assigned an expected useful life (or required action interval) and an accrual cost.[14] For systems requiring periodic replacement or major overhaul:

- *Useful life* is the age of a system when it must be replaced (or overhauled) because it has worn out or is approaching failure, and

- *Accrual cost* is the cost of replacing or overhauling the system.

For example, boilers are expected to last 25 years (useful life) and the associated accrual cost is the cost of a new boiler. A few items are not expected to wear out, but will need periodic

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[14]The basic reference for expected lives was Appendix B of "Accrual Actions and Expected Lives," from ICF, Inc., *Future Accrual of Capital Repair and Replacement Needs of Public Housing. Final Report,* (Washington, DC: HUD Office of Policy Development and Research, April 1989), written to supplement the Abt public housing study (Bain, 1988). Judgment of Abt staff experienced in conventional residential building construction and management was used to alter useful life estimates for some systems.

Exhibit 2.8

**BACKLOG OF PHYSICAL NEEDS FOR HEALTH AND SAFETY SYSTEMS
BY ASSISTANCE CATEGORY
(Per 2BR Equivalent)**

|		Total		Total Assisted	
	Total	**Unassisted**	**Assisted**	**Older As- sisted**	**Newer Assisted**
Total Properties	13,271	3,080	10,191	6,037	4,154
Percent of Properties	100%	23%	77%	59% [1]	41% [1]
Total Backlog (for All Property Systems)					
Mean	$1,520	$1,052	$1,662	$2,115	$1,003
Backlog for Health and Safety Systems[2]					
Mean	$377	$277 *	$407	$515 **	$250 .
Standard Error	$ 36	$ 61	$ 43	$ 59	$ 56
Median	$ 23	$ 0	$ 39	$101	$ 0
Health and Safety Backlog as Percent of Total Physical Backlog	25%	26%	25%	24%	25%

Data Source: Physical inspections, costing program.

Note   Column sums may not add to 100% due to rounding

*   Signifies that the assisted/unassisted or older assisted/new assisted difference is statistically significant at the 90% confidence level.

**   Signifies that the assisted/unassisted or older assisted/new assisted difference is statistically significant at the 95% confidence level.

[1]   Percentages in the older and newer assisted categories total 100% of the total assisted category's 77%   Older assisted properties comprise 45% of the universe, and newer assisted properties comprise 31%

[2]   Health and safety systems are defined as the following 8 of the 17 system groups assessed in this study: Unit Interior Construction, Unit Bathroom Fixtures, Unit Heating and Cooling, Unit Electrical, Building Heating and Cooling, Building Mechanical and Electrical, Building Elevators, and Site Distribution.

major action. For these items, the "expected life" is the action interval, and the accrual cost is the repair cost. For example, brick chimneys are not expected to wear out at any known interval, but must have the mortar joints raked out and repointed, and be waterproofed every ten years (useful life or action level). The associated accrual cost is the cost of raking and repointing mortar joints, as well as waterproofing.

Some systems were deemed inappropriate for accrual estimates because they were not expected to need replacement or overhaul over the 20-year horizon used for this study. An example is the Site-Level Domestic Hot Water Lines. Over time, a portion of the lines may need to be replaced, but this is not an expected occurrence.[15]

For most systems, inspectors recorded system age as part of the on-site inspections; for other systems, the study assigned age equal to the age of the buildings. To prevent double-counting of a property's physical needs, age was set to zero for any system that needed replacement or overhaul as part of the physical needs backlog. (In other words, for computing accrual, the study assumes that the repair/replacement backlog was fully remedied in year zero.)

The study's accrual costing program determined, for each of the next 20 years, whether the observed system would reach the end of its useful life that year (based on its expected useful life and on the system age), and if so, added the repair/replacement cost to the accrual total for that year. See Appendix C for more detail on the accrual of future needs for major repairs and system replacement.

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[15]Any defects in such systems that were observed by inspectors or known to the property's site manager were included in the physical backlog costs, discussed in the previous section of this chapter.

As shown in Exhibit 2.9, the mean annual accrual cost over the next 20 years was $832 per 2BR unit, with a median of $765.[16] The majority of properties had average annual accrual of needs well below $1,000 per 2BR unit.[17]

Exhibit 2.10 shows the distribution of accrual needs by Major Property Element. Over time, 41 percent of costs will be attributable to units, 41 percent to buildings, and 17 percent to sites. The percent of accrual needs relating to units was lower than the percent of current backlog attributable to units (59 percent), while the percent relating to the other system groups was higher. This may be because most HUD-insured properties are relatively new (over 90 percent have been put in place since 1970), and site and building systems will only begin to need major repairs in coming years.

2.4 Financial Condition of HUD-Insured and Held Properties

Financial condition was examined in terms of three indicators: *(1) net cash flow, (2) ability to cover backlog of physical needs* from its available reserve funds, and *(3) ability to cover expected accrual of needs from ongoing deposits to reserve for replacement account.* Net cash flow (before tax) shows the degree to which a property can cover current operations and routine maintenance, mortgage debt service, and annual deposits to its replacement reserve fund (to cover future physical replacements). Ability to cover the backlog of physical needs shows the degree to which a property can fund repairs to restore all systems to original working condition. Ability to cover ongoing accrual of needs provides an indication of potential future resource shortfalls.

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[16]Costs differ slightly across assistance categories, ranging from $795 in unassisted properties to $872 per 2BR unit in older assisted properties This difference results from differences among the categories in terms of their predominant building types and geographic locations. For example, newer assisted properties contain the highest proportion of high-rise buildings, older assisted the highest proportion of single-family attached (townhouse) buildings, and unassisted contain the highest proportion of walk-ups. These differences result in differences among the categories both in total accrual costs and in the distribution of costs between Building Systems and Unit Systems

[17]The average annual accruals over the next 5 years are similar to the 20-year averages, and are presented in Appendix D, Exhibit D.7. Appendix Exhibit D 8 presents the major property elements for five-year accrual Exhibits D.9 and D.10 provide accrual estimates for older assisted properties with large and small average size units

Exhibit 2.9

PROJECTED AVERAGE ANNUAL ACCRUAL OF PHYSICAL NEEDS, 1990-2009
(Per 2BR Equivalent)

		Total		Total Assisted	
	Total	Unassisted	Assisted	Older Assisted	Newer Assisted
Total Properties	13,271	3,080	10,191	6,037	4,154
Percent of Properties	100%	23%	77%	59% [1]	41% [1]
Accrual per 2BR Equivalent					
<$10	0%	0%	0%	0%	0%
$10-499	27%	32%	25%	21%	30%
$500-999	44%	36%	47%	50%	42%
$1,000-1,499	21%	25%	19%	17%	22%
$1,500-1,999	6%	3%	7%	8%	5%
$2,000-2,999	2%	3%	2%	3%	1%
$3,000-3,999	0%	0%	0%	0%	0%
$4,000-4,999	0%	0%	0%	1%	0%
$5,000 or more	0%	0%	0%	0%	0%
Statistics on Annual Accrual of Needs					
Mean	$832	$795	$842	$872	$800
Standard Error	$ 20	$ 46	$ 22	$ 30	$ 33
Median	$765	$741	$769	$759	$772

Data Source: Physical inspections, costing program.

Note: Column sums may not add to 100% due to rounding.

[1] Percentages in the older and newer assisted categories total 100% of the total assisted category's 77%. Older assisted properties comprise 45% of the universe, and newer assisted properties comprise 31%.

Exhibit 2.10

ANNUAL ACCRUAL OF NEEDS BY MAJOR PROPERTY ELEMENT (1990-2009)
(Per 2BR Equivalent)

		Total		Total Assisted	
	Total	Unassisted	Assisted	Older Assisted	Newer Assisted
Total Properties	13,271	3,080	10,191	6,037	4,154
Percent of Properties	100%	23%	77%	59%[1]	41%[1]
Major Property Element					
Site	17%	19%	17%	16%	20%
Building	41%	46%	40%	39%	42%
Unit	41%	36%	43%	46%	38%
Mean Annual Accrual	$832	$795	$842	$872	$800

Data Source: Physical inspections, costing program.

Note: Column sums may not add to 100% due to rounding.

[1] Percentages in the older and newer assisted categories total 100% of the total assisted category's 77%. Older assisted properties comprise 45% of the universe, and newer assisted properties comprise 31%.

Net Cash Flow

A property's net cash flow is its income less expenses. The primary income source for most properties is apartment rents paid by residential tenants. In assisted properties, subsidies paid by HUD are also a major revenue source. Other revenue sources may include commercial rent, financial revenue (such as interest income from reserve accounts), or forfeited tenant deposits. Property expenses include operating and maintenance costs, debt service, and deposits to the replacement reserve account. As was done in the previous section on physical needs, we report financial items on a per 2BR equivalent unit basis to allow comparisons across properties of different sizes (unit counts) and unit compositions (distribution of units by bedroom counts).

Net cash flow was defined as:

(1) 3-year weighted average property revenue

(2) *Minus* 3-year weighted average operating expenses

(3) *Minus* Deposits to replacement reserve account (maximum of actual and required deposit)

(4) *Minus* Mortgage debt service (including interest, principal, and Mortgage Insurance Premium).

Where:

(1) The 3-year weighted average of property revenues includes actual rental income (which equals potential rent net of any vacancy losses) from tenant paid apartment rents and tenant assistance payments, plus any commercial or financial income.[18] A weighted average over the most recent 3 years was used, with the more recent years receiving higher weights.[19] By averaging over 3 years, the measure focused on long-term revenue flows in a property, and reduced the effect of one-time

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[18]"Total revenue" less "vacancy loss" from income and expense reports, HUD form 92410. Finances of Section 236 properties are complicated because HUD makes interest reduction payments (IRPs) to lower effective interest rates to 1 percent, and owners must return to HUD, any rental income collected from higher income tenants that exceeds "basic rent " (Basic rent is based on the subsidized 1 percent rate) In reporting income and expenses, owners of Section 236s are supposed to have netted out these payments to and from HUD (so that they do not appear as income or expenses), but many owners have not. Therefore, this report includes Section 236 IRPs in property income and uses market interest rates to compute debt service on the expense side. Subsidy amounts reported on Section 236s include all subsidies, including IRPs, without attempting to reduce this amount by income in excess of basic rent from higher income households.

[19]For the 430 properties with 3 years of data available, the weights are 0.2 for the earliest year, 0.3 for the second earliest year, and 0.5 for the most recent year—to weight most heavily the most recent year. For the 86 properties with 2 years available, the weights are 0.4 for the earlier and 0.6 for the more recent year. For the 27 properties with only 1 year of data, the weight was 1. For the 27 properties that provided no financial data, values were imputed based on assistance category and building type.

outliers. The application of a higher weight to more recent years incorporated trends into the measure.

(2) The 3-year weighted average operating expenses equals the sum of the cost components reported in the project financial statements—administrative costs, utility expenses, operating and maintenance expenses, and tax and insurance expenses.[20]

(3) Deposits to the reserve for replacement account are the maximum of actual deposits as reported by HUD Field Offices in the study's data collection survey, and required deposits, which this study approximated as 0.5 percent of the original mortgage amount.[21] About 16 percent of all properties did not report payments to the replacement reserve account. These properties either did not make or did not report the required deposits. Not making payments to reserve accounts may be a way that properties with cash flow problems react in the short run. Thus, in order to account for all deposits that should be made, the study attributed the required deposit amount to properties reporting low or no payments.

(4) Mortgage debt service was computed from mortgage amount, term and interest rate. Mortgage insurance premium (0.5% of the outstanding principal balance) was added to the debt service costs, except for Section 221(d)3 BMIR properties, which pay no mortgage insurance premium.[22]

Net cash flow is a key indicator of a property's viability, showing whether it can meet its ongoing obligations.[23] Net cash flow is also a key element used by HUD in ranking applicants for its major remedial assistance programs (which are Flexible Subsidy or Section 8 Loan Management Set Aside).

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[20]Line 6263 Total Administrative Expense, Line 6400 Utilities Expenses, Line 6500 Operating and Maintenance Expense, and Line 6700 Total Tax and Insurance Expense, from the "Income and Expense Report" (HUD Form 92410), as reported in HUD's MIPS database.

[21]As of 1968 the required deposits to the replacement reserve account were 0.6 percent of the total replacement costs of structure for new construction properties, and 0.4 percent of the mortgage amount for rehab properties.

[22]For the majority of properties mortgage data are from HUD's F47 database Mortgage data on HUD-held properties is from HUD's MARS database.

[23]In assessing a property's viability, net cash flow must be examined concurrently with physical needs and property management. A property could have deceptively positive cash flow by failing to make necessary expenditures for repairs and replacements. Conversely, a property could have deceptively negative cash flow because a new owner or manager has begun a crash repair program to eliminate an accumulated backlog of physical needs

Exhibit 2.11 shows the components of annual income by assistance category. All data are presented in 1989 dollars.[24] Total revenues include commercial, financial, or other revenues, in addition to tenant-paid apartment rent and tenant assistance payments. The exhibit shows that:

- Total revenues were much lower in older assisted properties ($4,664 per 2BR unit) than in either newer assisted ($7,571) or unassisted ($6,162) properties. This reflects (in large part) the lower rents needed in older assisted properties to cover debt service. (See below.)

- Tenant-paid apartment rents were lower in assisted than unassisted properties ($2,747 vs. $6,079), largely reflecting the portion of expenses covered by HUD subsidies.

- Tenant-paid apartment rents were slightly higher in older assisted than newer assisted properties ($2,836 vs. $2,623),[25] despite the much higher total revenues (and monthly rents) in the newer assisted properties. This reflects the much deeper level of subsidy available from the Section 8 New Construction programs (used in the newer assisted properties) compared to the interest reduction payments or Section 8 Loan Management Set Aside used in the older assisted properties.

- Vacancy losses were much higher in unassisted properties (8.2 percent) than in assisted properties (2.6 percent). Unassisted properties would be expected to face stiffer market competition than assisted properties, in which rents to low-income tenants are reduced.

- Among assisted properties, older assisted properties had higher vacancy losses (3.4 percent) than did newer assisted properties (1.3 percent). This probably reflects programmatic differences, but may also reflect the poorer physical condition and higher tenant-paid rents in some of the older assisted properties, which together may make older assisted properties less attractive to tenants.

Exhibit 2.12 shows the components of annual expenses including total operating and maintenance costs, deposits to the replacement reserve account, and debt service costs.

- Operating and maintenance expenses were virtually identical between assisted ($3,098 per 2BR unit) and unassisted properties ($3,091).

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[24]Very few properties had 1990 data available at the time of our data collection, so 1989 was chosen as the base year for financial data. For several properties, where financial data were missing, we contacted field offices to request data. A few provided only one year of data, sometimes 1990. For these cases, 1990 data expressed in 1989 dollars were used The Housing Component of the Consumer Price Index was used to convert non-1989 values into 1989 dollars.

[25]This difference is not statistically significant at the 90 percent confidence level

Exhibit 2.11

COMPONENTS OF ANNUAL INCOME (PER 2BR EQUIVALENT UNIT)[1]

	Total	Total		Assisted	
		Unassisted	Assisted	Older	Newer
Total Properties	13,271	3,080	10,191	6,037	4,154
Percent of Properties	100%	23%	77%	59% [2]	41% [2]
Total Revenues (Net of Vacancies)					
Mean	$5,922	$6,162	$5,859	$4,664 **	$7,571
Standard Error	$128	$378	$125	$118	$208
Median	$5,174	$5,089	$5,215	$4,240	$6,874
Apartment Rent (Tenant-paid)					
Mean	$3,527	$6,079 **	$2,747	$2,836	$2,623
Standard Error	$108	$292	$81	$71	$180
Median	$2,979	$5,133	$2,503	$2,729	$1,951
Tenant Assistance Payments (Subsidies)					
Mean	$2,202	$0 **	$2,847	$1,532 **	$4,765
Standard Error	$108	$0	$122	$78	$231
Median	$1,156	$0	$2,105	$1,194	$4,746
Vacancy Loss (As Percent of Rent Revenue)					
Mean	3.9%	8 2% **	2 6%	3 4% **	1.3%
Standard Error	0.002	0.007	0.002	0 002	0.001
Median	1 9%	6.5%	1.5%	1 9%	0 9%

** Signifies that the assisted/unassisted or older assisted/newer assisted difference is statistically significant at the 95% confidence level.

Data Source: HUD MIPS database

[1] Expressed in 1989 dollars; equals a weighted average of the 3 most recent years of data available.
[2] Percentages in the older and newer assisted categories total 100% of the total assisted category's 77%. Older assisted properties comprise 45% of the universe, and newer assisted properties comprise 31%.

Exhibit 2.12

COMPONENTS OF ANNUAL EXPENSES
(PER 2BR EQUIVALENT UNIT)[1]

		Total		Assisted	
	Total	**Unassisted**	**Assisted**	**Older**	**Newer**
Total Properties	13,271	3,080	10,191	6,037	4,154
Percent of Properties	100%	23%	77%	59% [2]	41% [2]
Operating and Maintenance Expenses					
Mean	$3,093	$3,098	$3,091	$2,977 **	$3,256
Standard Error	$54	$150	$56	$63	$106
Median	$2,807	$2,747	$2,846	$2,756	$2,972
Replacement Reserve Deposit (Actual)					
Mean	$167	$103 **	$186	$202 **	$163
Standard Error	$7	$10	$8	$11	$12
Median	$131	$94	$151	$145	$155
Percent Non-Zero	83%	73%	86%	87%	86%
Replacement Reserve Deposit [max(Actual, Required)]					
Mean	$202	$162 **	$214	$219	$207
Standard Error	$7	$12	$8	$11	$10
Median	$159	$128	$170	$152	$186
Total Debt Service (including mortgage insurance premium)					
Mean	$2,297	$2,670 *	$2,184	$1,318 **	$3,443
Standard Error	$77	$255	$68	$35	$114
Median	$1,786	$1,911	$1,764	$1,189	$3,163

* Signifies that the assisted/unassisted or older assisted/newer assisted difference is statistically significant at the 90% confidence level

** Signifies that the assisted/unassisted or older assisted/newer assisted difference is statistically significant at the 95% confidence level.

Data Source: HUD MIPS database.

[1] Expressed in 1989 dollars; equals a weighted average of the 3 most recent years of data available

[2] Percentages in the older and newer assisted categories total 100% of the total assisted category's 77%. Older assisted properties comprise 45% of the universe, and newer assisted properties comprise 31%.

- Older assisted properties spent less for operating and maintenance than newer assisted properties ($2,977 vs. $3,256).

- Replacement reserve deposits were lower in unassisted properties compared with assisted properties ($103 vs. $186 per 2BR unit).

- Replacement reserve deposits were higher for older assisted than newer assisted properties ($202 vs. $163), perhaps reflecting ongoing efforts by the older assisted properties to deal with physical needs backlogs.

- Total debt service costs were highest in newer assisted properties ($3,443 per 2BR unit) and lowest in older assisted properties ($1,318). This reflects differences in mortgage amounts (construction costs at different times), interest rates, and HUD interest rate subsidies. Newer assisted properties, being most recently built, had the highest nominal construction costs and were financed during periods of high prevailing interest rates. (Older assisted properties, being on average oldest, were in the exact opposite situation.) Older assisted properties, in addition to having been built for lower nominal amounts, included some properties with below-market mortgage interest (Section 221(d)(3)BMIR). (Accounting for Section 236 properties reflects the interest reduction payments as a tenant assistance payment on the income side and full market-rate debt service on the expense side.)

Exhibit 2.13 brings together income and annual expenses (discussed above) to display net cash flow. Overall, 68 percent of the multifamily housing stock had positive net cash flow, with a mean of $330 per 2BR unit. Another 14 percent had small annual *deficits* of less than $250 (which on a monthly basis is under $21 per 2BR unit). However, 4 percent of properties had annual deficits exceeding $1,000 per 2BR unit.

As would be expected from the previous analyses of income and expenses, there were significant differences in net cash flow among assistance categories:

- Newer assisted properties had the best cash flow—87 percent had positive cash flow, and the mean cash flow was $665. Of the small group of properties with negative cash flow, deficits tended to be small, with extremely few properties having large negative cash flow.

- Unassisted and older assisted properties had similar proportions of positive cash flow properties (60 percent and 59 percent, respectively). However, the distribution of properties differed markedly between the two assistance categories, reflecting the respective benefits of subsidized and market operations.

    - High percentages of unassisted properties had large negative cash flow—11 percent with deficits exceeding $1,000, and 8 percent with deficits from $500 to $1,000. By contrast, only 2 percent of older assisted properties had deficits

Exhibit 2.13

ANNUAL NET CASH FLOW BY ASSISTANCE CATEGORY
(Per 2BR Equivalent)

	Total	Total		Assisted	
		Unassisted	Assisted	Older	Newer
Total Properties	13,271	3,080	10,191	6,037	4,154
Percent of Properties	100%	23%	77%	59% [1]	41% [1]
Negative Net Cash Flow	32%	41% **	29%	40% **	12%
<-$1,000	4%	11%	2%	2%	1%
-$1000-<-$500	6%	8%	5%	8%	1%
-$500-<-$250	8%	9%	8%	10%	4%
-$250-<$0	14%	13%	14%	20%	6%
Positive Net Cash Flow	68%	60% **	72%	59% **	87%
$0-<$250	25%	14%	28%	35%	16%
$250-<$500	13%	10%	15%	13%	16%
$500-<$1,000	14%	10%	16%	6%	30%
≥$1,000	16%	26%	13%	5%	25%
Statistics on Annual Net Cash Flow					
Mean	$330	$232	$359	$149 **	$665
Standard Error	82	329	53	74	56
Median	$184	$153	$184	$51	$563

Net Cash Flow   =   3 year weighted average revenues
                      -   3 year weighted average expenses
                      -   mortgage repayment
                      -   deposit to replacement reserve account

**   Signifies that the assisted/unassisted or older assisted/newer assisted difference is statistically significant at the 95% confidence level

Data Source: HUD MIPS database.
Note   Column sums may not add to 100% due to rounding

[1]   Percentages in the older and newer assisted categories total 100% of the total assisted category's 77%. Older assisted properties comprise 45% of the universe, and newer assisted properties comprise 31%.

exceeding $1,000, and 8 percent had deficits of from $500 to $1,000. Subsidy and regulation appear to protect the older assisted properties from severely negative financial consequences of bad markets or inefficient operation.

- On the positive end of the scale, 26 percent of unassisted properties had extremely large positive cash flow of better than $1,000, and another 10 percent had from $500 to $1,000. Older assisted properties, on the other hand, had only 5 percent with positive cash flow exceeding $1,000, and 6 percent with positive cash flow of from $500 to $1,000. Regulated operation limits the opportunity of older assisted properties to develop cash margins that may be available from strong markets or to efficient operations.

• Newer assisted properties, nevertheless, surpassed even unassisted properties in the proportion that have large positive cash flow—25 percent had cash flow exceeding $1,000 per unit per year, and another 30 percent had cash flow of from $500 to $1,000. These properties had their initial rents effectively set by new construction market rates, and had annual adjustments reflecting inflation in market rents and utilities. Older assisted properties, on the other hand, generally had tighter limits on initial rents, and annual adjustments generally tied to prior expenses or projected budgets.

In summary, mean values for net revenue, total costs, and net cash flow by assistance category are presented below and graphically in Exhibit 2.14.

	Unassisted	Older Assisted	Newer Assisted
Mean revenue	$6,162	$4,664	$7,571
Mean expenses	$5,930	$4,514	$6,906
Mean net cash flow	$232	$150	$665

where:

Mean net revenue = Total revenues net of vacancies
(Exhibit 2.11)

Mean expenses = (Exhibit 2 12)	Mean operating and maintenance expenses	+	Mean replacement reserve deposit [max (actual, required)]	+	Mean total debt service

Mean net cash flow = Mean net revenue - Mean expenses
(Exhibit 2.13)

Differences in net cash flow across assistance categories result from differences in both revenues and costs.

Exhibit 2.14

Net Cash Flow by Assistance Category

Source: MIPS
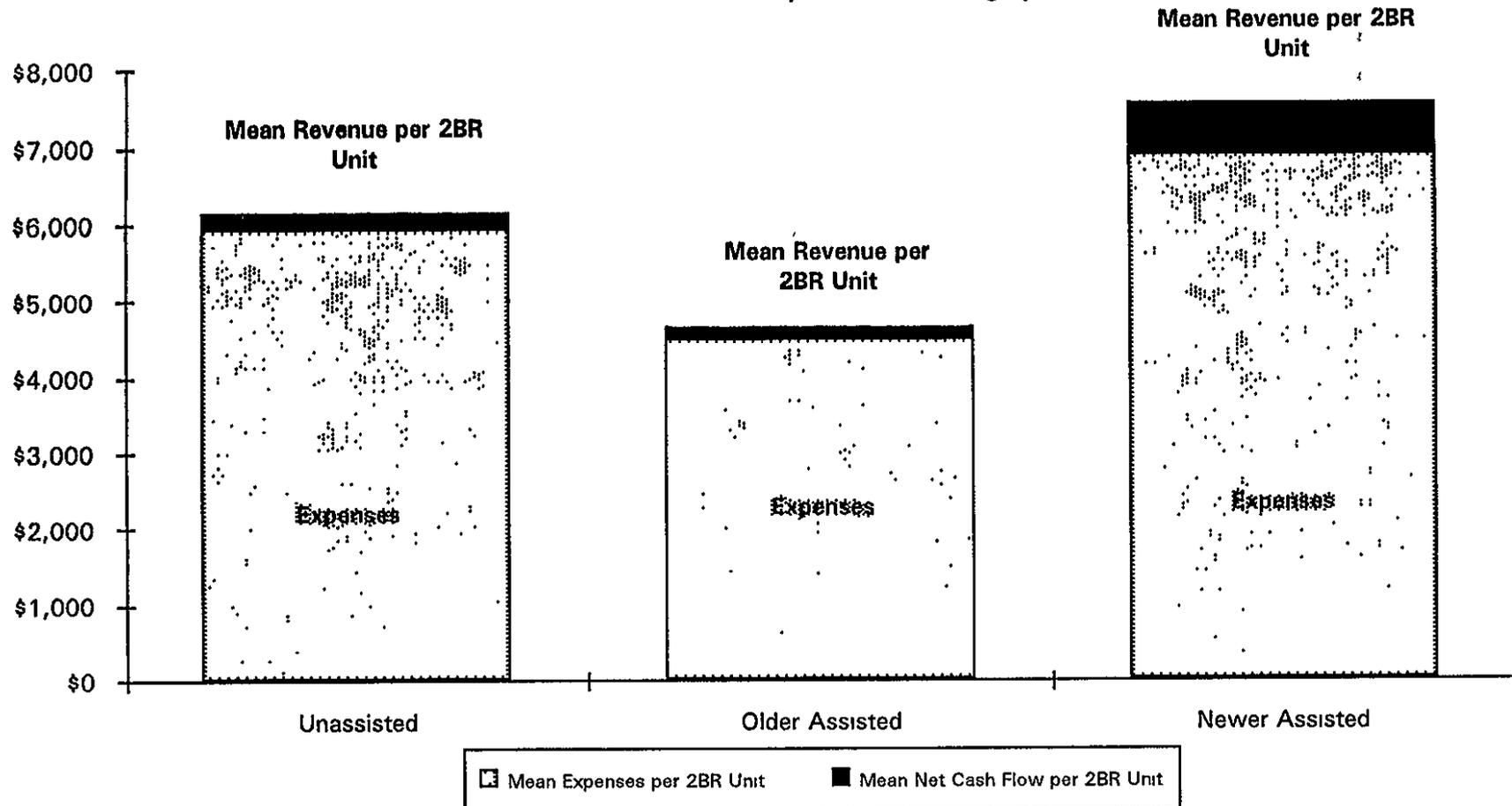
- Revenue differences between older and newer assisted properties are the result of higher subsidies provided to newer assisted properties (tenant-paid rents are nearly identical).

- Expense differences are primarily a result of differences in debt service, which are set based on mortgage date and HUD programs. Operating costs differ only slightly across assistance categories.

Ability to Cover the Current Backlog of Physical Needs from Reserve Funds

An important factor in a property's long-term viability is its having adequate reserve funds. This section examines the size of a property's reserve fund balance relative to its backlog of physical needs.

There are three accounts in which properties may have accumulated funds that could be used for funding major repairs and replacements:

- **Reserve for Replacements.** All HUD-insured or held properties are required to establish and fund a reserve for replacements account. This is their primary resource for funding major repairs and replacements.

- **Other Reserves.** Some properties have established special-purpose reserve accounts, such as painting reserves. Fewer than 10 percent of properties have any such other reserve accounts.

- **Residual Receipts Accounts.** Non-profit owners and certain for-profit owners are restricted by their mortgage regulatory (or other) contracts in their being able to take profits from the property's annual surplus cash after expenses. They are required to deposit non-distributable surplus cash into a residual receipts account. Non-profit owners, and certain owners who have received special remedial assistance or assistance under a workout, may not distribute any profit. Limited-dividend owners may distribute only a restricted amount, and only under stipulated conditions   While residual receipts accounts are not reserves for the property, HUD may require owners to contribute residual receipts funds (if any) for repairs in the case of physically deteriorated properties.

Exhibit 2.16 shows available balances in these funds. The replacement reserve is the primary source of funds to cover needed repairs, with an average balance of $854 per unit. Average balances were significantly lower for unassisted properties ($489) than for assisted properties ($964). Residual Receipts and Other Reserves accounts apply to a minority of properties, so while their overall impact may be small, they may be significant for particular properties.

Exhibit 2.15

RESOURCES FOR COVERING PHYSICAL NEEDS
(Per 2BR Equivalent)

	Total	Total		Assisted	
		Unassisted	Assisted	Older	Newer
Total Properties	13,271	3,080	10,191	6,037	4,154
Percent of Properties	100%	23%	77%	59% [1]	41% [1]
Total Replacement Reserve Balance					
Mean	$854	$489 **	$964	$864 **	$1,109
Standard Error	$33	$38	$40	$55	$50
Median	$643	$385	$814	$551	$1,022
Residual Receipts					
Mean	$179	$0 **	$226	$305 **	$111
Standard Error	$53	$0	$68	$103	$48
Median	$0	$0	$0	$0	$0
Percent Non-zero	16%	0%	20%	30%	7%
Other Reserves					
Mean	$67	$46 **	$73	$98 **	$37
Standard Error	$11	$32	$11 '	$16	$13
Median	$0	$0	$0	$0	$0
Percent Non-Zero	12%	5%	14%	19%	8%

** Signifies that the assisted/unassisted or older assisted/newer assisted difference is statistically significant at the 95% confidence level.

Data Source: HUD Field Offices

[1] Percentages in the older and newer assisted categories total 100% of the total assisted category's 77%. Older assisted properties comprise 45% of the universe, and newer assisted properties comprise 31%

Low reserve balances in themselves may not indicate problems. Reserve balances may be low, for example, because a major repair program was recently completed. However, if reserve balances are low in a property with a high backlog of physical needs, problems may be indicated. It is important, therefore, to examine available resources relative to the backlog of physical needs.

Exhibit 2.16 shows the *backlog coverage ratio* for the insured stock. This ratio equals the available resources relative to the backlog of repair needs. Specifically, *available resources* is defined as the sum of (a) any amount by which the reserve for replacement balance exceeds two years' worth of annual reserve deposits,[26] plus (b) residual receipts balance, plus (c) other reserves balances. Available resources are then divided by the amount of the backlog.

- Forty-five percent of properties had sufficient fund balances to cover repair needs. This includes the 20 percent of properties that had no backlog needs plus another 25 percent that had needs but also had sufficient resources to cover those needs.

- Fifty-five percent of properties lacked sufficient funds to cover backlog needs. This includes 13 percent that had no reserves available, and 23 percent that had in their reserves less than one-fourth the amount needed to cover current needs.

- Inability to cover repair needs was especially a problem for older assisted properties. Sixty-five percent had insufficient resources to cover current backlog, including 19 percent that had no reserves available and 30 percent that had available reserve balances that could meet less than one-fourth of their backlog.

- It was also a problem for unassisted properties, where 51 percent had insufficient resources to cover all repair needs.

Exhibit 2.17 shows the resulting *unfunded backlog* of physical needs, which is the total backlog reduced by available resources (as defined as above). The mean *unfunded* backlog of physical needs was $1,214 per 2BR unit (and the median was $228). In contrast, the mean *total* backlog (as was shown in Exhibit 2.4 earlier in this chapter) was $1,520 (and the median was $654). On average, almost the entire backlog was unfunded. Twenty-two percent of all properties had unfunded backlogs exceeding $2,000 per 2BR unit—about two and a half years' average accrual of needs.

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[26]Retaining two years' worth of deposits is in keeping with HUD's general loan servicing practices. Had we instead assumed that properties could use their entire reserves, that would have added less than $400 on average, and less than this or nothing for properties with reserve balance below this amount Dropping this restriction would make little difference in the ability of most properties to cover their backlog needs

Exhibit 2.16

BACKLOG COVERAGE RATIO
(AVAILABLE RESOURCES BALANCE RELATIVE TO
PHYSICAL NEEDS BACKLOG)

		Total		Assisted	
	Total	Unassisted	Assisted	Older	Newer
Total Properties	13,271	3,080	10,191	6,037	4,154
Percent of Properties	100%	23%	77%	59% [1]	41% [1]
Backlog Coverage Ratio[2]					
Insufficient Resources	55%	51%	56%	65% **	44%
Backlog > $0 & No Available Resources[3]	13%	14%	13%	19%	5%
Ratio >0 to < 0.25	23%	24%	23%	30%	13%
Ratio 0 25 to < 0.5	10%	10%	10%	10%	10%
Ratio 0.5 to < 1	9%	3%	10%	6%	16%
Sufficient Resources	45%	49%	44%	35% **	57%
Ratio ≥ 1	25%	17%	28%	25%	32%
Backlog Needs ≤$10 per 2BR	20%	32%	16%	10%	25%

[1] Percentages in the older and newer assisted categories total 100% of the total assisted category's 77%. Older assisted properties comprise 45% of the universe, and newer assisted properties comprise 31%.

[2] Repair Coverage Ratio =

Available Resources after Deposit to Replacement Reserve Account ÷ Backlog of Needs

If Resources > 0 and Backlog > 0

[3] Means that the existing reserve account balances are less than two years' worth of deposits to replacement reserve account, so that no internal resources are currently available to cover the backlog of physical needs

** Signifies that differences between older assisted and newer assisted are statistically significant at the 90% confidence level.

Data Source: Physical Needs: Inspections and Costing program.
Resources   HUD Field Offices.

Note. Column sums may not add to 100% due to rounding.

Exhibit 2.17

UNFUNDED BACKLOG OF PHYSICAL NEEDS BY ASSISTANCE CATEGORY
(Per 2BR Equivalent)

		Total		Assisted	
	Total	Unassisted	Assisted	Older	Newer
Total Properties	13,271	3,080	10,191	6,037	4,154
Percent of Properties	100%	23%	77%	59% [1]	41% [1]
$0	44%	46%	44%	35%	56%
$0-<$500	14%	20%	12%	10%	14%
$500-<$1,000	10%	7%	10%	11%	9%
$1,000-<$2,000	11%	13%	11%	13%	8%
$2,000-<$5,000	15%	9%	17%	22%	10%
$5,000-<$7,500	5%	4%	5%	6%	3%
$7,500+	2%	1%	2%	4%	0%
Statistics on Unfunded Backlog of Physical Needs					
Mean	$1,214	$922 **	$1,303	$1,726 **	$687
Standard Error	$88	$157	$104	$147	$113
Median	$228	$11	$291	$683	$0

** Signifies that the assisted/unassisted or older assisted/newer assisted difference is statistically significant at the 95% confidence level

Data Source: Inspections, HUD MIPS database, and HUD Field Offices.

[1] Percentages in the older and newer assisted categories total 100% of the total assisted category's 77%. Older assisted properties comprise 45% of the universe, and newer assisted properties comprise 31%

As with other resource problems, high levels of unfunded backlogs were most common in older assisted properties (which had a mean unfunded backlog of $1,726 compared with $687 for newer assisted properties and $922 for unassisted properties). Thirty-two percent of older assisted properties had over $2,000 of unfunded backlogs, compared with 13 percent of newer assisted properties and 14 percent of unassisted properties.

In order to remedy these unfunded backlogs, properties will have to cover them from current positive cash flow, owner contributions, loans, vacancy loss reductions, operating improvements, rent increases, and additional subsidies. The next chapter on distressed properties discusses properties' likely ability to cover these unfunded backlogs.

Ability to Cover Ongoing Accrual of Physical Needs from Deposits to Replacement Reserve Accounts and Positive Net Cash Flow

An important factor in a property's long-term viability is the ability to cover ongoing accrual of physical needs. As discussed above, we have estimated the average annual accruals of physical needs for each property (see Exhibits 2.9 and 2.10). There are two potential sources of funds available to cover these accrual costs:

- **Annual Deposits to the Reserve for Replacement Account.** All HUD-insured or held properties are required to make monthly deposits to the reserve for replacement account. As discussed above, the amount available to cover ongoing needs is the maximum of actual deposits as reported by HUD Field Offices in the study's data collection survey, and required deposits, which are approximated as 0.5 percent of the original mortgage.

- **Positive Annual Net Cash Flow.** Properties that have positive net cash flow after covering all operating and maintenance expenses, mortgage repayment and deposits to reserve accounts, may use remaining funds to cover ongoing accrual.

Annual *unfunded accrual* of physical needs is mean annual accrual reduced by available resources as defined above—reserve deposit and positive cash flow. Exhibit 2.18 shows that mean unfunded accrual was $394 per 2BR unit per year, and median was $242. As indicated in Exhibit 2.9, average annual accrual of needs was $832 overall. This means that on average, nearly half of all needs accrued each year cannot be met with existing resources.

- As with most other indicators, older assisted properties had on average higher levels of unfunded accrual compared with other property types. The average

Exhibit 2.18

UNFUNDED ACCRUAL OF PHYSICAL NEEDS
(Per 2BR Equivalent)

	Total	Total		Assisted	
		Unassisted	Assisted	Older	Newer
Total Properties	13,271	3,080	10,191	6,037	4,154
Percent of Properties	100%	23%	77%	59% [1]	41% [1]
$0	34%	42%	32%	19%	51%
$0-<$500	34%	30%	35%	39%	29%
$500-<$1,000	21%	17%	23%	27%	17%
$1,000-<$2,000	10%	10%	9%	14%	3%
$2,000+	1%	1%	1%	2%	0%
Statistics on Unfunded Accrual					
Mean	$394	$361 **	$403	$525 **	$227
Standard Error	$20	$44	$23	$30	$29
Median	$242	$163	$257	$411	$0

** Signifies that the assisted/unassisted or older assisted/newer assisted difference is statistically significant at the 95% confidence level.

Data Source: Inspections, HUD MIPS database, and HUD Field Offices.

[1] Percentages in the older and newer assisted categories total 100% of the total assisted category's 77%. Older assisted properties comprise 45% of the universe, and newer assisted properties comprise 31%.

annual unfunded accrual was $525 for older assisted properties, compared with $227 for newer assisted properties, and $361 for unassisted properties.

- Over half of all newer assisted properties had sufficient resources to cover ongoing needs, compared with only 19 percent of older assisted properties.[27]

While unfunded accrual is not necessarily a problem at the current time, assuming the backlog can be met, clearly it is an indicator of potential problems in the future. As time passes, and the unfunded accrual accumulates, properties may fall into disrepair.

Another way to look at the ability to cover ongoing accruals is to examine the effect on net cash flow of properties depositing sufficient amounts in their reserve for replacement to cover ongoing accruals. As described above, net cash flow is calculated assuming that the property owner deposits the maximum of actual and required annual deposits to the reserve for replacement account. According to HUD guidelines, deposits to the reserve account are intended to *help defray* future repair needs rather than to *completely* address future needs. Deposits to the reserve accounts equal on average about one-quarter of the annual accrual of physical needs. Exhibit 2.12 showed that the current mean deposit was $202, while Exhibit 2.9 showed that the average annual accrual of needs was $832. While the shortfall in resources is not necessarily an immediate problem, resources to cover future accruals will be needed at some point either from some sources internal to the property or from external sources. If properties were to deposit sufficient amounts to the reserve accounts to meet ongoing accrual needs, the average deposit to the reserve for replacement account would quadruple The effect on net cash flow (Exhibit 2.19) would be that a majority of properties (72 percent) would have negative cash

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[27]Unfunded Accrual = Max (0, Accrual-Replacement Reserve Deposit-Max(0, Net Cash Flow))

Because both unfunded accrual and cash flow available to fund accrual are either zero or higher, the mean value of unfunded accrual *is not* equal to the mean value of accrual minus the mean reserve deposit and the mean net cash. Essentially what this means is that properties with positive resources do not transfer funds to properties with no resources. Thus, while *on average* newer assisted properties have resources beyond what is needed to fund accrual, the overall mean unfunded accrual for newer assisted properties is positive.

Mean Values	Unassisted	Older Assisted	Newer Assisted
Accrual	$795	$872	$800
Reserve Deposit	$162	$219	$207
Cash Flow	$232	$149	$665
Accrual - (Reserve Deposit + Cash Flow)	$401	$504	-$72
Unfunded Accrual	$163	$525	$227

flow (assuming revenues from rents and HUD assistance did not increase). Under this situation, 87 percent of older assisted properties would have negative cash flow, as would 64 percent of unassisted and 56 percent of newer assisted properties. To avoid this situation property owners may take a number of actions, including increasing rents where allowed, reducing operating expenses, or obtaining outside assistance.

2.5   Receipt of Remedial Program Assistance by HUD-Insured Properties

This section describes the major forms of remedial assistance available to troubled properties and reports on the number of properties that have received assistance through each of the major assistance program initiatives available. We provide a breakdown of receipt of remedial assistance by property assistance category, and present current physical and financial condition by receipt of these.

Exhibit 2.20 lists the major remedial programs that have been received by HUD-insured properties. The exhibit also lists the portion of properties in each assistance category that have received each type of assistance. The exhibit shows that:

- Operating loss loans, which are additional loans provided to properties early on to make up for early shortfalls, are amortized as part of the mortgage and thus have been included as part of the first mortgage for our study. Only 1 percent of newer assisted properties, and 3 percent of unassisted properties have taken operating loss loans.

- Section 241 loans are HUD-insured market rate loans that insured properties may use to pay for improvements to the property, expand housing opportunities, or improve the property's safety features. These loans were rarely used regardless of assistance category. This is not surprising, given that these are unsubsidized loans carrying market interest rates and that owners must begin repayment immediately. Troubled properties are unlikely to qualify for these loans while properties that are financially well off do not need credit enhancement and may, instead, choose simpler conventional or private financing.

- Flexible Subsidy is a competitively awarded program that provides reduced-interest direct loans to properties that receive Federal assistance under the Section 236 or Rent Supplement programs (or Section 8 in place of former assistance under these programs). It consists of two components. The traditional Operating Assistance Loan Program for troubled properties is a deferred 1 percent interest loan. It can be used to correct physical deficiencies caused by deferred maintenance, financial deficiencies, and projected deficits for the assistance year. The newer Capital Improvement Loan Program, for troubled as well as some non-troubled properties, is an amortizing direct loan that carries a 3 to 6 percent interest rate set by HUD.

Exhibit 2.19

ALTERNATIVE NET CASH FLOW PER 2 BR EQUIVALENT UNIT ASSUMING DEPOSIT TO REPLACEMENT RESERVE ACCOUNT EQUALS AVERAGE ACCRUAL OF NEEDS

	Total	Total		Assisted	
		Unassisted	Assisted	Older[1]	Newer[1]
Total Properties	13,271	3,080 **	10,191	6,037	4,154
Percent of Properties	100%	23%	77%	59%	41%
Negative Alternative Net Cash Flow	72%	64%	74%	87%	56%
<-$1,000	29%	36%	27%	35%	15%
-$1000-<-$500	23%	15%	25%	30%	18%
-$500-<-$250	11%	6%	12%	12%	13%
-$250-<$0	9%	7%	10%	10%	10%
Positive Alternative Net Cash Flow	27%	36%	26%	13%	45%
$0-<$250	9%	11%	9%	1%	12%
$250-<$500	4%	3%	4%	3%	8%
$500-<$1,000	8%	10%	8%	2%	16%
<$1,000+	6%	12%	5%	2%	9%
Statistics on Alternative Net Cash Flow					
Mean	($517)	($579) **	($498)	($756) **	($124)
Standard Error	84	$320	62	86	$68
Median	($586)	($571)	($590)	($713)	($154)

Alternative
Net Cash Flow = 3 year weighted average revenues
- 3 year weighted average expenses
- mortgage repayment
- deposit to replacement reserve account (= average annual accrual of needs)

** Signifies that the assisted/unassisted or older assisted/newer assisted difference is statistically significant at the 95% confidence level.

[1] Percentages in the older and newer assisted categories total 100% of the total assisted category's 77%. Older assisted properties comprise 45% of the universe, and newer assisted properties comprise 31%.

Exhibit 2.20

RECEIPT OF REMEDIAL ASSISTANCE IN HUD-INSURED PROPERTIES

	Total	Total		Assisted	
		Unassisted	Assisted	Older	Newer
Total Properties	13,271	3,080	10,191	6,037	4,154
Percent of Properties	100%	23%	77%	59% [1]	41% [1]
Operating Loss Loan					
Received	1%	3%	0%	0%	1%
Did Not Receive	99%	97%	100%	100%	99%
S241 Loan					
Received	1%	2%	1%	1%	1%
Did Not Receive	99%	98%	99%	99%	99%
Flexible Subsidy					
Received	7%	0%	9%	14%	0%
Date Before 1/1/80	15%	NA	15%	15%	NA
1/1/80-12/31/85	82%	NA	82%	82%	NA
1/1/86 or later	3%	NA	3%	3%	NA
Did Not Receive	93%	100%	91%	86%	100%
TPA					
Had a TPA	17%	25% **	14%	22% **	3%
9/15/80 or before	16%	17%	15%	13%	40%
9/16/80-12/31/84	35%	17%	45%	48%	20%
1/1/85-2/4/88	32%	45%	25%	27%	0%
2/5/88 or later	17%	21%	15%	12%	40%
Did Not Have a TPA	83%	75%	86%	78%	97%
Section 8					
Section LMSA (regular)	14%	0%	18%	31%	0%
Section 8 LMSA (RS-conversion)	18%	0%	23%	39%	0%
No Section 8 LMSA	68%	100%	59%	30%	100%

** Signifies that the assisted/unassisted or older assisted/newer assisted difference is statistically significant at the 95% confidence level.

Data Source: HUD computer databases and Field Offices.

[1] Percentages in the older and newer assisted categories total 100% of the total assisted category's 77%. Older assisted properties comprise 45% of the universe, and newer assisted properties comprise 31%.

The Capital Improvement Loans cannot be used for capital improvements that are the result of deferred maintenance. Under both components, an owner must prepare and abide by a Management Improvement and Operating Plan, and a profit-motivated owner must make a 25 percent matching capital contribution to the property.[28] Receipt of Operating Assistance Loans requires that the property remain in low-income use for the balance of the original mortgage term[29] and suspends an owner's right to distribute dividends (until the loans are repaid).

HUD Field Offices did not report any of the study's properties receiving Capital Improvement loans. Fourteen percent of older assisted properties have received Flexible Subsidies. The majority of Flexible Subsidies (82 percent) were issued between January 1, 1980 and December 31, 1985. Properties with Flexible Subsidy after this date have a use restriction that makes them ineligible for preservation incentives.

- Transfers of Physical Assets (TPAs) are changes in ownership that keep the original HUD mortgage in place. As a condition of HUD's approving TPAs, owners are required to contribute funds, if needed, to bring properties up to a reasonable standard of repair or to eliminate outstanding financial deficiencies. Overall, 17 percent of properties had TPAs. TPAs were most common among unassisted properties (25 percent) and older assisted properties (22 percent), while very few newer assisted properties had TPAs (3 percent). Most TPAs took place between September 16, 1980 and December 31, 1984 (35 percent) and between January 1, 1985 and February 4, 1988 (32 percent).[30]

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[28]Nonprofit owners may provide in-kind services to property residents rather than make capital contributions

[29]This requirement makes owners of recipient properties ineligible for preservation incentives under the 1990 Preservation Act.

[30]Between 1981 and 1984, the largest proportion of ownership transfers (TPAs, or transfers of physical assets) were to new for-profit or limited-dividend owners taking advantage of the very rapid tax write-offs for depreciation allowed under the Economic Recovery Tax Act of 1981 These transfers were made even more attractive by a provision of the tax code that encouraged sellers to help finance a sale by holding a deferred-interest second trust note. These seller notes enabled buyers to acquire properties with little cash while providing them with a large basis for depreciation. Another advantage of these seller notes was that buyers were permitted to expense interest costs annually for tax purposes, even though no interest payments were due, while sellers did not have to claim interest income until the note was due, typically 15 years from the purchase This allowable interest expense on second notes, added to the rapid depreciation, greatly exceeded rental revenues, creating potential to shelter other income.

Subsequent tax legislation all but eliminated the tax shelter benefits of rental housing. The 1984 tax act eliminated the tax advantage of second trust notes by requiring both sellers and buyers to recognize interest payments at the same time for tax purposes. The 1986 Tax Reform Act placed severe restrictions on the extent to which passive losses could be used to shelter nonpassive income. The Act also reduced opportunities for rapidly depreciating properties These changes eliminated the major incentives for investors to participate, through limited partnerships, in ownership of HUD-insured properties.

TPAs involving HUD-held mortgages or with new Section 8 contracts as of February 5, 1988, are not eligible for preservation incentives.

- The Section 8 Loan Management Set Aside (LMSA) program was initiated in 1976 as part of the Section 8 Rental Assistance Program. LMSA, a subsidy to properties rather than to tenants (unlike Section 8 Certificates or Vouchers), pays owners the difference between the full rent level and 30 percent of a low-income tenant's income. HUD's major use of LMSA has been to replace subsidies under the older Rent Supplement or Rental Assistance Payment programs. However, LMSA has also been used as a competitively awarded remedial tool to help troubled properties increase occupancy or raise rents to levels sufficient to sustain operations. Any troubled multifamily property (regardless of prior assistance status or insurance program) is eligible to compete for remedial LMSA.[31] In practice, most remedial LMSA has been awarded to older assisted properties, particularly those originally insured under Section 236.

Thirty-one percent of older assisted properties have received LMSA as a form of remedial assistance to increase occupancy or raise rental rates to a level needed to sustain operations. (Section 8 LMSA has also replaced older rental assistance under the older Rent Supplement Program; this use of LMSA is not considered remedial assistance, and is identified in the exhibit as LMSA—RS Conversion).

Exhibit 2.21 shows physical needs backlog by receipt of remedial assistance.[32] It shows the total backlog and unfunded backlog of physical needs for properties that have and have not received remedial assistance. Note that many properties have received assistance through more than one program. While we have no information on the condition of properties prior to their receipt of special assistance, properties receiving either Flexible Subsidy or remedial LMSA generally had to be deemed troubled as a condition of eligibility. Properties that have received remedial assistance still had higher backlogs and unfunded backlogs after receiving assistance than did properties that did not receive remedial assistance.

Exhibit 2.22 shows net cash flow by receipt of remedial assistance. The exhibit indicates that cash flow was similar between properties that have received flexible subsidies and those that have not. Cash flow was lower among properties having had a Transfer of Physical Assets or receiving LMSA assistance than among properties that had not received these forms of assistance.

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[31]This includes any multifamily property with a HUD-insured or held mortgage, any property financed by a Section 202 direct loan, and any of these properties whose title has been assigned to HUD

[32]The number of Section 241 loans and operating loss loans are too small to warrant providing data in either Exhibit 2 21 or 2.22

Exhibit 2.21

BACKLOG OF PHYSICAL NEEDS AND UNFUNDED BACKLOG BY RECEIPT OF REMEDIAL ASSISTANCE

	Total	Flexible Subsidy		Transfer of Physical Assets (TPA)		LMSA		
		Received Flexible Subsidy	Did Not Receive Flexible Subsidy	Had a TPA	Did Not Have a TPA	Regular LMSA	Rent Sup/ RAP LMSA	No LMSA
Number of Properties	13,271	867	12,403	2,248	11,023	1,865	2,351	9,055
Percent of Properties	100%	7%	93%	17%	83%	14%	18%	68%
Total Backlog of Physical Needs (in dollars)								
Mean	$1,520	$3,372 **	$1,391	$1,801	$1,463	$2,003 **	$2,240 **	$1,234
Standard Error	92	488	89	229	100	238	249	103
Median	$654	$2,210	$602	$1,059	$596	$1,214	$1,232	$450
Unfunded Backlog (in dollars)								
Mean	$1,214	$2,847 **	$1,100	$1,570	$1,142	$1,697 **	$1,881 **	$942
Standard Error	88	502	85	224	96	237	246	97
Median	$228	$1,670	$112	$597	$48	$914	$638	$3

** Differences between the means for properties that received the tool and the means for those that did not are statistically significant at the 95% level.

Data Source: Inspections, costing program for physical needs, HUD Field Office data on resources to cover needs, HUD Field Offices and computer databases on receipt of tools

Exhibit 2.22

ANNUAL NET CASH FLOW BY RECEIPT OF
REMEDIAL PROGRAM ASSISTANCE
(Per 2BR Equivalent)

	Total	Flexible Subsidy		Transfer of Physical Assets (TPA)		LMSA		
		Received Flexible Subsidy	Did Not Receive Flexible Subsidy	Had a TPA	Did Not Have a TPA	Regular LMSA	Rent Sup/ RAP LMSA	No LMSA
Number of Properties	13,271	867	12,403	2,248	11,023	1,865	2,351	9,055
Percent of Properties	100%	7%	93%	17%	83%	14%	18%	68%
Percent Positive Net Cash Flow	68%	56% **	69%	60% **	70%	46% **	58% **	76%
Percent Negative Cash Flow	32%	44% **	31%	40% **	30%	54% **	42% **	24%
Statistics on Net Cash Flow								
Mean Net Cash Flow	$330	$292	$332	$301 *	$336	$152 **	$115 **	$422
Standard Error	$82	$158	$88	$88	$215	$221	$65	$114
Median Net Cash Flow	$184	$28	$190	$56	$203	($23)	$50	$289

Net Cash Flow = 3 year weighted average revenues
- 3 year weighted average expenses
- mortgage repayment
- deposit to replacement reserve account

** Differences between the Means or Proportions for properties that received the tool and the values for those that did not are statistically significant at the 95% level.

Data Source: HUD Field Offices and computer databases on receipt of tools and property incomes and expenses.

An important source of assistance for HUD-insured properties is the Section 8 program, which in addition to Loan Management Set Aside includes the Section 8 New Construction program and Property Disposition Section 8. As noted above, all of the newer assisted properties were assisted with Section 8 contracts. Exhibit 2.23 shows that:

- The Section 8 New Construction properties are generally fully assisted, and received on average $6,126 of assistance per 2BR unit per year.

- Section 8 LMSA assistance was lower on a per-unit basis compared with the new construction program. On average, 68 percent of units in the Section 8 LMSA properties received assistance, and the assistance averaged $1,877 per 2BR unit in the property (or $2,760 per assisted unit).

- Properties which received Property Disposition Section 8 received assistance for all units in the property, averaging $2,411 per 2BR unit per year.

- Properties which received LMSA assistance through Rent Supplement or Rental Assistance Payment (RAP) conversions, received assistance for on average 75 percent of units, averaging $2,418 per 2BR unit per year (or $3,224 per assisted unit).

2.6 Neighborhood Characteristics

Along with the actual physical property itself, the local neighborhood plays an important role in the overall well-being of residents. This section describes the neighborhoods where the HUD-insured properties are located. The specific study questions addressed are:

- Characteristics of neighborhoods where HUD-insured properties are located, and

- Property characteristics relative to local market.

Neighborhood Characteristics

The types of neighborhoods where insured properties are located were similar across assistance categories (Exhibit 2.24).[33] Neighborhoods for all assistance categories were predominantly residential (61 percent of structures are residential). Nearly half of the houses in all neighborhoods were single-family (48 percent). The second most common type of building

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[33]The source for data on property neighborhoods is primarily the inspector windshield survey. The inspectors drove through each neighborhood, as defined by the property manager, to determine its characteristics

Exhibit 2.23

SECTION 8 ASSISTANCE IN HUD-INSURED PROPERTIES

	New Construction, Moderate Rehabilitation	LMSA	Property Disposition	Rent Supplement/RAP Conversion
Number of Properties	4,154	1,864	80	2,351
Percent of Units Assisted				
Mean	96%	68%	100%	75%
Median	100%	77%	100%	99%
Assistance Value per 2BR Unit				
Mean	$6,126	$1,877	$2,411	$2,418
Median	$5,889	$1,648	$3,265	$2,427
Next Renewal Year				
1994 or earlier	23%	85%	67%	79%
1995 through 1999	16%	8%	33%	21%
2000 or later	61%	7%	0%	0%

Data Source: HUD computer databases and Field Offices.

Exhibit 2.24

NEIGHBORHOOD CHARACTERISTICS FOR HUD-INSURED PROPERTIES

	Total	Total		Assisted	
	Total	Unassisted	Assisted	Older	Newer
Total Properties	13,271	3,080	10,191	6,037	4,154
Percent of Properties	100%	23%	77%	59% [1]	41%[1]
Land Use					
Residential	61%	60%	62%	61%	62%
Commercial	23%	25%	23%	23%	23%
Industrial	6%	4%	6%	7%	6%
Institutional	8%	9%	7%	7%	7%
Other	2%	2%	2%	2%	2%
Residential Structure Age					
Pre-1945	21%	12% **	24%	22%	27%
1945-1960	28%	20% **	30%	31%	30%
1961-Present	51%	67% **	46%	48%	43%
Type of Residential Structure					
Single-Family Detached	48%	44%	49%	49%	49%
Garden/Row/Townhouse	12%	12%	12%	12%	12%
Multifamily 2-4 Units	9%	7%	10%	10%	8%
Multifamily 5-10 Units	10%	11%	10%	11%	10%
Multifamily ≥ 11 Units	20%	25% *	18%	17%	20%
Construction Type					
Wood Frame	45%	46%	45%	45%	45%
Masonry	36%	35%	37%	35%	38%
Mixed	18%	18%	18%	20%	16%
Central City Status					
MSA-Central City	58%	63%	56%	60% **	50%
MSA-Not Central City	32%	33%	31%	29%	34%
Non-MSA	11%	4% **	13%	11%	16%

** Signifies that the assisted/unassisted or older assisted/newer assisted difference is statistically significant at the 95% confidence level.

* Signifies that the assisted/unassisted or older assisted/newer assisted difference is statistically significant at the 90% confidence level

[1] Percentages in the older and newer assisted categories total 100% of the total assisted category's 77% Older assisted properties comprise 45% of the universe, and newer assisted properties comprise 31%

Data Source Inspector Windshield Survey, HUD MIDLIS database (for Central City status).

was large multifamily properties (20 percent). The construction type was similar across assistance category, with wood structures being the dominant building type (45 percent). Unassisted properties tended to be in areas with newer buildings compared with assisted properties. They were also slightly less likely to be non-MSA areas compared with assisted properties. Among the neighborhood characteristics of the two groups of assisted properties, the only significant difference was the higher concentration of older assisted properties in central cities.

Exhibit 2.25 shows the neighborhood conditions for the HUD-insured stock. Data for this exhibit are from the inspector windshield survey. Inspectors rated each neighborhood on several dimensions such as condition of streets, owner housekeeping, and general condition of housing. The unassisted properties were located in "better" neighborhoods compared with assisted properties across all dimensions. The inspectors rated about 90 percent of the neighborhoods of the unassisted properties as "good" or "excellent" in all definitions of quality, whereas 27 to 38 percent of assisted properties were in areas rated as "fair" or "poor" on all dimensions. There are no discernable differences between neighborhoods where newer assisted and older assisted properties are located, with the exception of the inspectors' rating of neighborhood quality relative to the city as a whole—39 percent of older assisted properties were rated as in worse than average neighborhoods, while only 29 percent of newer assisted properties were so rated.

Exhibit 2.26 shows the demographic characteristics of the neighborhoods where insured properties are located.[34] On average, insured properties are located in neighborhoods that are 68 percent white, 24 percent black, and 8 percent other groups. The average neighborhood percentage of Hispanic households was 10 percent.[35] Unassisted properties tend to be located

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[34]Data on property neighborhoods are from the Conquest database extracts of 1980 Census data A property's neighborhood is defined as the area within a one-mile radius of the property. Where the precise address was unknown, the property's zipcode area was used.

[35]Hispanics include both white and black individuals Thus, one cannot determine the proportion of non-Hispanic whites or blacks in any neighborhood. In the description of the insured properties, Hispanics, regardless of race, are identified as a separate group

Exhibit 2.25

NEIGHBORHOOD CONDITIONS FOR HUD-INSURED PROPERTIES

	Total	Total		Assisted	
	Total	**Unassisted**	**Assisted**	**Older**	**Newer**
Total Properties	13,271	3,080	10,191	6,037	4,154
Percent of Properties	100%	23%	77%	59% [1]	41% [1]
Condition of Streets/Curbs					
Excellent/Good	77%	91% **	73%	70%	77%
Fair/Poor	23%	9% **	27%	30%	23%
Street Maintenance					
Excellent/Good	74%	90% **	69%	66%	71%
Fair/Poor	26%	10% **	32%	34%	29%
Owner Housekeeping					
Excellent/Good	74%	90% **	69%	67%	71%
Fair/Poor	26%	10% **	31%	33%	29%
Quality as Residential Neighborhood					
Excellent/Good	69%	89% **	63%	62%	64%
Fair/Poor	31%	11% **	37%	38%	36%
Neighborhood Relative to City Quality					
Better than Average	36%	64% **	27%	24%	32%
Average	35%	27% **	38%	37%	40%
Worse than Average	29%	9% **	35%	39% **	29%
General Condition of Housing					
Sound Condition	71%	87% **	67%	66%	67%
Minor Deterioration	20%	11% **	23%	24%	21%
Major Deterioration	6%	1% **	8%	8%	8%
Dilapidated/Abandoned	2%	0%	2%	2%	3%

** Signifies that the assisted/unassisted or older assisted/newer assisted difference is statistically significant at the 95% confidence level.

[1] Percentages in the older and newer assisted categories total 100% of the total assisted category's 77%. Older assisted properties comprise 45% of the universe, and newer assisted properties comprise 31%.

Data Source Inspector Windshield Survey.

Note Columns sums may not add to 100% due to rounding.

Exhibit 2.26

DEMOGRAPHIC CHARACTERISTICS OF PROPERTY NEIGHBORHOODS

		Total		Assisted	
	Total	Unassisted	Assisted	Older	Newer
Total Properties	13,271	3,080	10,191	6,037	4,154
Percent of Properties	100%	23%	77%	59% [1]	41% [1]
Race/Ethnicity					
White	68%	75% **	65%	65%	66%
Black	24%	17% **	27%	26%	27%
Other	8%	7%	8%	9%	7%
Hispanic (regardless of race)	10%	6%	11%	12%	9%
Income Distribution					
<$7,500	13%	9%	14%	14%	14%
$7,500 - $10,000	8%	6%	8%	8%	8%
$10,000 - $15,000	10%	8%	11%	11%	11%
$15,000 - $25,000	18%	15%	19%	18%	19%
$25,000 - $35,000	15%	15%	15%	15%	15%
$35,000 - $50,000	16%	18%	16%	16%	16%
>$50,000	20%	29% **	18%	18%	17%
Income Distribution					
Percent <50% Median	36%	28% **	38%	38%	38%
Percent 50-80% Median	18%	17%	18%	18%	18%
Percent 80-100% Median	10%	11%	10%	10%	10%
Percent > Median	36%	45% **	33%	33%	33%
Percent Elderly Head of Household	17%	17%	17%	15%	17%
Mean Age of Head of Household	35 0	43.0	32.6	34.0	31.7
Average Household Size	2 5	2.4	2.5	2.6	2.5

** Signifies that the assisted/unassisted or older assisted/newer assisted difference is statistically significant at the 95% confidence level.

Data Source Inspections, HUD MIPS database, and HUD Field Offices.

Note: Column sums may not add to 100% due to rounding.

[1] Percentages in the older and newer assisted categories total 100% of the total assisted category's 77% Older assisted properties comprise 45% of the universe, and newer assisted properties comprise 31%.

in neighborhoods with higher concentrations of whites, while the racial composition of neighborhoods is similar for both groups of assisted properties.[36]

As expected, unassisted properties tended to be located in wealthier areas compared with assisted properties, both in terms of absolute income levels, and in terms of income relative to the area median. Forty-five percent of households in neighborhoods where unassisted properties were located earned more than the local area median, compared with 33 percent of households for the assisted properties' neighborhoods. At the opposite end of the income distribution, 38 percent of households in neighborhoods where assisted properties were located had incomes below 50 percent of the local median, compared with only 28 percent for unassisted properties. Though the percent of elderly residents was similar across all neighborhoods, the average age of head of household was higher (43 years) in neighborhoods where unassisted properties were located compared with assisted properties (32.6 years). Average household size was similar, about 2.5 people per unit across all neighborhoods.

Property Characteristics Relative to Neighborhood

This section compares property physical and occupancy characteristics with the characteristics of the surrounding neighborhood.

Exhibit 2.27 compares actual property rents with local market rents. The exhibit first compares the rents received by landlords (Apartment Revenue) with property rent potential in an unrestricted market. Unrestricted potential rents were computed based on information from Market Value summaries and are the expected rents for a similar property fixed up to its highest and best use.[37] The exhibit next compares the rents paid by tenants (Tenant Rents) with Section 8 Existing Fair Market Rents (FMRs). This provides an indication of what tenants face if a property is lost as low-income housing either because it is converted to unrestricted use, has the owner opt out of Section 8, or suffers from extreme physical and financial deterioration. The exhibit shows that:

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[36]Within each assistance category the stock of properties with HUD-insured or held mortgages had a slightly higher concentration of minorities compared with their local neighborhoods. (See Exhibit 2.2 above.)

[37]Highest and best use is determined by comparing the rent stream attainable with the repair and upgrade costs required to achieve such levels.

Exhibit 2.27

PROPERTY CHARACTERISTICS RELATIVE TO NEIGHBORHOOD

	Total	Total		Assisted	
	Total	Unassisted	Assisted	Older	Newer
Total Properties	13,271	3,080	10,191	6,037	4,154
Percent of Properties	100%	23%	77%	59% [1]	41% [1]
Apartment Rents/Unrestricted Rent Potential					
<0 5	5%	4%	6%	10% **	0%
0 5 - <0.75	20%	21%	20%	31% **	4%
0 75 - <1	39%	60% **	30%	35% **	23%
1 - <1 5	25%	12% **	29%	18% **	45%
≥1.5	12%	4% **	15%	6% **	28%
Tenant-paid Rents/Local FMR					
<0.25	18%	0% **	24%	10% **	44%
0.25 - <0 5	36%	3% **	45%	56% **	29%
0 5 - <0.75	20%	17%	21%	28%	10%
0.75 - <1	15%	46%	5%	5%	6%
1 - <1.5	10%	26% **	5%	0% **	10%
≥1.5	1%	8% **	0%	0%	1%
Neighborhood Vacancy Rate					
Tight Market (low vacancy)	40%	37%	41%	36% **	48%
Tight-Average	20%	23%	19%	23% **	13%
Average	18%	15%	19%	18%	20%
Average-Soft	11%	16% **	9%	9%	9%
Soft Market (high vacancy)	11%	10%	12%	14%	10%
Property Relative to Neighborhood Vacancy					
Property Lower than Neighborhood	44%	23% **	50%	50%	49%
Property Equal to Neighborhood	34%	23% **	38%	32% **	45%
Property Greater than Neighborhood	22%	54% **	12%	18% **	6%

Data Source:
>   1) Market Valuation Summary on Neighborhood Vacancies
>   2) HUD MIPS database for Property Rents, Tenant-paid Rents and Property Vacancies
>   3) HUD Fair Market Rent Data

** Signifies that the differences in proportions between the distressed and sound or stressed and sound properties are statistically significant at the 95% level.
* Signifies that the differences in proportions between the distressed and sound or stressed and sound properties are statistically significant at the 90% level.
[1] Percentages in the older and newer assisted categories total 100% of the total assisted category's 77%. Older assisted properties comprise 45% of the universe, and newer assisted properties comprise 31%.

- For the unassisted properties, rents received by owners were generally *below, though close to* their potential market rents. Eighty-five percent of owners received rents below their potential. Sixty percent of rents were between 75 percent and 100 percent of potential. This implies that a large portion of owners of unassisted properties were not maximizing their income from the property.

- Seventy-six percent of owners of older assisted properties received rents that were *below* their unrestricted market potential. Below market rents are common in these properties because of the program rent restrictions.

- Seventy-three percent of owners of newer assisted properties received rents *above* their unrestricted market potential. This is generally a result of the high levels of subsidies received. Another twenty-three percent received rents between 75 and 100 percent of unrestricted potential.

The exhibit next compares the rents paid by tenants (Tenant-Paid Rents) with Section 8 Existing Fair Market Rents (FMRs). This provides an indication of what tenants would face if a property were lost as low-income housing either because it was converted to unrestricted use, had the owner opt out of a Section 8 contract, or suffered from extreme physical and financial deterioration. The exhibit shows that:

- Rents paid by tenants in unassisted properties (which are equal to rents received by owners), are generally below the Section 8 FMRs, though 46 percent are between 75 and 100 percent of FMR.

- All residents in older assisted properties paid rents that were under the FMR. Most paid less than half the FMR (10 percent paid under one-quarter of the FMR, and another 56 paid between one quarter and one half of the FMR). This means that renting units in the unassisted market would be much more costly for these families.

- Eighty-nine percent of residents in newer assisted properties paid rents that were below the local FMRs. Most paid less than half the FMR (44 percent paid under one quarter of the FMR, and another 29 percent paid between one quarter to one half of the FMR). As with the older assisted properties, this implies that absent the assisted property, these families would likely face significantly higher housing costs.

The exhibit also describes local market vacancies (based on responses to the Market Valuation survey) and compares them with property economic vacancies (uncollected rents as

reported on financial statements).[38] The summary measures of local market vacancies reflect all responses provided to the market valuation summary. If, for example, all respondents reported that the neighborhood was in a tight market, the table reports a tight market. If, on the other hand, some respondents said the market was tight and others said it was average, the table reports "tight-average." There were few significant differences in neighborhood vacancies across assistance categories. However, there were differences in property vacancies relative to neighborhood vacancies.

- The majority of assisted properties had vacancies that were less than or equal to those of their neighborhoods.

- In contrast, over half of the unassisted properties had vacancies that were higher than the average in their neighborhoods. This indicates that there is room to reduce vacancies in unassisted properties.

2.7   Prepayment and Preservation

The continued role of the HUD-insured stock as a source of housing for low-income households is challenged in several ways. Some owners had the option to prepay mortgages on or after their twentieth anniversary, thereby ending low-income use restrictions; HUD may have to offer many of these owners financial incentives under the Low Income Housing Preservation and Homeownership Act of 1990 (Preservation Act) to keep their properties in low-income use. Other owners of Section 8 properties may opt out of their Section 8 contracts periodically (every 5, 15 or 20 years). The probability of an eligible owner converting from assisted to market use depends on the revenues and costs associated with each option. The owner decision model, discussed at length in the companion volume to this report, provides further insight into the process. This section provides information on the timing of prepayment possibilities, the associated costs of converting to market use, and the final market value of the properties in their "optimal" market position.

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[38]Economic vacancies are imperfect measures of the true annual vacancy rate They reflect the ratio of revenues collected to maximum potential revenues that could have been collected under approved rents at full occupancy. Economic vacancies thus combine lack of collection with lack of tenants. In addition, economic vacancies may use as the base for maximum potential revenues, a higher rent level than may have been in operation for the full year depending upon when rental rates were changed.

This section distinguishes among four categories of properties based on their prepayment eligibility:

- **1990 Preservation Act Assisted Properties.** Owners of these properties were originally eligible to prepay their mortgages after 20 years, but now may be eligible to receive preservation incentives instead.

- **Properties that are locked into low-income use for the full mortgage term.** Properties that have non-profit owners, or Preservation Act properties that have received Flexible Subsidy loans are generally locked in for the full mortgage term, and are thus restricted in terms of use based on program requirements.

- **Section 8 Opt-Out Properties.** These are properties with no prepayment restrictions, but with low-income use restrictions associated with Section 8 contract. Some Section 8 contracts require periodic renewals, enabling owners to terminate Section 8 and use restrictions instead of renewing the contracts.

- **Properties with no prepayment or use restriction.** For-profit owners with no HUD-imposed restrictions on the distribution of dividends generally have no restrictions on prepaying HUD mortgages after the first five years. They can voluntarily terminate their mortgages without HUD agreement as long as they receive consent from the mortgagee.

1990 Preservation Act Assisted Properties

The Preservation Act (Title VI of the National Affordable Housing Act of 1990) provides incentives to owners of properties that, according to the original regulatory agreement, would have been allowed to prepay the HUD-insured mortgage, typically at the end of 20 years, and convert the property to a non-assisted use. HUD may provide these incentives to maintain these properties in low-income use. Two types of incentives are provided—to Extend assisted operation under the current owner, or to Transfer title to another owner who is committed to maintaining assisted operation, in both cases for the "remaining useful life" of the property.

Properties with limited dividend owners that have mortgages insured under Section 221(d)(3) BMIR, Section 236, or Section 221(d)(3)MR with property-based Section 8 or Rent Supplement, fall under the rules of the 1990 Preservation Act. The Preservation Act, together with the body of other law regulating HUD insurance and assistance, restricts prepayment or requires use as low-income housing, as follows:

- **For full mortgage term (typically 40 years)**—Properties with TPAs from nonprofit owners since September 25, 1980, Flexible Subsidy since December 1979, or with Rent Supplement Contracts (which restrict use for its term).

- **For 20 years, after which Preservation Act options apply**—All other limited dividend properties insured and assisted as listed above. Under the Preservation Act, owners of these properties may under stipulated circumstances prepay anytime after the twentieth mortgage anniversary, request HUD incentives to keep the property in low-income use for its remaining useful life, or sell to another owner (also with HUD assistance) who will keep the property in low income use for its remaining useful life.

Properties with no prepayment restrictions fall into two categories—those with no use restrictions at all, and properties with Section 8 contracts, that require renting to low-income households for the term of the Section 8 contract.

As Exhibit 2.28 shows, overall 23 percent of owners have no restrictions on the use of the property; 32 percent can prepay their mortgages but still have use restrictions associated with Section 8 contracts; another 26 percent are eligible for preservation incentives after 20 years; and 19 percent are locked in for the full mortgage term. The distribution of prepayment eligibility varies by assistance category.

- Fifty-six percent of owners of older assisted properties are restricted from prepaying their mortgages for 20 years, after which the Preservation Act options, which include prepayment, apply. Thirty-nine percent of older assisted properties are locked in by the mortgage and/or subsidy programs to low-income occupancy for the full mortgage term.

- Nearly all unassisted and newer assisted properties can prepay their mortgages at any time. However, the newer assisted properties are still restricted by their Section 8 contracts for a period of up to 20 years.

Exhibit 2.29 shows the timing of prepayment eligibility for the insured stock, and the potential number of units affected each year. The distribution is drawn graphically in Exhibit 2.30. The prepayment year is defined as the twentieth anniversary of the mortgage for preservation properties, as the full mortgage term for properties locked in, and as the next renewal year for Section 8 properties for which no other restrictions apply.

- 2,999 properties (23 percent of the stock) have no prepayment or use restrictions.

- An additional 4,218 properties (32 percent of the stock) are eligible to prepay their mortgages at any time, but have Section 8 assistance contracts. To be free from use restrictions these properties would have to opt out of their Section 8 contracts at the next renewal. For over half the properties this will occur between the years 2000 and 2004.

Exhibit 2.28

PREPAYMENT/PRESERVATION STATUS BY ASSISTANCE CATEGORY

	Total	Total		Assisted	
	Total	Unassisted	Assisted	Older	Newer
Total Properties Percent of Properties	13,271 100%	3,080 23%	10,191 77%	6,037 59%[1]	4,154 41%[1]
Can Prepay Any Time, No Restrictions	23%	97%	0%	0%	0%
Section 8 Opt-Out Properties	32%	0%	42%	5%	94%
Eligible for Preservation Incentives	26%	0%	34%	56%	3%
Locked In for Full Mortgage Term	19%	3%	24%	39%	3%

Data Source: HUD databases.

[1] Percentages in the older and newer assisted categories total 100% of the total assisted category's 77%. Older assisted properties comprise 45% of the universe, and newer assisted properties comprise 31%.

Exhibit 2.29

PRESERVATION STATUS BY PREPAYMENT ELIGIBILITY YEAR

Preservation Status	1989 or earlier	1990- 1994	1995- 1999	2000- 2004	2005- 2009	2010- 2014	2015 or later	Total	Percent of Universe
Can Prepay Any Time, No Restrictions									
Total Properties	2,945	54	0	0	0	0	0	2,999	23%
Total Units	414,580	15,292	0	0	0	0	0	429,872	29%
2BR Equivalent Units	398,293	12,845	0	0	0	0	0	411,138	29%
Section 8 Opt-Out Possibility									
Total Properties	27	1,093	593	2,304	142	28	28	4,218	32%
Total Units	6,193	120,520	46,272	200,173	15,960	1,707	2,191	393,016	26%
2BR Equivalent Units	6,492	105,998	44,676	189,047	12,797	1,878	1,980	362,860	26%
Eligible for Preservation Incentives or Mortgage Prepayment at 20th Anniversary									
Total Properties	187	2,305	854	158	0	0	0	3,504	26%
Total Units	20,331	237,940	89,298	19,870	0	0	0	367,438	25%
2BR Equivalent Units	20,375	236,220	88,387	22,468	0	0	0	367,450	26%
Locked In for Full Mortgage Term (Usually 40 Years)									
Total Properties	0	13	0	94	374	1,659	409	2,549	19%
Total Units	0	108	0	15,873	44,130	182,125	55,248	297,483	20%
2BR Equivalent Units	0	126	0	14,422	45,351	166,456	52,779	279,134	20%
Insured Stock Total									
Total Properties	3,159	3,465	1,447	2,556	516	1,687	437	13,271	100%
Total Units	441,104	373,860	35,570	235,919	60,090	183,832	57,439	1,487,812	100%
2BR Equivalent Units	425,160	355,189	133,063	225,937	58,148	168,334	54,759	1,420,591	100%

Data Source: HUD data.

Exhibit 2.30

Preservation Status by Prepayment Eligibility Year
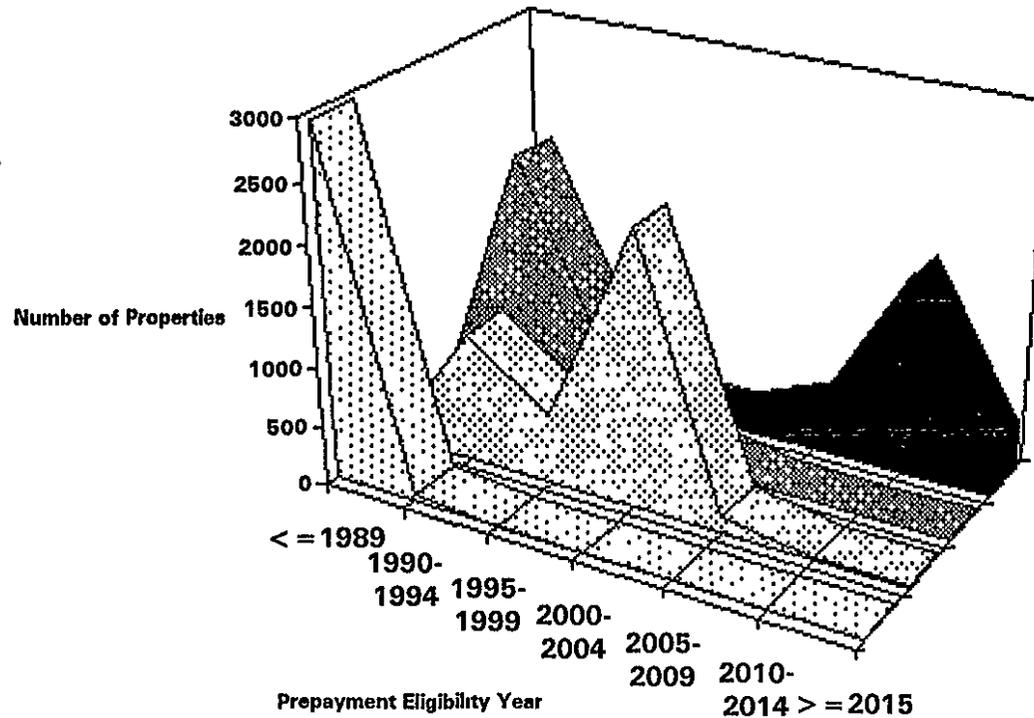
Prepayment/Preservation Status

| ☐ No Restrictions | ☐ S8 Opt out Possibility | ▨ Preservation Incentives at 20th Anniversary | ■ Locked in for Full Mortgage Term |

Source: MIDLIS, Section 8 MIS, HUD Field Offices

• 3,504 properties (26 percent of the stock) fall under the category of eligible for preservation incentives or mortgage prepayment. The timing of eligibility for the majority of these properties (2305) is between 1990 and 1994, with another 854 reaching their eligibility between 1995 and 1999.

• 2,549 properties (19 percent of the stock) are locked in for the full term of the mortgage, usually 40 years. As the exhibit shows, these mortgages will largely be paid off between the years 2010 and 2014.

Properties located in markets lucrative for conversion from assisted to market occupancy typically require expenditures for physical upgrading as part of the conversion. As part of this study's physical inspections, systems were identified that would have to be upgraded for such a conversion—higher level of repair, or replacement, or addition—over and above what would be required to bring the property into good repair. Exhibit 2.31 shows the per unit expenditures that would be required for physical upgrades to market occupancy (including remedying the physical needs backlog), were these properties to attempt such conversions immediately.[39] Mean upgrade costs are $8,771 per 2BR unit across the entire stock, regardless of prepayment eligibility. These costs are similar across all categories of properties, except in the properties with no use restrictions, which have higher average upgrade costs of $10,066 per 2BR. As the exhibit shows, some properties would face very high costs of upgrading (14 percent of properties had costs over $20,000 per unit).

The upgrade costs tie in to the ultimate market value of the property. Exhibit 2.32 shows properties' highest and best use value (per unit), which represents the value of each property in the highest return use the market would support (regardless of actual eligibility to convert to such use). The value was computed by taking the capitalized value of the rents achievable less operating costs after conversion to the highest and best use and subtracting the upgrade (and repair) costs required to reach that level.[40] The exhibit shows that along with higher upgrade costs, the unrestricted properties have the highest average market values. The

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[39]We recognize that many of these properties would not be permitted to convert for some time

[40]The portion of this study addressing the future status of the stock (reported in the companion to volume), takes this into account in estimating whether an owner, at each year after the twentieth mortgage anniversary, would be better off carrying out an upgrade to market occupancy No account is taken in the exhibit of conversion costs incurred in a change of tenancy, such as eviction costs, turnover redecoration, turnover vacancy loss, and re-rent advertising costs The model on future status, presented in the companion report, does estimate these costs.

Exhibit 2.31

MARKET UPGRADE COSTS PER 2BR UNIT, BY ELIGIBILITY TO PREPAY
(Including Fixing Physical Backlog)

Cost per 2BR	Can Prepay Any Time, No Restriction	Section 8 Opt-Out	Eligible for Preservation Incentives	Locked In for Full Term	Total
Total Properties	2,999	4,218	3,504	2,549	13,271
Percent of Properties	23%	32%	26%	19%	100%
$0	6%	8%	2%	4%	5%
<$1,000	18%	15%	15%	20%	17%
$1,000 - <$5,000	21%	28%	38%	26%	29%
$5,000 - <$10,000	20%	13%	14%	16%	15%
$10,000 - <$15,000	13%	17%	12%	12%	14%
$15,000 - <$20,000	4%	8%	4%	7%	6%
$20,000 - <$25,000	5%	6%	6%	7%	6%
$25,000 - <$30,000	3%	3%	6%	4%	4%
≥$30,000	10%	3%	3%	3%	4%
Statistics on Market Upgrade Costs					
Mean	$10,066	$8,320	$8,433	$8,458	$8,771
Standard Error	$1,093	$742	$687	$809	$409
Median	$6,801	$3,617	$4,024	$4,895	$4,895

Data Source: Inspections, costing program

Exhibit 2.32

PER 2BR UNIT VALUES AND MARKET POSITION
AT UNRESTRICTED OPTIMAL USE

Net Value per 2BR	Can Prepay Any Time, No Restriction	Section 8 Opt-Out	Eligible for Preservation Incentives	Locked In for Full Term	Total
Total Properties	2,999	4,218	3,504	2,549	13,271
Percent of Properties	23%	32%	26%	19%	100%
<$10,000	0%	2%	7%	5%	4%
$10,000 - <$20,000	10%	24%	36%	22%	23%
$10,000 - <$30,000	29%	36%	30%	39%	33%
$30,000 - <40,000	33%	18%	11%	15%	19%
≥$40,000	28%	19%	16%	19%	21%
Statistics on Market Value at Optimal Unrestricted Use					
Mean	$36,909	$30,236	$25,766	$29,826	$30,484
Standard Error	$1,689	$1,262	$1,062	$1,424	$684
Median	$33,099	$26,977	$22,289	$26,685	$27,101
Optimal Market Position					
Low-End Market	7%	25%	44%	31%	27%
Moderate Rent	84%	75%	56%	68%	71%
Luxury	9%	0%	0%	2%	2%

Data Source: Market Valuation Summaries, inspections, costing programs.

majority of properties, regardless of current use restrictions, would be positioned as moderate market rentals in an unrestricted market.

2.8 Multivariate Analysis of Factors Contributing to Backlog and to Unfunded Backlog

Section 2.3 above described the physical condition of the HUD-insured stock based on a sample of 570 inspected properties. In addition to the physical condition, a wide array of secondary data sources were used to characterize properties. Most property characteristics are presented as two-way tables, without presenting a method for predicting condition in the stock as a whole. The process of conducting on-site physical inspections is very costly, whereas many of the secondary sources used are readily available from HUD. Data on property age, property size, occupancy, cash flow, mortgage amount and mortgage start year are available from existing HUD data bases. In order to determine whether physical condition can be predicted based on these readily available data, we performed a multiple regression analysis relating physical condition to property and neighborhood characteristics. If we were to find that these variables explained a large portion of the variance in physical needs, HUD could use available characteristics to predict physical condition. To that end we constructed a multivariate regression analysis, attempting to identify all factors that are likely to contribute to physical needs backlog. The expected effect of each factor is presented in Exhibit 2.33.[41]

Exhibit 2.34 shows the results of regression equations which relate backlog of physical needs to available property characteristics that may be correlated with backlog. Because each assistance category is very different, the regressions were performed separately for each category.

Available data do not appear to predict physical needs.[42] All the variables together explain less than one fourth of the variance in physical needs backlog (adjusted R^2 ranges from 0.1392 for newer assisted properties to 0.2177 for unassisted properties).

Some of the variable coefficients have the expected sign and are statistically significant. For example, as expected, among unassisted and older assisted properties, high-rise buildings

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[41]While net cash flow is readily available from existing sources, in Appendix Exhibit D 11 we present a regression relating net cash flow to other property characteristics.

[42]An additional piece of data that should be available for these properties is the Form 9822 on physical condition and repair needs. This study did not explore whether these data could improve the ability of available data to explain the backlog (or unfunded backlog) of physical needs

Exhibit 2.33

FACTORS CONTRIBUTING TO PHYSICAL NEEDS BACKLOG

Dependent Variable: Backlog per 2BR Unit

Independent Variables	Unit	Expected Sign	
Total Units	Units	-	Efficiencies to scale
Property Age	Years	+	Older properties accrue higher need
Average Unit Size	Bedrooms	+	Larger average sized units indicate family occupancy
High-Rise	0=No 100=Yes	+	High-rise buildings have high cost components
Central City	0=No 100=Yes	+	Higher cost in central cities
Percent Vacancy Loss	0-100	+	Vacancies correlate with other problems
Percent Assisted	0-100	+	More assisted units worse condition
Remedial LMSA	0=No 100=Yes	?	Receiving LMSA means additional resources, however LMSA only provided to troubled properties
TPA	0=No 100=Yes	+	Owner required to make capital infusion at TPA
% Very Low Income	0-100	+	Lower income, worse condition
% Income > Median	0-100	-	Higher income, better condition
Percent Minority	0-100	?	
High Neighborhood Vacancy	0=No 100=Yes	+	Not worth investing in high vacancy neighborhoods
Good Neighborhood	0=No 100=Yes	-	Properties in good neighborhoods taken better care of
Bad Neighborhood	0=No 100=Yes	+	Properties in bad neighborhoods taken worse care of
Non-Profit Sponsor	0=No 100=Yes	+	Often assumed that non-profit owners less efficient
Flexible Subsidy	0=No 100=Yes	?	Receiving Flex means additional resources; however, Flex only provided to troubled properties
Per Unit Mortgage	in $1,000	+	
Existing	0=No 100=Yes	+	Systems likely to be older or more worn at time of insurance than in new construction or substantial rehab
Net Cash Flow	In $	?	Properties with high cash flow may be in better condition. However, troubled properties may trade off cash flow with maintenance.

Exhibit 2.34

MULTIVARIATE REGRESSION FACTORS CONTRIBUTING
TO PHYSICAL NEEDS BACKLOG

Dependent Variable. Backlog per 2BR Unit

Variables	Unassisted	Older Assist	Newer Assisted
Intercept	-850.3153 (1125 462)	6258.9267 ** (1697.559)	-843 2723 (1946.420)
Total Units	-0.1653 (1 522)	-5.2394 ** (2.025)	-1.6661 (2.282)
Property Age	-2.2550 (30 739)	-171.7206 ** (49 006)	116.6303 (104 957)
Average Unit Size (#BRs)	676.2033 (426.601)	91.4153 (289.865)	-111.6005 (243.054)
High-rise	9.3411 ** (4.482)	8.8425 * (5.117)	-6.9086 * (3.836)
Central City	4.0659 (3 281)	6.8629 ** (3.046)	-1.1908 (2.714)
Percent Vacancy Loss	-12 3131 (22 627)	41.6675 (33 757)	158.4995 * (84 176)
Percent Assisted		-0.0034 (3.994)	9 0065 (9.765)
Remedial LMSA		-1.4762 (3.128)	
TPA	3.0437 (3.534)	1.0615 (3.402)	(3.402)
Percent Very Low Income	9.1587 (8.528)	-1.7739 (8.181)	-5.5439 (9.765)
Percent Income Above Median	0 5388 (10.939)	-20 6919 (24.546)	
Percent Minority	16 2887 ** (6 516)	10 4574 ** 4.6160	6.4902 (4.082)
High Neighborhood Vacancy	-4.1228 (3.683)	1.0520 (3.382)	3 2158 (3.117)
Good Neighborhood	0.6482 (3.535)	-10.0901 ** (3.516)	-3.8394 (2.868)
Bad Neighborhood	20.2316 ** (6.230)	1.3190 (3.407)	5.1995 (3.303)

Exhibit 2.34 (continued)

MULTIVARIATE REGRESSION FACTORS CONTRIBUTING
TO PHYSICAL NEEDS BACKLOG

Variables	Unassisted	Older Assist	Newer Assisted
Non-Profit Sponsor		0.5537 (3.311)	
Flexible Subsidy		12 7820 ** (4 178)	
Per Unit Mortgage	-15 1958 (10.811)	-98.1101 ** (33.536)	18.7605 (16.240)
Existing		9.6294 * (5 009)	
Per Unit Net Cash	-0 0588 (0 059)	-0 0809 (0.111)	-0.4401 ** (0.208)
Observations	115	309	146
R-Squared	0.3206	0.2515	0.2224
Adjusted R-Squared	0 2177	0 1995	0.1392

*   Signifies statistical significance at the 0.10 level.

**   Signifies statistical significance at the 0 05 level.

have higher backlogs per unit. However, backlogs were negatively related to high-rises in newer assisted properties. Another variable having an effect the opposite of what was expected is property age. We expected older properties in each assistance category to have higher needs. In the case of older assisted properties, older properties appear to have lower backlogs of need.

One should note that the model presented here does not attempt to determine causality, but rather correlation. For example, high concentrations of minorities tend to be associated with higher backlogs. The regression *does not* address the issue of whether minorities, for example, cause high repair needs, have access only to properties that have high needs, or tend include more families with children rather than elderly couples or individuals.

As was the case with predicting overall backlog, the available data do not do well at predicting the unfunded portion of the backlog of physical needs. Exhibit 2.35 shows the results of a regression model that predicts unfunded backlog using property and neighborhood characteristics. (Expected effects of each factor are the same as for the overall level of backlog presented in Exhibit 2.33 above). The available data explain under 20 percent of the variance in the unfunded backlog in each of the three assistance categories (adjusted R^2 ranges from 0.1054 for newer assisted properties to 0.1893 for older assisted properties).

Some of the individual components of the regression appear to explain part of the variance. Unassisted properties in neighborhoods rated as "bad" by inspectors had higher unfunded backlogs. Older assisted properties in "good" neighborhoods had lower unfunded backlogs. However, as was the case with the total backlog, property age appears to be negatively correlated with unfunded backlog in older assisted properties.

Exhibit 2.35

MULTIVARIATE REGRESSION FACTORS CONTRIBUTING
TO UNFUNDED PHYSICAL NEEDS BACKLOG

Dependent Variable: Unfunded Backlog per 2BR Unit

Independent Variables	Unassisted	Older Assisted	Newer Assisted
Intercept	-910.0027 (1086.860)	5668.0608 ** (1684.858)	-96.4352 ** (1795.665)
Total Units	0 0434 (1.470)	-5.3311 ** (2.010)	-0.8373 (2.105)
Property Age	-9.6145 (29.685)	-181 7608 ** (48.640)	53.1539 (96.828)
Average Unit Size (#BRs)	712.6082 * (411.969)	138.9324 (287.696)	-136.7517 (224.229)
High-rise	9.2934 ** (4.329)	7.9136 (5.078)	-4.1946 (3.539)
Central City	4.0786 (3.169)	5.5604 * (3.023)	-1 2003 (2.503)
Percent Vacancy Loss	-10.5681 (21.851)	63.5308 * (33.504)	156.4316 ** (77 656)
Percent Assisted		0.5619 (3.964)	7 5334 (9 009)
Remedial LMSA		-0 8126 (3.105)	
TPA	3.4523 (3.413)	1.5951 (3.376)	
Percent Very Low Income	9.2741 (8.235)	1.7403 (8.119)	-4.5303 (9.040)
Percent Income Above Median	0.4237 (10.564)	-12.1226 (24.362)	
Percent Minority	14.6715 ** (6.292)	10 8687 ** (4.582)	6.3810 * (3.767)
High Neighborhood Vacancy	-4.6797 (3.557)	-0.3000 (3.356)	2.8713 (2 875)
Good Neighborhood	0.4160 (3.414)	-8.6411 ** (3.490)	-2 3178 (2 646)
Bad Neighborhood	16.8861 ** (6.016)	0.1365 (3 382)	4 5846 (3 048)

Exhibit 2.35 (continued)

MULTIVARIATE REGRESSION FACTORS CONTRIBUTING TO UNFUNDED PHYSICAL NEEDS BACKLOG

Independent Variables	Unassisted	Older Assisted	Newer Assisted
Non-Profit Sponsor		0.9356 (3.287)	
Flexible Subsidy		11 2959 ** (4.147)	
Per Unit Mortgage	-14.5010 (10.440)	-96 7280 ** (33 285)	3.4424 (14.982)
Existing	-	8.8384 * (4.972)	
Per Unit Net Cash	-0 0571 (0 057)	-0.0827 (0.110)	-0 3612 * (0 192)
Observations	115	309	146
R-Squared	0.2953	0.2420	0 1917
Adjusted R-Squared	0.1885	0 1893	0.1054

*   Signifies statistical significance at the 0.10 level.

**   Signifies statistical significance at the 0 05 level

CHAPTER THREE

DISTRESSED MULTIFAMILY RENTAL HOUSING WITH HUD-INSURED (OR HELD) MORTGAGES

This chapter focuses on distressed multifamily housing. Drawing on the data presented in Chapter Two on properties' physical and financial condition, a combined *Distress Index* is devised. This index provides a basis for comparing properties, assessing the extent of distress, and classifying properties as sound, stressed, and distressed. The remainder of this chapter examines the characteristics of distressed properties, with special focus on a group of predominantly older assisted properties—the Capital Needs Study properties—about which Congress has expressed particular concern.[1]

3.1   Distress Index—Measuring Distress

A property is distressed when it fails to provide sound housing and lacks resources to correct deficiencies, or if it is likely to fail financially. These two aspects of distress are intertwined. To measure distress, a Distress Index has been developed that reflects a property's cash flow, other financial resources, and backlog of physical repair needs. The Distress Index measures a property's financial capacity to meet current expenses, set aside reserves for future physical needs, and undertake a repair program to address its backlog of physical needs. The index is used in this chapter to identify distressed properties from among all HUD-insured (or held) properties, and to measure the degree of distress.

The Distress Index is computed by taking:

a)   Net Cash Flow

b)   *Minus* the amortized cost of remedying the Unfunded Backlog of Physical Needs

c)   *Plus* added rent from improving vacancy losses

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[1]The HUD Reform Act of 1989, Section 204(c)(1), directed HUD to study the capital needs of properties having mortgages insured under Sections 236 or 221(d)(5) [commonly known as 221(d)(3) BMIR, or Below Market Interest Rate]; or insured under Section 221(d)(3) and receiving rental assistance under Section 101 [Rent Supplement] or Section 8 These predominantly older assisted properties will be referred to as "Capital Needs Study properties."

The computation begins with net cash flow, which measures a property's capacity to meet current expenses and make deposits to its replacement reserves account. Net cash flow is then reduced by the amortized cost of remedying the unfunded backlog of physical needs, which represents the annual cost of undertaking a repair program. This simulates an owner's likely attempt to spread the remedial costs over time by spreading the work over time or spreading payments by borrowing. The final step in computing the Distress Index is to add back a portion of a property's excess vacancy loss to represent higher revenues resulting from improved operations and physical condition. These elements of the Distress Index are discussed below.

Net Cash Flow

Net Cash Flow (Weighted 3-Year Average) =

> *Total Revenue* (Weighted 3-Year Average)

> | *Minus* | *Operating and Maintenance Expenses* (Weighted 3-year Average, including expenses for administration, operations and maintenance, utilities, taxes and insurance) |
> |---|---|
> | *Minus* | *Mortgage Debt Service* (Interest, Principal and Mortgage Insurance Premium as required by mortgage) |
> | *Minus* | *Replacement Reserve Deposit* (using the greater of the property's actual deposit or an amount equal to 0.5% of the original mortgage) |

Net cash flow is computed as explained in Chapter Two, taking a weighted average over the most recent three years (expressed in 1989 dollars per 2BR unit) of both revenues and expenses. Averaging over three years focuses on problems that are significant or chronic, while applying a higher weight to more recent years incorporates trends into the index. Mortgage debt service (including insurance premium) was computed based on the original mortgage principal, interest rate, and mortgage term. The replacement reserve deposit was set at the greater of the amount paid in 1989 or an amount equal to 0.5 percent of the original mortgage principal (which approximates the contractually required deposit of 0.6 percent of replacement cost of structure

for new construction properties and 0.4 percent of the mortgage amount for rehabilitated properties).[2]

Amortized Cost of Remedying the Unfunded Backlog of Physical Needs

Amortized cost of remedying the unfunded backlog of physical needs =

> **Annual debt service on a loan amount equal to the unfunded backlog cost**
> (20 year term at 9% interest)

where   **Unfunded Backlog Cost = Total Backlog Cost - Available Resources**
(or 0 if resources exceed the total backlog)

and where   **Available Resources =**

         Replacement Reserve Balance *in excess of* 2 years' annual deposits

Plus   **Residual Receipts Account Balance**

Plus   **Other Reserve Account Balances** (such as painting reserves)

At this step a property's backlog of physical needs for replacements and non-routine repairs is taken into account. As explained in Chapter Two, a property's *unfunded backlog* of physical needs is its *total backlog* less *available resources* from the replacement reserve fund, special reserve account, and residual receipts account. Where resources exceed the total backlog cost, there is no unfunded backlog.

In computing the Distress Index, net cash flow is reduced by the amortized cost of the unfunded backlog, which is the annual cost of a loan (20 years at 9 percent interest) for the amount of the unfunded backlog. (The annual debt service on such a loan would equal 10.8 percent of the unfunded backlog of physical needs.) This computation does not mean that an

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[2]We used the replacement reserve deposit in computing the distress index, rather than the amount that would be needed to cover average annual accrual of future physical needs. Deposits to the reserve account reflect a property's *current* cash flow and are thus used in the distress index

Not depositing needed amounts to the reserve account, while not immediately a threat to the property, should serve as a caution to HUD and the property manager that future problems are likely. This measure was not used in the overall distress index because remedies may be found, including allowable rent increases, reduction in operating costs, or HUD assistance. However, this study has shown that replacement reserve deposits are typically less than the projected average annual accrual of future physical needs. The effect on net cash flow of using needed amounts to cover average annual accrual of future physical needs is presented on page 2-41 above.

owner would necessarily by willing or able to take out a loan at these terms to cover the needed repairs. Rather, it represents the real world situation where an owner, faced with years of accumulated backlog, spreads a repair program and payments over the future. An owner may effectively spread payments by a combination of:

- Staging repairs over time, beginning with highest priority items,

- "Borrowing" informally from creditors by deferring full payment of the property's obligations, including those to any identity-of-interest management agents or vendors (e.g., related accounting, legal, or plumbing firms),

- Deferring a portion of mortgage debt service (in the case of HUD-held mortgages under workout agreements),

- Providing advances to the property from the owner's own funds (or from loans secured by the owner and not the property), and, finally,

- Taking out a loan secured by the property.

In computing the Distress Index, the modified net cash flow figure is further adjusted by adding back a portion of the property's excess vacancy loss. This represents the income that would result if improved management and physical condition brought a property's excessive vacancy loss closer to the norm for the property's assistance category.

Added Rent from Improving Vacancy Losses

Added rent from improving vacancy loss =

(1) *For properties with vacancies in excess of the 75th percentile* of vacancy losses for properties in same assistance category

> *Current vacancy loss - 75th Percentile Vacancy Loss* (for properties in same assistance category)

(2) *For properties with vacancies between the median and 75th percentile* of vacancy losses for properties in same assistance category

> *Current vacancy loss - Median Vacancy Loss* (for properties in same assistance category)

(3) *For all other properties—No adjustment*

This computation is based on the assumption that properties whose vacancy losses rank in the highest 25 percent (among properties in their assistance category) will be able to reduce their vacancy losses down to the 75th percentile; that properties with vacancies between the median and the 75th percentile will be able to reduce vacancy losses to the median level for their assistance category; and that for all other properties, vacancy losses will remain as they are.[3]

The net result of these three factors yields the Distress Index, which can be thought of as a modified version of net cash flow. A non-negative value of the Distress Index will mean that a property has the financial capacity to meet all current expenses, make required deposits to the reserve for replacement account, and undertake a repair program to eliminate its entire unfunded backlog of physical needs. A negative value of the Distress Index—a deficit—will mean that a property cannot fully meet all of financial and physical repair obligations and, in the absence of improved finances, may be in danger of becoming distressed. With a relatively small deficit an owner can probably continue operating in the short run by juggling which obligations will be short-changed—for example, by continuing to defer backlog items, especially those that do not substantially reduce occupancy or rent levels. However, a large deficit on the Distress Index means that a property's obligations greatly exceed its resources, and probably exceed the respite to be gained from just cutting corners. Such a property is clearly distressed

To facilitate presenting the results of applying the Distress Index, the following thresholds and terms will be used to describe properties' distress status: Distressed Properties (Index Below Minus $250), Stressed Properties (Index between $0 and Minus $250), and Sound Properties (Index $0 or Positive). These terms are discussed below.

Distressed Properties—Distress Index *Deficit* Exceeding $250 per Unit per Year (i.e., Distress Index Below Minus $250)
Properties having a Distress Index deficit exceeding $250 per 2BR unit are considered *distressed*. In monthly terms, this deficit, exceeding $21 per unit, is large relative to

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[3]For the unassisted properties the top quartile of vacancy loss is 10 5 percent, and the median is 6.4 percent Thus, the quarter of unassisted properties with the highest vacancy losses will reduce their vacancy losses to 10 5 percent (and will add rents equal to the difference between actual vacancy loss and 10.5 percent). Similarly, vacancy losses for the quarter of unassisted properties with vacancy losses between the median and 10.5 percent are reduced to the median (6.5 percent) Older assisted properties are treated in two separate subcategories For older assisted properties with small units (property average of < 2 25 bedrooms per actual unit), the thresholds are 3.5 percent (top quartile) and 1.9 percent (median). For the older assisted properties with larger units (property average of ≥ 2 25 bedrooms per actual unit) the thresholds are 4 percent (top quartile) and 2 percent (median), and for the newer assisted the thresholds are 1 7 percent (top quartile) and .9 percent (median).

typical tenants' monthly rent payment,[4] and exists even after applying all of the property's resources and improving vacancy losses. Properties with deficits exceeding $250 lack an amount in excess of 9 percent of median total operating expenses. This level of shortfall in financial resources seems likely to exceed a property's ability to economize by postponing non-essential activities, even in the short run. At deficits exceeding this threshold, properties would be at risk because one or more of the following would suffer:

- Remedying critical systems of outstanding backlog of physical needs

- Funding essential operations, including minimum annual maintenance

- Paying full mortgage debt service.

A Distress Index deficit of over $250 could occur through any combination of physical and financial problems. For example, a property would be distressed, even with *no* cash flow problem, if had unfunded physical needs backlog exceeding approximately $2,300 per 2BR unit ($250 ÷ the 10.8 percent debt service factor). This amount is nearly three years' average annual accrual of physical needs. A Distress Index deficit of over $250 could also occur in a property with *no* unfunded physical needs backlog, but with cash flow negative by as much as 9 percent of operating expenses.

Distressed properties will need operating changes, remedial assistance, or (in the case of unassisted properties in soft markets) improved market outlooks if they are to survive as HUD-insured properties.

Stressed Properties—Distress Index *Deficit* up to $250 per Unit per Year (i.e., Distress Index between $0 and Minus $250)

Properties with an overall Distress Index between $0 and minus $250 will be considered *stressed*. In the absence of improved income or operations, these properties will likely develop serious problems in the future. However, their monthly shortfall of less than $21 per unit may be within reach of achievable improvements, and might be juggled for some time by cutting corners. Intensive loan servicing by HUD could help these properties so that problems will be remedied rather than accumulated further. The negative value of the overall index indicates that they must be falling short on either upkeep or mortgage payment or some combination of the two.

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[4]Exhibit 2.10 showed that monthly tenant rent payments averaged $294 per month overall, and $229 per month in assisted properties A rent increase of $21 per month is over 9 percent of current rent for residents in assisted properties and is likely to be financially difficult.

Sound Properties—Distress Index Breakeven or Positive (No Deficit)

Properties with a Distress Index of breakeven or better have sufficient resources to meet all of the property's current physical and financial obligations. Some of these properties may, nevertheless, have large physical needs backlogs; however, they can, on their own, use their resources to remedy these problems, or they can be made to do so through HUD's regulatory sanctions.

3.2   Distress in the Multifamily Stock with HUD-Insured (or Held) Mortgages

Exhibit 3.1 shows the result of applying the Distress Index to the full stock of multifamily rental housing with HUD-insured or held mortgages. The mean index value was positive overall and for each assistance category, but only marginally positive for older assisted ($28), highly positive for newer assisted ($625), and intermediate for unassisted ($293). This is consistent with the findings in the previous chapter on the physical and financial components of the Distress Index.

Overall, 24 percent of properties were distressed—they had Distress Index deficits of more than $250 per 2BR unit per year. The percent distressed varied sharply by assistance category. Only 9 percent of newer assisted properties were distressed, compared with 31 percent of older assisted and 30 percent of unassisted.

Within the older assisted category, additional analysis (Exhibit 3.2) reveals that problems were most acute among properties serving larger households. Among older assisted properties with larger average unit sizes (at least 2.25 bedrooms per unit on average), 44 percent were distressed. This subgroup includes properties housing larger families. By contrast, of the remaining older assisted properties—those having smaller average unit sizes (less than 2.25 bedrooms per unit on average), many of them serving elderly households—only 27 percent were distressed. These older assisted non-family properties were about on par with unassisted properties (which, on the whole, also provided smaller units rather than units for larger families) in terms of proportion in distress.

The *degree* of distress was most severe among unassisted properties, followed by older assisted properties. Twelve percent of unassisted properties had Distress Index deficits exceeding $1,000 per unit, and another 10 percent had deficits between $500 and $1,000. Among older assisted properties, 6 percent had Distress Index deficits exceeding $1,000, and

Exhibit 3.1

DISTRESS INDEX BY ASSISTANCE CATEGORY
Multifamily Rental Housing with HUD-Insured (or Held) Mortgages

	Total	Total		Assisted	
	Total	Unassisted	Assisted	Older Assisted	Newer Assisted
Total Properties	13,271	3,080	10,191	6,037	4,154
Percent of Properties	100%	23%	77%	59% [1]	41% [1]
Distressed	**24%**	**30%**	**23%**	**31% ****	**9%**
< -$1,000	6%	12%	4%	6%	1%
-$1,000 to <-$500	9%	10%	9%	12%	3%
-$500 to <-$250	9%	8%	10%	13%	5%
Stressed	**14%**	**10%**	**15%**	**21% ****	**6%**
-$250 to $0	14%	10%	15%	21%	6%
Sound	**62%**	**60%**	**63%**	**49% ****	**85%**
$0 to <$250	20%	15%	21%	26%	14%
$250 to <$500	13%	9%	15%	13%	18%
$500 to <$1,000	13%	8%	14%	5%	28%
≥ $1,000	16%	29%	13%	5%	25%
Statistics on Distress Index					
Mean	$276	$293	$271	$ 28 **	$625
Standard Error	$82	$326	$ 55	$ 75	$ 62
Median	$145	$184	$142	$(20)	$530

Distress Index =   Net Cash Flow + Added Rent from Reduced Vacancies - Loan Repayment on Unfunded Physical Backlog

Data Source: Computed.

Note   Column sums may not add to 100% due to rounding

**   Signifies that the differences in proportions between the older assisted and newer assisted properties are statistically significant at the 95% level   The differences between assisted and unassisted properties are not statistically significant

[1]   Percentages in the older and newer assisted categories total 100% of the total assisted category's 77%   Older assisted properties comprise 45% of the universe, and newer assisted properties comprise 31%

Exhibit 3.2

DISTRESS INDEX FOR OLDER ASSISTED PROPERTIES

Distress Index per 2BR Unit	Total Older Assisted	Older Assisted Average BR Size <2.25	Older Assisted Average BR Size ≥2.25
Total Properties Percent of Properties	6,037 100%	4,660 77%	1,377 23%
Distressed	31%	27%	44%
< -$1,000	6%	6%	3%
-$1,000 to <-$500	12%	11%	16%
-$500 to <-$250	13%	10%	25%
Stressed	21%	20%	22%
-$250 to $0	21%	20%	22%
Sound	49%	54%	35%
$0 to <$250	26%	28%	21%
$250 to <$500	13%	15%	6%
$500 to <$1,000	5%	5%	7%
≥ $1,000	5%	6%	1%
Statistics on Distress Index			
Mean	$ 28	$ 80	($148)
Standard Error	$ 75	$105	$ 66
Median	$(20)	$ 14	($168)

Distress Index = Net Cash Flow + Added Rent from Reduced Vacancies − Loan Repayment on Unfunded Physical Backlog

Data Source: Computed.

Note: Column sums may not add to 100% due to rounding.

12 percent between $500 and $1,000. Newer assisted properties had only 1 percent with deficits over $1,000 and 3 percent with deficits from $500 to $1,000.

On the other extreme of the Distress Index, 85 percent of newer assisted properties were sound, compared with 60 percent of unassisted properties and only 49 percent of older assisted properties. In other words, only half (49 percent) of older assisted properties and only 62 percent of insured properties overall had sufficient internal resources, under current operations, to cover all of their current financial and physical obligations. The remaining properties (38 percent of the stock or 5,043 properties) will require careful loan servicing, operating improvements, rent increases, or remedial assistance in order to remain viable in their current low-income use.

3.3   Characteristics of Distressed Properties—Multifamily Rental Housing with HUD-Insured (or Held) Mortgages

This section presents the characteristics of the distressed, stressed, and sound properties in the full multifamily rental stock with HUD-insured (or held) mortgages. These characteristics help show the context of distressed properties. In this section (as well as the next), data are presented by properties' distress status and not by their assistance categories.

Exhibit 3.3 describes the characteristics of residents by overall properties' distress status. This exhibit is important in showing who is most affected by the problems of distress.

- The overall income distribution of tenants tended to be similar across distress categories. There was, however, a small but significant difference in that distressed properties compared to sound properties had proportionately more tenants above median income and fewer below 50 percent of median income. This finding appears counter-intuitive, but it reflects the fact that over 80 percent of distressed properties are unassisted or older assisted properties, both of which include more moderate-income and fewer very low-income tenants than do newer assisted properties.[5]

- All categories of properties had more households headed by non-minority whites (49%) than by any other racial or ethnic group. However, distressed and stressed

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[5]Newer assisted properties (of which only 9 percent are distressed) are often 100 percent assisted by Section 8, which HUD has targeted to very low-income households. Exhibit 2.2 showed that 90 percent of residents of newer assisted properties have very low incomes, while only 1 percent have incomes at or above median. By contrast, unassisted properties (30 percent of which are distressed) have 18 percent of residents with incomes at or above median, but only 22 percent with very low incomes. Similarly, older assisted properties (31 percent of which are distressed) have 3 percent of tenants with incomes at or above median and only 77 percent with very low incomes.

Exhibit 3.3

TENANT CHARACTERISTICS BY DISTRESS INDEX
Multifamily Rental Housing with HUD-Insured (or Held) Mortgages

	Total	Distressed (Index < -$250)	Stressed (Index between -$250 and $0)	Sound (Index > $0)
Total Properties	13,271	3,168	1,816	8,287
Percent of Properties	100%	24%	14%	62%
Race/Ethnicity[1]				
White	58%	49% ××	51% ××	64%
Black	32%	41% ××	40% **	26%
Hispanic	5%	5%	4%	5%
Other	5%	5%	5%	5%
Household Size				
1 Person	41%	33% ××	31% ××	47%
2 People	27%	28%	28%	26%
3 People	16%	18%	20% ××	14%
4 People	10%	13% *	14% ××	8%
5 People	3%	5%	4%	3%
6+ People	3%	3%	2%	2%
Mean Household Size	2 1	2.4	2.5	2 0
Elderly Head of Household Percent	33%	25%	23% ××	38%
Household Income				
<50% of Median	68%	62% *	68%	70%
50-80% of Median	19%	19%	20%	18%
80-100% of Median	8%	9%	8%	7%
≥100% of Median	6%	10% ××	4%	4%

×× Signifies that the differences between *Distressed and Sound* or *Stressed and Sound* properties are statistically significant at the 95% confidence level

* Signifies that the *differences between Distressed and Sound or Stressed and Sound* properties are statistically significant at the 90% confidence level

Tenant Data Source: Owner/Manager Survey, HUD Form 50059 provided by property owners, and managers, HUD prepayment database, NHP study

Note Column sums may not add to 100% due to rounding

[1]Percents show the tenant characteristics of the average property in the category indicated by the column heading For example, the column headed "Distressed" shows that the average Distressed property has 49 percent of units occupied by families headed by whites, 33 percent of units occupied by 1-person households, and 62 percent of units occupied by households with income under 50 percent of median

properties, compared with sound properties, each had proportionately fewer households headed by whites, and proportionately more households headed by blacks. Hispanics and other minorities were equally distributed across the property distress categories.

- Sound properties had proportionately more single people and households headed by elderly members, and fewer large families.

Exhibit 3.4 describes the characteristics of properties by their Distress level.

- Distress was more prevalent in larger properties, with average property size being 124 units for distressed properties, compared with 107 and 109 units, respectively, for stressed and sound properties. This reflects the large proportion of distressed properties that are unassisted or older assisted, which tend to be larger than the newer assisted properties (as is shown in Exhibit 2.1).

- There were no significant differences in the types of buildings that were distressed versus sound (although stress was more common in walk-ups and less common in high-rises).

- Sound properties had smaller units (i.e., lower average bedroom count) on average compared with stressed and distressed properties. This is consistent with the higher concentration of single and elderly households in sound properties.

- Overall project quality is a rating the study's physical inspectors gave to 'each property at the end of the inspection. Not surprisingly, distressed and stressed properties were less likely to be rated as excellent by inspectors, and were more likely to be rated as fair or poor. Nevertheless, inspectors rated 68 percent of distressed and 88 percent of stressed properties as being excellent or good (as opposed to 94 percent of sound properties). Despite their distressed status, for the moment, most insured properties seemed to be providing tenants with good housing. (Over the longer run continued financial shortfalls or neglected backlogs may reduce project quality).

Exhibit 3.5 describes, by distress status, properties' locations and HUD programs.

- Distressed and stressed properties tended to be located in neighborhoods that were in worse condition than those in which sound properties were located.[6] In comparison to sound properties, distressed properties were also more likely to be found in central cities, and less likely to be found in non-metropolitan areas.

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[6]As part of the neighborhood windshield survey, inspectors rated neighborhoods on such items as condition of housing exteriors and yards, condition of streets and curbs, maintenance of streets, presence of litter, presence of environmental dis-amenities, and presence of amenities. Based on these ratings, inspectors developed summary ratings of each neighborhood relative to the city as a whole and as a residential neighborhood.

Exhibit 3.4

PROPERTY CHARACTERISTICS BY DISTRESS INDEX
Multifamily Rental Housing with HUD-Insured (or Held) Mortgages

	Total	Distressed (Index < -$250)	Stressed (Index between -$250 and $0)	Sound (Index > $0)
Total Properties	13,271	3,168	1,816	8,287
Percent of Properties	100%	24%	14%	62%
Property Size				
<50 Units	19%	19%	19%	18%
50-99 Units	34%	27% ˣ	32% ˣ*	37%
100-199 Units	35%	39%	39%	34%
≥200 Units	12%	15%	11%	11%
Mean Units	112	124 ˣ*	107	109
Standard Error	3.5	8 7	7 1	4
Median	96	100	98	90
Average Unit Size				
<2 25 Bedrooms	80%	75% ˣ*	68% ** '	85%
≥2.25 Bedrooms	20%	25% *	32% ˣ*	15%
Mean Unit Size	1.7	1 8 ˣ*	2.0 **	1.6
Standard Error	0 03	0.05	0.06	0.03
Median	1 9	1 9 '	2 1	1.7
Building Type				
High Rise	28%	28%	14% **	32%
Walk-Up	· 44%	43%	54% **	41%
SF Attached	28%	29%	30%	26%
SF Detached	0%	0%	2% ˣ	0%
Overall Project Quality				
Excellent	39%	26% ˣ*	33% ˣ*	45%
Good	48%	42%	55%	49%
Fair/Poor	13%	32% ˣ*	12% ˣ*	6%

ˣ* Signifies that the differences between *Distressed and Sound* or *Stressed and Sound* properties are statistically significant at the 95% confidence level

ˣ Signifies that the differences between *Distressed and Sound or Stressed and Sound* properties are statistically significant at the 90% confidence level.

Data Source: Inspections.

Note: Column sums may not add to 100% due to rounding.

Exhibit 3.5

NEIGHBORHOOD AND PROGRAM CHARACTERISTICS BY DISTRESS INDEX
Multifamily Rental Housing with HUD-Insured (or Held) Mortgages

	Total	Distressed (Index < -$250)	Stressed (Index between -$250 and $0)	Sound (Index > $0)
Total Properties	13,271	3,168	1,816	8,287
Percent of Properties	100%	24%	14%	62%
Neighborhood Quality Relative to City				
Better than Average	36%	33%	26% **	39%
Average	35%	28% **	38%	38%
Worse than Average	28%	38% **	35% **	21%
Quality as Residential Neighborhood				
Excellent/Good	69%	61% **	66% **	73%
Fair/Poor	31%	39% **	34% **	26%
Central City Status				
SMSA, Central City	57%	66% **	58%	54%
SMSA, not Central City	32%	28%	31%	33%
Non-SMSA	11%	6% **	11%	13%
Assistance Category				
Unassisted	23%	29%	18%	22%
Older Assisted	46%	59% **	68% **	36%
Newer Assisted	31%	13% **	14% **	42%
Sponsor Type				
Non-Profit/Coop	18%	22% **	29% **	14%
Limited Dividend	37%	39%	43% *	34%
For Profit	46%	39% **	27% **	52%
Mortgage Start Year				
Before 1970	6%	8%	4%	5%
1970-1979	54%	47%	73% **	52%
1980 or later	41%	45%	23% **	43%
Preservation Status				
Can Prepay Any Time	54%	46% **	30% **	63%
Eligible for Preservation Incentives	26%	29%	39% **	23%
Locked in for Full Term	19%	25% **	30% **	14%

** Signifies that the differences between *Distressed and Sound* or *Stressed and Sound* properties are statistically significant at the 95% confidence level.

* Signifies that the *differences between Distressed and Sound or Stressed and Sound* properties are statistically significant at the 90% confidence level.

Data Source: Windshield Survey, HUD MIDLIS database.

Note: Column sums may not add to 100% due to rounding.

Exhibit 3.5 (continued)

NEIGHBORHOOD AND PROGRAM CHARACTERISTICS BY DISTRESS INDEX
Multifamily Rental Housing with HUD-Insured (or Held) Mortgages

	Total	Distressed	Stressed	Sound
Total Properties	13,271	3,168	1,815	8,203
Percent of Properties	100%	24%	14%	62%
Property Rents/Local FMR				
<0 5	5%	7% **	7% *	3%
0.5-<1	59%	69% **	72% **	53%
1-<1 5	28%	19% **	19% **	34%
≥1.5	8%	5% *	2% **	10%
Tenant Paid Rents/Local FMR				
<0 25	18%	13% *	18%	20%
0.25-<0.5	36%	39%	40%	34%
0.5-<1	35%	37%	36%	33%
≥1	11%	11%	6% *	13%
Neighborhood Vacancy				
Tight (low vacancy)	40%	28% **	41%	44%
Tight-Average	20%	21%	26%	18%
Average	18%	19%	14%	18%
Average-Soft	11%	13%	7%	10%
Soft (high vacancy)	11%	18% **	12%	9%
Property Relative to Neighborhood Vacancy				
Property Less than Neighborhood	44%	43%	51%	42%
Property Equal to Neighborhood	34%	26% **	28% *	38%
Property Greater than Neighborhood	22%	31% **	21%	20%

Source   1) Market Valuation Summary on Neighborhood Vacancies
        2) HUD MIPS database for Property Rents, Tenant Paid Rents and Property Vacancies
        3) HUD Fair Market Rent Data

** Signifies that the differences between *Distressed and Sound* or *Stressed and Sound* properties are statistically significant at the 95% confidence level.

* Signifies that the *differences between Distressed and Sound or Stressed and Sound* properties are statistically significant at the 90% confidence level.

- Distressed and stressed properties, compared with sound properties, were more likely to be older assisted and less likely to be newer assisted. Older assisted properties accounted for 46 percent of the insured stock, but accounted for 59 percent of the distressed properties and for 68 percent of the stressed properties. In contrast, newer assisted properties accounted for 31 percent of the stock, but only for 13 percent of distressed properties and 14 percent of stressed properties.

- Distressed and stressed properties were more likely than sound properties to have nonprofit (or cooperative) owners and were less likely to have for-profit owners (unrestricted as to dividend distributions). These findings largely reflect difference in programs rather than difference in owners: For-profit owners predominate among newer assisted properties (where non-profits played a small ownership role) and non-profits (and cooperatives) were concentrated in older assisted properties (where unrestricted for-profits were all but absent).

- Distressed and stressed properties were more likely than sound properties to have rents below the local Section 8 fair market rent (FMR) levels.

- Distressed properties were more likely to be in soft markets (and less likely to be in tight markets) than were sound or stressed properties—a condition beyond their control. However, distressed properties were likely to have higher vacancies than the general vacancy rates in their neighborhoods—a condition that they may be able to improve.

Exhibit 3.6 shows that, as expected, distressed properties were more likely to have high backlogs of physical needs compared with sound properties.

- On average distressed and stressed properties had higher total physical backlogs ($3,272 and $1,581 per 2BR unit, respectively) than did sound properties ($837).

- On average distressed and stressed properties also had higher unfunded physical needs backlogs ($2,999 and $1,284 respectively) than did sound properties ($516). Not only did these properties have high repair needs, but they also lacked the resources to make the necessary repairs.

- The median unfunded backlog for distressed properties was $2,156. This means that even with positive net cash flows these properties were likely to be classified as distressed. The median backlog for sound properties was $0.

Also as expected, Exhibit 3.7 shows that mean annual cash flow for distressed properties (minus $880) and stressed properties (minus $28) was far lower than for sound properties (positive $871). Even before addressing the backlog of physical needs, distressed and stressed properties had insufficient revenues to cover operations and maintenance, mortgage debt service, and deposits to reserve accounts. Only 13 percent of distressed properties and 38

Exhibit 3.6

**TOTAL BACKLOG AND UNFUNDED BACKLOG OF PHYSICAL NEEDS
BY DISTRESS INDEX**
Multifamily Rental Housing with HUD-Insured (or Held) Mortgages

	Total	Distressed (Index < -$250)	Stressed (Index between -$250 and $0)	Sound (Index > $0)
Total Properties	13,271	3,168	1,816	8,287
Percent of Properties	100%	24%	14%	62%
Total Backlog per 2BR Unit				
<$10	20%	16% *	12% **	23%
$10 to <500	25%	9% **	15% **	33%
$500 to <1,000	13%	7% **	18%	14%
$1,000 to <2,000	17%	13%	22%	18%
$2,000 to <3,000	8%	12% **	15% **	6%
$3,000 to <4,000	6%	8%	12% **	4%
$4,000 to <5,000	4%	8% **	5%	2%
$5,000 to <7,500	5%	16% **	2% **	1%
≥$7,500	2%	10% **	0%	0%
Mean	$1,520	$3,273 **	$1,581 **	$837
Standard Error	$92	274	157	64
Median	$654	$2,311	$1,269	$341
Unfunded Needs Backlog per 2BR Unit				
$0	44%	21% **	25% **	57%
$0 to <500	14%	11%	11% *	15%
$500 to <1,000	10%	7%	17% **	9%
$1,000 to <2,000	11%	10%	19% **	10%
$2,000 to <5,000	15%	28% **	26% **	8%
$5,000 to <7,500	5%	16% **	1% **	1%
≥$7,500	2%	7% **	0% **	0%
Mean	$1,214	$2,999 **	$1,284 **	$516
Standard Error	$88	268	152	54.0
Median	$228	$2,156	$744	$0

** Signifies that the differences between *Distressed and Sound* or *Stressed and Sound* properties are
statistically significant at the 95% confidence level

* Signifies that the *differences between Distressed and Sound or Stressed and Sound* properties are
statistically significant at the 90% confidence level.

Data Source: Physical inspection, costing program, and HUD Field Office data on resources.

Note: Column sums may not add to 100% due to rounding

Exhibit 3.7

NET CASH FLOW BY DISTRESS INDEX
Multifamily Rental Housing with HUD-Insured (or Held) Mortgages

	Total	Distressed (Index < -$250)	Stressed (Index between -$250 and $0)	Sound (Index > $0)
Total Properties	13,271	3,168	1,816	8,287
Percent of Properties	100%	24%	14%	62%
Per 2BR Unit Cash Flow				
Negative Cash Flow	32%	86% **	62% **	4%
< -$1,000	4%	16% **	0%	0%
-$1,000 to < -$500	6%	23% **	0%	0%
-$500 to < -$250	8%	28% **	5%	1%
-$250 to < $0	14%	19% **	57% **	3%
Positive Cash Flow	68%	13% **	38% **	97%
$0 to < $250	25%	11% **	34%	28%
$250 to < $500	13%	2% **	3% **	20%
$500 to < $1,000	14%	0% **	1% **	23%
≥ $1,000	16%	0% **	0% **	26%
Statistics on Net Cash Flow				
Mean	$330	($880) **	($28) **	$871
Standard Error	82	184	19	100
Median	$184	($378)	($24)	$482
Mortgage Status				
In Force-Current	89%	79% **	90%	93%
Other	11%	21% **	10%	7%

** Signifies that the differences between *Distressed and Sound* or *Stressed and Sound* properties are statistically significant at the 95% confidence level

* Signifies that the *differences between Distressed and Sound or Stressed and Sound* properties are statistically significant at the 90% confidence level.

Data Source: HUD MIDLIS and MIPS data bases, HUD Field Offices

Note: Column sums may not add to 100% due to rounding.

percent of stressed properties had positive cash flows, compared with 97 percent of sound properties.[7] Sixty-seven percent of distressed properties had cash flows of less than minus $250 per unit (compared with only 5 percent of stressed and 1 percent of sound properties)—they were likely to be distressed regardless of their physical condition.

Distressed properties were more likely than sound properties to have had mortgage delinquency or assignment. Mortgage insurance was in force and the mortgage current for 93 percent of sound properties compared with only 79 percent of distressed properties.

Multivariate Analysis of Distress

The tables presented above present the characteristics of properties by their distress status. As with the discussion of physical needs above, we are interested in determining whether readily available data can be used to predict distress. Because each of the three assistance categories are very different, the regression analysis is conducted separately for each category. Since the distress index is a modified version of net cash flow, it is not surprising that net cash flow alone explains most of the variance in the distress index (Exhibit 3.8). (The adjusted R^2 is over 94 percent for each of the assistance categories in a model that used only cash flow as a predictor of distress. Adding additional property characteristics such as physical needs backlog—which is not readily available for most properties—adds very little to the predictive model.)

3.4   Distress in the Capital Needs Study Properties

As noted above, Congress expressed particular concern about the Capital Needs Study properties, a total of just under 6,000 assisted properties consisting primarily (but not exclusively) of older assisted properties. Specifically, the Capital Needs Study properties consist of 5,663 of the 6,037 older assisted properties (Sections 236, 221(d)(3)BMIR, and 221(d)(3) with Rent Supplement or Section 8 Loan Management Set Aside); and 228 of the 4,154 newer

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[7]Four percent of sound properties showed negative cash flow. These properties were not in the stressed or distressed categories because their negative cash flows are due to higher than average vacancies, which are assumed to be remedied by management and operating improvements

Exhibit 3.8

MULTIVARIATE REGRESSION
FACTORS CONTRIBUTING TO DISTRESS

Dependent Variable: Distress Index per 2 BR Unit

Independent Variables[1]	Unassisted	Older Assisted	Newer Assisted
Intercept	66.9258 ** (48.530)	-119.8311 ** (17.025)	-73.2018 ** (19.040)
Net Cash Flow	0.9759 ** (0.014)	0.9891 * (0.013)	1.0507 ** (0.020)
Observations	115	309	146
R-Squared	0.9782	0.9501	0.9508
Adjusted R-Squared	0.9780	0.9409	0.9505

Standard errors in parentheses

*   Signifies significance at the 0 1 level

**   Signifies significance at the 0 05 level

[1]   Dependent variable is the Distress Index per 2BR unit equivalent properties.

Distress Index =   Net Cash Flow   +   Added Rent from Reduced Vacancies   -   Loan Repayment on Unfunded Physical Backlog

Sound properties have positive values of Distress Index.

assisted properties (Section 221(d)(3) with Section 8 New Construction or Substantial Rehabilitation).[8] The characteristics of the Capital Needs Study properties, therefore, are virtually identical to those of the older assisted properties as defined in this report.

The Capital Needs Study properties are deserving of special focus because they face significantly worse financial and physical problems than do other HUD-insured properties.

Exhibit 3 9 shows the distribution of the Distress Index for these properties. Twenty-seven percent of the Capital Needs Study properties were distressed, twenty-two percent were stressed, and half were sound. As can be seen in the exhibit, the Capital Needs Study properties were somewhat more likely to be distressed, and considerably more likely to be stressed than the overall assisted stock. This reflects the high concentration of older assisted properties in this subset of assisted properties.

- Exhibit 3.10 describes the characteristics of residents in distressed, stressed, and sound Capital Needs Study properties. The income distribution of tenants tended to be similar across distress categories. Among residents in the Capital Needs Study properties, the lowest income households were no more likely to live in distressed properties than were households with higher incomes.[9] Households in sound properties were more likely to be headed by whites, while households living in stressed and distressed properties were more likely to be headed by blacks. Hispanics and other minorities were equally distributed across the types of properties. Single people and households headed by elderly members were more likely than larger families to live in sound properties.

Exhibit 3.11 describes the characteristics of Capital Needs Study properties by their Distress Index. In contrast with sound properties, both distressed and stressed properties tended to have somewhat fewer, but larger units. This is consistent with the higher concentration of single and elderly households in sound properties. Distressed and sound properties were similar in terms of prevalent building types, though stress was more prevalent in properties that

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[8]Thus 96 percent of capital needs properties are older assisted, and 94 percent of older assisted properties are Capital Needs Study properties Four percent of capital needs properties are newer assisted, and five percent of newer assisted properties are Capital Needs Study properties

[9]It should be noted however, that 93 percent of all households in the Capital Needs Study properties had incomes below 80 percent of the median for their area, and 77 percent had incomes below 50 percent of the median Thus, the bulk of the tenants in distressed properties are very low-income, even though no more so than those in sound properties.

Exhibit 3.9

DISTRESS INDEX
Capital Needs Study Properties versus All Assisted Properties

Distress Index per 2BR Unit	Total Assisted	Assisted Properties in Capital Needs Study
Total Properties	10,191	5,891
Distressed	**23%**	**27%**
< -$1,000	4%	3%
-$1,000 to <-$500	9%	11%
-$500 to <-$250	10%	13%
Stressed	**15%**	**22%**
$-250 to $0	15%	22%
Sound	**63%**	**50%**
$0 to <$250	21%	26%
$250 to <$500	15%	13%
$500 to <$1,000	14%	5%
≥ $1,000	13%	6%
Statistics on Distress Index		
Mean	$271	$84
Standard Error	$ 55	$76
Median	$142	$6

Distress Index =	Net Cash Flow	+	Added Rent from Reduced Vacancies	-	Loan Repayment on Unfunded Physical Backlog

Data Source   Computed

Note: Column sums may not add to 100% due to rounding.

Exhibit 3.10

TENANT CHARACTERISTICS BY DISTRESS INDEX
Capital Needs Study Properties

	Total	Distressed (Index < -$250)	Stressed (Index between -$250 and $0)	Sound (Index > $ 0)
Total Properties	5,891	1,646	1,266	2,979
Percent of Properties	100%	28%	21%	51%
Race/Ethnicity				
White	51%	41% **	46% **	59%
Black	37%	48% **	44% **	30%
Hispanic	6%	6%	4%	7%
Other	5%	5%	6%	4%
Household Size				
1 Person	35%	30% *	29% *	41%
2 People	25%	25%	26%	25%
3 People	19%	20%	22%	17%
4 People	13%	15%	16%	11%
5 People	5%	6%	5%	4%
6+ People	3%	4%	3%	2%
Mean Household Size	2.4	2.6	2.6	2.2
Elderly Head of Household (Percent)	32%	27% *	27% *	36%
Household Income				
<50% of Median	77%	76%	75%	78%
50-80% of Median	17%	16%	19%	16%
80-100% of Median	4%	4%	4%	4%
≥100% of Median	3%	4%	2%	2%

** Signifies that the differences between *Distressed and Sound* or *Stressed and Sound* properties are statistically significant at the 95% confidence level.

* Signifies that the *differences between Distressed and Sound or Stressed and Sound* properties are statistically significant at the 90% confidence level.

Data Source: Owner/Manager Survey, HUD Form 50059 provided by property owners, and managers, HUD prepayment database, NHP study.

Note   Column sums may not add to 100% due to rounding.

Exhibit 3.11

PROPERTY CHARACTERISTICS BY DISTRESS INDEX
Capital Needs Study Properties

	Total	Distressed (Index < -$250)	Stressed (Index between -$250 and 0)	Sound (Index > $0)
Total Properties	5,891	1,646	1,266	2,979
Percent of Properties	100%	28%	21%	51%
Property Size				
<50 Units	19%	27% **	16%	15%
50-99 Units	33%	30%	33%	35%
100-199 Units	37%	35%	43%	35%
≥200 Units	12%	8%	9%	15%
Mean Units	108	96 **	104 **	116
Standard Error	4 2	7.0	7.5	6.6
Median	96	80	100	98
Average Unit Size				
<2.25 Bedrooms	71%	61% **	68% **	79%
≥2.25 Bedrooms	29%	39% **	32% **	21%
Mean Unit Size	1 8	1.9 **	2.0 **	1.8
Standard Error	0.04	0.08	0.08	0 05
Median	2 0	2.1	2.1	2 0
Building Type				
High Rise	21%	17%	17%	25%
Walk-Up	46%	44%	54% **	43%
SF Attached	33%	39%	28%	32%
Overall Project Quality				
Excellent	26%	14% **	24%	34%
Good	52%	39% **	63% **	55%
Fair/Poor	22%	47% **	13%	11%

** Signifies that the differences between *Distressed and Sound* or *Stressed and Sound* properties are statistically significant at the 95% confidence level.

* Signifies that the *differences between Distressed and Sound or Stressed and Sound* properties are statistically significant at the 90% confidence level.

Data Source: Inspections.

Note· Column sums may not add to 100% due to rounding.

consisted of walk-ups.

Distressed and stressed Capital Needs Study properties were less likely to be rated as excellent by the study's inspectors, and distressed properties were more likely to be rated as fair or poor. Nearly half (47 percent) of distressed Capital Needs Study properties were rated as fair or poor.

As shown in Exhibit 3.12, both stressed and distressed Capital Needs Study properties tended to be in worse neighborhoods compared with sound properties, in terms of the neighborhood as a residential area (both stressed and distressed) and the neighborhood relative to its city (distressed only). Distressed Capital Needs Study properties also were more likely than sound Capital Needs Study properties to be found in central cities and tight markets.

Since most of the Capital Needs Study properties were older assisted, it is not surprising that there was no difference in the mortgage age for distressed versus sound properties (most of the mortgages involved were issued during the 1970s). There was also no difference in properties' categorical eligibility for preservation incentives under the Low Income Preservation and Homeownership Act of 1990. However, the bad neighborhoods and high physical needs backlogs of the distressed properties may make it less likely that owners could demonstrate preservation equity needed to rate incentives.

As expected, distressed and stressed Capital Needs Study properties had much higher backlogs of physical needs than did sound properties (Exhibit 3.13). On average, the distressed properties had $4,222 per unit of needed repairs, compared with $1,793 for stressed, and $1,003 for sound properties. Only 17 percent of Capital Needs Study distressed properties had physical needs backlogs of less than $1,000, compared with 37 percent of stressed, and 63 percent of sound Capital Needs Study properties.

The average *unfunded* backlog was also much higher in distressed Capital Needs Study properties ($3,882) and stressed properties ($1,454) than in sound properties ($576). Distressed and stressed Capital Needs Study properties not only had high backlogs, but they also lacked resources to make necessary repairs. Sixty-seven percent of distressed Capital Needs Study

Exhibit 3.12

NEIGHBORHOOD AND PROGRAM CHARACTERISTICS BY DISTRESS INDEX
Capital Needs Study Properties

	Total	Distressed (Index < - $250)	Stressed (Index between - $250 to 0)	Sound (Index > $0)
Properties	5,891	1,646	1,266	2,979
Percent	100%	28%	21%	51%
Neighborhood Quality Relative to City				
Better than Average	21%	14% **	17% **	28%
Average	38%	33%	42%	39%
Worse than Average	40%	52% **	41% *	33%
Quality as Residential Neighborhood				
Excellent/Good	60%	50% **	64%	66%
Fair/Poor	40%	50% **	36%	34%
Central City Status				
SMSA, Central City	59%	67% **	62%	53%
SMSA, not Central City	30%	25%	28%	35%
Non-SMSA	11%	8%	11%	12%
Sponsor Type				
Non-Profit/Coop	38%	39%	42% *	35%
Limited Dividend	62%	61%	58% *	65%
Mortgage Start Year				
Before 1970	9%	13%	5%	8%
1970-1979	86%	80%	92%	87%
1980 or later	5%	7%	2%	5%
Preservation Status				
Eligible for Preservation Incentives	60%	55%	56%	63%
Locked in for Full Term	40%	45%	44%	37%

** Signifies that the differences between *Distressed and Sound* or *Stressed and Sound* properties are statistically significant at the 95% confidence level.

* Signifies that the *differences between Distressed and Sound or Stressed and Sound* properties are statistically significant at the 90% confidence level

Data Source: Windshield Survey, HUD MIDLIS database.

Note: Column sums may not add to 100% due to rounding.

Exhibit 3.12 (continued)

NEIGHBORHOOD AND PROGRAM CHARACTERISTICS BY DISTRESS INDEX
Capital Needs Study Properties

	Total	Distressed	Stressed	Sound
Properties	5,891	1,646	1,266	2,979
Percent	100%	28%	22%	51%
Property Rents/Local FMR				
<0 5	9%	11%	11%	7%
0 5-<1	83%	84%	84%	82%
≥1	8%	5%	5%	11%
Tenant Paid Rents/Local FMR				
<0 25	11%	11%	12%	10%
0.25-<0 5	58%	64%	55%	56%
0.5-<1	30%	24%	33%	31%
≥1	1%	0%	0%	3%
Neighborhood Vacancy				
Tight (low vacancy)	36%	28% **	34%	41%
Tight-Average	24%	24%	28%	22%
Average	19%	23%	16%	19%
Average-Soft	9%	11%	4%	9%
Soft (high vacancy)	12%	14%	18% *	9%
Property Relative to Neighborhood Vacancy				
Property Less than Neighborhood	50%	52%	60% **	45%
Property Equal to Neighborhood	33%	26% *	29%	38%
Property Greater than Neighborhood	17%	22%	11%	17%

Source. 1) Market Valuation Summary on Neighborhood Vacancies
2) HUD MIPS database for Property Rents, Tenant Paid Rents and Property Vacancies
3) HUD Fair Market Rent Data

** Signifies that the differences in proportions between the distressed and sound or stressed and sound properties are statistically significant at the 95% level.

* Signifies that the differences in proportions between the distressed and sound or stressed and sound properties are statistically significant at the 90% level.

Exhibit 3.13

TOTAL BACKLOG AND UNFUNDED BACKLOG OF PHYSICAL NEEDS
BY DISTRESS INDEX
Capital Needs Study Properties

	Total	Distressed (Index < -$250)	Stressed (Index betw. -$250 to 0)	Sound (Index > $0)
Total Properties	5,891	1,646	1,266	2,979
Percent of Properties	100%	28%	21%	51%
Total Backlog per 2BR Unit				
<$10	11%	3% **	13%	15%
$10 to <500	21%	7% **	7% **	34%
$500 to <1,000	13%	7%	17%	14%
$1,000 to <2,000	18%	10%	24%	19%
$2,000 to <3,000	12%	15%	14%	9%
$3,000 to <4,000	9%	10% *	18% **	4%
$4,000 to <5,000	6%	13% **	5%	3%
$5,000 to <7,500	7%	21% **	2%	1%
≥$7,500	4%	13% **	0%	0%
Mean	$2,072	$4,222 **	$1,793 **	$1,003
Standard Error	147	364	186	103
Median	$1,219	$3,636	$1,619	$513
Unfunded Needs Backlog per 2BR Unit				
$0	38%	12% **	25% **	57%
$0 to <500	9%	6%	2% **	12%
$500 to <1,000	11%	6%	22% **	9%
$1,000 to <2,000	12%	9%	19%	12%
$2,000 to <5,000	22%	37% **	31%	9%
$5,000 to <7,500	6%	18% *	2% **	1%
≥$7,500	3%	12% **	0%	0%
Mean	$1,688	$3,882 **	$1,454 **	$576
Standard Error	145	362	183	84
Median	$638	$3,425	$1,059	$0

** Signifies that the differences between *Distressed and Sound or Stressed and Sound* properties are statistically significant at the 95% confidence level.

* Signifies that the *differences between Distressed and Sound or Stressed and Sound* properties are statistically significant at the 90% confidence level.

Data Source: Physical inspection, costing program, and HUD Field Office data on resources.

Note: Column sums may not add to 100% due to rounding.

properties had unfunded backlogs of over $2,000, and included in these, 30 percent had unfunded backlogs of over $5,000 per 2BR unit. Even with positive net cash flows these properties were likely to be classified as distressed.[10]

Regarding finances, 82 percent of distressed Capital Needs Study properties had negative cash flows, compared to 54 percent of stressed, and only 7 percent of sound Capital Needs Study properties (Exhibit 3.14). Even before addressing physical needs, revenues were insufficient to cover operations and maintenance, mortgage debt service, and deposits to reserve accounts on an ongoing basis. On average, distressed Capital Needs Study properties had a cash flow deficit of $268 per unit per year (which is likely to yield a Distress Index below the distress threshold even before covering physical needs). The stressed Capital Needs Study properties also had negative average cash flows of minus $5 per unit per year, with 46 percent having positive cash flows. In contrast the sound Capital Needs Study properties had positive cash flows averaging $567 per year, and 93 percent had positive cash flows.[11]

3.5 Conclusion—Capital Needs of Distressed Multifamily Properties

This concluding section provides national estimates of the capital needs of distressed properties. These estimates are based on the measures of the unfunded physical needs backlog discussed previously, and use the Distress Index derived in this chapter to classify properties as distressed, stressed, or sound.

Multifamily Rental Stock

Among the entire multifamily stock with HUD-insured (or held) mortgages, there were 3,168 distressed properties containing 382,358 2BR equivalent units (Exhibit 3.15). These properties had a total backlog of physical needs of nearly $989 million. Of this amount, nearly

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[10]The actual level of unfunded repairs which yields a distress index of below -$250 is $2,315 (10.8 percent of $2,315 = $250).

[11]Seven percent of sound properties showed negative cash flow. These properties were not in the stressed or distressed categories because their negative cash flows were due to higher than average vacancies, which are assumed to be remedied as part of management improvements.

Exhibit 3.14

NET CASH FLOW BY DISTRESS INDEX
Capital Needs Study Properties

	Total	Distressed (Index < -$250)	Stressed (Index between -$250 and $0)	Sound (Index > $0)
Total Properties	5,891	1,646	1,266	2,979
Percent of Properties	100%	28%	21%	51%
Per 2BR Unit Cash Flow				
Negative Cash Flow	38%	82%	54%	7%
< -$1,000	0%	0%	0%	0%
-$1,000 to < -$500	7%	23% **	0%	1%
-$500 to < -$250	10%	31% **	3%	2%
-$250 to < $0	21%	28% **	51% **	4%
Positive Cash Flow	62%	18%	46%	93%
$0 to < $250	36%	13% **	40%	47%
$250 to < $500	13%	4% *×	5% **	22%
$500 to < $1,000	7%	1% **	1% ××	12%
≥ $1,000	6%	0% **	0%	12%
Statistics on Net Cash Flow				
Mean	$211	($268) **	($5) **	$567
Standard Error	74.0	32 0	21 3	143.0
Median	$ 56	($271)	$(4)	$229
Mortgage Status				
In Force-Current	89%	87%	90%	90%
Other	11%	13%	10%	10%

** Signifies that the differences between *Distressed and Sound or Stressed and Sound* properties are statistically significant at the 95% confidence level.

× Signifies that the *differences between Distressed and Sound or Stressed and Sound* properties are statistically significant at the 90% confidence level

Data Source: HUD MIDLIS and MIPS data bases, HUD Field Offices.

Note: Column sums may not add to 100% due to rounding.

Exhibit 3.15

TOTAL CAPITAL NEEDS OF DISTRESSED MULTIFAMILY HOUSING
Multifamily Rental Stock and Capital Needs Study Properties
Housing with HUD-Insured (or Held) Mortgages

	Distressed Properties	Stressed Properties	Total Distressed & Stressed
Multifamily Rental Stock—All Properties			
Number of Properties Number of Units (2BR equivalents)	3,168 382,358	1,816 203,513	4,984 585,871
Total Backlog of Physical Needs (in $ millions)	$988.5	$338.1	$1,326 6
Unfunded Backlog of Physical Needs (in $ millions)	$897.7	$285.8	$1,183.5
Assisted Properties			
Number of Properties Number of Units (2BR equivalents)	2,258 229,250	1,494 162,652	3,752 391,902
Total Backlog of Physical Needs (in $ millions)	$785.7	$291.6	$1,077 3
Unfunded Backlog of Physical Needs (in $ millions)	$708.3	$247.0	$955.3
Capital Needs Study Properties			
Number of Properties Number of Units (2BR equivalents)	1,646 159,297	1,266 136,804	2,912 296,101
Total Backlog of Physical Needs (in $ millions)	$619 0	$255.6	$874.6
Unfunded Backlog of Physical Needs (in $ millions)	$564.4	$214 8	$779.2

Based on DISTRESS INDEX derived in Chapter 3, physical inspections, HUD MIPS financial data, and Field Office records

$898 million was unfunded backlog.[12] There were an additional 1,816 stressed properties (with 203,513 2BR units) that had a total backlog of physical needs of $338 million, of which nearly $286 million was unfunded backlog. Thus, the combined unfunded backlog for distressed and stressed properties was nearly $1.2 billion.[13]

This unfunded backlog represents the *upper limit* on the amount of resources that these insured properties would need (from sources external to the property) to fund all repairs and replacements. This is because:

- *Many properties had positive cash flow that could be applied toward remedying the physical backlog.* As was shown in Exhibit 3.7, 13 percent of distressed properties and 38 percent of stressed properties had some positive cash flow even at their current levels of rent, occupancy, and operating efficiency.

- *Many properties could fund some of their backlog by improving cash flow.* By improving operations or staging repairs, some distressed and stressed properties could improve occupancy, efficiency, or rent levels, thus increasing cash flow available to remedy backlogs (or amortize repair loans).

- *Owners of some unassisted properties could reap higher rents and occupancy by investing their own funds in remedying backlogs.* Unlike assisted properties, whose rents and occupancy are tightly regulated, many unassisted properties are able to rent at market levels for the quality of housing they provide.

- *A minority of properties have extremely high backlogs which, from the Federal budgetary standpoint, may not be cost effective to remedy relative to other options.* For example, Exhibit 3.6 showed that 7 percent of distressed properties had unfunded backlogs exceeding $7,500 per unit, and another 16 percent had unfunded backlogs of from $5,000 to $7,500 per unit. These properties add disproportionately to the national backlog estimates. Depending upon their overall quality, their locational desirability to tenants relative to other housing options, and their current annual subsidy costs (if assisted), it may be more cost effective to

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[12]*Total physical needs backlog* is the cost to restore all systems to original working condition. *Unfunded physical needs backlog* is the amount by which the total backlog exceeds funds available in a property's replacement reserve or residual receipts accounts. Based on HUD practice, any amounts up to two years' reserve deposits is considered unavailable

[13]The backlog for sound properties was omitted from Exhibit 3 13 because sound properties have sufficient internal resources (from their reserve accounts, cash flow, and potential operating improvements) to cover their backlogs while continuing to make deposits to their reserve accounts to cover future physical needs. There were 8,287 sound properties containing 834,720 2BR equivalent units. These properties had a total backlog of $707 4 million, of which $452.4 million was unfunded backlog. These properties should be able to make all necessary repairs and replacements without additional Federal assistance

retire some of these especially high backlog properties from the stock of HUD-insured housing rather than to repair them.

- *For some distressed properties, lack of an owner willing to cooperate may make it impossible to undertake an effective program of physical improvements.* HUD's ability to assist properties depends upon the presence of a cooperative owner. While HUD may resort to administrative and legal sanctions to motivate some uncooperative owners, and may be able to effect the replacement of others; in some situations (such as weak local market conditions, limited financial potential of a property) it may be difficult for HUD to install an owner who will undertake an effective physical improvement program even with HUD assistance.

Assisted Properties

Assisted properties comprise a major portion of the distressed and stressed multifamily stock discussed above (Exhibit 3.15). There were 2,258 distressed properties (containing 229,235 2BR units), and 1,494 stressed properties (containing 162,662 2BR units). Distressed properties had a total needs backlog of $786 million, of which $708 million was unfunded backlog. Stressed properties had a total needs backlog of $292 million, of which $247 million was unfunded. Thus, the combined unfunded needs backlog of assisted properties that are either distressed or stressed was $955 million.[14] For the reasons given above, this $955 million in capital needs represents the upper limit on properties' need for additional assistance from HUD.

Many of these distressed and stressed properties among the assisted stock would be eligible to apply for the Department's existing remedial assistance programs, Section 8 Loan Management Set Aside (LMSA), Flexible Subsidy Operating Loans, and Flexible Subsidy Capital Improvement Loans.

Capital Needs Study Properties

Capital Needs Study properties (which are a subset of assisted properties discussed above) include 1,646 distressed properties (containing 159,297 2BR equivalent units) and 1,266 stressed properties (containing 136,804 2BR equivalent units) (Exhibit 3.15). Distressed properties had a total backlog of physical needs of $619 million, of which $564 million was

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[14]There were 6,439 sound assisted properties containing 602,415 2BR equivalent units. These properties had total physical needs backlogs of $530.4 million of which $302.4 million was unfunded backlog. However, as was true of sound properties in the entire multifamily stock, these sound properties have sufficient internal resources to cover their full backlogs without need for additional Federal assistance

unfunded backlog. Stressed properties had a total physical needs backlog of $255 million, of which $215 million was unfunded. Thus, the combined unfunded backlog for distressed and stressed properties was $779 million.[15] Again, this estimate represents the upper limit on properties' need for additional assistance from HUD.

Capital Needs Study properties account for a large share of the national unfunded backlog in multifamily housing: Distressed Capital Needs Study properties are 52 percent of all distressed properties, and account for 63 percent of the unfunded needs backlog of the distressed multifamily stock; they are also 73 percent of the distressed assisted properties and account for 80 percent of the unfunded needs backlog of distressed assisted properties.

Distressed and stressed Capital Needs Study properties would be eligible to apply for assistance under the current remedial assistance programs, Flexible Subsidy and Section 8 LMSA.

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[15]There were 2,979 sound Capital Needs Study properties containing 327,656 2BR equivalent units These properties had total physical needs backlogs of $336 4 million of which $193 4 million was unfunded backlog However, as was true of sound properties in the entire multifamily stock, these sound properties have sufficient internal resources to cover their full backlogs without need for additional Federal assistance

APPENDIX A

SAMPLING

A.1   Target Population

The potential respondent universe for the study is the multifamily residential housing stock that, as of mid-1989, had a fully insured or HUD-held mortgage and was in a Metropolitan Area or adjacent county in the contiguous 48 states or the District of Columbia. The universe selection is designed to balance policy research needs against study cost, respondent burden, and data collection feasibility.[1]

The universe consists of some 13,271 properties[2] entered in the HUD Multifamily Insured and Direct Loan Information System (MIDLIS), which is the Department's master

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[1]We have excluded the following property types for the following reasons·

- Properties not in the contiguous 48 states or the District of Columbia and properties in remote rural counties—these areas include relatively few properties and would prohibitively raise data collection costs
- Properties with PHA, Public Body, or condominium owners—inclusion of properties having these owner types would greatly complicate modeling and analysis while providing HUD with relatively little policy guidance.
- Co-insured properties—would require separate analysis, because of flawed underwriting, would require costly extra data collection because Field Offices maintain less complete files on them, and would be of relatively little policy guidance since the Department has terminated these programs because of their flawed design
- Nursing homes and mobile homes—are quite separate in structure, management, and purpose from the multifamily residential properties that are the core of this study
- Veterans and War Housing—HUD has generally had less direct oversight over these special purpose properties, and rarely has project files available for analysis. This would make data collection much more burdensome to respondents and more costly.
- Properties whose titles have been acquired by HUD—these properties, which constitute less than 4 percent of the stock, generally leave the inventory relatively quickly, and have incomplete project files, both making data collection and analysis difficult and costly.
- Section 202 Elderly or Handicapped Direct Loan Projects—these projects have direct loans to nonprofit sponsors rather than insured mortgages, and generally differ substantially from the insured stock Their inclusion would greatly complicate and raise the cost of this study
- Uninsured State 236 and Uninsured S8—HUD lacks key data on these uninsured properties, and has less programmatic control over time. Their inclusion would complicate the study and greatly raise respondent burden and costs.
- 235 and Other Single Family—these properties have little in common with the multifamily rental properties upon which this study focuses

[2]We originally assumed that the universe included 13,667 properties However, our Field Office survey produced an estimate of nearly 400 properties in the MIDLIS file that were not part of the study universe because they were life care facilities, their mortgages had been paid off, or they were HUD-acquired

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processing file on multifamily insurance programs. Properties included in the universe are of three assistance categories:

1. Unassisted

The following Sections of the Act, unless they have some rental assistance:

207 Multifamily Housing
220 Urban Renewal
231 Elderly
221(d)(3) Market Interest Rate (MR)
221(d)(4) Multifamily Rental Housing

2. Older Assisted

Any of the following three classes are included:

Sections of the Act:
221(d)(3) Below Market Interest Rate (BMIR), formally known as 221(d)(5)
236 Interest Supplement on Rental and Cooperative Housing

Any project that has a Rent Assistance Program (RAP) or Rent Supplement contract

Any insured multifamily Section of the Act having one of following types of Section 8 assistance:
Loan Management Set Aside (LMSA) Section 8
Property Disposition Section 8
Rent Supplement conversion
RAP conversion

3. Newer Assisted

Any insured multifamily Section of the Act having any one of the following types of Section 8 assistance:

Section 8 New Construction
Section 8 Substantial Rehab
Section 8 Mod Rehab

The sampling frame for this study was drawn from properties in the MIDLIS data base. Variables used to define the sample were drawn primarily from MIDLIS, with supplementary variables extracted from other HUD computerized data bases, particularly the Section 8 Management Information System (MIS).

The sample contains two major components. The first is a large probability sample of roughly 1,000 properties for which we have assembled a basic set of data drawing heavily upon records already required and available on HUD computer files or at HUD Field Offices. This sample is termed the monitoring sample because it provides baseline data on a sample for which HUD could update the data relatively easily for ongoing monitoring of the HUD-insured multifamily rental stock. A 90 percent completion rate was expected for this sample, yielding about 900 sample properties with the required data. During our preliminary data collection with Field Offices, Field Office staff identified 24 properties that were either no longer in the inventory (n=19) or were ineligible for the sample because they were elderly congregate housing (n=5). Following the on-site inspections, two additional properties were determined to be ineligible, leaving a final monitoring sample of 974 properties (which is a completion rate of 97 percent).

A subsample of 600 of the 1,000 properties was randomly drawn to form the analysis sample. As noted above, during the Field Office data collection 24 properties were determined to be ineligible for the study. These included 12 properties from the analysis sample. Prior to collecting on-site data, we replaced these properties with other monitoring sample properties in the same geographic areas and assistance categories as the ineligible properties, so that our preliminary analysis sample included 600 properties. For this sample we also obtained physical inspections, market value assessments, owner/manager data, and tenant data. We had originally expected that this could be successfully carried out in about 575 of the 600 properties, for a completion rate of around 96 percent. Data were successfully collected for 570 of the 600 properties Some properties were not inspected due to refusals on the part of owners or managers or difficulty in scheduling inspections (n=28). Other properties were inspected, but the data were not used because we later discovered that the properties were not eligible for the study (n=2). Thus, our final analysis sample included 570 properties, which is a completion rate of 95 percent.

As discussed in more detail later, the three categories of properties divide into four sampling domains, for which separate estimates are needed—unassisted, older assisted properties which can house large families, other older assisted properties, and newer assisted properties.

- Unassisted properties are of interest because of HUD's contingent mortgage insurance liability, and the fact that many tenants are low-income.

- Newer assisted properties represent the major resource for new low-income housing. In addition they are also at risk for opt outs, that is, voluntary termination of their Section 8 housing assistance payment contracts.

- Older assisted properties are of particular interest because of their higher likelihood of being in distress; many are also at risk for prepayment or opt-outs.

- Special attention is paid to projects accommodating larger families (with average bedroom size 2.25 or greater per unit) because:

    - From prior research, we know these are disproportionately distressed;

    - These are households for whom it is hardest to find alternatives, which is especially important for prepayment and opt-outs, where vouchers alone are less likely to be adequate.

The overall and domain sample sizes for the monitoring sample and analysis sample are shown on the following page along with the corresponding population counts.

Monitoring Sample

Domain	Universe[3] (Properties)	Initial Sample[4] Size (Properties)	Expected Completion Rate	Expected Number of Properties with Required Data	Actual Completion Rate	Actual Properties with Required Data
Unassisted	3,080	205	90%	184	92%	188
Older assisted, Avg BR ≥ 2.25	1,377	200	90%	180	99%	198
Older assisted, Avg BR < 2.25	4,660	340	90%	306	98%	334
Newer assisted	4,154	255	90%	230	100%	254
Total	13,271	1,000	90%	900	97%	974

Analysis Sample

Domain	Population Size (Properties)	Initial Sample Size (Properties)	Expected Completion Rate	Expected Number of Properties with Required Data	Actual Completion Rate	Actual Properties with Required Data
Unassisted	3,080	123	96%	118	93%	115
Older assisted Avg BR ≥ 2 25	1,377	120	96%	115	96%	115
Older assisted Avg.BR < 2 25	4,660	204	96%	195	95%	194
Newer assisted	4,154	153	96%	147	96%	146
Total	13,271	600	96%	575	95%	570

[3]In our original sample we assumed the actual universe was:

Unassisted	3,357
Older assisted, average BR ≥ 2.25	1,392
Older assisted, average BR < 2.25	4,748
Newer assisted	4,170
Total	13,667

About 400 properties were later estimated to be ineligible based on the results of the monitoring sample.

[4]The sample sizes for each group were predetermined to provide reliable estimates for each domain of interest. Both groups of older assisted properties were oversampled due to their higher policy relevance.

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A.2 Statistical Methods

Stratification and Sampling

Introduction

The main objectives of this study relate to both the current status of the HUD-insured multifamily rental housing stock and future condition of this stock. Some of the basic descriptors of the current status of the stock can be addressed using the monitoring sample, which involves only secondary data collection from existing HUD data files. Answering some of the more detailed questions regarding the current status of the stock as well as simulating future conditions involves more detailed primary data collection. Given these objectives, the design involved first selecting a monitoring sample of properties and then selecting a subsample as the analysis sample for which primary data were collected. The sample sizes selected for each of the four key domains of policy interest along with universe size for each category of property determine the sampling fractions. The universe, sample sizes, and resulting sampling fractions are:

Domain	Assumed Universe Size (Properties)	Monitoring Sample Size (Properties)	Sampling Fraction[5]
Unassisted	3,357	205	0.0611
Older Assisted, Avg. BR $\geq$ 2.25	1,392	200	0.1437
Older Assisted, Avg. BR $<$ 2.25	4,748	340	0.0716
Newer Assisted	4,170	255	0.0611
Total	13,667	1,000	0.0730

As shown above, the two older assisted domain were oversampled due to their higher policy relevance. In the sections that follow the details of the sample design are presented.

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[5]Sampling fraction = Sample Size / Universe Size

Selection of Primary Sampling Units

While the monitoring sample involved only secondary data collection, the analysis sample involved several intensive on-site primary data collection efforts for each sampled property. As with any national sample, cost-efficiency as related to travel cost between properties was a major concern. The approach to dealing with this issue was to cluster the sample of 1,000 properties within a first-stage sample of 53 Primary Sampling Units (PSUs), with each PSU composed of Metropolitan Statistical Areas (MSAs) and non-MSA counties. In some cases nearby or adjacent MSAs were grouped together in order to satisfy minimum PSU size requirements in terms of number of properties. The sample size of 53 PSUs was determined by taking cost and variance considerations into account. Fifty to 100 geographic clusters is typical of national surveys of 500-2000 respondents. The number of clusters ensures that subgroups of properties are distributed across geographic locations, without being overly expensive.

We wanted the sampled properties to have equal weight within each domain. This in turn determines the minimum PSU size from the requirement that:

$$\frac{53 \ MOS_i}{13,667} \ x \ f_{2ij} = 0.1437$$

where 0.1437 equals the sampling fraction for older assisted properties with average BR size ≥ 2.25 which are sampled in the highest proportion, f_{2ij} equals the second stage sampling fraction for this group within PSU_i, which in a "take-all" situation would equal one, and MOS_i is the total number of properties in the ith PSU. Solving for MOS_i yields a value of 37 properties as the required minimum PSU size. This means that any MSA with fewer than 37 properties would have to be combined with a nearby or adjacent MSA if one exists.

Sample PSUs were selected with probability proportional to size (PPS) sampling. The PPS sampling procedure used total properties as the measure of size. The sampling frame of PSUs was stratified prior to PSU selection in order to reduce the sampling error of property-level estimates. First, all PSUs were sorted by the ten HUD regions. Within each HUD region, PSUs were next sorted by total number of dwelling units in all properties in the PSU. This ensured that the sample is representative of all PSUs in terms of total units contained.

HUD Region	Sort Order
I	High to low
II	Low to high
III	High to low
IV	Low to high
V	High to low
VI	Low to high
VII	High to low
VIII	Low to high
IX	High to low
X	Low to high

To draw the 53 sample PSUs the total measure of size was cumulated, and an initial PPS selection interval, K, of:

$$K = 13,667/53 = 257.87$$

was first computed. PSUs that would have had a selection probability of 0.65 or greater were in fact included in the sample with certainty. These are PSUs with a measure of size greater than or equal to 167.6 properties. A total of 17 PSUs met this criterion. The 0.65 inclusion criterion was chosen to ensure that all of the larger MSAs, in terms of total properties, were represented in the sample. Following this step, 36 noncertainty PSUs were selected with probability proportional to size sampling by first recomputing the PPS selection interval with the certainty PSUs removed, and then applying this recomputed PPS selection interval to the noncertainty PSU sampling frame. Exhibit A.1 shows the sample PSUs.

Total properties is the measure of size. However, we also examined a composite (weighted) measure of size. The composite measure is equal to:

$$MOS_i' = \sum_{j=1}^{4} f_j N_{ij},$$

where MOS_i' is the composite measure of size of the ith PSU, f_j is the desired sampling fraction for each of the four key domains, and N_{ij} equals the count of properties in the jth domain in the ith PSU. For a self-weighting sample $MOS_i' = MOS_i$. Recall however that the two groups of older assisted properties are being oversampled compared to unassisted and newer assisted. We

Exhibit A.1

List of Study PSUs*

Ann Arbor, MI
Appleton, WI
Asheville, NC
Atlanta, GA - C
Augusta, GA
Baltimore, MD - C
Birmingham, AL
Bismarck, ND
Boston, MA - C
Charleston, WV
Chicago, IL - C
Chico, CA
Cincinnati, OH - C
Columbus, OH - C
Dayton, OH
Denver, CO - C
Detroit, MI - C
Duluth, MN
El Paso, TX
Fayetteville, NC
Gary, IN
Hartford, CT
Houston, TX
Indianapolis, IN - C
Jersey City, NJ
Kansas City, MO - C
Knoxville, TN
Las Vegas, NV
Lewiston, ME
Longview, TX
Los Angeles, CA - C
Miami, FL
Milwaukee, WI
Minneapolis, MN - C
Mobile, AL
Monroe, LA
New York, NY - C
Oakland, CA
Omaha, NE

Pittsburgh, PA - C
Raleigh, NC
Richmond, VA
Rochester, NY
Sacramento, CA - C
San Francisco, CA
Seattle, WA
Spokane, WA
St. Louis, MO - C
Stockton, CA
Tampa, FL
Tulsa, OK
Washington, DC - C
Youngstown, OH

*C identifies the certainty PSUs.

computed MOS'_i and MOS_i and determined the value of their product-moment correlation. It is very high (+.996), therefore total properties (MOS_i) was used as the measure of size.

When properties vary in size in terms of number of dwelling units, one could instead consider using total property dwelling units in the PSU as the measure of size. This is not, however, necessary because, for the 217 PSUs in the sampling frame, the PSU-level correlation between total properties versus total dwelling units as the measure of size is +.96. Therefore, a property-based measure of size, which is more attuned to the planned modeling of owner decisions, is reasonable to use. Using properties as the measure of size will still allow unit based estimates, however.

Sampling Properties for the Monitoring Sample

The desired sample size for the monitoring sample was 1,000 properties. This total was to be allocated across the four key domains as follows:

Domain	Desired Sample Size
Unassisted	205
Older assisted, average BR ≥ 2.25	200
Older assisted, average BR < 2.25	340
Newer assisted	255
Total	1,000

The procedures for selecting properties from PSUs, therefore, involved the following steps:

1. Stratify properties in a PSU into the four key domains.

2. For each domain, compute the second stage sampling fraction f_2 as follows:

   - Unassisted: $f_2 = .0611/f_1$
   - Older assisted, average BR ≥ 2.25: $f_2 = .1437/f_1$
   - Older assisted, average BR < 2.25: $f_2 = .0716/f_1$
   - Newer assisted: $f_2 = .0611/f_1$

   where the numerator equals the overall sampling fraction for the domain and f_1 equals the selection probability of the PSU.

3. The expected sample size of properties, n_{ij}, from the PSU_i for each domain j equals:

$$n_{ij} = f_2 \times N_{ij}$$

where N_{ij} equals the total number of properties in domain j in PSU i.

4. To select the sample of PSUs, compute the sampling interval F_2 by taking the reciprocal of the second stage sampling function f_2. Apply the interval F_2 to draw a systematic random sample of PSUs without replacement.

National Low Income Housing Preservation Sample

We included a portion of the approximately 300 properties from the Preservation Commission study in the sample. This provided some initial data about these properties and should allow analysts to compare the Preservation Commission simulation results for those properties with the results from additional data collection and the simulation model developed for this study.

Inclusion in the sample of a portion of the sample of properties studied by the National Low Income Housing Preservation Commission (Preservation Commission) does not affect the ability to use the total sample to form national estimates. The sample of 53 PSUs was drawn without regard to whether they contain any Preservation Commission sample properties. The Preservation Commission sample is a national simple random sample of older assisted properties.[6] There are however differences in the definition of older assisted properties used for this study and the Preservation Commission study. The preservation study included a random sample of pre-1975 properties developed under FHA's Sections 221(d)(3)BMIR, 236, and 221(d)(3)MR with assistance. The current study also includes as older assisted properties post-1974 properties developed under the above Sections of the Act as well as properties developed under other sections which receive RAP, Rent Sup, LMSA, or property disposition assistance.

In order to include a portion of the Preservation Commission study sample we split both of the older assisted domains into two subgroups for sampling purposes—those in the

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[6]The Preservation Commission study sampled properties included in HUD's 1987 study of insured rental housing. See Laurent Hodes et al., *HUD/FHA Insured Rental Housing: Physical and Financial Condition of Multifamily Properties Insured Before 1975* (U S Department of Housing and Urban Development, April 1987).

Preservation Commission sample and those not in the Preservation Commission sample. To judge the degree of oversampling of Preservation Commission sample properties that is feasible it is first necessary to examine how the universe of older assisted properties distributes:

| | Older Assisted | | | |
| | Average BR ≥ 2.25 | | Average BR < 2.25 | |
	Number	Percent	Number	Percent
In Preservation Commission sample	73	5.2%	202	4.3%
Not in Preservation Commission sample	1,319	94.8%	4,546	95.7%
Total	1,392	100.0%	4,748	100.0%

If no oversampling took place one would expect the sample of 200 older assisted properties with average BR ≥ 2.25 to contain only 10 Preservation Commission sample properties, and the sample of 340 older assisted properties with average BR < 2.25 to contain 15 such properties. This represents only 25 out of the 1,000 properties in the monitoring sample. This yield can be doubled to 50 properties out of the 1,000 without having any significant negative consequences for the sampling variance of the two older assisted domains. Increasing the yield beyond this was not advisable because it would overly increase the sampling variance.

The revised sampling fractions for the two older assisted domains become:

	In Preservation Commission Sample	Not in Preservation Commission Sample
Older assisted, average BR ≥ 2.25	20/73 = .274	180/1,319 = .137
Older assisted, average BR < 2.25	30/202 = .149	310/4,546 = 068

The sampling design contains the above four domains plus the unassisted and newer assisted domains, for a total of six sampling domains. The sampling fractions and sample sizes for each of the study's PSUs are presented in Exhibit A.2.

Exhibit A.2

Sampling Fractions and Sample Sizes for Each PSU

Monitoring Sample PSU MSA NAME, STATE	PSU SIZE (MOS)	PSU SAMPLING FRACTION (f1i)	SAMPLING DOMAIN	OVERALL SAMPLING FRACTION (ADJUSTED)	PROPERTIES COUNT (Nij)	EXPECTED SAMPLE SIZES (nij)	SECOND-STAGE SAMPLING FRACTION (f2ij)	1st AND 2nd STAGE SAMPL FRACTION (f1ij x f2ij)
CERTAINTY SAMPLE								
1 BOSTON,MA	190	1 000000						
			UNASSISTED	0 056702	32	1 814	0 056702	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	4	0 555	0 138673	0 138673
			OLD ASST/NONFAM/NOT NHF	0 071740	70	5 022	0 071740	0 071740
			OLD ASST/FAMILY/IN NHP	0.359868	3	1 080	0 359868	0 359868
			OLD ASST/FAMILY/NOT NHP	0 131036	27	3 538	0 131036	0 131036
			NEWER ASSISTED	0 062425	54	3 371	0 062425	0 062425
			TOTAL		190	15 379		
2 NEW YORK,NY	727	1 000000						
			UNASSISTED	0 056702	301	17 067	0 056702	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	6	0 832	0 138673	0 138673
			OLD ASST/NONFAM/NOT NHF	0 071740	126	9 039	0 071740	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	2	0 720	0 359868	0 359868
			OLD ASST/FAMILY/NOT NHP	0 131036	26	3 407	0 131036	0 131036
			NEWER ASSISTED	0 062425	266	16 605	0 062425	0 062425
			TOTAL		727	47 670		
3 WASHINGTON,DC	327	1 000000						
			UNASSISTED	0 056702	84	4 763	0 056702	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	6	0 832	0 138673	0 138673
			OLD ASST/NONFAM/NOT NHF	0 071740	84	6 026	0 071740	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	5	1 799	0 359868	0 359868
			OLD ASST/FAMILY/NOT NHP	0 131036	42	5 504	0 131036	0 131036
			NEWER ASSISTED	0 062425	106	6 617	0 062425	0 062425
			TOTAL		327	25 541		
4 BALTIMORE MD	244	1 000000						
			UNASSISTED	0 056702	100	5 670	0 056702	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	2	0 277	0 138673	0 138673
			OLD ASST/NONFAM/NOT NHF	0 071740	65	4 663	0 071740	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	3	1 080	0 359868	0 359868
			OLD ASST/FAMILY/NOT NHP	0 131036	17	2 228	0 131036	0 131036
			NEWER ASSISTED	0 062425	57	3 558	0 062425	0 062425
			TOTAL		244	17 476		
5 PITTSBURGH,PA	171	1 000000						
			UNASSISTED	0 056702	38	2 155	0 056702	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	5	0 693	0 138673	0 138673
			OLD ASST/NONFAM/NOT NHF	0 071740	64	4 591	0 071740	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	1	0 360	0 359868	0 359868
			OLD ASST/FAMILY/NOT NHP	0 131036	14	1 835	0 131036	0 131036
			NEWER ASSISTED	0 062425	49	3 059	0 062425	0 062425
			TOTAL		171	12 693		
6 CINCINNATI,OH	229	1 000000						
			UNASSISTED	0 056702	43	2 438	0 056702	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	6	0 832	0 138673	0 138673
			OLD ASST/NONFAM/NOT NHF	0 071740	90	6 457	0 071740	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	0	0 000	0 000000	0 000000
			OLD ASST/FAMILY/NOT NHP	0 131036	24	3 145	0 131036	0 131036
			NEWER ASSISTED	0 062425	66	4 120	0 062425	0 062425
			TOTAL		229	16 992		
7 ATLANTA,GA	168	1 000000						
			UNASSISTED	0.056702	16	0 907	0 056702	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	0	0 000	0 000000	0 000000
			OLD ASST/NONFAM/NOT NHF	0 071740	73	5.237	0 071740	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	0	0 000	0 000000	0 000000
			OLD ASST/FAMILY/NOT NHP	0 131036	43	5 635	0 131036	0 131036
			NEWER ASSISTED	0 062425	36	2.247	0 062425	0 062425
			TOTAL		168	14 026		
8 CHICAGO,IL	379	1.000000						
			UNASSISTED	0 056702	138	7 825	0 056702	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	5	0 693	0 138673	0 138673
			OLD ASST/NONFAM/NOT NHF	0 071740	95	6 815	0 071740	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	1	0 360	0 359868	0 359868
			OLD ASST/FAMILY/NOT NHP	0 131036	16	2 097	0 131036	0 131036
			NEWER ASSISTED	0 062425	124	7 741	0 062425	0 062425
			TOTAL		379	25 531		

Sampling Fractions and Sample Sizes for Each PSU

Monitoring Sample PSU MSA NAME, STATE	PSU SIZE (MOSi)	PSU SAMPLING FRACTION (f1i)	SAMPLING DOMAIN	OVERALL SAMPLING FRACTION (ADJUSTED)	PROPERTIES COUNT (NIj)	EXPECTED SAMPLE SIZES (nIj)	SECOND-STAGE SAMPLING FRACTION (f2i)	1st AND 2nd STAGE SAMPL FRACTION (f1Ij x f2Ij)
9 DETROIT,MI	406	1 000000						
			UNASSISTED	0 056702	164	9.299	0 056702	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	4	0 555	0 138673	0 138673
			OLD ASST/NONFAM/NOT NHF	0 071740	153	10 976	0 071740	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	1	0 360	0 359868	0 359868
			OLD ASST/FAMILY/NOT NHP	0 131036	57	7 469	0 131036	0 131036
			NEWER ASSISTED	0 062425	27	1 685	0 062425	0 062425
			TOTAL		406	30 344		
10 ST.LOUIS,MO	218	1 000000						
			UNASSISTED	0 056702	93	5.273	0 056702	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	0	0 000	0 000000	0 000000
			OLD ASST/NONFAM/NOT NHF	0 071740	23	1 650	0 071740	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	1	0 360	0 359868	0 359868
			OLD ASST/FAMILY/NOT NHP	0 131036	16	2 097	0 131036	0 131036
			NEWER ASSISTED	0 062425	85	5 306	0 062425	0 062425
			TOTAL		218	14 686		
11 MINNEAPOLIS,MN	209	1 000000						
			UNASSISTED	0 056702	93	5 273	0 056702	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	5	0 693	0 138673	0 138673
			OLD ASST/NONFAM/NOT NHF	0 071740	69	4 950	0 071740	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	0	0 000	0 000000	0 000000
			OLD ASST/FAMILY/NOT NHP	0 131036	6	0 786	0 131036	0 131036
			NEWER ASSISTED	0 062425	36	2.247	0 062425	0 062425
			TOTAL		209	13 950		
12 COLUMBUS,OH	188	1 000000						
			UNASSISTED	0 056702	53	3 005	0 056702	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	2	0.277	0 138673	0 138673
			OLD ASST/NONFAM/NOT NHF	0 071740	62	4 448	0 071740	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	0	0 000	0 000000	0 000000
			OLD ASST/FAMILY/NOT NHP	0 131036	11	1 441	0 131036	0 131036
			NEWER ASSISTED	0 062425	60	3 746	0 062425	0 062425
			TOTAL		188	12 917		
13 INDIANAPOLIS IN	168	1 000000						
			UNASSISTED	0 056702	35	1 985	0 056702	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	2	0.277	0 138673	0 138673
			OLD ASST/NONFAM/NOT NHF	0 071740	78	5 596	0 071740	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	0	0 000	0 000000	0 000000
			OLD ASST/FAMILY/NOT NHP	0 131036	15	1 966	0 131036	0 131036
			NEWER ASSISTED	0 062425	38	2 372	0 062425	0 062425
			TOTAL		168	12 195		
14 KANSAS CITY,MO	242	1 000000						
			UNASSISTED	0 056702	49	2 778	0 056702	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	3	0 416	0 138673	0 138673
			OLD ASST/NONFAM/NOT NHF	0 071740	83	5 954	0 071740	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	1	0 360	0 359868	0 359868
			OLD ASST/FAMILY/NOT NHP	0 131036	45	5 897	0 131036	0 131036
			NEWER ASSISTED	0 062425	61	3 808	0 062425	0 062425
			TOTAL		242	19.213		
15 DENVER,CO	176	1 000000						
			UNASSISTED	0 056702	33	1 871	0 056702	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	4	0 555	0 138673	0 138673
			OLD ASST/NONFAM/NOT NHF	0 071740	39	2 798	0 071740	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	1	0 360	0 359868	0 359868
			OLD ASST/FAMILY/NOT NHP	0 131036	16	2 097	0 131036	0 131036
			NEWER ASSISTED	0 062425	83	5 181	0 062425	0 062425
			TOTAL		176	12 861		
16 LOS ANGELES, CA	438	1 000000						
			UNASSISTED	0 056702	15	0 851	0 056702	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	6	0 832	0 138673	0 138673
			OLD ASST/NONFAM/NOT NHF	0 071740	227	16.285	0 071740	0 071740
			OLD ASST/FAMILY/IN NHP	0.359868	6	2 159	0 359868	0 359868
			OLD ASST/FAMILY/NOT NHP	0 131036	41	5 372	0 131036	0 131036
			NEWER ASSISTED	0 062425	143	8 927	0 062425	0 062425
			TOTAL		438	34 426		

Sampling Fractions and Sample Sizes for Each PSU

Monitoring Sample PSU MSA NAME, STATE	PSU SIZE (MOSi)	PSU SAMPLING FRACTION (f1i)	SAMPLING DOMAIN	OVERALL SAMPLING FRACTION (ADJUSTED)	PROPERTIES COUNT (Nij)	EXPECTED SAMPLE SIZES (nij)	SECOND-STAGE SAMPLING FRACTION (f2ij)	1st AND 2nd STAGE SAMPL FRACTION (f1ij x f2ij)
17 SACRAMENTO,CA	301	1 000000						
			UNASSISTED	0 056702	153	8 675	0 056702	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	6	0.832	0 138673	0 138673
			OLD ASST/NONFAM/NOT NHF	0 071740	76	5 452	0 071740	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	0	0 000	0 000000	0 000000
			OLD ASST/FAMILY/NOT NHP	0 131036	12	1 572	0 131036	0 131036
			NEWER ASSISTED	0 062425	54	3 371	0 062425	0 062425
			TOTAL		301	19 903		

NONCERTAINTY SAMPLE

18 HARTFORD,CT	64	0.259285						
			UNASSISTED	0 056702	7	1 531	0.218686	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	2	1 070	0 534829	0 138673
			OLD ASST/NONFAM/NOT NHF	0 071740	35	9 684	0.276684	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	0	0 000	0 000000	0 000000
			OLD ASST/FAMILY/NOT NHP	0 131036	6	3 032	0 505375	0 131036
			NEWER ASSISTED	0 062425	14	3 371	0 240759	0 062425
			TOTAL		64	18 687		
19 LEWISTON,ME	36	0 145848						
			UNASSISTED	0 056702	4	1 555	0 388776	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	0	0 000	0 000000	0 000000
			OLD ASST/NONFAM/NOT NHF	0 071740	9	4 427	0 491883	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	0	0 000	0 000000	0 000000
			OLD ASST/FAMILY/NOT NHP	0 131036	8	7 188	0 898445	0 131036
			NEWER ASSISTED	0 062425	15	6 420	0 428015	0 062425
			TOTAL		36	19 590		
20 ROCHESTER,NY	23	0 093180						
			UNASSISTED	0 056702	3	1 826	0 608518	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	0	0 000	0 000000	0 000000
			OLD ASST/NONFAM/NOT NHF	0 071740	9	6 929	0 769904	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	0	0 000	0 000000	0 000000
			OLD ASST/FAMILY/NOT NHP	0 131036	1	1 406	1 406261	0 131036
			NEWER ASSISTED	0 062425	10	6 699	0 669937	0 062425
			TOTAL		23	16 860		
21 JERSEY CITY,NJ	50	0.202566						
			UNASSISTED	0 056702	5	1 400	0 279918	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	0	0 000	0 000000	0 000000
			OLD ASST/NONFAM/NOT NHF	0 071740	13	4 604	0 354156	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	0	0 000	0 000000	0 000000
			OLD ASST/FAMILY/NOT NHP	0 131036	3	1 941	0 646880	0 131036
			NEWER ASSISTED	0 062425	29	8 937	0 308171	0 062425
			TOTAL		50	16 881		
22 RICHMOND,VA	69	0.279541						
			UNASSISTED	0 056702	23	4 665	0 202839	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	1	0 496	0 496074	0 138673
			OLD ASST/NONFAM/NOT NHF	0 071740	21	5 389	0.256635	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	0	0 000	0 000000	0 000000
			OLD ASST/FAMILY/NOT NHP	0 131036	10	4 688	0 468754	0 131036
			NEWER ASSISTED	0 062425	14	3 126	0.223312	0 062425
			TOTAL		69	18 365		
23 YOUNGSTOWN,OH	39	0 158002						
			UNASSISTED	0 056702	2	0 718	0.358870	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	0	0 000	0 000000	0 000000
			OLD ASST/NONFAM/NOT NHF	0 071740	16	7.265	0 454046	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	0	0 000	0 000000	0 000000
			OLD ASST/FAMILY/NOT NHP	0 131036	6	4 976	0 829334	0 131036
			NEWER ASSISTED	0 062425	15	5 926	0 395091	0 062425
			TOTAL		39	18 885		
24 CHARLESTON,WV	23	0 093180						
			UNASSISTED	0 056702	0	0 000	0 000000	0 000000
			OLD ASST/NONFAM/IN NHP	0 138673	0	0 000	0 000000	0 000000
			OLD ASST/NONFAM/NOT NHF	0 071740	7	5 389	0 769904	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	0	0 000	0 000000	0 000000
			OLD ASST/FAMILY/NOT NHP	0 131036	3	4.219	1 406261	0 131036
			NEWER ASSISTED	0 062425	13	8 709	0 669937	0 062425
			TOTAL		23	18 317		

Sampling Fractions and Sample Sizes for Each PSU

Monitoring Sample PSU MSA NAME, STATE	PSU SIZE (MOSi)	PSU SAMPLING FRACTION (f1i)	SAMPLING DOMAIN	OVERALL SAMPLING FRACTION (ADJUSTED)	PROPERTIES COUNT (Nij)	EXPECTED SAMPLE SIZES (nij)	SECOND-STAGE SAMPLING FRACTION (f2ij)	1st AND 2nd STAGE SAMPL FRACTION (f1ij x f2ij)
25 ASHEVILLE,NC	20	0 081026						
			UNASSISTED	0 056702	7	4 899	0 699796	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	1	1 711	1 711454	0 138673
			OLD ASST/NONFAM/NOT NHF	0 071740	1	0.885	0 885390	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	0	0 000	0 000000	0 000000
			OLD ASST/FAMILY/NOT NHP	0 131036	3	4 852	1 617200	0 131036
			NEWER ASSISTED	0 062425	8	6 163	0 770428	0 062425
			TOTAL		20	18 510		
26 FAYETTEVILLE NC	42	0 170156						
			UNASSISTED	0 056702	9	2 999	0 333236	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	0	0 000	0 000000	0 000000
			OLD ASST/NONFAM/NOT NHF	0 071740	3	1.265	0 421614	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	0	0 000	0 000000	0 000000
			OLD ASST/FAMILY/NOT NHP	0 131036	10	7 701	0 770095	0 131036
			NEWER ASSISTED	0 062425	20	7 337	0 366870	0 062425
			TOTAL		42	19 302		
27 AUGUSTA,GA	39	0 158002						
			UNASSISTED	0 056702	8	2 871	0 358870	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	1	0 878	0 877669	0 138673
			OLD ASST/NONFAM/NOT NHF	0 071740	10	4 540	0 454046	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	0	0 000	0 000000	0 000000
			OLD ASST/FAMILY/NOT NHP	0 131036	3	2 488	0 829334	0 131036
			NEWER ASSISTED	0 062425	17	6 717	0 395091	0 062425
			TOTAL		39	17 494		
28 BIRMINGHAM,AL	44	0 178253						
			UNASSISTED	0 056702	16	5 089	0 318089	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	0	0 000	0 000000	0 000000
			OLD ASST/NONFAM/NOT NHF	0 071740	6	2 415	0 402450	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	1	2 019	2 018802	0 359868
			OLD ASST/FAMILY/NOT NHP	0 131036	2	1 470	0 735091	0 131036
			NEWER ASSISTED	0 062425	19	6 654	0 350194	0 062425
			TOTAL		44	17 647		
29 MOBILE,AL	61	0.247131						
			UNASSISTED	0 056702	24	5 507	0.229441	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	0	0 000	0 000000	0 000000
			OLD ASST/NONFAM/NOT NHF	0 071740	18	5.225	0.290292	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	0	0 000	0 000000	0 000000
			OLD ASST/FAMILY/NOT NHP	0 131036	1	0 530	0 530230	0 131036
			NEWER ASSISTED	0 062425	18	4 547	0.252599	0 062425
			TOTAL		61	15 809		
30 KNOXVILLE,TN	67	0.271439						
			UNASSISTED	0 056702	24	5 013	0 208894	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	1	0 511	0 510882	0 138673
			OLD ASST/NONFAM/NOT NHF	0 071740	19	5 022	0.264296	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	0	0 000	0 000000	0 000000
			OLD ASST/FAMILY/NOT NHP	0 131036	1	0 483	0 482746	0 131036
			NEWER ASSISTED	0 062425	22	5 060	0.229978	0 062425
			TOTAL		67	16 088		
31 MIAMI,FL	54	0.218771						
			UNASSISTED	0 056702	17	4 406	0.259184	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	0	0 000	0 000000	0 000000
			OLD ASST/NONFAM/NOT NHF	0 071740	16	5.247	0 327922	0 071740
			OLD ASST/FAMILY/IN NHP	0.359868	1	1 645	1 644950	0 359868
			OLD ASST/FAMILY/NOT NHP	0 131036	6	3 594	0 598963	0 131036
			NEWER ASSISTED	0 062425	14	3 995	0.285344	0 062425
			TOTAL		54	18 886		

Sampling Fractions and Sample Sizes for Each PSU

Monitoring Sample PSU MSA NAME, STATE	PSU SIZE (MOSI)	PSU SAMPLING FRACTION (f1i)	SAMPLING DOMAIN	OVERALL SAMPLING FRACTION (ADJUSTED)	PROPERTIES COUNT (Nij)	EXPECTED SAMPLE SIZES (nij)	SECOND-STAGE SAMPLING FRACTION (f2ij)	1st AND 2nd STAGE SAMPL FRACTION (f1ij x f2ij)
32 RALEIGH,NC	112	0 453748						
			UNASSISTED	0 056702	34	4.249	0 124964	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	1	0 306	0 305617	0 138673
			OLD ASST/NONFAM/NOT NHF	0 071740	8	1.285	0 158105	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	0	0 000	0 000000	0 000000
			OLD ASST/FAMILY/NOT NHP	0 131036	25	7.220	0.288786	0 131036
			NEWER ASSISTED	0 062425	44	6 053	0 137576	0 062425
			TOTAL		112	19 092		
33 TAMPA,FL	78	0.316003						
			UNASSISTED	0 056702	18	3.230	0 179435	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	2	0 878	0 438834	0 138673
			OLD ASST/NONFAM/NOT NHF	0 071740	38	8 627	0.227023	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	1	1 139	1 138812	0 359868
			OLD ASST/FAMILY/NOT NHP	0 131036	5	2 073	0 414667	0 131036
			NEWER ASSISTED	0 062425	14	2 766	0 197546	0 062425
			TOTAL		78	18 712		
34 MILWAUKEE WI	152	0 615801						
			UNASSISTED	0 056702	51	4 696	0 092078	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	1	0.225	0.225191	0 138673
			OLD ASST/NONFAM/NOT NHF	0 071740	40	4 660	0 116499	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	1	0 584	0.584390	0 359868
			OLD ASST/FAMILY/NOT NHP	0 131036	9	1 915	0.212790	0 131036
			NEWER ASSISTED	0 062425	50	5 069	0 101372	0 062425
			TOTAL		152	17 149		
35 DAYTON OH	146	0.591493						
			UNASSISTED	0 056702	31	2 972	0 095862	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	0	0 000	0 000000	0 000000
			OLD ASST/NONFAM/NOT NHF	0 071740	39	4 730	0 121286	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	1	0 608	0 608406	0 359868
			OLD ASST/FAMILY/NOT NHP	0 131036	18	3 988	0.221534	0 131036
			NEWER ASSISTED	0 062425	57	6 016	0 105538	0 062425
			TOTAL		146	18 314		
36 ANN ARBOR,MI	47	0 190412						
			UNASSISTED	0 056702	17	5 062	0 297786	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	0	0 000	0 000000	0 000000
			OLD ASST/NONFAM/NOT NHF	0 071740	19	7 158	0 376762	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	0	0 000	0 000000	0 000000
			OLD ASST/FAMILY/NOT NHP	0 131036	10	6 882	0 688170	0 131036
			NEWER ASSISTED	0 062425	1	0 328	0 327841	0 062425
			TOTAL		47	19 430		
37 GARY,IN	27	0 109386						
			UNASSISTED	0 056702	1	0 518	0 518368	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	0	0 000	0 000000	0 000000
			OLD ASST/NONFAM/NOT NHF	0 071740	13	8 526	0 655844	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	0	0 000	0 000000	0 000000
			OLD ASST/FAMILY/NOT NHP	0 131036	2	2 396	1 197926	0 131036
			NEWER ASSISTED	0 062425	11	6.278	0 570687	0 062425
			TOTAL		27	17 718		
38 APPLETON,WI	43	0 174207						
			UNASSISTED	0 056702	4	1 302	0 325487	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	1	0 796	0 796025	0 138673
			OLD ASST/NONFAM/NOT NHF	0 071740	12	4 942	0 411809	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	1	2 066	2 065751	0 359868
			OLD ASST/FAMILY/NOT NHP	0 131036	9	6 770	0 752186	0 131036
			NEWER ASSISTED	0 062425	16	5 733	0.358338	0 062425
			TOTAL		43	21 609		
39 DULUTH,MN	27	0 109386						
			UNASSISTED	0 056702	3	1 555	0.518368	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	0	0 000	0 000000	0 000000
			OLD ASST/NONFAM/NOT NHF	0 071740	12	7 870	0 655844	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	0	0 000	0 000000	0 000000
			OLD ASST/FAMILY/NOT NHP	0 131036	3	3.594	1 197926	0 131036
			NEWER ASSISTED	0 062425	9	5 136	0.570687	0 062425
			TOTAL		27	18 155		
40 EL PASO,TX	20	0 081026						
			UNASSISTED	0 056702	1	0 700	0 699796	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	1	1 711	1 711454	0 138673
			OLD ASST/NONFAM/NOT NHF	0 071740	10	8 854	0 885390	0.071740
			OLD ASST/FAMILY/IN NHP	0 359868	0	0 000	0 000000	0 000000
			OLD ASST/FAMILY/NOT NHP	0 131036	6	9 703	1 617200	0 131036
			NEWER ASSISTED	0 062425	2	1.541	0 770428	0 062425
			TOTAL		20	22 509		

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Sampling Fractions and Sample Sizes for Each PSU

Monitoring Sample PSU MSA NAME, STATE	PSU SIZE (MOSi)	PSU SAMPLING FRACTION (f1i)	SAMPLING DOMAIN	OVERALL SAMPLING FRACTION (ADJUSTED)	PROPERTIES COUNT (Nij)	EXPECTED SAMPLE SIZES (nij)	SECOND-STAGE SAMPLING FRACTION (f2ij)	1st AND 2nd STAGE SAMPL FRACTION (f1ij x f2ij)
41 MONROE,LA	46	0 186361						
			UNASSISTED	0 056702	14	4.260	0 304259	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	0	0 000	0 000000	0 000000
			OLD ASST/NONFAM/NOT NHF	0 071740	11	4.234	0 384952	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	0	0 000	0 000000	0 000000
			OLD ASST/FAMILY/NOT NHP	0 131036	4	2 813	0 703131	0 131036
			NEWER ASSISTED	0 062425	17	5 694	0 334968	0 062425
			TOTAL		46	17 001		
42 LONGVIEW,TX	52	0.210669						
			UNASSISTED	0 056702	16	4 306	0.269152	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	2	1 317	0 658251	0 138673
			OLD ASST/NONFAM/NOT NHF	0 071740	18	6 130	0 340535	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	0	0 000	0 000000	0 000000
			OLD ASST/FAMILY/NOT NHP	0 131036	8	4 976	0 622000	0 131036
			NEWER ASSISTED	0 062425	8	2 371	0 296318	0 062425
			TOTAL		52	19 099		
43 TULSA,OK	67	0.271439						
			UNASSISTED	0 056702	10	2 089	0 208894	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	1	0 511	0 510882	0 138673
			OLD ASST/NONFAM/NOT NHF	0 071740	32	8 457	0.264296	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	0	0 000	0 000000	0 000000
			OLD ASST/FAMILY/NOT NHP	0 131036	8	3 882	0 482746	0 131036
			NEWER ASSISTED	0 062425	16	3 680	0 229978	0 062425
			TOTAL		67	18 599		
44 HOUSTON,TX	117	0 474005						
			UNASSISTED	0 056702	27	3 230	0 119623	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	2	0 585	0 292556	0 138673
			OLD ASST/NONFAM/NOT NHF	0 071740	58	8 778	0 151349	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	0	0 000	0 000000	0 000000
			OLD ASST/FAMILY/NOT NHP	0 131036	4	1 106	0 276445	0 131036
			NEWER ASSISTED	0 062425	26	3 424	0 131697	0 062425
			TOTAL		117	17 123		
45 OMAHA,NE	50	0.202566						
			UNASSISTED	0 056702	7	1 959	0 279918	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	0	0 000	0 000000	0 000000
			OLD ASST/NONFAM/NOT NHF	0 071740	12	4 250	0 354156	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	0	0 000	0 000000	0 000000
			OLD ASST/FAMILY/NOT NHP	0 131036	9	5 822	0 646880	0 131036
			NEWER ASSISTED	0 062425	22	6 760	0 308171	0 062425
			TOTAL		50	18 811		
46 BISMARCK,ND	9	0 036462						
			UNASSISTED	0 056702	3	4 665	1 555103	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	1	3 803	3 803230	0 138673
			OLD ASST/NONFAM/NOT NHF	0 071740	2	3 935	1 967533	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	0	0 000	0 000000	0 000000
			OLD ASST/FAMILY/NOT NHP	0 131036	0	0 000	0 000000	0 000000
			NEWER ASSISTED	0 062425	3	5 136	1 712061	0 062425
			TOTAL		9	17 540		
47 OAKLAND,CA	129	0.522621						
			UNASSISTED	0 056702	39	4.231	0 108496	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	4	1 061	0.265342	0 138673
			OLD ASST/NONFAM/NOT NHF	0 071740	44	6 040	0 137270	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	1	0 689	0 688584	0 359868
			OLD ASST/FAMILY/NOT NHP	0 131036	15	3 761	0 250729	0 131036
			NEWER ASSISTED	0 062425	26	3 106	0 119446	0 062425
			TOTAL		129	18 888		
48 SAN FRANCISCO,CA	111	0 449697						
			UNASSISTED	0 056702	24	3 026	0 126089	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	3	0 925	0 308370	0 138673
			OLD ASST/NONFAM/NOT NHF	0.071740	48	7 657	0 159530	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	0	0 000	0 000000	0 000000
			OLD ASST/FAMILY/NOT NHP	0 131036	8	2 331	0.291387	0 131036
			NEWER ASSISTED	0 062425	28	3 887	0 138816	0 062425
			TOTAL		111	17 827		

Sampling Fractions and Sample Sizes for Each PSU

Monitoring Sample PSU MSA NAME, STATE	PSU SIZE (MOSI)	PSU SAMPLING FRACTION (f1i)	SAMPLING DOMAIN	OVERALL SAMPLING FRACTION (ADJUSTED)	PROPERTIES COUNT (Nij)	EXPECTED SAMPLE SIZES (nij)	SECOND–STAGE SAMPLING FRACTION (f2ij)	1st AND 2nd STAGE SAMPL FRACTION (f1ij x f2ij)
49 LAS VEGAS,NV	56	0.234977						
			UNASSISTED	0 056702	27	6 515	0.241309	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	1	0.590	0 590156	0 138673
			OLD ASST/NONFAM/NOT NHF	0 071740	12	3 664	0 305307	0 071740
			OLD ASST/FAMILY/IN NHP	0.359868	1	1 532	1.531505	0 359868
			OLD ASST/FAMILY/NOT NHP	0 131036	2	1 115	0 557655	0 131036
			NEWER ASSISTED	0 062425	15	3 985	0.265655	0 062425
			TOTAL		58	17 401		
50 STOCKTON,CA	41	0.166104						
			UNASSISTED	0 056702	26	8 875	0 341364	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	0	0 000	0 000000	0 000000
			OLD ASST/NONFAM/NOT NHF	0 071740	11	4 751	0 431898	0 071740
			OLD ASST/FAMILY/IN NHP	0.359868	0	0 000	0 000000	0 000000
			OLD ASST/FAMILY/NOT NHP	0 131036	0	0 000	0 000000	0 000000
			NEWER ASSISTED	0 062425	4	1 503	0 375818	0 062425
			TOTAL		41	15 130		
51 CHICO,CA	40	0 162053						
			UNASSISTED	0 056702	17	5 948	0 349898	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	1	0 856	0 855727	0 138673
			OLD ASST/NONFAM/NOT NHF	0 071740	15	6 640	0 442695	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	0	0 000	0 000000	0 000000
			OLD ASST/FAMILY/NOT NHP	0 131036	0	0 000	0 000000	0 000000
			NEWER ASSISTED	0 062425	7	2 696	0 385214	0 062425
			TOTAL		40	16 141		
52 SPOKANE,WA	91	0 368670						
			UNASSISTED	0 056702	39	5 998	0 153801	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	4	1 505	0 376144	0 138673
			OLD ASST/NONFAM/NOT NHF	0 071740	35	6 811	0 194591	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	0	0 000	0 000000	0 000000
			OLD ASST/FAMILY/NOT NHP	0 131036	6	2 133	0 355429	0 131036
			NEWER ASSISTED	0 062425	7	1 185	0 169325	0 062425
			TOTAL		91	17 631		
53 SEATTLE,WA	123	0 498313						
			UNASSISTED	0 056702	13	1 479	0 113788	0 056702
			OLD ASST/NONFAM/IN NHP	0 138673	4	1 113	0.278285	0 138673
			OLD ASST/NONFAM/NOT NHF	0 071740 `	54	7 774	0 143966	0 071740
			OLD ASST/FAMILY/IN NHP	0 359868	1	0 722	0 722173	0 359868
			OLD ASST/FAMILY/NOT NHP	0 131036	11	2 893	0.262959	0 131036
			NEWER ASSISTED	0 062425	40	5 011	0 125273	0 062425
			TOTAL		123	18 992		

OVERALL TOTAL   999 99772

TOTAL EXPECTED SAMPLE SIZES BY STRATUM

UNASSISTED	204 9968
OLD ASST/NONFAM/IN NHP	29 9999
OLD ASST/NONFAM/NOT NHP	310 0003
OLD ASST/FAMILY/IN NHP	20 0001
OLD ASST/FAMILY/NOT NHP	180 0005
NEWER ASSISTED	255 0001
OVERALL TOTAL	999 9977

Sampling Properties for the Analysis Sample

The analysis sample was drawn as a subsample of the 1,000 property monitoring sample. A random subsampling procedure, taking 60 percent of properties within each of the four groups in each PSU, was used to attain the following expected sample sizes:

Unassisted	123
Older assisted, average BR $\geq$ 2.25	120
Older assisted, average BR $<$ 2.25	204
Newer assisted	<u>153</u>
	600

We originally expected to be successful in completing primary data collection for about 96 percent of these sample properties. In fact, we completed data collection for 95 percent:

	Expected Completions	Actual Completions
Unassisted	118	114
Older assisted, average BR $\geq$ 2.25	115	115
Older assisted, average BR $<$ 2.25	195	194
Newer assisted	<u>147</u>	<u>147</u>
	575	570

A.3   Weighting Methodology

Each sample property in the initial monitoring sample received a basic sampling weight equal to the reciprocal of the probability of selection of its PSU and the within-PSU selection probability of the property itself. Before estimating national and domain means, total and proportions, the weights of the 974 properties in the final monitoring sample for which data collection is completed were adjusted for properties determined to be ineligible.

Stratum	Total Eligible Properties
Unassisted	3,080
Older assisted, average BR $\geq$ 2.25 - in Preservation Commission sample	73
Older assisted, average BR $\geq$ 2.25 - not in Preservation Commission sample	1,304
Older assisted, average BR $<$ 2.25 - in Preservation Commission sample	202
Older assisted, average BR $<$ 2.25 - not in Preservation Commission sample	4,458
Newer assisted	4,154

The weighting process for the analysis sample followed the same steps. The only modification was that the calculation of the basic sampling weight took into account the subsampling of 600 of the 1,000 properties.

The sampling weight for the six strata are shown below.

Stratum	Basic Sampling Weight	Adjusted Weight	Analysis Sample Weight
Unassisted	17.636	16.296	26.782
Older assisted, average BR ≥ 2.25 - in Preservation Commission sample	2 779	3 650	4 056
Older assisted, average BR ≥ 2 25 - not in Preservation Commission sample	7.631	7.301	13.446
Older assisted, average BR < 2.25 - in Preservation Commission sample	7.211	6.733	7 481
Older assisted, average BR < 2 25 - not in Preservation Commission sample	13.939	14.665	26.694
Newer assisted	16.019	16.417	28.450

The monitoring and analysis samples were used to form descriptive estimates of the current status of the target universe. The analysis sample was also used to develop simulation models of future actions. This is discussed in more detail elsewhere.

The descriptive estimates take two forms. Property as unit of analysis estimates were formed using the post-stratified nonresponse adjusted weights. For example, for a variable, y, the unbiased sample estimator of the mean and total would be:

$$\bar{y} = \frac{\Sigma W_{yk} y_{yk}}{\Sigma W_{yk}}, \quad \text{and}$$

$$\hat{Y} = \Sigma W_{yk} y_{yk}$$

Not only is there interest in examining the proportion of properties with some characteristics of interest, but to also estimate the proportion of dwelling units with the same characteristic of interest. To form these estimates the weights assigned to a sample property will

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be multiplied times the number of dwelling units in that property. Unlike public housing, where there is considerable variation in the number of units in a property, HUD-insured multifamily rental housing exhibits less variability:

Domain	Mean Number of Units[7]	Standard Error	Element Coefficient of Variation
Unassisted	147	11.6	0.78
Older assisted, average BR $\geq$ 2.25	112	5.5	0 68
Older assisted, average BR $<$ 2.25	110	6.6	0.64
Newer assisted	87	4 6	0.64

This means that the sampling variance of the unit-based estimates should not be greatly increased over that of the property-based estimates.

A.4 Level of Accuracy

The main objective of the study was to provide reliable national estimates for the four key domains of interest, as well as overall national estimates. There are additional subgroups, such as the distressed stock, properties eligible to prepay Section 221(d)(3) or 236 mortgages, and particular Sections of the Act for which estimates are also desired. Both the monitoring and analysis samples are used to develop profiles of the HUD-insured multifamily rental stock.

Much of the analysis involves describing and characterizing properties. To judge the precision of a typical estimate, assume that 50 percent of properties have a characteristic of interest. For each domain the 90 percent confidence limits of P = 50 percent are derived from:

$$1.65 \ \sqrt{Deff} \ \sqrt{50(100-50)/n} \ ,$$

where n is the domain sample size of properties, and the design effect, Deff, equals $1 + \rho(\bar{b} - 1)$, where $\bar{b}$ is the average number of properties per PSU and ρ is the intra-cluster

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[7]Based on analysis sample.

correlation. The typical ρ value is around 0.01, given that we are using entire MSAs and their adjacent non-MSA counties as PSUs. The calculation results are shown below.

Monitoring Sample

Domain	Sample Size	$\bar{b}$	$\sqrt{Deff}$	90% Confidence Limits
Unassisted	188	3 55	1.01	±6.1%
Older assisted, average BR ≥ 2 25	198	3 74	1 01	±5 9%
Older assisted, average BR < 2 25	334	6 0	1 03	±4 7%
Newer assisted	254	4.79	1.02	±5.3%

Analysis Sample

Domain	Sample Size	$\bar{b}$	$\sqrt{Deff}$	90% Confidence Limits
Unassisted	115	2.15	1 01	±7.8%
Older assisted, average BR ≥ 2.25	115	2.17	1.01	±7.8%
Older assisted, average BR < 2.25	194	3.66	1.01	±6 0%
Newer assisted	146	2.77	1.01	±6 9%

For the overall monitoring and analysis sample the 90 percent confidence limits for P=50 percent can be derived from:

$$1+L = (\Sigma W_j k_j)(\Sigma W_j k_j)$$

where 1+L represents the increase in variance due to weighting. If one lets W_j equal the universe proportion of properties in the jth key domain and k_j equal the relative weight assigned to the jth domain, then variances are increased by the factor:

$$1.65 \sqrt{Deff} \sqrt{50(100-50)/n} \sqrt{1+L}$$

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With the moderate degree of oversampling of older assisted properties, the value of $\sqrt{1+L}$ is only 1.03. Incorporating this into the above equation yields:

Monitoring Sample

Domain	Sample Size	$\bar{b}$	$\sqrt{Deff}$	90% Confidence Limits
Overall sample	974	18.38	1.08	±2 94

Analysis Sample

Domain	Sample Size	$\bar{b}$	$\sqrt{Deff}$	90% Confidence Limits
Overall sample	570	10.75	1.05	±3.37%

These tables show that in estimating any characteristic of the universe of properties, one can be 90 percent confident that the true value is within ±2.94 percent of an estimate obtained from the monitoring sample, or ±3.37 percent of an estimate obtained from the analysis sample.

While we did not set out to obtain estimates for particular Sections of the Act, our sample will allow us to obtain estimates for Sections 221(d)(3)BMIR, 221(d)(3)MR, 221(d)(4) and 236. The following table of confidence limits takes into account the effects of clustering and the weighting.

Section of the Act	Sample Size		90% Confidence Limits	
	Monitoring Sample	Analysis Sample	Monitoring Sample	Analysis Sample
221(d)(3)BMIR	92	58	±8.9%	±11.2%
221(d)(3)MR	94	54	±8.8	±11.6
221(d)(4)	386	221	±4 5	±5 8
236	335	190	±4.8	±6.3

APPENDIX B

DATA COLLECTION SUMMARY

The study's data collection on multifamily properties was conducted in three phases, with each successive phase focusing more intensively on a smaller group of properties. In the first phase, data were assembled on all multifamily rental properties having HUD-insured or HUD-held mortgages. This phase was limited to collecting data from automated data bases in HUD's Central Office. It ultimately provided the information needed to identify the universe of policy interest (initially 13,667 properties, reduced to 13,271 properties at study completion) and to draw the Monitoring and Analysis Samples. In the second phase, data were collected on the Monitoring Sample (initially 1,000 properties, 974 properties at study completion). These additional data were limited to information available from HUD's Field Offices or from various computer files available to the Department. In the third phase, primary data were collected on the Analysis Sample (initially 600 properties, 570 properties at study completion), the Analysis Sample being a subsample of the Monitoring Sample. These data were obtained by surveying each property using a mixture of on-site, telephone, and mail data collection.

In addition to collecting data on the stock of multifamily housing, the study also collected data necessary to model HUD's programs, rules, and procedures. This information was compiled through a series of interviews with staff in HUD's Office of Multifamily Housing Programs and from published notices, regulations, and other issuances.

All data collection was directed by Abt Associates and carried out by staff of Abt, its specialty subcontractors, and HUD. Exhibit B.1 provides an overview of data collection on multifamily properties.

B.1 Data Collection on the Universe of HUD Properties—HUD's Automated Data Bases

In 1989, data were extracted from two of HUD's automated data bases to identify the universe of policy interest and to create the sampling frame. The primary data source was the Multifamily Insured and Direct Loan Information System (MIDLIS), which contains information (derived from HUD's mortgage underwriting and loan servicing) on all direct loans (primarily Section 202) and on all mortgages ever insured on multifamily properties. MIDLIS provided the study with information on Section of the Act, mortgage terms, status of mortgage insurance,

Overview of Data Collection Activities

```
                          ┌─────────────────┐
                          │   Draw Sample   │
                          └────────┬────────┘
                                   │
                                   ▼
          ┌──────────────────────────────────────────────┐
          │ Existing Information From HUD Central Office Data Bases │
          └──────────────────┬───────────────────────────┘
                             │
                 ┌───────────┴──────────┐
                 ▼                      ▼
        ┌─────────────────┐    ┌─────────────────┐
        │ Extract HUD Data│    │ Print Data Forms│
        │  from MIDLIS    │───▶│  and send to    │
        │  MIPS, S8 MIS,  │    │  Field Offices  │
        │     etc.        │    │                 │
        └────────┬────────┘    └────────┬────────┘
                 │                       │
```

HUD Files and Forms Located in Field Offices	HUD Field Office Economists
* Additional project-level descriptors * Additional data on project subsidies and insurance history * Project site plans where available * Tenant composition data (Form 50059) where available * Management and owner organization information	Expert Market Contacts

OKM Team Owner/Manager Surveys	Inspection Team Inspect Properties and Neighborhood	AREA Team Telephone Local Real Estate Market Experts

Completed Surveys	Site Plan/ Inspection Contacts	Completed Inspections	Windshield Survey Maps Photographs List of Contacts	Conduct Interviews Collect Secondary	Market Valuation

Tenant Data
Form 50059
or diskette
where
needed

geographic identifiers, property characteristics (such as unit size or building type), receipt of subsidies, and intended occupancy type. The second data source was the Section 8 Management Information System (Section 8 MIS) which contains information on all Section 8 contracts, including those on uninsured multifamily properties. MIDLIS and Section 8 MIS, together, permitted the study to identify the universe of interest—defined by Section of the Act, geographic location, ownership type, and insurance status (in force or HUD-held).

MIDLIS, together with Section 8 MIS, also provided the information necessary to stratify the universe by the four broad "assistance categories" and to array the universe by HUD Region, and Probability Sampling Unit (MSA/county location).

B.2   Data Collection on the Monitoring Sample—HUD Data and Compiled Sources

Data collection for the Monitoring Sample was limited to sources that did not involve primary collection at the property level. Since the Analysis Sample is a subsample of the Monitoring Sample, data collected for the Monitoring Sample are also available for all properties in the Analysis Sample.

OKM Associates, a firm specializing in managing and analyzing rental properties, conducted a mail/telephone survey of HUD's loan management staff in the Field Offices that are responsible for the properties included in the Monitoring Sample. These HUD staff reviewed (and corrected as necessary) data obtained from MIDLIS and Section 8 MIS, and provided additional information not available from other sources, including replacement reserve balances and deposits, residual receipt balances, dates of transfers of physical assets, and local market contact information. Field Office staff also provided certain data on properties' local markets, as discussed elsewhere in this appendix.

Financial data were extracted from HUD's Multifamily Information and Processing System (MIPS), a Field Office-based automated system used in loan servicing. The MIPS financial data are derived directly from annual statements of income and expense provided by each property owner as required by HUD mortgage regulatory agreements. These data include multiple years of income and expense statements for most properties in the sample. Missing data were imputed based on building type and assistance category, as described in the data documentation.

The study also drew on other automated data bases available to HUD for additional information on the Monitoring Sample. These included HUD's F47 Payment Database on HUD-insured properties, and MARS database on HUD-held properties, both of which are more reliable than MIDLIS on mortgage terms and status; HUD's 1991 "Form 949" Civil Rights Tenant Characteristics/Occupancy Report on unassisted properties (which HUD compiles annually from owner surveys); HUD's "Form 951" Addresses and Site Codes of Multifamily HUD-assisted Housing, which geo-codes project addresses; HUD's Prepayment Database, compiled by Central Office staff; HUD's Section 8 Fair Market Rents and Annual Adjustment Factors, prepared by HUD's Economic and Market Analysis staff; and the Conquest Marketing Information System (®Donnelley Marketing Information Services) for neighborhood demographic data. The study also drew upon hard copy files on HUD's Rent Supplement and Rental Assistance Payment contracts and on Flexible Subsidy contracts.

B.3   Data Collection on the Analysis Sample—Primary Data on Properties

For the Analysis Sample, the study collected data on each property's:

- Physical condition

- Local market conditions

- Ownership and finances, and

- Tenant characteristics

Each of these types of data collection is discussed below.

Physical Condition

The physical condition of the stock was assessed on-site by architects from three architectural firms (The DLR Group, Lane Frenchman Associates, and Bradfield Associates) that were experienced not only in inspecting multifamily properties, but also in applying the specialized inspection approach used by the study. The inspectors were responsible for gathering three kinds of information on each property: 1) current condition—observations that were used in the study to estimate the backlog of needs (the cost to bring all systems up to their original condition); 2) upgrade feasibility—whether a property could be physically upgraded to a higher

market use, and information needed to estimate costs of upgrading; 3) property take-offs—a measurement inventory of average units, typical building dimensions, and certain systems, used by the study both in costing backlog needs and estimating future accruals of repair/replacement costs. The inspectors also conducted neighborhood windshield surveys and collected preliminary information that was used as input for the market assessment team (discussed below).

The study's inspection approach is known as the Observable Systems Method, which was initially developed to estimate the modernization needs of the U.S. public housing stock[1]. Under this method, the condition of each property's systems is observed, evaluated, and assessed on-site; and then costed in a consistent manner off-site using a computerized costing program and cost files.

A system is defined as an observable component of a building, unit, or project site such as roof coverings, building exterior walls, boilers, elevator shaftways, refrigerators, bathroom fixtures, landscaping, parking areas, site electrical distribution systems, and building power wiring. For the current study, we tailored the Observable Systems to reflect private housing stock instead of public housing stock. We added systems, such as more unit amenities, special building envelope features, and air-conditioning systems. The inspection protocol included observing conditions of 116 mechanical, electrical, and architectural systems.

For each system, the inspector judged and recorded the level of remedial action needed to restore the system to its original condition. The action levels were "No Action," "Minor Action," "Moderate Action," "Major Action," and "Replacement," based on the observed condition. Minor defects that would be corrected through routine maintenance (e.g. faucet washer replacement) were generally excluded. The action levels assigned to each observable system condition were provided to all inspectors in training sessions and a series of handbooks. This uniform set of instructions assured consistency across individual inspectors. Exhibits B.2 and B.3 are sample action level descriptions and the appropriate section of an inspection booklet. The examples are taken from the "Full Bathroom" section of the "Unit Inspection" booklet. (Exhibit B.2 is a page from this booklet.) Under the section labelled "Full Bathrooms," are the first five systems observed in the bathroom inspection. Some systems (walls and ceilings,

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[1]Dixon Bain et al., *Study of the Modernization Needs of the Public and Indian Housing Stock* (Cambridge, MA: Abt Associates, Inc., March 1988). This inspection method proved sufficiently cost-effective that it has subsequently been adapted and used by at least one commercial inspection firm.

UNIT BOOKLET

KITCHENS (CONTINUED)

	ABSENT	AGE	ACTION LEVEL	
			N/A	REP
Refrigerator		___	☐	☐
Garbage Disposal	☐	___	☐	☐
Dishwasher	☐	___	☐	☐
Microwave	☐	___	☐	☐
Trash Compactor	☐	___	☐	☐

KITCHEN UPGRADE FEASIBILITY

	MODERATE UPGRADE			MAJOR UPGRADE	
	N/A	PART	FULL	FEASIBLE	NOT FEASIBLE
Kitchen	☐	☐	☐	☐	☐

	YES	ADD
Need to Expand	☐	
Don't Need to Expand	☐	
Add Window		☐
Other: _____	☐	☐

FULL BATHROOMS

NUMBER OF BATHS PRESENT: _____

	TYPE		AGE	ACTION LEVEL				
				N/A	MIN	MOD	MAJ	REP
Walls & Ceilings-Partitions & Surfaces				☐	☐	☐	☐	___%
Floor Cover & Sub-base	Ceramic	☐	___	☐			☐	☐
	Resilient	☐						
Fixtures	Porcelain	☐	___	☐	☐	☐	☐	☐
	Fiberglass	☐						
Accessories				☐		☐		☐
Vanities	Single	☐		☐				☐
	Double	☐						

accessories) require only an action level in order to estimate repair cost; others require a type (i.e., the materials in use or size) as well as action level for the repair estimate. For example, under the Bathroom Floor Cover and Subbase System, "Type" is necessary because replacing a *ceramic* tile floor would be more costly than replacing a *resilient* tile floor or linoleum.

Exhibit B.3 is taken from the *Inspector's Workbook* of conditions and action levels. Under the system heading there are three columns. The first column is the description of the *Observed Condition,* the middle column is the *Action Level* needed, and the third column is a description of the *Likely Repair Needed to Restore the System* to full usefulness.

Inspectors used a standard set of five booklets—Site Features, Building Envelope, Building Mechanical and Electrical, Dwelling Unit (both architectural and mechanical systems are included), and Takeoff—to collect all relevant system level information. For each Observable system, they noted the presence or absence of the system, the age, the type, if appropriate (e.g., battery or hard-wired smoke detectors), the number, if appropriate (e.g., the number of windows), and the repair/replace action level associated with the observed condition.[2] Using architectural drawings, when available, or "pacing off" when no plans were available, the inspectors calculated take-off measurements for site areas and distribution systems, average unit square footage for all unit sizes present at the property, and key building dimensions for up to three predominant types/sizes of buildings. These measurements were recorded in the Takeoff booklet.

Two other forms—Project Quality Distribution and Inspection Building Type and Quality—were used to obtain overall descriptions of the building stock and the relative quality of units and buildings at the property.

In advance of the site visit, the inspector sent a Project Quality Distribution form to the site manager. The manager completed the information on the number of units by size (bedrooms) and condition, as well as the number of buildings by type (high-rise, walk-up, etc.) and condition. A definition guide on conditions was attached to the form to make it easier for the manager to categorize the units and buildings. When the inspectors arrived on-site, they

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[2]The inspections excluded observations related to detecting or abating special hazards due to presence of asbestos or lead paint. At the time the study was designed, neither the information needed to categorize the presence and level of these hazards, nor the optimal abatement methods (and costs) were available. HUD's budget for the study, therefore, excluded funds for these specialized inspections

Bathroom Walls and Ceilings: Partitions and Surfaces

Condition	Level	Action
Surface intact but exhibits simple aging or deterioration.	Minor	Surface material needs to be restored with minimal prep work, paint.
Surface has occasional damage but no loss of partition integrity.	Moderate	Major prep work required for surface material restoration, paint
Considerable damage to surface but no loss of partition integrity.	Major	Major prep work required for surface material restoration including tile replacement, paint.
Wall and/or ceiling has lost integrity: substaintial water damage; sagging or buckling of partition.	Replace	Replace wall/ceiling material and paint Indicate percentage to be replaced

Bathroom Floor Covering and Sub-base

Type= Ceramic Tile or Resilient

Condition	Level	Action
N/A	Minor	N/A
N/A	Moderate	N/A
Floor covering severely deteriorated.	Major	Replace floor covering
Floor is buckling, warped or splintered.	Replace	Replace floor covering and sub-floor

Bathroom Fixtures

Type= Porcelain or fiberglass

Condition	Level	Action
Sink is chipped, rusted, cracked or generally deteriorated	Minor	Replace sink
Toilet is chipped, rusted, cracked or generally deteriorated	Moderate	Replace toilet
Sink and toilet or tub is chipped, rusted, cracked or generally deteriorated.	Major	Replace sink and toilet or replace tub
All fixtures are chipped, rusted, cracked or generally deteriorated	Replace	Replace all fixtures

Bathroom Accessories

(Medicine cabinet, towel bar, shower rod, soap, holders)

Condition	Level	Action
N/A	Minor	N/A
Some accessories missing or broken (not medicine cabinet)	Moderate	Replace 2-3 broken or missing accessories
N/A	Major	N/A
Majority of accessories missing or broken.	Replace	Replace all accessories

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reviewed the Project Quality Distribution form with the site manager and discussed the general characteristics of the property, including:

- Number, type (high rise or elevator buildings, low-rise, garden/townhouses, or single-family detached), and age of buildings,[3]

- Number of units by bedroom size,[3] and

- The property manager's assessment of overall condition of buildings and units, i.e., what proportion the manager estimated were in excellent, good, fair, or poor condition.[4]

From this composite of the property, inspectors selected up to three buildings and three units to inspect, based on predominant quality categories and predominant building and unit types. If multiple quality buildings were present, inspectors were instructed to inspect the lowest quality building. Inspectors were also told to inspect at least one building containing an elevator if one existed at the property, regardless of its likelihood to be inspected under the guidelines based on predominant quality and type. For example, if the property had one high rise building and twenty townhouse buildings, the inspector would inspect the high rise and two townhouses.

For units, the inspectors were instructed to inspect units from the predominant sizes with the provision that the inspectors select units that, in the manager's opinion, were in the worst physical condition.[5] If all the units at the property were in good condition, then the inspector made the selection based solely on predominant unit size. If, however, there were units ranging in quality from poor to excellent, the inspector would select poor, fair, and good units, and not inspect units in excellent condition. This protocol was followed to obtain direct observations on the elements most costly to repair. Adjustments to property-level repair costs for the relatively less expensive repairs of better quality units are described in Appendix C.

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[3]Inspector recorded this information on the Inspector Building Type and Quality (IBTQ) form

[4]Manager and inspector recorded this information on the Project Quality Distribution (PQD) form.

[5]The value to the study of the manager's rating of units and buildings by overall condition depended primarily on the manager's *consistency*, rather than on the manager's use of the exact definition of excellent, good, fair, or poor. The inspector conducted quick "walk-throughs" of units in the various categories, in addition to conducting the actual inspections, to verify the consistency of the manager's ratings. If discrepancies existed, the inspector adjusted the distribution to reflect the differences.

In addition to assessing the current physical condition, inspectors provided information on the physical (but not market) feasibility of upgrading certain observable systems for both a "moderate" and a "major" market conversion. They recorded this information in the inspection booklets, as shown in the example in Exhibit B.2 for "Kitchen Upgrade Feasibility". (This information is needed to ascertain net market value—that is, to subtract upgrade costs from capitalized net operating income for market-level unassisted rents.) In some cases, upgrading meant adding a system if one did not currently exist (e.g., a swimming pool). If the system already existed, upgrading it would involve replacing it with better quality materials.

A total of 1,089 buildings and 1,520 units were inspected at all 570 properties of the Analysis Sample.

Local Market Conditions

Applied Real Estate Analysis, Inc. (AREA), a firm specializing in market analysis, conducted local market assessments for all 570 properties in the Analysis Sample. The local market assessments provide several types of key data:

- Potential unrestricted market rents, and potential value as condominiums

- Likely use of the property in an unrestricted market

- Local market characteristics: vacancy rates, property appreciation rates, condominium absorption rates, capitalization rates

- Local assisted and affordable housing, Section 8 success rates, condominium conversion rules, and housing and real estate activity by nonprofit community-based organizations.

HUD's Field Office economists provided AREA with initial information on the local markets and competitive properties, and names and phone numbers of local contacts knowledgeable about the markets (including property managers, realtors, and local planners). This information was generally supplemented by HUD Field Office loan servicers and by the study's physical inspectors.

The study's inspectors also provided AREA with important information about the properties and their neighborhoods. The inspectors photographed the sample properties, nearby potentially competitive properties, and some views of the neighborhood surrounding the property to aid in defining the neighborhood context. They also conducted a brief windshield survey,

recording observations about the neighborhood such as age of residential structures, density, non-residential uses, major amenities (such as a park or shopping area), and any neighborhood elements that would detract from the market value (such as an old, rundown industrial area).

AREA staff conducted surveys by telephone. They gathered information from realtors, public housing and community development officials, and others knowledgeable about the local market on possible alternative uses (such as condominiums, market-rate rental, or nonresidential) and current rental market position (i.e., is the property currently a low-rent property, a moderate rental, or a high-end luxury complex?), vacancy rates, and trends in supply and demand. The final assessment of the local market context of each property was summarized on a Market Valuation Summary Guide form.

Ownership and Finances

OKM Associates, in addition to surveying HUD Field Offices, also surveyed owners and managers of the properties in the analysis sample. The Owner/Manager's FHA Questionnaire was mailed to managers and asked them to provide information not available from HUD sources (e.g., management operations, ownership structure, financial obligations, and tenant characteristics) as well as to verify some of HUD's data on their properties. The survey forms listed the information already obtained from HUD files, so that for many items, managers simply needed to scan for accuracy. For other items, however, some managers needed input from owners or accountants.

Response rates were disappointing. Even after two OKM follow-ups by telephone, and numerous phone calls from HUD's Field Offices and Central Office staff, the final response rate was 63 percent. Response rates were even lower for questions on ownership structure and property finances.

Tenant Characteristics

The primary source of data on the characteristics of tenants in HUD-insured properties was property owners and managers. The tenant characteristics included household income, race/ethnicity of head of household, elder status and household size. Owners/managers of assisted properties were asked to provide tenant characteristics of individual households from HUD Form 50059. In addition, all owners/managers were asked to provide summary

characteristics for the property of residents' income, race, age, and household size. We received micro level data from 31 owners/managers and summary data from 255. (There was some overlap between the two sources.) Where available, we filled in missing data from HUD's prepayment database (for older assisted properties that are eligible to prepay their mortgages)—51 properties—and from the National Low Income Housing Preservation Commission study—15 properties. These backup sources, however, included only some of the demographic data elements needed. Missing were household size (in the Preservation Commission data), and age and race of head of household (in both the Prepayment and Preservation Commission data).

Tenant characteristics were missing for approximately half the sample. We imputed the characteristics of tenants in properties with missing data, based on the mean values of characteristics among "similar" properties that provided data. Details on the imputation procedures are provided in the data documentation.

The study had originally been designed to include tenant data from HUD's Multifamily Tenant Certification System (MTCS) and HUD Region III's ASTEC system. The MTCS, however, was not available in time, and the ASTEC system did not cover any of the properties in the study sample.

B.4 Other Data Collection

For the Monitoring Sample, demographic data on the sample neighborhoods were extracted from the Conquest Marketing Information System, a proprietary product of Donnelly Marketing Information Services that updates and supplements information available from the U.S Decennial Census. This study used Conquest to produce estimates for 1991 (based on the 1980 census) of population characteristics within a one-mile radius of each sample property.

To obtain information needed to model HUD's programs and rules, a series of interviews were conducted with staff of HUD's Office of Multifamily Housing Programs, particularly those in the Office of Preservation and Property Disposition and the Office of Multifamily Management. This information, which supplemented and interpreted published information, covered items such as rent increase methods, allocation of Section 8 LMSA or Flexible Subsidy, property disposition, mortgage prepayment and incentives available under the Preservation Act, Section 8 Opt Outs, and loan servicing practices.

B.5   Data Cleaning and Quality Control

For each data collection task, final data cleaning was performed by Abt staff. In addition, for any collection done by a subcontractor, the subcontractor's staff performed quality control checks on at least 10 percent of the work, and edited forms for completeness and clarity before sending the data to Abt. As an example, 10 percent of the physical inspections were repeated by a second inspector, using a second set of forms.

Abt staff did extensive cleaning for completeness and consistency. For the data obtained from HUD sources, Abt faxed lists of missing or conflicting data elements to Field Office staff for corrections. Most inconsistencies in data collected by the inspectors and market analysts were corrected by subcontractor staff before the data were sent to Abt. The remaining errors on key data elements were corrected either by discussing the case with the inspector or market analyst, or in rare instances, by calling the property manager.

Because it was essential to have complete data on the analysis sample as input for the simulation model (see companion volume, *Modeling the Future Status of the HUD-Insured (Or Held) Multifamily Stock*), values on critical missing variables were imputed based on data for otherwise similarly situated properties. For example, the market value data omitted "estimated unassisted market rents" for some unit sizes (bedroom/bath combinations) for some properties. These were imputed from other rent estimates for that unit size within the same assistance category using the ratio of rents of adjacent sizes. Imputations also were necessary for missing values of critical financial items. These imputations were based on assistance category and building type. Data files provided to HUD contain flags to indicate variables for each property that were imputed. Data documentation transferred with the data files provide more specific descriptions of imputation steps and other manipulations used to generate analysis variables.

APPENDIX C

SYSTEM FOR ESTIMATING PHYSICAL NEEDS BACKLOG AND ACCRUAL COSTS FROM INSPECTIONS

This appendix outlines the approach used to relate observations made by inspectors to costs of repairs and replacements. The first section describes the methods for arriving at costs of the *backlog of currently needed repairs and replacements* ("physical needs backlog costs"). The second section describes the method to obtain *upgrade feasibility costs*, that is, amounts that would have to be expended in order to convert a property to unassisted market occupancy ("upgrade costs"). The third section addresses the method for estimating *future accrual of major repair and replacement costs* ("accrual costs").

C.1 Estimating Physical Needs Backlog Costs from Property Inspections

The process of estimating repair costs based on the property inspections involved five steps:

- Conducting a *physical inspection* of the overall site and up to 3 buildings and units within each project in the analysis sample;

- Generating a system-level *cost file* (116 systems or groupings of physical features were inspected in the properties);

- Calculating system-level *costs for the site and inspected units and buildings*;

- Computing *property-level costs* by inferring costs for uninspected units and buildings from inspected units and buildings;

- *Regionally adjusting* the property-level costs.

Physical Inspection of the Property

The physical inspection method—the Observable Systems Method—was described previously in "Appendix B: Data Collection Summary." The inspection produces information for each property on: the current condition and required repair action level for each of 116 systems for the site and for the buildings and units that were inspected; upgrade feasibility to

higher market use; and property take-offs—a complete inventory of the presence, count, age, type, and dimensions of components.

System Level Cost File for Computing Physical Needs Backlog

As was discussed in Appendix B, under the Observable Systems Method, the costs of carrying out the repair actions recorded by the inspector is computed off-site using a computerized cost file and program. The first step in generating the cost file was developing up to five system-specific, categorized levels of repair, ranging from no action to replacement of a system, to correspond to action levels the inspector would use to describe the repairs needed to bring the system up to a safe, sound, marketable condition. The action level groups are:

- NA for no action

- MIN for minor repair

- MOD for moderate repair

- MAJ for major repair, and

- REP for replace

For any system, each action level denotes a specific repair action. For example, for Kitchen Cabinets/Counters/Sinks (a dwelling unit system), the MIN action is to replace countertop or faucet fittings; the MOD action is to refinish existing cabinets, or repair doors or drawer hinges as well as replacing anything covered under MIN; MAJ includes the components of MOD as well as replacing the countertop *and* sink; and REP includes all MAJ components plus replacing countertop back splash and cabinets. In the above example for cabinets/countertops/sinks, the MIN cost is $600 for each kitchen requiring MIN action. MOD costs are $700 for each kitchen requiring a MOD level of repair. MAJ costs are $1,400 for each kitchen. REP costs are $2,200 per kitchen.[1] Exhibit C.1 shows the cost for each action level for each system. Not all systems have 5 action levels. The *Inspection Handbook* for this study details each allowable action level for each system.

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[1] While the costs for most systems increase as the action level increases, some systems do not have higher costs at higher action levels This is because of the definition of the action levels. For example, replacement of storm/screen windows in the window system (MAJ) is less costly than replacing the window security devices (MOD).

		Exhibit C1: Fix System Cost	By Action Level			
SYSTEM	MIN	MOD	MAJ	REP	Unit of Measure	Assumptions
+++ SITE SYSTEMS						
Landscape	0.10	0.20	0 75	1.00	Landscape-SF	
Roadways	0.14	0.29	0.51	1 56	Road-SF (min 1000)	
Parking	0.14	0.29	0 51	1 33	Park-SF (min 1000)	
Paved Pedestrian	0.20	0.40	0.70	1.44	PvdPed SF(min1000)	
Curbing-Bituminous	NA	NA	NA	3 00	Curbing-LF	
Curbing-Concrete	NA	NA	10 00	16.00	Curbing-LF	
Curbing-Granite	NA	2.00	8.00	NA	Curbing-LF	
Fencing-Chain Link	NA	NA	NA	12 00	Fencing-LF	
Fencing-Wrought Iron	NA	NA	NA	33 00	Fencing-LF	
Fencing-Wood	NA	NA	NA	10 00	Fencing-LF	
Retaining Walls	NA	15.00	NA	150.00	Retain Wall-LF	6 ft
Site Drain-Undergrnd	NA	890.00	3350 00	7850.00	# Catch Basins	
Site Drain-Surface	NA	0.75	0.95	NA	Landscape-SF	
Pole Lighting	500.00	800.00	1300 00	3500.00	# Poles	
Site Furniture	30.00	60.00	100.00	150.00	Site Units	
Yards & Enclosures	NA	350.00	NA	750 00	# Yards	
Dumpsters	1000.00	3500 00	2100.00	5600.00	# Dumpsters	
Swimming Pool	4600.00	5600.00	14000.00	NA	# Pools	
Tennis Courts	3000.00	NA	4300 00	21000 00	# Courts	Double Court
Basketball Courts	3000.00	1800.00	NA	11000.00	# Courts	
Elec Dist-Ovr w/elec	NA	NA	95 00	130.00	Site Elec Dist-LF	
Elec Dst-Ovr wo/elec	NA	NA	75.00	100.00	Site Elec Dist-LF	
Elec Dist-Und w/elec	NA	NA	115.00	150 00	Site Elec Dist-LF	
Elec Dst-Und wo/elec	NA	NA	90 00	120.00	Site Elec Dist-LF	
Heat Watr Dst-Steam	NA	NA	NA	150.00	Heat Water Dist-LF	
Heat Watr Dst-Ht Wtr	NA	NA	NA	175 00	Heat Water Dist-LF	
Dom Hot Water Lines	NA	NA	NA	25.00	Dom Hot Water-LF	
Dom Cold Water Lines	NA	NA	NA	20 00	Dom Cold Water-LF	
Main Water Service	NA	NA	NA	40 00	Main Water Serv-LF	
Gas Lines	NA	NA	NA	25.00	Gas Line-LF	
Site Sanitary Lines	NA	NA	NA	35 00	Site Sanitary-LF	
Septic System	NA	NA	312 50	7500 00	Site Units	
Sewage Ejectors	800.00	1400 00	2000 00	3500 00	# Ejectors	
Hydrants	NA	NA	NA	1500 00	# Hydrants	

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These cost elements include labor, building and profit overhead

Table 1:Continued

SYSTEM	MIN	MOD	MAJ	REP	Unit of Measure	Assumptions
*** ENVELOPE SYSTEMS						
Foundation-4 ft	0.60	NA	2.50	NA	Perimeter-LF	
Foundation-8 ft	NA	1 60	3 10	NA	Perimeter-LF	
Slab-Slab on Grade	NA	0.40	2.00	4 75	Footprint-SF	
Slab-Basement	NA	0 40	2 50	5 25	Footprint-SF	
Ext Wall-Masonry	1 00	NA	4 00	15 00	Masonry-SF	
Ext Wall-Plaster	1 00	NA	2 00	6 50	Plaster-SF	
Ext Wall-Wood	0 75	1 25	2.00	4 00	Wood-SF	
Ext Wall-Vinyl	0 75	1 25	1 75	2 50	Vinyl-SF	
Insulation-Walls	NA	NA	0 70	NA	Sum Al types-SF	
Insulation-Ceilings	NA	NA	1 00	NA	Roof1+Roof2-SF	
Roof Covering-EDPM	0.75	1 00	2 25	3 25	Roof-SF	
Roof Cover-Shingles	0.50	0 80	1 00	1 65	Roof-SF	
Roof Cover-Built-up	1.00	1 20	2 75	4 50	Roof-SF	
Parapet Wall	NA	30 00	NA	60 00	Perimeter-LF	3 ft high
Chimney	200 00	NA	NA	800 00	# Chimneys	2'x2'x4' high
Roof Hatches-Small	NA	NA	NA	500 00	# Roof Hatches	< 10 SF
Roof Hatches-Medium	NA	NA	NA	900 00	# Roof Hatches	10-20 SF
Roof Hatches-Large	NA	NA	NA	1500 00	# Roof Hatches	20-30 SF
Skylight-Small	NA	NA	NA	300 00	# Skylights	< 10 SF
Skylight-Medium	NA	NA	NA	800 00	# Skylights	10-20 SF
Skylight-Large	NA	NA	NA	1200 00	# Skylights	20-30 SF
Penthouse-Small	NA	NA	560.00	1800 00	# Penthouses	4'x10'x8'
Penthouse-Medium	NA	NA	1380 00	6300 00	# Penthouses	8'x14'x10'
Penthouse-Large	NA	NA	3000 00	22500 00	# Penthouses	20'x20'x10'
Roof Drainage	NA	NA	1 00	2 00	Roof1+Roof2-SF	
Windows-Small	50 00	75 00	75 00	350 00	#Windws(need act)	< 15 SF
Windows-Medium	75 00	125 00	95 00	525 00	#Windws(need act)	< 30 SF
Windows-Large	100 00	175 00	135 00	900 00	#Windws(need act)	> 30 SF
Ext Com Doors-Wood	200 00	NA	550 00	850 00	#Doors (need act)	
Ext Com Doors-Metal	200 00	NA	550 00	850 00	# Doors (need act)	
Ext Com Doors-Glass	200 00	NA	650 00	950 00	# Doors (need act)	
Unit Ent Doors-Wood	200 00	NA	550 00	750 00	# Doors (need act)	
Unit Ent Doors-Metal	200 00	NA	550 00	750 00	# Doors (need act)	
Unit Ent Doors-Glass	200 00	NA	650 00	850 00	# Doors (need act)	* See Note 1
Storm/Screen Doors	NA	NA	NA	250 00	# Doors (need act)	
Canopies-Small	NA	200 00	NA	600 00	# Canops(need act)	6'x4'
Canopies-Medium	NA	850 00	NA	2500 00	# Canops(need act)	6'x16'

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Table 1:Continued

SYSTEM	MIN	MOD	MAJ	REP	Unit of Measure	Assumptions
Canopies-Large	NA	2000 00	NA	6000 00	# Canops(need act)	10'x30'
Exterior Stairs-Wood	300 00	NA	600 00	1800 00	# flights need act	
Ext Stairs-Concrete	500 00	NA	1000 00	4000 00	# flights need act	
Bldg Mtd Site Lights	NA	250 00	NA	400 00	# Lights(need act)	* See Note 2
Fire Escapes	NA	300 00	NA	1500 00	#escps * #stries	
Porches (w/roof)	NA	800 00	NA	4000 00	# Porches need act	8'x16'
Decks (wo/roof)	NA	600 00	NA	2500 00	# Decks need act	8'x16'
Attchd Storage Sheds	NA	350 00	NA	900 00	# Sheds need act	4'x6'
Vestibules	1 50	NA	3.25	NA	Vestibule-SF	
Corridors	1 50	3 00	4 25	5 00	Corridor-SF	
Stairways	1 50	3 50	5 00	6 00	Int Stair-SF or 160 * #stories	
Interior Lights	NA	1 00	NA	2 50	Corrdor+Com Rm -SF	
Mail Facilities-Box	NA	NA	NA	65 00	# Mail Boxes	
Mail Facil-Kiosk	NA	NA	NA	1950 00	# Mail Facilities	16 per mount
Laundry Rooms	1 00	3 00	3 50	5 00	18SF * #pcs equip	
Laundry Equipment	NA	200 00	NA	600 00	# pieces of equip	
Common Rooms	1.00	3 00	3 50	5 00	Common Room -SF	
Common Kitchen	1.00	3 00	5 00	NA	Common Kitchen -SF	

Note 1.Glass entry Doors not in Inspector's Handbook

Note 2 Handbook does not say to record #

Table 1:Continued

SYSTEM	MIN	MOD	MAJ	REP	Unit of Measure	Assumptions
**** BME SYSTEMS						
Heating Risers	75.00	100.00	150 00	200 00	Bldg Units	
Gas Distribution	75.00	150.00	250 00	320.00	Bldg Units	
Ht & Cold Water Dist	100.00	200 00	300 00	400.00	Bldg Units	
Sanitary Dist	100.00	200 00	300.00	500.00	Bldg Units	
Fire Suppression	0.25	0.50	35000.00	2.00	Gross Area SF Maj:flat cst	Piping not inc
Sump Pumps-Small	NA	150.00	NA	400 00	# Sump Pumps	
Sump Pumps-Large	NA	400.00	NA	1100.00	# Sump Pumps	
Compactors-Small	NA	1500 00	2500 00	5000 00	# Compactors	
Compactors-Large	NA	1500.00	3000 00	12000.00	# Compactors	
Cen Vent & Exh	NA	0.75	1.25	2.00	Gross Area SF	
Central AC	NA	1.50	NA	4.50	Gross Area SF	
Swtchgear-w/Elec Ht	NA	NA	NA	1 50	Gross Area SF	
Swtchgear-wo/Elec Ht	NA	NA	NA	1 00	Gross Area SF	
Bldg Power Wiring	NA	NA	NA	2.00	Gross Area SF	
Emer Generator	400.00	1200.00	5000 00	30000.00	1 per project	
Emergency Lights	NA	NA	NA	400 00	Bldg Units / 6	
Smoke Det-Battery	NA	NA	NA	200 00	Bldg Units / 6	
Smoke Det-Hardwired	NA	NA	NA	250.00	Bldg Units / 6	
Communication Sys	NA	NA	NA	200.00	Bldg Units / 6	
Emer Call Alarm Sys	NA	NA	NA	300 00	Bldg Units / 6	
Master TV Antenna	NA	NA	NA	3000.00	Bldg Units / 6	
Closed Circuit TV	NA	NA	NA	1000 00	Bldg Units / 6	
Hot Air Furnaces	NA	200 00	600.00	1300.00	Bldg Units	
Boilers	100 00	300.00	600 00	1300.00	Bldg Units	
Boiler Room Piping	150.00	250 00	400 00	660 00	Bldg Units	
Boiler Rm Periphs	500.00	900.00	1400 00	2100 00	Bldg Units	
DHW Generation	50.00	125.00	175 00	235 00	Bldg Units	
Shaftways-Hydraulic	100.00	200.00	1000 00	5000 00	Num Elevators	
Shaftways-Hoist	200.00	500 00	2000 00	5000 00	Num Elevators	
Shaftway Doors-Dbl	300.00	500 00	1200 00	2000 00	Num Floors	
Shaftway Doors-Sgl	150 00	250 00	600 00	1000.00	Num Floors	
Cabs	300.00	500.00	700.00	2500 00	Num Elevators	
Controller	500 00	1000 00	1500 00	5000.00	Num Elevators	
Machinery-Hydraulic	5000 00	10000 00	15000 00	40000 00	Num ELevators	
Machinery-Hoist	2000 00	4000.00	6000 00	20000.00	Num ELevators	

Table 1:Continued

SYSTEM	MIN	MOD	MAJ	REP.	Unit of Measure	Assumptions
*** UNIT SYSTEMS						
Int Walls,Ceil Part	NA	NA	NA	2.50	TotSF-(kit,bath)*4	
Interior Floor	NA	NA	NA	1.50	Tot SF-(kit,bath)	
Int Walls,Ceil Surf	0.60	0.95	1.35	NA	TotSF-(kit,bath)*4	
Floor-Carpet	NA	NA	NA	2.25	Tot SF-(kit,bath)	
Floor-Resilient	NA	NA	NA	1.50	Tot SF-(kit,bath)	
Int Doors, Frames	NA	35.00	200 00	320.00	# Doors need act	
Kit Walls, Ceilings	0.65	0.90	1 95	3.80	0B=40SF; 1B=180SF Rest=264SF	
Kitchen Floors	NA	NA	1.60	2 60	0B=40SF;1B=60SF; Rest=88SF	
Cabnts,Counters,Sinks	600.00	700.00	1400.00	2200 00	1 per Kitchen	
Range & Hood	125.00	200.00	450.00	975.00	1 per Kitchen	
Refrigerator	NA	NA	NA	450.00	1 per Kitchen	
Garbage Disposal	NA	NA	NA	200 00	1 per Kitchen	
Dishwasher	NA	NA	NA	450.00	1 per Kitchen	
Microwave	NA	NA	NA	250 00	1 per Kitchen	
Trash Compactor	NA	NA	NA	425.00	1 per Kitchen	
Full Bath Walls/Ceil	0.65	0.90	3.85	5.75	200SF * #full bths	50% tile
Full Bath Flrs-Tile	NA	NA	6.50	8 00	40SF * #full bths	
Full Bath Flrs-Resil	NA	NA	1 50	2.50	40SF * #full bths	
Full Fixt-Porclain	300.00	300.00	600 00	1300 00	# Full Baths	
Full Fixt-Fiberglass	300.00	300.00	600 00	1200 00	# Full Baths	
Full Bath Accessries	NA	75.00	NA	150.00	# Full Baths	
Full Vanities-24"	NA	NA	NA	275.00	# Full Baths	
Full Vanities-36"	NA	NA	NA	325.00	# Full Baths	
Half Bath Walls/Ceil	0.65	0.90	3.85	5.75	110SF * #half bths	50% tile
Half Bath Flrs-Tile	NA	NA	6 50	8 00	20SF * #half bths	
Half Bath Flrs-Resil	NA	NA	1.50	2.50	20SF * #half bths	
Half Bath Fixtures	300.00	300.00	600 00	NA	# Half Baths	
Half Bath Accessries	NA	75 00	NA	150 00	# Half Baths	
Half B Vanities-24"	NA	NA	NA	275.00	# Half Baths	
Half B Vanities-36"	NA	NA	NA	325 00	# Half Baths	
HVAC - Heating only	NA	360.00	NA	960 00	# HVAC Units	
HVAC - Heat/Cool	NA	960 00	NA	4800 00	# HVAC Units	
Radiation Hydronic	NA	6 00	NA	12.00	Proj Avg Perim/ (BldgUnits/Stries)	
Radiation Electric	NA	NA	NA	16.00	2/3 ProjAvg Perim/	

Table 1:Continued

SYSTEM	MIN	MOD	MAJ	REP	Unit of Measure	Assumptions
					(BldgUnits/Stries)	
Unit Boiler	NA	800 00	NA	2000.00	1 per Unit	
Unit Furnace	NA	500.00	NA	1200.00	1 per Unit	
Unit DHW Generation	NA	NA	NA	350.00	1 per Unit	
Temperature Controls	NA	NA	NA	100.00	# Temp Controls	Wall-mounted
Wall Air Conditioner	NA	NA	NA	700.00	# Wall ACs	
Unit Elec Panel	NA	NA	NA	900.00	1 per Unit	
Unit Elec Wiring	NA	NA	NA	3.00	Total Unit SF	
Bell/Intercom	NA	NA	NA	150 00	1 per Unit	
Closed Circuit TV	NA	NA	NA	100 00	1 per Unit	
Emer Call Alarm Sys	NA	NA	NA	125.00	1 per Unit	
Smoke Det-Battery	NA	NA	NA	100.00	1 for 0 bed;2 for 1-2 bed;3 for 3-4 bed	
Smoke Det-Hardwire	NA	NA	NA	125.00	1 for 0 bed;2 for 1-2 bed;3 for 3-4 bed	

We obtained the services of A.M. Fogarty and Associates, a firm with extensive experience in costing for private housing construction and modernization, to review the cost file developed for the Abt public housing study[2] and to define cost elements which corresponded to each system and action level combination. As one test of the cost file, Abt conducted statistical comparisons between these cost elements and related elements in the R.S. Means *Repair and Remodeling Cost Data* and *Square Foot Costs* for 1991. The two systems provided highly consistent results (with a Pearson correlation coefficient between the two sets of costs equal to 0.964).

System Level Costs for the Site and Inspected Units and Buildings

In this step, the inspector's observations and the cost files are combined to calculate, for each property, costs for repair actions on items that have been inspected. A mathematical algorithm is applied to each system the inspector checked off as needing some level of repair. The basic concept is multiplying unit cost by a quantity measure, where the quantity measure may be scaled by a percentage of the item affected.

For example, for Roadways the algorithm first checks to see if the Roadway square feet (SF) noted on the Takeoff form is larger than 1,000—the minimum SF allowed by the calculation. The algorithm then multiplies the larger of Roadway SF or 1,000 SF by the cost element associated with the Roadway action level noted on the Site booklet. In addition, if the action level is MIN, then only 10 percent of the SF is used (still keeping 1,000 as a minimum however), as the definition of the MIN action for Roadways is to "patch a pothole or swale and repave, and regravel the area—less than 10 percent of the road." Thus to calculate the MIN cost for a 25,000 SF Roadway, the algorithm would be: $0.14 (cost per SF/minimum action) * 25,000 (# of SF) * 0.10 (% of system affected) = $350. For a MOD action on the same system and property, the inspector would have noted on the Site form the percentage (between 10 and 50 percent) of the Roadway that needs to be resurfaced, regraded as well as repaved or regraveled. Thus, if the inspector estimated that 35 percent of the roadway needed repair, then the algorithm would be: $0.29 * 25,000 sq.ft. * 0.35 = $2,537.50.

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[2]Dixon Bain et al., *Study of the Modernization Needs of the Public and Indian Housing Stock* (Cambridge, MA· Abt Associates, Inc., March 1988). This inspection method proved sufficiently cost-effective that it has subsequently been adapted and used by at least one commercial inspection firm.

A COBOL program was written to process the clean database by relating all the inspection data collection instruments to each other via the HUD Project ID. A physical needs backlog cost is then calculated for each system that required some repair or replace action. Some of the algorithms make use of the takeoff data as in the above example on Roadways. This cost element is on a per square foot basis. Other cost algorithms are based on the number, such as the number of windows, that required the action. Exhibit C.1 shows the multiplier for each cost element in addition to showing the cost for each action level.

After the per system costs are calculated, they are grouped together to form analysis groups. For example, the Envelope system group called *Windows and Doors* includes the inspection systems: Windows-small, Windows-medium, Windows-large, Exterior Common Doors, Unit Entry Doors, and Storm/Screen Doors. Exhibit C.2 shows which Observable systems are included in each analysis group.

Property Level Costs

In order to generate costs for the property as a whole, costs for buildings and units that were not inspected needed to be estimated.[3]

For each property, costs were generated for the buildings and units that were *not inspected* based on their relationship to buildings and units that were inspected. During the inspection, the inspector filled out an additional form—the *Inspector Building Type and Quality Form* (IBTQ). For each building in the project (whether inspected or not), the inspector recorded the age, overall building quality, the building type (High rise, Walk-up, Garden, Single family detached), and a count of units in each size category (0BR/1Bath, 1BR/1Bath, 2BR/1Bath, 2BR/1+Baths, 3BR/1Bath, 3BR/1+Baths, 4BR/1Bath, 4BR/1+Baths) in the building. Another form, the *Project Quality Distribution Form*, was completed by the property manager and reviewed by the inspector. The purpose of the PQD form was to collect data, at a property level, on how many units overall (without a breakdown at the building level) in each size category fell into each quality category (Excellent, Good, Fair, and Poor). The PQD form categories for units were by bedroom count only. The IBTQ form included more specific breakdowns by bedroom *and* bath count. The average unit square footage calculations are for

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[3]This is not true for Site systems because all site elements were inspected.

Exhibit C 2

System Groups and Associated System Components for Backlog Needs Cost Estimates

System Group Name	System Component
Unit Interior Construction	Interior Walls-Partitions Floors Sub-base
Unit Interior Finish	Interior Walls-Surface Floor Covering: Carpet Floor Covering. Resilient Interior Doors Kitchen Walls Kitchen Floor Bathroom Walls Bathroom Floor
Kitchen Fixtures	Kitchen Cabinet/Counter Range and Hood Refrigerator Garbage Disposal Dishwasher Microwave Trash Compactor
Bathroom Fixtures	Bathroom Fixtures Bathroom Accessories Vanities
Unit Heating and Cooling	HVAC units Radiation Boiler (Unit level) Furnace (Unit level) DHW Generation (Unit level) Temperature Control Wall Air Conditioner
Unit Electric	Electrical Panel Electrical Wiring Bell/Intercom CCTV ECAS Smoke Detector
Building Exterior Closure	Foundation Slab Exterior Wall Insulation

Exhibit C.2 (continued)

System Groups and Associated System Components for Backlog Needs Cost Estimates

Roofs

Roof Covering
Parapet Wall
Chimney
Roof Hatches
Skylight
Penthouse
Roof Drainage

Windows and Doors

Windows
Exterior Common Doors
Unit Entry Doors
Storm/Screen Doors

Exterior Features

Canopies
Exterior Stairs
Bldg Mounted Site Lights
Fire Escapes
Porches
Decks
Sheds

Common Areas

Vestibules
Corridors
Stairways
Interior Lights
Mail Facilities
Laundry Rooms
Laundry Equipment
Common Rooms
Common Kitchens

Building Mechanical and Electric

Heating Risers
Gas Distribution
Dom Hot/Cold Water Dist
Sanitary Distribution
Fire Suppression
Sump Pump
Compactors
Switchgear
Building Wiring
Emergency Lights
Building Smoke Detector
Communication System
Building ECAS
Master TV Antenna
Building CCTV

Exhibit C.2 (continued)

System Groups and Associated System Components for Backlog Needs Cost Estimates

Building Heating and Cooling

        Central Vent/Exhaust
        Central Air Conditioning
        Furnace (Building level)
        Boiler (Building level)
        Boiler Room Piping
        Boiler Room Peripherals
        DHW Generation

Elevators

        Shaftways
        Shaftway Doors
        Cabs
        Controller
        Machinery

Site Areas

        Landscaping
        Roadways
        Parking
        Paved Pedestrian Area
        Curbing
        Fencing
        Retaining Wall
        Site Drainage
        Pole Mounted Site Lighting

Site Amenities

        Site Furniture
        Yards and Enclosures
        Dumpsters
        Pool
        Tennis Courts
        Basketball Courts

Site Distribution

        Emergency Generator
        Site Electrical Dist
        Hot Water Distribution
        Dom Hot Water Lines
        Dom Cold Water Lines
        Main Water Service
        Gas Lines
        Site Sanitary Lines
        Septic System
        Sewage Ejectors
        Hydrants

the more precise bedroom *and* bath categories; to make use of this higher precision, we redistribute the unit quality indicators on the PQD to reflect the more detailed descriptors on the IBTQ. For example, if according to the PQD data, the property had 50 2-bedroom units, 25 in Excellent condition and 25 in Good condition, but the IBTQ revealed that 20 of the 50 2-bedroom units had more than one bath, then the unit quality distribution for 2-bedroom units was changed to 15 Excellent 2BR/1 Bath, 10 Excellent 2BR/1+ baths, 15 Good 2BR/1 baths, and 10 Good 2BR/1+ baths.

In order to estimate the backlog cost for the *uninspected* units, the first step was to compute per square foot costs for each *inspected* dwelling unit (the physical needs backlog costs for the inspected units divided by the overall square feet for the particular units). The estimated backlog costs for the uninspected units was then simply their square footage multiplied by the average repair costs of inspected units of the same quality category. This was straightforward because inspectors had recorded average size in square feet of each unit size.

Estimating the backlog cost for uninspected buildings was similar, but more complex because inspectors did not collect square footages of uninspected buildings. In order to be able to apply costs from the inspected sample to the uninspected sample, the costs for the inspected buildings had to be normalized to account for differences in building sizes. We chose to normalize building costs to a per 2-bedroom equivalent. The computation to normalize the inspected building costs was as follows:

1) Overall national average square feet for each unit size category were calculated as a weighted average of the square footage of all units in all buildings in the analysis sample properties, regardless of whether the building was inspected. The weights were the unit size distributions in each building.

2) The number of 2BR/1Bath equivalent units in each building was calculated as the total square footage of living space in each building divided by the national average square footage of a 2BR/1 bath unit (843.9 sq. ft.). The total square footage of living space was calculated by multiplying the national average square feet for each unit size by the number of units of that size in the building.

3) Building costs for each inspected building were normalized to a per-2BR cost equivalent by dividing total costs by the number of 2BR equivalent units in the building, thus generating a normalized cost for the inspected building which could then be applied to the uninspected buildings.

For example, Project X has 3 buildings. Building 1 is composed of 10 studio apartments, 20 1BR/1 Bath, and 10 3BR/1+ Bath. Building 2 has 20 2BR/1+ Bath. Building 3 has 10 4BR/1+ Bath. Based on the full sample of projects, the average square feet for a studio is 460.4; a 1BR/1 Bath is 640.3; a 2BR/1+ Bath is 1016.9; a 3BR/1+ Bath is 1160.3; and a 4BR/1+ Bath is 1342.7. The *national average* square feet for a 2BR/1 Bath is 843.9. Thus, the number of 2BR equivalents for Building 1 was ((10*460.4) + (20*640.3) + (10*1160.3)) / 843.9 or 34.38. Building 2 has (20*1016.9) / 843.9 or 24.1 2BR equivalents. Building 3 has (10*1342.7) / 843.9 or 15.91 2BR equivalents. Building 1's costs were divided by 34.38; Building 2's by 24.1; and Building 3's by 15.91, to obtain cost per 2 bedroom equivalent for each building.

Based on the assumption that buildings or units of the same type within the project will have similar costs, costs for the uninspected units and properties were generated in one of three ways:

- *Same type-same quality.* If the inspection included a building of the same type and quality as the uninspected building, the normalized 2BR equivalent cost (in the inspected building) was multiplied by the number of 2BR equivalent units in the uninspected building to produce the uninspected building's cost. Similarly, if the inspection included a unit of the same size and quality as the uninspected unit, its per square foot cost was multiplied by the total square feet of the uninspected unit to generate the cost for that uninspected unit.

- *Same type-different quality.* Ratios between quality categories within type were calculated using the normalized costs for the inspected buildings or units. If multiple inspected buildings (or units) of the same type but with different quality existed for the project, the inspected building (or unit) with the closest quality was used as a cost reference point. (Inspected buildings or units with poorer qualities were chosen if a choice needed to be made. In other words, if a Good high rise needed to be costed and both an Excellent and a Fair high rise had been inspected, the Fair high rise would have been chosen as the reference point.) Once the inspected reference point was chosen, the normalized cost was first multiplied by the national average ratio between the costs for the uninspected and inspected qualities for that building or unit type. In the above example, the normalized cost for the Fair high rise would have been multiplied by the ratio between the national average for a Good high rise to the national average for a Fair high rise. Next, the cost was multiplied by the appropriate factor[4] for the uninspected building or unit.

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[4]For buildings, the factor is the number of 2BR equivalents discussed above. The factor for units is the total square feet for the unit.

- *Different type.*[5] If the inspection included no building of the same type (or unit of the same size), the ratio between the project cost and the national average cost for inspected buildings (or units) was applied to the national average cost for the type being costed. This ratio equals the sum of the actual inspected costs for the project divided by the sum of the national weighted costs (i.e , the costs for the inspected buildings using national average costs.). To cost buildings or units with different types than those inspected in the project, the national averages for the uninspected type and quality were multiplied first by this project-to-national ratio, and then by the appropriate factor (either number of 2BR equivalent units or square feet) for the uninspected building or unit being costed. For example, if a Good high rise existed in a project for which only Poor walk-ups had been inspected, a project-to-national ratio would have been calculated by dividing the sum of the inspected Poor walk-up building costs by the national average for a Poor walk-up multiplied by the number of 2BR equivalents for each inspected building in the project. The national average for a Good high rise would then be multiplied by this project-to-national ratio, and then multiplied by the number of 2BR equivalents in the Good high rise being costed.

Regional Adjustment to the Property Level Cost numbers

The cost element numbers created by A.M. Fogarty and Associates were based on current costs for the Washington D.C. area. Using the R.S. Means "City Cost Indices" from the *Repair and Remodeling Cost Data* book for 1991, the property level physical needs backlog costs were adjusted by multiplying them by the ratio of the R.S. Means Index for the city where the property is located to the R.S. Means index for Washington D.C. (which is 96.4). For example, the computed cost for a New York City property would be multiplied by 1.315 (which is the New York-to-Washington index ratio, 126.8 / 96.4).

This system of inspection and costing was compared with actual work bids on public housing in San Francisco, and proved to be very consistent with the bids. For a similar study for the San Francisco Housing Authority (SFHA), Abt Associates used the same cost elements and Observable Systems Method described in this Appendix. The SFHA compared the costs Abt generated against actual bids for work under the HUD Comprehensive Improvements Assistance Program and found a high degree of overall agreement. As expected, differences were noted in cases where project redesign was necessary, since the study's inspection was intended only to estimate the costs to repair existing systems, not the costs of redesign.

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[5]Based on the inspection protocol, this occurrence was rare, arising only when a property contained a great diversity of building types and quality levels. The occurrence was greater for units, however, due to the limit of 3 unit inspections per property.

C.2   Upgrade Feasibility Costs

In addition to assessing the current physical condition of the properties, the inspectors recorded in the inspection booklets, information on the *physical* feasibility of upgrading certain observable systems for both a moderate and major market conversion. This information is needed to ascertain net market value—that is, to subtract upgrade costs from capitalized net operating income for market-level unassisted rents. The inspector rated the feasibility of upgrading the market level by adding amenities or improving the quality of materials in an existing system in order to make the property and its units marketable at a higher rent level. Two levels of upgrading were possible: upgrading the property to a "moderate" market quality, and upgrading the property to a high or "major" market quality. A "moderate" market quality is defined as an average quality unit, generally in good condition, with average amenities. A "major" market quality unit would command a high rent and may include such amenities as tennis courts, swimming pools, and central air conditioning.

If the current condition and amenities already positioned the property into the "moderate" market category, the upgrade feasibility rating was limited to "major" market feasibility. If the property was already at a high-end market rent, no upgrade feasibility analysis was necessary. In addition, if the layout or size of the buildings or units was not conducive to the upgrades needed, the property was deemed infeasible for that upgrade level.

Upgrade actions could also be affected by physical needs backlog. In some cases, upgrading meant adding a system if it did not currently exist (e.g., adding a swimming pool). If the system already existed, upgrading it would involve replacing it with better quality materials than would be used for repair. Some upgrade system costs are "additive" to the backlog repair cost—the backlog repair would still have to occur before upgrading the system. An example is Landscaping. If the backlog repair action requires a portion of the current Landscaping to be reseeded, this would have to occur regardless of the Landscaping upgrade.

Other systems have "instead of" costs. This means that the backlog repair action would not occur if the property were being upgraded. For example, there would be no reason to repair windows that were being replaced with better quality materials. Exhibit C.3 lists for each Upgrade system, whether its associated cost is additive to, or replaces the physical needs backlog cost. The method of calculating upgrade costs is similar to that used for physical needs backlog costs. Cost elements were derived by A.M. Fogarty and Associates. Exhibit C.4 lists

Exhibit C.3

Upgrade Systems—Additive to Repair Backlog vs Instead of Repair Backlog

Additive Systems	**Instead of Systems**
Landscaping	Parking
Emergency Generator	Site Lighting
	Yards and Enclosures
	Swimming Pool
	Tennis Court
	Basketball Courts
Exterior Stairs	Exterior Wall
Bldg Mounted Site Lights	Windows
Porches	Exterior Common Doors
Decks	Vestibules
Sheds	Interior Lights
Corridors	Mail Facilities
Stairways	Laundry Facilities
	Common Rooms
Central Vent/Exhaust	Electrical Service
Central Air	Emergency Lights
Smoke Detector	Furnace
Communication System	Boiler
ECAS	DHW Generation
CCTV	Elevator Cabs
	Unit Interiors
	Unit Kitchen
	Unit Bathroom

Exhibit C4: Upgrade System Elements						
UPGRADE COSTS	MODERATE YES/PART	ADD/FULL	MAJOR YES/FULL	REHAB	UNIT OF MEASURE	ASSUMPTIONS
*** SITE UPGRADES						
Landscape	0.55		0.55		Landscape-SF	
Parking-Upgrade	1.66	700.00	1 66		Parking-SF;# of new spaces	360 SF per space
Parking-Add		17500.00			Per Project	
Site Lighting-Upgrade	1400.00		1400.00		# Poles	
Site-Lighting-Add		3500.00			# Site units/12	
Site Furniture	400.00	900.00	400 00		# Site units	
Yards-Upgrade	360.00		360.00		# Yards or # Site Units	400 SF
Yards-Add		750.00			# Site Units	
Swimming Pool	30000.00	75000.00	30000 00		1 per project	20x'40'x6' deep
Tennis Courts		25000.00			1 per project	
Basketball Court		20000.00			1 per project	
*** ENVELOPE UPGRADES						
Ext Wall-Plaster	6.50		6.50		Ext Wall-Plaster:SF	
Ext Wall-Wood	4.00		4 00		Ext Wall-Wood:SF	
Ext Wall-Vinyl	2.50		2.50		Ext Wall-Vinyl:SF	
Windows-Small	425.00		425 00		# Small Windows	
Windows-Medium	575.00		575.00		# Medium Windows	
Windows-Large	1100 00		1100.00		# Large Windows	
Common Doors	1500 00		2200 00		# Common Doors	
Exterior Stairs	1100.00		1100 00		# Stairs	
Bldg Mtd Site Lights	350.00	750.00	350 00		# Bldg Units divided by 6	
Porches		4500.00			# Bldg Units	8'x16'
Decks		2800.00			# Bldg Units	8'x16'
Storage Sheds		900.00			# Bldg Units divided by 6	
Vestibules	7.50		41.66		Vestibule-SF	10'x12'
Corridors	4.16		4 16		Corridor-SF	6' wide
Stairs	5.00		5 00		If avail: Int Stair-SF; Else 160 times # Stories	
Int Lights	3.00		3 00		Bldg Footprint-SF	
Mail Facilities	75.00		75 00		# Bldg Units	
Laundrys	6000.00		6000.00		# Laundry Rooms	3 washers, 3 dryers
Common Rooms	6.00		6.00		Common Room-SF	

	MODERATE		MAJOR		
Exhibit C4: Upgrade System Elements					
UPGRADE COSTS	YES/PART	ADD/FULL	YES/FULL	REHAB	UNIT OF MEASURE / ASSUMPTIONS
•••• BME UPGRADES					
Central Vent & Exhaust	1.50	4.50	1.50		Bldg Gross Area-SF
Central Air Conditioning	2.50	7.50	2.50		Bldg Gross Area-SF
Electrical Service	3.00		3 00		Bldg Gross Area-SF
Emergency Generator•	· 12500.00	40000.00	12500.00		*Site level Cost-1 per proj
Emergency Lights	150.00	400.00	150.00		Bldg Units divided by 6
Smoke Detection	250 00		250.00		Bldg Units/4
Communication System	100 00	300.00	100.00		Bldg Units/6
Emer Call Alarm System		300 00			Bldg Units/6
Closed Circuit TV		1000.00			Bldg Units/6
Hot Air Furnaces	2500.00		2500.00		Bldg Units
Boilers	2500 00		2500.00		Bldg Units
DHW Generation	800.00		800.00		Bldg Units
Elevator Cabs	2000.00		2000.00		Number Elevators
•••• UNIT UPGRADES					
Interior(ex kitchen,bath)	3.00	7.00	12.00	35.00	Total Unit SF-(kit, bath SF)
Kitchen	4000.00	6500.00	10000.00		1 per unit
Full Baths	3970 00		4470.00		# Full baths
Half Baths	1875.00		5970.00		# Half baths

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these elements for each Upgrade system as well as the dimensional multiplier. Two levels of Upgrade are possible—Moderate and Major. For units there is a further distinction: to Partial and Full for Moderate Upgrade, and Full or Rehab for Major Upgrade. Sites and BME systems only allow for moderate upgrades. If the system is present, then the upgrade is Moderate Yes; if the system is not present, then the upgrade is Moderate Add. Envelope systems also breakdown Moderate upgrade to Yes, for present systems, and Add when the system is not present. In addition, major Yes is an upgrade option for Envelope systems.

After the costs are calculated for the inspected site, units, and buildings, costs are generated for the full property (including uninspected units and buildings) using the same procedures followed for costing physical needs backlogs:

- Building upgrade costs for inspected buildings are normalized to a per 2 bedroom equivalent, and unit upgrade costs are normalized to a per square foot cost;

- Costs are generated using one of the three methods[6] that were outlined above for physical needs backlog costs; and

- Regional adjustments are applied as discussed above.

C.3   Estimating Accrual of Repair and Replacement Costs

Accrual cost estimates are the total amount a property will need to cover expected repairs and replacements for each Observable System over each of the next 20 years. Each system was given either a repair or a replacement cost depending upon the standard wear of the system. For example, boilers are expected to be replaced after a certain number of years, but landscaping only needs periodic major maintenance. Some systems were deemed inappropriate for accrual estimates because they generally will not need replacement or standard maintenance over the 20-year horizon used for this study. An example is the Site-level Domestic Hot Water Lines. Over time, a portion of the lines may need to be replaced, but this is not an expected occurrence. The repair or replacement system cost is based on the same algorithm used for the physical needs backlog costings.

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[6]Same type-same quality; same type-different quality; different type.

In addition to a repair/replacement cost, each system is assigned an average useful lifetime (or in the case of items which will be repaired, "action-intervals" are assigned).[7] For systems requiring replacement over time, the useful life is the age the system is expected to be when it must be replaced because it is worn-out or approaching failure. Boilers are expected to last 25 years. This is the expected life for the Boiler systems. Interior walls in Units are not expected to wear out, but will need to be painted every 7 years. This is the action interval (rather than expected life) for Interior Walls. The repair cost associated with Interior Walls is the cost of painting the walls. Exhibit C.5 lists for each system involved in accrual, the action level appropriate to accrual, and the useful life (or action interval).

For each of the next 20 years, for each Accrual system, we test whether the system will reach the end of its useful life (or action interval) that year. As the starting point, we used the system ages where they were collected by the Inspector; otherwise, we estimated system age to be the average age of the buildings in the project. We assume, however, that any system that needed to be replaced as part of the physical needs backlog, was indeed replaced: therefore, the age of such systems is set back to zero. The age is then increased for each accrual year. In any year that a system's accrual age equals its expected life, then the repair/replace cost is added into the accrual total for that year.

The accrual yearly totals are calculated on the sites, units, and buildings that were actually inspected. These costs are then scaled up to reflect the total property, using the same scaling factors developed for estimating property-level physical needs backlog costs. The property totals are then regionally adjusted as discussed previously. Accrual costs are based on current dollars.

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[7]The basic reference for expected lives was Appendix B, "Accrual Actions and Expected Lives" from *Future Accrual of Capital Repair and Replacement Needs of Public Housing, Final Report*, prepared for HUD by ICF, Inc., April 1989 as an update of the Abt public housing study (Bain, 1988). Abt staff experienced in conventional residential building construction and management altered these lifetimes for some systems

Exhibit C.5

Life Expectancies and Repair/Replace Action Levels for Accrual Systems

SYSTEM	LIFE EXPECTANCY		REPAIR ACTION LEVEL
Landscaping	5		MIN
Roadways	25		REP
Parking Areas	25		REP
Paved Pedestrian	25		REP
Curbing	25		REP
Fencing	20		REP
Retaining Walls	10		MOD
Site Drainage	25		REP
Pole Mntd Lighting	25		REP
Site Furniture	15		REP
Yards	20		REP
Dumpster	15		REP
Pool	15		MAJ
Tennis	15		MAJ
Basketball	15		MOD
Dom Hot Water Dist	40		REP
Dom Cold Water Dist	40		REP
Sewage Ejector	40		REP
Unit-Wall Surface	7		MIN
Unit-Carpet	10	(5)[1]	REP
Unit-Floor Resilient	20	(15)	REP
Kitchen Wall	7		MIN
Kitchen Floor	15	(10)	REP
Kitchen Cabinet	25	(20)	REP
Kitchen Range	15		REP
Refrigerator	15	(10)	REP
Garbage Disposal	7		REP
Dishwasher	15		REP
Microwave	10		REP
Trash Compactor	15		REP
Bathroom Walls	7		MIN
Bath Floor-Ceramic	50		REP
Bath Floor-Resilient	20	(15)	REP
Bath Fixtures	40	(25)	REP
Bath Accessories	40	(25)	REP
Bath Vanities	40	(25)	REP
Unit HVAC	20		REP
Radiation[2]	25	(20)	REP
Unit Boiler	25		REP

[1]Numbers in parenthesis are life expectancies for family occupied units and buildings

[2]Hydronic only.

Exhibit C.5 (continued)

Life Expectancies and Repair/Replace Action Levels for Accrual Systems

Unit Furnace	25		REP
Unit DHW Generation	20		REP
Temperature Control	25		REP
Wall Air Conditioner	15		REP
Bell/Intercom	30		REP
Unit CCTV	30		REP
Unit ECAS	30		REP
Unit Smoke Detector	40	(15)	REP
Building Foundation	10		MIN
Exterior Wall	10		MIN
Roof-Membrane	40		REP
Roof-Shingles	20		REP
Roof-Builtup	40		REP
Parapet Wall	10		MOD
Chimney	10		MIN
Penthouse	10		MAJ
Roof Drainage	25		REP
Windows	40		REP
Ext Common Door	60	(30)	REP
Unit Entry Door	20		MOD
Storm/Screen Door	15	(7)	REP
Canopies	20		MOD
Exterior Stairs	10		MIN
Bldg Mtd Site Lights	10	(8)	REP
Fire Escapes	40		REP
Porches	40		REP
Decks	25		REP
Sheds	40		REP
Vestibules	10		MIN
Corridors	10		MOD
Stairways	10		MIN
Interior Lights	25		MOD
Mail Facilities	20	(10)	REP
Laundry Rooms	15		MOD
Laundry Equipment	10		REP
Common Rooms	10		MOD
Common Kitchen	20		MAJ
Heating Riser	15		MOD
Gas Distribution	15		MOD
Dom Hot/Cold Water	50		REP
Sanitary Dist	10		MIN
Fire Suppression	5		MIN
Sump Pump	20		REP
Compactor	10	(7)	REP
Central Vent/Exhaust	10		MAJ
Central Air	20		REP
Emergency Generator	35		REP

Exhibit C.5 (continued)

Life Expectancies and Repair/Replace Action Levels for Accrual Systems

Emergency Lights	35		REP
Smoke Detector	40	(20)	REP
Communication System	30		REP
Building ECAS	30		REP
Master TV Antenna	30		REP
Building CCTV	30		REP
Building Furnace	25		REP
Building Boiler	25		REP
Boiler Room Piping	50		REP
Boiler Peripherals	25		REP
DHW Generation	20		REP
Elevator Shaftways	15	(10)	REP
Shaftway Doors	15	(10)	REP
Elevator Cabs	30	(15)	REP
Elevator Controller	30	(25)	REP
Elevator Machinery	30	(25)	REP

APPENDIX D

SUPPLEMENTARY TABLES

Exhibit D.1

MEAN PHYSICAL BACKLOG COST BY SYSTEM GROUP, OLDER ASSISTED STOCK ONLY, PER 2BR EQUIVALENT

	Older Assisted		
	Total	Avg. BR < 2.25	Avg. BR ≥ 2.25
Total Properties	6037	4460	1377
Percent of Properties	100 %	77 %	23 %
Mean Site Costs	**9 %**	**8 %**	**12 %**
Site Areas	8	7	9
Site Amenities	1	1	2
Site Distribution	0	0	1
Mean Building Costs	**30 %**	**28 %**	**33 %**
Mechanical & Electrical	2	1	2
Heating & Cooling	5	6	2
Elevators	0	0	1
Exterior Closure	10	9	12
Roofs	3	2	6
Windows and Doors	6	6	6
Exterior Features	1	1	2
Common Areas	3	3	2
Mean Unit Costs	**61 %**	**63 %**	**55 %**
Interior Construction	1	1	1
Interior Finishes	37	38	36
Kitchen Fixtures	15	16	12
Bath Fixtures	4	5	3
Unit Heating & Cooling	1	1	1
Electrical	2	2	2
Mean Backlog Cost per 2BR Equivalent Unit	**$2,115**	**$2,003**	**$2,494**

Source: Physical inspections, costing program.

Note: Column sums may not add to 100% due to rounding.

Exhibit D.2

DISTRIBUTION OF PHYSICAL BACKLOG COSTS FOR PROPERTIES WITH MEAN BACKLOGS > $2,500 PER 2BR EQUIVALENT

Systems	Total	Total		Total Assisted	
		Unassisted	Assisted	Older Assisted[1]	Newer Assisted[1]
Total Properties	2,804	428	2,376	1,778	598
Percent of Properties	100%	15%	85%	75%	25%
Mean Site Costs	7%	10%	6%	7%	4%
Site Areas	6%	7%	5%	6%	3%
Site Amenities	1%	3%	1%	1%	1%
Site Distribution	0%	0%	0%	0%	0%
Mean Building Costs	32%	31%	32%	31%	38%
Mechanical & Electrical	1%	1%	1%	1%	1%
Heating & Cooling	6%	6%	6%	6%	10%
Elevators	0%	1%	0%	0%	0%
Exterior Closure	11%	4%	12%	11%	15%
Roofs	3%	3%	3%	3%	4%
Windows and Doors	7%	12%	6%	6%	6%
Exterior Features	1%	2%	1%	1%	0%
Common Areas	3%	2%	3%	3%	2%
Mean Unit Costs	61%	59%	61%	62%	58%
Interior Construction	1%	1%	1%	2%	0%
Interior Finishes	38%	35%	38%	38%	38%
Kitchen Fixtures	14%	20%	13%	14%	9%
Bath Fixtures	4%	3%	4%	4%	3%
Unit Heating & Cooling	1%	0%	2%	2%	2%
Electrical	3%	0%	3%	2%	6%
Mean Cost	**$4,909**	**$4,878**	**$4,915**	**$5,208**	**$4,044**

[1]   Percentages in the older and newer assisted categories total 100% of the total assisted category's 18%
Source   Physical inspections, costing program.
Note   Column sums may not add to 100% due to rounding.

Exhibit D.3

TENANT CHARACTERISTICS BY BACKLOG OF PHYSICAL NEEDS
Multifamily Rental Housing with HUD-Insured (or Held) Mortgages

	Total	Backlog < $2,500 per 2BR	Backlog ≥ $2,500 per 2BR
Total Properties	13,271	10,467	2,804
Percent of Properties	100%	79%	21%
Race/Ethnicity			
White	58%	63%**	41%
Black	32%	27%**	50%
Hispanic	5%	5%**	5%
Other	5%	5%	4%
Household Size			
1 Person	41%	44%	30%
2 People	27%	27%	27%
3 People	16%	15%	19%
4 People	10%	9%	14%
5 People	3%	3%	5%
6+ People	3%	2%	4%
Mean Household Size	2.1	2.1	2.5
Elderly Head of Household Percent	33%	35%**	24%
Household Income			
<50% of Median	68%	67%	74%
50-80% of Median	19%	19%	17%
80-100% of Median	8%	8%	5%
≥100% of Median	6%	6%	4%

** Signifies that the differences between high- and low-backlog properties are statistically significant at the 95% confidence level

Tenant Data Source: Owner/Manager Survey, HUD Form 50059 provided by property owners, and managers, HUD prepayment database, NHP study.

Note: Column sums may not add to 100% due to rounding.

Exhibit D.4

PROPERTY CHARACTERISTICS BY BACKLOG OF PHYSICAL NEEDS
Multifamily Rental Housing with HUD-Insured (or Held) Mortgages

	Total	Backlog < $2,500 per 2BR	Backlog ≥ $2,500 per 2BR
Total Properties	13,271	10,467	2,804
Percent of Properties	100%	79%	21%
Property Size			
<50 Units	19%	17%*	25%
50-99 Units	34%	35%	30%
100-199 Units	36%	35%	36%
≥200 Units	12%	13%	10%
Mean Units	112	115*	101
Standard Error	3.5	4	6
Median	96	97	87
Average Unit Size			
<2 25 Bedrooms	80%	83%**	70%
≥2.25 Bedrooms	20%	17%**	30%
Mean Unit Size	1.7	1.6**	1.9
Standard Error	0.03	0.03	0.06
Median	1.9	1.8	2 0
Building Type			
High Rise	28%	30%	23%
Walk-Up	44%	43%	47%
SF Attached	28%	27%	28%
SF Detached	0%	0%	2%
Overall Project Quality			
Excellent	39%	47%**	8%
Good	48%	47%	53%
Fair/Poor	13%	6%**	40%

** Signifies that the differences between high- and low-backlog properties are statistically significant at the 95% confidence level.

* Signifies that the differences between high- and low-backlog properties are statistically significant at the 90% confidence level.

Tenant Data Source: Inspections

Note. Column sums may not add to 100% due to rounding

Exhibit D.4 (continued)

PROPERTY CHARACTERISTICS BY BACKLOG OF PHYSICAL NEEDS
Multifamily Rental Housing with HUD-Insured (or Held) Mortgages

	Total	Backlog < $2,500 per 2BR	Backlog ≥ $2,500 per 2BR
Total Properties	13,271	10,467	2,804
Percent of Properties	100%	79%	21%
Neighborhood Quality Relative to City			
Better than Average	36%	41%**	16%
Average	35%	37%	31%
Worse than Average	28%	22%**	53%
Quality as Residential Neighborhood			
Excellent/Good	69%	75%**	46%
Fair/Poor	31%	25%**	54%
Central City Status			
SMSA, Central City	57%	53%**	73%
SMSA, not Central City	32%	35%**	20%
Non-SMSA	11%	12%	7%
Assistance Category			
Unassisted	23%	25%**	15%
Older Assisted, Avg. BR Size <2.25	35%	32%**	45%
Older Assisted, Avg. BR ≥2.25	11%	8%**	18%
Newer Assisted	31%	34%**	21%
Sponsor Type			
Non-Profit/Coop	18%	18%	17%
Limited Dividend	37%	32%**	54%
For Profit	46%	50%**	29%
Mortgage Start Year			
Before 1970	6%	5%	8%
1970-1979	54%	52%	60%
1980 or later	41%	43%**	32%
Preservation Status			
Can Prepay Any Time	54%	59%**	38%
Eligible for Preservation Incentives	26%	22%**	42%
Locked in for Full Term	19%	19%	20%

** Signifies that the differences between high- and low-backlog properties are statistically significant at the 95% confidence level

* Signifies that the high- and low-backlog properties are statistically significant at the 90% confidence level.

Data Source: Windshield Survey, HUD MIDLIS database
Note: Column sums may not add to 100% due to rounding.

Exhibit D.5

**PHYSICAL BACKLOG AND UNFUNDED PHYSICAL BACKLOG
BY BACKLOG OF PHYSICAL NEEDS
Multifamily Rental Housing with HUD-Insured (or Held) Mortgages**

	Total	Backlog < $2,500 per 2BR	Backlog ≥ $2,500 per 2BR
Total Properties	13,271	10,467	2,804
Percent of Properties	100%	79%	21%
Total Backlog per 2BR Unit			
<$10	20%	25%	0%
$10 to <500	25%	31%	0%
$500 to <1,000	13%	16%	0%
$1,000 to <2,000	17%	22%	0%
$2,000 to <3,000	8%	6%	19%
$3,000 to <4,000	6%	0%	30%
$4,000 to <5,000	4%	0%	18%
$5,000 to <7,500	5%	0%	21%
≥$7,500	2%	0%	11%
Mean	$1,520	$612**	$4,909
Standard Error	$92	$33	$223
Median	$654	$314	$4,028
Unfunded Needs Backlog per 2BR Unit			
$0	44%	58%	4%
$0 to <500	14%	20%	0%
$500 to <1,000	10%	13%	0%
$1,000 to <2,000	11%	13%	7%
$2,000 to <5,000	15%	4%	59%
$5,000 to <7,500	5%	0%	22%
≥$7,500	2%	0%	8%
Mean	$1,214	$424**	$4,365
Standard Error	$88	$30	$241
Median	$228	$0	$3,643

** Signifies that the differences between high- and low-backlog properties are statistically significant at the 95% confidence level

* Signifies that the high- and low-backlog properties are statistically significant at the 90% confidence level.

Data Source: Physical inspection, costing program, and HUD Field Office data on resources.

Note Column sums may not add to 100% due to rounding.

Exhibit D.6

FINANCIAL CHARACTERISTICS BY BACKLOG OF PHYSICAL NEEDS
Multifamily Rental Housing with HUD-Insured (or Held) Mortgages

	Total	Backlog < $2,500 per 2BR	Backlog ≥ $2,500 per 2BR
Total Properties	13,271	10,467	2,804
Percent of Properties	100%	79%	21%
Per 2BR Unit Cash Flow			
Negative Cash Flow	**32%**	**29%**[**]	**41%**
< -$1,000	4%	4%	2%
-$1,000 to < -$500	6%	4%	13%
-$500 to < -$250	8%	7%	11%
-$250 to < $0	14%	14%	15%
Positive Cash Flow	**68%**	**70%**[**]	**60%**
$0 to < $250	25%	24%	25%
$250 to < $500	13%	14%	12%
$500 to < $1,000	14%	14%	14%
≥ $1,000	16%	18%	9%
Statistics on Net Cash Flow			
Mean	$330	$364	$201
Standard Error	$82	$103	$77
Median	$184	$211	$56
Mortgage Status			
In Force-Current	89%	91%[**]	84%
Other	11%	9%	16%

[**] Signifies that the differences between high- and low-backlog properties are statistically significant at the 95% confidence level.

[*] Signifies that the *differences between Distressed and Sound or Stressed and Sound* properties are statistically significant at the 90% confidence level.

Data Source: HUD MIDLIS and MIPS data bases, HUD Field Offices.

Note. Column sums may not add to 100% due to rounding.

Exhibit D.7

PROJECTED AVERAGE ANNUAL ACCRUAL OF PHYSICAL NEEDS, 1990-1994
(Cost Per 2BR Equivalent)
Multifamily Rental Housing with HUD-Insured (or Held) Mortgages

	Total	Total		Total Assisted	
	Total	**Unassisted**	**Assisted**	**Older Assisted**[1]	**Newer Assisted**[1]
Total Properties	13,271	3,080	10,191	6,037	4,154
Percent of Properties	100%	23%	77%	59%	41%
Accrual Cost Per 2BR Equivalent					
$ < 10	1%	2%	0%	0%	1%
$10-499	48%	54%	46%	28%	72%
$500-999	22%	19%	23%	25%	19%
$1,000-1,499	14%	11%	15%	21%	5%
$1,500-1,999	7%	3%	8%	12%	3%
$2,000-2,999	6%	6%	6%	10%	0%
$3,000-3,999	1%	3%	1%	2%	0%
$4,000-4,999	1%	1%	1%	1%	0%
$5,000-7,499	0%	0%	0%	0%	0%
$7,500 or more	0%	0%	0%	0%	0%
Statistics on Annual Accruals					
Mean	$825	$729	$854	$1,163	$405
Standard Error	$ 41	$ 83	$ 47	$ 66	$ 30
Median	$534	$360	$548	$913	$313

[1]   Percentages in the older and newer assisted categories total 100% of the total assisted category's 77%   Older assisted properties comprise 45% of the universe, and newer assisted properties comprise 31%

Source· Physical inspections, costing program

Note: Column sums may not add to 100% due to rounding

Exhibit D.8

MAJOR PROPERTY ELEMENTS AS PERCENTAGE
OF ANNUAL ACCRUAL, 1990-1994
Multifamily Rental Housing with HUD-Insured (or Held) Mortgages

		Total		Total Assisted	
	Total	Unassisted	Assisted	Older Assisted[1]	Newer Assisted[1]
Total Properties	13,271	3,080	10,191	6,037	4,154
Percent of Properties	100%	23%	77%	54%	41%
Element					
Mean Site Costs	14%	12%	14%	14%	17%
Mean Building Costs	38%	46%	36%	37%	33%
Mean Unit Costs	48%	42%	50%	49%	50%
Mean Annual Accrual Cost	$825	$729	$854	$1,163	$405

[1]   Percentages in the older and newer assisted categories total 100% of the total assisted category's 77%. Older assisted properties comprise 45% of the universe, and newer assisted properties comprise 31%

Source: Physical inspections, costing program.

Exhibit D.9

PROJECTED AVERAGE ANNUAL ACCRUAL OF PHYSICAL NEEDS, 1990-2009,
Older Assisted Stock Only

	Older Assisted		
	Total	Avg. BR < 2.25	Avg. BR ≥ 2.25
Total Properties	6,037	4,660	1,377
Percent of Properties	100%	77%	23%
Accrual Cost per 2BR Equivalent			
$10-499	21%	19%	29%
$500-999	50%	48%	56%
$1,000-1,499	17%	20%	10%
$1,500-1,999	8%	9%	4%
$2,000-2,999	3%	4%	0%
$3,000-3,999	0%	0%	0%
$4,000-4,999	0%	1%	0%
Statistics on Accrual Costs			
Mean	$872	$924	$ 695
Standard Error	$ 30	$ 40	$ 32
Median	$ 759	$ 799	$ 627

Source· Physical inspections, costing program

Exhibit D.10

PROJECTED AVERAGE ANNUAL ACCRUAL OF PHYSICAL NEEDS, 1990-1994, Older Assisted Stock Only

	Older Assisted		
	Total	Avg. BR < 2.25	Avg. BR ≥ 2.25
Total Properties	6,037	4,660	1,377
Percent of Properties	100%	77%	23%
Accrual Cost per 2BR Equivalent	--		
<$10	0%	0%	0%
$10-499	28%	28%	28%
$500-999	25%	22%	34%
$1,000-1,499	21%	19%	29%
$1,500-1,999	12%	14%	6%
$2,000-2,999	10%	11%	3%
$3,000-3,999	2%	2%	0%
$4,000-4,999	1%	2%	0%
$5,000-7,499	0%	0%	0%
$7,500 or more	0%	1%	0%
Statistics on Accrual Costs			
Mean	$1,163	$1,246	$883
Standard Error	$ 66	$ 91	$ 52
Median	$913	$934	$823

Source. Physical inspections, costing program

Note: Column sums may not add to 100% due to rounding.

Exhibit D.11

MULTIVARIATE REGRESSION FACTORS CONTRIBUTING
TO NET CASH FLOW

Dependent Variable: Net Cash Flow per 2BR Unit

Variables	Unassisted	Older Assisted	Newer Assisted
Intercept	7065 5674 ** (1768.232)	1811.8713 * (894.003)	-1570.2066 * (801.404)
Total Units	-0 2637 (2 575)	-0 8155 (1.073)	-0 1745 (0.953)
Property Age	44.4656 (51.817)	6.5359 (25 984)	219.9989 ** (39 435)
Average Unit Size (#BRs)	-2292.4343 ** (684 394)	-303.0518 * (152 699)	-226 1946 * (99.590)
High-rise	7.9099 (7.542)	7.1401 ** · (2.681)	-1.7072 (1.595)
Central City	0 3535 (5 551)	0.5523 (1.615)	-0.2447 (1.133)
Percent Vacancy Loss	-67.6596 * (37.680)	-38.7468 * (17 758)	-44.6234 (34 943)
Percent Assisted		0.8763 (2.117)	0.4896 (4.079) ·
Remedial LMSA		1.4789 (1.657)	
TPA	-10.5511 * (5 885)	4.2389 * (1.787)	
Percent Very Low Income	-6 6840 (14.413)	-6.4237 (4.322)	-0 0732 (4.093)
Percent Income Above Median	-2.9590 (18.506)	-15.4653 (12 986)	
Percent Minority	-6 2202 (11.007)	-3 5581 (2 439)	0 1107 (1.705)
High Neighborhood Vacancy	-3.5336 (6.222)	1 0126 (1.793)	-1.2124 (1.298)
Good Neighborhood	5.4700 (5.957)	0.8722 (1.864)	-0.3351 (1.198)
Bad Neighborhood	-11 4439 (10.477)	2.2838 (1.802)	-1.2194 (1.376)

Exhibit D.11 (continued)

MULTIVARIATE REGRESSION FACTORS CONTRIBUTING
TO PHYSICAL NEEDS BACKLOG

Variables	Unassisted	Older Assisted	Newer Assisted
Non-Profit Sponsor		0 1492 (1.756)	
Flexible Subsidy		3.5428 (2.206)	
Per Unit Mortgage	-100.3923 ** (15.290)	-55.0256 ** (17.490)	13.4588 * (6.681)
Existing		7.8410 ** (2 616)	
Observations	115	309	146
R-Squared	0.5037	0.1564	0 3422
Adjusted R-Squared	0.4342	0.1009	0 2774

* Signifies statistical significance at the 0.10 level.

** Signifies statistical significance at the 0.05 level.

GLOSSARY

Terms Used in Report

BMIR. See Section 221(d)(3) Below Market Interest Rate.

Excess Income Account. For Section 236 properties only, this account receives monthly income in excess of basic rent (after adjustments); funds accumulated in this account are used to finance the Flexible Subsidy Program and are not available to the owners of properties.

FHA. Federal Housing Administration.

Flexible Subsidy Program. Flexible Subsidy is a competitively awarded program that provides reduced-interest direct loans to properties that receive Federal assistance under the Section 236 or Rent Supplement programs (or Section 8 in place of former assistance under these programs). It consists of two components. The traditional Operating Assistance Loan Program for troubled properties is a deferred 1 percent interest loan. It can be used to correct physical deficiencies caused by deferred maintenance, financial deficiencies, and projected deficits for the assistance year. The newer Capital Improvement Loan Program, for troubled as well as some non-troubled properties, is an amortizing direct loan that carries a 3 to 6 percent interest rate set by HUD. It cannot be used for capital improvements that are the result of deferred maintenance. Under both components, an owner must prepare and abide by a Management Improvement and Operating Plan, and a profit-motivated owner must make a 25 percent matching capital contribution to the property.[1] Receipt of Operating Assistance Loans also requires that the property remain in low-income use for the balance of the original mortgage term[2] and suspends an owner's right to distribute dividends (until the loans are repaid).

FMR. See Section 8 Fair Market Rent.

HUD. U.S. Department of Housing and Urban Development.

Income:

> *Passive Income.* Income generated from a passive activity. A passive activity involves:

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[1]Nonprofit owners may provide in-kind services to property residents rather than make capital contributions.

[2]This requirement generally makes owners of recipient properties ineligible for preservation incentives under the 1990 Preservation Act.

1. The conduct of any trade or business in which the taxpayer does not materially participate;

2. To the extent provided in the regulations, the conduct of an activity for profit in which the taxpayer does not materially participate in the activity; or

3. Any rental activity regardless of whether the taxpayer materially participates in the activity. Material participation exists when a taxpayer is involved in the operations of an activity on a regular, continuous, and substantial basis.

Phantom Income. Income generated by a partnership in excess of the amount of cash distributions actually received. Examples include rental income used to pay mortgage principal, or net income in excess of allowable dividends that is required to be placed in a reserve account. Also see Residual Receipt Account.

Low-Income. Generally used to refer to families with incomes no greater than 80 percent of the area's median, adjusted for family size, or sometimes those in the 50 to 80 percent range.

Moderate-Income. Generally refers to families with incomes between 80 and 95 percent of the area's median.

Very Low-Income. Generally used to refer to families with incomes no greater than 50 percent of the area's median, adjusted for family size.

Loan Management Set-Aside (LMSA). Initiated in 1976, this form of rent supplement has been available through the Section 8 Program to both Section 221(d)(3) and Section 236 properties. For some properties, LMSAs replaced 40-year rent supplements or Rental Assistance Payments. This exchange was advantageous to owners because it shortened the length-of-use restrictions and because Section 8 provides a budgetary cushion to cover inflation in the operating cost, allowing owners to improve their cash flow to financially troubled properties. Like the other rental assistance programs, Section 8 aid limits tenants' rent payments to 30 percent of adjusted income. The term of Section 8 contracts is 15 years. Prior to 1983, owners were permitted to cancel their contracts every 5 years. Since 1983, this "opt out" provision is no longer offered to owners. With LMSA, rents on projects older than 6 years are renegotiated. The newly established rent generally may not exceed the Section 8 Existing fair market rent (FMR) for the area.

Property Disposition Program. Because low-income properties built with Federal assistance all carry FHA mortgage insurance, owners who have been unable to maintain the financial viability of their properties through supplemental assistance may default on their mortgages, leading to insurance claims against HUD. The process whereby lenders notify HUD that an owner intends to default on a mortgage, and before HUD actually pays the claim and assumes the mortgage, is usually complex and drawn out and involves negotiations to try to keep the original owner in place as long as possible and to keep the property serving low-income tenants. The Housing and Community Development Act of 1987 required that property acquired by HUD through foreclosure and eventually resold must carry with it a commitment by the new owner to maintain

the property as low-income housing. HUD must also provide enough subsidy to make this use as low-income housing economically possible for the new owner.

Rent:

> ***Basic Rent.*** The minimum rent charged for a unit in Section 221(d)(3) and 236 properties. Calculated by determining the operating expenses, allowed returns, and debt service at 1 or 3 percent interest. Tenants pay the basic rent or 30 percent of their income (but never more than "market" rent), whichever is greater. For very low-income tenants not receiving additional rent subsidies, such as rent supplement payments or Section 8, this can mean a rent burden much higher than 30 percent of income. For higher income tenants, the rent payment is proportionate to their income but not necessarily as much as the unit would command if rents were totally uncontrolled.

> ***FHA Rent.*** The rent calculated to accommodate debt service at a below-market interest rate, operating costs, and, for limited-dividend sponsors, a reasonable rate of return.

> ***Contract Rent.*** The rent an owner actually charges for a unit occupied by a tenant receiving Section 8 assistance. The contract rent can be less than the applicable FMR, but may not exceed it for a unit of a given size and type.

> ***Market Rent.*** In the Section 221(d)(3) and 236 programs, the maximum rent that can be charged based on a calculation of operating expenses, allowable returns, and debt service at market rate. This rent is identical to basic rent, except that it includes an allowance to cover the mortgage insurance premium, and the component meant to amortize the unit's mortgage is calculated at a level sufficient to pay off the loan at the full unsubsidized interest rate at which it was written. Any amounts collected by landlords over the basic rents revert to HUD. This "market rent" is not the same as the usual use of the term to describe the going economic rent for similar apartments in a market area. The Section 236 "market rent" may be higher or lower than the true market rent, and may also be different from the so-called fair market rent (FMR) or "allowable rent" that HUD permits under the Section 8 Existing Housing program. See also Section 236 market rent.

> ***Unassisted Market Rent.*** This is the rent, estimated by local market experts in this study, that a conventional unassisted dwelling unit would command in the conventional housing market.

Rent Supplement and Rental Assistance Payment Programs. Enacted in 1965, these programs provided subsidies to reduce rent burdens of low-income tenants in Section 221(d)(3) and 236 properties to 30 percent of tenant income. The subsidies made up the difference between the basic rent and what low-income tenants could afford to pay for rent at 30 percent of their income. Up to 100 percent of the tenants in Section 221(d)(3) properties and 40 percent (with the HUD Secretary's approval) of the tenants in Section 236 properties could be assisted through rent supplements. Without such subsidies, rents in the properties were not affordable to many tenants, particularly those with incomes below 50 percent of median. Payments were available

for a maximum of 40 years (or the remaining life of the mortgage), but starting in 1976 many were replaced by Loan Management Set-Asides.

Residual Receipt Account. An account established by the mortgagee on behalf of an owner of a Section 221(d)(3) or 236 property. This account, which may bear interest, receives any money available at the end of the fiscal year that is in excess of the allowable 6 percent dividend. Money cannot be withdrawn from the account without HUD approval, but is available to the owner when the mortgage is repaid.

Section 8 Existing Rental Housing Program. A tenant-based subsidy program that makes up the difference between what a tenant can afford to pay for rent at 30 percent of adjusted income and the rent being charged for a modest, standard apartment. The subsidy is paid to the owner on behalf of the tenant. Tenants are free to occupy any unit that meets acceptable standards of repair (Housing Quality Standards) and that rents at or below an established maximum rent level (existing fair market rent). Unlike the Section 8 Substantial Rehabilitation and New Construction Programs, tenants receiving Section 8 Existing assistance are free to move and take their assistance with them.

Section 8 Fair Market Rent (FMR). Rent annually calculated by HUD and used to establish maximum rents that may be charged for Section 8 Rental Voucher and Certificate units. The rents represent the 45th percentile of rents paid by renters who have moved into a standard existing non-subsidized dwelling unit during the past 2 years, adjusted for size, type, and the particular housing market. The FMR for existing housing is adjusted upward to reflect accurately the higher rents for rehabilitated and newly constructed units.

Section 8 LMSA: See "Loan Management Set-Aside."

Section 8 Rehabilitation and New Construction Programs. Housing programs implemented under Section 8 of the Housing Act of 1974. Under these programs, private developers own and construct or rehabilitate housing that they then rent to lower-income tenants. The maximum rents charged by owners to tenants are restricted. The difference between 30 percent of a tenant's adjusted income and the rent being charged for the unit is paid to the owner by the Government. Section 8 rental payments for substantial rehabilitation and new construction are made to the owner for 20 to 40 years, depending upon the precise terms of the contract, and for 15 years in the case of moderate rehabilitation. The subsidies are property-based—a tenant who moves from an assisted building no longer receives assistance.

Section 207 Multifamily Housing: Program under which HUD insures mortgages made by private lending institutions to finance the construction or rehabilitation of multifamily rental housing by private or public developers. The project must contain at least five dwelling units. Housing financed under this program, whether in urban or suburban areas, should be able to accommodate families (with or without children) at reasonable rents. Legislation establishing this program was enacted in 1934. Investors, builders, developers, and others who meet HUD requirements may apply for funds to an FHA-approved lending institution after conferring with their local HUD office. The housing project must be located in an area approved by HUD for rental housing and in which market conditions show a need for such housing.

Section 221(d)(3) and (4) Multifamily Rental Housing for Moderate-Income Families: HUD insures mortgages made by private lending institutions to help finance construction or substantial rehabilitation of multifamily (five or more unites) rental or cooperative housing for moderate-income or displaced families. Projects in both cases may consist of detached, semi-detached, row, walk-up, or elevator structures. Currently, the principal difference between the programs is that HUD may insure up to 100 percent of total project cost under Section 221(d)(3) for nonprofit and cooperative mortgagors, but only up to 90 percent under Section 221(d)(4), irrespective of the type of mortgagor. Sections 221(d)(3) and 221(d)(4) mortgages may be obtained by public agencies; nonprofit, limited-dividend, or cooperative organizations; private builders; or investors who sell completed projects to such organizations. Additionally, Section 221(d)(4) mortgages may be obtained by profit-motivated sponsors. Tenant occupancy is not restricted by income limits.

Section 221(d)(3) Below Market Interest Rate (BMIR). Enacted in 1961 and continued through 1968, this program provided an up-front subsidy effectively reducing interest rates on privately written FHA mortgages to 3 percent. In return, rents paid to the limited dividend and non-profit owners were controlled by the FHA. New tenants generally could not have an income exceeding 95 percent of median. Tenants paid the established FHA rent or, if their income exceeded 110 percent of the median for the area, an amount equal to 120 percent of the FHA rent. Returns on equity for limited dividend owners were limited to 6 percent, with any excess going into a special "residual receipts account."

Section 231 Housing for the Elderly: Program under which HUD insures mortgages made by private lending institutions to build or rehabilitate multifamily projects consisting of five or more units. HUD may insure up to 100 percent of project cost for nonprofit and public mortgagors, but only up to 90 percent for private mortgagors Legislation establishing this program was enacted in 1959. Investors, buildings, developers, public bodies, and nonprofit sponsors may qualify for mortgage insurance. All elderly (62 or older) or handicapped persons are eligible to occupy units in a project insured under this program.

Section 236 Program. Active between 1968 and 1973, although some final endorsement dates (start of mortgage loan) were as late as 1980, this program provided subsidies to reduce mortgage interest rates to 1 percent. In exchange for the favorable interest rates, owners were required to keep rents low and to rent to tenants with incomes at 80 percent of the median or below. Tenants paid a "basic rent" or 30 percent of income (up to an established market rent), whichever was higher. Very low-income tenants paying more than 30 percent of their income for the basic rent were assisted through rent supplements. Limited-dividend owners were limited to 6 percent return on equity. Any excess income derived from relatively higher income tenants paying more than the basic rent was returned to an "excess income account."

Section 241 Supplemental Insurance: Flexible Subsidy is a competitively awarded program that provides reduced-interest direct loans to properties that receive Federal assistance under the Section 236 or Rent Supplement programs (or Section 8 in place of former assistance under these programs). It consists of two components. The traditional Operating Assistance Loan Program for troubled properties is a deferred 1 percent interest loan. It can be used to correct physical deficiencies caused by deferred maintenance, financial deficiencies, and projected deficits for the assistance year. The newer Capital Improvement Loan Program, for troubled as well as

some non-troubled properties, is an amortizing direct loan that carries a 3 to 6 percent interest rate set by HUD. It cannot be used for capital improvements that are the result of deferred maintenance. Under both components, an owner must prepare and abide by a Management Improvement and Operating Plan, and a profit-motivated owner must make a 25 percent matching capital contribution to the property.[3] Receipt of Operating Assistance Loans also requires that the property remain in low-income use for the balance of the original mortgage term[4] and suspends an owner's right to distribute dividends (until the loans are repaid). Fourteen percent of older assisted properties have received Flexible Subsidies. The majority of Flexible Subsidies (82 percent) were issued between January 1, 1980 and December 31, 1985. Properties with Flexible Subsidy after this date have a use restriction that makes them ineligible for preservation incentives.

Transfer of Physical Assets (TPA). Primarily between 1982 and 1984, many Section 221(d)(3) and 236 properties underwent a transfer of some or all of their assets from the original owner to a new owner through a process known as "transfer of physical assets." The transaction was primarily intended, without the infusion of Federal funds, to provide financially troubled projects with needed resources, usually through sale to an entity—often profit-making—with greater financial strength. The TPA needed HUD's approval. In return for permitting a new owner to assume the assets, liabilities, and obligations of the property and also the tax benefits of restarting the depreciable base for tax purposes, HUD required that the new owner complete all deferred maintenance and needed capital improvements and eliminate any outstanding financial delinquencies. Tax changes in 1984 significantly reduced the use of this mechanism by deflating its tax value to new owners.

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[3]Nonprofit owners may provide in-kind services to property residents rather than make capital contributions.

[4]This requirement generally makes owners of recipient properties ineligible for preservation incentives under the 1990 Preservation Act