A HOUSING GAP MODEL FOR CHAMPAIGN-URBANA, ILLINOIS

BY

JOSHUA ALEXANDER RUNHAAR

B.A., Utah State University, 2002

THESIS

Submitted in partial fulfillment of the requirements
for the degree of Master of Landscape Architecture
in the Graduate College of the
University of Illinois at Urbana-Champaign, 2005

Urbana, Illinois

CERTIFICATE OF COMMITTEE APPROVAL

University of Illinois at Urbana-Champaign
Graduate College

April 15, 2005

We hereby recommend that the thesis by:

JOSHUA ALEXANDER RUNHAAR

Entitled:

A HOUSING GAP MODEL FOR CHAMPAIGN-URBANA, ILLINOIS

Be accepted in partial fulfillment of the requirements for the degree of:

Master of Landscape Architecture

Signatures:

Director of Research - Douglas M. Johnston

Head of Department - James L. Wescoat

Committee on Final Examination*

Chairperson - Douglas M. Johnston

Committee Member - Lewis D. Hopkins

Committee Member - Mary Ellen Wuellner

Committee Member -

Committee Member -

Committee Member -

* Required for doctoral degree but not for master's degree

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

GRADUATE COLLEGE

This is to certify that the format and quality of presentation of the thesis submitted by

Joshua Alexander Runhaar

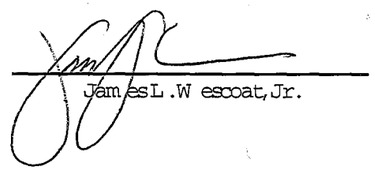
as one of the requirements for the degree of

Master of Landscape Architecture

is acceptable to the

Department of Landscape Architecture

Approval as of April 15, 2005



Departmental Format Approval

ACKNOWLEDGEMENTS

Many thanks to my adviser, Doug Johnston, who worked through the confusion of data to help produce this. Also thanks to my committee members, Mary Ellen Wuellner and Lew Hopkins who offered guidance and support. I would also like to make special mention of the Neighborhood Services Department at the City of Champaign who helped me discover the need for affordable and decent housing in all of our communities. And finally, thanks to Chris and Bailey for their love and support and to my parents for giving me the desire to do what I do.

TABLE OF CONTENTS

LIST OF FIGURES

Figure

INTRODUCTION

Each year billions of dollars are spent in an attempt to correct housing issues in communities across the nation. These funds cover down payment assistance to promote homeownership, rehabilitation of dilapidated housing, public housing operation and maintenance funds, and rental assistance funds. Many of the agencies that utilize the funding provided by the federal government, whether they are municipalities or not-for-profits, often take a piecemeal approach to housing issues, dealing with one house or housing project at a time. Because of this approach, the broader picture of a community's housing supply and demand may be overlooked.

As communities attempt to deal with the complicated issue of affordable housing, it would be extremely useful to consider the entire housing market in deciding what actions should be taken, determining the effects of those actions on the housing market and residents, and if publicly funded redevelopment or rehabilitation is efficiently meeting the needs of the community. The issue of efficiency is most specifically applied when attempting to determine what methods should be used to correct housing affordability gaps. The argument present at both national and local levels is whether supply (building new housing or renovating vacant housing) or demand (providing rent assistance) sided approaches are more financially effective or efficient in correcting the failures of the housing market.

This research proposes a basic housing gap model that can assist in the decision making process related housing construction and rehabilitation programs. This model is then applied to the community of Champaign-Urbana, Illinois, to examine how public funding may affect the housing market and if current public housing development projects will ultimately address the needs of area residents. The primary focus is on housing and residents who are below 30% of the area median family income (MFI).

CONTEXT OF THE MODEL

Scope of the Model: Subsidizing America's Housing

Within the broad topic of housing there are two terms that must be clearly defined, subsidized and affordable. Often these two terms, along with others, are used improperly as buzz words for a myriad of housing types both within the public and private housing market. Clearly defining the use of each term is important as they define the limits and focus of this study.

Subsidized housing is any housing that has the cost of construction, operation, maintenance, or rent paid for in part or in whole by a federal, state, or local government agency. The financial assistance of subsidized housing can be directly tied to the housing unit as seen in the construction of housing through HOPE VI funds or low-income tax credits, or can be a floating subsidy in the form of rental assistance as in the Section 8 Housing Choice Voucher Program.

Conversely, the term affordable housing is typically used to refer to low cost housing, whether the housing is created through government subsidy programs or through natural forces within the private housing market. In either case, the affordability of housing is based on both the cost of housing and the residents' ability to pay. This still requires that a specific target population be identified prior to defining what housing cost is considered to be affordable. In effect, homes costing $250,000 or more can be considered affordable if the target population contains households with annual incomes in excess of $150,000, but certainly not for households making between $20,000 and $30,000 annually. Because this study is focusing on extremely low income households, affordable housing is being defined within this study as:

1) Housing that is available to residents with incomes below 30% Median Family Income (MFI) without the addition of rental assistance vouchers.
2) Housing provided by public or private sources.

A History of America's Housing Programs

Since the inception of America's subsidized housing program in the mid 1930's, there have been many programs initiated by the federal government that have sought to deal with housing issues throughout the nation. The programs are generally divided into two categories; those that provide funding only, and those that physically provided housing (bricks and mortar programs).

This section provides a general description and brief history on both types of federal subsidy programs as well as those programs currently in use.

Federal Funding Programs for Housing

In 1967, the U.S. Department of Housing and Urban Development (HUD) was created to expand federal housing policy and programs, with the agency's mission being "to increase homeownership, support community development and increase access to affordable housing free from discrimination."[1] Within the realm of affordable housing, HUD distributes funds, establishes policies and guidelines for housing development and maintenance, and provides a voice for communities in the federal government.[2] Although HUD is the central agency in charge of national housing issues, "the federal government's involvement in subsidized housing in general and the location and occupancy of subsidizing housing in particular have been to develop broad, vague policies and then to supply the necessary funding. The actual implementation of subsidized housing is left to local decision makers."[3]

The local decision makers are the greater than 3,000 smaller agencies throughout the nation, typically based in large urban centers (Chicago Housing Authority) or counties (Housing Authority of Champaign County), that receive funding to provide services and housing to those in need. Each individual Public Housing Authority, or PHA, is charged with the development of new housing units, maintenance of current units, distribution of Section 8 vouchers, and regulation of people who currently or are applying to receive housing assistance. Funding from HUD is not limited to only local PHA's though, with funding also being distributed to state governments, local municipal governments (county and city), not-for-profit organizations (NPO's), faith-based housing organizations, and private developers. The largest funding programs administered by HUD include Community Development Block Grants (CDBG), HOME, HOPE VI, and the many rental assistance programs.

Initiated in 1974, CDBG is one of HUD's oldest active funding programs. It provides funding to states and local jurisdictions, called entitlement communities, "to ensure decent affordable

[1] www.hud.gov
[2] www.hud.gov
[3] Fleisher, Subsidized Housing and Residential Segregation in American Cities, p 80.

housing for all, and to provide services to the most vulnerable in our communities, to create jobs and expand business opportunities." Funds are allocated through a formula system that "uses several objective measures of community needs, including the extent of poverty, population, housing overcrowding, age of housing and population growth lag in relationship to other metropolitan areas." Activities eligible for the use of CDBG funds include those that aid low and moderate-income individuals, prevent or remove blight in a community, or other needs that present an immediate threat to the health or welfare of a community. Total funding for the CDBG program in FY 2004 was $4,934,315,000.[4]

HOME, a funding program started in 1990, is the largest block grant made available with the single purpose of creating housing affordable to low-income households. Funding is provided through a formula system to states and local communities or groups of communities (consortia) based on the "relative inadequacy of each jurisdiction's housing supply, its incidence of poverty, its fiscal distress, and other factors." Activities eligible for funding through HOME include providing assistance for home purchase or rehabilitation (for owner or renter occupied units), site acquisition or improvement, demolition of deteriorated housing, and other activities related to the development of affordable housing. Total funding for the HOME program in FY 2004 was $2,005,597,000.[5]

HOPE VI began in 1993 with the purpose of providing funds to public housing authorities with extremely distressed public housing. This funding is intended to cover: "Capital costs of major rehabilitation, new construction and other physical improvements; Demolition of severely distressed public housing; Acquisition of sites for off-site construction; and Community and supportive service programs for residents, including those relocated as a result of revitalization efforts." Total funding for the HOME program in FY 2003 was approximately 574 million dollars.[6]

Rental assistance programs seek to assist low-income households with their monthly rent payments while still relying on the private market to provide housing. While there are many

[4] HUD
[5] HUD
[6] HUD

different programs that the government utilizes to assist those in need with their rent (Section 8: tenant-based assistance, Section 202: elderly housing, Section 811: housing for persons with disabilities, Section 236: federally subsidized privately owned housing, etc.), Section 8 is the largest and perhaps most known program. Initiated in 1970, the rental assistance programs, like the Section 8 voucher for instance, had the intent of ensuring that a household would pay no more than 30% of its income towards housing.[7] The difference between what the tenant can pay with the 30% cap rate and the monthly rent is made up by monthly rent assistance. All of the rental assistance programs, much like public housing, are only provided to households that qualify financially. Total funding for the Section 8 Housing Choice Voucher Program alone was nearly 14.2 billion dollars in FY2004 which provided vouchers for 2.1 million households.[8]

History of Public Housing Development

The Federal Housing Administration was initially founded in 1934 with the purpose of providing public housing in place of substandard or blighted housing. A massive housing construction program initiated with the 1937 National Housing Act started the clearance of slums and the construction of federally funded, operated, and subsidized housing projects. Development continued throughout the 1940's, 50's, and 60's with large public housing projects that were intended to house an increasing number of the nation's poor. Although the architecture and development patterns of public housing have varied from one location to another, the basic trends found throughout the building types, size, massing, and proportion of building footprints to site were maintained throughout the history of public housing development. Because of the focus of the case study in Illinois, the example of the Chicago Housing Authority has been used to show development practice in public housing since the 1930's.


Figure 1: Jane Addams Houses – 1938

The early years of public housing (1930's – mid 1940's) found public housing developing in relatively dense pattern. Buildings were low-rise apartments or row houses, typically 2 to 4

[7] The Federal Government has established that any household paying more than 30% of its income towards housing is housing cost burdened, or paying too much for housing.
[8] http://www.tacinc.org/ October 28, 2004

stories tall. Four representative projects developed during this period contained on average 1050 units per development, with approximately 23% of the project sites covered by buildings. These developments had strongly defined boundaries with architecture that was visually similar throughout, creating a stark and clearly identifiable 'project' area which also contained few site improvements and limited access to open space.[9]


Figure 2: Grace Abbott Homes - 1955

The next period of public housing (mid 1940's – mid 1950's) continued with low-rise buildings as the predominant architectural type, but the introduction of high-rise and 'super block' developments distinguishes this period of development. The design of the structures and sites often suffered through this period as public housing became increasingly more segregated from the rest of the urban fabric. The high-rise buildings, most between 6 and 9 stories tall, lost all sense of human scale with massive structures set in the middle of large sites like Dearborn Homes (1950), in which only 10 percent of the site area was covered by buildings. The public housing of this period was inhospitable, out of scale and context, and effectively segregated from the rest of the community by its size and lack of infrastructure connections.[10]

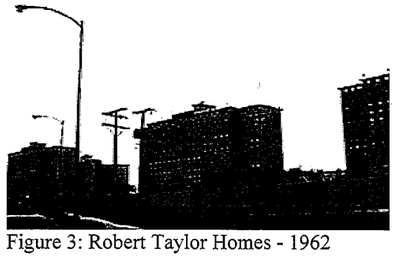


Figure 3: Robert Taylor Homes - 1962

The mid 1950's through the late 1960's saw a drastic increase in the development of high-rise towers. Buildings were 10 to 17 stories high, identical and set upon a bare fraction of the site (as little as 7%). These massive structures often contained more than 200 units, and were visual and physically forbidding as well as being socially segregated from the community. The sites had limited improvements and access to quality open space was not considered. The origins of high-rise development in Chicago came from Elizabeth Wood in 1945 that "spoke of the need

[9] Struyk, A New System for Public Housing, p25
[10] Struyk, A new System for Public Housing, p26

to rebuild to city and argued that the projects...had to have sufficient scale to not be overwhelmed by the surrounding neighborhood."[11] It was the 'projects' themselves that became overwhelming in terms of crime, social segregation of poverty and minorities, and a complete detachment from the community and urban fabric surrounding them.

The 1970's and 80's saw a period where little new development of public housing occurred. This is due to Congress limiting the availability of development funds, and also the capping public housing rents at 25% of the tenant's income in 1969. The cap effectively reduced rents received from tenants by 16.6%, but the legislation to provide additional funding to PHA's to compensate them for the decreased rent funds was slow to gain support from Congress, resulting in the even further cuts of the maintenance and administration of existing housing. This accelerated the deterioration of the nation's public housing stock.[12] What housing was constructed during these two decades was typically isolated, low-rise apartment buildings or small sections of row houses. Another movement that began in early 1970's with the publishing of Oscar Newman's book titled *Defensible Space* was the effort to improve existing housing projects. This was done by using design to increase the safety of the residents, improve open and recreational

Figure 4: The Failure of Public Housing

Physical Issues:

- Many authors cite the fact that since public housing was constructed in a manner so as to erect the maximum number of units for as little money as possible, architects and developers sought to reduce costs by reusing generic building plans whenever possible, eliminate design elements, reducing living space to the bare minimum, building high density towers with little interior public space, and ignoring site or community factors.
- Because public housing was developed as a way to replace slums, the new developments were placed on former areas of slum or blighted housing. These areas were typically removed and disconnected from the community, serving to further isolate the residents from employment and educational opportunities.
- A final piece identified by many authors including HUD (Public Housing that Works p3) for the failure of public housing is the inability of public housing authorities to manage pubic housing effectively. This problem is seen within tenant/staff relations, the maintenance of the housing units, and the general failure of public housing authorities.

Social Issues:

- One of the most commonly talked about issues within public housing is the residents. Arguments about the quality of the residents, the lack of opportunity or income, or even race are often brought up when discussing the problems of public housing. Kleit argues that "social problems are contagious and spread through the influence of the peer group" and that "when large numbers of people are unable to live up to society's expectations, they create a common 'deviant' subculture to deal with their common failures." (Kleit p 36) Both of these arguments point to the fact that people in a disadvantaged position will tend to continue to maintain themselves and their peers in this position, maintaining in effect a downward social spiral based within the public housing community.
- Public housing over the years has become a negative icon, with people that live in these developments carrying with them a stigma. This "stigma persists in other ways that still communicate this sense of moral disdain. In the case of American public housing, the visible scars include not just psychically injured humans but also the disfigured landscapes of the projects; the stigma of person and the stigma of place have become linked in the most dispiriting of ways." (Vale (Reclaiming Public Housing) p 13)

[11] Struyk, A New System for Public Housing, p27
[12] Vale, Reclaiming Public Housing, p 6

spaces, and attempt to provide the residents with ownership of both the buildings and spaces.

The trigger for Newman's *Defensible Space* was the recognition by federal and local agencies, designers and developers, and even the general public that public housing projects were beginning to fail by 1970. Poor planning, site and building design, structural problems brought on by cost cutting construction, and the overall lack of management or maintenance was compounded by recurring social issues were the primary issues at the root of the failure of many pubic housing projects. While many public housing projects limped along for decades before they were finally demolished (i.e. Cabrini Greens and Robert Taylor Homes in Chicago), the most well-known and complete failure was Pruitt-Igoe in St. Louis. This project, which contained "some 2,800 units…in 33 11-story buildings situated on 57 acres"[13] was built in the mid-1960's on an isolated slum clearance site. The deterioration of conditions within this project was so rapid that by 1969, the largest rent strike nationally to date occurred, which further inflamed the situation. The first buildings were demolished in the spring of 1972, with the development being completely vacated by May 1974, less than ten years after construction of the project. Some attempt was made to delay the collapse of other developments for a time, but the lack of maintenance funds continued to compound with the physical and social problems of public housing to result in wholesale failure of developments throughout the 1990's and 2000's.

Current Housing Strategies

In an effort to replace failing public housing projects, the U.S. Department of Housing and Urban Development (HUD) has shifted its efforts from public housing to project based developments, where private developers are compensated through federal low-income tax credits, CDBG, HOME, and HOPE VI funds to construct new housing units in place of public housing that are typically available to households at various income levels. This effort has also been an attempt to decentralize the control of subsidized housing, reducing the amount of control that the federal government, or its local subsidiaries, has over the day-to-day affairs of operating and maintaining the housing. Instead, regulation is maintained through the control of construction funds, the land through leases, and the issuance of rent based assistance to the residents of the new development.

[13] Plunz, p2

Redevelopment since 1993, when HOPE VI funds were first made available, has shifted the public housing market away from high-density high-rise projects to lower density, mixed-income, and often scattered-site developments. Much of the redevelopment has been creating town homes, row-houses, and even single family homes for individuals of all income levels, some developments even including market rate homes. Greater emphasis has also been placed on site and architectural design of the developments, along with more money and effort placed into site amenities, open space, and recreation areas.

Figure 5: Orchard Park Homes
HOPE VI Redevelopment

The change in both the federal government's attitude towards public housing and the new types of developments being built have led some to question whether or not the extremely poor residents of public housing are losing their ability to be housed. To date though, there have been no comprehensive studies about this as the shift to project-based development is still an emergent trend. The analysis presented through this research effort was an attempt to understanding the composition of a low income housing market taking into account public housing, low rent private housing, and federal housing subsidies within a compact area. The analysis compares resident income and the cost of rental housing to determine where housing shortages are occurring, and to determine the effect both rental assistance programs and the removal of public housing.

DEVELOPING A HOUSING GAP MODEL

Conceptual Framework

The history of housing America's poor is filled with arguments about the design and location of public housing, policy questions about which programs to fund, and social issues within the sphere of subsidized housing. The purpose of this study is not to argue for or against any one approach to affordable housing, but rather to investigate the local housing market to determine the quantity of affordable housing and how federal funding that is in place within local communities affects the levels of affordable housing in a community. There are numerous writings and case studies that have investigated affordable housing, federal housing policies, funding programs, and public housing. Because these studies typically explore the issues at large while using specific locations only as examples, there are few methods by which individual communities can investigate their housing needs and how federal housing policies and funding effect local housing.

This purpose of this study is to therefore enable individual communities to analyze the local housing market. This study utilizes a housing gap model (or deficit model), which has the ability to quantitatively identify affordable housing by showing where housing deficits are within a community based on primarily resident incomes and rental rates. Gap models, which are often used as "pragmatic devices for shaping and implementing public policies,"[14] create a framework for analyzing multiple functions of a housing market within a community. The housing gap model developed within this study provides a means by which to assess:

1) The availability and cost of housing.
2) The ability of households to pay for housing.
3) The effect of current housing subsidizes.
4) The potential effects of public housing redevelopment.

The key components of the gap model are the supply and demand of housing. The supply portion of the model consists of an analysis of the available housing stock in an area including the number of units, whether the units are owned or rented, the cost of the units, the condition of the units, and other indicators. The demand portion of the model is a demographic analysis that

[14] Myers, Pitkin, Park, p568

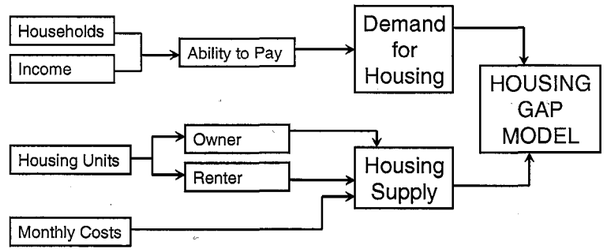
provides information on the number of households and their size, income, and where they reside. The comparison of the supply and demand models at a specific point-in-time provides a housing gap model, which shows surpluses and deficits in the housing market based on the affordability of housing and the ability for residents to pay for housing. (Figure 6)

This housing gap model, as constructed, is intended to provide an analysis of only the rental market in a community. This limitation is in place primarily because of the lack of accurate data on the monthly cost of home ownership.[15]

Construction of the Model

The primary components of a Housing Gap Model are housing supply and demand. Additional portions including rent based assistance and other federal housing programs, housing cost burden rates, and vacancy rates. Because this model is concerned with the affordability of housing, median family income (MFI) is used as a measure of both housing cost (supply) and tenant ability to pay (demand). Median family income is a standard used by many studies and housing agencies including HUD that essentially provides a financial standard by which households in a designated area are measured.

Figure 6: Conceptual Housing Gap Model



Housing Supply and Demand

The Housing Supply and Demand portions of the model is created using the data sets US Census Bureau Decennial Census SF1 H1 Housing Units, which provides an actual count of housing units by tenure, SF3 H62 Gross Rent, which provides a sample of the number of housing units at a series of gross rent ranges, SF1 H15 Tenure by Household Size, which provides a total count of owner and renter occupied housing units, and finally the MFI levels for a standard four person household.

[15] The monthly cost of homeownership varies within the census data because of the nature of mortgages. Because many households are able to fully repay their mortgage or refinance for lower payments, the cost of homeownership within the census data is much lower than the actual costs typically found within the open market.

To provide a method by which housing supply and demand can be compared to each other, the cost of housing (supply) and tenant's ability to pay (demand) are both altered to be measured by MFI levels. Figure 7 shows the method by which the various MFI level dollar amounts for both housing supply and demand are determined. Figure 8 shows the annual income limits and monthly housing expenditure limits by MFI level based on the assumption of an area MFI of $50,000. The monthly housing expenditure limit is the real measure of what a family at each MFI level is able to afford by HUD's standards for all of their housing costs. Figure 9 provides the rent ranges by MFI level for housing supply and demand in the Champaign-Urbana area.

Figure 7: Monthly Housing Expenditure Limits

$$\frac{\text{Annual Income (by MFI Level)}}{\text{12 Months}} \times \text{30\% Housing Cost Burden Limit} = \text{Monthly Housing Expenditure Limit by MFI Level}$$

Figure 8: MFI Levels and Monthly Housing Expenditure Limits – Based on an assumed $50,000 MFI

	30% MFI	50% MFI	80% MFI	100% MFI	120% MFI	150% MFI
Annual Income	$15,000	$25,000	$40,000	$50,000	$60,000	$75,000
Monthly Housing Expenditure Limit	$375	$625	$1,000	$1,250	$1,500	$1,875

Figure 9: Monthly Gross Rent Limits in Champaign-Urbana

<30% MFI	30-50% MFI	50-80% MFI	80-100% MFI	100-120% MFI	120-150% MFI	150%+ MFI
<$400	$401-$700	$700-$1,100	$1,100-$1,400	$1,400-$1,650	$1,651-$2,000	$2,001+

Because the gross rent census data has many more divisions than the monthly housing expenditure limits, the census data is grouped to better fit the divisions represented through the MFI levels. Summing all of the census divisions within the MFI level and adding a proportion of any census divisions not wholly within a MFI level accomplish this. For example, to determine the number of units available at <30% MFI (from $1 to $375 in monthly gross rent), the number of units are summed in each field from less than $100 to $300-$349 in SF3 H62 Gross Rent, then half of the units in the $350-$399 range are added. This is then completed for each MFI level to determine the number of housing units available at each rent level.

To improve the accuracy of the model in terms of the total number of housing units in the study area, the number of units available at each MFI level is converted to a percentage, which is then multiplied by the number of housing units provided by SF1 H1 Housing Units (Figure 10). This is done because the SF1 data is more accurate in terms of a total number of units, and is therefore used to correct the gross rent data from the SF3 dataset.

Figure 10: Total Housing Unit Correction

$$\frac{\text{Number of Units at 30\% MFI (from SF3 H62)}}{\text{Number of Units at all MFI Levels (from SF3 H62)}} \times \text{Total Number of Units (from SF1 H1)} = \text{Total Units Available at 30\% MFI (Adjusted)}$$

Rent Based Assistance

Information on the level of rental assistance within the given study area can typically be obtained from the local PHA, which should be able to provide the total amount of funding for rental assistance and the number of households being assisted. Additional information is typically available covering the receiving household's income, how much that household pays in rent, and what the total rent for the housing unit being rented is. This provides information on what MFI level the households are and what MFI level of housing they are renting. Because the rent voucher pays the difference in what the resident can afford and what rent is due, housing within the model is then adjusted to account for rental assistance subsidies within the community.

Vacant Housing

The Vacant Housing portion of the model is created using SF3 H59 Rent Asked which provides the number of vacant rental units at a series of gross rent ranges and the MFI levels for a standard four person household. The rent range divisions within the SF3 H59 Rent Asked data is converted to MFI levels in a similar manner to how the housing supply was converted to MFI levels, thus providing the number of vacant rental units at each MFI level.

Housing Cost Burden Rates

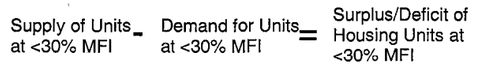
The Housing Cost Burden Rates are determined from SF3 H73 Renter Housing Cost Burden that provides data on the percentage of income paid towards housing costs for a range of income levels. As with the supply and demand portions of the model, the income level divisions within

SF3 H73 Renter Housing Cost Burden are converted to MFI levels, then the number of households paying more than 30% of their income are summed for each MFI level. The number of households paying more than 30% of their income in housing costs is then divided by the total number of households for each MFI level to obtain the rate of housing cost burden at each MFI level. (Figure 10)

The Housing Gap Model

The model is completed by comparing the total housing units at each MFI level found within the supply component to the same within the demand component of the model. (Figure 11) After the number of raw housing units is compared within each MFI level, local influences such as rent based assistance programs, vacancy rates, and the rate of households that are housing cost burdened can be factored in. Appendix A contains a flow chart for the completed Housing Gap Model including the source for data used for the various sections of the model.

Figure 11: Surplus/Deficit of Housing Units



Once the gap model is completed and the housing surpluses and deficits are determined for each MFI level, external influences can be analyzed. The most important external influence within this study is the effect of rent based assistance programs. Because rent assistance programs assist households with their rent payments, these programs effectively shift a portion of the housing demand from a lower MFI level to a higher one. This shift is seen because while the household may be at <30% MFI, with the rent assistance they are able to afford housing that is in a higher MFI level without becoming housing cost burdened. The number of households shifted and the income levels of the households being affected will vary, but the typical influence of rent assistance programs will be to shift households from the <30% MFI level up to the 30-50% MFI level. This has the effect of reducing the demand for housing within the <30% MFI level.

Secondary to the effects of assistance programs for households are the issues of vacant housing and housing cost burdened households. Of limited importance is the vacancy rate, which can be

used to identify possible market failures. For instance, if a large proportion of the vacant housing is available in the <30% MFI level, it could signify that there are physical problems with this housing stock which impairs it use (qualitative) or that there is a surplus of housing beyond the demand for housing in the area (quantitative). The rate of housing cost burdened households can show both failures is the market and within the model. For example, a high rate of housing cost burden within the <30% MFI level (even if there is no housing deficit) can signify either that there is some market failure occurring where low-income residents are unable to obtain the lower cost housing or that because of the coarseness of the income categories, the households within the <30% MFI may have an income near the bottom of the <30% MFI income range yet are renting a unit in the top of the <30% MFI range.

The final outcome of the rate of households that are housing cost burdened is the fact that households with higher incomes often have more choice in housing and often rent at MFI levels lower than their monthly housing expenditure limit. While this is not directly tied into the Housing Gap Model in terms of the housing supply or demand, it is used to confirm that the housing deficit at lower MFI levels is having an effect on households.

Housing Gap Model Development Details

With the establishment of how the components of the Housing Gap Model are created, it is necessary to provide some detail the selection of study areas, data, and how local issues influence the model.

Study Area Selection

The delineation of a study area is important, as it will affect the availability and accuracy of data, the range of issues that can be investigated, and the physical boundaries of the analysis. Small geographic areas can be targeted if there is a specific housing issue like blight in a neighborhood, whereas an entire city can be selected to look at broader issues like the availability of housing or geographic comparisons of housing availability throughout the city. In many cases, housing issues are not limited to specific jurisdictional boundaries, but instead may affect a community containing multiple cities, unincorporated lands, and even public institutions like military bases

or universities. Whether large or small, the study area should accurately reflect what is desired from the analysis and should include all of the areas that affect or influence the analysis.

Data Standards

The limiting factor of any model is the amount, accuracy, and age of the available data. Because of the cost, difficulty, and time required to collect data, many models, including this gap model, rely on federal data collection systems like the US Census and the Bureau of Labor Statistics.

In addition to the collecting hard data from the census, this model utilizes many other standards frequently used throughout the housing industry. The first is median family income (MFI), which is established by HUD to provide annual income level guidelines for specific geographic areas (metropolitan statistical areas – MSA's). An area's MFI represents that location's median annual income for a standard family size of four individuals. In addition to the use of MFI as a financial standard, the model uses the concept of housing cost burden, which is used by HUD to indicate the maximum expenditure of 30% of monthly income on housing expenses, which includes rent, utilities, taxes, and insurance. Because housing cost burden standards consider all housing expenses, the housing supply side of the model was constructed using gross rent which accounts for monthly rent and utilities for a housing unit (it is assumed that taxes and insurance for the housing unit is included within the rent by the landlord).

Local Influences

While the census provides the majority of the data required to complete the gap model, it does not always account for local variations within the housing market. Local influence include the provision of public housing and of rental assistance vouchers, but other influences like the existence of a military base, university, or even reservation lands decrease the reliability of the data used in the gap model.

In the case study, the largest issue present is the existence of a university and a college. Although students are a vital component of the market, their inclusion in the Gap Model skews the data resulting in a larger deficit of housing at <30% MFI than really exists. Figure 12 shows that the areas of the study with high student populations have a large supply of housing within

the 30-50% MFI range and high demand within the <30% MFI range. The large difference between the supply and demand of housing is the result of the census data only reporting the actual income of the students. While student incomes are largely within the <30% MFI range, they are able to afford higher rent levels because of their ability to access external funds from either families or financial aid. Within the model, students act much in the same way as those households that receive federal rent assistance as they are a part of the <30% MFI in terms of demand, they are able to afford housing with rents in the 30-50% MFI range. Because of this, the removal of areas with high concentrations of student populations can decrease the inaccuracy of the model.

Figure 12: Student Populations within the Housing Gap Model

	Supply of Renter Housing Units by MFI Level						
	<30%	30-50%	50-80%	80-100%	100-120%	120-150%	150%+
Champaign	1304	2176	932	340	124	100	0
Urbana	371	1834	772	143	32	10	7
	Demand of Renter Housing Units by MFI Level						
Champaign	3,400	1,096	333	81	39	37	10
Urbana	1,720	678	445	161	64	63	40

CASE STUDY: CHAMPAIGN-URBANA, ILLINOIS

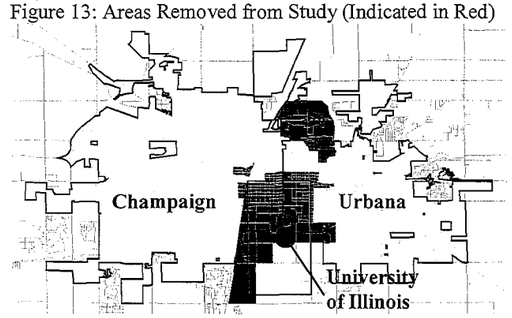
The Housing Gap Model was used in Champaign-Urbana in order to first analyze the rental housing market at <30% MFI and then determine the effect of government subsidy programs. Because the Housing Gap Model is intended to serve as an analytical aid for municipalities, PHA's, and not-for-profit housing agencies, it is useful to not only show where housing deficits are occurring but also how the current programs are affecting the market.

The study area selected was limited to the jurisdictional boundaries of the cities of Champaign and Urbana, Illinois, which happens to include the University of Illinois and Parkland College. This case study will highlight the supply and demand portions of the model, the results of the Housing Gap Model along with the effects of current housing assistance programs, and conclude with a discussion about how subsidy programs may be altering the market.

A Housing Gap Model for Champaign-Urbana

All of the data within the Housing Gap Model generated for Champaign-Urbana were obtained from the 2000 census with the exception of the subsidy related data from 2003, which was the only data available. The census data being used for the gap model is at the block group level, and the study contained all block groups that were at least partially within the jurisdictional boundaries of Champaign and Urbana.

Figure 13: Areas Removed from Study (Indicated in Red)



Because of the large student populations in this community, it was decided to remove any block group from the study area where the population was 75% or more students. (Figure 13) This was extremely effective in removing the majority of the student from the gap model because most of the student population for the University of Illinois lives in close proximity to campus along the southeast side of Champaign and the southwest side of Urbana. This alteration of the study area resulted in the removal of 80% of the undergraduate students and 38% of graduate students. The remaining student populations were similar to the

student populations found in most communities throughout the Midwest that have some type of junior college. (Figure 14) Additionally, there are also a large number of students that live in dormitories or the expansive Greek system, however these populations and housing units not contained within the gap model because these residents and housing units are a part of the census data sets dealing with institutional housing, which is maintained in separate data sets by the US Census from the data sets used in this model.

Figure 14: Students Removed from the Study Area

	Total Population 2000 Census	Total Population with Students Removed	Percent of Population Remaining
Champaign	67,518	50,098	74%
Urbana	36,395	24,341	67%
	103,913	74,439	72%

	Removed Undergraduate Students	Total Undergraduate Students	Percent of Students Removed
Champaign	14,611	18,203	80%
Urbana	8,834	11,137	79%
	23,445	29,340	80%

	Removed Graduate Students	Total Graduate Students	Percent of Students Removed
Champaign	1,574	4,357	36%
Urbana	1,648	4,012	41%
	3,222	8,369	38%

The median family income for the Champaign-Urbana MSA in 2000 as provided by HUD was $54,600. This was converted to a monthly housing cost limit, which designates the amount a household at each MFI level from <30% to 150%+ can afford to spend on housing, utilizing the housing cost burden rule of a household spending no more than 30% of its income on housing. (Figure 15)

Figure 15: Monthly Housing Cost Limit by MFI Level for Champaign-Urbana (2000)

MFI Level	<30%	30-50%	50-80%	80-100%	100-120%	120-150%	150%+
Annual Income	<$16,380	$16,381-$27,300	$27,301-$43,680	$43,681 - $54,600	$54,601 - $65,520	$65,521 - $81,900	$81,901+
Monthly Housing Cost Limit	<$400	$401-$700	$701 - $1,100	$1,101 - $1,400	$1,401 - $1,650	$1,651 - $2,000	$2,001+

Results of the Housing Gap Model

The Housing Gap Model initially shows a deficit of 2,666 units in the <30% MFI category, small deficits at 50%+ MFI category[16], and a surplus of 5,348 units in the 30-50% MFI category. (Figure 16) The deficit of housing within the <30% MFI category shows that there is truly a lack of affordable rental housing within the community.

Figure 16: Housing Stock, Demand, and Gap Model Results – Limited Students

	<30%	30-50%	50-80%	80-100%	100-120%	120-150%	150%+	
	Supply of Renter Housing Units by MFI Level							
Champaign	1,440	5,190	2,396	178	25	21	12	9,262
Urbana	896	3,926	796	109	40	61	35	5,863
	2,336	9,115	3,193	287	64	83	47	15,125
	Demand of Renter Housing Units by MFI Level							
Champaign	2,817	2,233	2,031	827	419	436	499	9,262
Urbana	2,185	1,499	1,268	443	143	153	172	5,863
	5,002	3,732	3,298	1,271	562	590	671	15,126
	Gap Model: Renter Housing (Deficit)/Surplus							
Champaign	(1,377)	2,957	365	(650)	(394)	(415)	(487)	
Urbana	(1,289)	2,427	(471)	(334)	(104)	(92)	(137)	
	(2,666)	5,384	(106)	(983)	(498)	(507)	(624)	

The large surplus of housing in the 30-50% MFI category exists because of average rents in the study area. HUD fair market rent standards for Champaign-Urbana show that the rent for efficiencies, one, and two bedroom apartments range from $403 to $640. (Figure 17) Census data (SF3 H42 Tenure by Bedrooms) shows that 79.8% of Champaign's rental units and 82.9% of Urbana's are zero, one, or two bedroom units, adequately substantiating the fact that 60% of the housing supply in the area is located within the 30-50% MFI category.

[16] The deficits of units above 50% MFI is not an issue as households within these income ranges have the ability to locate housing at lower MFI levels.

Figure 17: Fair Market Rents for Champaign-Urbana, IL

	1 Bedrooms	2 Bedrooms	3 Bedrooms	4 Bedrooms
Post Redevelopment Rents	$447-$581	$536-$716	$620-$847	$691-$954
Current Section 8 Ability to Pay	$121	$126	$145	$127

To explore further the housing market, Section 8 vouchers were factored into the model. The Section 8 vouchers used throughout the community (574 in Champaign and 408 in Urbana[17]), shift households that are only able to afford housing within the <30% MFI to be able to afford housing within the 30-50% MFI level. With this adjustment, the housing deficit at <30% MFI is reduced from 2,666 units to 1,684 units. (Figure 18)

Figure 18: Corrected Housing Gap Model – Section 8 Included

	Renter Housing (Deficit)/Surplus - Section 8 Corrected						
	<30%	30-50%	50-80%	80-100%	100-120%	120-150%	150%+
Champaign	(803)	2,383	365	(650)	(394)	(415)	(487)
Urbana	(881)	2,019	(471)	(334)	(104)	(92)	(137)
	(1,684)	4,402	(106)	(983)	(498)	(507)	(624)

An analysis of the housing cost burden rates across the MFI levels shows that 77% of the households within the <30% MFI category are housing cost burdened. (Figure 19) This figure was expected as a large housing deficit in this category would require that households with <30% MFI seek housing within the 30-50% MFI category. What is surprising is that even with the large surplus of housing within the 30-50% MFI category, 50.9% of the households are housing cost burdened. These housing cost burden rates indicate that even though the model shows that there is plenty of housing available for individuals in this income range, households are not in housing that is affordable to them by the housing cost burden standard.

Figure 19: Renter Households Housing Cost Burden Rates by MFI – Limited Students

	<30%	30-50%	50-80%	80-100%	100-120%	120-150%	150%+
Champaign	78.0%	51.1%	22.0%	4.1%	0.0%	0.0%	0.0%
Urbana	77.3%	50.5%	16.8%	5.4%	7.9%	6.9%	0.0%
	77.7%	50.9%	20.0%	4.6%	3.1%	2.7%	0.0%

[17] Section 8 voucher figures are for 2003, no data is available for 2000.

The final piece of the model shows the number of rental units that are available but currently vacant. The area contains 1,178 vacant rental units with these units having a similar distribution across MFI categories as the occupied rental units. 55% of the vacant units are available within the 30-50% MFI category and 31% available within the <30% MFI category. (Figure 20) The fact that the vacancy rate has remained steady since 1990, is currently at only 7.2%, and matches the distribution found within the housing supply component of the gap model shows that there are no obvious failures in the market in related to vacancy.

Figure 20: Vacant Units for Rent by MFI Level in 2000

	<30%	30-50%	50-80%	80-100%	100-120%	120-150%	150%+	
Champaign	211	315	74	2	2	0	0	604
Urbana	150	338	54	31	0	0	0	574
	361	653	129	34	2	0	0	1,178

Discussion of the Results

The primary focus of this study was to analyze the availability of affordable rental housing (rents below 30% MFI for the purpose of this study) in the cities of Champaign and Urbana Illinois. Throughout the process of this study and supported by the housing gap model, it was determined that there was a deficit of rental housing at below 30% MFI. Initial estimates showed a very large deficit of affordable units, but after the large student population was accounted for and removed, the deficit was 2,666 units. While this figure included public housing units in the market, it did not account for other methods that are currently being used to deal with housing cost issues.

The primary method by which housing is made affordable to low income residents is through the use of Section 8 vouchers, which are a demand side solution to affordable housing where households receive a direct rent subsidy. Section 8 vouchers were added to the model to help account for the effect of current rent assistance programs, which reduced the housing deficit at <30% MFI by 37% to a gap of 1,684 units, but by no means eliminated the deficit. The supply side solution to affordable housing (public housing) was already included within the model as these units were counted into the original census data used. The 333 public housing units in

Champaign and 227 units in Urbana constitute 24% of all rental units available for rents below 30% MFI.

Current federal subsidy and housing programs provide housing for 1,542 households (982 Section 8 vouchers and 560 public housing units) in Champaign and Urbana, or 31% of the households that are <30% MFI. $5.6 million in Section 8 vouchers (~$475 per month per household) are provided annually within the study area. The 560 public housing units cost approximately $1.6 million annually to operate (~$240 per unit per month). Initially, public housing appears to be much more efficient in terms of cost to support per unit, but other factors like the cost of construction and increased maintenance funds (current subsidy levels provide insufficient funding to fully maintain and update the aging structures) reduce the cost efficiency of public housing. However, funding for public housing is becoming ever more problematic as most projects having arguably exceeded their useful life. New public housing projects have not been initiated, instead the federal government has turned to project based developments, low-income tax credit housing, and rent based assistance.

While there are no long term solutions for eliminating the remainder of the housing deficit at <30% MFI, the current subsidy programs will most likely not be able to fill this deficit. The expansion of the Section 8 vouchers to meet the needs of an additional 1,684 households will cost approximately $6.4 million more annually. Beyond the raw cost of Section 8 vouchers, each PHA is limited to a maximum annual growth of only 10% above the vouchers currently distributed, requiring at least ten years of maximum voucher growth to fulfill the needs of households <30% MFI. Public housing is a rapidly deteriorating and failing system. Every year as more public housing units are taken off line, the deficit of housing will continue to increase.

Because the current systems do not have the ability to fully meet the affordable housing needs of Champaign-Urbana, both municipalities and the Housing Authority of Champaign County (HACC) are seeking to involve private developers in the provision of affordable housing to try to replace the worst public housing. Through project based developments in which HOPE VI, CDBG, tax credits, and rents are used to leverage private developers, both communities are attempting to replace the worst public housing projects so as to reduce the overall loss of public

housing units. The cost of this type of development has yet to be fully realized as projects are only now starting.

Conclusions for Champaign-Urbana

With the gap model showing such a large deficit of housing at <30% MFI, specific analyses can be completed. While the funding for the Section 8 program has continued to expand, the budget expansion often does not increase the number of vouchers but instead only increases the subsidy per household as rents continue to increase. This leaves communities unable expand their capacity to meet their total affordable housing needs.[18] Without the expansion of the number of rental subsidies and with the changing attitudes and policies at the federal level, many communities are attempting to obtain funds for the redevelopment of public housing while continuing to maintain and use what remains of public housing.

The cities of Champaign and Urbana, like many other communities, are seeking to redevelop existing public housing, Burch Village in Champaign (66 units) and Lakeside Terrace in Urbana (99 units). This redevelopment of public housing is essentially shifting the burden of building and managing subsidized housing from the federal government to local jurisdictions and private developers. However, even with the substantial levels of subsidy from the federal government, HACC, and both cities, the inclusion of private developers in the affordable housing arena is shifting the base rents of these redeveloped units from the <30% MFI category to the 40-100% MFI categories. (Figure 21)

Figure 21: Post Redevelopment Rents and Current Section 8 Household's Ability to Pay[19]

	1 Bedrooms	2 Bedrooms	3 Bedrooms	4 Bedrooms
Post Redevelopment Rents[20]	$447-$581	$536-$716	$620-$847	$691-$954
Current Section 8 Ability to Pay[21]	$121	$126	$145	$127

[18] HUD
[19] Ability to Pay refers to a household's housing expenditure limit of 30% of their income.
[20] These rent figures are estimates as provided to the City of Champaign by the developer for the Burch Village project.
[21] HACC

This makes it perfectly clear that the redevelopment of public housing by private developers is in no way going to meet the total deficit of housing at the <30% MFI category in the community. The 165 public housing units being redeveloped (7% of the housing available at <30% MFI) are effectively being removed from the community. The replacement units are fewer in number as project densities are reduced to attempt to combat social issues and more expensive as more amenities are included and construction costs increase. While the existing residents who are being displaced are provided special Section 8 vouchers allowing them to obtain housing elsewhere in the private sector, most will be unable to afford any of the newly redeveloped housing being built without continuation of such assistance.

While the current cost of providing rent subsidies and operating public housing is known, the full cost of redevelopment will remain unknown until it is complete. This renders any attempt to make direct comparisons about the fiscal efficiency of redevelopment difficult for the time being. Even without this direct comparison, it is argued that the federal government is inefficiently approaching this housing problem. In the case of using a private developer for the redevelopment of Burch Village, approximately 44 new units will be provided at 40% - 100% MFI. This redevelopment is inefficient for two reasons: the new rental units are within MFI levels not in short supply within the existing housing market[22] and the federal government is required to immediately increase the number of Section 8 Vouchers to house the households displaced by redevelopment.

While these redevelopments are addressing serious housing conditions and blight issues within both communities with limited local costs, it is not a solution to the overall housing deficit at <30% MFI. But the housing gap model does show that the federal government is paying developers to build housing that is already being adequately provided by the private market, then assuming the recurring cost of providing rental subsidies to households that are no longer being housed. This study does not suggest what methods will be effective in providing housing for low income individuals and thus diminishing the affordable housing gap, but rather provides a tool for communities to use in analyzing possible affordable housing scenarios. Even with the

[22] A deficit was found at 50% or greater MFI in Table 4, but it was argued to be inconsequential because households at these income levels have greater choice in housing and can rent at costs lower than their income level.

coarseness of the rent and income categories, it has been clearly shown that housing with rents below $400 is clearly needed within Champaign and Urbana. With the Housing Gap Model, future development and subsidy programs can be used in the gap model in much the same way that Section 8 vouchers were to determine if those efforts are improving the deficit of affordable housing.

RECOMMENDATIONS FOR FUTURE MODELING

The primary limitation within this housing model is the availability of data. For many communities, data is limited to only census data, the accuracy and completeness of which has already been discussed. While the most accessible and reliable data measuring the population and number of households in an area will likely still come from the census, in order to make a more complete and precise housing model projection of available census data to the present and the systematic collection of data from multiple parts of the community is required.

While the figures provided by the census are static, they can be made current by utilizing demographic projections to estimate population growth based on known growth in the area, historic growth trends, or other system of mathematical estimation. Additional data can also be collected to make the model more detailed including building surveys that include information of condition, size, number of units, and tenure of the occupants; resident surveys that determine the demand for housing, barriers to housing, housing costs, and resident incomes; and collection of data about underserved members of the community like the homeless, extremely low income households, housing units containing multiple households, and other specialized populations.

These additional data sets and data projections can be best maintained within GIS (Geographic Information Systems) database. The use of GIS in generating Housing Gap Models can improve the accuracy, effectiveness, and speed at which the model can be produced. Compiling data will allow for models to be generated quickly, analyze a wide range of geographic areas, and target analyses to specific locations, housing problems, or demographic issues, and most importantly look at sequential data for the analysis of trends.

BIBLIOGRAPHY

Bowly, Devereux Jr. The Poorhouse: Subsidized Housing in Chicago, 1895-1976. Carbondale and Edwardsville, Illinois: Southern Illinois University Press, 1978.

Cisneros, Henry G. Defensible space: deterring crime and building community. Washington D.C.: U.S. Department of Housing and Urban Development, 1995.

Fleischer, Richard Stuart. Subsidized Housing and Residential Segregation in American Cities: An evaluation of the site selection and occupancy of federally subsidized housing. Diss. University of Illinois Urbana-Champaign, 1979.

Hall, Phoebe. Chicago Public Housing Design. newmedia.medill.northwestern.edu/studentprojects/hall/projects/cha1.htm

HUD USER. www.huduser.org

Kleit, Rachel Garshick. "Housing, social networks, and access to opportunity: the impact of living in scattered-site public housing." Diss. U of North Carolina, 1999.

Mitchell, J. Paul. Federal Housing Policy & Programs. New Brunswick, New Jersey: Center for Urban Policy Research, 1985.

National Public Housing Conference. Public Housing Tour Guide. New York: National Public Housing Conference, 1940.

Newman, Oscar, and the US Department of Housing and Urban Development. Creating Defensible Space. Washington D.C.: U.S. Department of Housing and Urban Development, 1996.

Newman, Oscar. Defensible Space: Crime prevention through urban design. New York: The MacMillan Company, 1972.

Plunz, Richard. Housing Form and Public Policy in the United States. New York: Praeger Publishers; 1980.

Rabiega, William A. and Linda M. Robinson. Property Value Impacts and Neighborhood Perceptions of Public Housing in Low and Moderate Density Residential Neighborhoods. Portland, Oregon: The Center for Urban Studies, 1980.

Stegman, Michael A. State and Local Affordable Housing Programs: A rich tapestry. Washington, D.C.: The Urban Institute Press, 1999.

Struyk, Raymond J. A New System for Public Housing: Salvaging a national resource. Washington D.C.: The Urban Institute, 1980.

Struyk, Raymond J., Margery A. Turner, and Makiko Ueno. Future U.S. Housing Policy. Washington, D.C.: The Urban Institute Press, 1988.

The Housing Assistance Council. Public Housing Manual: A guide for bringing low-rent housing to small towns and rural areas. Washington, D.C.: The Housing Assistance Council, 1981.

US Department of Housing and Urban Development and the Congress of the New Urbanism. Principles of Inner City Design. Linked from http://www.hud.gov

US Department of Housing and Urban Development. Http://www.hud.gov

US Department of Housing and Urban Development. Public Housing that Works: The transformation of America's public housing. Washington D.C.: U.S. Department of Housing and Urban Development, 1996.

Vale, Lawrence J. From the Puritans to the Projects: Public housing and public neighbors. Cambridge, Massachusetts: Harvard University Press, 2000.

Vale, Lawrence J. Reclaiming Public Housing: A half century of struggle in three public neighborhoods. Cambridge, Massachusetts: Harvard University Press, 2002.

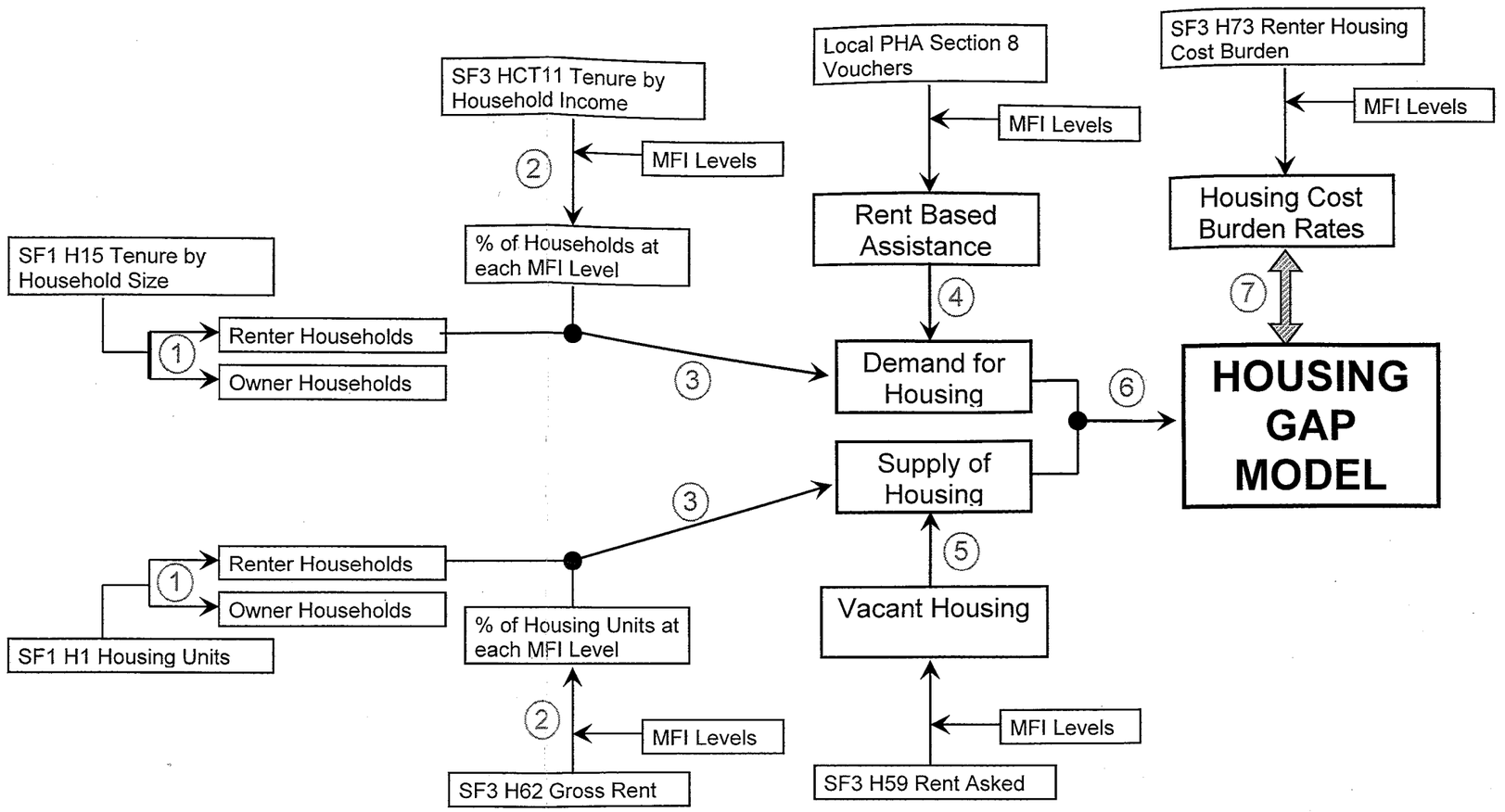
APPENDIX A: Diagram of the Housing Gap Model

(1) Census data provides the total number of both owner/renter occupied housing units and owner/renter households. Because only the rental market is being analyzed in this study, only the number of rental households and housing units is utilized.

(2) Gross Rent and Household Income census data is converted to MFI levels to determine the percent of households and housing units within the given study area that are within each MFI level.

(3) The total number of rental housing units and households are multiplied by the percentage of units/households at each MFI level to obtain a total number of housing units and households at each MFI level. These figures are used as the base for the supply and demand for housing.
The total number of units or households comes from the SF1 census data because this is more accurate that the SF3 census data, which is only a sampling.

(4) The number of local Section 8 Vouchers is incorporated into the model by determining how many vouchers are being used at each MFI level, then adjusting the ability to pay for the appropriate number of households. This in effect shifts households from one MFI level (in terms of ability to pay) to a higher one.



(5) The census rent asked data provides information on how many units were available for rent and at what cost. The number of vacant units are then converted to MFI levels and added to the Housing Supply.

(6) The number of housing units available at each MFI level are compared to the number of households at each MFI level. This comparison provides information on where housing surpluses and deficits are in each market. This shows the Housing Gap at each MFI level.

(7) The housing cost burden rates are used to check the results of the Housing Gap Model by comparing deficits in lower MFI levels to housing cost burdened rates. Housing cost burden rates are a good indicator of the number of households that are paying too much for housing.