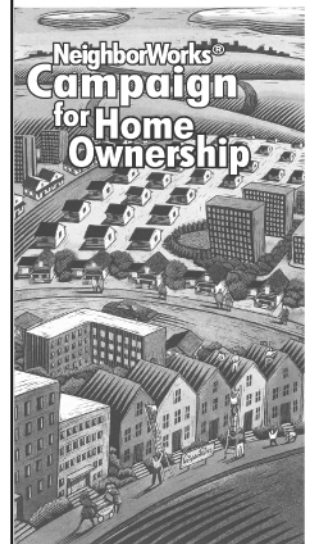


Affordability and the Funding Gap: Trends Among Low- and Moderate- Income Households, 1995–2005

A Report Prepared for
NeighborWorks® America

Mark Duda and Doug Foster

January 2007



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THE NEIGHBORWORKS[®] NETWORK AND
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The publication was written by Doug Foster and Mark Duda. It was edited and formatted by Amy Christian.

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Abstract

The period between 1995 and 2005 was a tumultuous one for low- and moderate-income (LMI) households seeking to purchase their first home. A booming housing market, stagnant incomes, and low interest rates taken together have presented both opportunities and challenges for these households. Meanwhile, regional disparities have increased markedly due to the different rates of price appreciation across housing markets. The upshot of these regional disparities is that LMI households can achieve homeownership without significant subsidies in some places, while in other places multiple layers of grants and concessionary financing, in combination with other policy tools, are the only hope for such families to ever achieve homeownership.

The severe erosion of housing affordability in many markets has undermined the ability of government and nonprofit organizations to promote homeownership attainment by blunting the effectiveness of their traditional policy approaches. The response to this situation is a two-stage process. First, the nature of affordability challenges must be understood at the market level, and metropolitan-level housing markets must be accurately classified based on the difficulty that low- and moderate-income households face in becoming homeowners in each place. Second, organizations operating in each market must have access to the right tools to help their clients become owners; the approach must be accurately matched to the affordability regime in the market(s) in which they operate.

This paper addresses the first issue. It develops a housing market typology based on affordability into which markets can be sorted, and to which homeownership policy approaches can be matched. The paper unfolds in several steps. It begins by deconstructing housing affordability into three elements — house prices, incomes and mortgage costs — and reviewing recent changes in each. It then looks at the performance of house price indexes over the past decade, explaining why they tend to show only small affordability declines despite substantial changes in house price. Following this, the paper examines affordability conditions for low- and moderate-income families in 127 housing markets using two measures: the change in affordability-index values and the gap between the maximum mortgage a household can afford and the amount required to purchase a modest home. Based on these results, we develop an affordability-based typology of market types that can be linked to policy interventions designed to promote homeownership attainment in each type of market.

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Introduction

For those promoting homeownership among low- and moderate-income (LMI) households, the generally robust but geographically uneven performance of the housing market over the past decade has three key implications. First, the affordability of owner-occupied housing has declined substantially. Second, declining affordability has hit households at the lower end of the income distribution far more severely than those at the top. Third, the actual ability of LMI borrowers to become homeowners varies dramatically across housing markets. Taken together, these three factors present a different set of challenges for would-be owners and community-based organizations working on their behalf in the different types of markets.

This paper analyzes the deterioration and diversification of housing affordability in 127 housing markets. It begins with a background discussion of housing affordability, disaggregating it and discussing trends in each component over the 1995 to 2005 period. The paper then looks at the major affordability indexes, highlighting the key assumptions behind each, and explaining why affordability appears relatively stable for much of the study period, despite the major price run-up in much of the country. Next, the paper calculates affordability indexes and “funding gaps” for LMI households at the national and metropolitan area levels by varying some of the key assumptions behind the major indexes in ways that make the results more applicable to the situation actually faced by LMI households. Finally, the results of the analysis are used to develop an affordability-based typology of housing markets.

The fundamental conclusion of the paper is that the increased disparity in affordability conditions across markets requires that national initiatives take a segmented approach to homeownership promotion. That is, the approach that works in Toledo will not necessarily work in San Diego. Locating markets in this typology will help focus and improve ownership interventions in what has been an increasingly difficult market for most would-be LMI borrowers over the past decade.

The Components of Housing Affordability

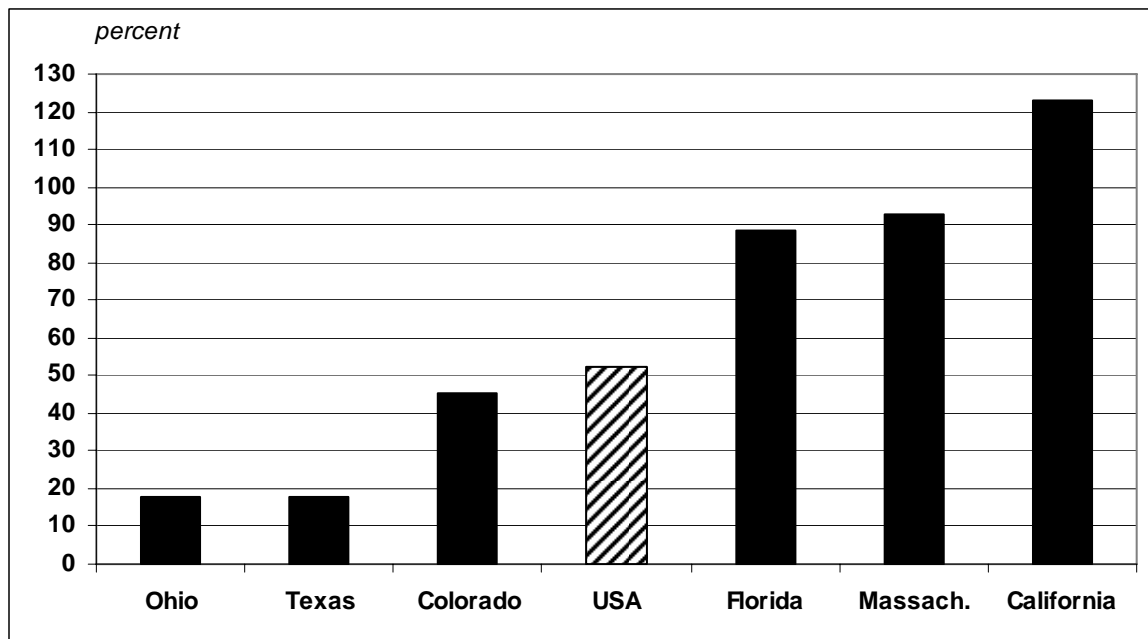
There is no standardized method for measuring housing affordability. It is obvious, however, that housing costs and household income are at the center of any such calculation. In countries such as the United States with mature housing finance systems, the cost of mortgage credit is a third key factor. Changes in housing affordability over time are therefore the result of the combined effect of changes in house prices, incomes, and mortgage interest rates. This section reviews recent changes in each factor.

House Prices

As is widely known, house prices rose dramatically during the last decade. Figure 1 shows that, in real terms, national house prices rose more than 50 percent between the beginning of 1995 and the end of 2005. In states such as Massachusetts and Florida, real house prices nearly doubled, while in California they rose fully 122.8 percent. The figure also shows that even in notoriously weaker markets, such as Ohio and Texas, prices rose faster than the rate of general inflation.

Overall then, while prices are indeed up substantially from their levels a decade ago, the extent of the increase varies significantly. All else equal, these differences are large enough to have an enormous influence on the ability of LMI borrowers to afford homes. The next section shows how this regional variation is reinforced by variation over the income distribution.

Figure 1: The Dramatic Rise in Real House Prices, 1995–2005

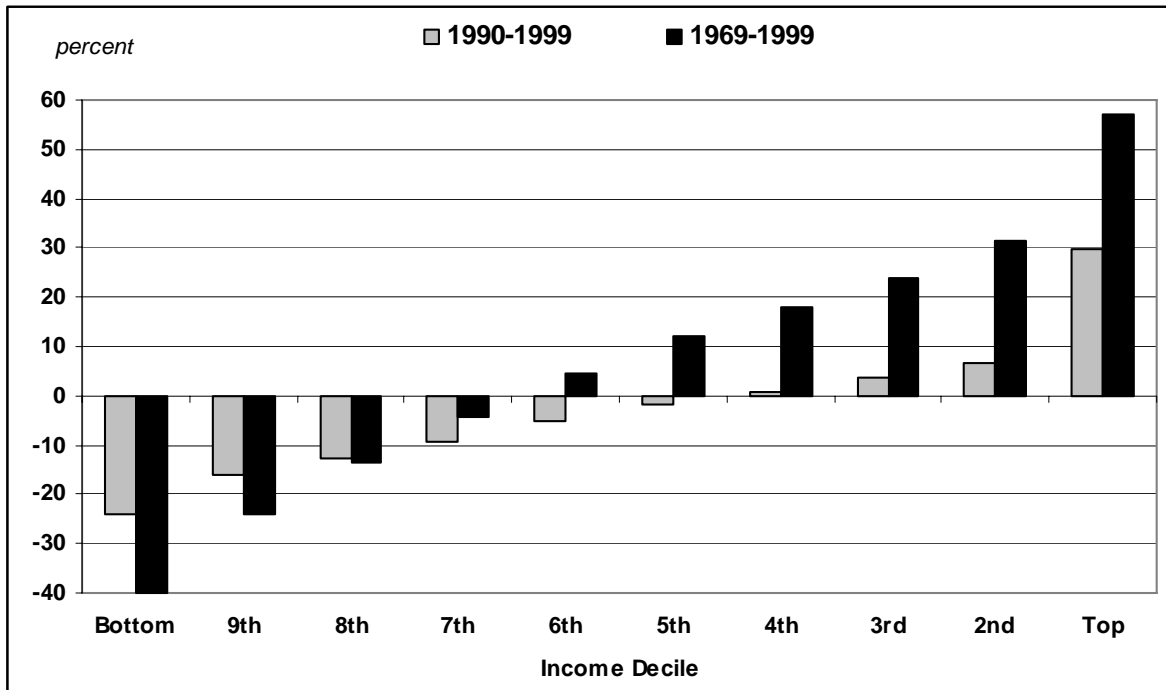


Source: OFHEO House Price Index, 2006:2 release (www.ofheo.gov/HPI.asp), deflated using CPI-UX.

Family Income

In order to understand the extent to which these price increases affect would-be owners' ability to purchase a house, it is necessary to also look at changes in income. If income grows as quickly as house prices, then households are able to withstand the effects of price increases. Figure 2 shows the rate of income growth by decile for the group most relevant to discussions of homeownership attainment and sustainability — employed family households whose heads are ages 18-64.¹

Figure 2: Change in Real Family Income by Decile



Note: Includes families with working household heads between the ages of 18 and 64.

Source: Lee, C. 2005. Rising Family Income Inequality in the United States 1968-2000. NBER working paper 11836.

Several points emerge from Figure 2. First, the rate of income growth or decline is dramatically different for low-income families than for those with higher incomes. In fact, income growth is slowest for the lowest-income working families and fastest for the highest-income families. Second, the trend of slower real income growth (actually income declines) among low- and moderate-income households is accelerating over time. For households in the bottom 30 percent of the income distribution, two-thirds of their combined 21.6 percent decrease in real earnings between 1969 and 1999 occurred in the 1990s. While middle-income households experienced modest income increases over the three decades, both groups saw real incomes fall during the 1990s. Although data are not available by decile for the second half of our study period, it is possible to look at changes in median income using the American Community Survey. These data show that

¹ Limiting the sample to employed households with working-age heads (1) focuses on the target population for ownership-promoting policy interventions, and (2) avoids the confounding effects of the large population of low-income elderly households with substantial housing wealth.

real income of the median family declined — from \$56,285 to \$55,832 — between 2000 and 2005. This slight decline is consistent with the 1990-to-1999 decline shown in for the fifth and sixth deciles in Figure 2.

The effect of changes in real income on affordability between 1995 and 2005 is clear. Households with lower incomes have seen their capacity to purchase a home decline over time, especially in the past decade. As house prices were rising sharply, their ability to save for a down payment and make monthly mortgage payments was simultaneously declining. For those in the middle, income growth has barely kept pace with inflation since 1990, meaning that the net effect of changes in income and house prices has been a reduction in housing affordability. For the wealthy, income growth has worked to offset rising prices.

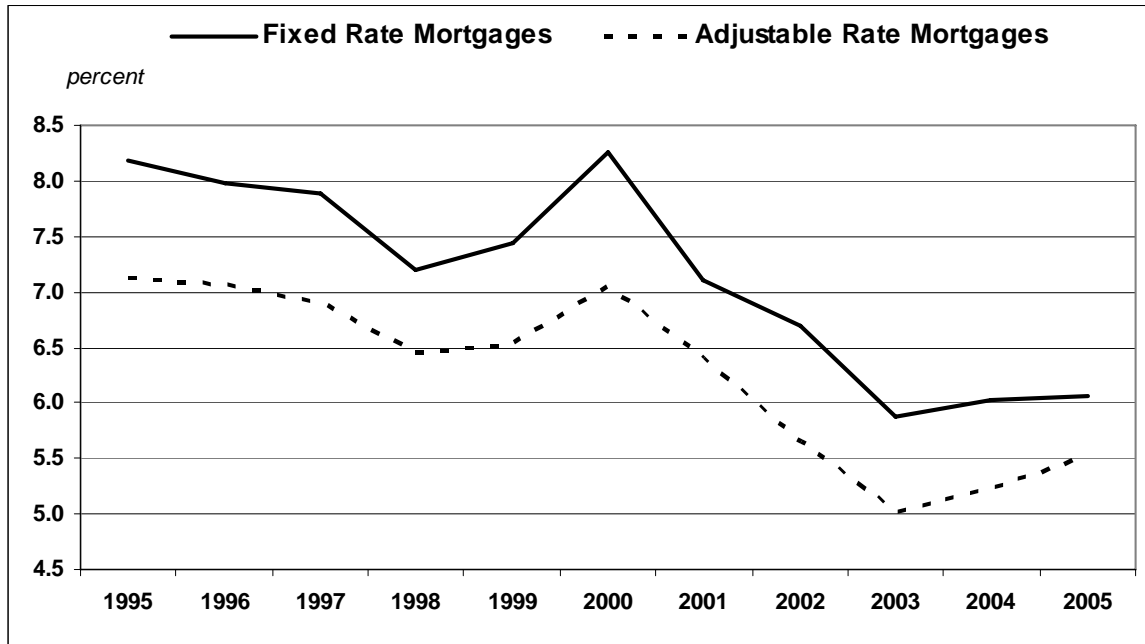
Mortgage Interest Rates

The final factor to consider with respect to housing affordability is the cost of mortgage credit. Figure 3 shows effective mortgage interest rates from 1995 to 2005.² Over the period, interest rates on fixed-rate loans (the solid line) declined more than two full points, from an annual percentage rate (APR) of 8.2 to 6.1. For a \$200,000 mortgage, this is equivalent to a decline in monthly payment from \$1,496 to \$1,212. That is, payments on the same loan were 23.4 percent higher in 1995 than in 2005.

The role of interest rates in enhancing affordability can also be seen by the impact of adjustable-rate mortgages, which had APRs at origination that were 0.5 to 1.2 points lower than fixed-rate loans over the period. Many borrowers used such loans to help maintain affordability toward the end of the period when house prices were rising rapidly. These loans come with a risk that interest rates will rise, however, causing payments to adjust upward and erasing the affordability benefits they temporarily conveyed. Price increases have, in fact, forced many buyers to address affordability concerns not only through traditional adjustable-rate loans, but also by taking out “exotic” mortgages. Although they take many forms, these mortgages have in common the exchange of low initial payments for the borrower’s willingness to take on the risk, and in some cases the guarantee, of substantially higher payments in the future. Although such products convey substantial advantages during rapidly rising housing markets — by allowing lower-income borrowers to participate in price appreciation — they can have debilitating effects on household budgets and may lead to default and foreclosure when the higher payment schedule sets in and/or house prices fall or flatten.

² Effective mortgage interest rates transform points and fees into interest rate points so that loans with different terms can be compared.

Figure 3: Effective Mortgage Interest Rates



Source: Federal Housing Finance Board, <http://www.fhfb.gov/Default.aspx?Page=53>.

Summary

Overall, during the period 1995–2005 interest rates and house prices worked in opposite directions. As house prices rose ever more steeply, interest rates helped maintain housing affordability until about 2004, when rates bottomed out while prices continued rising rapidly. For the typical household, changes in real income did not keep pace with rising home prices, helping explain the fact that in recent years many households shifted to adjustable-rate loans and more exotic mortgage products, such as payment-option and negative-amortization loans in 2005. For low- and moderate-income households, real income declined, making housing ever more unaffordable in most markets. The next section discusses indexes that summarize the impact of the components of affordability reviewed here.

Housing Affordability Trends, 1995–2005

This section briefly shows how affordability indexes measure housing affordability. It then explains why they do not accurately reflect the challenges facing LMI households. Finally, it shows how the methodology embedded in these indexes can be expanded to illuminate the situation LMI households are facing.

Summary of Major Affordability Indexes

There are two widely cited housing affordability indexes in the United States. The first of these is the National Association of Realtors’s Housing Affordability Index (HAI), which “measures whether or not a typical family could qualify for a mortgage loan on a typical home.”³ An index score of 100 indicates that a family earning the median family income has exactly enough money to afford the monthly mortgage payments on a median-priced existing home. Scores above 100 indicate that the median-earning family has more than enough earnings to afford the median-priced home. Scores below 100 indicate that this family cannot afford the median-priced home. The second major index is the National Association of Homebuilders’s Housing Opportunity Index (HOI). The HOI is “the share of homes sold in that area that would have been affordable to a family earning the local median income based on standard mortgage underwriting criteria.”⁴ HOI values are simply percentages and thus range from 0 to 100.

Figure 4 summarizes key aspects of the two series. Both are based on current sales (i.e., on sales recorded in the month or quarter for which the index is reported) of single-family homes. NAR data are for existing homes only and are drawn from its own survey of home sales. NAHB uses proprietary sales data from First American Real Estate Solutions for both new and existing homes for its home sales data. Both indexes are based on the earnings of the median family. NAR’s index uses the median home price (NAHB’s methodology does not require a specific price point to be specified). Both data sets assume the family purchases the home using a 30 year, fixed-rate loan and both use the Federal Housing Finance Board’s effective interest rate as the price of mortgage credit. NAR assumes the household makes a 20 percent down payment, whereas NAHB assumes 10 percent.

Figure 4: Characteristics of Affordability Indexes

Index	Housing Affordability Index (NAR)	Housing Opportunity Index (NAHB)
Index Characteristic		
Price data type	Current sales	Current sales
Price data source	NAR existing home sales survey	1 st American Real Estate Solutions
Frequency	Monthly/quarterly	Quarterly
Unit type	Existing single family	New/existing single family

³ www.realtor.org/Research.nsf/Pages/HAmeth.

⁴ www.nahb.org/generic.aspx?sectionID=135&genericContentID=533.

Affordability Parameters		
House price point	Median	N/A
Reference household income	Median	Median
Income source	Updated from Decennial Census	HUD median family income
% income for housing expense	25% of gross income	28% of gross income
Mortgage interest rate	FHFB effective rate (existing)	FHFB effective rate (all homes)
Mortgage type	30 year, fixed rate	30 year, fixed rate
Loan-to-value ratio	80%	90%
Geographies Covered		
Nation	X	X
Regions	X	
Metropolitan areas		X

Source: www.nahb.org/page.aspx/category/sectionID=135 and www.realtor.org/research.nsf/pages/HousingInx?OpenDocument.

Key Shortcomings Limiting Applicability to LMI Households

For the purposes of understanding housing affordability among NeighborWorks® America’s target population, both the HOI and HAI are problematic. One straightforward limitation is the fact that NAHB does not release the home sales price data that it uses to calculate the percentage of homes that are affordable to the median earning family.⁵ As a result, the share that is affordable to households other than median earners cannot be calculated. A basic challenge with NAR’s index is that it is released only for the nation and the four major regions of the country (Northeast, Midwest, South, and West). Despite the regionality of house price trends and affordability conditions, aggregation at this level obscures important variation within regions that is essential to understanding the affordability at the market level.

A more fundamental set of problems that makes the HAO and HOI poorly reflect affordability among LMI households arises from the assumptions embedded in their calculations. One such issue is the fact that both indexes use the median-earning family as their reference household. As the previous section showed, real income has been declining much more quickly for buyers below the median for the past several decades. The use of the median income in affordability index calculations therefore overstates the actual affordability of housing for LMI households, which we define as those between 50 and 80 percent of area median income (AMI).

A second issue is the fact that most LMI households do not have the savings necessary to match either the 10 or 20 percent down payments assumed by NAHB and NAR, respectively. The average down payment of NeighborWorks® America’s borrowers between 1998 and 2006 period, for example, was 3 percent. Assuming that households have the

⁵ This is not intended as a criticism of NAHB. Presumably their agreement with First American Real Estate Solutions prevents release of the raw house price data.

savings necessary to lower their borrowing to 80 or 90 percent of the home's value once again overstates affordability because reducing the size of the mortgage the household is assumed to need reduces the gap between the size of the loan required to purchase the reference home and the maximum loan for which the household can qualify.

Finally, the indexes assume that the household is purchasing a median-priced home. For LMI first-time buyers this is unrealistic, even for those at 80 percent AMI. This assumption serves to understate affordability for LMI households who would be more likely to purchase a lower-priced home.

Taken together, these issues suggest that indexes tracking broad affordability trends will not accurately capture the situation facing LMI households. Over the particular period examined in this study, it is probable that customizing the indexes to better reflect conditions among LMI households will show a more substantial deterioration in affordability over the period, but will not necessarily result in findings of aggregate "un-affordability" because the reference home is substantially overpriced in the aggregate model. The net effect of these kinds of customization-based changes is examined in the next section.

A More Nuanced Approach

In response to the concerns listed above, we developed an index that takes advantage of the raw materials provided by NAHB and NAR. Our methodology (presented in detail in Appendix 1) can be summarized by noting the following: (1) We use NAR's affordability formula but use NAHB's metropolitan area level summary data in order to develop index values for the period 1995 to 2005. (2) We use different assumptions on house price as a share of median, down-payment percentage, and income growth rates over the period than either NAHB or NAR. (3) We calculate index values for households at 50 and 80 percent of area median income, in addition to median income. The key parameters in the calculations are summarized in Figure 5. The assumption that mortgage payments constitute 26.5 percent of gross income is a compromise between the 25 percent rate used in calculation of NAHB's index and the 28 percent used by NAR.⁶

Our index is interpreted similarly to NAR's Housing Affordability Index. A value of 1.0 indicates that a household at that income level can just afford the reference home (priced at 75 percent of the median sales price in that year in that market) with a 97 percent LTV loan. Values below 1.0 indicate that the household cannot afford the reference home. More specifically, they show the share of this house price that the household could afford in that year. A value of 0.85, for example, indicates that the household could afford a home priced at 85 percent of the price of the reference unit. Likewise, values above 1.0 indicate that the household could afford a home more costly than the reference unit. Because index values are not always intuitive, we also present results in terms of the gap between the size of the mortgage the household can afford and the amount it needs to borrow to purchase the reference home, which we refer to as the "funding gap." Differences in funding gaps across markets reflect the different level of affordability challenges facing would-be LMI owners in each place.

⁶ The ratio for NeighborWorks[®] America's actual customers rose 25 to 29 percent between 1998 and 2006.

Figure 5: Assumptions Underlying Affordability Calculations

Characteristic	Assumption
Down payment	3%
House price as share of median	75%
Annual rate of real income growth ⁷	
<i>Median families</i>	-0.33%
<i>80% AMI families</i>	-0.71%
<i>50% AMI families</i>	-1.09%
Mortgage type/rate	Fixed rate (FHFB effective)
Mortgage payment as share of gross income	26.5%

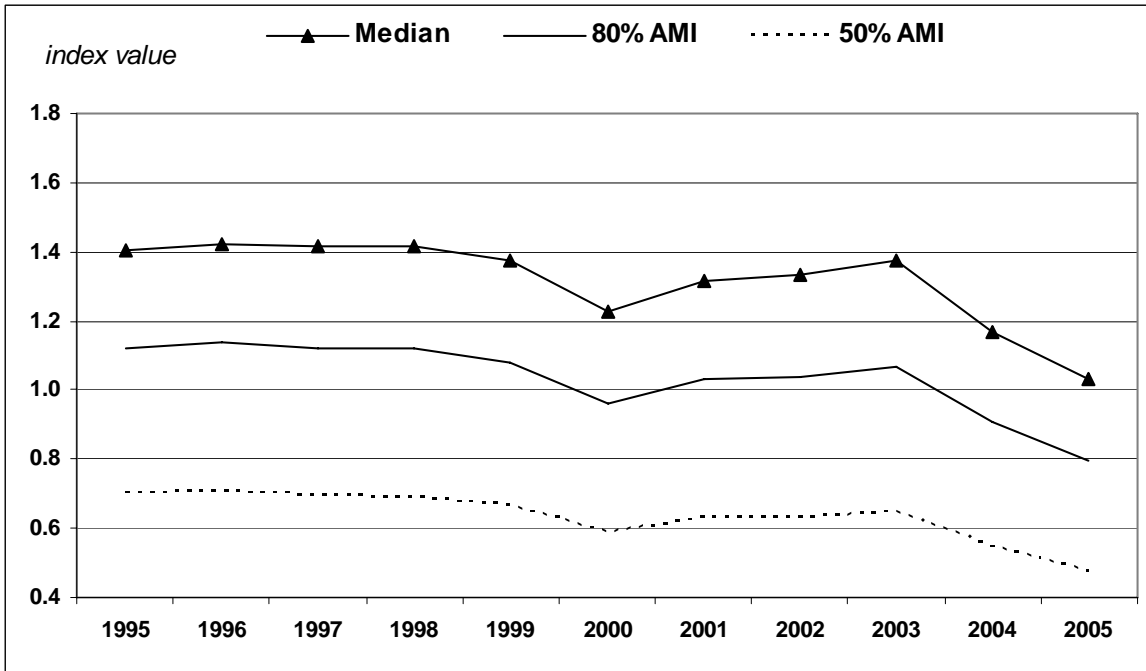
Affordability at the National Level

Before delving into cross-market variation in affordability conditions it is useful to look at national affordability trends for our three income groups during the study period. Figure 6 presents affordability index results for the three household income groups between 1995 and 2005. It shows that a stable period ending in 1998 was followed by a dip and subsequent recovery that lasted through 2003. As noted earlier, this relative stability was driven largely by declines in interest rates. After 2003, when rates could fall no further, and prices continued rising, affordability began to decline sharply. Between the beginning of the period and the end, the index declined 26.6 percent for median income households, 29.4 percent for those at 80 percent of area median and 32.0 percent for those at 50 percent of area median. Put another way, affordability declined 10.2 and 20.2 percent faster for 50 and 80 percent AMI households, respectively, than it did for the median income household over the 1995–2005 decade. These differences are caused by more rapid real income declines among poorer households.

It is interesting to note that the reference home remained affordable (index value above 1.0) for median-earning families during the entire period, even as affordability declined substantially. As a result, the median-income household never experienced a funding gap between the mortgage it could qualify for and the amount it need to borrow to purchase the reference home. Figure 6 shows that this was not the case for the LMI households, which were below 1.0 for the entire period.

⁷ The source for these changes is the same as the real income change by decile figure presented earlier (Lee, C. 2005. *Rising Family Income Inequality in the United States, 1968-2000*. NBER working paper 11836). As in that figure, rates of real income growth are for families with employed heads between the ages of 18 and 64.

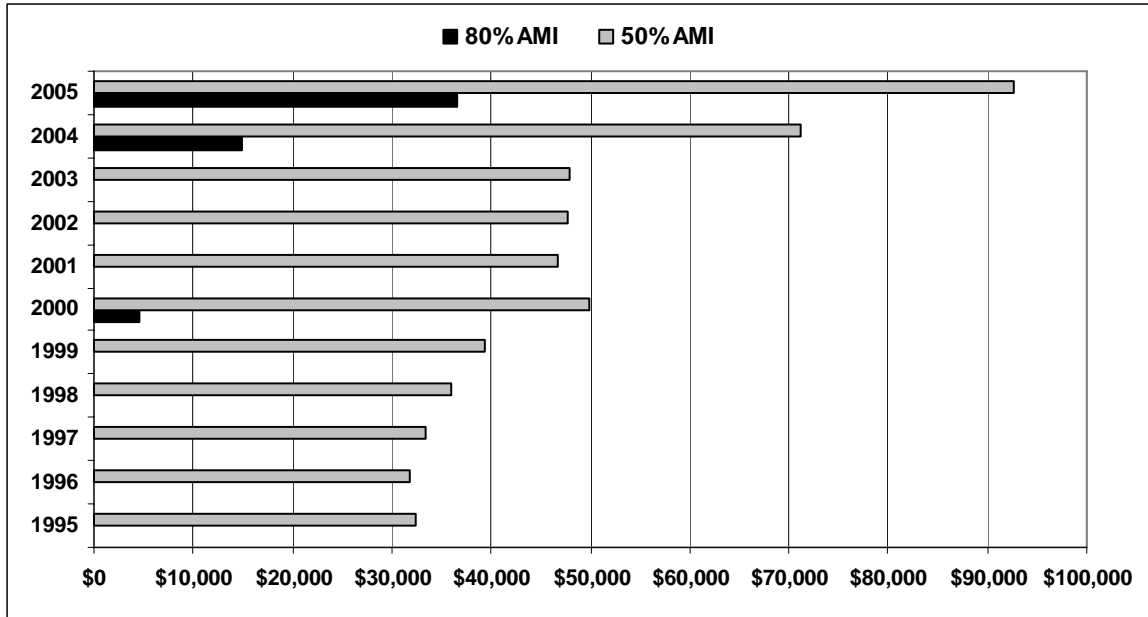
Figure 6: Affordability Trends for Different Households, 1995–2005



Note: Based on reference home priced at 75% of area median sales price in that year. Interest rate is FHFB effective rate on fixed-rate loans. Down payment is 3% and maximum mortgage payment assumed to be 26.5% of gross income.

Families earning 80 percent of area median income (AMI) first became unable to afford the reference home when interest rates spiked in 2000. Figure 7 shows that in that year they fell \$4,700 dollars short. This funding gap increased to \$14,900 and \$36,600 for 80 percent AMI families purchasing homes in 2004 and 2005, respectively. Households at 50 percent AMI faced a funding gap throughout the period. It began at \$32,400 in 1995 and climbed to \$49,800 in 2000. The gap then dropped slightly for three years before jumping to \$71,200 in 2004 and \$92,600 by 2005. At such levels it is clear that families earning half the median income faced almost insurmountable challenges in transitioning to homeownership during much of the period.

Figure 7: Funding Gap for Low- and Moderate-Income Families, (2005\$)



Note: Figures in 2005 dollars. Calculations based on reference home priced at 75% of area median sales price in that year. Interest rate is FHFB effective rate on fixed-rate loans. Down payment is 3%. Maximum mortgage assumed to be 26.5% of gross income.

Summary

This section has shown how affordability — an intuitive concept but one that can be difficult to precisely define— is conceptualized and how it can be measured so as to accurately reflect conditions among LMI households. It also shows how conditions have changed for these households. The trend has been one of substantial declines in affordability since the mid to late 1990s. For those at the top of the LMI income range, this deterioration did not fully compromise their ability to purchase the reference home priced at 75 percent of the median sales price until 2004. In contrast, those at the bottom of LMI income range faced substantial challenges throughout the period that became extreme toward the end.

The results presented here are only illustrative of general trends, however, because no household shops for housing in a market defined by national average characteristics. Rather, they shop in locally defined housing markets that have much more varied performance over the period. The next section explores the impact of this variation on housing affordability among the LMI target population at the metropolitan area level.

Housing Affordability in 127 Markets, 1995–2005

Analyzing affordability changes at the market level reveals a remarkable level of diversity. Of the 127 markets, 65 never had a year in which 80 percent AMI households could not afford the reference home. For 50 percent AMI households the comparable figure is 6, and for median earners it is 95. Funding gaps range from a low of \$0 to highs of \$350,642 and \$432,486, for 80 and 50 percent AMI households, respectively. Similarly, the amount by which the funding gap increased during the study period ranges from \$0 to \$276,071 among 80 percent AMI households and to \$289,172 for those at 50 percent of the median. The remainder of this section reviews conditions in the least and most affordable markets, and a sample of those in the middle, as an introduction to the diversity of affordability challenges confronting would-be owners and homeownership promotion efforts across the country. (Full results are presented in Appendix 2.)

Conditions in the Least Affordable Markets

Figure 8 shows conditions in the 10 least affordable markets, all of which are in California (New York is eleventh). The upper panel of the table shows that even in the best year during the study period (“Max” column), affordability conditions were crippling for households at 50 percent AMI. In none of these ten markets were these households close to being able to afford the reference home in the best year and, in the worst year, values had fallen into the 0.2 to 0.3 range. At these levels the incomes of the 50 percent AMI groups qualify them for a mortgage that will buy only about one-quarter of the price of the reference home.

Conditions were bad, if not quite as dismal, for households at 80 percent AMI in these cities. In the best year, housing was mildly unaffordable (index values between 0.9 and 1.0) in 7 of the 10 least affordable markets, but even in these places it had plummeted below 0.5 by 2005. Families earning the median income also faced substantial problems trying to purchase the reference home by the end of the period; whereas their index values all began above 1.0 (except in San Francisco), they had fallen into the 0.5 to 0.6 range by the end of the period.

Translating these index values into funding gaps (lower panel of Figure 8) reinforces the magnitude of the challenge facing would-be buyers and the daunting nature of the task facing homeownership programs in these markets. The average funding gap in the best year (“Min” column) across these ten markets is \$23,300 for 80 percent AMI households, and \$81,000 for those at 50 percent AMI. By 2005, conditions had gotten dramatically worse. In that year (“Max” column), the average funding gap for 80 percent AMI households was \$237,900 and for 50 percent AMI households averaged \$307,600. The lesson from the least affordable markets is that bridging gaps of these levels is simply not possible with standard mortgage products or even with traditional ownership-promoting policy interventions.

Figure 8: Conditions in the Ten Least Affordable Markets, 1995–2005

Rank	Market	Median		80% AMI		50% AMI	
		Max	Min	Max	Min	Max	Min
		Index Value					
1	San Francisco-San Mateo-Redwood City, CA	0.89	0.49	0.71	0.38	0.44	0.23
2	Santa Cruz-Watsonville, CA	1.00	0.48	0.80	0.37	0.50	0.22
3	Salinas, CA	1.03	0.45	0.81	0.35	0.50	0.21
4	San Jose-Sunnyvale-Santa Clara, CA	1.13	0.64	0.90	0.49	0.56	0.30
5	San Luis Obispo-Paso Robles, CA	1.15	0.52	0.91	0.40	0.57	0.24
6	Santa Rosa-Petaluma, CA	1.11	0.56	0.89	0.43	0.55	0.26
7	Santa Barbara-Santa Maria, CA	1.18	0.57	0.94	0.44	0.58	0.26
8	Oakland-Fremont-Hayward, CA	1.17	0.64	0.94	0.49	0.58	0.30
9	San Diego-Carlsbad-San Marcos, CA	1.17	0.59	0.93	0.45	0.58	0.27
10	Los Angeles-Long Beach-Glendale, CA	1.21	0.60	0.96	0.46	0.60	0.28
		Funding Gap (thousands of 2005\$)					
1	San Francisco-San Mateo-Redwood City, CA	\$272.8	\$29.1	\$334.0	\$75.1	\$415.8	\$143.2
2	Santa Cruz-Watsonville, CA	\$252.9	\$0.2	\$306.5	\$39.4	\$378.2	\$98.0
3	Salinas, CA	\$232.1	\$0.0	\$275.6	\$30.2	\$333.8	\$78.6
4	San Jose-Sunnyvale-Santa Clara, CA	\$162.4	\$0.0	\$229.3	\$20.8	\$318.6	\$93.9
5	San Luis Obispo-Paso Robles, CA	\$180.2	\$0.0	\$224.2	\$12.8	\$283.1	\$61.8
6	Santa Rosa-Petaluma, CA	\$170.8	\$0.0	\$221.1	\$18.6	\$288.5	\$74.7
7	Santa Barbara-Santa Maria, CA	\$164.1	\$0.0	\$213.5	\$9.4	\$279.7	\$64.4
8	Oakland-Fremont-Hayward, CA	\$141.9	\$0.0	\$199.6	\$11.7	\$276.7	\$75.1
9	San Diego-Carlsbad-San Marcos, CA	\$143.1	\$0.0	\$190.3	\$9.8	\$253.5	\$62.4
10	Los Angeles-Long Beach-Glendale, CA	\$138.2	\$0.0	\$185.2	\$5.2	\$248.1	\$57.6

Note: Calculations based on reference home priced at 75% of area median sales price in that year. Interest rate is FHFB effective rate on fixed-rate loans. Down payment is 3%. Maximum mortgage assumed to be 26.5% of gross income.

Conditions in the Most Affordable Markets

In contrast, conditions in the most affordable markets, which are concentrated in and around the Midwest, make them amenable to counseling, modest subsidies and other proven ownership-promoting policy interventions. Index values (upper panel of Figure 9) show that in the most affordable markets the median income is enough to qualify for a mortgage *double* the amount needed to purchase the reference home in the *worst* affordability year between 1995 and 2005. Households at 80 percent AMI in these markets are always able to afford a home priced at least 50 percent above the reference home. Even those at 50 percent AMI face only modest problems in the least affordable years.

Under such conditions it would seem that LMI borrowers and organizations running homeownership programs face relatively manageable *affordability* issues in their efforts

to support the ownership attainment efforts of their clients.⁸ Funding gaps never exist for 80 percent AMI households, and are even rare among those at 50 percent AMI. For 50 percent AMI households the highest gap represented in the Figure is \$5,200 and, among the 5 markets that had a gap in any year, the average is \$2,800.

Figure 9: Conditions in the Ten Most Affordable Markets, 1995–2005

Rank	Market	Median		80% AMI		50% AMI	
		Max	Min	Max	Min	Max	Min
		Index Value					
118	Champaign-Urbana, IL	2.63	2.00	2.05	1.57	1.25	0.95
119	Oklahoma City, OK	2.37	1.95	1.84	1.53	1.12	0.94
120	Dayton, OH	2.54	1.97	1.97	1.55	1.19	0.95
121	Mansfield, OH	2.65	1.98	2.05	1.56	1.24	0.95
122	Rockford, IL	2.52	2.10	1.94	1.64	1.17	1.00
123	Davenport-Moline-Rock Island, IA-IL	3.00	2.38	2.33	1.88	1.41	1.15
124	Lima, OH	2.95	2.31	2.29	1.81	1.39	1.11
125	Peoria, IL	2.71	2.16	2.10	1.70	1.27	1.04
126	Rochester, NY	2.63	2.01	2.04	1.61	1.24	1.00
127	Springfield, IL	2.78	2.08	2.16	1.66	1.31	1.03
		Funding Gap (thousands of 2005\$)					
118	Champaign-Urbana, IL	\$0.0	\$0.0	\$0.0	\$0.0	\$5.2	\$0.0
119	Oklahoma City, OK	\$0.0	\$0.0	\$0.0	\$0.0	\$4.5	\$0.0
120	Dayton, OH	\$0.0	\$0.0	\$0.0	\$0.0	\$3.9	\$0.0
121	Mansfield, OH	\$0.0	\$0.0	\$0.0	\$0.0	\$3.2	\$0.0
122	Rockford, IL	\$0.0	\$0.0	\$0.0	\$0.0	\$0.2	\$0.0
123	Davenport-Moline-Rock Island, IA-IL	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
124	Lima, OH	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
125	Peoria, IL	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
126	Rochester, NY	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
127	Springfield, IL	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0

Note: Calculations based on reference home priced at 75% of area median sales price in that year. Interest rate is FHFB effective rate on fixed-rate loans. Down payment is 3%. Maximum mortgage assumed to be 26.5% of gross income.

Conditions in Mid-Range Markets

Figures for the most and least affordable markets obviously do not represent conditions in most of the country. In order to address this without discussing every market, we examine a set of mid-range markets, those ranked between 61st and 70th by our affordability index.

⁸ These markets are, however, subject to different types of problems, including unfavorable localized macroeconomic conditions such as permanent job losses and low income ceilings due to plant closures and outsourcing of manufacturing jobs, that challenge efforts to foster ownership among the target population.

The first thing to note is that there is more geographic variation among the mid-range cities than either the most or least affordable groups. Looking at the index values in Figure 10 shows that affordability declined substantially for all groups. For median households it remained well above the affordability threshold in all years in all markets. The same is more or less true of 80 percent AMI households, though half dipped just below the 1.0 level in 2005. For 50 percent AMI households in these mid-level markets, affordability was consistently problematic and in recent years hit levels that put housing far out of reach for these households.

Figure 10: Conditions in Ten Mid-Range Markets

Rank	Market	Median		80% AMI		50% AMI	
		Max	Min	Max	Min	Max	Min
		Index Value					
61	Salt Lake City, UT	1.63	1.22	1.27	0.96	0.77	0.58
62	Austin-Round Rock, TX	1.56	1.23	1.21	0.96	0.75	0.59
63	Virg. Beach-Norfolk-Newport News, VA-NC	1.73	1.28	1.38	0.99	0.86	0.60
64	Tampa-St. Petersburg-Clearwater, FL	1.67	1.26	1.29	0.99	0.80	0.60
65	Pueblo, CO	1.94	1.29	1.54	0.99	0.96	0.60
66	Chicago-Naperville-Joliet, IL	1.62	1.29	1.28	1.01	0.79	0.62
67	Raleigh-Cary, NC	1.88	1.33	1.46	1.03	0.89	0.62
68	Charlotte-Gastonia-Concord, NC-SC	2.13	1.37	1.70	1.05	1.06	0.63
69	Birmingham-Hoover, AL	2.75	1.37	2.14	1.05	1.30	0.63
70	Salem, OR	1.75	1.36	1.40	1.06	0.87	0.65
		Funding Gap (thousands of 2005\$)					
61	Salt Lake City, UT	\$0.0	\$0.0	\$5.6	\$0.0	\$64.4	\$28.0
62	Austin-Round Rock, TX	\$0.0	\$0.0	\$4.7	\$0.0	\$53.3	\$29.6
63	Virg. Beach-Norfolk-Newport News, VA-NC	\$0.0	\$0.0	\$1.5	\$0.0	\$57.0	\$12.0
64	Tampa-St. Petersburg-Clearwater, FL	\$0.0	\$0.0	\$1.3	\$0.0	\$35.5	\$14.4
65	Pueblo, CO	\$0.0	\$0.0	\$1.0	\$0.0	\$51.6	\$2.9
66	Chicago-Naperville-Joliet, IL	\$0.0	\$0.0	\$0.0	\$0.0	\$66.5	\$27.4
67	Raleigh-Cary, NC	\$0.0	\$0.0	\$0.0	\$0.0	\$64.2	\$12.5
68	Charlotte-Gastonia-Concord, NC-SC	\$0.0	\$0.0	\$0.0	\$0.0	\$61.9	\$0.0
69	Birmingham-Hoover, AL	\$0.0	\$0.0	\$0.0	\$0.0	\$57.3	\$0.0
70	Salem, OR	\$0.0	\$0.0	\$0.0	\$0.0	\$51.2	\$14.9

Note: Calculations based on reference home priced at 75% of area median sales price in that year. Interest rate is FHFB effective rate on fixed-rate loans. Down payment is 3%. Maximum mortgage assumed to be 26.5% of gross income.

Translating index values into funding gaps reveals modest problems for 80 percent AMI households. The gap averages just \$1,400 in the worst year for these 10 markets. Conditions among 50 percent AMI households are far worse, with average gaps of \$14,200 in

the best and \$56,300 in the worst years. Overall the mid-level affordability grouping reveals an income-based pattern of affordability challenges that may reflect the challenges that historically faced homeownership programs in many cities. Median earners can always afford a modestly-priced home, and those at 80 percent of median can usually, but not always, do so without a small subsidy. Those at 50 percent AMI require subsidies to become owners even in the best of times. When affordability conditions deteriorate, homeownership becomes prohibitively costly for households this far down the income distribution.

Summary

As noted at the outset of this paper, the issue raised for a national homeownership initiative by variation in affordability across markets is whether and to what extent its policy tools and approaches work in each place. Clearly the opportunities and constraints are not the same in California markets as they are in many Midwestern ones. It therefore makes sense to sort markets on the basis of the severity of affordability challenges, in order to tailor ownership-attainment strategies to conditions in each type of place. The next section develops an affordability-based typology that can help guide a national approach in supporting local homeownership programs and would-be LMI homeowners across markets of varying types.

An Affordability-Based Market Typology

Our grouping of market types is based on the notion that a more challenging affordability environment for LMI borrowers demands more aggressive policy intervention in order to make ownership attainable. We therefore categorize the 127 markets examined here based on the depth of subsidy required to make housing affordable to LMI households in the least affordable year.

A primary division exists among the 62 markets in which 80 percent AMI families were able to afford the reference home (the index value is at least 1.0) throughout the entire study period. Because this group is large and diverse, containing markets in which the funding gap ranges from \$0 to \$66,531, we split it based on whether the funding gap was above or below \$25,000 for 50 percent AMI households in these 62 markets. As shown in Figure 11, this results in two groups with 32 (Tier 4) and 30 (Tier 5) markets each.

Tier 3 is defined by examining the effect of a modest but significant subsidy on housing affordability among the 80 percent AMI group in the remaining 65 markets. Specifically, we use the affordability impact of down-payment assistance equal to 2 percent of the purchase price and an interest rate reduction of 1.5 percentage points relative to the base case. Subsidies at this level improve affordability conditions to the extent that 80 percent AMI households in 25 of the 65 markets would now be able to afford the reference home. This process is then repeated for the remaining 40 markets with the interest rate subsidy pushed to 3 percentage points. The resulting improvement makes the reference home affordable in 16 additional markets in all years (Tier 2). The final group (Tier 1) comprises markets in which even subsidies at this level cannot qualify borrowers for a mortgage on the modest reference home.⁹

Figure 11: Market Affordability Typology¹⁰

Tier 1	Tier 2	Tier 3	Tier 4	Tier 5
San Francisco	Honolulu	Worcester	Chicago	San Antonio
Santa Cruz	Reno	Boulder	Baltimore	Houston
Salinas	Newark	Port St. Lucie	Minneapolis	Milwaukee
San Jose	Washington DC	Charleston	Philadelphia	Columbia (SC)
San Luis Obispo	Las Vegas	Hagerstown	Ann Arbor	Cleveland
Santa Rosa	Atlantic City	Phoenix	Raleigh	Akron
Santa Barbara	Miami	Tacoma	Richmond	Cincinnati
Oakland	Visalia-Porterville	Fort Walton Beach	New Haven	St. Louis
San Diego	Seattle	Fort Lauderdale	Trenton	Reading (PA)
Los Angeles	Providence	Provo	Hartford	Harrisburg
New York	Sarasota	Tucson	Jacksonville	Grand Rapids
Stockton	Bakersfield	Portland (OR)	Charlotte	Tulsa

⁹ Full results for the size of the funding gap under each scenario are presented in Appendix 3.

¹⁰ In the interest of space, only the first part of multi-node metropolitan statistical areas and metropolitan divisions are included in the figure. Appendix 2 has full geographic information.

Tier 1	Tier 2	Tier 3	Tier 4	Tier 5
Vallejo	West Palm Beach	Deltona	Allentown	Canton
Sacramento	USA	Punta Gorda	Lakeland	Fort Worth
Merced	Cape Coral	Orlando	Springfield (MA)	Pittsburgh
Modesto	Greeley	Fort Collins	Salem	Duluth
Barnstable		Colorado Springs	Gainesville	Vineland
Riverside		Albuquerque	Birmingham	Toledo
Nassau-Suffolk		Denver	Wilmington	Buffalo
Naples		Norwich	Dallas	Lansing
Boston		Salt Lake City	Pensacola	Champaign-Urbana
Fresno		Austin	Atlanta	Oklahoma City
Chico		Virginia Beach	Detroit	Dayton
Redding (CA)		Pueblo	Pittsfield	Mansfield
		Tampa	Greensboro	Rockford
			Columbus (OH)	Davenport
			Ocala	Lima
			El Paso	Peoria
			Indianapolis	Rochester (NY)
			Tallahassee	Springfield (IL)
		Lancaster		
		Greenville		

Figure 12 summarizes affordability characteristics for each group of markets. Not surprisingly, house price levels are quite different among the groups. Tier 1 markets have 2005 house prices 3.7 times higher than those in Tier 5, and 75.4 percent higher even than those in Tier 2. The second row of the table shows that these differences have been driven in large part by trends over the last ten years. The average real price of the reference home in Tier 1 markets increased by \$186,800, against just \$10,700 in Tier 5 markets. The real price of the reference home in Tier 1 was just 1.9 times higher than in Tier 5 markets in 1995 but, as noted above, has now reached 3.7 times higher.

In contrast to house prices, incomes across the five groupings are surprisingly similar. As shown in the third row of the table, there is little difference and no trend in income levels among 80 percent AMI households in Tiers 2–5, which average \$39,800. Tier 1 incomes are 12.7 percent higher, a meaningful amount but one that is almost irrelevant to affordability given the massive price differentials among the groups. Since interest rates are the same in all markets in our calculations, affordability differences across markets are attributable primarily to house prices, and especially to differences in rates of price growth over time.

Figure 12: Summary Characteristics of Affordability Groups (thousands of 2005\$)

Characteristic	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5
Affordability Components					
Mean of Reference House Prices, 2005	\$339.8	\$193.7	\$154.3	\$129.6	\$92.7
Average Real Price Increase: 1995-2005	\$186.8	\$88.9	\$52.2	\$29.1	\$10.7
Mean of 80% AMI Income, 2005	\$44.8	\$40.1	\$38.2	\$41.4	\$39.5
Affordability: Funding Gap					
Mean Max Funding Gap 80% AMI	\$165.6	\$49.6	\$13.9	\$0	\$0
Mean Min Funding Gap 80% AMI	\$9.7	\$0	\$0	\$0	\$0
Mean Max Funding Gap 50% AMI	\$231.0	\$108.0	\$66.8	\$41.3	\$11.5
Mean Min Funding Gap 50% AMI	\$51.1	\$19.5	\$19.9	\$8.3	\$0.5

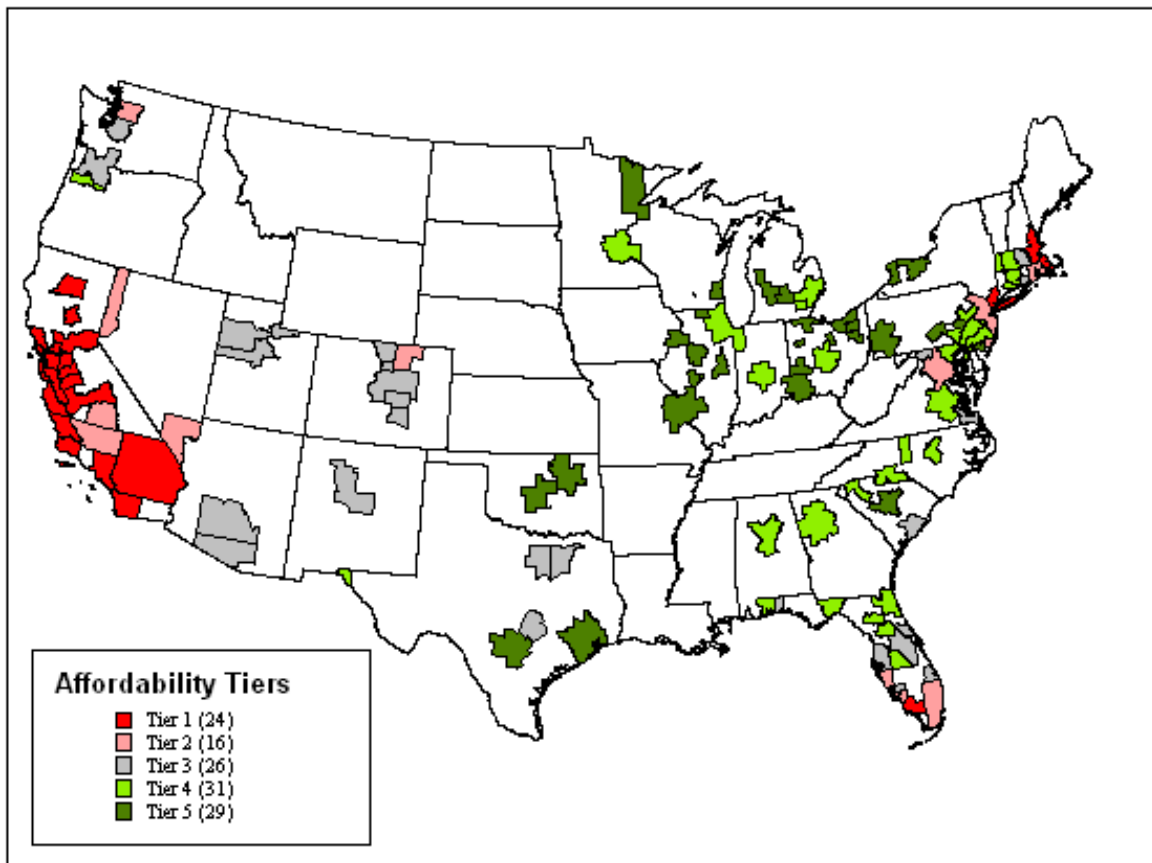
The lower portion of Figure 12 examines our summary measures of affordability across the groups. As noted at several points above, the maximum funding gap occurs in 2005 in most markets. The minimum gap, when housing was most affordable during the study period, typically occurred in the early part of the period, around 1998. Looking at the maximum and minimum gap for 80 percent AMI households indicates that only in Tier 1 markets was the reference home unaffordable in the early part of the study period, and not by very much (\$9,700). By the maximum year, Tier 3’s funding gap for 80 percent AMI families exceeded this level and those of Tier 1 and 2 vastly surpassed it.

The trends are similar, though far more severe, among 50 percent AMI households. Affordability started out problematic but manageable with the type of help available from traditional homeownership programs in Tier 4 and 5 markets, and perhaps in Tiers 2 and 3 as well. In all but the least affordable markets (Tier 1), households between 60 and 70 percent of median income most likely had a realistic opportunity to purchase the reference home. By 2005, this was no longer true in Tiers 2 and 3, and perhaps much of Tier 4 as well. Households earning less than 50 percent of area median would seem to have no reasonable hope of purchasing a home, even with subsidies, outside of Tier 4 and 5 markets.

Mapping Affordability

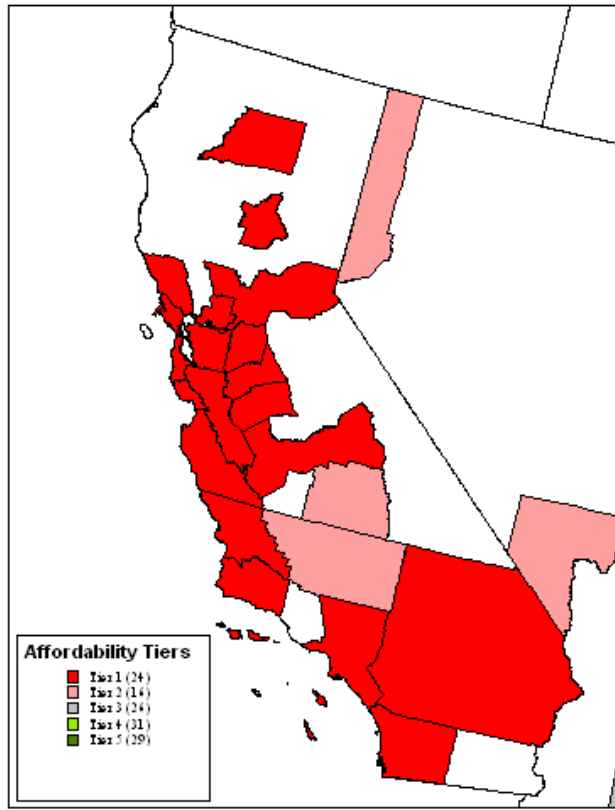
This section briefly fleshes out points made earlier by presenting market-level affordability maps. As noted earlier, the affordability groupings show some regional patterning. Map 1 shows the distribution of markets by affordability class. The least affordable markets are located almost exclusively in three areas: California, Florida and the Northeast.

Map 1: Affordability Tiers Nationwide



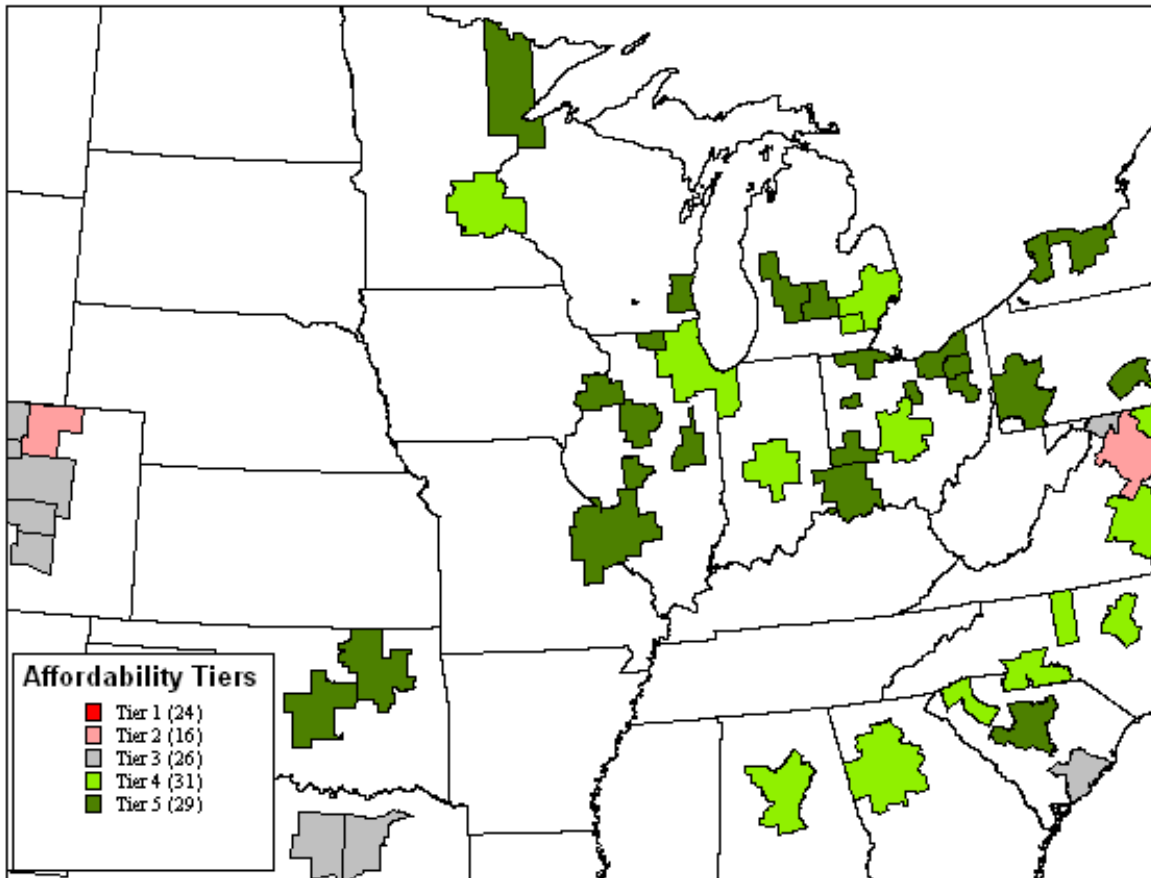
Map 2 focuses on California, which is clearly the area of the deepest and most concentrated affordability problems in the country. Whereas in the past affordability problems were concentrated in the Bay Area and Los Angeles County, virtually the entire state has become extremely unaffordable. In essence, enough people have fled the historically unaffordable markets for surrounding areas such as Riverside-San Bernardino and Vallejo-Fairfield to make these places highly unaffordable. And, more shockingly, even places that have been historically very affordable, such as Merced, Modesto, Fresno, and Chico, are now facing severe affordability challenges as well.

Map 2: California Is the Epicenter of Housing Affordability Problems



The aging cities of the Midwest stand in marked contrast to California. The area from Illinois to Ohio, and extending just into the western-most portions of New York and Pennsylvania, contains 21 of the 30 markets in Tier 5, and several more from Tier 4. In some markets, especially in the South and West, affordable conditions are the result primarily of the ability to build new housing inexpensively because the supply of land is large and its price low. Many Midwestern cities combine this availability of developable land (due to the ability to convert farmland to residential use) with an underutilized stock of existing housing. Because housing is durable, the supply of housing in places like Buffalo, Springfield and Duluth far exceeds the need at current levels of population and employment. The result is very limited upward pressure on house prices outside of very specific submarkets and, hence, a more affordable housing market.

Map 3: Affordability Prevails in the Midwest



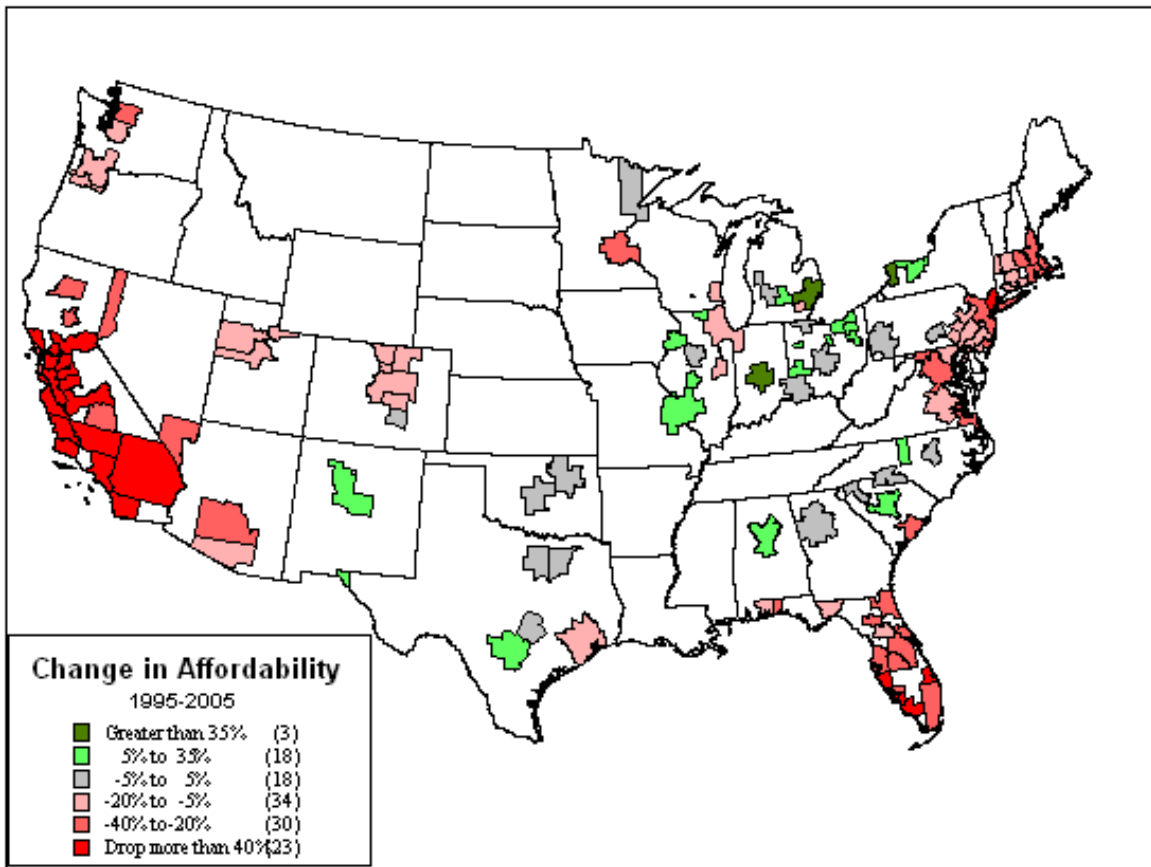
Together these three maps indicate that macroeconomic factors play a substantial role in the volatility of the housing market, and hence its affordability. The fact that, over the study period, relatively higher-paying manufacturing jobs have left the Midwest results in a weakening of demand for owner-occupied housing in an area that already had a large supply of such housing. In contrast are the markets in California, Florida and the Northeast. The latter has been largely built out for decades and has development restrictions such as minimum lot size rules in undeveloped areas that make housing supply much more fixed. California's large population, development restrictions, and overfilled commuting pathways effectively combine to achieve the same result. In Florida, geographic barriers and increasing build-out, in combination with a strong speculative element, are responsible for low affordability levels. The fact that macroeconomic conditions are so different across the different markets reinforces the need for segmented housing attainment strategies among organizations pursuing homeownership initiatives.

Where Affordability Changed Most

The perception of "affordability" problems among buyers, and to some extent their actual experience as well, may be driven by *changes* in affordability rather than affordability levels. Would-be owners in markets in which the affordability level drops from 1.45 to 0.95 in a decade, for instance, may feel that purchasing a home is more of a challenge

than those in places where it declines from 0.95 to 0.85. The obvious psychological aspects of rapidly declining affordability in formerly affordable places may be reinforced by the fact that households accustomed to and expecting access to housing at reasonable costs may have taken on additional and potentially long-term expenses, such as higher car payments, that prospective buyers in markets with well established affordability problems would not have. In order to examine the extent to which families in various markets may be subject to these sorts of affordability challenges, we examined the change in affordability between 1995 and 2005.

Map 4: Changing Affordability, 1995–2005



Map 4 shows the pattern of such changes at the national level, based on the change in affordability index values during the study period. For the most part, the geographic pattern follows that of overall affordability conditions, with Tier 1 and 2 markets becoming much less affordable and Tier 4 and 5 markets remaining stable or improving. This results in an ever widening disparity between markets. For example, on average Ohio’s markets were 62 percent more affordable than California’s in 1995. By 2005, however, they had become 246 percent more affordable. The change was the net effect of California markets’ overall 47 percent decrease in affordability (from 1.18 to 0.62) and Ohio’s 13 percent increase (from 1.91 to 2.15).¹¹

¹¹ Index values are for 80 percent AMI families.

The extent to which sharp affordability declines occurred in the least affordable markets is reconfirmed by Figure 13, which shows the 20 markets in which housing affordability declined most. In these 20 markets, affordability declines averaged just under 50 percent, a staggering drop considering that there is a floor of zero and many of these places began the period with index values below 1.0. Fully 18 of the 20 are among the 24 Tier 1 markets. The California concentration evident in Map 4 is supported by the fact that 15 of the 20 markets in which affordability declined most, including the top 11, are located in California. Both of the non-Tier 1 markets where affordability declined most are in Florida (Cape Coral-Fort Myers and Port St. Lucie-Fort Pierce).

Figure 13: Most Rapid Declines in Housing Affordability, 1995–2005

Market	Change Rank	Change in Index (%)	Tier	Affordability Rank
Salinas, CA	1	54.8	1	3
Merced, CA	2	54.5	1	15
San Luis Obispo-Paso Robles, CA	3	53.4	1	5
Modesto, CA	4	53.3	1	16
Stockton, CA	5	52.4	1	12
Santa Cruz-Watsonville, CA	6	51.9	1	2
Riverside-San Bernardino-Ontario, CA	7	51.2	1	18
Santa Barbara-Santa Maria, CA	8	50.7	1	7
San Diego-Carlsbad-San Marcos, CA	9	49.0	1	9
Sacramento-Arden-Arcade-Roseville, CA	10	48.8	1	14
Los Angeles-Long Beach-Glendale, CA	11	48.5	1	10
Barnstable Town, MA	12	48.1	1	17
Naples-Marco Island, FL	13	47.7	1	20
Santa Rosa-Petaluma, CA	14	47.7	1	6
Port St. Lucie-Fort Pierce, FL	15	47.4	3	40
Vallejo-Fairfield, CA	16	46.1	1	13
Fresno, CA	17	45.3	1	22
Oakland-Fremont-Hayward, CA	18	45.2	1	8
New York-White Plains-Wayne, NY-NJ	19	45.0	1	11
Cape Coral-Fort Myers, FL	20	44.5	2	38

Note: Change rank and percent change in index are for households at 80% AMI.

In contrast, affordability actually improved in some markets between 1995 and 2005. For this to happen, house prices needed to fall or rise modestly, allowing declining interest rates to reduce the cost of purchasing a home on net. In all, there were 27 such markets, of which 21 are colored green on the map and the remaining 6, with affordability improvements less than 5 percent, are colored gray. As was the case with affordability, green areas are predominantly located in the Midwest and parts of the South. Buffalo, Detroit and Indianapolis had the largest increases in affordability over the study period, with affordability increases of 54.1%, 45.3% and 39.1%, respectively, for 80 percent

AMI households. In Buffalo, even families at 50 percent AMI saw a substantial improvement: their affordability index improved from 0.86 in 1995 to 1.28 in 2005. Mortgage-rate declines and real home prices that fell 14.2 percent were responsible for the notable improvement.

Overall, the fact that affordability trends were so different across markets reinforces the need for a segmented approach to homeownership attainment in the different types of markets. Housing in Tier 1 markets started out as unaffordable, and became dramatically more so over time. Nevertheless, in the meantime housing became more affordable in 20 percent of the markets examined here. The net result is even more differentiation in affordability-based ownership barriers over time at the market level.

Summary

This section has segmented 127 of the nation's largest housing markets based on affordability criteria, showing a dramatic gulf across markets. In a few places, ownership opportunities exist, even for those with very low incomes. In others, even families earning the median income have little hope of purchasing a modest home. These trends have a geographical dimension, with the Midwest and parts of the South, especially in Texas, containing most of the affordable markets. The least affordable places are in California, Florida and the Northeast. Overall, the typology reinforces the notion that diversity sufficient to undermine any sort of national once-size-fits-all approach to engendering homeownership among NeighborWorks[®] America's target households exists at the market level.

Conclusion

This paper has addressed a number of topics related to housing affordability in the United States. It began by reviewing the components of affordability and showing how they had changed between 1995 and 2005. In doing so it revealed that at the national level, rising house prices were offset for much of the period by declining interest rates. Ultimately, however, price increases combined with small but steady declines in real household income swamped the beneficial effects of low mortgage rates, when these rates bottomed out at historically low levels in recent years. Among low- and moderate-income households, affordability declined, though not always by enough to render a modestly priced home unaffordable to families earning 80 percent of the median income. For families at 50 percent of the median income, a modest home was unaffordable at the outset of the study period and became far less affordable over time.

The paper presents an analysis of housing affordability for three income groups at the housing market level. This analysis shows significant variation in the conditions facing households at the same point in the income distribution in different markets. We use this variation to sort the 127 markets into an affordability-based typology. Cross-group differences in this typology are significant. For example, the funding gap for 80 percent AMI families in the 24 least affordable markets averaged \$165,600 in the least affordable year. In contrast, there was no funding gap at all in the 62 most affordable markets, even in the least affordable year. Mapping the typology reveals strong regional trends. Regionality is most distinct among the least affordable markets, three quarters of which are located in California.

In identifying and codifying differences across metropolitan-area-level housing markets, this paper has addressed the first part of the challenge set out at the beginning of the paper: segmenting markets based on the magnitude of the affordability challenges in each, so that policies can be appropriately targeted to them. In concluding, it is worth noting that many local homeownership programs serve urban areas smaller than the metropolitan statistical area or metropolitan division by which housing markets are defined in this paper. For this reason additional analysis that captures intrametropolitan variation in price trends and affordability may further illuminate the challenges faced by specific organizations as they continue promoting homeownership among low- and moderate-income households. Also, this paper also does not assess conditions in rural housing markets because annual house price data were not available. If a data source could be identified, a similar study focused on rural housing markets would be useful to the many organizations operating outside of metropolitan areas.

Appendix 1: Data Sources and Methodology

The analysis presented in the paper is based on the National Association of Realtors' Housing Affordability Index (HAI).¹² The HAI uses three data points to calculate affordability: mortgage interest rate, median home sales price, and median family income. The first two are used to calculate the monthly payment on the median priced home according to the following formula:

$$(1) \text{ Monthly payment} = (\text{Median Sales Price}) * (0.8) * ((1 + (\text{MIR}/12))^{360} / (((1 + (\text{MIR}/12))^{360}) - 1))$$

This is the standard formula to calculating principal and interest payments. In addition to the use of the median priced home as the reference unit, it is also worth noting that NAR's assumes an 80 percent LTV loan (represented by the 0.8 by which sales price is multiplied). Our analysis uses the same formula but with two key differences. First, our reference home is priced at 75 percent of median sales price. Second, we assume households use a 97 percent LTV loan. (This assumption is based on actual LTVs of NeighborWorks's clients between 1998 and 2006.) Our version of formula (1), therefore, looks like this:

$$(1a) \text{ Monthly payment} = (\text{Median Sales Price} * 0.75) * (0.97) * ((1 + (\text{MIR}/12))^{360} / (((1 + (\text{MIR}/12))^{360}) - 1))$$

Because NAR does not release the median sales price data necessary to compute monthly principal and interest payments at the metropolitan area level, we use data provided by the National Association of Home Builders (which purchases it from First American Real Estate Solutions). This data includes the median sales price for both new and existing single family homes.

The next step is to compute the share of the median income constituted by one year of mortgage payments. The formula NAR uses is shown in equation (2). For this purpose NAR uses the Decennial Census family income figure updated annually to reflect price level changes. Again, because NAR does not release this at the market level we use NAHB's median income figures for each of the 127 markets examined in the paper. These figures come from HUD and are the standard family income figures used for housing policy purposes. Because we compute affordability for three income groups (median, 80 percent of median, and 50 percent of median) the denominator of the first term is multiplied by 1.0, 0.8, or 0.5 in our version of (2).

$$(2) \text{ Payment as share of median income} = [(\text{Monthly payment} * 12) / (\text{Median Income})] * 100$$

NAR next computes the income necessary to qualify for a loan on the median priced home by multiplying monthly payment times twelve to get an annual principal and interest figure and multiplying this by four, as shown in (3).

$$(3) \text{ Qualifying income} = (\text{Monthly payment}) * (12) * (4)$$

¹² [www.realtor.org/Research.nsf/files/Formulas_HAI.pdf/\\$FILE/Formulas_HAI.pdf](http://www.realtor.org/Research.nsf/files/Formulas_HAI.pdf/$FILE/Formulas_HAI.pdf).

The use of 4 as a multiplier is a function of NAR's assumption that housing expenses should consume no more than 25 percent of gross income. As noted in the text, NAHB assumes a level of 28 percent in its affordability calculations and actual NeighborWorks clients had average rates that increased from 25 to 29 percent between 1998 and 2006. Our computations assume that housing consumes 26.5 percent of gross income, a level halfway between the NAHB and NAR assumptions and consistent with NeighborWorks® clients' level during the study period. We therefore need a slightly more complex version of (3), as shown in (3a).

$$(3a) \text{ Qualifying income} = (\text{Monthly payment}) * (12) * (1/.265)$$

The final step in computing NAR's index is to divide median income by qualifying income and multiplying by 100, shown in (4).

$$(4) \text{ Affordability Index} = (\text{Median income}/\text{qualifying income}) * 100$$

Our index calculation is the same, except that we do not calculate affordability based only on the median income family. Our version of (4) therefore looks like this:

$$(4a) \text{ Affordability Index} = [(\text{Median income} * \text{constant}) / \text{qualifying income}] * 100$$

Our analysis uses only 1.0, 0.8, and 0.5 as values of the constant to reflect the upper and lower values of NeighborWorks's target population and to preserve the ability to compare to median households that are the subject of many affordability computations.

Our analysis also goes one step further than the NAR methodology by computing a "funding gap" between the value of the maximum mortgage a household can afford (with a 3 percent down payment and 26.5 percent of gross income devoted to mortgage payments) and the value of the mortgage required to purchase the reference home (priced at 75 percent of median sales price in that area) under the same assumptions. If the result is negative (i.e., the households can afford a larger mortgage than that required to purchase the reference home) the funding gap is \$0. Otherwise, it takes increasingly large value depending on the severity of affordability challenges facing the household.

Appendix 2: Detailed Affordability Results for 127 Markets — Part 1, Index Values

Rank	Market	Affordability Index					
		Median		80% AMI		50% AMI	
		Max	Min	Max	Min	Max	Min
1	San Francisco-San Mateo-Redwood City, CA	0.89	0.49	0.71	0.38	0.44	0.23
2	Santa Cruz-Watsonville, CA	1.00	0.48	0.80	0.37	0.50	0.22
3	Salinas, CA	1.03	0.45	0.81	0.35	0.50	0.21
4	San Jose-Sunnyvale-Santa Clara, CA	1.13	0.64	0.90	0.49	0.56	0.30
5	San Luis Obispo-Paso Robles, CA	1.15	0.52	0.91	0.40	0.57	0.24
6	Santa Rosa-Petaluma, CA	1.11	0.56	0.89	0.43	0.55	0.26
7	Santa Barbara-Santa Maria, CA	1.18	0.57	0.94	0.44	0.58	0.26
8	Oakland-Fremont-Hayward, CA	1.17	0.64	0.94	0.49	0.58	0.30
9	San Diego-Carlsbad-San Marcos, CA	1.17	0.59	0.93	0.45	0.58	0.27
10	Los Angeles-Long Beach-Glendale, CA	1.21	0.60	0.96	0.46	0.60	0.28
11	New York-White Plains-Wayne, NY-NJ	1.37	0.60	1.09	0.46	0.67	0.28
12	Stockton, CA	1.38	0.62	1.09	0.48	0.67	0.29
13	Vallejo-Fairfield, CA	1.35	0.68	1.07	0.53	0.66	0.32
14	Sacramento-Arden-Arcade-Roseville, CA	1.49	0.71	1.17	0.55	0.73	0.33
15	Merced, CA	1.44	0.62	1.14	0.47	0.70	0.29
16	Modesto, CA	1.58	0.67	1.25	0.52	0.77	0.31
17	Barnstable Town, MA	1.38	0.69	1.10	0.53	0.68	0.32
18	Riverside-San Bernardino-Ontario, CA	1.63	0.74	1.29	0.57	0.80	0.34
19	Nassau-Suffolk, NY	2.12	0.89	1.68	0.69	1.04	0.41
20	Naples-Marco Island, FL	1.60	0.84	1.28	0.64	0.80	0.39
21	Boston-Quincy, MA	1.55	0.89	1.23	0.69	0.77	0.41
22	Fresno, CA	1.58	0.77	1.25	0.60	0.77	0.36
23	Honolulu, HI	1.49	0.93	1.16	0.72	0.71	0.43
24	Reno-Sparks, NV	1.50	0.90	1.19	0.70	0.73	0.42
25	Chico, CA	1.38	0.80	1.09	0.62	0.67	0.37
26	Redding, CA	1.50	0.82	1.19	0.63	0.73	0.38
27	Newark-Union, NJ-PA	1.54	0.98	1.22	0.75	0.75	0.45
28	Wash.-Arlington-Alexandria, DC-VA-MD-WV	1.88	1.02	1.49	0.78	0.92	0.47
29	Las Vegas-Paradise, NV	1.54	0.91	1.22	0.70	0.75	0.42
30	Atlantic City, NJ	1.96	0.95	1.55	0.73	0.96	0.44
31	Miami-Miami Beach-Kendall, FL	1.59	0.92	1.27	0.71	0.80	0.43
32	Visalia-Porterville, CA	1.65	0.90	1.30	0.69	0.81	0.41
33	Seattle-Bellevue-Everett, WA	1.43	1.04	1.14	0.80	0.71	0.48
34	Providence-New Bedford-Fall River, RI-MA	1.77	0.99	1.38	0.76	0.85	0.46
35	Sarasota-Bradenton-Venice, FL	1.74	0.98	1.39	0.75	0.87	0.45
36	Bakersfield, CA	1.91	0.98	1.51	0.75	0.93	0.45
37	West Palm Beach-Boca Raton-Boynton Beach, FL	1.73	1.03	1.37	0.79	0.85	0.48
38	USA	1.42	1.03	1.14	0.79	0.71	0.48

Rank	Market	Affordability Index					
		Median		80% AMI		50% AMI	
		Max	Min	Max	Min	Max	Min
39	Cape Coral-Fort Myers, FL	1.87	1.03	1.49	0.79	0.93	0.48
40	Worcester, MA	1.68	1.11	1.33	0.85	0.82	0.51
41	Boulder, CO	1.48	1.09	1.18	0.86	0.74	0.53
42	Port St. Lucie-Fort Pierce, FL	2.16	1.09	1.71	0.84	1.06	0.51
43	Charleston-North Charleston, SC	1.56	1.10	1.25	0.85	0.78	0.51
44	Hagerstown-Martinsburg, MD-WV	1.74	1.12	1.38	0.87	0.85	0.52
45	Phoenix-Mesa-Scottsdale, AZ	1.63	1.14	1.27	0.88	0.79	0.53
46	Tacoma, WA	1.46	1.14	1.17	0.88	0.73	0.53
47	Greeley, CO	1.39	1.07	1.11	0.84	0.69	0.52
48	Fort Walton Beach, FL	1.75	1.13	1.40	0.87	0.87	0.52
49	Ft. Lauderdale-Pompano Bch.-Deerfield Bch., FL	1.80	1.16	1.44	0.89	0.90	0.54
50	Provo-Orem, UT	1.41	1.11	1.10	0.87	0.66	0.53
51	Tucson, AZ	1.51	1.14	1.18	0.88	0.73	0.53
52	Portland-Vancouver-Beaverton, OR-WA	1.45	1.16	1.12	0.90	0.69	0.54
53	Deltona-Daytona Beach-Ormond Beach, FL	1.99	1.14	1.57	0.88	0.97	0.53
54	Punta Gorda, FL	1.96	1.15	1.53	0.89	0.95	0.53
55	Orlando-Kissimmee, FL	1.83	1.19	1.47	0.92	0.92	0.55
56	Fort Collins-Loveland, CO	1.47	1.17	1.17	0.92	0.72	0.56
57	Colorado Springs, CO	1.47	1.18	1.18	0.92	0.74	0.57
58	Albuquerque, NM MSA	1.60	1.16	1.24	0.93	0.75	0.58
59	Denver-Aurora, CO	1.65	1.21	1.32	0.95	0.82	0.58
60	Norwich-New London, CT	1.75	1.25	1.38	0.96	0.85	0.58
61	Salt Lake City, UT	1.63	1.22	1.27	0.96	0.77	0.58
62	Austin-Round Rock, TX	1.56	1.23	1.21	0.96	0.75	0.59
63	Virginia Beach-Norfolk-Newport News, VA-NC	1.73	1.28	1.38	0.99	0.86	0.60
64	Pueblo, CO	1.67	1.26	1.29	0.99	0.80	0.60
65	Tampa-St. Petersburg-Clearwater, FL	1.94	1.29	1.54	0.99	0.96	0.60
66	Chicago-Naperville-Joliet, IL	1.62	1.29	1.28	1.01	0.79	0.62
67	Baltimore-Towson, MD	1.88	1.33	1.46	1.03	0.89	0.62
68	Minneapolis-St. Paul-Bloomington, MN-WI	2.13	1.37	1.70	1.05	1.06	0.63
69	Philadelphia, PA	2.75	1.37	2.14	1.05	1.30	0.63
70	Ann Arbor, MI	1.75	1.36	1.40	1.06	0.87	0.65
71	Raleigh-Cary, NC	1.71	1.29	1.33	1.01	0.80	0.62
72	Richmond, VA	1.80	1.44	1.44	1.11	0.90	0.66
73	New Haven-Milford, CT	2.00	1.50	1.58	1.15	0.98	0.69
74	Trenton-Ewing, NJ	1.91	1.54	1.52	1.18	0.94	0.71
75	Hartford-West Hartford-East Hartford, CT	1.98	1.53	1.57	1.18	0.97	0.71
76	Jacksonville, FL	1.88	1.40	1.50	1.08	0.94	0.65
77	Charlotte-Gastonia-Concord, NC-SC	1.72	1.30	1.34	1.02	0.81	0.62
78	Allentown-Bethlehem-Easton, PA-NJ	2.03	1.45	1.57	1.11	0.96	0.67
79	Lakeland, FL	1.95	1.34	1.56	1.03	0.98	0.62

Rank	Market	Affordability Index					
		Median		80% AMI		50% AMI	
		Max	Min	Max	Min	Max	Min
80	Springfield, MA	1.82	1.45	1.44	1.11	0.89	0.67
81	Salem, OR	1.55	1.30	1.24	1.02	0.78	0.62
82	Gainesville, FL	1.96	1.42	1.57	1.09	0.98	0.66
83	Birmingham-Hoover, AL	1.90	1.29	1.48	1.02	0.90	0.62
84	Wilmington, DE-MD-NJ	2.01	1.59	1.59	1.23	0.98	0.74
85	Dallas-Plano-Irving, TX	1.88	1.44	1.46	1.13	0.88	0.69
86	Pensacola-Ferry Pass-Brent, FL	1.90	1.44	1.48	1.11	0.92	0.67
87	Atlanta-Sandy Springs-Marietta, GA	1.91	1.50	1.48	1.17	0.92	0.72
88	Detroit-Livonia-Dearborn, MI	2.90	1.49	2.23	1.17	1.34	0.72
89	Pittsfield, MA	1.90	1.58	1.48	1.22	0.90	0.73
90	Greensboro-High Point, NC	1.93	1.43	1.50	1.12	0.91	0.69
91	Columbus, OH	1.78	1.49	1.41	1.17	0.88	0.72
92	Ocala, FL	1.88	1.46	1.48	1.12	0.92	0.68
93	El Paso, TX	1.83	1.29	1.42	1.03	0.87	0.64
94	Indianapolis, IN	2.46	1.52	1.91	1.20	1.16	0.73
95	Tallahassee, FL	1.92	1.62	1.54	1.25	0.96	0.75
96	Lancaster, PA	1.85	1.63	1.43	1.28	0.88	0.77
97	Greenville-Spartanburg,	1.95	1.50	1.51	1.18	0.92	0.72
98	San Antonio, TX	2.02	1.46	1.57	1.16	0.95	0.73
99	Houston-Sugar Land-Baytown, TX	1.94	1.61	1.54	1.27	0.96	0.78
100	Milwaukee-Waukesha-West Allis, WI	2.19	1.74	1.76	1.34	1.10	0.81
101	Columbia, SC	2.16	1.60	1.68	1.26	1.02	0.77
102	Cleveland-Elyria-Mentor, OH	2.14	1.63	1.66	1.28	1.01	0.78
103	Akron, OH	2.20	1.62	1.71	1.27	1.04	0.78
104	Cincinnati-Middletown, OH-KY-IN	2.01	1.67	1.56	1.31	0.97	0.80
105	St. Louis, MO-IL	2.40	1.68	1.86	1.32	1.12	0.81
106	Reading, PA	2.09	1.75	1.63	1.38	0.99	0.83
107	Harrisburg-Carlisle, PA	2.16	1.69	1.68	1.33	1.02	0.81
108	Grand Rapids-Wyoming, MI	2.12	1.72	1.69	1.35	1.05	0.83
109	Tulsa, OK	2.06	1.68	1.60	1.32	0.97	0.81
110	Canton-Massillon, OH	2.52	1.69	1.96	1.33	1.19	0.81
111	Fort Worth-Arlington, TX	2.13	1.76	1.68	1.38	1.04	0.85
112	Pittsburgh, PA	2.13	1.74	1.65	1.37	1.00	0.84
113	Duluth, MN-WI	2.43	1.76	1.89	1.38	1.14	0.85
114	Vineland-Millville-Bridgeton, NJ	2.45	1.89	1.90	1.46	1.15	0.88
115	Toledo, OH	2.39	1.85	1.85	1.45	1.12	0.89
116	Buffalo-Niagara Falls, NY	2.92	1.82	2.25	1.46	1.35	0.91
117	Lansing-East Lansing, MI	2.85	1.93	2.21	1.51	1.34	0.93
118	Champaign-Urbana, IL	2.63	2.00	2.05	1.57	1.25	0.95
119	Oklahoma City, OK	2.37	1.95	1.84	1.53	1.12	0.94
120	Dayton, OH	2.54	1.97	1.97	1.55	1.19	0.95

Affordability and the Funding Gap

Rank	Market	Affordability Index					
		Median		80% AMI		50% AMI	
		Max	Min	Max	Min	Max	Min
121	Mansfield, OH	2.65	1.98	2.05	1.56	1.24	0.95
122	Rockford, IL	2.52	2.10	1.94	1.64	1.17	1.00
123	Davenport-Moline-Rock Island, IA-IL	3.00	2.38	2.33	1.88	1.41	1.15
124	Lima, OH	2.95	2.31	2.29	1.81	1.39	1.11
125	Peoria, IL	2.71	2.16	2.10	1.70	1.27	1.04
126	Rochester, NY	2.63	2.01	2.04	1.61	1.24	1.00
127	Springfield, IL	2.78	2.08	2.16	1.66	1.31	1.03

Appendix 2: Detailed Affordability Results for 127 Markets — Part 2, Funding Gap

Rank	Market	Funding Gap (2005\$)					
		Median		80% AMI		50% AMI	
		Max	Min	Max	Min	Max	Min
1	San Francisco-San Mateo-Redwood City, CA	272.8	29.1	334.0	75.1	415.8	143.2
2	Santa Cruz-Watsonville, CA	252.9	0.2	306.5	39.4	378.2	98.0
3	Salinas, CA	232.1	0.0	275.6	30.2	333.8	78.6
4	San Jose-Sunnyvale-Santa Clara, CA	162.4	0.0	229.3	20.8	318.6	93.9
5	San Luis Obispo-Paso Robles, CA	180.2	0.0	224.2	12.8	283.1	61.8
6	Santa Rosa-Petaluma, CA	170.8	0.0	221.1	18.6	288.5	74.7
7	Santa Barbara-Santa Maria, CA	164.1	0.0	213.5	9.4	279.7	64.4
8	Oakland-Fremont-Hayward, CA	141.9	0.0	199.6	11.7	276.7	75.1
9	San Diego-Carlsbad-San Marcos, CA	143.1	0.0	190.3	9.8	253.5	62.4
10	Los Angeles-Long Beach-Glendale, CA	138.2	0.0	185.2	5.2	248.1	57.6
11	New York-White Plains-Wayne, NY-NJ	130.8	0.0	175.6	0.0	235.5	42.6
12	Stockton, CA	112.8	0.0	154.6	0.0	210.6	39.1
13	Vallejo-Fairfield, CA	99.6	0.0	149.4	0.0	215.9	47.0
14	Sacramento-Arden-Arcade-Roseville, CA	84.0	0.0	131.0	0.0	193.9	34.5
15	Merced, CA	92.4	0.0	126.5	0.0	172.0	26.3
16	Modesto, CA	85.0	0.0	125.1	0.0	178.7	23.2
17	Barnstable Town, MA	82.4	0.0	124.5	0.0	180.7	35.5
18	Riverside-San Bernardino-Ontario, CA	66.2	0.0	110.2	0.0	169.1	20.1
19	Nassau-Suffolk, NY	34.4	0.0	100.4	0.0	188.6	0.0
20	Naples-Marco Island, FL	39.5	0.0	86.0	0.0	148.2	21.1
21	Boston-Quincy, MA	28.3	0.0	83.6	0.0	157.5	30.1
22	Fresno, CA	45.8	0.0	81.8	0.0	130.0	20.6
23	Honolulu, HI	18.6	0.0	74.4	0.0	149.0	45.0
24	Reno-Sparks, NV	23.0	0.0	72.0	0.0	137.4	32.9
25	Chico, CA	35.7	0.0	69.1	0.0	113.8	30.5
26	Redding, CA	33.2	0.0	68.0	0.0	114.5	24.5
27	Newark-Union, NJ-PA	5.6	0.0	65.3	0.0	145.1	37.7
28	Wash.-Arlington-Alexandria, DC-VA-MD-WV	0.0	0.0	60.4	0.0	147.7	10.9
29	Las Vegas-Paradise, NV	17.4	0.0	60.2	0.0	117.4	27.3
30	Atlantic City, NJ	10.5	0.0	55.5	0.0	116.3	3.4
31	Miami-Miami Beach-Kendall, FL	14.2	0.0	51.4	0.0	101.1	17.4
32	Visalia-Porterville, CA	16.5	0.0	48.9	0.0	92.4	15.2
33	Seattle-Bellevue-Everett, WA	0.0	0.0	44.8	0.0	116.5	40.1
34	Providence-New Bedford-Fall River, RI-MA	1.3	0.0	44.6	0.0	102.5	14.8
35	Sarasota-Bradenton-Venice, FL	3.7	0.0	43.0	0.0	95.4	11.0
36	Bakersfield, CA	4.2	0.0	42.3	0.0	93.2	5.2
37	West Palm Beach-Boca Raton-Boynton Beach, FL	0.0	0.0	40.7	0.0	102.6	16.3
38	USA	0.0	0.0	36.6	0.0	92.6	31.8

Affordability and the Funding Gap

Rank	Market	Funding Gap (2005\$)					
		Median		80% AMI		50% AMI	
		Max	Min	Max	Min	Max	Min
39	Cape Coral-Fort Myers, FL	0.0	0.0	34.8	0.0	87.0	5.5
40	Worcester, MA	0.0	0.0	27.4	0.0	90.4	19.9
41	Boulder, CO	0.0	0.0	26.1	0.0	97.0	36.4
42	Port St. Lucie-Fort Pierce, FL	0.0	0.0	25.9	0.0	80.6	0.0
43	Charleston-North Charleston, SC	0.0	0.0	22.7	0.0	72.2	19.2
44	Hagerstown-Martinsburg, MD-WV	0.0	0.0	21.0	0.0	75.3	13.6
45	Phoenix-Mesa-Scottsdale, AZ	0.0	0.0	20.8	0.0	79.0	21.7
46	Tacoma, WA	0.0	0.0	20.0	0.0	77.5	29.7
47	Greeley, CO	0.0	0.0	19.8	0.0	62.9	30.7
48	Fort Walton Beach, FL	0.0	0.0	19.3	0.0	69.8	10.3
49	Ft. Lauderdale-Pompano Bch.-Deerfield Bch., FL	0.0	0.0	18.5	0.0	78.5	9.0
50	Provo-Orem, UT	0.0	0.0	17.9	0.0	70.3	41.7
51	Tucson, AZ	0.0	0.0	17.8	0.0	67.6	25.1
52	Portland-Vancouver-Beaverton, OR-WA	0.0	0.0	17.3	0.0	76.8	37.0
53	Deltona-Daytona Beach-Ormond Beach, FL	0.0	0.0	15.9	0.0	63.1	1.9
54	Punta Gorda, FL	0.0	0.0	14.9	0.0	61.1	3.3
55	Orlando-Kissimmee, FL	0.0	0.0	12.2	0.0	67.9	6.9
56	Fort Collins-Loveland, CO	0.0	0.0	11.9	0.0	64.9	34.7
57	Colorado Springs, CO	0.0	0.0	9.7	0.0	55.7	27.3
58	Albuquerque, NM MSA	0.0	0.0	8.9	0.0	52.4	27.3
59	Denver-Aurora, CO	0.0	0.0	7.8	0.0	65.5	19.7
60	Norwich-New London, CT	0.0	0.0	6.2	0.0	70.0	15.8
61	Salt Lake City, UT	0.0	0.0	5.6	0.0	64.4	28.0
62	Austin-Round Rock, TX	0.0	0.0	4.7	0.0	53.3	29.6
63	Virginia Beach-Norfolk-Newport News, VA-NC	0.0	0.0	1.5	0.0	57.0	12.0
64	Pueblo, CO	0.0	0.0	1.3	0.0	35.5	14.4
65	Tampa-St. Petersburg-Clearwater, FL	0.0	0.0	1.0	0.0	51.6	2.9
66	Chicago-Naperville-Joliet, IL	0.0	0.0	0.0	0.0	66.5	27.4
67	Baltimore-Towson, MD	0.0	0.0	0.0	0.0	64.2	12.5
68	Minneapolis-St. Paul-Bloomington, MN-WI	0.0	0.0	0.0	0.0	61.9	0.0
69	Philadelphia, PA	0.0	0.0	0.0	0.0	57.3	0.0
70	Ann Arbor, MI	0.0	0.0	0.0	0.0	51.2	14.9
71	Raleigh-Cary, NC	0.0	0.0	0.0	0.0	50.8	24.9
72	Richmond, VA	0.0	0.0	0.0	0.0	48.6	9.8
73	New Haven-Milford, CT	0.0	0.0	0.0	0.0	47.7	2.6
74	Trenton-Ewing, NJ	0.0	0.0	0.0	0.0	47.1	6.7
75	Hartford-West Hartford-East Hartford, CT	0.0	0.0	0.0	0.0	45.6	3.6
76	Jacksonville, FL	0.0	0.0	0.0	0.0	45.1	4.8
77	Charlotte-Gastonia-Concord, NC-SC	0.0	0.0	0.0	0.0	44.9	18.9
78	Allentown-Bethlehem-Easton, PA-NJ	0.0	0.0	0.0	0.0	44.5	4.0
79	Lakeland, FL	0.0	0.0	0.0	0.0	42.5	1.5

Rank	Market	Funding Gap (2005\$)					
		Median		80% AMI		50% AMI	
		Max	Min	Max	Min	Max	Min
80	Springfield, MA	0.0	0.0	0.0	0.0	41.6	9.9
81	Salem, OR	0.0	0.0	0.0	0.0	41.0	20.2
82	Gainesville, FL	0.0	0.0	0.0	0.0	39.8	1.3
83	Birmingham-Hoover, AL	0.0	0.0	0.0	0.0	39.2	9.3
84	Wilmington, DE-MD-NJ	0.0	0.0	0.0	0.0	38.7	2.0
85	Dallas-Plano-Irving, TX	0.0	0.0	0.0	0.0	37.5	13.7
86	Pensacola-Ferry Pass-Brent, FL	0.0	0.0	0.0	0.0	36.5	6.0
87	Atlanta-Sandy Springs-Marietta, GA	0.0	0.0	0.0	0.0	33.8	9.1
88	Detroit-Livonia-Dearborn, MI	0.0	0.0	0.0	0.0	32.9	0.0
89	Pittsfield, MA	0.0	0.0	0.0	0.0	32.0	9.3
90	Greensboro-High Point, NC	0.0	0.0	0.0	0.0	31.3	8.5
91	Columbus, OH	0.0	0.0	0.0	0.0	31.1	11.0
92	Ocala, FL	0.0	0.0	0.0	0.0	29.9	5.4
93	El Paso, TX	0.0	0.0	0.0	0.0	29.5	8.4
94	Indianapolis, IN	0.0	0.0	0.0	0.0	28.7	0.0
95	Tallahassee, FL	0.0	0.0	0.0	0.0	28.1	3.1
96	Lancaster, PA	0.0	0.0	0.0	0.0	25.7	11.1
97	Greenville-Spartanburg,	0.0	0.0	0.0	0.0	25.5	7.4
98	San Antonio, TX	0.0	0.0	0.0	0.0	24.7	3.9
99	Houston-Sugar Land-Baytown, TX	0.0	0.0	0.0	0.0	23.2	4.0
100	Milwaukee-Waukesha-West Allis, WI	0.0	0.0	0.0	0.0	23.2	0.0
101	Columbia, SC	0.0	0.0	0.0	0.0	21.4	0.0
102	Cleveland-Elyria-Mentor, OH	0.0	0.0	0.0	0.0	21.1	0.0
103	Akron, OH	0.0	0.0	0.0	0.0	20.6	0.0
104	Cincinnati-Middletown, OH-KY-IN	0.0	0.0	0.0	0.0	19.5	2.2
105	St. Louis, MO-IL	0.0	0.0	0.0	0.0	19.1	0.0
106	Reading, PA	0.0	0.0	0.0	0.0	18.0	0.7
107	Harrisburg-Carlisle, PA	0.0	0.0	0.0	0.0	17.0	0.0
108	Grand Rapids-Wyoming, MI	0.0	0.0	0.0	0.0	16.4	0.0
109	Tulsa, OK	0.0	0.0	0.0	0.0	15.6	2.8
110	Canton-Massillon, OH	0.0	0.0	0.0	0.0	15.5	0.0
111	Fort Worth-Arlington, TX	0.0	0.0	0.0	0.0	14.7	0.0
112	Pittsburgh, PA	0.0	0.0	0.0	0.0	12.7	0.0
113	Duluth, MN-WI	0.0	0.0	0.0	0.0	12.3	0.0
114	Vineland-Millville-Bridgeton, NJ	0.0	0.0	0.0	0.0	11.4	0.0
115	Toledo, OH	0.0	0.0	0.0	0.0	9.0	0.0
116	Buffalo-Niagara Falls, NY	0.0	0.0	0.0	0.0	7.2	0.0
117	Lansing-East Lansing, MI	0.0	0.0	0.0	0.0	6.3	0.0
118	Champaign-Urbana, IL	0.0	0.0	0.0	0.0	5.2	0.0
119	Oklahoma City, OK	0.0	0.0	0.0	0.0	4.5	0.0
120	Dayton, OH	0.0	0.0	0.0	0.0	3.9	0.0

Rank	Market	Funding Gap (2005\$)					
		Median		80% AMI		50% AMI	
		Max	Min	Max	Min	Max	Min
121	Mansfield, OH	0.0	0.0	0.0	0.0	3.2	0.0
122	Rockford, IL	0.0	0.0	0.0	0.0	0.2	0.0
123	Davenport-Moline-Rock Island, IA-IL	0.0	0.0	0.0	0.0	0.0	0.0
124	Lima, OH	0.0	0.0	0.0	0.0	0.0	0.0
125	Peoria, IL	0.0	0.0	0.0	0.0	0.0	0.0
126	Rochester, NY	0.0	0.0	0.0	0.0	0.0	0.0
127	Springfield, IL	0.0	0.0	0.0	0.0	0.0	0.0

Appendix 3: Segmenting Markets Based on Impact of Policy Interventions

Income Level	50% AMI	80% AMI	80% AMI	80% AMI
Down-payment Subsidy	—	—	+2%	+2%
Interest Rate Subsidy	—	—	-1.5 points	-3.0 points
	Tier 1			
San Francisco-San Mateo-Redwood City, CA	\$415,808	\$333,964	\$285,389	\$236,618
Santa Cruz-Watsonville, CA	\$378,209	\$306,526	\$263,692	\$220,976
Salinas, CA	\$333,827	\$275,645	\$240,325	\$205,655
San Jose-Sunnyvale-Santa Clara, CA	\$318,626	\$229,265	\$179,020	\$125,770
San Luis Obispo-Paso Robles, CA	\$283,125	\$224,247	\$189,633	\$154,548
Santa Rosa-Petaluma, CA	\$288,505	\$221,137	\$182,262	\$142,117
Santa Barbara-Santa Maria, CA	\$279,664	\$213,549	\$175,468	\$136,070
Oakland-Fremont-Hayward, CA	\$276,719	\$199,607	\$156,213	\$110,262
San Diego-Carlsbad-San Marcos, CA	\$253,518	\$190,326	\$154,213	\$116,557
Los Angeles-Long Beach-Glendale, CA	\$248,118	\$185,204	\$149,339	\$111,848
New York-White Plains-Wayne, NY-NJ	\$235,459	\$175,607	\$141,499	\$105,834
Stockton, CA	\$210,601	\$154,646	\$122,956	\$89,612
Vallejo-Fairfield, CA	\$215,924	\$149,391	\$112,420	\$72,773
Sacramento-Arden-Arcade-Roseville, CA	\$193,919	\$131,005	\$96,257	\$58,767
Merced, CA	\$171,966	\$126,451	\$100,660	\$73,537
Modesto, CA	\$178,704	\$125,116	\$95,240	\$63,306
Barnstable Town, MA	\$180,717	\$124,484	\$93,274	\$59,765
Riverside-San Bernardino-Ontario, CA	\$169,089	\$110,212	\$77,949	\$42,863
Nassau-Suffolk, NY	\$188,628	\$100,381	\$53,361	\$774
Naples-Marco Island, FL	\$148,227	\$86,009	\$52,544	\$15,468
Boston-Quincy, MA	\$157,509	\$83,599	\$44,227	\$184
Fresno, CA	\$129,966	\$81,806	\$55,588	\$26,889
Chico, CA	\$113,753	\$69,073	\$44,890	\$18,265
Redding, CA	\$114,479	\$67,990	\$42,907	\$15,204
	Tier 2			
Honolulu, HI	\$149,002	\$74,396	\$34,860	\$0
Reno-Sparks, NV	\$137,397	\$71,977	\$37,170	\$0
Newark-Union, NJ-PA	\$145,053	\$65,297	\$23,325	\$0
Wash.-Arl.-Alexandria, DC-VA-MD-WV	\$147,720	\$60,448	\$14,747	\$0
Las Vegas-Paradise, NV	\$117,410	\$60,203	\$29,822	\$0
Atlantic City, NJ	\$116,293	\$55,485	\$23,095	\$0
Miami-Miami Beach-Kendall, FL	\$101,102	\$51,411	\$25,040	\$0
Visalia-Porterville, CA	\$92,363	\$48,935	\$25,805	\$0
Seattle-Bellevue-Everett, WA	\$116,491	\$44,808	\$7,370	\$0
Providence-New Bedford-Fall River, RI-MA	\$102,538	\$44,634	\$14,220	\$0
Sarasota-Bradenton-Venice, FL	\$95,448	\$42,973	\$15,358	\$0
Bakersfield, CA	\$93,211	\$42,267	\$15,446	\$0

Affordability and the Funding Gap

Income Level	50% AMI	80% AMI	80% AMI	80% AMI
Down-payment Subsidy	—	—	+2%	+2%
Interest Rate Subsidy	—	—	-1.5 points	-3.0 points
W. Palm Bch.-Boca Raton-Boynton Bch., FL	\$102,633	\$40,693	\$8,304	\$0
USA	\$92,564	\$36,609	\$7,353	\$0
Cape Coral-Fort Myers, FL	\$86,956	\$34,760	\$7,456	\$0
Greeley, CO	\$62,872	\$19,822	\$263	\$0
	Tier 3			
Worcester, MA	\$90,404	\$27,351	\$0	\$0
Boulder, CO	\$96,999	\$26,144	\$0	\$0
Port St. Lucie-Fort Pierce, FL	\$80,631	\$25,929	\$0	\$0
Charleston-North Charleston, SC	\$72,212	\$22,660	\$0	\$0
Hagerstown-Martinsburg, MD-WV	\$75,259	\$20,975	\$0	\$0
Phoenix-Mesa-Scottsdale, AZ	\$79,020	\$20,838	\$0	\$0
Tacoma, WA	\$77,523	\$20,038	\$0	\$0
Fort Walton Beach, FL	\$69,833	\$19,307	\$0	\$0
Ft. Laud.-Pompano Bch.-Deerfield Bch., FL	\$78,473	\$18,482	\$0	\$0
Provo-Orem, UT	\$70,350	\$17,875	\$0	\$0
Tucson, AZ	\$67,609	\$17,779	\$0	\$0
Portland-Vancouver-Beaverton, OR-WA	\$76,766	\$17,332	\$0	\$0
Deltona-Daytona Beach-Ormond Beach, FL	\$63,050	\$15,865	\$0	\$0
Punta Gorda, FL	\$61,064	\$14,853	\$0	\$0
Orlando-Kissimmee, FL	\$67,885	\$12,209	\$0	\$0
Fort Collins-Loveland, CO	\$64,887	\$11,912	\$0	\$0
Colorado Springs, CO	\$55,690	\$9,726	\$0	\$0
Albuquerque, NM MSA	\$52,431	\$8,864	\$0	\$0
Denver-Aurora, CO	\$65,464	\$7,778	\$0	\$0
Norwich-New London, CT	\$70,048	\$6,159	\$0	\$0
Salt Lake City, UT	\$64,357	\$5,619	\$0	\$0
Austin-Round Rock, TX	\$53,334	\$4,713	\$0	\$0
Virg. Bch.-Norfolk-Newport News, VA-NC	\$57,001	\$1,464	\$0	\$0
Pueblo, CO	\$35,522	\$1,308	\$0	\$0
Tampa-St. Petersburg-Clearwater, FL	\$51,618	\$952	\$0	\$0
	Tier 4			
Chicago-Naperville-Joliet, IL	\$66,531	\$0	\$0	\$0
Baltimore-Towson, MD	\$64,155	\$0	\$0	\$0
Minneapolis-St. Paul-Bloomington, MN-WI	\$61,887	\$0	\$0	\$0
Philadelphia, PA	\$57,343	\$0	\$0	\$0
Ann Arbor, MI	\$51,169	\$0	\$0	\$0
Raleigh-Cary, NC	\$50,834	\$0	\$0	\$0
Richmond, VA	\$48,587	\$0	\$0	\$0
New Haven-Milford, CT	\$47,714	\$0	\$0	\$0
Trenton-Ewing, NJ	\$47,136	\$0	\$0	\$0
Hartford-West Hartford-East Hartford, CT	\$45,642	\$0	\$0	\$0

Income Level	50% AMI	80% AMI	80% AMI	80% AMI
Down-payment Subsidy	—	—	+2%	+2%
Interest Rate Subsidy	—	—	-1.5 points	-3.0 points
Jacksonville, FL	\$45,137	\$0	\$0	\$0
Charlotte-Gastonia-Concord, NC-SC	\$44,870	\$0	\$0	\$0
Allentown-Bethlehem-Easton, PA-NJ	\$44,490	\$0	\$0	\$0
Lakeland, FL	\$42,541	\$0	\$0	\$0
Springfield, MA	\$41,639	\$0	\$0	\$0
Salem, OR	\$40,985	\$0	\$0	\$0
Gainesville, FL	\$39,824	\$0	\$0	\$0
Birmingham-Hoover, AL	\$39,234	\$0	\$0	\$0
Wilmington, DE-MD-NJ	\$38,718	\$0	\$0	\$0
Dallas-Plano-Irving, TX	\$37,482	\$0	\$0	\$0
Pensacola-Ferry Pass-Brent, FL	\$36,454	\$0	\$0	\$0
Atlanta-Sandy Springs-Marietta, GA	\$33,832	\$0	\$0	\$0
Detroit-Livonia-Dearborn, MI	\$32,944	\$0	\$0	\$0
Pittsfield, MA	\$31,970	\$0	\$0	\$0
Greensboro-High Point, NC	\$31,270	\$0	\$0	\$0
Columbus, OH	\$31,102	\$0	\$0	\$0
Ocala, FL	\$29,855	\$0	\$0	\$0
El Paso, TX	\$29,510	\$0	\$0	\$0
Indianapolis, IN	\$28,710	\$0	\$0	\$0
Tallahassee, FL	\$28,124	\$0	\$0	\$0
Lancaster, PA	\$25,674	\$0	\$0	\$0
Greenville-Spartanburg,	\$25,543	\$0	\$0	\$0
	Tier 5			
San Antonio, TX	\$24,732	\$0	\$0	\$0
Houston-Sugar Land-Baytown, TX	\$23,186	\$0	\$0	\$0
Milwaukee-Waukesha-West Allis, WI	\$23,166	\$0	\$0	\$0
Columbia, SC	\$21,431	\$0	\$0	\$0
Cleveland-Elyria-Mentor, OH	\$21,071	\$0	\$0	\$0
Akron, OH	\$20,624	\$0	\$0	\$0
Cincinnati-Middletown, OH-KY-IN	\$19,540	\$0	\$0	\$0
St. Louis, MO-IL	\$19,071	\$0	\$0	\$0
Reading, PA	\$18,035	\$0	\$0	\$0
Harrisburg-Carlisle, PA	\$16,995	\$0	\$0	\$0
Grand Rapids-Wyoming, MI	\$16,428	\$0	\$0	\$0
Tulsa, OK	\$15,642	\$0	\$0	\$0
Canton-Massillon, OH	\$15,464	\$0	\$0	\$0
Fort Worth-Arlington, TX	\$14,746	\$0	\$0	\$0
Pittsburgh, PA	\$12,737	\$0	\$0	\$0
Duluth, MN-WI	\$12,283	\$0	\$0	\$0
Vineland-Millville-Bridgeton, NJ	\$11,421	\$0	\$0	\$0
Toledo, OH	\$9,045	\$0	\$0	\$0

Affordability and the Funding Gap

Income Level	50% AMI	80% AMI	80% AMI	80% AMI
Down-payment Subsidy	—	—	+2%	+2%
Interest Rate Subsidy	—	—	-1.5 points	-3.0 points
Buffalo-Niagara Falls, NY	\$7,170	\$0	\$0	\$0
Lansing-East Lansing, MI	\$6,300	\$0	\$0	\$0
Champaign-Urbana, IL	\$5,177	\$0	\$0	\$0
Oklahoma City, OK	\$4,475	\$0	\$0	\$0
Dayton, OH	\$3,933	\$0	\$0	\$0
Mansfield, OH	\$3,210	\$0	\$0	\$0
Rockford, IL	\$241	\$0	\$0	\$0
Davenport-Moline-Rock Island, IA-IL	\$0	\$0	\$0	\$0
Lima, OH	\$0	\$0	\$0	\$0
Peoria, IL	\$0	\$0	\$0	\$0
Rochester, NY	\$0	\$0	\$0	\$0
Springfield, IL	\$0	\$0	\$0	\$0