# What Has Happened to the Bottom of the US Housing Market?

**Article** *in* Urban Studies · December 1996

DOI: 10.1080/0042098966385

CITATIONS
66

READS
306

**2 authors:**

Stephen Malpezzi
University of Wisconsin–Madison
**56** PUBLICATIONS **2,082** CITATIONS
SEE PROFILE

Richard K. Green
University of Southern California
**109** PUBLICATIONS **2,568** CITATIONS
SEE PROFILE

*Urban Studies, Vol. 33, No. 10, 1807–1820, 1996*

CARFAX

# What Has Happened to the Bottom of the US Housing Market?

Stephen Malpezzi and Richard K. Green

{*Paper received in final form, July 1996*}

**Summary. Housing quality has improved dramatically for most low-income households, but they are paying much larger shares of their income for it. Many discussions of the bottom of the market focus on either the rising costs (the 'bad' news) or the rising quality (the 'good' news). Both points of view have some merit. This paper takes a positivist approach to the question: what's happening to the bottom of the housing market. We use a variety of indicators to look at whether the supply of low-cost units has fallen. We then focus on whether this dwindling supply reflects a market failure. If the market for low-income housing is indeed failing, we would observe: relatively high prices per unit of housing services provided by low-quality housing; obstructions to the supply of low-cost housing, which arises largely from filtering; and high vacancy rates. We find evidence of market failure in some markets but not in others. Finally, we focus on one possible source of market failure—excessive regulation—to see whether it is a common thread across those markets that have difficulty producing low-cost housing.**

Two central facts about the bottom of the US housing market are easy to characterise: housing quality has improved dramatically for most low-income households, but they are paying much larger shares of their income for it. John Weicher (1991) performed calculations that show that from 1974 to 1987, the number of very low-income families living in severely inadequate housing dropped from more than 10 to less than 2 per cent of such families; and that the number of such families paying more than half their money income for rent rose from 24 per cent to 36 per cent. More recent data from HUD show the latter figure to be over 40 per cent. In short, America's poorest are spending more to get better housing.

Unfortunately, many discussions of the bottom of the market focus on either the rising costs (the 'bad' news) or the rising quality (the 'good' news).

On the one hand, some argue that the inability to provide very low-cost housing to very low-income households is a strong indicator of market failure. (Michael Teitz calls the market for low-income housing an "intractable market".) In particular, some academics and advocates emphasise data showing that the supply of affordable units—i.e. units costing less than $300 in 1984 dollars—has dwindled by more than two-thirds in the private market and by about one-seventh altogether. Community development groups have expressed concern that

*Stephen Malpezzi and Richard K. Green are in the Center for Urban Land Economics Research, The School of Business, The University of Wisconsin, 975 University Avenue, Madison, WI 53706–1323, USA. Fax: 608–265–2738. e-mail: smalpezzi@bus.wisc.edu; rgreen@bus.wisc.edu.* *This paper was presented at the University of Pennsylvania's Symposium on the Occasion of William G. Grigsby's Retirement. It is based on draft material for a longer monograph. The authors are grateful to George Galster, Steven Hornburg, Larry Ozanne, Anthony M. J. Yezer and especially to William Grigsby for comments on earlier versions of some of the material. Views expressed in this paper are those of the authors alone.*

0042-0980/96/101807-14 $6.00 

many subsidised units constructed under the HUD Section 221 and 236 programmes are about to be converted to unrestricted market-rent units (although Congress has passed legislation that makes it largely unfeasible for landlords to do so). The work of the Advisory Committee on Regulatory Barriers to Affordable Housing (1991) implies that building code regulations truncate filtering and that gross rent burdens are therefore worsening for low-income households, because housing cannot filter to a sufficiently low quality. Green (1993) showed a 'mismatch' between incomes and rents in many parts of the country, implying that few vacant units were available at the low end of the market. Finally, although they have little to do with the functioning of the housing market *per se*, both rising utility costs and falling incomes at the bottom of the income distribution have reduced the ability of low-income households to afford housing.

On the other hand, others take heart at improving quality, and argue that the market has either corrected or is in the processing of correcting affordability problems. For instance, some (Lowry, 1960) will argue that subsidised units will inevitably 'crowd-out' low-cost market-rate rental units. Others speculate that converted subsidised units will be low-quality and therefore remain affordable.[1] Census housing report data suggest that vacancy levels are no different for many low-rent units than they are for others. Finally, it is reasonable to point out that rent burden problems could represent an income problem more than a housing market problem, and should therefore be dealt with through income assistance programmes.

It almost goes without saying that both points of view have some merit, but also are just that: points of view. Our purpose here is to take a positivist approach to the question: what's happening to the bottom of the US housing market. Specifically, we wish to begin the process of sorting out whether the higher-cost/better-quality combination reflects the actual desires of households in the marketplace, or an intractable market containing institutions that prevent low-cost/lower-quality housing from taking its place in the market.

We begin by using a variety of indicators to look in some detail at whether the supply of low-cost units has fallen; we find it has, but perhaps by not as much as individual indicators in isolation would suggest. We then focus on whether this dwindling supply reflects a market failure. If the market for low-income housing is indeed failing, we would expect to observe

(1) relatively high prices per unit of housing services provided by low-quality housing;
(2) obstructions to the supply of low-cost housing, which arises largely from filtering; and
(3) high vacancy rates.

Not surprisingly, we find evidence of market failure in some markets but not in others. Finally, we focus on one possible source of market failure—excessive regulation—to see whether it is a common thread across those markets that seem to have difficulty producing low-cost housing.

## What is Happening to the Supply of Low-cost Units?

Overall, the US housing market seems to work well: aggregate production of housing is up; vacancies are up; and contract rents are rising no more than other prices.[2] But like the apocryphal statistician who puts his head in the oven and his feet in the freezer and decides, on average, he's comfortable—then, of course, he computes a confidence interval and is no longer sure—these aggregate statistics mask gains in the top of the market and losses at the bottom. This point of view is well expressed in the Joint Center's recent (1992) *State of the Nation's Housing*:

> Over the past 15 years, the supply of market-rate units renting for $300 or more has steadily grown while the supply of subsidized or otherwise affordable units has steadily shrunk... Between 1974 and 1980, the number of privately owned un-

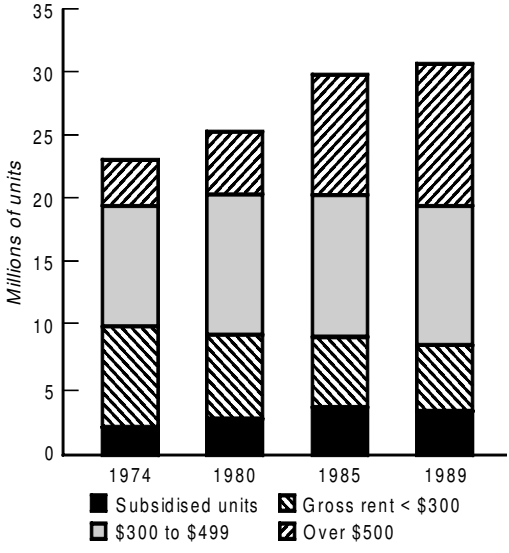


**Figure 1.** The supply of housing rental units in the US, 1974–89. (Rents in $1989.) *Source*: Joint Center (1992).

> subsidized units renting for less than $300 {in constant $ 1989} fell by 1.4 million units... {and the number of such units}... fell from 5.3 million in 1985 to 5.0 million in 1989... The supply of subsidized units, meanwhile, grew significantly.... This increase was not enough, however, to offset the losses of low-cost unsubsidized units. The total number of affordable rental units... declined from 9.9 million in 1974 to 9.3 million in 1980, and to 9.0 million in 1989. (Joint Center, 1992, p. 4)

The Joint Center's data supporting this argument clearly show a decline in the number of private unassisted units with a gross rent of less than $300; and an increase in subsidised units which does not quite make up the difference (see Figure 1).[3]

But while the reduction in sub-$300 units is disturbing, there is more to the story. First, American Housing Survey and Census data show that utility costs rose substantially during the 1980s, while contract rents lagged behind. And utility payments do not vary much by income.[4] Yet another perspective on Figure 1 is to re-examine the relationship between subsidised and low-cost units. Of the roughly 4m federally subsidised households, a little over 1m households receive vouchers or Section 8 existing certificates. To the extent that these allowances are used in low-cost housing,[5] units which appear to disappear from the low-income stock have not disappeared, they have just been subsidised. As a bound, if the 1 060 000 certificates and vouchers in 1989 were put in place since 1974, and if they all came out of the sub-$300 private stock, the total stock of affordable units and more expensive units subsidised with vouchers would have remained virtually unchanged. The sharp decline in privately provided sub-$300 stock was moreover certainly at least in part caused by the construction of public housing. Murray (1983) and Swan (1973) have estimated the degree of substitution between public and private housing construction. Murray's results suggest that for every 100 units publicly built, 85 units are ultimately removed from the stock; while Murray does not address this issue, we would expect those losses to come largely from the bottom of the stock. Only if public supply is a net addition to the stock should we be surprised at Figure 1.

Still, it is doubtless the case that the total number of units low-income households can afford in the absence of vouchers declined from 1974 to 1989. An important question remains, however, as to whether this phenomenon reflects a dysfunctional market for low-cost housing that does not respond appropriately to economic incentives. The question is important for policy-makers, because a dysfunctional market requires intervention. If low-cost housing markets actually work smoothly, housing affordability problems are more a function of the income distribution than anything else, and are best addressed through income subsidies. We therefore turn to our three indicators of how well the bottom of the US housing market functions—relative prices, the ability to produce via filtering, and vacancies.

## What is the Relative Price of Low-quality Housing?

The 'standard housing bundle' will always

cost more than a low-quality house; otherwise, no one would live in a low-quality house. As Olsen's (1969) seminal paper on filtering points out, in an efficient housing market, the amount of housing services provided by low-quality and standard housing should represent differences in depreciated replacement cost. The size of the difference will depend on

(1) differences in the amount and location of land used;
(2) differences in initial construction quality; and
(3) differences in age and maintenance quality.

In an efficient long-run equilibrium, the unit cost of housing services should be constant with respect to changes in the quantity of units consumed (Rosen, 1974). While it is difficult to be precise about what the magnitudes of these differences are, they are generally large enough that if markets are working efficiently, the cost of the low-quality house should be substantially lower than the standard house.

Thomas Thibodeau (1992) published an extensive set of MSA-specific price indexes for units of varying quality levels for 60 large metropolitan areas. Using American Housing Survey data, Thibodeau estimated tenure-specific hedonic indexes. He then used the results to price various representative bundles (vectors representing metropolitan averages of housing characteristics for various categories). We use his results to determine the price ratio of the average metropolitan 'sub-standard' rental units to average 'standard existing' rental units.[6] Thibodeau also estimated the number of sub-standard and total rental units in each market, permitting straightforward calculation of the percentage of each MSA's housing stock which is in this quality category.

Metropolitan areas vary widely both in the proportion of their stock that is sub-standard and in the relative price of that sub-standard stock (see Figure 2). At one extreme, Colorado Springs has only 5 per cent sub-standard rental (by this particular definition), and the estimated price of a representative sub-standard unit is 95 per cent of the estimated price of a standard-quality existing unit. At the other extreme, 23 per cent of New York's housing is sub-standard, and its relative price is about 77 per cent of a standard unit. The scatter plot suggests some negative correlation between the relative size of the low-quality rental stock and the relative rent paid for that stock. Low-quality housing thus exhibits typical market behaviour—it is relatively inexpensive where there is a lot of it, and expensive where it is more scarce.[7]

Still, these simple calculations of relative prices produce a disturbing outcome—in 12 of the 60 cities, the ratio of sub-standard rents to standard rents is greater than 90 per cent. We take this as *prima facie* evidence of imperfections at the bottom of these housing markets.

## Production at the Bottom of the Market: Does Filtering Still 'Work'?

A commonly held view of low-quality/low-cost housing in the US is that much of it is supplied indirectly through filtering rather than directly through new construction.[8] Probably no term used so often in housing market analysis is so often used without careful definition. Grigsby (1963) discusses three separate uses of the term:

(1) the phenomenon of units' changes in nominal rents (see also Ratcliff, 1949);
(2) a change in a unit's place in the quality distribution (see Grebler *et al.*, 1956);
(3) a differential change in real rent, or relative price, of units at various quality levels (see Lowry, 1960).

We use the last of these definitions to examine whether filtering 'works'.

A necessary condition for filtering to work is that new units, which are mostly at or near the top of the quality level of the stock, do not simply displace low-quality units, at the same price per unit of housing services. Figure 3 presents Grigsby's original evidence. While data availability limited him to nine cities, he showed that markets with high rates

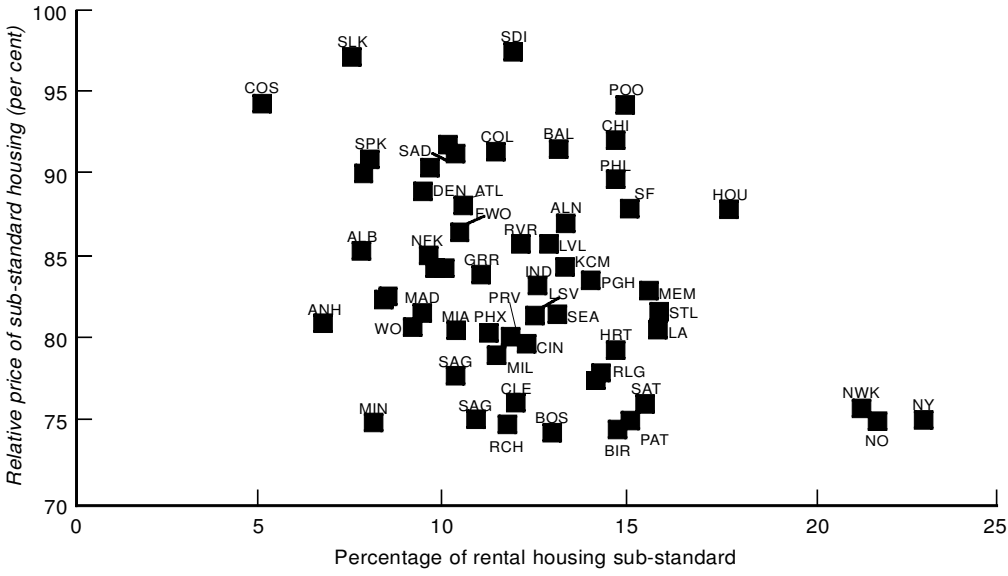


**Figure 2.** The relative price of sub-standard housing in US metropolitan areas, *c*.1980–83. (See Appendix for key.) *Source*: Thibodeau (1992).

of new construction at the top end of the market have on average lower increases in prices of existing housing. (The simple correlation coefficient in the data shown in Figure 3 is 0.28. Grigsby presents similar results for the value of owner-occupied units.) This is consistent with a well-functioning filtering process.

Now we turn to our own evidence. Thibodeau (1992) prepared counts of sub-standard rental units for each year of the metropolitan American Housing Surveys. Most MSAs were surveyed in the mid 1970s and again in the early 1980s. Thus, we can construct the annual growth in the sub-standard stock during this period, and compare it to additions from new construction. We measure the latter by a three-year average of permits per capita near the end of the period. The correlation in Figure 4 is clear; high-quality new construction is associated with growth in the low-quality stock as well. The corresponding regression equation is:

$$\begin{aligned}\text{Annual growth in sub-standard rental} &= 0.026 + 4.634\ (\text{permits per capita})\\ &\quad (0.016)\ \ (1.997)\end{aligned}$$

The probability of observing such a result under the null (no effect) is less than 1 in 40. To get some sense of the implied magnitude of the production of low-cost units via filtering, consider the following. In 1995, there were roughly 1 300 000 building permits pulled in the US. The US has an approximate population of 260 000 000, so there were 0.005 building permits per capita. Consequently, our simple regression suggests that new units led to an increase of nearly 2.5 per cent in sub-standard rental units. This number is quite substantial when one considers that the number of permits in 1995 was equal to slightly under 1.4 per cent of the existing stock at the beginning of that year. Consequently, it is fair to say that the stock of subsidised housing remains a fairly fixed share of all housing. This lends support to the filtering hypothesis. (See Weicher and Thibodeau, 1988 for a micro-level study consistent with these MSA aggregates.) It also lends support to a phenomenon not easily understood by policy-makers—to the extent that a city makes it easy for *any* type of housing to be built, it will also enhance the available stock of low-cost housing. Con-

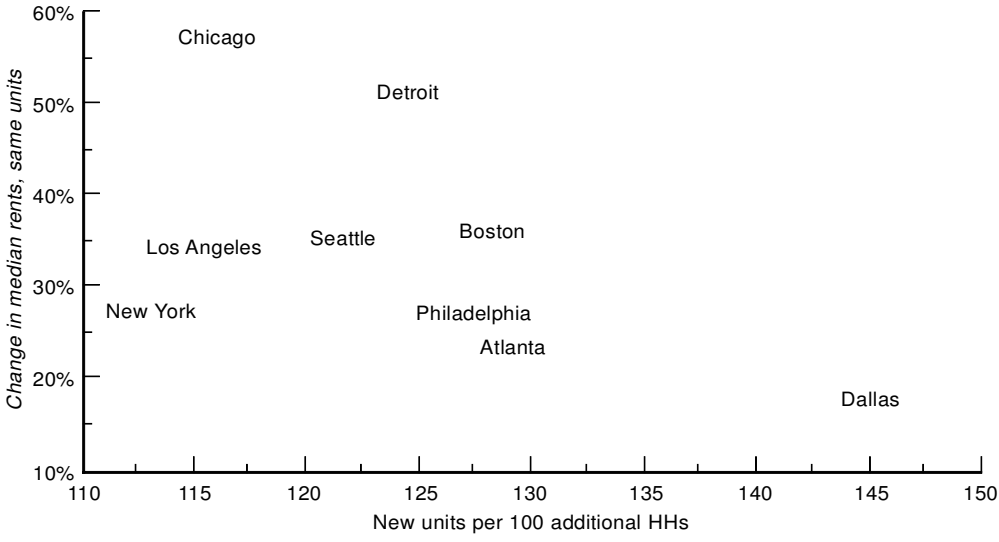


**Figure 3.** New construction and the change in rents in nine US metropolitan areas, 1950–56. *Source*: Grigsby (1963).

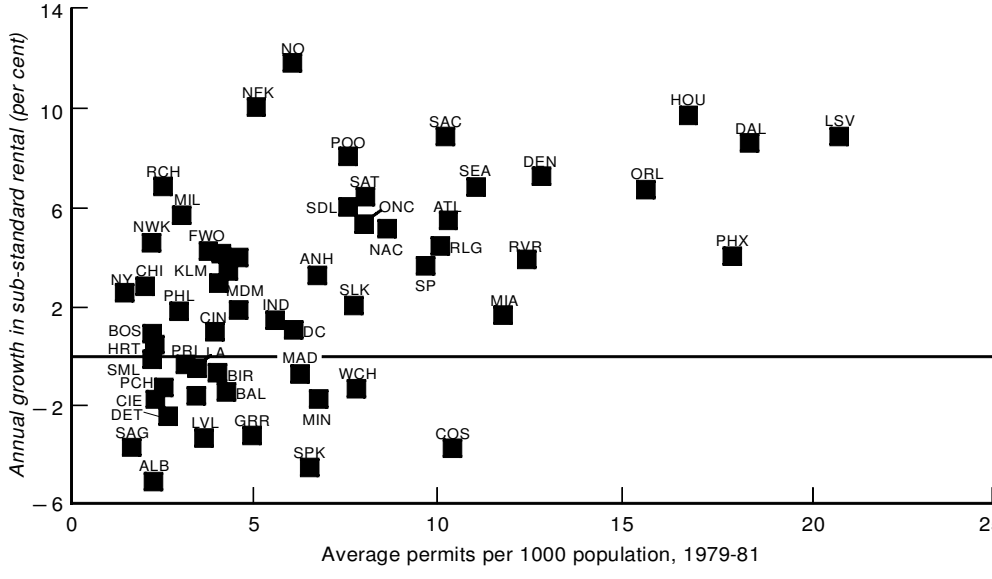


**Figure 4.** The annual growth in sub-standard rental stock in US metropolitan areas, *c.* 1974–76 *c.*1980–83, relative to permits issued for new building, 1979–81. (See Appendix for key.) *Source*: Thibodeau (1992) and Census Construction Reports, Series C40, various issues.

versely, restrictions on any kind of housing construction will also constrict the available stock of low-cost housing.

## What's Happening to Vacancy Rates?

Our final look at the bottom of the US market (or at least the middle to the bottom) focuses on vacancy rates. In the aggregate, current rental vacancy rates are about 7 or 8 per cent, somewhat above their 25-year average of 6.6 per cent. But given that we have observed a decline in the supply of affordable units, we must look to see how vacancy rates vary by

**Table 1.** Rental vacancy rates, 1994

| Rent range ($) | Vacancy rate (percentage) |
|---|---|
| LT 100 | 4.1 |
| 100–199 | 5.0 |
| 200–299 | 7.5 |
| 300–349 | 8.0 |
| 350–399 | 8.4 |
| 400–449 | 8.0 |
| 450–499 | 8.1 |
| 500 or more | 7.0 |
| All units | 7.4 |

*Source:* Census Housing Report, H111/94A.

rent levels—should vacancy rates be unusually low for low-rent units, we will have evidence that the bottom of the market is not functioning properly.

Recent data suggest that, in the aggregate, vacancy rates are actually higher in the low-to-moderate rent range and lower in both the very low-cost and high-cost range (Table 1). The relatively high vacancy rates around $200–300 may appear puzzling, given the high rent burdens among low-income households. Participants at a recent Urban Institute housing policy seminar advanced two cogent possibilities: that there is a mismatch between size of units and size of families; and that the vacant units at the bottom are so dilapidated that most will never be rented even at these low offered rents (see Turner and Reed, 1990, pp. 32–33). But these observations are not an indictment of how well the market 'works'—that is, how well it responds appropriately to economic incentives. Available square feet or bedrooms per person are certainly measures of quality, as is the general state of a unit's repair. If lower-quality housing is available at a lower price, and low-income people are choosing not to live in it, the market is operating properly, and the problem becomes the entirely normative issue of what constitutes an appropriate minimum living standard.

But these aggregate data have serious problems. First, the census data are not stable; in the year preceding the data presented here, the vacancy rate in the highest category is more than double (11.9 per cent), and in the lowest category is halved (2.1 per cent)—since the Census does not like to release data with substantial sampling error, this must either reflect substantial non-sampling error, or true underlying instability. Secondly, the data do not deal with spatial issues. For instance, the fact that vacancy rates for low-cost housing are high relative to higher-cost housing in a place like, say, New Orleans is not particularly helpful to low-income households seeking the economic opportunity necessary to shed their low-income status.

Let us examine variation in low- and moderate-income vacancy rates among US metropolitan areas. HUD publishes estimates of vacancy rates for units renting below the fair market rent (FMR) in 44 large metropolitan areas, and corresponding vacancy rates for the entire market (see US Department of Housing and Urban Development, 1992, Table 9). In the typical large MSA, about 60 per cent of rental units are below the FMR, ranging from 81 per cent in New Orleans to 43 per cent in Dallas.

In the late 1980s, 25 of 44 MSAs had higher vacancy rates for such units than for the market as a whole; 10 markets had the same rates; and in only 9 markets were rental markets tighter than average for units renting below the FMR. (The vacancy rates were estimated using metropolitan AHS data for the latest years available, ranging from 1987 to 1990.) Just as important, when we performed a simple regression using per capita income to explain the difference between vacancy rates in the stock below FMR and the stock at or above FMR, the *t*-statistic on per capita income is less than one. Low-income people in areas with strong economic opportunities will therefore not necessarily face unusually low vacancy rates in the low-cost sector.

Still, the data do represent a fairly broad range of rents (we were unable to find vacancy data for very low-rent units), and do suggest the possibility of a problem in some, if not many, metropolitan areas.

**How Does Regulation Affect the Price of Housing at the Bottom of the US Market?**

To this point, we have shown that price, production and vacancy indicators suggest that the bottom of the US housing market functions quite well in some places, but not everywhere. One potential impediment to the smooth functioning of the bottom of the housing market is excessive regulation. We therefore present an admittedly exploratory investigation here.

We begin by looking at regulation and prices. Our expectation is that we would observe higher *relative* prices for low-quality units in heavily regulated markets. Figure 5 presents the relative price plotted against one regulatory measure, the percentage of land unavailable for development. The latter data were collected by Segal and Srinivasan in their (1985) survey of urban planning officials. The data were collected for the 1975–78 period, and are estimates of the percentage of otherwise developable suburban land removed from possible development during the period. About one-third of the MSAs studied had no land removed; at the other extreme, Sacramento had 43.5 per cent removed. The simple bivariate plot shown in Figure 5 suggests that supply-side constraints drive up the price of low-quality housing relative to standard quality. The corresponding regression equation is:

$$\frac{P_{\text{low quality}}}{P_{\text{std quality}}} = \underset{(0.009)}{0.818} + \underset{(0.0007)}{0.0020}\ (\%\ \text{land unavailable}) \quad R^2 = 0.16$$

The probability of observing such a result under the null (no effect) is less than 1 in 100.

Of course, this is entirely descriptive. Let us now focus on the effect of regulation, controlling for other variables, on the first and third quartile prices in the market. Specifically, we extend the results in Malpezzi (1996). That paper examined the relationship between regulatory measures and median house prices and rents; now we replace the median price with the first and third quartiles of each metropolitan area's distribution.

Malpezzi (1996) constructs several measures of the restrictiveness of the land use regulatory environment across a number of metropolitan areas, and uses those measures in models explaining rents, asset prices of housing, tenure choice and several 'externality' outcomes (neighbourhood satisfaction, segregation and congestion). In multivariate models, Malpezzi (1996) finds that regulations do raise rents; this is, by itself, unsurprising. What is perhaps more interesting in the current context is that asset prices are driven up faster than rents.

Figure 6 shows the simple bivariate relationship between the first quartile of 1990 MSA contract rent and one of the regulatory measures, constructed from the Wharton data collected circa 1988 by Linneman *et al.* (1990).[9] Table 2 presents results from simple OLS regressions determining the first quartiles of rents and house values, using logarithmically transformed census data as the dependent variable.[10] Note that the equations are reduced form, rather than structural equations—we omit such endogenous variables as vacancy rates and quantity of housing. In the current context, all we are interested in is how well regulation predicts prices.

The fits of the equations are quite good for such a cross-section model, and most variables meet expectations: population and income are significant determinants of rents, especially changes in the former and levels of the latter. Cities next to large parks and bodies of water may have higher rents but the estimates are imprecise. Of the regulatory variables, the state index performs most strongly for rents. A joint test of all the regulatory variables rejects the null.

For the value equation, most of the variables again have the correct sign and reasonable standard errors. The effect of REGTEST is strongly quadratic. We suspect this reflects the fact that some cities with few written regulations have an 'informal' regulatory structure that does not show up in our indices. For instance, Chicago has the lowest score in the regulatory index, and yet our conversations with Chicago developers suggest to us that the process for getting devel-

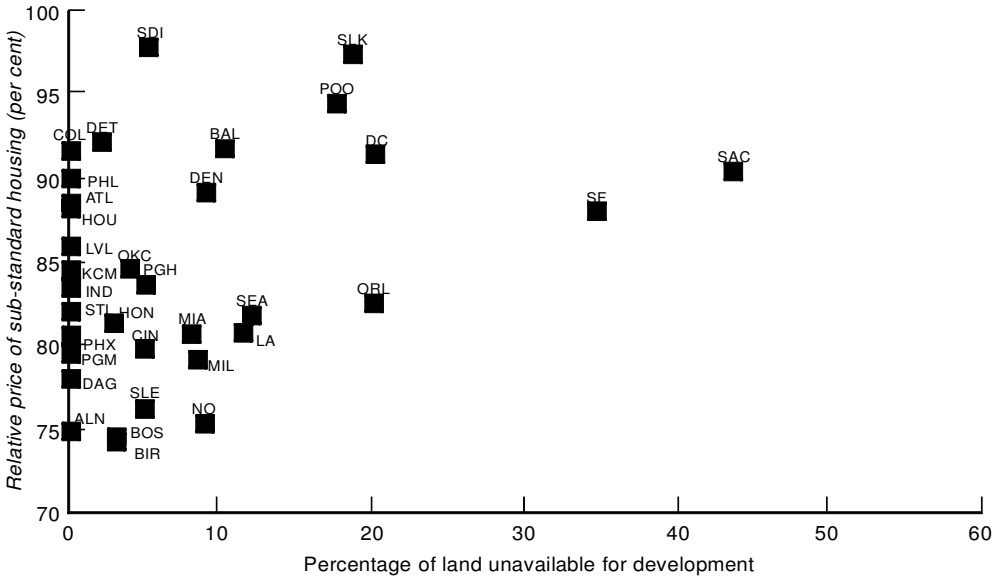


**Figure 5.** The price of sub-standard housing in US metropolitan areas, 1980–83, relative to the percentage of land unavailable for development, 1975–78. (See Appendix for key.) *Source*: Thibodeau (1992) and Segal and Srinivasan (1985).

opments approved there is far more arduous than it is in, say, Houston. Perhaps the best way to put it is that in contrast to most areas, where getting permission to build is largely an administrative matter, in Chicago it is far more a political matter. An *F*-test for the regulatory variables (SREG1, RCDUM, REGTEST, REGSQ) again rejected the null hypothesis.

The value model performs somewhat better than the contract rent model. This is not surprising given that the total supply of housing services is rather inelastic over the short run. See Capozza *et al.*, 1996.[11]

In order to get a rough-and-ready measure of the joint effect of regulatory variables, we calculated the estimated percentage increase in rents and values given a movement from RCDUM = 0 to 1, and from first to third quartiles of the other regulatory variables.[12] Using this as a measure of moving from a lightly regulated environment to a heavily regulated environment, we find that the coefficients in Table 2 suggest first quartile rents would rise by 21 per cent and house values rise by 60 per cent. These are strong effects, but then these are fairly large changes in regulatory environments.

Interestingly, the effect of this change is stronger at the bottom of the market than it is at the middle and top. Figure 7 shows that the corresponding simulated effects on median and third quartile rents are increases of about 17 per cent; median value would increase by 'only' 53 per cent; and third quartile values would go up 49 per cent. These differences are consistent with the notion that stricter regulations tend to be more binding on the bottom of the housing market.[13]

As for filtering, it is straightforward to argue that any restriction placed on overall housing construction will lower the 'production' of housing at the bottom of the market. Building permit moratoria and growth controls clearly have an adverse effect on the supply of low-cost housing.

Finally, we examine vacancy rates and the regulatory regime. Figure 8 plots the low- and moderate-income vacancy rates by the simple measure of regulatory stringency from Segal and Srinivasan. The plot shows that metropolitan areas with more restrictive

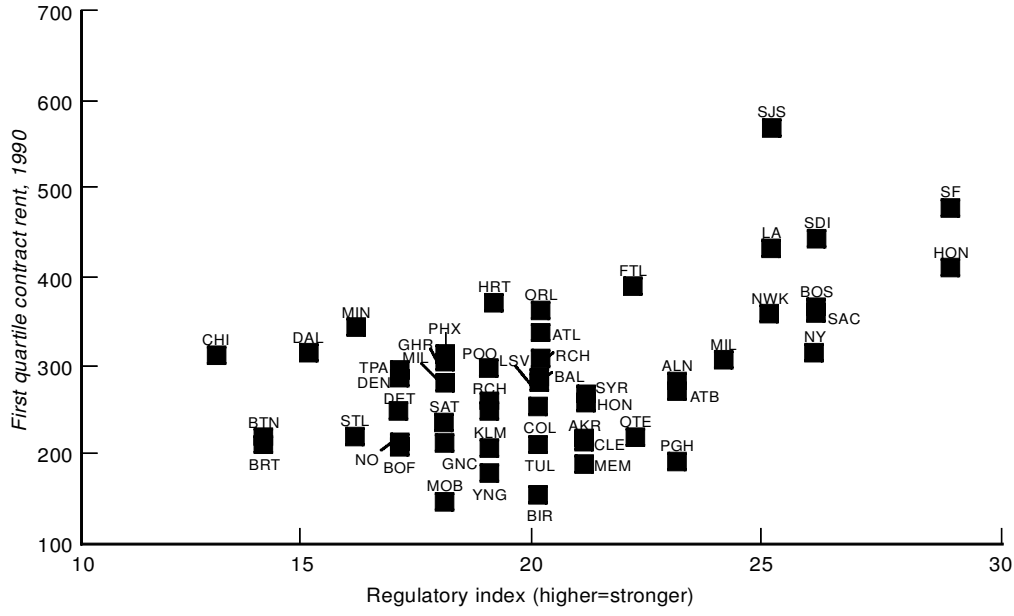


**Figure 6.** The first quartile of MSA contract rent, from 1990, relative to regulation. (See Appendix for key.) *Sources*: Linneman *et al.* (1990); Malpezzi (1996).

**Table 2.** The effect of regulation on rents and housing prices: lowest quartile of rent

| | LN (value) (owners) | LN (rent) (renters) |
|---|---|---|
| Intercept | 9.88 | −1.30 |
| | (3.10) | (2.18) |
| LMPOP90, Log population | 0.0005 | 0.04 |
| | (0.05) | (0.03) |
| DMPOP8090, Population growth | 5.30 | 9.62 |
| | (3.12) | (2.19) |
| LMYPC90, Log income per capita | 0.25 | 0.62 |
| | (0.26) | (0.19) |
| MRDYP87, Income growth | 7.19 | 0.95 |
| | (2.42) | (1.70) |
| ADJPARK, Adjacent large park, etc. | 0.24 | 0.13 |
| | (0.11) | (0.08) |
| ADJWATER, Adjacent ocean or large lake | 0.11 | 0.03 |
| | (0.07) | (0.05) |
| SREG1, State regulatory index | 0.04 | 0.04 |
| | (0.02) | (0.02) |
| RCDUM, Rent control dummy | 0.30 | 0.02 |
| | (0.11) | (0.08) |
| REGTEST, MSA regulations index | −0.22 | −0.01 |
| | (0.09) | (0.06) |
| REGSQ, REGTEST squared | 0.006 | 0.0005 |
| | (0.002) | (0.002) |
| $N$ | 48.00 | 48.00 |
| $R^2$ | 0.87 | 0.81 |

*Note*: Standard errors are in parentheses.

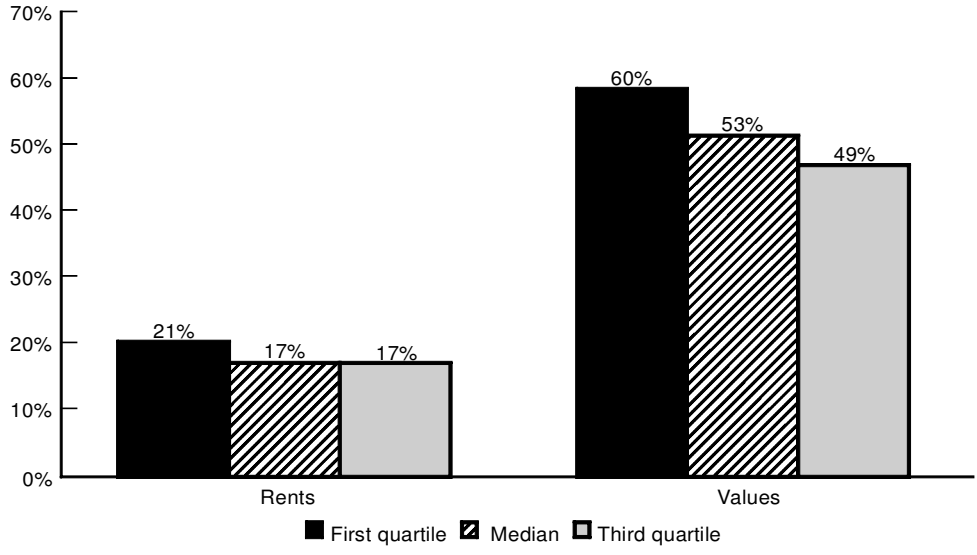


**Figure 7.** Simulated effect of a large change in regulation on US metropolitan housing 'prices'.

land-use policies have lower vacancy rates for this market segment. The corresponding regression equation is:

$$\text{Vacancy rate}_{\text{Below FMR}} = 0.146 - 0.0024\ (\%\ \text{Land unavailable}) \quad R^2 = 0.06$$
$$(0.014)\ (0.0014)$$

The probability of observing such a result under the null (no effect) is less than 1 in 10. Other plots (not presented) show the same pattern for total vacancy rates, and there is little apparent relationship between the difference in overall and low-cost vacancy rates and this particular regulatory measure. Differential effects on low/moderate segments of the market have yet to be demonstrated.

## Conclusions

We have in the paper used three indicators—prices, production and vacancy rates—to investigate whether the bottom of the US housing market 'works'. All these indicators suggest that the bottom of the housing market works similarly to all other markets—when it is allowed to. When overly stringent local land-use regulations are imposed, however, the relative price of low-cost housing rises, production falls and vacancies tighten.

The implications of these findings are twofold. First, there are markets in which low-cost housing responds to economic incentives—and low-income households choose not to purchase it, either because it is too small, or is in unacceptable condition. But this does not reflect a *housing market* problem; it reflects a living standard problem. If society makes the normative judgment that, say, there should be no more than two people living in each bedroom, then it must provide households with sufficient minimum income to purchase two-people-per-bedroom housing.

Secondly, land-use regulation has distributional consequences. Local policy-makers must recognise that land-use regulations can cause the bottom of the housing market to malfunction, and that to restore equity, they need to consider subsidising those harmed by the malfunction. We are not so politically naive as to think this will in fact happen (indeed, some local governments could use the evidence presented here to develop a strategy for 'fencing out' low-income house-

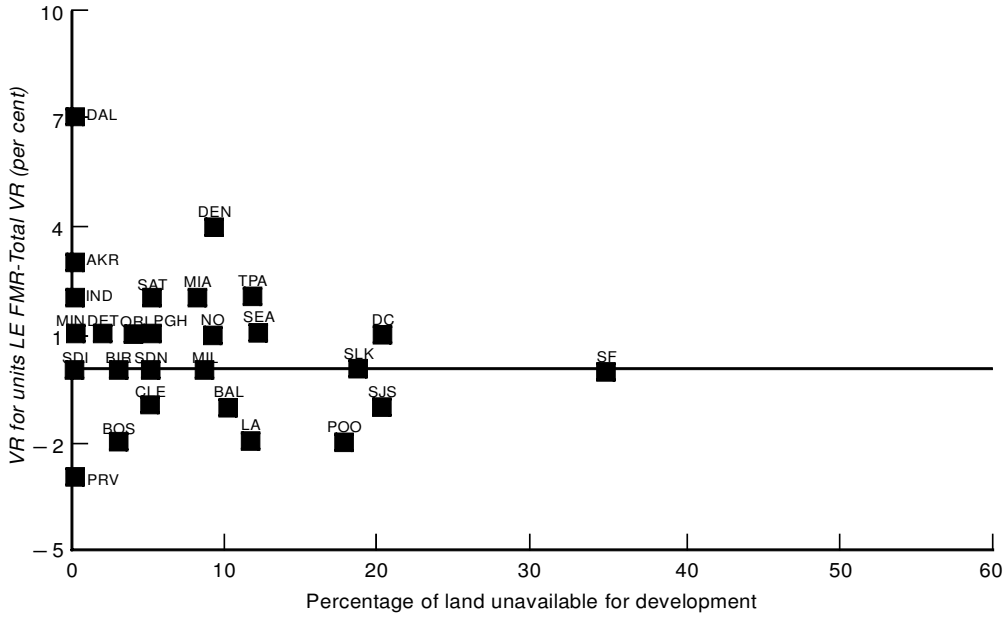


**Figure 8.** Rental vacancy rates, 1987–90, relative to the percentage of land unavailable for development. (See Appendix for key.)

holds), but from a positivist perspective, we may say that land-use controls without countervailing subsidies harm those at the bottom of the distribution.

Finally, we note that the results presented here are exploratory—as usual, further research to check the robustness of our conclusions would be welcome.

## Notes

1. One of the authors has had discussions with owners of Section 236 units about their future in the event of conversion. Many have replied that the subsidies for the units have not been sufficient to maintain them in good condition, and that they would therefore remain low-rent properties in the future. But because Congress has made conversion so difficult, the future of these units remains almost entirely a matter of speculation.
2. Green and Malpezzi (1995) show that increasing *average* rent burdens are due mostly to falling incomes, demographic shifts and rising utility prices rather than any widespread failure of the housing market.
3. The 1989 AHS count of subsidised units in the printed report is substantially higher than the Joint Center's.
4. For example, 1989 AHS data show that the median electricity payment for all renters is $41; for renters below the poverty line it is $39. Median gas payment for renters with gas is $27; renters below the poverty line pay $29. Median shelter cost, including utilities, is $424 for all renters, $281 for poor renters. Of course, identifying utility payments as part of the problem does not make the problem disappear; rather, it is not particularly a housing problem. Rising utility payments for low-income households can be dealt with much more efficiently with vouchers than with supply-side programmes.
5. Authoritative data are hard to develop because a number of studies suggest low-cost landlords inflate their rents to the Fair Market Rent (FMR). See Drury *et al.* (1978).
6. The exact definition of these bundles can be found on pp. 148–149 of Thibodeau (1992). Of course, not all low-cost units are sub-standard, nor are all sub-standard units low-cost. But in order to study relative prices, we have to base our definition on some measure of the quantity of housing services rather than rents; no better definition of the bottom of the market based on characteristics of the units exists, to our knowledge; and we believe what happens to units so defined would be correlated with other reasonably defined low-quality units.

7. Perhaps this appears unremarkable, but in this exploratory work we have not yet controlled for differences in demand for low-quality housing. And there are analysts who believe rental housing is produced in a far from competitive market. See Gilderbloom and Appelbaum (1987).
8. Despite the ubiquitousness of this view, remarkably few serious empirical studies of housing filtering (as opposed to chains of moves) were taken up after Grebler *et al.*'s (1956) book. Of course, several interesting theoretical papers appeared in the 1970s—notably Sweeney (1975). Two relatively recent high-quality empirical studies include Weicher and Thibodeau (1988) and Rothenberg *et al.* (1991).
9. The variable REGTEST is a simple additive scale of responses to questions regarding difficulty in obtaining permits, sub-division approval, infrastructure and the like, based on the Wharton data. The values of the index ranged from lows of 13 in Chicago and 14 in Dayton and Gary to 29 in San Francisco and Honolulu. The variable SREG1 is an additive scale on the state level of various state environmental regulations, based on data from the American Institute of Planners. The values ranged from 0 in New Mexico and Idaho to 6 in California, Massachusetts and Minnesota, and 7 in Washington. Details of variable construction can be found in Malpezzi (1996).
10. Regression results from medians and third quartiles are available upon request.
11. In the very long run, the supply of housing from new construction is fairly elastic in the US. See Follain (1979) and Malpezzi and Maclennan (1994). In the short and medium run, however, the bulk of supply is from the existing stock, and said supply is much less elastic. See also Ozanne and Struyk (1978). We also note that in the presence of stringent development regulations and natural constraints, supply can be inelastic even in the long run.
12. Specifically, an increase in REGTEST from 18 to 22.5, in REGTESTSQ from 324 to 506, and in SREG1 from 2 to 5. This follows a procedure put forth in Malpezzi (1996).
13. We have not, as yet, constructed confidence intervals for the simulated increases.

## References


AMERICAN INSTITUTE OF PLANNERS (1976) *Survey of state land use planning activity*. Report to U.S. Department of Housing and Urban Development.

CAPOZZA, D., GREEN, R.K. and HENDERSHOTT, P.H. (1996) *Taxes and real house prices*. Working Paper, Ohio State University.

DRURY, M., LEE, O., SPRINGER, M. and YAP, L. (1978) *Lower income housing assistance program (Section 8): nationwide evaluation of the existing housing program*. US Department of Housing and Urban Development.

FOLLAIN, J.R. (1979) The price elasticity of the long run supply of new housing construction, *Land Economics*, 55, pp. 190–199.

GILDERBLOOM, J.I. and APPELBAUM, R.P. (1987) Toward a sociology of rent: are rental housing markets competitive?, *Social Problems*, 34(3), pp. 261–276.

GREBLER, L., BLANK, D.M. and WINNICK, L. (1956) *Capital Formation in Residential Real Estate: Trends and Prospects*. Princeton: Princeton University Press for NBER.

GREEN, R.K. (1993) Testimony before Subcommittee on Housing and Community Development of the Committee on Banking, Finance and Urban Affairs, House of Representatives, 18 November.

GREEN, R.K. and MALPEZZI, S. (1995) *A Primer on U.S. Housing Markets and Policies*. Center for Urban Land Economics Research Working Paper, University of Wisconsin.

GRIGSBY, W. (1963) *Housing Markets and Public Policy*. Philadelphia: University of Pennsylvania Press.

JOINT CENTER FOR HOUSING STUDIES (1992) *State of the Nation's Housing: 1992*. Cambridge: Harvard University Press.

LINNEMAN, P., SUMMERS, A., BROOKS, N. and BUIST, H. (1990) *The state of local growth management*. Wharton Real Estate Working Paper No. 81, November.

LOWRY, I.S. (1960) Filtering and housing standards, *Land Economics*, 35, pp. 362–370.

MALPEZZI, S. (1996) Housing prices, externalities, and regulation in U.S. metropolitan areas, *Journal of Housing Research*. (Forthcoming).

MALPEZZI, S. and MACLENNAN, D. (1994) *The long run price of supply of new construction in the United States and the United Kingdom*. Paper presented to the *European Network for Housing Research/American Real Estate and Urban Economics Association Conference*, Glasgow, September.

MURRAY, M.P. (1983) Subsidized and unsubsidized housing starts: 1961–77, *Review of Economics and Statistics*, 65(4), pp. 590–597.

OLSEN, E.O. (1969) A competitive theory of the housing market, *American Economic Review*, 59(4), pp. 612–622.

OZANNE, L. (1981) Double vision in the rental housing market, and a prescription for correcting it, in: J.C. WEICHER, K.E. VILLANI and E.A. ROISTACHER (Eds) *Rental Housing: Is There a Crisis?*, pp. 39–48. Washington, DC: Urban Institute.

OZANNE, L. and STRUYK, R. (1978) The price elasticity of the supply of housing services, in: L.S. BOURNE and J.R. HITCHCOCK (Eds) *Urban Housing Markets: Recent Directions in Research and Policy*, pp. 109–138. Toronto: University of Toronto Press.

RATCLIFF, R.U. (1949) *Urban Land Economics*. New York: McGraw Hill.

ROSEN, S. (1974) Hedonic prices and implicit markets: product differentiation in pure competition, *Journal of Political Economy*, 82(1), pp. 34–55.

ROTHENBERG, J., GALSTER, G., BUTLER, R.V. and PITKIN, J.K. (1991) *The Maze of Urban Housing Markets: Theory, Evidence and Policy*. Chicago: University of Chicago Press.

SEGAL, D. and SRINIVASAN, P. (1985) The impact of suburban growth restrictions on U.S. housing price inflation, 1975–78, *Urban Geography*, 6(1), pp. 14–26.

SWAN, C. (1973) Housing subsidies and housing starts, *AREUEA Journal*, 1 (Fall), pp. 119–140.

SWEENEY, J.L. (1975) A commodity hierarchy model of a rental housing market, *Journal of Urban Economics*, 1, pp. 288–323.

THIBODEAU, T.G. (1992) *Residential Real Estate Prices: 1974–1983*. Mt Pleasant, MI: Blackstone.

TURNER, M.A. and REED, V.M. (1990) *Housing America: Learning from the Past, Planning for the Future*. Washington, DC: Urban Institute.

US DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT (1992) *The location of worst case needs in the late 1980s: a report to Congress*. HUD-1387-PDR.

WEICHER, J.C. (1991) *Housing policy and programs: a new strategy to alleviate poverty*. Paper presented to the *LaFollette Conference on US Housing Policy*.

WEICHER, J.C. and THIBODEAU, T. (1988) Filtering and housing markets: an empirical analysis, *Journal of Urban Economics*, 23 (January), pp. 21–40.

## Appendix. Identification Variables for Use with Figures

| Metropolitan area | Two- and three-letter codes | Metropolitan area | Two- and three-letter codes |
|---|---|---|---|
| Albany | ALB | New Orleans | NO |
| Allentown | ALN | New York | NY |
| Anaheim | ANH | Newark | NWK |
| Atlanta | ATL | Norfolk | NFK |
| Baltimore | BAL | Oklahoma City | OKC |
| Birmingham | BIR | Omaha | OMH |
| Boston | BOS | Orlando | ORL |
| Buffalo | BUF | Paterson | PAT |
| Chicago | CHI | Philadelphia | PHL |
| Cincinnati | CIN | Phoenix | PHX |
| Cleveland | CLE | Pittsburgh | PGH |
| Colorado Springs | COS | Portland | POO |
| Columbus OH | COL | Providence | PRV |
| Dallas | DAL | Raleigh | RLG |
| Denver | DEN | Riverside | RVR |
| Detroit | DET | Rochester | RCH |
| Fort Worth | FWO | Sacramento | SAC |
| Grand Rapids | GRR | Saginaw | SAG |
| Hartford | HRT | Saint Louis | STL |
| Houston | HOU | Salt Lake City | SLK |
| Indianapolis | IND | San Antonio | SAT |
| Kansa City MO | KCM | San Diego | SDI |
| Las Vegas | LSV | San Francisco | SF |
| Los Angeles | LA | Seattle | SEA |
| Louisville | LVL | Spokane | SPK |
| Madison | MAD | Springfield MA | SMA |
| Memphis | MEM | Tacoma | TAC |
| Miami | MIA | Washington | DC |
| Milwaukee | MIL | Wichita | WCH |
| Minneapolis | MIN | | |