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A PROPOSED PERFORMANCE STANDARD FOR LOWER-COST HOUSING
IN THE UNITED STATES DERIVED FROM LIFE CYCLE ANALYSIS OF
PRESENT HOUSING PRACTICE

by
James H. Davis*

INTRODUCTION

For the past decade there has been an intense effort to formulate and implement housing practices and policies that would solve our housing problems. In fact, one might describe the period of the sixties as a frantic scramble to come up with one idea or combination of ideas that would prove to be the cure. Major studies, sweeping legislation, dramatic goals came and went almost faster than they could be tried, until now we are left with a complex and chaotic housing policy that still cannot provide the quality and variety in shelter that we need.

The problem is of our own making of course; we in housing have misled ourselves. We have too often looked upon sub-standard housing as if that were the norm. In fact, the housing stock of the United States is of a very high standard. Often too, we have bleakly appraised industry's slipping capacity to produce--all through those mortgage lean years--offering our most inventive proposals to rationalize and increase production; but in 1971, with money available, conventional builders, seemingly at a moment's notice, produced 2,048,200 units, (1) the best year on record.

Still, we know that many, amidst this tremendous affluence, are inadequately housed. But this stems from problems more subtle and difficult than replacing slums or frantically boosting production. It is perhaps more correctly described as the result of inadequate economic institutions and fragile social relations; that is, fundamental social and economic issues. Solutions effected in these issues can improve our housing, but it is difficult for improvements in our housing to effect solutions in these more basic issues. Still, it is vital that the housing industry wrestle with its side of the problem.

The thrust of this study is that the housing sector is integral to the alleviation of these fundamental problems, but that it must itself be healthy. The study will develop the case that lower cost housing is neither encouraged nor possible within the context of current housing practice, though there is a definite need. It indicates that much of this has developed from the erroneous belief that higher priced housing would filter down to lower income users through the natural function of the market but that, in fact, this has largely failed and must fail as long as the housing market and housing practices are structured as they are. The study will indicate that lower cost housing is possible through a redefinition of housing cost based on the life cycle costs of a unit rather than the present first cost practice.

CURRENT NATIONAL HOUSING PRACTICE AND ITS COSTS

The role of the public sector in current housing practice is two-fold: (1) facilitating the efficient operation of the private sector, and (2) subsidizing certain elements within the housing sector to correct for social inadequacies of the market. In practice this has led to the many state, local and federal programs and policies requirements and standards of which our housing stock is almost a direct reflection.

Although the present structure of housing practice is controlled and supported by government policy, it is not widely viewed as such. These policies: codes, zoning, monetary policy, minimum property standards, production subsidies, etc., are often considered individually as something apart from one another and other aspects of housing as well. It is important not only to recognize a particular policy, however, but the interdependence of all policies and their total impact on the housing sector. Not only does this attitude illuminate the complexities of the actual situation, but the

inherent difficulties in effecting any major change as well. Some elements of this control, such as FHA minimum standards, are obvious; other factors, such as the influence of FHA and VA policies on inflation of land prices are less so, but still evident. A court decision supporting school desegregation through busing is generally not considered at all, though its implications to housing are potentially great.

There is some purpose for the existence of each of these policies and each imposes restraints on the housing sector, which in turn establishes in some part what housing will cost. There are so many of these restrictions, all with some purpose, that they have imposed a de facto price below which it is impossible to build housing. In theory, we could remove some of the restrictions, but which ones. All, to some degree, represent vested interests; most exist for sound reasons and most contribute to our high general standard of housing. Codes are a very good example. From the mid-sixties on, pressure mounted for building code reform. Many felt it was the restrictive nature of outmoded codes that kept us from producing true low cost housing. Code reform was undertaken, still continues and is an important step in the modernization of the housing industry. But, sober reflection tells us that the effect on first cost will be slight, for codes deal mainly with the physical structure, which in turn is probably only a third of the cost of the house. And, since it has not been the history of building codes to lower any given standard, it must be assumed that standards, hence costs, will gradually increase--even with code reform.

For the consumer, housing has a qualitative and quantitative context. The qualitative aspects were made quite clear in the report of the President's Committee on Urban Housing (the Kaiser Committee). Subsequent studies and Congressional action have confirmed their work, and though we need not linger on the well-known, it is valuable to reflect upon some of what that committee found. In order to provide enough standard housing for the entire population by 1978, the nation will need to build 13.4 million dwelling units for the new young families formed in the decade ahead, and replace or rehabilitate 8.7 million units that are expected to deteriorate into substandard condition, and replace 3 million units that will be accidentally or intentionally destroyed, and build 1.6 million units to create the proper proportion of vacancies for an increasingly mobile population. The total: a staggering 26.7 million units.

The problem is compounded, however, by the qualitative nature of housing, especially for the 7.8 million house-poor families. Unlike those in the normal housing market, they haven't the dollars to pay for their needs and preferences, which are both unique and varied. They must have that possibility for their own satisfaction and for the creation of an adequate and flexible housing stock.

Housing, along with food, clothing, transportation, and medical care, is a basic human requirement. It also has complex personal, social, economic, and political implications, not the least of which are connotations of property and symbolic standing within the community. At its most basic level, housing must be evaluated as to how adequately it shelters its inhabitants from threats in their environments--from situations that are physically or emotionally damaging. The house must serve as a refuge within which the individual can refuel the energies and sense of security that he needs to function in the outside world.

House-poor families generally range from the lower class through traditional working class to lower middle class; people with different motivations and needs. In such a mix, expectations, housing, and environment will vary widely. The lower middle class, for example, is characterized by an increasing prosperity that has given them an expanding outlook toward housing. There is a great desire to own one's home rather than enrich a landlord. Along with the house and yard goes an elaboration of the house

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interior in a manner that creates a pleasant and cozy image closely approximating the standard of All-American affluence.

At the other extreme, for the lower class the primary criterion for housing is that it provide shelter from physical and psychological threats, both inside and outside the home. Lee Rainwater notes that a "home to which one could retreat from such an insecure world would be of great value, but for lower class people such a home is not easy to come by. In part, this is due to the fact that one's own family members themselves often make trouble or bring it in the home, but even more important, it is because it seems very difficult to create a home and an immediate environment that actually does shut out danger." (2)

Woven through this spectrum of housing expectations are different views of family size, child rearing practices, privacy, and intangibles such as "soul" and "taste." Certainly housing is an integral part of a family's social and psychological well-being. It is more than just something to keep out the elements. In contrast, federal housing programs for those of low and moderate income have generally assumed a middle class view which is applied so that the results are only a shadow of anything that the middle class would even look at.

It is apparent then that the societal context and implications of housing are such that mere shelter is not acceptable. It is equally apparent that current housing practice makes anything more than mere shelter, no matter what the technology, impossible to provide at a low first cost. However, this same society whose institutions have made housing for the low income family impossible, has also committed itself to compensating for those inadequacies that it has created in the housing market. It would, therefore, seem important to examine the housing costs in the larger context of this society.

Where do the costs of housing accumulate over its life: what are the actual costs, how are they paid and by whom. Figure 1 represents the average estimated cost for a \$24,000.00 FHA financed home. It is limited to the costs directly attributable to the unit itself with only peripheral indication of larger costs.

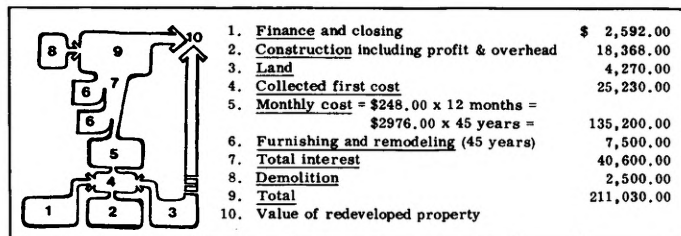


Fig. 1.

It has been clear for some time that it is impossible to produce an acceptable low cost house. Yet there has been a wide spread, albeit diminishing belief, that the house-poor were served, if only inefficiently, by the downward flow, or filtering of used housing units.

Filtering is generally considered to be the result of shifts in supply and demand, of excess vacancies, and the process by which some sections of the housing stock become vacated, occupied by lower income groups, abandoned, demolished, or converted to another use. We can compare filtering in the housing market to the more obvious example of filtering in the case of automobiles. A car is sold new and, despite the general inflation, it can generally be purchased a decade later for a mere fraction of its original price, even if it is in the very best of condition. Many cars will have, in that period, declined all the way to junk value and passed out of the stock completely. A car will drop in value both absolutely and relative to the auto stock as a whole and, in the process, it becomes available to lower income groups. A house, however, may not filter relative to the housing inventory in the same direction as it filters relative to general prices. Housing can filter up or down. Further, since the rate of deterioration of a house is highly controllable and is much more a function of underlying demand factors rather than of time or weather, filtering must be associated with technological, site, and locational obsolescence as well. Deterioration may simply be the manifestation of the later factors.

Because filtering of housing is not proportional to the rate of deterioration, there seems to be little hope of raising the rate of depreciation above the rate of quality decline. Partial responsibility for this must be attributed to governmental and land planning policies that have attempted to strengthen, not depreciate, values. (3) However, even in an affluent society, the high initial cost of housing and its role as a necessity naturally work against rapid decline in values. Unfortunately, relative decline, when translated into a price reduction, diminishes in the later stages of a structure's life. This occurs because, at each lower value level, more families can afford to buy. Grigsby notes that, "Assuming the dwelling unit is not converted or demolished before the end of its potential economic life, the entire depreciation curve is then an inverted S, or the mirror image of a growth curve." (4) It also appears that the families most satisfied with their accommodations, and thus most reluctant to move, tend to be those of higher incomes on whom the market depends for creating most of the surplus supply that will filter down to families of lower earning power. Considering the foregoing in light of the pyramidal shape of housing values in which production near the top will be retarded by only a small absolute excess of units, it is apparent that the farther down the scale that new construction can be injected, the larger the excess absolutely needed to check further building, and the greater the ultimate effect at the bottom of the market.

That brings us back to producing a low cost house; something apparently beyond our reach. We are faced with a socially inequitable situation. Society in some form must step in. In this country the federal government, working directly or through delegated agents, has assumed the major portion of this burden. Unfortunately, it is not possible to say that this burden has been assumed easily or in any systematic manner. But, there are presently five major active federal subsidy programs aimed at relieving these market inequities: Section 235 homeownership housing, Section 236 rental housing, Rent supplements, Low rent public housing, Rural homeownership housing. These programs have been vigorously implemented over the past few years in particular (see fig. 2).

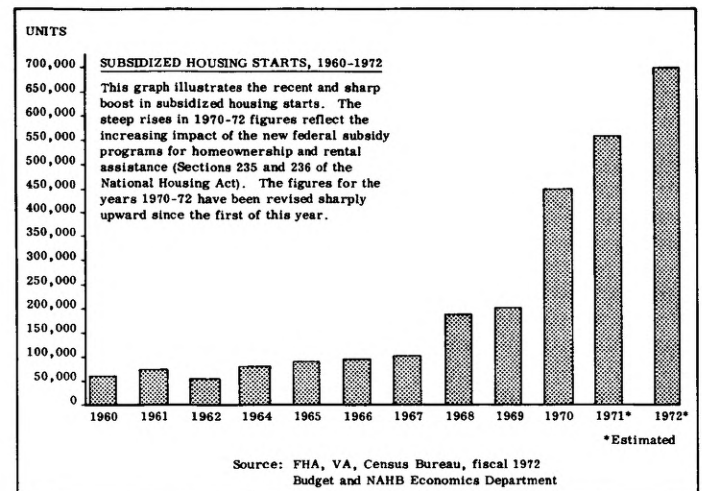


Fig. 2.

Subsidized production of low and moderate income housing has increased to the point that it represented approximately one-fourth of national production in 1971 (see fig. 3). HUD estimates assisted starts increasing to 500,800 in the current period and 564,000 in FY 1973. (5)

	Fiscal 1970			Fiscal 1971	
	1st target	Revised target	Actual production	1st target	Revised target
Total production . . .	2,000,000	1,850,000	1,792,000	2,225,000	2,040,000
Unsubsidized new starts . . .	1,500,000	1,090,000	1,062,000	1,600,000	1,060,000
Subsidized new starts . . .	400,000	260,000	297,000	475,000	445,000
Subsidized rehabilitations . . .	100,000	50,000	32,000	150,000	60,000
Mobile home shipments . . .	(1)	450,000	401,000	(1)	475,000

1. Not targeted.

Fig. 3.

Good; this is what many of us have been wanting for some time: a serious assault on the shortage of standard housing for those households unable to afford what the market offers.

Unfortunately, our long sought assault has created a situation that we had not envisioned. This situation gained general attention from the special investigation of "abuses in federal low-and-moderate income housing programs", conducted by the House Committee on Banking and Currency. Reading the case studies of this report is a discouraging saga of "faulty plumbing, leaky basements and roofs, cracked plaster, faulty or inadequate wiring, rotten wood in floors, staircases, ceilings, porches, lack of insulation and faulty heating units." This is corroborated by recent GAO findings that 25 percent of all newly built homes under the 235 homeownership program had serious structural defects that should have been corrected before sale. The most serious abuses, however, seem to be associated with existing and rehabilitated houses. There, for example, the GAO found serious defects in 44 percent of existing homes bought under subsidy programs.

The cost and waste of such abuses outrage us because they are highly visible. But less visible costs may be even greater. 235 and 236 are financed by budget gimmickry with mortgage interest subsidies stretched over 30 and 40 years. This stretch-out made initial expenditures very small, and attractive when they were initiated. But what started as a token program in 1968 turns out to have enormous consequences in 1972. We are now visibly alarmed over runaway housing subsidy costs. In its goals report, the Administration said that "for the three fiscal years 1970 to 1972 (we) have already obligated the federal government to subsidy payments of perhaps \$30 billion over the next 30 to 40 years... By 1978 present estimates suggest that the federal government will be paying out at least \$7.5 billion in subsidies... Over the life of the mortgages this could amount to the staggering total of more than \$200 billion..." (6)

This disastrous situation has further complications. Many are now claiming that F.H.A. is underwriting the collapse of large residential areas of our central cities. "The agency's programs designed to allow poor people to own their homes have been largely misused by corrupt real estate speculators who are buying and selling unsound houses in decaying urban neighborhoods to people who cannot afford to refurbish, or even maintain them." (7) The result: abandonment of single-family dwellings and the attraction of drugs, crime and other social ills to what used to be stable urban communities on a scale that is decimating entire neighborhoods. The gravity of this problem is illustrated by the belief of many housing experts that the Federal Government is the largest owner of single-family dwellings in at least two major cities, Philadelphia and Detroit. The cost of repossessing the housing is staggering, \$200 million in these two cities alone. In Detroit, HUD and GAO experts estimate that the Federal Government has lost about \$10,000 per house and would have to invest another \$9,000 in each house to make it more liveable, and still there probably wouldn't be any buyers.

LIFE CYCLE PERFORMANCE STANDARD

We need an entirely new housing policy, one based in a broad perspective that recognizes housing as part of a larger eco-system of social requirements and costs. This viewpoint necessitates a life cycle definition of housing requirements and costs to the individual and the larger society. For the unit itself this means an accounting of: first cost, cost of money, cost of use-denial, operation and maintenance, rehabilitation, conversion, demolition. Housing induced costs to the larger society are more difficult but include items in the categories of: public safety costs of deteriorated houses and neighborhoods, use-denial costs of capital invested in housing, costs in fixed public utilities and facilities for given development patterns, costs in discarded fixed public utilities and facilities associated with abandoned homes and neighborhoods, economic activity generated by replacement of obsolete or sub-standard dwellings. Additionally, there are many housing-related factors such as general environmental quality which are not easily given a dollar figure but still have deep economic implications.

With this comprehensive definition of life cycle building costs it becomes possible to begin to develop a more realistic housing

policy. Such information would allow one further innovation: housing policy developed to the level performance necessary to meet stated national housing goals. Past housing policies, in contrast, have relied too heavily on only hopes and expectations. Performance standards establish how the elements of a structure must perform to meet certain requirements rather than prescribing an acceptable response to a particular situation. This definition would be retained in developing a new housing policy but it would be interpreted more broadly.

HUD presently is completing a performance specification, Guide Criteria for the Design and Evaluation of Operation Break-through, covering all dwelling types from single-family detached to multi-family highrise. This excellent document is chiefly concerned with matters of health, safety and comfort. However, it could be expanded to include standards of maintenance, operational expense, longevity, permutability, disposability, etc.; standards that would apply to each element of life cycle housing costs. Such a performance guide depends on more data than is presently available and would be impossible to list here. Yet, it is valuable to touch on the general nature of such a guide in order to illustrate the complexity of interrelationships it should resolve.

Criteria concerned with the maintenance and operation of a housing unit, permutability in relation to use or rehabilitation or demolition are essentially technical problems. They would, therefore, fit fairly comfortably into the format already established by the HUD document. Policy questions, however, are not strictly technical and are subject to complex interrelationships of market and non-market factors. These form the difficult areas of any comprehensive performance standard for housing.

A highly simplified look at housing stock replacement rates, for example, reveals this complexity. Replacement rate requirements are established by: 1) setting optimum economic life for units of a given quality-type; 2) balancing this against the outright loss of units to the housing stock for that quality-type; 3) all the forementioned factors are then integrated with the rate of consumer improvement demand. Consumer improvement demand is a prediction of what the demand for housing improvements will be over a given time period, combined with what policymakers determine will most benefit the overall housing stock during that same period. Whether the housing stock should be replaced continuously over that period, or totally at one time, have wide ramifications and are questions that add further to the complexity of establishing such standards. Related policies establishing elements such as minimum space and quality standards are established in other parts of the performance criteria, but must be reflected in the replacement rate policy requirements. Finally such a guideline to replacement rates must have the flexibility and fine control to respond to local deviations from the National Standard.

All elements of the housing policy would be delineated by these specific standards of performance, and though the effects on the housing sector are not entirely clear, they would be many. It seems likely, for example, that there would be an increased emphasis on the modification of housing. This, in turn, would bring change in other components of the housing sector. Financial institutions might provide long term loans for re-modeling not generally available at present. Tenure patterns might lengthen, restricting the filtering that does exist. An entirely new industry of standard replacement components might emerge.

In almost all areas of such a guideline, the voice of the consumer would be strengthened.

IMPLICATIONS

The contention here should be clear. There is a defacto limit, below which it is impossible to build housing in this society. That limit should be recognized, as should the fact that first costs are only a small part of the economic activity associated with a housing unit over its life. That in fact we should not limit our concern to first costs but should seek to rationalize lifetime costs. Society has committed itself to decent housing for all, including outright subsidy where necessary. It should therefore recognize the nature of its commitment, including the larger costs to itself and seek to optimize the whole even though initial costs for individual units might increase. Actually realizing this optimal condition depends

on a workable, comprehensive policy that subjects the various components of the housing sector to uniform standards of performance.

Such a comprehensive standard implies the active role of the Federal Government. But, there is a backlash growing against federal involvement in housing. Fortune magazine, for example, recently called for a return to reliance on the market with the federal government confining itself to "providing broad incentives and refereeing conflicts between various groups of citizens." (8)

But falling back on the market simply says that the problem is not within our grasp. We would lose a great foothold of valuable though costly experience and allow the largest component of our national investment to wander, thereby lessening our ability to manage the nation's economic well-being. And still our housing problems would not disappear. Political pressure would inevitably grow again for immediate solutions, the pendulum would swing, and we would be back to a chaotic mixture of short-term cures.

For those of us involved in housing industrialization and systems, these are critically important issues. Industrialization depends on a predictable market; a comprehensive housing policy provides this. Conversely, a workable housing policy depends on uniform standards and predictable levels of performance from the individual units within the housing stock--concepts at the very heart of industrial production. Plainly, our housing problems cannot be solved without a comprehensive housing policy, and this will be difficult to implement without the long term commitment of true industrialization, commitment that utilizes industrial capabilities and resources to control planning, design, construction, operation,

maintenance, rehabilitation and final disposal of all units within the housing stock. Long term commitment will not be feasible or attractive until a method is devised to measure the social and economic long-term value of housing. Long term evaluation requires performance criteria, both accurate and relevant, by which to measure.

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