## COMPONENTS OF CHANGE IN THE NATION'S HOUSING INVENTORY IN RELATION TO THE 1960 CENSUS

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#### Introduction

In the short period of 25 years we have observed the transformation of the residential construction industry from a purely private activity of the economy to one of our most publicized, analyzed, and legislated industries. The residential construction industry had constituted an important segment of the Nation's economy before it became clothed with a public interest. However, when it was seized upon, during the 1930's, as both a means of stimulating a lagging economy and of raising the American standard of living, our housing industry moved to the forefront of political and legislative activity. Again, when the unflagging pace of housing construction helped shore up the economy during the recession of 1953-54, the Cinderella-like quality of the industry was further enhanced.<sup>1</sup> Today, with the problem of urban blight plaguing every sizable community in the Nation, housing problems associated with slum clearance and urban renewal have become almost a daily topic of discussion.

It is no coincidence that during this same quarter of a century that statistical knowledge about the housing field has jumped from almost nothing to a fairly well documented aspect of American life. The real property inventories of the 1930's, followed by the 1940 and 1950 Censuses of Housing provided the basis for this major statistical breakthrough. Data provided by the censuses actually preceded the existence of agencies able to exploit fully this information--particularly at the local community level.<sup>2</sup>

During the early 1950's pressures developed from several sources for more sophisticated and useful data on the dynamics of housing than that provided by the Housing Census. The first major recognition of this need was a joint project of the Housing and Home Finance Agency and the Bureau of the Census. The housing experts of these agencies undertook the task of defining concepts to express these needs. Techniques for collecting the necessary data were explored and developed, and the results of the project were reported in a formida-ble 200 page document.<sup>3</sup> The culmination of this work was a two sentence congressional appropriation in 1956 for \$1,000,000 for "expenses necessary for conducting a survey of housing." Shortly there-after the Bureau of the Census created a separate Housing Division to carry out the 1956 National Housing Inventory--the first systematic attempt to measure changes in the Nation's housing inventory.

The National Housing Inventory was undertaken in the fall of 1956 and preliminary results were released in the fall of 1957; the first of twentyone reports was issued in May of 1958 and the last appeared in April 1959. Despite the time lapse in producing them, these reports were well received in housing circles, and during the planning for the 1960 Housing Census many requests were received by the Bureau to incorporate a Components of Change survey within the Housing Census program. In response to the urging of the Bureau's Housing Advisory Committees and the Federal Housing Agencies, the Housing Division included within its census program plans for a Components of Change survey.

When the Director of the Bureau of the Census affirmed a decision to undertake a Components of Change survey in the fall of 1959, it marked a milestone in the field of housing statistics in the United States. This decision was the green light for a project which would provide the first complete explanation of the changes in the housing inventory which occur between decennial censuses. Enumeration was undertaken this fall and is nearing completion. With good fortune we should have our results by the end of next year.

The Components of Change program has been designed to utilize the total inventory figures to be obtained from next year's Housing Census to increase the reliability of the new construction estimates. And through the Bureau's Post Census Evaluation Program, we hope to link the 1959 dwelling unit inventory figures with the 1960 Housing Census results obtained from use of the new unit of enumeration--the Housing Unit. The linking process should account for the differences between the inventory figures obtained from the two programs attributable: (1) to the differences in definition of the unit of enumeration, and (2) to the time lapse between the 1959 and 1960 enumeration.

Before further discussing the inter-relationship of the Components of Change and other phases of the 1960 Housing Census program, it would be useful to review the nature and objectives of the Components of Change program as it was developed in 1956.

#### Major Subjects of Inquiry

What is the character and significance of the changes which were to be measured? These may be classified under the following major categories:

New construction. -- What is the rate of new additions to the housing inventory? Despite two housing censuses and Bureau of Labor Statistics monthly housing starts data, 4 no really accurate measure of this statistic existed. BLS housing starts data, even when placed in the most favorable light, have been shown to understate nonfarm new construction when compared with Census results. The "year built" data of both the 1940 and 1950 censuses were widely at variance with the BLS estimates. However, the census "year built" data could not be accepted as conclusive because this information was subject to response error. As a result, users of data have remained dissatisfied with available estimates of new residential construction. A corollary question in connection with new additions to the inventory is: What is the rate of "other additions" to the housing inventory, i.e., the shift from nonresidential to residential use? With respect to this question, virtually no information was available.

Conversions and mergers .-- These types of changes within the housing inventory long have been the subject of deduced estimates, but of little certain knowledge. During the depression thirties, about a third of the additions to the housing inventory were attributed to conversions--the division of existing dwelling units into smaller units. During the war and immediate postwar forties a somewhat smaller proportion of the net additions was credited to this source. Housing analysts believed that this phenomenon had become a declining influence on the housing inventory by the 1950's, but there were no figures to demonstrate it. Correspondingly, they also suspected that mergers, or the combining of dwelling units into fewer units were becoming an increasingly important source of losses from the inventory. It is, of course, recognized that conversions and mergers add or subtract virtually nothing from total living space, but merely change the existing supply into a larger number of smaller units or smaller number of larger units. Nevertheless, no analysis of the housing inventory would be complete until this phenomenon can be measured.

<u>Demolitions and other losses.</u>--Possibly the most distressing gap in housing knowledge was in data on withdrawals from the housing supply. How much of the Nation's inventory is lost annually through demolition, fire, flood or the shift from housing to nonresidential purposes?

Direct information was of the most fragmentary nature. Some estimates had been made on the basis of the overall changes in the total inventory measured by the 1940 and 1950 housing censuses. But even these were subject to varying assumptions about the other components of change, i.e., new construction, other additions, conversions and mergers.

Qualitative changes in the housing inventory.--In what direction is the quality of the existing housing inventory changing over time? Although new construction tends to improve overall housing quality, what are the characteristics of the housing being removed from the inventory? More important, what is happening to the remaining inventory? And at what rate?

These questions are particularly relevant in any discussion of "housing needs" for America. This subject probably has generated more heat in the housing field than any other as a result of the widely disparate estimates of "housing needs" that have been developed over the years. Glenn Beyer notes that "when the 1949 Housing Act was being considered in Congress, leaders of the home building industry set a range of 600,000 to 900,000 per year" as the annual need for new construction. For the ten year period 1956-1965, Beyer places the need between 1,300,000 and 1,900,000 annually depending upon the assumptions used." At the other extreme, estimates by William Wheaton placed annual need at 2.0 to 2.4 million units annually.<sup>8</sup> Although much of the differences among these estimates stemmed from disagreement among analysts over the rapidity and methods by which the substandard inventory was to be eliminated, a part of the difference is attributable to different guesses about the direction and rate of qualitative changes in the housing inventory.

<u>Household formation</u>.--The annual rate of new household formation is another statistic that eludes accurate measure between censuses. True, the Bureau of the Census now publishes annually a total household figure obtained from its monthly Current Population Survey, and from this has been derived an annual change in number of households. The latter figure, however, is subject to such a large variance that it is of little utility in making year to year estimates of household increase. As long as more precise data on this subject are lacking, analysis of market demand for housing based upon the rate of household formation cannot be undertaken.

<u>Mobility and housing demand</u>.-The mobility of the American population has created problems for housing analysts in estimating the ability of local markets to absorb new construction. Some analysts believe that, by itself, "sheer mobility alone tends to increase the quantity of housing demanded even if net migration is zero."<sup>9</sup> The various types of population mobility further complicates the problems of analysis, e.g.:

- (1) The general movement from the central city to the suburbs;
- (2) the continued shift from rural to urban areas, including the shift of nonwhites from the rural south to central cities of the north, and the migration of Puerto Ricans to New York City.
- (3) The regional movement to Florida and the West Coast (particularly California).
- (4) Growth and mergers in American industry have created large industrial aggregates and established thousands of new branches in suburban and rural areas, resulting in the movement of tens of thousands of business managers, engineers and other scientists in a constant cross-current of movement.

One aspect of our population movement which has been well noted is the increase in home ownership from 55 to 60 percent of all households since 1950. Other aspects of this movement are less well known. For example, what are the components of the net shift in tenure? Who are the people that move--are they a typical cross-section of the population or not? Do they have special characteristics which will help predict the impact of future movement on housing demand? Does sheer movement, per se, increase the demand for housing? What effect do household moves have upon the relative expenditures of income for housing?

# The Results of the 1956 National Housing Inventory

The information yielded by the 1956 National Housing Inventory provided direct answers to many of the questions raised in the preceding paragraphs. Some of the results and experiences associated with obtaining them are worth reviewing.

<u>NHI results--new construction.</u>--Since new construction represents the largest change in the housing inventory, these figures were of most interest. Staff members of the Housing Division had made national estimates of new construction for the 6-3/4 year period ranging from 9.6 million to 11.5 million or annual rates of 1.4 to 1.7 million.

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These figures were higher than any existing published estimates because of a conviction that BLS starts were continuing to understate the volume of new residential construction. The first UNIVAC runs on new construction were dismayingly low. Of the nine SMA's, five actually were slightly below BLS estimates. The national figure was 9.1 million compared to a comparable BLS estimate of 8.1 million for this period. On the surface, the national new construction figure was not unreasonable even though it was below the lowest staff estimate. The extent to which some of the SMA figures were below BLS estimates was more disturbing. This, plus a "red light" warning of a control figure built into the tabulation program, led to a complete review of the processing procedures. Parenthetically, it might be observed that not only was the NHI conceptually a new program, but it was the first major survey to use the new FOSDIC device.<sup>10</sup> Consequently, there were serious fears that something untoward had developed in processing. These fears were realized when a print-out of an SMA output tape was compared with the original schedules and it was discovered that FOSDIC had only intermittently transcribed the new construction mark from the microfilms to the magnetic tape.11

Time and cost factors prohibited any consideration of a "refosdicing" the microfilmed data. Since the tracked down difficulty affected only the simple count of new construction, it was decided to obtain these figures for the nine SMA's and the United States by a hand count. The final verified hand counts largely closed the gap between the BLS and NHI figures in the SMA's, nevertheless, it left four SMA's with slightly lower totals than the BLS estimates since the overall count was increased by only four percent. The significant change as a result of the hand count occurred for the U.S. total which was raised from the original UNIVAC figure of 9,100,000 to 10,900,000, an increase of about 20 percent.<sup>12</sup>

Although Housing Division personnel involved in processing NHI spent several anxious weeks before finally obtaining a valid new construction count, the experience carried an important lesson. No matter how marvelous and efficient are the complex electronic devices available to us, they will perform no better than the quality of the personnel responsible for their operation. Although they need not be responsible for operations, subject matter people must understand the workings and monitor the output of our electronic equipment. In this instance, had the subject matter people been unfamiliar with operations, the warning provided by the check incorporated within the UNIVAC program might have been rationalized or even ignored. But with operational knowledge, housing personnel were alerted by the warning, and coupled with their intuitive conviction about the magnitude of new construction figures to be expected, the figures obtained from the original UNIVAC run were emmediately investigated.<sup>13</sup>

It was many months before the significance of the new construction data provided by NHI had any public impact. And when it came, the reactions were understandably adverse. The possibility that the United States had been adding new housing at an average rate of 1,600,000 units annually since 1950 seemed incredible. It is not surprising that the figure was branded as incorrect by many analysts. Many months of checking by staffs of the Bureau and other interested government agencies, however, failed to reveal any significant source of error in the NHI findings.

Only recently, a leading daily newspaper headlined a story that the government was looking for 2 million houses "lost" somewhere between 1950 and 1956--referring, of course, to the BLS-NHI disparity.14 This time, however, Federal administrative processes moved rapidly. While some readers were learning for the first time in November 1959 that the Nation had built far more homes than it suspected between 1950 and 1956, the responsibility for collecting housing starts data had rested with the Bureau of the Census since July 1, 1959. Henceforth, inconsistencies between housing starts statistics and future components of change data will be the headache of a single statistical family. But with the responsibility for both sets of data so centralized, the pressures for clarifying concepts and improving methods of data collection to close the statistical gap will be multiplied manyfold.

<u>NHI results--conversions and mergers.--The</u> intuitive feeling among housing analysts that conversions had become a declining influence on the Nation's housing inventory was confirmed by NHI. Approximately 700,000 units became 1,400,000 between 1950 and 1956. This average of one unit gained from each one involved in conversion is the lowest that normally might be expected from this process and it signalizes the end of the era of large old single family mansions being cut up into four, six, or ten units. The evidence in table 1

fable	1CONVERSIONS	AND	MERGERS	IN	THE	HOUSING	INVENTORY:	1950	TO	1956
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(In thousands of dwelling units)

4700		Conversi	ons		Merger	Net change from	
Area	From	То	Net Gain	From	То	Net Loss	mergers
United States	668	1,376	708	1,321	649	672	+36
Inside SMA's	422	880	458	765	371	394	+64
Outside SMA's	246	496	250	556	277	279	-29
Northeast	199	412	213	349	170	179	+34
North Central	215	452	237	422	216	206	+31
South	184	378	194	431	204	227	-33
West	71	133	62	120	60	60	+2

indicates that this type of conversion, since 1950, no longer has been an influence of significance in the housing supply.

Almost as interesting is the manner in which mergers have completely nullified the effect of conversions on the housing inventory. The picture presented in table 1 demonstrates that this occurred in each of four regions as well as inside and outside standard metropolitan areas. Again, the average loss of one unit from each two involved in merger is the exact reverse of the results obtained from conversions.

<u>NHI results-demolitions and "other losses."--</u> The loss from all sources of 2-1/2 million units in 6-3/4 years, an average of nearly 400,000 annually, was somewhat higher than most analysts' estimates. That less than half of these were classed as demolitions might seem a little surprising, but the demolition figure probably is a conservative estimate because some units actually demolished were incorrectly reported as "other losses" by enumerators. The "other losses" component of withdrawals from the housing inventory, which numbered 1,400,000, probably is conceptually the weakest figures produced by NHI. A significant proportion of "other losses," about 400,000, consisted of units recorded by enumerators as "abandoned." This proved to be a poor concept in that it offers to less conscientious enumerators an easy disposition for vacant units in rural areas when no one is conveniently nearby to furnish information on the dwelling. Post enumeration investigation of "abandoned" units suggests that some proportion of them should have been classified as vacant. For this reason the term "abandoned" has been discontinued for both the 1960 Housing Census and the 1959 Components of Change program.

Another and equally large component of "other losses"--about 400,000 units--was classified as "moved from site." This is essentially a segment concept rather than an inventory concept, that is, it is associated with the data collection technique. The concept "moved from site" has real meaning to an enumerator seeking a house which has moved out of the way of a road-building project, or trying to explain a trailer which has left the site in the segment. This concept has a counterpart within the category "units added through other sources," and is usually labeled "moved to side."

Although these two concepts literally are examples of housing mobility, they are not, strictly speaking, housing inventory concepts since they really do not represent additions or subtractions from the Nation's housing inventory. However, even this statement must be qualified. For example, a vacation trailer which is sold and moved from a backyard to a lot where it is used as a permanent residence actually is an "other gain" to the housing inventory.<sup>15</sup> A house that is moved out of the way of a road-building project to a "used house" lot or to another site where it is used for nonresidential purposes actually is an "other loss." Some of the houses moved out of a segment may subsequently have been demolished. It is not known to what extent this occurred. For

this reason it was decided to record all units moved into, or moved out of a segment as "other gains" or "other losses." Since these two factors essentially are opposite sides of the same coin, they should be self-cancelling except for the type of examples cited above. Actually, about 400,000 units were recorded as moved out of segments and slightly less than 500,000 were recorded as moved into segments.

Of the remaining 600,000 units ascribed to "other losses," nearly 200,000 represented shifts from dwelling units to quasi dwellings, i.e., rooming houses, boarding houses, transient hotels, etc. It is probable that some large old former single family structures have continued to disappear into this category. Another 250,000 units shifted to nonresidential use and the remaining 150,000 were ascribed to fire, wind, storm, and "torn down," i.e., demolitions inaccurately recorded in this category.

It is probable that the rate of demolitions and "other losses" will continue to increase in the years to come. The full impact of urban renewal and our highway construction programs has not yet been felt. Although the future rate of withdrawals from the housing inventory is a matter of speculation, there is little evidence to justify a recent estimate that "new permanent construction for the next decade will have to be 1,250,000 units greater than the net increase in households and vacancies in order to replace those units lost from the inventory."<sup>16</sup> An estimate of twice this size would not be unreasonable.

NHI results--qualitative changes.--The NHI figures on condition and plumbing facilities showed a significant decline in substandard dwellings between 1950 and 1956. About 3,000,000 units, which were recorded in 1950 as dilapidated or lacking some or all plumbing facilities, in 1956 were recorded as not dilapidated, with all plumbing facilities. Upon consideration, this change is not too surprising since the Nation's level of living has moved upward in every respect during the 1950's. According to the definition of substandard housing generally accepted today, two-thirds of the Nation's rural housing, much of which was sound in construction, but which lacked running water and inside plumbing facilities was classified as substandard in 1950. Since the nature of urban life makes a facility like running water a necessity, whereas this is not necessarily the case in homes in rural areas, application of the term substandard to some of our rural housing probably is questionable. Nevertheless, nearly 2,000,000 of the 3,000,000 units which changed from substandard to standard between 1950 and 1956 were outside standard metropolitan areas, where much of the housing is rural.

Nothing in these figures, however, should give cause for any complacency about the problem of substandard housing. It is to be expected that housing should participate in the general rise in our level of living, and presumably only the lack of adequate data on expenditures on private residential repairs and rehabilitation justifies surprise at the extent of improvement in housing quality recorded since 1950.<sup>17</sup> On the other hand, it is

reasonable to presume: (1) that major expenditures on improving existing housing most frequently occurs in urban neighborhoods that are not rundown and in rural housing that does not require major rehabilitation; and (2) that the largest proportion of repairs and improvement expenditures was not major rehabilitation but the installation of inside plumbing facilities, particularly running water and water heating equipment -- a relatively less expensive means of shifting units from substandard to standard status than major rehabilitation work. This would argue, then, that the rapidity of the improvement in housing quality from 1950 to 1956 is attributable to the completion of the easier and less expensive improvements required to remove housing from substandard status. If this is true, it means that continued improvement in quality of the existing stock during the 1960's will come harder and more slowly. It also means that the hard core of the substandard housing problem -- namely homes of low income owners in deteriorated neighborhoods who are unable to improve their housing and rental properties in slum areas whose owners are not financially justified in investing in improvements or unable to obtain financing when they are willing--basically is not touched by this type of upgrading.

Consequently, it may be unwarranted to utilize a projection of the 1950-56 NHI results to justify the conclusion reached by Reinhold Wolff that repair and rehabilitation will upgrade as many as 4,600,000 substandard units during the 1960's, unless there is substantial increase of local and Federal activity in the form of code enforcement, urban renewal, and subsidies to accelerate the removal or improvement of substandard housing.<sup>18</sup>

NHI results--household formation.--In March 1957, the Census Bureau published a CPS household figure of 49,543,000 which, compared to the CPS household figure of March 1950, gives an annual rate of household increase of 856,000 for the seven year period.<sup>19</sup> The 1956 NHI figures for occupied dwelling units (households) was 49.9 million compared with the 1950 Census figure of 42.8 million, or an annual rate of increase of about 1,000,000 for the 6-3/4 years. Although dissatisfaction has been expressed with this variance in household figures emerging from the same agency, it is a danger inherent in the measurement of the same concept by separate surveys with different orientations. The primary task of CPS is to identify employment status of persons in the labor force. True, in the process, households are defined and an attempt is made to obtain their proper definition, but it is not the primary emphasis. in NHI, on the other hand, great stress in the training and induction of enumerators was placed upon the definition of the dwelling unit.20 As a consequence, it is reasonable to expect that the NHI enumerators did a more thorough job in this area than is done by the CPS. Although it is regrettable that such differences occur, it should be remembered that before the NHI results became available, CPS was the only source of any information on households. Even though Bureau statisticians had reservations about the use that might be made of the annual CPS household figure, it was published upon the urging of many users that some

information on households was better than none at all.

NHI results -- mobility. -- Some aspects of the amazing mobility of American households were measured by NHI. The dimensions of this mobility were familiar, but its characteristics were not well known. For example, it was well established that owner households tended to move less than renter households, but it was not known that over half (57%) of the renter households (as of 1956) had been in their present unit between two and three years while about half of the owner occupants had been in their units 6 years or more. The instability of the renter population was least marked inside central cities--47 percent of the households outside SMA's had moved into their present unit within the past two years; for SMA's, the corresponding figure was 44 percent and for central cities 41 percent.

Information obtained on present tenure, previous tenure, and "year moved into present unit" permits analysis of the increase in owner-occupancy from 55 to 60 percent of all households between 1950 and 1956. About one quarter (14 million) of the Nation's 55.3 million households moved into their dwelling unit during 1955 or 1956. Twelve million of these were households with the same head, of which 9 million were former renters and 3 million were former owners. Although most renter movers remained renters, 2.7 million or 30 percent shifted to owner-occupancy. Only 3/4 million former home owners became renters; however, they constituted 27 percent of all former owners who moved in these two years. During this same period, about 2 million moves involved a change in household composition, a large part of which represented new household formation. Three quarters of these 2 million movers whose previous tenure was not investigated, became renter households.

Not too much can be said from our tabulations about the distance of moves. For example, 10 percent of all households who moved crossed State boundaries. But we do not know what proportion of this group merely crossed nearby borders, such as the Hudson River from New York City to New Jersey or vice versa, and what proportion made crosscountry moves. The flow to the suburbs, however, is indicated in the moves of households formerly residing in central cities. About one third or 1.3 million of nearly 4 million central city households who moved in 1955 and 1956 left the city.

The majority of households who moved from one owner occupied single family unit to another paid more for their new homes. The median value of the house they moved from was \$10,000 compared to a median value of \$13,100 for their new house--a 30 percent increase.<sup>21</sup> There are also significant differences between households which have moved from one owned home to another and all owner households. For example, their median household size was 3.5 compared to 3.1 for all owner households; their median income was \$5,400 contrasted to \$4,800 reported for all owners.<sup>22</sup> The quality of homes acquired by these movers also improved significantly. Whereas 16 percent of all owner occupied units in the United States were dilapidated or lacking plumbing facilities (substandard), only 9 percent of the units occupied by recent owner to owner movers fell into this category.

In contrast, the characteristics of households who moved from renter-occupied units to other rental units are not very different from all renters. In terms of household size, median number of persons for renter to renter movers was 3.0 compared to 2.8 for all renter households; median incomes were about the same, \$3,700 for renter to renter movers compared to \$3,600 for all renters. Similarly, there was virtually no change in the quality of housing of this group of movers, although there was a slight but possibly not significant increase in median contract rent from \$54 in the previous unit to \$58 in the new unit.

A comparison of the average value of homes occupied by former renters with the average rents they used to pay shows a correlation of +.48, but the dispersion is wide. In short, previous rents would be poor predictors of the value of homes presently occupied.<sup>23</sup> The median contract rent of households which shifted from renting to owning in 1955 and 1956 was \$61. Although this was higher than the \$54 median for renters who moved to other rented units, many of the new home owners came from the low rent brackets. About a sixth previously paid less than \$40 a month rent. The wide spread in value of homes purchased by these previously low rent payers is shown in the following illustration:

### Table 2.--VALUE OF ONE-DWELLING UNIT NONFARM STRUCTURES FOR RECENT MOVERS FROM THE \$30-\$39 RENT CATEGORY: 1956

Percent of recent movers from the \$30-\$39 rent category	Purchased homes valued at:
27	\$6,000 or less
26	\$10,000 to \$15,000
19	\$15,000 or more

Source: Unpublished 1956 NHI tabulations

Only one cross-tabulation was obtained for recent movers who shifted from owner to renter occupancy (table 4). The data show a correlation of +.46 between value of previous residence and the present rent paid by former owner-occupants indicating that the higher the value of the previous residence, the higher will be the present rent paid by former owner-occupants. The median value of their former homes was the same as that for all owner-occupants who moved in 1955 or 1956---\$10,000. But the \$68 median contract rent of former owner-occupants was \$10 higher than that of movers from renter-occupied units and \$15 higher than the median contract rent for all renteroccupied units. This fact seems to be significant relative to the demand for rental units. If the shift from owner to renter occupancy increases appreciably, the demand for better quality and higher rent units may be strengthened. Even today. this may be a factor in the recent resurgence in the rental market discussed by Louis Winnick's ACTION report.24

<u>NHI results--some conclusions</u>.--The 1956 NHI results answered many questions that have been

raised about the housing market in recent years. Even the cursory discussion in the preceding paragraphs, however, indicates the endless possibilities that exist for more intensive mining of these data. Nevertheless, we now have a basis for evaluating an approach commonly used by housing analysts in estimating future "demand" for new residential construction. This method begins by making assumptions or estimates for the period ahead about:

- (1) The state of the economy--employment, incomes, etc.
- (2) Net new household formation.
- (3) Units lost and units added in the existing inventory.
- (4) Change in gross vacancies.

The analysis of "(1) The state of the economy..." is used in making estimates of net new household formation, losses and gains in the existing inventory, and the expected direction and magnitude of change in vacancies. These estimates then become factors in the following equation:

"(2) Net new household formation" + "(3) Units lost and units added in the existing inventory" + "(4) Change in gross vacancies" (i.e., + increase or - decrease in gross vacancies) - "need" for new construction.

The resulting "need" for new construction theoretically can be translated into effective demand if certain conditions about the price and mortgage credit terms of new construction are met.

Table 5b fills in the variables of the above equation from data obtained from NHI for the period 1950-1956<sup>25</sup> The adjoining table 5a provides the background of absolute change against which these relative changes may be examined. The relationships derived for this period were obtained from an economic climate of full employment and high incomes even though encompassing the recession of 1953-1954. For the United States as a whole, 178 units were provided for each 100 households added. Of this total, 155 were new units and 23 were additions from other sources. Losses in the inventory amounted to 46 units for each 100 households added. The surplus of 32 (178 provided, less 46 lost) represents additions to the vacancy supply-although only 14 of these were in the form of available vacancies. The other 19 units were either held off the market, owned or bought and awaiting occupancy, or dilapidated.

When the national figures are classified by inside and outside standard metropolitan areas, relationships change sharply.<sup>26</sup> The first and most obvious fact is that relative growth inside standard metropolitan areas was twice that outside standard metropolitan areas (table 5a). More important, however, only 146 units were needed to accommodate each 100 households added inside standard metropolitan areas compared with nearly twice this figure (275) outside standard metropolitan areas (table 5b). A similar ratio held for the number of new units constructed for each 100 households added--128 inside standard metropolitan areas and 233 outside standard metropolitan areas.

## Table 3.--CONTRACT MONTHLY RENT OF PRESENT UNITS BY VALUE OF PREVIOUS PROPERTIES, FOR UNITS OCCUPIED BY RECENT MOVERS: 1956

(In thousands)

	Same Head in Present and Previous Unit												
nonfarm renter units	Value of Previous Property: Owner-occupied nonfarm 1-unit structures												
occupied by recent movers	Total	Under \$6,000	\$6,000 to \$7,999	\$8,000 to \$9,999	\$10,000 to \$11,999	\$12,000 to \$14,999	\$15,000 to \$17,999	\$18,000 to \$19,999	\$20,000 or more	NR			
Total	510	124	43	73	57	67	46	14	54	30			
Less than \$30	31	20	4	2		2				3			
\$30 to \$39	31	10	3	4	3	2	4		3	2			
\$40 to \$49	51	18	4	8	8	2	4			6			
\$50 to \$59	71	27	9	21	4	1			10				
\$60 to \$69	73	10	8	10	15	16	7	1	1	6			
\$70 to \$79	61	17	6	7	9	10	4	3	2	2			
\$80 to \$99	69	10	5	9	7	14	14	1	7	2			
\$100 or more Not reported	97 25	3 9	4 	7 4	8 3	16 3	14 	9 1	29 2	8 2			

NOTE: Due to independent rounding, figures may not add to totals.

Source: Unpublished 1956 NHI tabulations.

Table 4.--VALUE OF PREVIOUS CONTRACT MONTHLY RENT BY VALUE OF PRESENT PROPERTY, FOR UNITS OCCUPIED BY RECENT MOVERS: 1956

(In thousands)

	Contract monthly rentnonfarm renter units occupied by recent movers										
Value of present property Owner-occupied nonfarm 1-unit structures	Total	Less than \$30	\$30 to \$39	\$40 to \$49	\$50 to \$59	\$60 to \$69	\$70 to \$79	\$80 to \$99	\$100 or more	NCR or NR	
Total	2,214	142	205	293	346	391	242	248	195	152	
Less than \$6,000	227	50	56	52	26	20	2	2		19	
\$6,000 to \$7,999	208	21	27	57	34	39	18	5		7	
\$8,000 to \$9,999	273	25	29	47	64	50	15	18	9	16	
\$10,000 to \$11,999	291	12	21	37	66	66	37	27	8	18	
\$12,000 to \$14,999	501	20	33	63	87	114	82	53	26	23	
\$15,000 to \$17,999	312	10	22	15	35	64	35	53	55	22	
\$18,000 to \$19,999	117		2	3	17	13	31	32	10	8	
\$20,000 or more	257	2	16	16	13	24	22	56	83	25	
Not reported	29	2	1	4	3			2	4	13	

Source: Unpublished 1956 NHI tabulations.

It is clear that, inside standard metropolitan areas, the relationship between net new household formation and new construction (between 1950 and 1956) was close enough so that the measure of one Would have provided a good basis for predicting the other, whereas this was not true outside standard metropolitan areas.<sup>27</sup>

Since standard metropolitan areas are frequently treated as analyzable housing markets, and since most forecasts of new construction are made for local housing markets, the NHI figures showing the relationship of new construction to increase in number of households for the nine standard metropolitan areas are of particular interest. These relationships range from a low of 105 new dwelling units per 100 new households in the Los Angeles SMA to 144 per 100 in the Dallas SMA. The average for the nine SMA's was 124, close to the figure of 128 recorded for all SMA's of the Nation. This suggests that the variation in the ratio between new construction and net new household formation for individual SMA's is not so wide as to vitiate the usefulness of the average in predicting demand for new construction for individual SMA's. The relevant question is with respect to the stability of this ratio for the near-term future, i.e., can it be used for prediction?

Examination of the composition of this ratio indicates that there is basis for expecting it to be stable over the next decade for SMA's which continue to grow at approximately their 1950 to 1956 rate. Internal change <sup>28</sup> in the housing inventory of these areas are small and largely offsetting relative to net household growth. However,

### Table 5a.---NUMBER AND INCREASE IN HOUSEHOLDS: 1950 to 1956

# Table 5b.--CHANGES IN THE HOUSING INVENTORY PER 100 HOUSEHOLDS ADDED: 1950 to 1956

	Number of	Increase in households 1950 to 1956		Number	of unit	s added	Minua	Equals	Minus	Equals	
Area	holds 1950 (thous- ands)	Number (thous- ands)	Per- cent	Total	By new con- struc- tion	From exist- ing inven- tory <sup>1</sup>	all losses <sup>2</sup>	net addi- tions	increase in gross vacancies	increase in number of households	
U. S Inside SMA's Outside SMA's	42,826 24,514 18,312	7,048 5,264 1,784	16.5 21.5 9.7	178 146 275	155 128 233	23 17 42	46 32 86	132 114 188	33 14 89	100 100 100	
REGIONS											
Northeast North Central South West	11,228 12,972 12,633 5,994	1,780 1,618 1,852 1,797	15.9 12.5 14.7 30.0	153 179 231 149	133 150 203 131	20 29 28 17	32 50 70 30	121 130 161 118	21 30 61 18	100 100 100 100	
SMA's											
Atlanta Boston Chicago Dallas Detroit Los Angeles N.Y N.E.N.J. Philadelphia Seattle	191 646 1,607 187 829 1,440 3,774 1,018 236	66 50 268 52 199 600 654 185 42	34.6 7.7 16.7 27.8 24.0 41.7 17.3 18.2 17.8	139 182 134 156 136 117 128 143 138	129 138 115 144 124 105 113 127 121	11 44 19 12 12 12 16 16 16 17	23 44 27 38 23 16 25 21 33	117 138 106 117 113 102 104 122 105	15 40 5 17 14 2 4 22 5	100 100 100 100 100 100 100 100	

Source: 1956 National Housing Inventory, Volume I. <sup>1</sup>Includes units added through conversion and from other sources.

<sup>2</sup>Includes units lost through merger, demolition and other means.

NOTE: Because of independent rounding of figures, detail may not add to totals.

Source: 1956 National Housing Inventory, Volume III.

for those few standard metropolitan areas which are growing only slowly, internal changes will be large relative to net household change and the relationship between new construction and net household increase will fall apart.<sup>29</sup>

What are the implications of a close relationship between new construction and net increase in households? To the realtor, the builder, and the supplier of mortgage funds, a close relationship between these two variables probably is desirable because it indicates a stable housing market. From a purely social standpoint, a close relationship between these variables is not necessarily desirable. When the housing market starts from a position of tightness -- a very low available vacancy rate--as in 1950, a practically one-to-one ratio between new construction and net new household formation precludes any easing of the market and the efficient operation of the filtration process --one means whereby the quality of the housing supply may be improved.<sup>30</sup> Thus, the construction of 281 new units for each additional 100 households in Philadelphia theoretically would mean that improvement in the quality of housing occurred through operation of the filtration process to the extent that new units replaced substandard units which shifted to the available vacant category or completely disappeared from the housing inventory. However, no such conclusion can be deduced. Although about one-quarter of the increase in Philadelphia's vacancies and three-quarters of the units removed from the inventory were substandard, the city's experience was similar to that of SMA's whose new construction-household increase ratio approached one.

Without further evidence, the most that can be said is that the occurrence of a high ratio of new construction to net new household formation in a housing market creates the condition for an improvement in the quality of housing by providing scope for the operation of the filtration process. So long as such a development does not continue to the point where vacancies become a glut on the market and react negatively on construction activity, a high ratio of new construction to net new household formation may be regarded as desirable.

Part of the preceding discussion alluded to the reversibility of the new construction-net new household formation ratio, i.e., one can attempt to estimate new construction if estimates of household formation are available, and occasionally, estimates of net new household formation for the recent past are made on the basis of new construction figures. The NHI data indicate that the foregoing types of estimates could have been made with reasonable accuracy for the early 1950's. The difficult task for individual SMA's is a forecast of net new household increase which, for the nine NHI standard metropolitan areas, ranged from 8 percent for Boston to 42 percent for Los Angeles. It is obvious that it would be difficult to use the new construction-net new household formation relationship to forecast the demand for new construction unless techniques for obtaining good estimates of net new household formation in local areas are developed. If the new construction-net new household formation relationship for the Nation has any stability, it can be useful for forecasting national demand for new construction since aggregate household growth is more easily predicted than that for a single standard metropolitan area.<sup>31</sup>

### Extrapolating the NHI Results to 1959

It will soon be possible to check the stability of the relationships shown in table 5b and thus their usefulness for prediction. What kind of figures will the 1959 program yield on the basis of the 1956 relationships? Since economic conditions for 1956-1959 basically were similar to the earlier years of the decade, it is reasonable to assume a rate of net new household formation of 1,000,000 per year for the past three years. This would give a net addition of 4,000,000 units and a total inventory figure of 59,300,000 dwelling units; the figure for new construction would be 4,650,000.32 As a forecast, the figure for new construction seems reasonable, but the total inventory figure appears high.<sup>33</sup> At any rate, the results of the 1959 Components of Change survey will permit an evaluation of the stability and usefulness of these relationships.

### The 1959 Components of Change program and the 1960 Census

The 1959 Components of Change program will mark the climax of a decade of research in the dynamics of housing statistics. Basically, the program is identical with the NHI which has been discussed in some detail in the previous pages. The experience gained from NHI proved valuable in planning the present survey and some of the problems that arose in 1956 have been eliminated. The information obtained for the United States and the nine standard metropolitan areas in the 1956 sample segments has been transcribed to schedules used in the current survey. This information will be compared with the 1959 status of dwelling units in the same segments. In order to obtain measurement of new construction since 1956, an added group of new construction segments have been delineated and will be enumerated throughout the United States.

The 1959 Components of Change enumeration will be carried out independently of the 1960 Housing Census. However, the total housing inventory figure obtained in the 1960 Census will be used for ratio estimating to obtain a more accurate new construction figure, which is the largest single change in the inventory. This will require re-enumeration of the components of change segments immediately after the 1960 Census to obtain the count of housing units--the new unit of enumeration to be used in the 1960 Housing Census--in those segments. The count of housing units in the sample segments, and the total count for the Nation will provide the 1960 factors for the ratio estimating equation.

At an earlier stage it was planned to utilize the 1960 re-enumeration of the Components of Change segments to obtain a complete reconciliation of the 1959 dwelling unit figures with the 1960 housing unit figures--including accounting for changes that occurred in the time lapse between the survey and the census. Time and cost factors have led to a shift of this objective to the Bureau's 1960 Census Evaluation program, which will provide such a reconciliation on a national basis. Information about several housing characteristics and about family income were left off the 1959 schedule because these data will be obtainable from the 1960 Census. Consequently, tabulations for the 1959 program will be essentially limited to those provided in Volume I of the 1956 NHI plus some tabulations for recent movers that appeared in Volume III.

The sample for the Components of Change program was expanded in 1959 to include eight additional standard metropolitan areas--all those of 1,000,000 or more inhabitants in 1950. Budgetary limitations, however, require use of a smaller sample for the newly added standard metropolitan areas. The method of making the 1950-1959 comparison will be essentially the same as that used for the 1956 National Housing Inventory. Enumerators will compare the status of dwelling units in their segments with the information reported on the 1950 Census schedules.

When all phases of the 1959 Components of Change program are complete, components of change statistics in terms of dwelling units will be provided for the 9-2/3 years since the 1950 Census, permitting a virtually complete explanation of all housing changes which have occurred during the intercensal period; estimates will be available to link these dwelling unit data with the housing unit results obtained from the 1960 Census of Housing; and housing and household characteristics from the 1960 Census of Housing will provide the information not available from the Components of Change program. This will make available to analysts the most complete set of housing statistics ever provided--in this Nation or any other.

<sup>1</sup> The favorable terms of the 1954 Housing Act probably contributed materially to the high level residential construction through this recession.

Major exceptions to this point were some local and regional planning agencies, and local housing authorities which were compelled to undertake serious study of available statistics to justify requests for public housing subsidies. The recent success of the Bureau's contract block statistics program indicates that this pressure still is strong. Some 250 places below the 50,000 population level are under contract for 1960 housing statistics by blocks. The willingness of local governments to expend funds for these statistics, plus the ability to read, understand and carry out the Bureau's meticulous directions for preparation of adequate block maps is not only a sign of growth in statistical sophistication in the Nation's communities, but an indication of the extent to which small communities now are participating in federally subsidized urban renewal programs.

<sup>3</sup> U. S. Bureau of the Census, <u>Intercensal Hous</u>ing Surveys, (1957).

Collection of accurate data on housing starts was hampered by what we now see were inadequate funds.

<sup>5</sup> Grebler, Blank and Winnick, <u>Capital Formation</u> in Residential Real Estate, Princeton University Press, Princeton, N. J., 1956, p. 373. The authors quote a "Reconciliation of the Net Change in the Nonfarm Housing Inventory, 1940-1950, (reported by Census) and New Construction as reported by the Bureau of Labor Statistics" labeled as a "preliminary report of an interdepartmental committee of federal agencies (to be published)," which indicated that BLS underestimated new construction by 6 percent for this period. The "Reconciliation" quoted was prepared by the Bureau of Labor Statistics members of the interdepartmental committee, but it neither was accepted as official by the committee

nor was its publication authorized. <sup>6</sup> Glenn H. Beyer, <u>Housing: A Factual Analysis</u>, Macmillan, New York, 1958, p. 281.

Ibid., p. 285.

<sup>8</sup> William C. Wheaton, "American Housing Needs, 1956-1970," The Housing Yearbook, 1954, Washington National Housing Conference, p. 11.

<sup>9</sup> Rapkin, Winnick, and Blank, <u>Housing Market</u> Analysis, U. S. Housing and Home Finance Agency,

1953, p. 60. <sup>10</sup> FOSDIC is a device, developed by Bureau of Standards' engineers, designed to eliminate punch cards and card-to-tape operations by a process of transcribing marks from 16 or 35 millimeter microfilm to magnetic tape. This requires a specially designed enumeration form although it is marked by ordinary pencil. The document is microfilmed and then fed through the FOSDIC device. The magnetic tape output of FOSDIC then is ready as input to

UNIVAC. <sup>11</sup> The difficulty eventually was traced to inexact printing of the schedules where accuracy is measured up to the thousanth of an inch.

<sup>12</sup> The problems in obtaining NHI new construction figures turned out to be the only major processing difficulty the Housing Staff experienced. In retrospect, it can fairly be said that the processing and tabulation job accomplished by FOSDIC and UNIVAC was an amazing accomplishment. In

addition, the Bureau's engineering staff gained invaluable experience in preparing the new FOSDIC's for processing the coming 1960 Census. <sup>13</sup> The memory of this experience has carried

over into preparations for processing the 1960 Census. Both operations and subject matter staffs have combined to incorporate into the final program sufficient checks to assist in the detection of processing flaws.

<sup>14</sup> Wall Street Journal, November 2, 1959, p. 1,

col. 1. <sup>15</sup> Trailers comprised about 150,000 units "moved <sup>15</sup> Trailers comprised about 150,000 units "moved from site." site" and nearly 100,000 units "moved from site."

<sup>16</sup> U. S. Senate Subcommittee on Housing, <u>Study</u> of Mortgage Credit, Dec. 1958, Sherman J. Maisel, "Importance of Net Replacements in Housebuilding Demand," pp. 32-42. The analysis in the Maisel paper on this point is open to question. Table 16, the core of his argument, is a combination of estimates and extrapolations that can be accepted or rejected depending upon the assumptions one is willing to make. The statement (p. 37) "Table 16 shows a Census estimate that net losses...averaged 210,000 annually from 1950 through 1956" is not accurate--this is Maisel's estimate not a Census estimate. On another point, I would reverse his projection of 40,000 units gained from conversions and mergers in 1961-70 to an annual net loss of nearly the same magnitude. Finally, seasonal units should not be included in table 16 as an offset to losses from the inventory. These in effect are second homes; or they are held as income properties for seasonal use of persons who normally have their own homes elsewhere. An increase in the number of units of this type does not offset losses in the inventory.

<sup>17</sup> It is hoped that work of the Bureau of the Census' new Construction Office will, in the near future, fill the gap in data on expenditures on residential repairs and rehabilitation.

<sup>18</sup> U. S. Senate Subcommittee /on Housing, <u>Study</u> of Mortgage Credit, Dec. 1958, Reinhold P. Wolff, "Substandard Units and Their Replacement, 1961-70," pp. 43-58. Wolff overstates the NHI 1950-56 figure for "substandard units rehabilitated and now standard" by 1.1 million units in his table 20. It is not clear how he arrived at this result. This error may have contributed to his projection of 4.6 million units to be shifted from substandard to standard during the 1960's which is, I judge, too optimistic. If this gross figure reaches 3 million the Nation would be fortunate.

19 U. S. Bureau of the Census, <u>Current Popula-</u> tion Reports, P-20, No. 76, table 1.

<sup>20</sup> In an effort to improve the quality of enumeration, Bureau personnel accompanied each new enumerator in the nine SMA's through his first few interviews. NHI was the first major Bureau survey in which a systematic attempt was made to induct new enumerators in the field under supervision. <sup>21</sup> Value information for recent owner to owner

movers probably is the most reliable of the NHI value data collected, since it represents, for the most part, actual prices received and paid for homes in the two years, 1955 and 1956.

<sup>22</sup> The median value for all owner-occupied nonfarm 1-unit structures was \$11,400.

<sup>23</sup> Nevertheless, the generalization may be made that the higher previous rent, the higher is the

value of the home subsequently purchased.

<sup>24</sup> Louis Winnick, Rental Housing: <u>Opportuni-</u> ties for Private Investment, McGraw-Hill Book Co., Inc.. New York, 1958.

Inc., New York, 1958. <sup>25</sup> Analysis of the relationships shown in table 5b was suggested by Miss Beulah Washabaugh, Chief of the Housing Division's Occupancy and Utilization Branch.

<sup>26</sup> Although the dichotomy is not at all clear cut, housing inside standard metropolitan areas is essentially urban while virtually all rural (as well as much urban) housing is located outside standard metropolitan areas.

<sup>27</sup> The construction of 233 new units for each 100 households added outside SMA's has virtually no analytical significance because of the diverse composition of this part of the Nation. About half of the housing outside SMA's consists of urban places of 2,500 to 49,999; the other half is classified as rural and includes farm and other isolated housing, small settlements below 2,500 population, and the suburban housing outside of places of 2,500 to 49,999. <sup>28</sup> Conversions, mergers, demolitions, other

<sup>28</sup> Conversions, mergers, demolitions, other losses, additions other than new construction, and changes in vacancies.

<sup>29</sup> Indirect evidence on this point exists from data about this relationship for two NHI cities. In Chicago where the percent increase in number of households from 1950 to 1956 was 4.2 percent, 183 new construction units were provided for each 100 households added. In Philadelphia, with a household increase of 2.7 percent, the ratio was 281 new construction units provided for each 100 households added.

<sup>30</sup> The essence of the filtration process is in the production of a surplus of new housing--a new construction-net new household formation ratio substantially greater than one--permitting poorer quality housing to be released to successively lower levels of demand until the effect reaches the bottom of the market, where the poorest housing will remain vacant or be removed.

<sup>31</sup> This is true because migration into or out of standard metropolitan areas, which causes wide variations in household growth rates of individual SMA's, does not affect such estimates for the Nation.

<sup>32</sup> Column 5 of table 5b gives a relative of 132 for net additions to the housing inventory and column 2 a figure of 155 as the relative for new construction. Thus:

3,000,000 added households X 132 - 4,000,000 net addition of dwelling units

3,000,000 added households X 155 = 4,650,000 newly constructed units

Total inventory = 55,300,000 + 4,000,000=59,300,000

<sup>33</sup> If any modification is to be looked for in the U. S. relationships in table 5b, one might expect a decline in units added from the existing inventory and an increase in all losses, which would tend to drop the figure for net additions. I would estimate that the relative of 132 for net additions thus might decline to about 124, which would yield a total inventory figure of about 59,000,000 dwelling units as of December 1959.