Meeting 21st Century Demographic Data Needs—Implementing the American Community Survey

Issued July 2004

Report 10: Comparing Selected Physical and Financial Characteristics of Housing With the Census 2000

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Executive Summary

The American Community Survey (ACS) is one of three program components required to achieve the 2010 Census re-engineering strategy goals. Data collected over the decade by the ACS will take the place of the once-a-decade collection and estimation of detailed socio-economic and housing characteristics collected on a sample basis as part of each census, and produce annual and multi-year estimates of these same characteristics. The Census 2000 Supplementary Survey (C2SS) was conducted in conjunction with Census 2000 using the ACS methods and systems to demonstrate the operational feasibility of conducting the ACS on a national scale at the same time that the Census Bureau was conducting the decennial census. To date, reports have been issued that address questions concerning the procedural and technical performance of the ACS methodologies. This report is one of several exploring the quality that can be expected of ACS estimates. The focus of these assessments is a comparison of the C2SS results with the results from the Census 2000 Sample. The scope of this particular report is a comparison of C2SS estimates of important physical and financial characteristics of the nation's housing stock with the same estimates derived from the Census 2000 Sample.

Major Findings

Distributions of physical and financial housing characteristics from the C2SS were very similar to those produced from the Census 2000 Sample. We found nothing that should preclude the use of housing estimates produced by ACS methods for any purpose for which Census 2000 Sample estimates are used. Estimates of 86 housing characteristics derived from data collected from two very large samples were compared in this study. Although 63 of the estimates differed significantly between the C2SS and the Census 2000 Sample results at the 90 percent confidence level, only 23 of these differences were greater than 0.5 percentage points, and only 8 differed by more than 1.0 percentage point. The largest difference was 1.9 percentage points (for units reporting 4 rooms). The statistically significant differences seen at the county level are quite a bit larger than at the national level. This is expected since the county samples are considerably smaller and county differences must be larger for them to be considered beyond sampling error. However, only slightly more than one-fourth of the county-level comparisons reflect differences of more than 2 percentage points.

More than the effect of sampling error should be taken into account when considering the differences in these distributions. Comparing the relative levels of potential nonsampling error plays an important role in assessing the accuracy of the distributions and in understanding some of the differences seen in these estimates. After rigorous analysis of the housing characteristics produced by the Census 2000 Sample and the C2SS, it is clear that there are many reasons for the differences observed between the data sets. This report attempts to explore and explain them. Given the findings, it is note-worthy that the housing distributions produced by the Census 2000 Sample and C2SS are so consistent.

Differences in several of the financial characteristics may be primarily a reflection of the way the interviews and enumerations distribute across the time frames covered by the two

sample surveys. The C2SS interviewing, adhering to ACS data collection methods, was conducted almost daily during every month in 2000, while the Census 2000 enumeration occurred over a 6-month period from March through August. This variation is likely influencing several of the distributions analyzed in this report. The Census 2000 Sample estimates represent characteristics based on information skewed toward the first months of enumeration and reflect circumstances centered around March and April of 2000. In contrast, the C2SS estimates represent conditions for all 12 months in 2000. A careful review of census long form questionnaires makes it clear that only the establishment of household membership (and therefore, occupancy status) and each person's age is pegged to April 1. The most influential date for both the Census 2000 Sample and the C2SS distributions is the date on which the information was collected. None of the housing items covered in this profile study included a reference to any date other than the date of collection. Estimates from both the C2SS and the Census 2000 Sample are affected by the way housing unit interviews spread over the period of data collection. Given the considerable difference between the time frame referenced by the collected information, it is actually amazing that the estimates of the housing characteristics are so similar despite this variation.

Some housing estimates may be affected by the different residence rules used, but these differences would most likely be confined to highly seasonal areas. The decennial census "usual residence" rules attempt to assign an occupancy status to every housing unit and to form households as of Census Day where people lived "most of the time". The ACS "current residence" rule considers a housing unit occupied when contacted if at least one person staying in the unit is staying for more than two months. This "two month rule" is one of the basic differences between the ACS and decennial census, not to mention the more traditional current surveys, since it allows the characteristics of people residing in areas for more than two months to be represented in the area, instead of just the people who claim "usual residence" there. The expectation is that the impact of this difference will be most obvious in highly seasonal parts of the country. The extent of the effect on the distributions of housing characteristics is not yet known, but since occupancy status determines most of the universes for the housing profile tables discussed in this report, it seems logical that some part of the county-level differences seen are reflecting differing residence rules.

The larger estimate of occupied housing units in Census 2000 than in the C2SS may be playing an important role in some housing distribution differences. The ACS 3-month data collection design that focuses on interviewing occupied units during the first two phases and leaves the possibility of finding vacant housing to the last personal visit phase was expected to produce higher estimates of occupied housing units and lower estimates of vacant units by the C2SS than by Census 2000. The opposite result occurred (Love, 2001a). The occupied unit estimate forms the basic universe for many of the housing distributions in this report, and is probably contributing in part to the difference in the resulting characteristic distributions. The design of the ACS has been shown to produce lower estimates of vacant units than traditional surveys and the 1990 census. The C2SS vacancy rate estimates were significantly higher than the Census 2000 rates not only nationally but in nearly all ACS test sites, a phenomenon most likely linked to the census misclassification of vacant units as occupied and related to the duplication and subsequent 0.5 percent net overcount of the population (Love, 2001b; Barrett et

al. 2001; U.S. Census Bureau 2003; and Fronczek, 1998). These differences in critical housing universes could be expected to result in variation in the estimated housing characteristics between the C2SS and the Census 2000 Sample.

A review of the housing results by data collection mode suggests that differences, when found, were more likely to be reflected in the data collected by enumerators and interviewers as opposed to self-response data. The tasks involved in completing the Census 2000 long form questionnaire and completing the C2SS mail questionnaire were the same. Each required motivation, literacy, and the ability to follow sometimes confusing directions and understand somewhat esoteric concepts. The higher national self-response rate to the Census 2000 long form than to the C2SS mail questionnaire – 68.2 percent versus 58.4 percent – (Love, 2003) is most likely attributable to the heightened publicity and civic-mindedness that surrounds the decennial census. It is not unreasonable to assume that households that self-responded to the C2SS would have responded to the Census 2000 long form had they received one.[1] Preliminary mode analysis conducted on two of the physical housing characteristics showed that the pattern of answers from the two self-selecting mail return universes were remarkably similar, while data from the followup operations often accounted for most of the differences between the C2SS and Census 2000 Sample distributions, regardless of the race and origin of the householder and whether the units were owned or rented. We concluded that key aspects of the self-selecting nature of the mail return distributions do not explain the large gross differences in the housing distributions that are based on followup data.

Some differences in the final estimates are probably explained by the different levels of nonresponse between the Census 2000 Sample and the C2SS. The level of unit nonresponse and the weighting methods used by the Census 2000 Sample and the C2SS to correct for it were quite different. Overall unit nonresponse in the Census 2000 Sample was 8.8 percent; it was 4.9 percent for the C2SS (Griffin, Love and Obenski, 2003). Most Census 2000 Sample unit nonresponse is the direct result of insufficient information being collected on long forms. For the most part, unit nonresponse is synonymous with not collecting the minimum amount of information required for a sample unit to be considered enumerated or interviewed,[2] and nearly

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[1]The C2SS sample was matched against the Census 2000 sample. Units selected to receive a long form were not also selected for the C2SS.

[2] Long forms enumerating occupied housing units had to include at least one person whose response record contained answers to at least two "100%" items and two "sample" items. Long forms enumerating vacant housing units had to have answers to at least two "sample" housing items. Long forms that met the minimum criteria were considered to be "sample data-defined" and placed in the census sample. To be considered an interviewed unit in C2SS, a household's response record had to have an "acceptability index" of at least 2.5. The index is computed by counting the number of basic population items with answers (sex, age, relationship, marital status, Hispanic origin, and race), a computable age counting as two, and dividing this total by the number of people in the household. Occupied housing units not meeting this minimum index value are treated as noninterviews in the estimation process. No housing items are used to compute this index. Response records for vacant housing units are not subject to a minimum data requirement. All are considered interviews.

all "noninterviews" in both the Census 2000 Sample and the C2SS are from followup operations. This raises concerns about the possibility of nonresponse bias being introduced into the distributions, since the characteristics of households enumerated during followup operations can be very different from those of mail response households. Households in the C2SS that were not successfully interviewed were adjusted for separately in the survey's weighting and estimation process by geography and mode to more accurately represent the characteristics of the noninterview universe. The Census 2000 Sample weighting process, however, did not include a noninterview adjustment to correct for the households enumerated during followup on long forms that were dropped from the Census 2000 Sample.

Adding to the possible impact of nonresponse on the differences seen in the housing estimates is the level of item nonresponse. Item nonresponse was higher in the Census 2000 Sample than in the C2SS for nearly all housing characteristics, particularly when the data was collected in followup operations. The reasons for the having more missing data in the Census 2000 Sample results is probably explained, at least in part, by differences in the census and survey methods and the goals for these operations. The comparison results show that, in general, data from occupied housing units are benefitting considerably from ACS collection methods, although there is still much room for improvement in the collection of the information required for a few specific items. ACS methods have not been shown to consistently lower the level of item nonresponse for characteristics of vacant units compared with census sample data.

Differences in the experience of the Census 2000 and the C2SS workforces and the procedures guiding their tasks are most likely responsible for these differences in overall levels of nonresponse. The Census acceptance of information from respondents who are not members of the household being enumerated does reduce the levels of both unit and item nonresponse, but the information collected in this manner may not be accurate or complete. The C2SS field representatives are more highly trained and gain a better understanding of the content of the survey and how to gain the cooperation of reluctant respondents. Their procedures do not allow the interviewing of non-household members, and yet they consistently maintain low levels of both unit and item nonresponse. The results in this comparison report, although it is restricted to housing characteristics, clearly show that a highly trained and experienced cadre of field representatives under the direction of an accomplished supervisory staff are capable of collecting, at high levels of completeness, the wide-ranging content that has been standard decennial census sample fare.

Coverage differences in the Census 2000 Sample and C2SS sampling frames may also be responsible for minor discrepancies in the distributions. Housing unit updates were made to the decennial census version of the Master Address File (MAF) throughout the Census 2000 period of enumeration, while the C2SS sample was selected from a pre-census version of the MAF. Although the Census 2000 sampling frame was more complete than the C2SS sampling frame, the national housing unit sample completeness rate – a measure that indicates how closely the number of interviewed sample units approximates the total census housing count when they are weighted by their probabilities of selection – was actually higher for the C2SS than for the Census 2000 Sample. The more complete census sampling frame did not translate into higher representation of housing units in the Census 2000 Sample than in the C2SS because

insufficient information was collected from too many units. The overall Census 2000 sample loss of housing units was greater than the undercoverage of the C2SS sample when measured against the full Census 2000 housing unit count.

1. OVERVIEW AND PURPOSE

Data users have long argued that the currency of detailed population and housing data should be increased, while the Census Bureau has concluded that the operations that make up the decennial census must be simplified. Consequently, the Census Bureau has implemented the 2010 census reengineering strategy to manage risk and reduce complexity while improving coverage and containing costs in the 2010 census. The American Community Survey (ACS) is one of three program components required to achieve the 2010 census reengineering strategic goals. Collecting the content traditionally found on the decennial long form questionnaire throughout the decade by the ACS, instead of all at once during the decennial census, will profoundly benefit the design, planning, and potential quality of the 2010 Census.

Over 10 years ago, in response to congressional and other stakeholder demands for more current information, the Census Bureau began examining a new approach for gathering census sample data. In lieu of the static, once-a-decade snapshot of the nation's population and housing, Census Bureau experts began researching the feasibility of a continuous survey that would collect and disseminate demographic and socioeconomic data every year. This research culminated in 1994 with the initiation of the ACS development program.

The primary purpose of the ACS development program was to develop the methods for providing timely, accurate, and detailed social, economic, and housing data for demographic groups each year. Testing of these methods began in four test sites and expanded over a four year period to 36 counties. The Census 2000 Supplementary Survey (C2SS) was conducted coincident with the Census 2000 in 1,203 additional counties, using the ACS methods. Data collection activities for the 2001 and 2002 Supplementary Surveys have been continuing in the same counties. These surveys will allow multi-year estimates to be produced and will help demonstrate the data's usability and continuing reliability.

This report is one of a series of reports on analytical studies being conducted that compare the results of Census 2000 and the Census 2000 Supplementary Survey (C2SS). It provides a starting point for measuring and understanding the differences in estimates of the physical and financial characteristics of the nation's housing between those produced in the past by decennial census samples and those to be produced in the future by the ACS. The report describes the basic methods and processes of the ACS and a decennial sample, and relates their distinctions to the differences in the distributions produced by the C2SS and the Census 2000 Sample where they may be applicable. Making these comparisons is important for two reasons: (1) to demonstrate that estimates produced in a continuous manner using ACS methods are sound, and are of high quality, and (2) to help educate users of housing data as they make the transition from decennial census sample estimates to ACS estimates.

The scope of this report is a comparison between the estimates that make up the Profile of Selected Housing Characteristics produced by Census 2000 (Profile Table DP-4) and by the C2SS (Profile Table 4). Comparisons are made between single-year estimates at the national

level and at the county level for selected counties. The methodology used to conduct the analysis is described in detail in Section 4.

In preparing this report, Census Bureau analysts considered the respective purposes of the Census 2000 and its sample, the C2SS, and the full set of methods and procedures for both data collection and estimation tasks. When different methods were used in the C2SS and in the census sample, the rationale for choosing the methods was reviewed and efforts were made to assess the likely impact on the data. When available, analysts integrated the results of other research and analytic projects to provide more insight into possible reasons for differences. Both the C2SS and the Census 2000 Sample estimates are the result of the design and methods chosen to collect and process the required information, and how successfully these methods were carried out. Whenever possible, data are provided that speak to these quality issues. Only those methods that likely contributed to differences seen in the resulting distributions are discussed in detail.

This is the last of a series of Census Bureau comparison reports released in 2004. The reports previously released are:

- A detailed comparison of Census 2000 General Demographic and Housing Characteristics (Table DP-1) with the C2SS at the national level. This profile includes items such as sex, age, relationship, Hispanic origin, race, and tenure.

- A detailed comparison of Census 2000 Social Characteristics (Table DP-2) with the C2SS at the national level. This profile includes items such as school enrollment and disability.

- A detailed comparison of Census 2000 Economic Characteristics (Table DP-3) with the C2SS at the national level. This profile includes items such as employment status and income.

- A detailed comparison of all Census 2000 Profile Table estimates with 3-year ACS estimates for the 36 ACS test counties and their tracts.

- A detailed comparison of quality measures between Census 2000 Sample estimates and 3-year ACS estimates for the 36 ACS test counties. It includes estimates of self-response, unit and item nonresponse, and sample completion.

2. BACKGROUND

The ACS is replacing a national sample survey that has evolved over many decades and whose estimates are used more extensively than any other survey. Information collected from decennial census samples has been responsible for estimating a wide variety of detailed social, economic, and housing characteristics of the nation. The last seven censuses have used sampling to collect information not asked of everyone, and each of these surveys has had different content,

and used different data collection procedures and sampling and estimation methods. The design of the decennial census sample has been constantly evolving, and the ACS is the next step in this evolution. This section provides a short summary of the evolution of the decennial census and ACS sample designs, as well as a discussion of what the housing estimates produced from these two types of collection efforts each represent. A synopsis of the methods used to collect the Census 2000 long form and C2SS data follows. As data users consider the transition from population and housing characteristic estimates derived from a national decennial census sample selected and interviewed once every ten years to estimates derived from a continuous measurement approach that will produce yearly estimates and aggregate them over 5 year periods to approximate recent decennial census sample sizes, it is important that they understand the "old" sample estimates that will no longer be provided, and the "new" sample estimates that will take their place.

The full implementation of the ACS is the next chapter of a dynamic 70-year saga of a work in progress since sampling was first introduced. The ACS is a major innovative step to meeting the nation's need for the kind of information that has previously only been available through the modern census samples and only once every ten years. By adopting the concept of continuous measurement, spreading a sample of about 3 million housing units every year over twelve months to create a workload that can be managed well, the ACS is expected to meet higher standards than what is possible for a decennial sample. The ACS methods should also produce estimates of the traditional census sample content that reference a more consistent time frame and are, therefore, easier to conceptualize and use well.

2.1 The Decennial Census Sample Design

The 1940 census made history by introducing a 5 percent probability sample of the population into the decennial in an effort to collect more information without a noticeable increase in respondent burden (U.S. Census Bureau, 2002). Since this was the one time every ten years when the entire population was contacted, it provided the perfect opportunity to use sampling and conduct a large national survey. It worked so well it was increased to an 20 percent sample in the 1950 census. The modern decennial census sample was introduced in 1960, when the primary sampling unit was changed from the person to the housing unit, and 1 in every 4 units was systematically selected. Data from the 1960 census sample were provided for areas as small as tracts, and sampling's more extensive use introduced moderate amounts of sampling error into the estimates. In an attempt to control the variance, ratio estimation of the sample data to the full census counts was introduced, replacing the simple weighting by the probabilities of selection that had been used previously.

The decennial census sample continued to evolve. Interpenetrating samples of 15 and 5 percent were used in the 1970 census but have not been used since. Differential sampling was introduced in 1980, selecting half of the units in sparsely populated areas to produce more reliable estimates of these areas, while units in the rest of the country were selected at a rate of 1 in 6. A third rate of 1 in 8 for highly populated areas was introduced in the 1990 census, and a fourth rate of 1 in 4 was added in 2000 in less populated areas. Since 1960, the decennial samples have been single-stage systematic samples of housing units, either from lists of

pre-census addresses or from listing books filled by enumerators during the data collection process. All housing units in the country were given a chance to be selected in the sample.

2.2 The ACS and C2SS Sample Designs

The evolution of the ACS sample design is much shorter. From 1995 to 1998 the ACS sample was a simple systematic sample of residential addresses selected from the first versions of the Master Address File (MAF) developed specifically for the ACS test counties.[3] All units had the same initial probability of selection, except when a small test county was purposely oversampled so that yearly estimates could be released. Housing units whose addresses were unmailable were subsampled at a rate of 2-in-3 for personal visit followup, while all other housing units requiring a personal visit were subsampled at a rate of 1-in-3. The census method of differential sampling, i.e., oversampling of small governmental units to produce better estimates of the characteristics of more sparsely populated places and special areas such as American Indian reservations, was introduced into the sampling of the 36 ACS test counties in 1999, using differential sampling rates that mirrored the rates to be implemented in Census 2000. This is the sampling method to be used when the ACS is fully implemented. As in past decennial censuses, the probabilities of the initial selection of housing units in the ACS will differ. However, the design provides a chance for any residential address on the MAF to be systematically selected from all 3141 counties in the nation, and from Puerto Rico.

The C2SS Sample design is not the ACS sample design. To conduct studies of ACS methods and results on a national basis that would allow survey estimates of population and housing characteristics to be compared with those produced by the Census 2000 Sample, 1203 counties were selected to participate in a national test of the ACS methods. A design similar to that of the Current Population Survey (CPS) was used to select these counties, a stratified cluster sample of counties from which addresses within the selected counties were selected using differential rates. A complete description of the sampling of the supplementary counties is documented in the memorandum noted in the References section (Shoemaker, 1998).

The two samples together – the housing units selected from the 36 ACS test counties and those selected from the 1203 supplementary counties – form the complete C2SS sample. Data collected from these two samples produced the C2SS estimates that are compared with the Census 2000 Sample estimates and analyzed in this report. The C2SS national estimates are based on successful interviews with nearly 600,000 housing units, while the Census 2000 Sample estimates are based on successful long form enumerations of about 18 million housing units. When fully implemented, ACS estimates are expected to be based on at least 2.2 million interviews each year.

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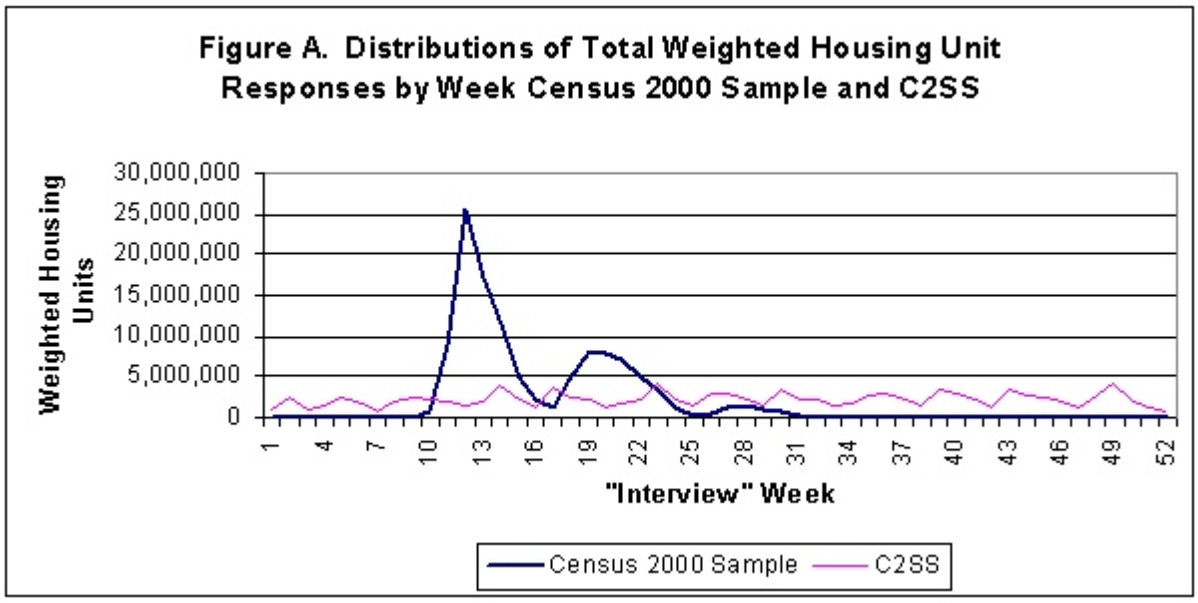
[3] Testing of the newly-designed ACS began in four counties in 1996. The number of test counties increased until 1999, when the number reached 36.

2.3 Interpreting the Estimates Produced by the Decennial Census Sample and the ACS

Estimates produced by the ACS methods are not measuring exactly what decennial samples have been measuring. The ACS yearly samples, spread over 12 months, collect information that is anchored to the day on which the sampled units are interviewed, whether it is the day that a mail questionnaire is completed or the day that an interview is conducted by telephone or personal visit. Individual questions with time references such as "last week" or "last 12 months" all begin the reference period as of the interview date. Even the information on types and amounts of income refers to the 12 months prior to the day the question is answered. ACS interviews are conducted just about every day of the year, and most of the yearly estimates that the survey releases are considered to be averages for that time frame. Decennial census sample estimates are similarly anchored to the day of enumeration. The most obvious difference with the ACS is that the census enumeration time period is about half that of a single year of ACS interviewing. But a more important difference can be seen when the distribution of the dates of interview for a continuous measurement ACS estimate and the dates of enumeration for a decennial census sample are compared.

The figure below illustrates the difference in the way the data collection from fully weighted housing units in the Census 2000 Sample and the C2SS distribute over the census enumeration and the survey interviewing time frames. The week during which the data were collected was determined for each housing unit placed in the Census 2000 Sample and interviewed in the C2SS, and the weighted housing units were then graphed according to their interview week.

The Census 2000 Sample estimates are based on information representing the "interview" dates for the three Census 2000 data collection processes. These were the return of long form questionnaires by mail and the two followup operations – Nonresponse Followup (NRFU) and Coverage Improvement Followup (CIFU). The peaks and time frames of these three data collection activities can be clearly seen in the graph. They do not overlap but are sequential, each operation covering about a third of the overall enumeration period, with self-responses representing the months of March and April, NRFU data representing May and June, and CIFU July and August. The "average" interview date for the Census 2000 Sample data is actually March 27, 2000, early in week 12 of enumeration. Census Day is the last day of week 13.



The fluctuations in the C2SS data collection effort are also very evident. ACS data collection is also done in three phases– Mail, Computer-Assisted Telephone Interviewing (CATI), and Computer-Assisted Personal Interviewing (CAPI) – but during each month all three phases of collection are occurring, each on a different monthly sample of housing units. The peaks and valleys show the ACS mail returns and followup interviews every week, a response pattern that is much less erratic than the decennial pattern, with the phases of data collection conducted for 12 independent monthly samples overlapping each other every month.

The C2SS estimates, therefore, are based on aggregates of monthly data representing both self-responding and nonresponding housing units. For C2SS the "average" time frame of the interviews falls early in week 27, about July 2, 2000.

2.4 Collecting the Information by Adapting to Different Environments

The C2SS and Census 2000 used similar methods of data collection but adapted them to meet their unique goals and very different environments. Census 2000 relied heavily on the mail to enumerate the population in housing units. Because of the enormous size of the task and the tight time frame, targeting replacement mailings of the census questionnaire to addresses that did not respond to the first mailing were not possible and only one questionnaire package was mailed. Follow-up interviews were conducted by nearly 500,000 temporary enumerators who conducted personal visits to complete the enumeration of unresponsive households and vacant housing units. The mailout and enumerator delivery of pre-addressed short and long form questionnaires occurred in March of 2000, and field follow-up operations took place from the end of April to mid-August. All mailed-back questionnaires were returned to one of four

processing centers for data capture, and raw data files were sent to Census Bureau headquarters for post-capture processing. The "100%" data, derived from responses on both short form and long form questionnaires, were captured and processed first to meet the legal deadlines for providing apportionment and redistricting counts to Congress and the states, and to meet the schedule required for the Accuracy and Coverage Evaluation (A.C.E.) operations. The capture of "sample" data was completed once the "100%" capture was finished.

The ACS data collection methods consist of mail, telephone, and personal visit data collection phases spread over a three-month time period for each independent monthly sample of addresses. Every month a unique national sample of addresses is sent an ACS questionnaire. Addresses that do not respond by returning a completed questionnaire are sent a second questionnaire, a step that is easily accomplished because of the manageable monthly sample size. Mail returns that are missing required information are contacted by telephone to obtain the data. Addresses not responding to either mailout are telephoned during the second month of data collection if a phone number for the address is available (CATI), and personal visits are conducted during the third and last month of data collection on a subsample of the addresses still not interviewed (CAPI). Both followup operations are conducted by permanent Census Bureau telephone and field interviewers under close supervision of three call centers and 12 regional offices. Data are collected and captured continuously throughout the year, and data products are to be released every year based on single-year, 3-year, and 5-year accumulations of survey estimates.

Although the content of the Census 2000 Sample and the C2SS were basically the same, the design of the questionnaires and the order in which the information was collected differed. The ordering of the tasks and the flow of the interview for the C2SS mail questionnaire and in the CATI and CAPI instruments was developed for the ACS and was based on the overall design used for the 1970, 1980, and 1990 census long form questionnaires. The C2SS data collection took the following approach:

- decide on household membership and make a list of the members (rostering);
- collect the basic demographic population data for everyone in the household;
- **collect the housing data** *(pages 4 through 6 of the questionnaire);*
- collect the detail population data for everyone in the household, one person at a time.

The C2SS questionnaire placed the rostering and the collection of the basic person demographics together in the first section, using a matrix layout. The housing questions were clearly identified and appeared as a separate section directly following the matrix. Finally, each household member has a separate section covering the detail population questions. The questionnaire has room for complete survey information for 5 household members and for the names of 7 other members on the roster. A telephone operation collected the characteristics of the extra people in households with more than 5 members. The computerized instruments collected all the information for households with up to 20 members.

Census 2000 approached the data collection differently than previous censuses and C2SS. There were actually two different interview flows used in the design of the Census 2000 long form

questionnaire, one for the mail long form and another for the long form completed by enumerators. The ordering of data collection on the mail form was:

- decide on household membership and make a list of the members (rostering);
- collect all the population data for Person 1 (the householder);
- **collect the housing data** *(starting in the second column of page 8 through page 10 of the questionnaire);*
- collect all the population data for everyone else in the household, up to a total of 6.

The roster had room for 12 names, and space was available for complete information to be collected for 6 household members. Persons 1 through 6 had his or her own section in which all population questions – "100%" as well as "sample" – were asked and answered. The housing questions were in the Person 1 section, distinguished from the population items by a small arrow and the statement "Now, please answer questions 33-53 about your household," and were not set apart in their own section and shared a page with Person 1's income questions. Separate population sections for Persons 1 through 6 followed.

The interview flow of the enumerator long form had some elements of the C2SS questionnaire and some elements of the Census 2000 mail long form. The "100%" data were collected in a matrix, but no complete roster of names was made, and the housing questions appeared in the same position in the Person 1 space as they did on the mail form and were introduced with the same statement.

The housing questions– the source of the estimates that are the focus of this report – were clearly identifiable on the C2SS questionnaire and allotted their own space on the form. The Census 2000 long form questionnaires did not place the housing questions in a separate housing section, but integrated them into the Person 1 space, directly following all the population questions for that person. The different positioning and identification of the housing questions as a group may have influenced the results of the housing distribution comparisons in a general way. The housing sections of the C2SS and the Census long form questionnaires, along with the screens that present these questions to the CATI and CAPI interviewers, appear in Appendix B.

3. INTRODUCTION

This report documents the comparison of C2SS and Census 2000 Sample estimates of the physical and financial characteristic of housing units that are included in the profile tables. The physical characteristics of housing include estimates of units in structure, the year the structure was built, the number of rooms in housing units and the number of occupants per room, the year the householder moved into the unit, the number of vehicles available for home use, the house heating fuel used most, the existence of complete plumbing and kitchen facilities and telephone service. The financial characteristics of housing include estimates of property value, mortgage status and selected monthly owner costs, selected monthly owner costs as a percentage of household income, gross rent, and gross rent as a percentage of household income. The Census 2000 Sample distributions are based on data collected from housing units through mail

and personal visit enumerations on long form questionnaires placed in the census sample. The C2SS distributions of these same items are based on data collected from sampled housing units interviewed on mail questionnaires and through Computer-Assisted Telephone Interviewing (CATI) and Computer-Assisted Personal Interviewing (CAPI) instruments used to conduct the followup of housing units that did not respond by mail.

3.1 ACS estimates of physical and financial housing characteristics will provide the critical information needed throughout the decade

In place of decennial census samples, the ACS will now be providing critical estimates of housing characteristics, estimates that will be updated throughout the decade. Areas of at least 65,000 population will have new housing estimates every year, with averages of 3 years of aggregated data released for areas with populations of 20,000 or more, and estimates for other areas of less than 20,000 population based on averages of 5-year aggregates released every year. Housing represents most homeowners' largest investment, and Congress has long recognized the role of housing in the nation's well-being and its commitment to make good quality housing generally available. The Housing Act of 1949 declares "the goal of a decent home and a suitable living environment for every American family". The decennial census, the American Housing Survey (AHS), the Housing Vacancy Survey (HVS), and now the ACS are the barometers which allow us to recognize our successes and identify our deficiencies. The housing data the Census Bureau collects are essential for monitoring the interaction of housing needs, demands, and supply, tracking the changing conditions of the housing stock, and measuring changing costs and accompanying affordability. Programs as wide-ranging as the Department of Housing and Urban Development's (HUD) setting of Fair Market Rents and the Community Development Block Grant Program to the National Income and Products Accounts produced by the Bureau of Economic Analysis will be dependent on this new data source. Instead of only once-a-decade, or even every 2 years, the ACS will be providing data every year that are necessary to meet the needs of these and many more housing programs, data that will reflect the changes occurring in the nation. These data will allow the monitoring of critical housing programs administered at all levels of government and in the private sector, as well as the ability to monitor changes in the both physical and financial aspects of the housing environment at levels of geography not previously possible.

Because of their extensive use of census sample data, HUD commissioned a study that examined the department's uses and needs this data and assessed the feasibility of using ACS data as a replacement. The study categorized their uses of census sample data into allocation formulae, eligibility determinations, program parameters, program operations, monitoring and enforcement, needs assessment, and research and evaluation. The study concluded that ACS could benefit both HUD and its clients in all areas of HUD activities that make use of census sample data and would create no serious problems in current programs that could not be resolved (Eggers, 2002). Other federal agencies are contemplating similar studies.

3.2 The ACS has provided the opportunity to solve the growing conflict between the primary goal of a decennial census and the collection of complete and accurate long form data

Collecting the information desired from a sample of housing units has never been the primary goal of the decennial censuses. As required, the foremost responsibility of the decennial census has always been to determine as complete and accurate a count of the population as possible given the resources available. As the nation has grown and become more diverse, modern decennial censuses have collected a steadily decreasing amount of information from everyone, the set of basic data in Census 2000 including only sex, age, relationship, race, Hispanic origin, and tenure. These data are used for apportionment, redistricting, and to support important legislation such as the Civil Rights Act and the Voting Rights Act. Since obtaining a complete count of the population as of Census Day is the primary goal of the decennial census, priority is given to designing a census that facilitates obtaining this count by the legal deadlines. The introduction of the mailout/mailback method of data collection in 1970 eased the collection of both the basic required data as well as the detailed sample by allowing households to fill out the census questionnaires themselves and return them by mail. This greatly reduced the number of labor-intensive and costly personal visits that had to be made to complete the enumeration. However, the differences between the levels of self-response to the short form with only the required basic "100%" questions and the long form with both the basic and the sample questions became wider with each subsequent census, causing the personal visit nonresponse followup operations to be responsible for the enumeration of progressively higher proportions of long form units. By Census 2000, collection of the sample data from nonresponse housing units – both occupied and vacant – had become less important. Unlike previous censuses, there was no clerical edit of the responses on mail return questionnaires or of the responses on the long form questionnaires completed during the nonresponse followup operations. Also, no attempt was made to collect the required information that was missing from the questionnaires.

From the beginning of its development and testing period, the highest priority of the ACS has been the consistent collection of complete content. By separating the collection of the "long form" data from the decennial census and making it the focus of a specially-designed survey, the Census Bureau has reaffirmed the importance of making available accurate information from a large national sample of housing units. The benefits to the once-a-decade census process are enormous, but so are the benefits to everyone who has come to depend on the estimates of population and housing characteristics that have been produced by the decennial sample. The ACS innovation has been made possible by dividing a sample of 3 million addresses a year into 12 manageable monthly samples, and making use of the best mail and the best followup techniques to collect the data. The continuous nature of the survey also makes it possible to constantly review the quality of the results, and to respond to changing technologies and data demands in a systematic and controlled way.

4. METHODOLOGY

This section describes the methods used to compare the C2SS and Census 2000 Sample results for housing characteristics. The tables included in this report compare final published C2SS estimates with final published Census 2000 Sample estimates.[4] Comparisons consist of simple percentage point differences between the two distributions. Estimates of the margins of error on the differences are shown at the 90 percent confidence level, and those differences that are beyond sampling error are identified. Due to the very large sample sizes, the variances are quite small, resulting in most differences being statistically significant though neither practically nor analytically important. The estimation process for both the C2SS and the Census 2000 Sample controls the national and county total housing estimates to the Census 2000 total housing unit count.

Although only national data tables appear in the report, selected sub-national comparisons are displayed graphically. Estimates from 18 of the 36 counties included in the ACS test sites over the last several years were examined to provide some additional information on how the C2SS and Census 2000 Sample results compare. The differences in the estimates found to be significant at the 90 percent confidence level are provided in Appendix E.

All C2SS and Census 2000 methods were examined to assess whether nonsampling error might be associated with the data they produce and to consider its potential effects on both the C2SS and Census 2000 Sample estimates. Coverage, nonresponse, processing, and measurement errors were studied to be certain that the observed differences were not due to problems inherent in the design of the ACS. In addition, the effect of differences in residence rules, and reference and interview periods were considered. However, because of the interdependencies among errors and methods, the relative effects of these differences cannot be determined. Consequently, this report does not definitively attribute identified differences to specific methods or practices.

The results section of this report documents the outcomes of this analysis and identifies areas in which improvements in ACS methods or additional research are recommended. Every decennial census is different - methodologically as well as procedurally. It is expected, however, that the ACS will be relatively consistent from year to year, improving its methods and processes as errors are found and corrected. This study provided the opportunity to identify systematic differences that may exist in the estimates of the physical and financial characteristics of housing units produced by ACS relative to those produced from the Census 2000 Sample and from decennial censuses in general.

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[4]Other comparison reports in this series have had to recompute Census 2000 estimates for the household population only. Characteristics of housing units as published already exclude group quarters.

4.1 Methods were developed to identify differences

The profile analysis tables in the report compare C2SS and Census 2000 Sample results for units in structure, the year the structure was built, the number of rooms in housing units and the number of occupants per room, the year the householder moved into the unit, the number of vehicles available for home use, the house heating fuel used most, the existence of complete plumbing and kitchen facilities and the availability of telephone service. Also compared are the financial measures of property value, mortgage status and selected monthly owner costs, selected monthly owner costs as a percentage of household income, gross rent, and gross rent as a percentage of household income. Unlike the companion studies analyzing differences in estimates of population characteristics, no special processing was required to make the C2SS and Census 2000 Sample data comparable. However, in order to conduct the statistical tests on the differences in the two distributions, estimates of the standard errors on the Census 2000 Sample results had to be calculated. Standard errors on the C2SS estimates were already available from the survey's normal processing.

4.1.1 Differences between the C2SS and Census 2000 Sample national distributions of housing characteristics were determined and tested for statistical significance, and illustrative measures were derived to guide the analysis

The subject of this analysis is the characteristics shown in **Table DP-4. Profile of Selected Housing Characteristics: 2000** and **Table 4. Profile of Selected Housing Characteristics**, the official Census 2000 Sample and C2SS national-level housing profile tables available on the Census Bureau's website through American FactFinder (AFF). This section describes the contents of the analysis tables comparing these characteristics, how they were produced, and how they should be interpreted. An example of the table for **Year Structure Built** is shown below.

Example Table. Year Structure Built, National-Level Distributions (C2SS compared with the Census 2000 Sample)

Year Structure Built	Census 2000 Sample Estimate (in percent)	C2SS Estimate (in percent)	Difference (C2SS-Census) (in percentage points)	Margin of Error of Difference (in percentage points)	Is the Difference Statistically Significant?
Total housing units	115,904,641	115,904,641	controlled		
1995 to 2000	9.7	9.2	-0.5	± 0.1	Yes
1990 to 1994	7.3	7.3	-0.0	± 0.1	No
1980 to 1989	15.8	15.8	-0.0	± 0.1	No
1970 to 1979	18.5	18.3	-0.2	± 0.2	Yes
1960 to 1969	13.7	13.3	-0.5	± 0.1	Yes
1940 to 1959	20.0	19.9	-0.1	± 0.1	No
1939 or earlier	15.0	16.3	1.3	±0.2	Yes
Gross differences	x	x	2.6	x	x

KEY: Estimates are rounded to one decimal place; a value of 0.0 indicates an estimate of less than 0.05.
Gross differences = the sum of the absolute values of the column differences.

The first row of the table shows the universe on which the percentages in the other rows are based. The universe for this table is total housing units, and is the same for each data source because the C2SS estimate was controlled to the corresponding Census 2000 Sample estimate of total housing. The distributions of the various subgroups or categories in the table rows were calculated and rounded and the Census 2000 Sample percentages and the C2SS percentages for each specified group placed next to each other. In the above example, 13.7 percent of total housing units were estimated by the Census 2000 Sample to have been built from 1960 to 1969. The C2SS estimated this same group of units as representing 13.3 percent of total housing. The "Difference" column shows a rounded result of the simple subtraction of the Census 2000 Sample percent from the C2SS percent for each row before the estimates were finally rounded to one decimal place for the table display. The percentage point differences shown in the table, therefore, will not always reflect the difference in the table estimates. Because of rounding, a difference of ±0.0 does not necessarily mean there was no difference--it only means that the actual difference was less than ±0.05 percent. The rounding to one decimal place was done to avoid over-emphasizing very small and unimportant differences in these distributions.

The last row of every table shows the total gross differences for each column in which differences are displayed. These percentages are simply the sum of the absolute values of all the differences shown in the table for that column. The measure was derived and is used only as a way of comparing the overall levels of difference for individual housing items, as well as the difference levels in the various occupancy status and mode distributions. These rates are not true gross difference rates since the comparisons being made in this study are not based on units that have been matched between the two data source. Their sole purpose is to provide a way of summarizing the relative levels of difference observed for each distribution.

Sampling errors were computed to determine if the differences were statistically significant. Both the C2SS and the Census 2000 Sample are sample surveys and their results are subject to sampling error. To determine if differences beyond those expected due to sampling error existed, variance estimates were calculated on both data sets using methods designed for a complex sample design, and statistical tests were conducted on the differences (U.S. Census Bureau, 2000). This report uses a confidence level of 90 percent as the dividing line for statistical significance and the resulting margins of error are shown. The tables identify when the observed percentage point differences were not explained by sampling error. Due to the large sizes of both the C2SS and the Census 2000 Sample national samples, nearly three-fourths of the differences in the profile analysis tables--no matter how small–were statistically significant. Whenever it is stated that a difference is significant, it means that the difference is *statistically* significant, which may or not represent a meaningful or important difference. A negative difference means that the Census 2000 Sample percent estimate was mathematically larger than the C2SS estimate before it was rounded.

Not all differences that are statistically significant, especially at the 90 percent level, are important or even meaningful. The two samples responsible for producing the national estimates being analyzed are extremely large, and nearly three-fourths of them were found to be significant at this level. The yard-stick adopted for this study is to consider differences of 0.5 percentage points or less as not important. This cut-off is a rather arbitrary one, and it does not take into account the size of the estimates being compared. Using the results provided in the report, readers can set their own standards of comparison, while the main focus of this analysis is on national differences of more than 1 percentage point.

4.1.2 National-level distributions of housing characteristics were computed by mode of data collection and compared to help understand the observed differences

To more fully examine the differences seen at the national level between the housing distributions produced by the Census 2000 Sample and the C2SS, simplified versions of many of the profile analysis tables were produced by mode of data collection, and where possible, by occupancy status. Using variables available on both census and survey data files, the fully weighted Census 2000 Sample and C2SS data were divided into three subsets – all data collected for vacant housing units, data collected on mail return forms for occupied housing units, and data collected by enumerators or interviewers for occupied units. The distributions of characteristics of each subset were calculated and compared, and the resulting percentage point differences between the Census 2000 Sample and the C2SS tabulated, but no statistical testing has been done on these differences. The mode/occupancy comparison tables appear as part of the analysis in the results section of the report. A gross difference measure is also shown as an overall measure of the level of difference between the characteristics for occupied mail and followup units and of vacant units as estimated by the Census 2000 Sample and the C2SS. This measure is simply the sum of the absolute values of the percentage point differences for the mode/occupancy status distribution.

The example of a mode table below is the companion of the profile table example in section 4.1.1. The table shows the separate percentage point differences between the occupied housing

unit distributions based on data collected by mail and the data collected from followup operations. A negative sign denotes that the distribution of the characteristic produced by the Census 2000 Sample was larger than that estimated by the C2SS. Similar percentage point differences between the Census 2000 Sample and the C2SS characteristic distributions for vacant units are also shown in this table because data on the subject is collected for both occupied and vacant housing units. The overall gross difference measure for each mode is shown for each column. Again, no statistical testing has been done on the differences in the mode tables.

Example Mode Table. Year Structure Built, Differences in National-Level Distributions by Mode and Occupancy Status (C2SS compared with the Census 2000 Sample)

Year Structure Built	C2SS Estimate minus Census 2000 Sample Estimate			
	Occupied Units			Vacant Units
Universe	Mail	Followup	Total Occupied	Followup
1995 to 2000	-0.5	-0.1	-0.3	-3.2
1990 to 1994	-0.1	0.5	0.0	-0.3
1980 to 1989	0.0	0.2	0.0	-0.5
1970 to 1979	0.0	-0.6	-0.2	-0.3
1960 to 1969	0.2	-1.2	-0.4	-1.6
1940 to 1959	0.2	-0.2	-0.1	0.0
1939 or earlier	0.1	1.6	0.8	6.0
Gross differences	1.1	4.4	1.8	11.9

KEY: Estimates are rounded to one decimal place; a value of 0.0 indicates an estimate of less than 0.05
Gross differences = the sum of the absolute values of the column differences.

Examining the differences in the housing profile distributions by data collected by mail versus followup methods and separating the results for occupied and vacant units was done to help explain the differences in the profile table comparisons for which margins of error were calculated. The mode tables are used in the analysis to look for general trends in the results, and to relate possible levels of nonsampling error to self-response versus enumerator - or interviewer - collected information.

The possibility that the universes responsible for the results seen in the mode tables differ merely as a consequence of self-selection was considered, and a preliminary analysis has been done to determine if the differences noted in many of the occupied housing distributions are the result of differential self-response rates between the Census 2000 Sample and the C2SS. Specifically, we were concerned about the fact that C2SS estimates are based on a lower proportion of mail returns and a higher proportion of data from followup operations than the Census 2000 sample. Because the demographic composition of the followup population in the C2SS is unlike that of the Census 2000 Sample, the interpretation of the differences as due to the performance of those conducting the followup is potentially compromised. We addressed this concern by decomposing the distributions for **Units in Structure** and **Rooms** into the populations specific to

the characteristics by which mail return rates have been found to differ based on previous research. Cross-tabulations of the mode distributions of these two housing estimates were produced for occupied units according to the householder's race and Hispanic origin, and by tenure. These results showed that the differences between the Census 2000 Sample and the C2SS estimates are always greater for the followup universe than for the self-response universe, regardless of race, origin, or tenure, and that the differences increase as one moves from owner to renter, and from non-Hispanic White to other race/origin categories. However, the patterns discussed in the analysis of **Units in Structure** and **Rooms** – the fact that differences between the distributions are found mostly in the followup mode – still hold across the demographic groups, indicating that the observed mode differences are probably not merely the result of self-selection bias.

4.1.3 County-level data were analyzed to assess sub-national results

ACS methods have been tested in a growing number of selected counties across the nation since 1995. The sample design used in these counties is consistent with the design planned for full implementation in July 2004. The ACS test counties represent a diverse set of areas that vary in size geographically and demographically, reflecting both urban and rural areas with differing demographics. Comparison results from 18 of the 36 ACS test counties are included in this report. The 18 were selected because of their diverse characteristics and locations and the fact that they had sufficient sample sizes to produce reliable single-year estimates. A few summary characteristics for these 18 counties relevant to the subject matter of this report can be found in Appendix D.

The same methods used to produce the national analysis tables were used to produce comparison data for these 18 counties. The comparisons for selected characteristics were graphed and appear in the relevant results section of the report. A "•" symbol is used to mark the census value and a "▲" is used to mark the C2SS value. The graph allows you to see, for each county, the estimated percentages and the differences between them. Bolded symbols indicate that the difference is statistically significant, and all graphs show a range of 50 percentage points, from zero to 50 percent, unless otherwise noted in the results. The counties are ordered vertically by population size, beginning with the least populous test county, Sevier, TN closest to the origin and ending with the most populous, Broward, FL farthest from the origin. An attempt was made to determine if the national findings were also reflected in the selected ACS test counties, or if the national-level results masked important county-level results. The expectation was that national findings of no major differences could mean that some counties differed in one direction while others differed in the opposite direction, netting to no difference at the national level. We also expected that minor differences at the national level could mean that some counties would show no differences while others would have very large differences. The discussion in the results section uses these county-level results to make a preliminary assessment of what national findings might imply for lower levels of geography. We should note here that the larger sample sizes in the counties with the greater populations make it more likely that differences in these counties will be identified as statistically significant. Comparisons of these distributions, while providing some consistent differences across the 18 counties, do not definitively establish the

relationship of county-level housing estimates between the Census 2000 Sample and the C2SS. Analysis of state-level distributions should also be undertaken.

Appendix E includes county-level tables similar to the national profile analysis tables in the results section but displaying only the statistically significant differences between the C2SS and Census 2000 Sample county distributions, not the distributions themselves. As with all comparison tables in this report, a positive value indicates that the C2SS estimated percent was greater than the Census estimated percent, and a negative value means that the C2SS estimate was lower. County-level differences of less than 2 percentage points are not considered too meaningful, and the main focus is on county patterns that involve differences greater than 3 percentage points.

4.2 The design and implementation of survey and census methods were examined

The report systematically reviews ACS and Census 2000 methods to assess whether these methods may have led to differences in results. The fundamentally different purposes of the ACS and Census 2000 and their timing led to critical differences in the choice of methods. Some methods reflect a conscious decision to measure concepts differently. For example, residence rules are instrumental in determining a unit's occupancy status and household membership, and defining the rules in a dissimilar way can affect those two very important estimates. The Census 2000 residence rules, which determined where people should be counted, were based on the principle of "usual residence" on April 1, 2000 in keeping with the census's focus on the requirements of congressional apportionment and state redistricting. The ACS residence rules used in the C2SS were based on a "current residence" concept since data were collected continuously throughout the entire year in a defacto manner, and for the most part without a reference date other than the date of survey contact and interview. This method is consistent with the ACS's focus on producing estimates that reflect yearly averages of the characteristics of all kinds of areas. Differences in reference periods referred to by individual questions were purposive, while some slightly varying question wording was inadvertent. The report examines how well the C2SS and Census 2000 implemented data collection and processing activities. Given the low levels of sampling error, nonsampling error (coverage, nonresponse, measurement and processing errors) must explain essentially all of the statistically significant differences between the distributions of estimates except where the ACS and Census 2000 were intentionally estimating concepts differently.

4.2.1 Coverage error was investigated and may account for some differences

Coverage error--excluding or duplicating housing units from the survey–was addressed by recently defined measures known as sample housing completeness rates. These rates indicate the overall adjustments that were needed to bring Census 2000 long form enumerations placed in the Census 2000 sample and successful C2SS interviews to the level of the full Census 2000 total housing unit counts. The Census 2000 Sample housing unit completeness rate is the ratio of the total housing units placed in the census sample (those meeting the minimal data requirement), weighted by the inverse of their expected probabilities of selection, to the full Census 2000 total housing unit count. The ratio is then expressed as a percent. The housing unit

completeness rate for the C2SS is the ratio of the survey's interviewed units, weighted by the inverse of their initial probability of selection and subsampling factor if applicable, to the full Census 2000 total housing unit, also expressed as a percent. The total housing unit completeness rates for the Census 2000 Sample and the C2SS are estimated to be 91.2 percent and 93.4 percent, respectively, very similar levels of housing unit sample coverage (Dalzell, 2000-2004). The national net undercount rate for housing units in Census 2000 was estimated to be only 0.6 percent (Barrett et al. 2001).

Because the overall net census coverage error is so low and the completeness rates do not substantively differ, we do not believe that coverage error per se is influencing the observed differences in the housing distributions. Housing unit updates were made to the decennial census version of the Master Address File (MAF) throughout the Census 2000 period of enumeration, and samples of these added units were taken. The C2SS sample was selected from a pre-census version of the MAF and did not have the benefit of these additions. However, the more complete census sampling frame did not translate into improved housing unit representation in the Census 2000 Sample, most likely because insufficient information was collected from too many units. The overall Census 2000 sample loss of housing units was greater than the undercoverage of the C2SS sample when measured against the full Census 2000 housing unit count.

To address potential coverage error, most surveys are adjusted to independent controls. These controls are based on the intercensal estimates produced by the Census Bureau's Population Division and represent the nation's population and housing as of July 1 of every year. This step is taken to standardize estimates across all major current surveys at high geographic levels, but the way these intercensal estimates are actually applied can differ from survey to survey. The C2SS did not use the July 1, 2000 intercensal estimates as controls, but instead controlled to the actual Census 2000 count of the household population and total housing units. This was purposively done to minimize possible confusion for data users between the full Census 2000 count results released early in 2001 and the C2SS results released in mid-2001. It also facilitated the many comparison studies slated to be conducted between the C2SS and Census 2000 by eliminating the possibility that differences observed in the data distributions could be the result of using one set of controls for the census sample and another for the C2SS. The Census 2000 Sample was controlled to the full Census 2000 counts at tract levels, using aggregations of population and housing cohorts. The C2SS population controls were applied at the stratum level (mostly to individual counties), using similar Census 2000 population aggregations of age, sex, and race cohorts, by Hispanic and non-Hispanic. C2SS housing estimates were also controlled at the stratum level but only to the census total housing unit counts. Estimates from the Census 2000 Sample of occupied, vacant, owner-occupied and renter-occupied units were controlled to their full census counts, but C2SS estimates of these types of units were not. All housing characteristics estimated by ACS methods, including occupancy and homeownership rates, are determined directly from the survey results.

We are not directly studying the effect of controls on the survey estimates of housing characteristics produced by the C2SS as was done in the comparison of the general demographic characteristics (U.S. Census Bureau, 2004a). The application of the controls to the C2SS

estimates is the last two steps in the C2SS weighting process, and their effect is easily isolated. The census sample weighting process, however, consists of a sequence of ratio-estimating steps that ultimately produce final distributions that are in basic agreement with the census "100%" results. It is not possible to produce "uncontrolled" census sample distributions. Several of the C2SS housing profile table distributions were checked against uncontrolled versions. No changes of note were found. The control adjustments generally brought the C2SS distributions of the housing characteristics closer to those of the Census 2000 Sample but did not change the comparative result. Research to study the effect of controls on the ACS data, particularly at low levels of geography, is planned.

4.2.2 Levels and treatment of unit nonresponse in the Census 2000 Sample and the C2SS must be considered

Unit nonresponse is the failure to obtain sufficient information from a sample unit for it to be considered an interview–a responding unit. Until recently, a unit nonresponse rate had never been derived for a decennial census sample. Because of the need to compare the results of the C2SS and the efficacy of the ACS methods with the Census 2000 Sample results, we defined four response-related measures in a way that was comparable for the C2SS and the Census 2000 Sample. The four measures were the self-response rate and rates of unit nonresponse, item nonresponse, and sample completeness. The results section of this report considers the measures of unit nonresponse and item nonresponse measures in the analysis of individual profile estimates.

The C2SS national unit nonresponse rate was 4.9 percent, which translates into a weighted survey response rate of 95.1 percent. The comparable rate for the Census 2000 Sample was a unit nonresponse rate of 8.8 percent, or a survey response rate of 91.2 percent (Love and Griffin, 2003).[5] These levels of unit nonresponse, at first glance, might not be considered high. However, the noninterview units responsible for these rates come almost exclusively from the followup universes of both surveys. Nationally, one in every five occupied housing units enumerated on census long form questionnaires during followup operations did not meet the minimum data requirements and were dropped from the sample. Sixteen percent of all long form vacant units were also dropped. Therefore, the detailed housing characteristics of these units are, therefore, not represented in the final Census 2000 Sample distributions. The weighting process ratio-adjusts the housing units placed in the census sample to the full census housing unit counts only by their occupancy status and by whether the unit is owned or rented. Noninterviews in the C2SS accounted for about 8 percent of the followup units. The lack of characteristics attributable to these noninterview households was corrected for in the weighting process by a series of three geographic and mode adjustments to the interview data. The data collected from self-response (mail return) households in both the C2SS and on Census 2000 long forms met the minimum data criteria over 98 percent of the time, and thus are very well

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[5]The occupied unit nonresponse rates for the Census 2000 Sample and the C2SS were 8.5 percent and 5.4 percent, respectively. The Census 2000 Sample vacant unit nonresponse rate was 12.1 percent. All vacant units in C2SS were considered interviews.

represented in both the C2SS and the Census 2000 Sample. The tendency of the Census 2000 Sample to be more heavily reliant on data from self-response households and more deficient in its representation of households enumerated by followup operations than the C2SS indicates that there is a higher potential for nonresponse bias to be introduced into the Census 2000 Sample distributions, which may contribute to the differences observed in the comparison of these survey results.

4.2.3 Higher levels of item nonresponse and the accompanying higher allocation rates in some Census 2000 Sample estimates, particularly in the followup data, may be responsible for some of the differences observed

Item nonresponse occurs when a responding unit fails to provide complete and usable information for a data item. Item nonresponse can occur in all data collection modes, often for different reasons. A respondent may fill out a mail form incompletely and omit sections or questions unintentionally. Follow-up interviewers may find an otherwise cooperative respondent unwilling to provide them with sensitive information, such as income. Most item nonresponse was corrected for in both the C2SS and in Census 2000 through the use of an imputation method known as allocation. Allocation occurs when a missing value is supplied from responses present for other members of the same household or from other responding households with similar characteristics that are close geographically.[6] Rates of item allocation are often used as a measure of the level of item nonresponse and are computed as the ratio of the number of eligible housing units or people that had a value allocated for a specific item to the number of housing units or people for which a response was required. The Census 2000 Sample content edits were applied only to the long form enumerations that were placed in the census sample. Similarly, the C2SS edits were performed only on the survey interviews. In both the census and survey processing, these records were not only the source of all imputed data, but donor values were not required to agree with the data collection mode of the donee response record. In other words, mail return data could be used as donors for missing followup answers, and vice versa.

As a rule of thumb when judging levels of item imputation for this study, housing allocation rates that were less than 5 percent were considered to have little influence on final estimates, rates from 5 percent to 10 percent to have possible but not probable influence on final estimates, and rates higher than 10 percent were considered problematic and most likely influencing the results (Schneider, 2004). This categorization was adopted as a convention to simplify analysis. The allocation rates for all housing items involved in this analysis appear in Appendix A, and the reader can decide what level of difference in missing data they might want to consider important or troublesome. Most of the allocation rates are shown separately by mode, and by occupancy status if the data are also collected for vacant units. For many of the housing unit profile items

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[6] The "nearest neighbor" approach to housing data imputation probably works very well in the large decennial sample where the process often results in a donor from the same census block. Since sample units are much more widely dispersed in a recurring survey, research should be conducted on other methods of imputation for missing housing data in the ACS.

overall measures of nonresponse have been produced by adding the applicable unit nonresponse rates to the item allocation rates. These measures appear in the analysis portions of the results section. Housing item allocation rates were consistently lower for the C2SS than for the Census 2000 Sample.

Two ACS methods are expected to reduce item nonresponse – telephone edit follow-up of information missing from mail returns and the use of computer-assisted instruments. Telephone edit follow-up recontacts mail return households whose questionnaires are missing required responses. The full potential of the edit follow-up operation seen in previous ACS testing was not realized with the C2SS because incoming calls concerned with the census hampered the ability to make out-going calls. However, it has been met in the 2001 and 2002 Supplementary Surveys. Appendix A includes allocation rates by mode for some of the 2001 Supplementary Survey (SS01) housing items, and these data indicate the lower levels of allocation for mail returns that had been anticipated from the edit follow-up operation in 2000, and reflect the rates expected to be maintained in future years. The C2SS computer-assisted instruments (used for telephone and personal visit follow-up) included "soft" edits that assessed consistency of response during the actual interviews. These checks of related information during the interview process decreased the amount of inconsistent and missing data that the final content edit and allocation programs had to correct. For some items, particularly those dependent on skip patterns from earlier items in the interview, the instruments were very successful in minimizing the amount of overlooked information, and therefore the allocation rates in the C2SS CATI and CAPI modes (Love, 2004a). The acceptance of "Don't Know" responses in these modes, however, can have a detrimental effect on data completeness and raise imputation rates. The computer-assisted instruments accept these answers as responses, but the final survey content edits, of course, do not. When they occur they are blanked and legal values are imputed. Further analysis is needed on the extent of both "Don't Know" and "Refused" instrument responses to individual housing items.

The Census Bureau's subject matter experts were responsible for designing and specifying the programmed content edits for those instances in which allocation was required. While some of the edit and allocation methods used in the C2SS differed from those used in the Census 2000 Sample, the basic edits were very similar. However, these differences in the rules used in editing and allocation, where they exist, may have contributed to inconsistencies.

4.2.4 Measurement and processing errors may explain some observed differences

Measurement and processing errors can occur for a variety of reasons and are the consequence of errors made during the data collection and data processing stages of the survey. Biemer et al (1991) describe measurement error as having four primary sources - the questionnaire, the mode of data collection, the interviewer, and the respondent. This report considered each of these sources when differences were detected. For example, we considered if the questions were worded differently, if interviewers were trained differently, and if respondents were given the same assistance. Processing error can occur during the series of operations that convert reported data to consistent machine-readable information and published estimates. For example, error will be introduced if the OCR software misinterprets Census 2000 Sample utility cost entries or

if a data entry clerk keys the wrong monthly rent from a C2SS mail return questionnaire. Errors introduced during the editing and file creation process are another possible source of processing error, which may be the result of errors in specification (e.g., incomplete, unclear, or incorrect specifications) or in programming. We reviewed processing methods and procedures as part of this analysis.

Measurement error manifests itself in two broad ways–response and interviewer errors. Response error occurs if a respondent does not understand the meaning of a question or fails to recall the information accurately, or deliberately gives a wrong answer. Interviewer error can also be a source of systematic measurement error if interviewers are not properly trained, if they misinterpret their procedures, or if they implement procedures poorly. Response error, in the form of variance or bias, can result because of a question's design or because respondents simply find the concepts complex and undefined, such as questions about race and relationship. Questionnaire presentation, the way a question is asked, and the response categories provided can affect, either individually or in tandem, how a respondent answers a question. Differences in presentation and wording existed between the C2SS and the Census 2000 long form questionnaires, and may contribute to differences in distributions. Appendix B includes facsimiles of the housing questions as they appeared on the Census 2000 long forms and in the C2SS data collection instruments.

Response error can also occur when the person who provides the information is not the best source. This is often the case when someone other than a household member provides detailed survey information. Responses received from non-household members such as neighbors are referred to as "proxy" responses and, when allowed at all, are usually only accepted when a household member cannot be contacted. Proxy enumerations have always been allowed in the decennial census in order to meet the critical deadline for establishing the count of the population. Only about 80 percent of the occupied nonresponse follow-up enumerations on long form questionnaires in Census 2000 were conducted with household members. That percent increased to 90 percent after households enumerated on long forms that did not meet the minimum data requirements to be part of the census sample were dropped. In the C2SS, proxy interviews were not allowed for occupied households, resulting in survey estimates that are based exclusively on information obtained from the sample households themselves, not from neighbors.

Interviewer error is another source of measurement error that could have contributed to differences. The most obvious contrast between the C2SS and Census 2000 interviewers was the level of training and amount of experience. The C2SS interviewers were highly trained and experienced permanent employees. Of necessity, the Census 2000 workforce was comprised of temporary employees with less experience in soliciting information from respondents. C2SS interviewers were trained to elicit and check responses and were more familiar with some of the complex concepts measured in both the census and the C2SS. For example, it would seem on the face of it that classifying a housing unit as occupied or vacant would be simple; in fact, this

determination can be complex. The more experienced C2SS interviewers would be more likely to understand and correctly apply the vacancy rules.[7]

Processing error is recognized as a form of systematic error that can be introduced when systems or programs designed to capture, edit, and tabulate data include error. Such errors can be attributed to problems in specifications, programming, or implementation, and both Census 2000 and C2SS had many quality assurance procedures in place to control such errors. During this analysis we identified several instances where processing error may have contributed to the observed differences in housing distributions. The differences in data capture methods used to capture and convert the Census 2000 Sample long form information and the C2SS mail return information to computerized response files may have contributed to some inconsistencies in the resultant distributions. About 55 percent of the weighted data in the C2SS estimates were captured from paper questionnaires. The method used was key data entry, and the reported field keying error rate is 0.6 percent (U.S. Census Bureau, 2004b). The remaining 45 percent of the data were from computer-assisted instruments, and the data entry error rate is unknown. Nearly all of the Census 2000 Sample weighted data were captured from paper questionnaires. The census used an optical mark and character recognition system (OMR and OCR) to interpret responses from digital images of the census forms, and write-in fields that could not be read with a fair degree of certainty were sent to data entry keyers for capture. There was considerable variation in the error rates for individual questions depending on whether the method used was OMR (check boxes), OCR (write-ins), or keying (OCR-rejected write-ins). For example, the median errors for mail returns ranged from 0.9 percent for disability items to 8.9 percent for the military battery of questions. Enumerator return errors ranged from 0.8 percent to 20.5 percent for these same item groups. Error rates are not available for individual housing items, but the median error rate for the entire housing section of the Census 2000 long form for mail returns was estimated to be 1.8 percent, and 1.5 percent for enumerator returns (Conklin, 2003).

4.2.5 The impact of different residence rules, reference periods, and data collection time frames was considered

The Census 2000 residence rules were designed to accurately count the population as of April 1, 2000, while the ACS residence rules are designed to collect representative information on a wide range of topics continuously over 12 months, and produce yearly average distributions of these characteristics for all kinds of areas. Differences in residence rules may have contributed to variation in the level of occupancy and to diverse household membership, universes on which the housing and household economic characteristics depend. Census 2000 used a set of residence rules that were based on the principle of usual residence as of April 1, 2000. These rules are premised on the need to establish one and only one residence for each respondent. Establishing one usual residence is critical to minimizing the chance that a respondent will be counted in more than one location. Additionally, the usual residence concept is linked to the Constitutional requirement of a census to support apportionment. In contrast, the

[7] ACS training on classifying vacant units and collecting the required information for them has been deficient. Proposed changes have been made to the training and will be implemented in 2004.

ACS methods call for interviewing nearly every day of the year. A residence rule needed to be adopted that could be easily understood and applied by respondents and interviewers alike and ensured that representative data were collected regardless of when the interview was conducted.

The ACS "current residence" concept recognizes that people can have more than one place where they live or stay over the course of a year, and that estimates of the population characteristics for some areas are affected by these people. Since the ACS is designed to produce a continuous measure of the characteristics of states, counties, and places every year, with the ability to note changes in these characteristics from year to year, a different set of residence rules was needed that allowed better representation of seasonal and migratory groups.

The differences in distributions between the C2SS and Census 2000 caused by the residence rules are most likely minimal for most of the housing data. Even the obvious variation in occupancy status is primarily the result of the three-month data collection design for each sample which relegates most vacant unit interviewing to the third month. The influence of the current resident concept is most likely a secondary cause. However, for certain segments of the population the usual and current concepts can result in different residence decisions. Appreciable differences may occur in areas where large numbers of people spend several months of the year in what would not be considered their residences under the census usual residence concept. In particular, estimated distributions of certain characteristics for states like Florida and Arizona, and for areas like beach, lake, or mountain vacation spots may differ appreciably between the census and the ACS because of their large seasonal populations. Similarly, areas with large colleges or universities may see differences in distributions due to the more defacto nature of the ACS current resident rule.

Related to residence rules is the concept of a reference date. The decennial census centers its count and its age distributions on a reference date of April 1, the assumption being that the remaining "100%" demographic items are also reflecting that date, regardless of whether the enumeration is conducted by mail in March or by a field followup operation in July. However, only one sample question on the Census 2000 long form – mobility – asked for information as of the April 1, 2000 date, while income and agriculture sales are the only other questions that used a date-specific reference that were independent of the housing unit's enumeration date.[8] All other Census 2000 Sample distributions are anchored to the date on which the information was collected. Questions with their own reference periods, such as "last week," are referring to the week prior to the day of enumeration. The idea that all census data reflect the characteristics of the nation as of Census Day is a myth. Decennial samples actually provide estimates based on aggregated data reflecting the entire period of decennial data collection, and are greatly influenced by delivery dates for the mail questionnaires and the time frames of nonresponse data collection operations. Although housing occupancy status is supposedly based on "usual residence" rules and reflects a Census Day occupancy status, none of the census sample housing

[8] The question on mobility asked "Did this person live in this house or apartment 5 years ago (on April 1, 1995)?" The income and agriculture sales questions are the only other Census 2000 Sample items that are date-specific, referring to income received and sales made during calendar year 1999.

questions asks for information that describe the physical or financial characteristics as they existed on April 1.

The ACS occupancy status is established on the interview date itself and is based on a "current residence" rule applied to people staying in the sample unit when it is visited. The resulting ACS estimations of characteristics are reflective of the circumstances on the day the data are collected, or when time period references are made in individual questions, of a period measured from that day. The ACS data also show a pattern of questionnaire mailout and followup operations, but its continuous nature means that self-response and followup interviewing are occurring simultaneously in every month, and therefore producing estimates that better represent average characteristics over time than the census sample.

The Census 2000 Sample housing estimates are, in many ways, quite similar to the C2SS housing estimates in that they are both based on aggregated data collected over a set period of time, and reflecting the physical characteristics of units as of the day of data collection. Similarly, many of the financial characteristics reference a specific time period prior to but starting with the data collection day. The C2SS estimates, however, reflect information that closely represents each month of the entire 2000 calendar year equally. The Census 2000 Sample estimates reflect data collected during 6 months of that same year but cannot be said to represent that 6 month period (see Background). The dissimilarity between what the Census 2000 Sample and the C2SS estimates are actually representing, seen in distribution of enumerated and interviewed weighted housing units across the data collection period, may be the largest contributor to the differences in the Census 2000 Sample and C2SS distributions in general, and in the housing profile tables in particular.

5. RESULTS

This section documents and discusses the comparisons made of the distributions of the estimates of physical and financial housing characteristics that appear in both the C2SS and the Census 2000 Sample Profiles of Selected Housing Characteristics. All data in this report reflect final estimates, fully weighted and controlled in accordance with the Census 2000 Sample and the C2SS weighting and estimation processes. Two sets of data are provided for every housing profile distribution – tables comparing national-level distributions and differences, and selected county-level graphs of specific distributions. A summary of all statistically significant differences in the housing profile distributions for the 18 selected ACS test counties appears in Appendix E, providing sub-national comparisons. Tables showing differences in the national distributions by mode of data collection and, when applicable, by occupancy status appear for most profile tables and are often helpful in explaining and understanding both the Census 2000 Sample and the C2SS data.

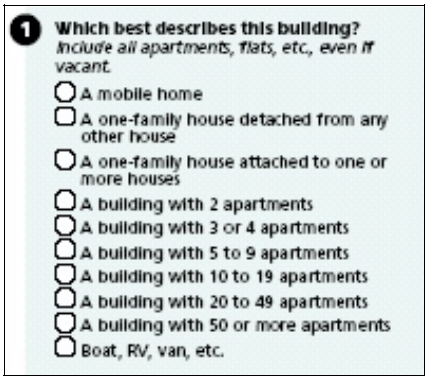
5.1 Units in Structure

5.1.1 Description of Item

Data from this item are used as an integral component by the Department of Housing and Urban Development to set Fair Market Rents for all areas of the country. For a more complete list of federal uses, refer to Appendix C.

Units in Structure appeared as the first question in the housing section of the C2SS questionnaire and the CATI and CAPI instruments. On the Census 2000 long forms, **Units in Structure** was the second question in the housing battery, following **Tenure**. The questions were identical in both wording and layout.

Census 2000 enumerators were provided a flash card for this item so that respondents could select from the 10 possible response categories. The C2SS CAPI interviewers were also given a flash card for this purpose; it was the only housing item for which an ACS flash card was provided. CATI interviewers were supposed to read the list of response categories to the respondent, but in actuality, probably asked whether the unit was a single family house, a mobile home, or an apartment, and based on the respondent's answer probed if necessary for the more exact categorization to select one of the more detailed response categories.


1 **Which best describes this building?**
Include all apartments, flats, etc., even if vacant.
- A mobile home
- A one-family house detached from any other house
- A one-family house attached to one or more houses
- A building with 2 apartments
- A building with 3 or 4 apartments
- A building with 5 to 9 apartments
- A building with 10 to 19 apartments
- A building with 20 to 49 apartments
- A building with 50 or more apartments
- Boat, RV, van, etc.

5.1.2 National Level Comparisons

The estimates shown in Table 1a illustrate the way in which total housing units were distributed into the nine categories of structures in the housing profile tables by the Census 2000 Sample and the C2SS. The response categories for 20 to 49 units and 50 or more units in the **Units in Structure** question were combined. The universe for this item in both the C2SS and the Census 2000 Sample was controlled to the Census 2000 count of total housing units at the national level. For the most part the C2SS data reflect higher estimated units in multi-unit structures from *2 units* to *10 to 19 units*, and lower estimates in large multi-units of *20 or more units* than the Census 2000 Sample. Estimates of *1-unit detached* structures and units classified as *Boat, RV, van, etc.* were slightly lower in C2SS than in the Census 2000 Sample. Only one category – *20 or more* units – differed by more than 0.5 percentage points. The overall gross difference level for the **Units in Structure** comparison in Table 1a is 2.5 percentage points, the lowest level of

gross differences seen in these comparisons between the C2SS and the Census 2000 Sample for a physical housing characteristic based on total housing units.

Table 1a. Units in Structure, National-Level Distributions (C2SS compared with the Census 2000 Sample)

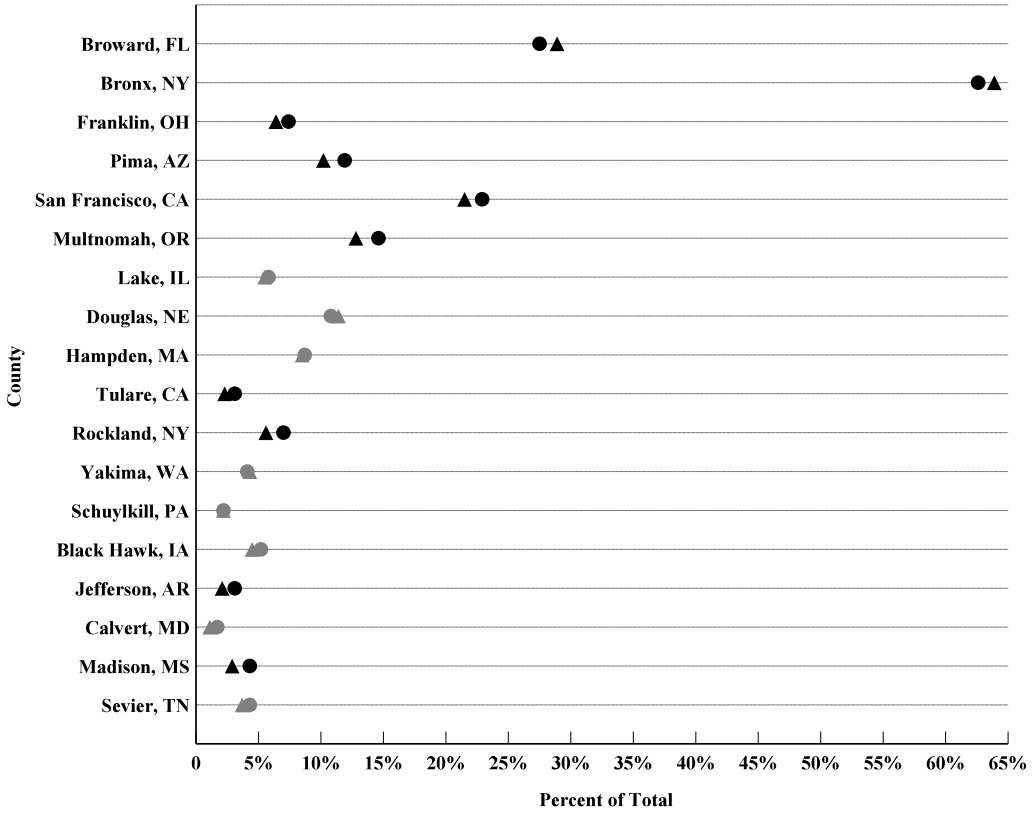
Units in Structure	Census 2000 Sample Estimate (in percent)	C2SS Estimate (in percent)	Difference (C2SS-Census) (in percentage points)	Margin of Error of Difference (in percentage points)	Is the Difference Statistically Significant?
Total housing units	115,904,641	115,904,641	controlled		
1-unit, detached	60.3	60.0	-0.2	± 0.2	Yes
1-unit, attached	5.6	5.6	-0.0	± 0.1	No
2 units	4.3	4.6	0.3	± 0.1	Yes
3 or 4 units	4.7	4.9	0.1	± 0.1	Yes
5 to 9 units	4.7	5.1	0.5	± 0.1	Yes
10 to 19 units	4.0	4.4	0.3	± 0.1	Yes
20 or more units	8.6	7.8	-0.8	±0.1	Yes
Mobile home	7.6	7.5	-0.1	±0.2	No
Boat, RV, van, etc.	0.2	0.1	-0.1	± 0.0	Yes
Gross differences	x	x	2.5	x	x

KEY: Estimates are rounded to one decimal place; a value of 0.0 indicates an estimate of less than 0.05
Gross differences = the sum of the absolute values of the column differences.

5.1.3 County Level Comparisons

Sub-national data for the set of 18 counties were analyzed to determine if the national observations held at these lower levels of geography. Nationally, the *20 or more units* category showed the biggest difference (-0.8 percentage points) between the C2SS and Census 2000 Sample. Figure 1 graphs each pair of county-level estimates of *20 or more units* as percents of total units for each of the 18 counties. Eight of the 10 counties that differed significantly agreed with the national finding that the Census 2000 Sample estimated a higher percentage of units in the largest structures. In the two most populous counties, however – Bronx, NY and Broward, FL – the C2SS actually estimated a higher percentage by 1.3 percentage points. Because of the large percentage of structures in the Bronx with 20 or more units, the range of the graph had to be extended to 65 percent. All differences were less than 2 percentage points, and the actual estimates tracked very well across all 18 counties.

Figure 1. Percent of Units in Structures of 20 or More Units C2SS and the Census 2000 Sample County-Level Estimates



KEY: 1. Census 2000 Sample county-level estimates are shown as circles; C2SS county-level estimates are shown as triangles.
2. Whenever the differences between the two estimates was determined to be statistically significant, the symbols for both the Census 2000 Sample and the C2SS estimates are bolded.

Appendix E, Table 1, identifies the 18 counties and the differences in the **Units in Structure** distributions found to be statistically significant in each. Of further interest may be the *2 units* category. Its percentage point difference nationally was only 0.3 percentage points but the difference in 11 of the 18 counties is statistically significant, with 10 showing higher C2SS percentages in comparison with the Census 2000 Sample. Two of these differences – San Francisco, CA and Franklin, OH – were greater than 2 percentage points.

5.1.4 Analysis

The differences in the **Units in Structure** distribution appear to be very minor, but a few of the categories do need to be compared and discussed. The **Units in Structure** question was asked of all housing units slated for enumeration on census long form questionnaires, both occupied and vacant, and of all housing units in the C2SS sample. The issue with this question goes to whether the entity enumerated was a housing unit or not. The *Boat, RV, van, etc.* category was to be used only for occupied units, since boats, RVs, and similar entities are only considered to be housing units if they are actually occupied as "usual" living quarters in the census, or as

"current" living quarters in the C2SS. In past censuses the **Units in Structure** information has been collected on both the short and long form questionnaires, which allowed the edit of this item to reject data from enumerations placed in this category when they were reported as vacant. In Census 2000, because the **Units in Structure** item was asked only on the long form, these erroneous housing units could only be identified when they were placed in the Census 2000 Sample. Unlike in previous censuses, we could not edit them out of the census housing unit count (Weinberg, 2001a and Weinberg, 2001b). When this mistake occurred in the C2SS, they were identified during editing and deleted from the C2SS sample since they do not represent housing units.

The distributions of the **Units in Structure** differences between Census 2000 and C2SS are shown separately below for occupied and vacant units, and for occupied units enumerated or interviewed by self-response modes (e.g. mail) and by followup operations (NRFU or CIFU in the census; CATI or CAPI followup in C2SS).

When the occupied and vacant units are separated and their distributions compared (Table 1b), it appears that the vacant units are responsible for several of the differences noted in Table 1a. The differences in the percentage of units in structures with *5 to 9 units* and *10 to 19 units* are mainly due to a lower census sample estimates of vacant units in these structures, while the entire difference in the *Boat, RV, van, etc.* category is the result of Census 2000 enumerating such entities as housing units in error. The biggest differences for occupied units occurred in the followup data, with C2SS estimating more *1-unit detached* units than the census sample and fewer structures with *20 or more units* (Table 1b). No statistical testing of the differences in the mode tables has been done, and the results are used only to help understand the reasons for overall differences. Not shown separately in the profile table is the percent of units estimated to be in structures of *50 or more units*. This multi-unit category is responsible for over half of the difference in the collapsed profile category, the census sample estimate again the larger of the two estimates.

Table 1b. Units in Structure, Differences in National-Level Distributions by Mode and Occupancy Status (C2SS compared with the Census 2000 Sample)

Units in Structure	C2SS Estimate minus Census 2000 Sample Estimate			
	Occupied Units			Vacant Units
Universe	Mail	Followup	Total Occupied	Followup
1-unit, detached	0.7	2.4	-0.1	-0.6
1-unit, attached	0.2	-0.2	0.0	-0.4
2 units	-0.3	0.5	0.3	0.6
3 or 4 units	0.0	-0.6	0.1	0.7
5 to 9 units	0.1	0.1	0.4	0.8
10 to 19 units	0.1	-0.1	0.3	1.0
20 or more units	-0.2	-2.2	-0.8	-0.5
Mobile home	-0.7	0.0	-0.1	-0.2
Boat, RV, van, etc.	0.0	0.0	0.0	-1.5
Gross differences	2.3	6.2	2.1	6.3

KEY: Estimates are rounded to one decimal place; a value of 0.0 indicates an estimate of less than 0.05
Gross differences = the sum of the absolute values of the column differences.

The edits performed on the **Units in Structure** data were the same for both the census sample and the C2SS, with the exception of the handling of the "vacant" *Boat, RV, van* cases. These response records were deleted from the C2SS sample since they are not considered housing units and should not have been interviewed, but they remained in the Census 2000 Sample because there was no way to remove them from the full census housing count. However, these records were not allowed to be donors for missing answers in the census **Units in Structure** edit.

The decision to ask the **Units in Structure** question only on the long form in 2000 also meant that the block-level edits that had been applied to data collected by this item in previous censuses could no longer be used. When the item was asked of every housing unit and not just for the sample, answers to the three largest structure size categories were checked against the answers given by close-by units in the same block to see if other respondents also reported living in a structure of this size before they were accepted. Answers that were unsubstantiated were assigned by the edit to what was judged to be the correct lower structure size categories. It was not possible to edit **Units in Structure** in this way in 2000, either in the census or in C2SS, because the data were collected only from a sample.

The comparisons of estimates in the 18 test counties show significant differences between **Units in Structure** categories mostly in the counties with the largest populations, and those differences of over 2.0 percentage points tend to be in different categories in each county (see Appendix E, Table 1).

Considerably more answers to the **Units in Structure** question were missing from the Census 2000 Sample response records than the C2SS response records and had to be imputed by the edit

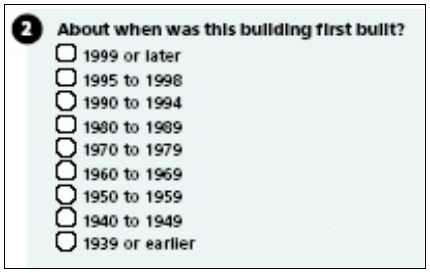
process. The allocation rates for this item appear in Table 1 in Appendix A and are shown separately for occupied and vacant units, and for occupied units responding by self-response modes and those whose information was collected in nonresponse followup operations. **Units in Structure** was the only sample housing item in the Census 2000 Sample whose allocation rates were below 5 percent for each of the mode subsets, even followup. The total housing unit item allocation rate in the Census 2000 Sample was 4.1 percent and the comparable C2SS rate was 1.4 percent. It also is the only housing question that often can be answered by observation, most likely the reason for the low rates of missing answers. If we take unit nonresponse into account along with item nonresponse, the overall level of nonresponse to this item for total housing units was 12.9 percent in the Census 2000 sample (4.1+8.8) and 6.3 percent in C2SS (1.4+4.9). For occupied units it was 12.5 percent and 6.8 percent, and for vacant units, 13.7 percent and 1.8 percent, respectively.

5.2 Year Structure Built

5.2.1 Description of Item

Data from this item are used by several federal agencies in formulas for allocating funds, determining substandard housing and constructing surveys. For example, the data are required for the Department of Housing and Urban Development's Community Development Block Grant Program HOME, and Public Housing Modernization allocation formulas. For a more complete list of federal uses, refer to Appendix C.

The **Year Structure Built** question followed the **Units in Structure** question on both the mail and enumerator Census long forms and the C2SS questionnaire and instruments. The information was collected for all housing units, vacant as well as occupied, and the response option categories on the long form questionnaires and the C2SS mail form, consisting of ranges of years, were identical. Neither Census 2000 nor C2SS provided a flash card to its enumerators or interviewers for this item. CATI interviewers asked the question in an open-ended way, as did the CAPI interviewers. The instrument showed the same response options that appeared on the mail form, and interviewers entered the respondents' answers into the instrument by checking the option that included the answer given.



5.2.2 National Level Comparisons

The distribution of total housing units according to the year they reportedly were built is displayed in Table 2a, along with the difference between the C2SS and Census 2000 Sample distributions and the results of the statistical test of significance on this difference. The largest, and perhaps the only truly important difference is in the estimate of total units built in *1939 or earlier*. This is the only category within the **Year Structure Built** distribution with a higher estimate in C2SS than the Census 2000 Sample. Estimates of units built in the three more recent time frames that differ significantly showed the C2SS result to be less than the Census 2000 Sample result, but none of the differences is greater than 0.5 percentage points. The overall gross differences for the **Year Structure Built** distribution in Table 2 is 2.6 percentage points – comparable to that of the **Units in Structure** distribution comparison.

Table 2a. Year Structure Built, National-Level Distributions (C2SS compared with the Census 2000 Sample)

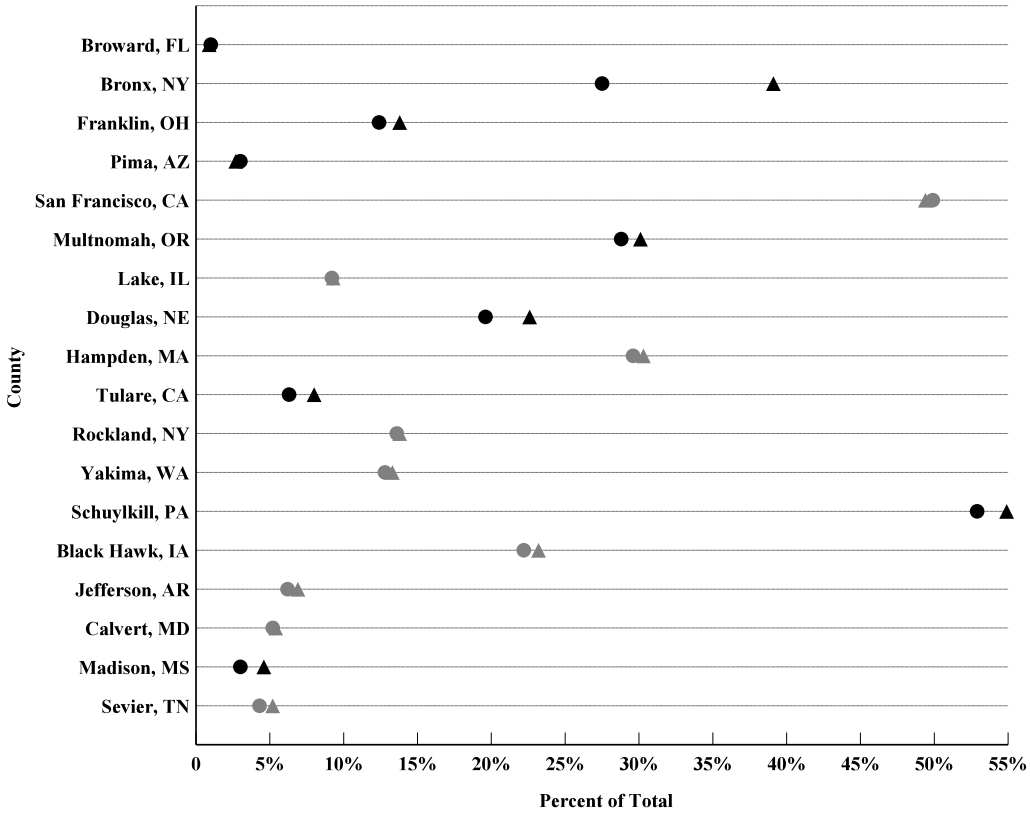
Year Structure Built	Census 2000 Sample Estimate (in percent)	C2SS Estimate (in percent)	Difference (C2SS-Census) (in percentage points)	Margin of Error of Difference (in percentage points)	Is the Difference Statistically Significant?
Total housing units	115,904,641	115,904,641	controlled		
1995 to 2000	9.7	9.2	-0.5	± 0.1	Yes
1990 to 1994	7.3	7.3	-0.0	± 0.1	No
1980 to 1989	15.8	15.8	-0.0	± 0.1	No
1970 to 1979	18.5	18.3	-0.2	± 0.2	Yes
1960 to 1969	13.7	13.3	-0.5	± 0.1	Yes
1940 to 1959	20.0	19.9	-0.1	± 0.1	No
1939 or earlier	15.0	16.3	1.3	±0.2	Yes
Gross differences	x	x	2.6	x	x

KEY: Estimates are rounded to one decimal place; a value of 0.0 indicates an estimate of less than 0.05
Gross differences = the sum of the absolute values of the column differences.

5.2.3 County Level Comparisons

Figure 2 displays the pairs of county-level percentage estimates of the oldest housing units – those built in *1939 or earlier*. It is the "oldest" category that shows the largest percentage point difference nationally between the C2SS and the Census 2000 sample, with C2SS estimating a higher percentage. Significant differences between the percentage of the housing inventory consisting of these oldest units was found in 9 of the 18 counties, with most showing higher C2SS estimates than Census 2000 Sample estimates, especially in Bronx, NY. The distributions themselves show considerable similarities, however, with the exception of the Bronx. This is discussed in the Analysis section below. Note that the scale of Figure 2 was extended to 55 percent to accommodate the results for Schuylkill, PA.

Figure 2. Percent of Units Built in 1939 or Earlier
C2SS and the Census 2000 Sample County-Level Estimates



KEY: 1. Census 2000 Sample county-level estimates are shown as circles; C2SS county-level estimates are shown as triangles.
2. Whenever the differences between the two estimates was determined to be statistically significant, the symbols for both the Census 2000 Sample and the C2SS estimates are bolded.

Appendix E, Table 2, identifies the 18 counties and the percentage point differences in the **Year Structure Built** distributions found to be statistically significant in each. Of further interest may be the "newest" units not shown separately in the profile tables – those built in *1999 or later*. Eleven of the 18 counties show the C2SS estimate of these units as a lower percentage of the housing inventory than the Census 2000 sample, a finding consistent with the national analysis below.

5.2.4 Analysis

The **Year Built** distributions are more consistent than might have been assumed, given the differences in the sampling and time frames. Since the C2SS data collection was conducted continuously during every month in 2000 and the census data collection lasted only from March 2000 to August 2000, the C2SS could theoretically estimate considerably more units built during 1999 and 2000 than the Census 2000 Sample. This, however, was not the case. Units reportedly built in 1999 or 2000 by C2SS were estimated to be only 1.8 percent of the total while the percent in the Census 2000 Sample was estimated to be 2.4 percent. This "new construction" is responsible for the difference seen in the *1995 to 2000* category, most likely due to differences

in the currency of the sample frames. The units interviewed by the C2SS were selected from the Master Address File (MAF) in the summer of 1999 and supplemented by a sample of additional addresses in January 2000. Census 2000 began with a sampling frame of approximately the same vintage as the C2SS but updated that frame several times during the course of the decennial enumeration. A reasonable conclusion is that those units added during the actual census process are responsible for the difference seen in the estimate of the most recently built units in Table 2a.

Table 2b below separates the differences in distributions for occupied units and vacant units, and the differences in distributions for occupied units whose data were collected by self-response modes and those whose data resulted from followup operations. The vacant units seem to be responsible for even more of the differences in **Year Structure Built** between the Census 2000 Sample and C2SS than for **Units in Structure**. The Census 2000 Sample estimated a considerably higher percentage of recently built vacant units (*1995 to 2000*) than did the C2SS. It is likely that this category is larger in the Census 2000 Sample because of the additional units added to the Master Address File (MAF) by operations conducted during the census, especially new construction, that were not reflected in the sampling frame used for the C2SS samples. At the other end of the distribution, the C2SS shows an even larger difference in vacant units built in *1939 or earlier*.

The C2SS consistently estimated a higher percentage of oldest units for all subsets shown – county-level as well as national. More significant differences were actually seen in the smaller populated counties, indicating that difficulty with this question may be greater in the more rural areas, with the exception of areas like Bronx, NY. One of the largest differences of any county-level estimate shown in this report is that of units built in *1939 or earlier* in the Bronx, NY. The Bronx was part of the ACS 3-Year Comparison Study conducted by Joseph Salvo using three years of ACS data. ACS data representing 1999, 2000, and 2001 were aggregated into these same housing profile tables and compared to the Census 2000 Sample results at the neighborhood level. The report, using administrative record data, concluded that the higher ACS estimates of housing units built in *1939 or earlier* were considerably closer to the city's records than the Census 2000 Sample estimates (Salvo, Lobo and Calabrese, 2004).

Table 2b. Year Structure Built, Differences in National-Level Distributions by Mode and Occupancy Status (C2SS compared with the Census 2000 Sample)

Year Structure Built	C2SS Estimate minus Census 2000 Sample Estimate			
	Occupied Units			Vacant Units
Universe	Mail	Followup	Total Occupied	Followup
1995 to 2000	-0.5	-0.1	-0.3	-3.2
1990 to 1994	-0.1	0.5	0.0	-0.3
1980 to 1989	0.0	0.2	0.0	-0.5
1970 to 1979	0.0	-0.6	-0.2	-0.3
1960 to 1969	0.2	-1.2	-0.4	-1.6
1940 to 1959	0.2	-0.2	-0.1	0.0
1939 or earlier	0.1	1.6	0.8	6.0
Gross differences	1.1	4.4	1.8	11.9

KEY: Estimates are rounded to one decimal place; a value of 0.0 indicates an estimate of less than 0.05
Gross differences = the sum of the absolute values of the column differences.

The occupied unit distributions based on the data collected by mail in both the C2SS and the Census 2000 Sample differ the least of all housing profile distributions. It is the information that comes from units that do not self-respond – the vacant units and the followup households – that is the source of most of the differences. Data collected for vacant units in both the Census 2000 Sample and C2SS are deficient, and this is probably responsible for much of the discrepancy in the **Year Structure Built** distributions.

Year Structure Built is the only sample housing item to have a higher occupied unit allocation rate in C2SS than in the Census 2000 Sample, and is one of only two housing items to have a higher allocation rate for occupied units interviewed in C2SS followup operations than in the Census 2000 followup. This question is known to be a difficult one for many respondents to answer, especially renters. In the 1990 census, a "don't know" category was provided for this item, and the nonresponse rate for the range-of-years categories increased dramatically. This option was removed from the item for Census 2000 and has never been a category on an ACS questionnaire. However, the CATI and CAPI followup instruments developed for the ACS allow, as they do for nearly every question, the entry of an "R" or a "D" by the telephone or field interviewer when a respondent refuses to answer the question or claims not to know the answer, respectively. These types of entries in the survey instruments were responsible for the rates of missing data observed in C2SS for this question. Some of the differences in the **Year Structure Built** distributions could be the result of the high rates of allocation that were needed to correct for missing data in both the census and C2SS. Only the data from self-response households had less than 10 percent of the answers allocated. The total Census 2000 Sample allocation rate was 12.7 percent and the total C2SS rate was 14.9 percent. When unit nonresponse is included, however, overall nonresponse to **Year Structure Built** for total housing was 21.5 percent in the census sample and 19.8 percent in C2SS. For occupied units it was 20.2 percent and 18.8 percent, and for vacant units it was 35.1 percent and 29.1 percent, respectively.

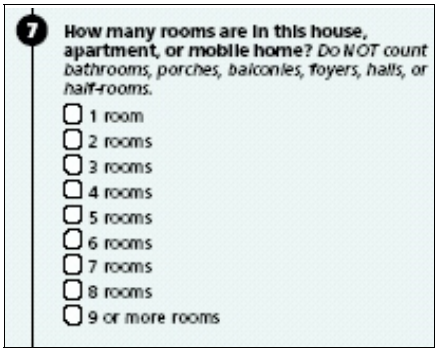
5.3 Rooms

5.3.1 Description of Item

This item is mandated by law to be used in the Department of Housing and Urban Development's Public Housing Modernization Formula. Data from this item are also used in conjunction with other census data by the Bureau of Economic Analysis to develop its state per capita income estimates that are used in the allocation formulas or eligibility criteria of more than 20 Federal programs, such as Medicaid. For a more complete list of federal uses, refer to Appendix C.

The question on the number of **Rooms** was worded differently on the Census 2000 long form than on the C2SS mail questionnaire. The C2SS asked "How many rooms are in this house..." while the census asked "How many rooms do you have in this house....". This slight difference is seen in many of the housing questions. The Census 2000 wording is the traditional decennial wording while the C2SS wording mirrors that used in the ACS. The use of the nonpersonal reference in the housing questions was a purposive change from the 1990 census wording adopted by the ACS in 1995 to make it more inclusive.

Number of **Rooms** was collected for both occupied and vacant sample units in the Census 2000 Sample and in C2SS. The question did not appear in the same sequence on the Census 2000 long form and the C2SS mail questionnaire and the computer instruments, however, and its responses also took different forms. On the two mail questionnaires the answers were indicated by checking a response option category, but the Census 2000 categories were double-banked on the census long form. Answers to the question on the enumerator form were recorded as numeric write-ins, as they were in the C2SS CATI and CAPI instruments.


7 How many rooms are in this house, apartment, or mobile home? *Do NOT count bathrooms, porches, balconies, foyers, halls, or half-rooms.*

- ☐ 1 room
- ☐ 2 rooms
- ☐ 3 rooms
- ☐ 4 rooms
- ☐ 5 rooms
- ☐ 6 rooms
- ☐ 7 rooms
- ☐ 8 rooms
- ☐ 9 or more rooms

5.3.2 National Level Comparisons

The distributions of the data collected by the **Rooms** question from all modes in the C2SS and Census 2000 Sample are shown in Table 3a. **Rooms** is the physical measure of size for all housing units, and seems to differ considerably between the Census 2000 Sample and C2SS. The estimates of largest and smallest units appear to be lower in the C2SS when compared with the Census 2000 Sample, and higher for units in the middle, especially those with *4 rooms* and

5 rooms. The difference of 1.9 percentage points for the *4 rooms* category is the largest of all national differences observed in the comparisons made in the housing profile analysis. The gross difference of 6.0 percentage points is the largest seen in the housing profile analysis tables for an item based on total housing units or on occupied housing units.

Table 3a. Rooms, National-Level Distributions (C2SS compared with the Census 2000 Sample)

Rooms	Census 2000 Sample Estimate (in percent)	C2SS Estimate (in percent)	Difference (C2SS-Census) (in percentage points)	Margin of Error of Difference (in percentage points)	Is the Difference Statistically Significant?
Total housing units	115,904,641	115,904,641	controlled		
1 room	2.2	1.6	-0.6	± 0.0	Yes
2 rooms	4.8	3.9	-0.9	± 0.1	Yes
3 rooms	9.8	10.0	0.1	± 0.1	Yes
4 rooms	16.0	17.8	1.9	± 0.1	Yes
5 rooms	20.9	21.9	1.0	± 0.1	Yes
6 rooms	18.5	18.5	0.0	± 0.1	No
7 rooms	12.1	11.8	-0.3	± 0.1	Yes
8 rooms	8.1	7.5	-0.6	± 0.1	Yes
9 or more rooms	7.7	7.1	-0.6	± 0.1	Yes
Gross differences	x	x	6.0	x	x

KEY: Estimates are rounded to one decimal place; a value of 0.0 indicates an estimate of less than 0.05
Gross differences = the sum of the absolute values of the column differences.

The **Occupants Per Room** statistic in Table 3b is a derived measure reflecting the differences in **Rooms** seen in Table 3a, combined with differences in the household size distribution between the Census 2000 Sample and C2SS. The universe for this table is occupied units, an estimate known to be significantly lower in C2SS than in the Census 2000 Sample. The C2SS results show a considerably lower measure of crowding, i.e., the percent of occupied units with more than one occupant per room, than does the Census 2000 Sample.

Table 3b. Occupants Per Room, National-Level Distributions (C2SS compared with the Census 2000 Sample)

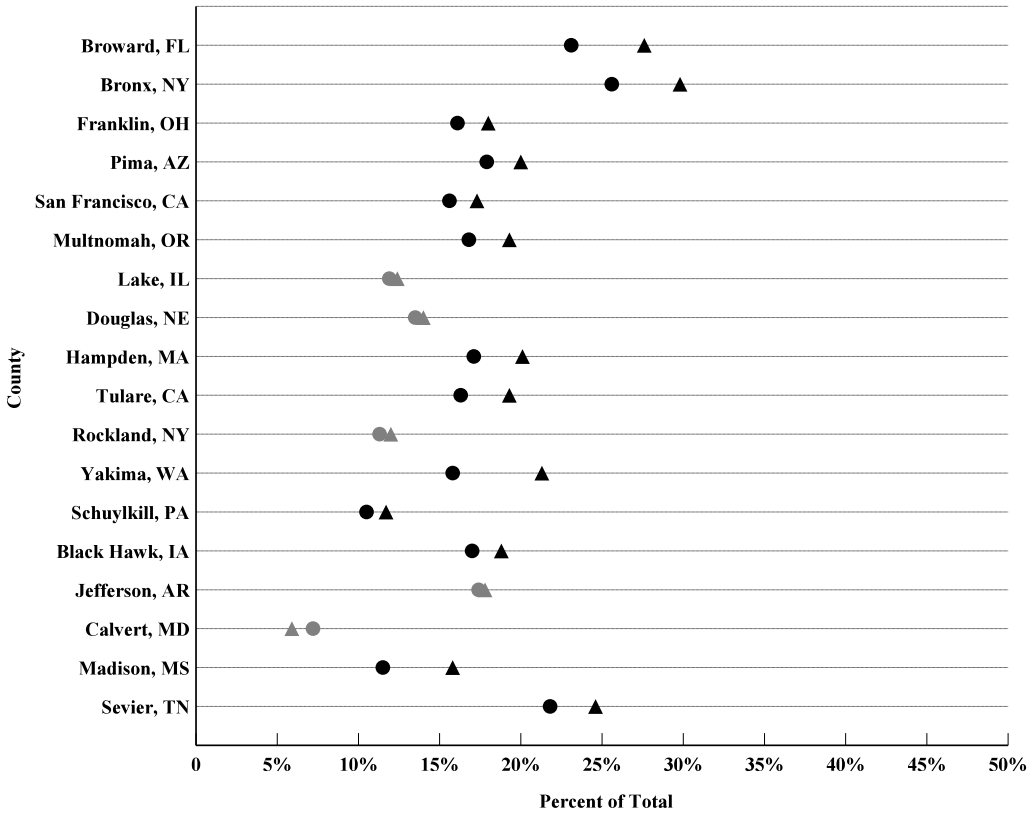
Occupants Per Room	Census 2000 Sample Estimate (in percent)	C2SS Estimate (in percent)	Difference (C2SS-Census) (in percentage points)	Margin of Error of Difference (in percentage points)	Is the Difference Statistically Significant?
1.00 or less	94.2	95.8	1.6	± 0.2	Yes
1.01 to 1.50	3.0	2.7	-0.3	± 0.0	Yes
1.51 or more	2.7	1.4	-1.3	± 0.0	Yes
Gross differences	x	x	3.2	x	x

KEY: Estimates are rounded to one decimal place; a value of 0.0 indicates an estimate of less than 0.05
Gross differences = the sum of the absolute values of the column differences.

5.3.3 County Level Comparisons

Figure 3 illustrates the county-level comparison of the percentage of units consisting of *4 rooms*. This category showed the largest percentage point difference nationally between the C2SS and the Census 2000 sample for the **Rooms** characteristic, with the C2SS significantly higher. The county comparisons agree with the national result. Thirteen of the 18 counties show significant differences in the *4 rooms* category percent, with the C2SS estimating higher percentages in all 13 counties. The county-level data illustrate what appears to be a pronounced overall inconsistency between the Census 2000 Sample and the C2SS distributions of housing by number of **Rooms**.

Figure 3. Percent of Units With 4 Rooms
C2SS and the Census 2000 Sample County-Level Estimates



KEY: 1. Census 2000 Sample county-level estimates are shown as circles; C2SS county-level estimates are shown as triangles.
2. Whenever the differences between the two estimates was determined to be statistically significant, the symbols for both the Census 2000 Sample and the C2SS estimates are bolded.

Appendix E, Table 3a identifies the 18 counties and the percentage point differences in the **Rooms** distributions found to be statistically significant in each. Of further interest may be the smallest units – those in the *1 room* and *2 rooms* categories. Ten counties show significant differences in the percent of *1 room* units, and 9 show significant differences in the percent with *2 rooms*. In every case, the C2SS estimate is less than the Census 2000 Sample estimate. Both

findings are consistent with the national comparative results. Possibly meaningful differences – those greater than 2 percentage points – account for 22 of the 73 significant county-level differences, and 6 of these differences are greater than 4.0 percentage points. The inconsistencies are widespread over all 18 of the counties, regardless of size, but seem to cluster in the smallest and the largest, with significant differences varying in both directions. These results are most likely an indication of a rather widespread difficulty with the concept itself.

The significant differences in **Occupants Per Room** (Appendix E, Table 3b) are very consistent with the profile analysis Table 3b above. All 14 counties with significant differences in the percent of households with *1.00 or less* occupants per room show a higher estimate in the C2SS than in the Census 2000 sample, while the reverse is true for households with *1.51 or more* occupants per room. Most of the significant differences are clustered in the 9 counties with the smallest populations.

5.3.4 Analysis

The differences in the Rooms distributions seem to indicate, at least nationally, that the ACS methods result in fewer small units, more mid-sized units, and fewer large units than the Census 2000 Sample estimated. The gross differences in Table 3a are the largest of all the housing profile distributions involved in this analysis. **Rooms** distribution comparisons between the Census 2000 Sample and C2SS at both the county and tract levels have proven to differ even more. The reason for this is still unclear, but there are many factors that could be contributing to this difference. The separation of the **Rooms** result by occupied and vacant units indicates that some of the biggest differences are in the vacant unit subset, while other large differences occur predominantly in the followup data collected from occupied units. The *1 room*, *2 rooms*, *4 rooms*, and *5 rooms* estimates show the highest inconsistencies in the followup distributions, while the *3 rooms* and *4 rooms* vacant unit estimates differ the most overall. For all subsets, the percentage of *1 room* and *2 rooms* units is higher in the census sample than in C2SS, while the opposite is true for the *4 rooms* units. Several factors are probably at play here, ranging from the effect of proxy information and high levels of response variance on the part of respondents to this question (Singer and Ennis, 2000) to differences in data capture, especially involving the OCR write-in **Rooms** entries on Census 2000 long forms completed in followup.

Table 3c. Rooms, Differences in National-Level Distributions by Mode and Occupancy Status (C2SS compared with the Census 2000 Sample)

Rooms	C2SS Estimate minus Census 2000 Sample Estimate			
	Occupied Units			Vacant Units
Universe	Mail	Followup	Total Occupied	Followup
1 room	-0.4	-1.1	-0.7	-0.4
2 rooms	-0.6	-1.5	-0.9	-1.0
3 rooms	-0.3	-0.5	-0.1	2.1
4 rooms	0.6	1.6	1.7	2.3
5 rooms	0.2	1.8	1.1	-0.1
6 rooms	0.1	0.8	0.2	-0.9
7 rooms	0.2	0.1	-0.2	-0.7
8 rooms	0.1	-0.6	-0.5	-0.7
9 or more rooms	0.2	-0.8	-0.6	-0.6
Gross differences	2.7	9.1	6.0	8.8

KEY: Estimates are rounded to one decimal place; a value of 0.0 indicates an estimate of less than 0.05
Gross differences = the sum of the absolute values of the column differences.

In 1990, **Rooms** was a "100%" question, asked at every housing unit enumerated in the census. For Census 2000 it was moved to the sample, appearing only on the long form, where it joined the **Bedrooms** question. **Rooms** and **Bedrooms** – the latter not included in the housing profiles– have always been edited together, but because **Rooms** was a "100%" item, its responses tended to take precedence over the responses to **Bedrooms**, a sample item. This was because the "100%" edits were run and the results decided before any sample edits were run. The values for **Rooms** could not be changed when the sample edits, in general, and the **Bedrooms** edit, in particular, were run. This meant that the **Bedroom** edit, when faced with an improbable combination of answers, always changed the **Bedroom** response, accepting the **Rooms** response as reported or imputed. Few changes were made in the 1990 joint edit for 2000, and the C2SS edit basically adopted the Census 2000 edit, with one difference. For mobile homes in the C2SS with responses of *9 or more rooms*, the response was accepted but the unit was not allowed to be a donor in the **Rooms/Bedrooms** allocation matrix. In other words, the edit could not propagate more 9-room mobile homes. The Census 2000 edit, however, did not restrict these large mobile homes from the donor pool. Although handled differently, it is unlikely that these mobile homes contributed in any meaningful way to the higher census estimate of units with *9 or more rooms*.

The consistently higher estimates of the small units in the Census 2000 Sample across all subsets shown in the mode table seem to imply a systematic difference for these units, but to date none has been found. With the exception noted for large mobile homes, both edits seem to treat the various **Room/Bedroom** combinations in the same way.

Preliminary analysis was conducted on the mail and followup mode distributions for **Rooms** by determining the demographic compositions of the two subsets as defined by the Census 2000 Sample and the C2SS results. Based on previous research on the patterns of mail response, the **Rooms** data were decomposed by race and Hispanic origin of the household by tenure to determine if the widespread differences could be explained by self-selection bias, given the lower levels of mail return responses in the C2SS compared with the Census 2000 Sample. Perhaps households living in the smaller units – single people or roommates living in apartments – were less likely to mail back a C2SS questionnaire than a Census 2000 long form in 2000, or perhaps a considerably higher proportion of renters self-responded to the census but not to the survey. The preliminary mode analysis showed similar patterns of differences between the mail and followup **Rooms** distributions, regardless of race, origin, or tenure.

Although the gross difference of 6.0 in Table 1a is the largest of any housing profile table, the gross difference in the distribution comparison of mail return data is only a little higher than that for **Units in Structure**. The big differences occur between the two followup distributions and are most likely the key to understanding why the **Rooms** differences are so pervasive. The county-level comparisons show many of the same significant differences and directions in the **Rooms** category as the national comparison (Appendix E, Table 3a).

The differences seen in these distributions are probably the result of several phenomena – the continuing confusion on the part of respondents on the definition of a room, evidenced by the high inconsistency index estimated to be 57.1 for this item by the Census 2000 Content Reinterview Survey (Singer and Ennis, 2000), the continued acceptance of **Rooms** entries over **Bedrooms** entries when the answers are questionable, and the use of information from non-household member proxy respondents in the census. Research is now being conducted on how best to edit the **Rooms**/**Bedrooms** responses, with a goal of improving the joint edit in the ACS by 2005.

The **Occupants per Room** statistics are derived from the estimates of household size and rooms together. We have concentrated here on the size, source, and reasons for the differences in the distributions of number of rooms between the Census 2000 Sample and C2SS. Significant differences also exist between the Census 2000 Sample estimate of the number of occupied units and the C2SS estimate. Differences also exist in the two household size distributions. The occupancy rate for Census 2000 was 91.0 percent and estimated to be 90.4 percent by the C2SS. These differences were discussed in detail in Report 4: Comparing General Demographic and Housing Characteristics to Census 2000. Derived measures like those in Table 3b are only reflecting the differences in the data on which they are based.

Appendix A, Table 3 shows the various allocation rates calculated for **Rooms**. The allocation rates for data collected from the self-response and followup modes for occupied units were higher for the Census 2000 Sample than for C2SS, as were the rates for vacant units. Only the allocation rates for vacant units in both surveys were inordinately high – 24.2 percent in the census and 19.4 percent in C2SS. Taking into account unit nonresponse, the overall rate of nonresponse to **Rooms** for total housing was 16.6 percent in the Census 2000 Sample and

9.1 percent in C2SS. For occupied units it was 14.7 percent and 8.0 percent, and for vacant units it was 36.3 percent and 19.4 percent, respectively.

Nearly all vacant units in C2SS are identified and interviewed in the CAPI data collection stage. This means that these units are physically much farther apart than most occupied units in C2SS. Most housing edits rely on "nearest neighbor" matrices to provide answers that are missing. This type of imputation works well when the donors and donees are close to each other, and less well when they are not. It is quite likely that the "nearest neighbor" approach to imputation may not be as unbiased when used in a survey like the C2SS as it would be in a decennial census sample.

5.4 Year Householder Moved into Unit

5.4.1. Description of Item

This item is needed by federal agencies, such as the Departments of Health and Human Services and Housing and Urban Development, to calculate turnover among specified population groups such as the elderly and minority households. For a more complete list of federal uses, refer to Appendix C.

The **Year Householder Moved into Unit** question directly followed the **Year Structure Built** question on all housing unit instruments, paper as well as computerized. The question was worded slightly differently, the Census 2000 long forms referring to "this person" while the C2SS mail questionnaire referring to "Person 1 (listed in the List of Residents on page 2)". In the CATI and CAPI instruments the question references the name of the householder supplied earlier in the interview. The method used to record the answer on the paper questionnaires also differed. The Census 2000 long forms provided six categorical ranges of years as response options, while the C2SS provided two write-in spaces, one for "Month" and one for "Year". The inclusion of "month moved in" in the **Year Householder Moved in** question for ACS was to allow the survey to tabulate answers by the length of time the householder had lived in the sample unit, since the information is collected from a new sample every month. The CATI and CAPI followup instruments also treat this question as a two-part write-in. The "Year" write-in entries from the C2SS mail forms and the instruments are coded to the ranged categories during processing.

5.4.2 National Level Comparisons

The **Year Householder Moved into Unit** is obviously based only on occupied housing units, a universe that is 0.6 percent larger in the Census 2000 Sample than in the C2SS, a statistically significant difference. The C2SS estimate of the percentage of householders who moved into sample units from *1995 to 2000* is 1.2 percentage points higher than the Census 2000 sample estimate – a difference worth noting. Each of the other four profile categories are lower in the C2SS than the Census 2000 Sample, three of them significantly if not substantively lower. Overall, this distribution differs less than the previously discussed ones, with gross differences of 2.4 percentage points, most likely because few categories are displayed.

Table 4. Year Householder Moved into Unit, National-level Distributions (C2SS compared with the Census 2000 Sample)

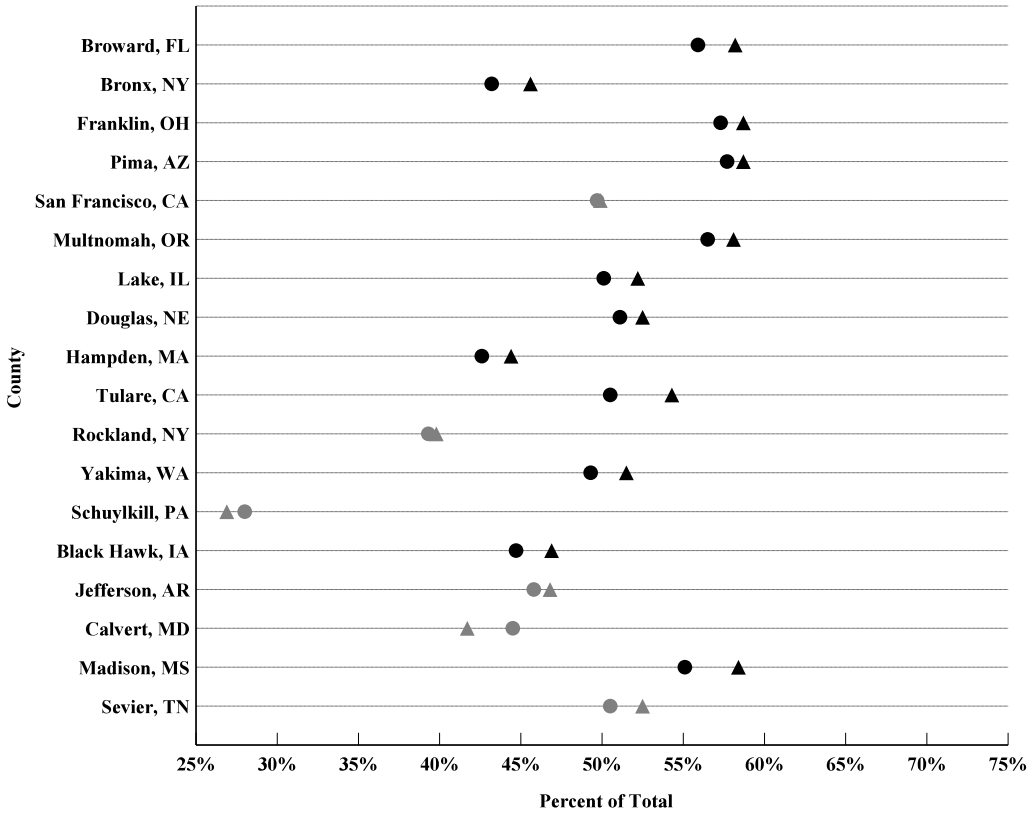
Year Householder Moved into Unit	Census 2000 Sample Estimate (in percent)	C2SS Estimate (in percent)	Difference (C2SS-Census) (in percentage points)	Margin of Error of Difference (in percentage points)	Is the Difference Statistically Significant?
Total occupied units	105,480,101	104,819,002	-661,099		
1995 to 2000	48.8	50.0	1.2	± 0.2	Yes
1990 to 1994	16.1	15.5	-0.6	± 0.1	Yes
1980 to 1989	15.6	15.5	-0.1	± 0.1	No
1970 to 1979	9.9	9.5	-0.3	± 0.1	Yes
1969 or earlier	9.7	9.4	-0.2	± 0.1	Yes
Gross differences	x	x	2.4	x	x

KEY: Estimates are rounded to one decimal place; a value of 0.0 indicates an estimate of less than 0.05
Gross differences = the sum of the absolute values of the column differences.

5.4.3 County Level Comparisons

Figure 4 illustrates the county-level comparison of the percentage of units whose householder moved into the unit from *1995 to 2000.* This most recent category had the largest percentage point difference nationally, and the county comparisons appear to mirror the national result. Twelve of the 18 counties show significant differences in the percent of units in the *1995 to 2000* category, with C2SS estimating higher percentages in all 12 of the counties. The pattern of high and low estimates are similar in both the Census 2000 Sample and the C2SS. Note that the scale in Figure 4 goes from 25 percent to 75 percent instead of from 0 to 50 percent to accommodate the county results.

Figure 4. Percent of Occupied Units into which Householder Moved in 1995 or Later C2SS and the Census 2000 Sample County-Level Estimates



KEY: 1. Census 2000 Sample county-level estimates are shown as circles; C2SS county-level estimates are shown as triangles.
2. Whenever the differences between the two estimates was determined to be statistically significant, the symbols for both the Census 2000 Sample and the C2SS estimates are bolded.

Appendix E, Table 4 identifies the 18 counties and the percentage point differences in the **Year Householder Moved into Unit** distributions found to be statistically significant for each. Only 9 of the 27 significant differences are greater than 2 percentage points, none differs by more than 3.8, and most occur in the less populated counties.

5.4.4 Analysis

The estimates produced to reflect the **Year Householder Moved into Unit**, since they are based on a question asked only of occupied units, or households, is affected by the design of the C2SS data collection, which mirrors the ACS methods. The reasons for the significant differences between the estimates of occupied units in Census 2000 and C2SS have been discussed at length in Report 4 of this series. The difference is a result primarily of the ACS's 3-month design which tends to estimate more occupied housing units than other surveys because the identification and interviewing of nearly all vacant units does not occur until the third and final month of data collection for each sample. This design has been shown to produce higher occupancy rates when compared with results from the 1990 census and the Current Population Survey (CPS). The unique ACS "current residence" rule that determines occupancy status based

on whether anyone is staying in the sample unit for more than two months also has a tendency to increase the yearly occupancy rates in highly seasonal areas with migratory populations who meet the current residency requirement.

The Census 2000 Sample estimate of households is not consistent with this previous analysis, as its national estimate exceeds the C2SS household estimate by over half a million. The Census 2000 Sample estimates of occupied units is controlled to the full Census 2000 count of occupied units.

The category in Table 4 indicating the most recent moves of households is a collapsing of the first two categories in the Census 2000 Sample and C2SS housing profile tables.[9] This was done because the first category in each table did not reflect the same time period. The two categories combined were 1995 to 1998 and 1999 to 2000. As explained earlier with **Year Structure Built**, the C2SS data are an average of the survey responses that cover the entire calendar year 2000, while the census category is a distribution covering answers given during the months of March through August 2000. Much of the difference seen in Table 4 between the percentage of the Census 2000 Sample and C2SS most recent movers is in the 1999 to 2000 subgroup (18.2 percent vs 22.0 percent), a result to be expected since the C2SS covered the entire time frame during that period, with similar amounts of data collected during each of the months. The differences in the most recently built units estimated by the **Year Structure Built** item were primarily the result of vacant units, not occupied units. The comparative results of these two items considered together seem logical.

Appendix A, Table 4 shows that the levels of allocation needed to adjust for item nonresponse to the **Year Householder Moved into Unit** item are in the moderate range, with rates below 10 percent for both mode subsets. The largest difference in allocation rates is between the Census 2000 Sample and C2SS followup data. Considering the effect of unit nonresponse on occupied unit data, the overall level on nonresponse to this item was 14.7 percent in the Census 2000 Sample – 6.2 percent allocation + 8.5 percent occupied unit nonresponse – and 9.1 percent in C2SS – 3.7 percent allocation + 5.4 percent occupied unit nonresponse.

5.5 Vehicles Available

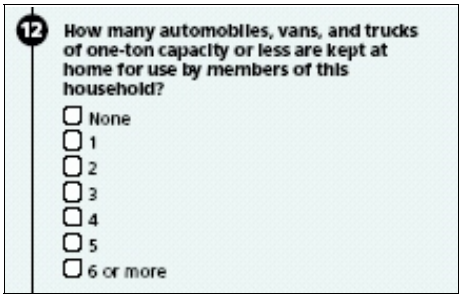
5.5.1 Description of Item

This item provides, in combination with place of work and journey to work, data that are essential for transportation programs under the Intermodal Surface Transportation Efficiency Act of 1991. For a more complete list of federal uses, refer to Appendix C.

The question on **Vehicles Available** was identically worded except for the C2SS reference to "this household" and the Census 2000 long form reference to "your household," a difference that

[9]The data in this profile table are weighted by the housing unit weight and not the person weight of the householder.

exists for most of the housing and household economic questions. The information was collected only for occupied housing units, and response option categories on all paper questionnaires allowed respondents to select from a list of check boxes labeled from "none" to "6 or more". The C2SS CATI and CAPI instruments asked the question and entered the response as a numeric write-in, which was coded to the categories during processing. The profiles for both the Census 2000 Sample and the C2SS collapsed the results into four groups, combining the estimated occupied units reporting more than 2 vehicles into the category "3 or more".



5.5.2 National Level Comparisons

The C2SS distribution shows a smaller percent of occupied units than the Census 2000 Sample with *no vehicles available* or with only *1*, and a considerably higher percent of households with *3 or more* vehicles. A modal response of two vehicles per household seems to be agreed upon, however. Each of the individual pre-coded categories on the questionnaires but not shown separately in Table 5a – 3, 4, 5, and 6 or more – show C2SS with a slightly larger estimated percentage than the Census 2000 Sample.

Table 5a. Vehicles Available, National-Level Distributions (C2SS compared with the Census 2000 Sample)

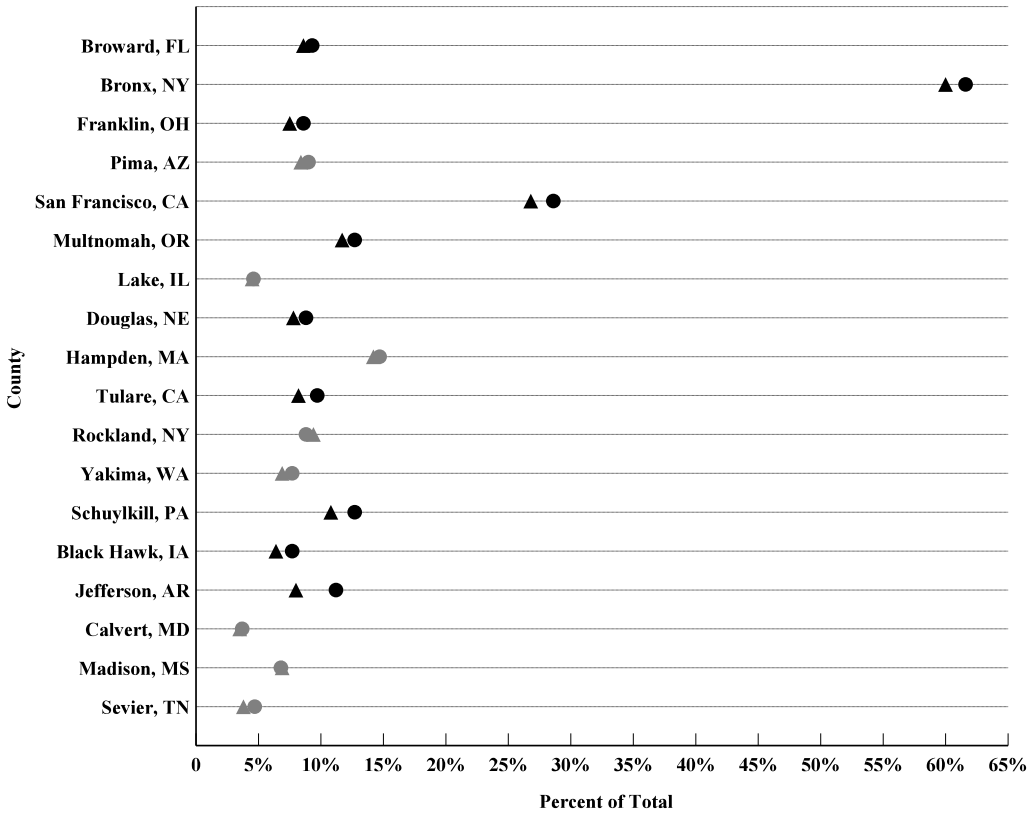
Vehicles	Census 2000 Sample Estimate (in percent)	C2SS Estimate (in percent)	Difference (C2SS-Census) (in percentage points)	Margin of Error of Difference (in percentage points)	Is the Difference Statistically Significant?
Total occupied units	105,480,101	104,819,002	-661,099		
No vehicles available	10.3	9.4	-0.9	± 0.1	Yes
1	34.2	33.8	-0.4	± 0.1	Yes
2	38.4	38.5	0.2	± 0.2	No
3 or more	17.1	18.3	1.2	± 0.1	Yes
Gross differences	x	x	2.7	x	x

KEY: Estimates are rounded to one decimal place; a value of 0.0 indicates an estimate of less than 0.05
Gross differences = the sum of the absolute values of the column differences.

5.5.3 County Level Comparisons

Figure 5 illustrates the county-level comparison of the percentage of occupied units with *no vehicles available*. The difference between this percent in the C2SS and the Census 2000 sample was significant for 10 of the 18 counties, with the Census 2000 Sample estimate higher in all 10. All *no vehicles available* differences were less than 2 percentage points. Nationally, it was the *3 or more* category with the largest percentage point difference. At the county level, the difference in the *3 or more* percents was significant in only 7 of the 18 counties, but the C2SS percent was higher than the Census 2000 Sample for all seven. The range of Figure 5 was extended to 65 percent to accommodate the results for Bronx, NY.

Figure 5. Percent of Occupied Units with No Vehicles Available C2SS and the Census 2000 Sample County-Level Estimates



KEY: 1. Census 2000 Sample county-level estimates are shown as circles; C2SS county-level estimates are shown as triangles.
2. Whenever the differences between the two estimates was determined to be statistically significant, the symbols for both the Census 2000 Sample and the C2SS estimates are bolded.

Appendix E, Table 5 identifies the 18 counties and the percentage point differences in the **Vehicles Available** distributions found to be statistically significant in each. Only 5 of the 24 significant differences were greater than 2 percentage points, all occurring in the counties with lesser populations. No counties with populations placing them in the upper half of the group experienced a difference greater than 1.7 percentage points.

5.5.4 Analysis

The comparison results for this rather simple question are very different from the results of the previous, seemingly more complex, housing questions. The differences in the estimates of **Vehicles Available** in Table 5a are surprising, since the question would seem to be quite straightforward. However, even the mode distributions vary from those of previous housing item comparisons in this report. Uncharacteristically, it is the self-responding households that seem to be responsible for the distribution differences in estimates of household with *no vehicles available* and those with *3 or more*, while estimates of households with only *1 vehicle* differ most when the information was collected in followup operations. However, the county-level comparisons indicate possible meaningful differences only in the lesser populated counties, particularly concerning the *no vehicles available* category. The Census 2000 Sample estimate of occupied units with *no vehicles available* is always higher, while the estimate of *3 or more vehicles* is always lower.

Table 5b. Vehicles Available, Differences in National-Level Distributions by Mode (C2SS compared with the Census 2000 Sample)

Vehicles	C2SS Estimate minus Census 2000 Sample Estimate			
	Occupied Units			Vacant Units
Universe	Mail	Followup	Total Occupied	Followup
No vehicles available	-1.8	-0.4	-0.9	n/a
1	-0.3	-1.7	-0.4	n/a
2	0.5	1.1	0.2	n/a
3 or more	1.6	1.0	1.2	n/a
Gross differences	4.4	4.2	2.7	x

KEY: Estimates are rounded to one decimal place; a value of 0.0 indicates an estimate of less than 0.05
Gross differences = the sum of the absolute values of the column differences.

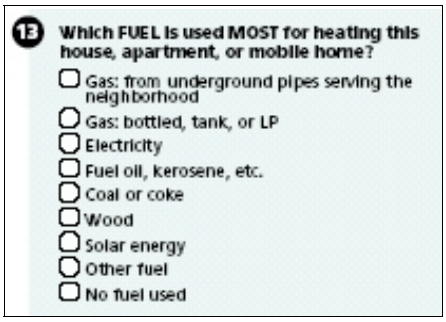
Appendix A, Table 5 shows the various allocation rates computed for **Vehicles Available**. The difference between the Census 2000 Sample allocation rate for **Vehicles Available** and the C2SS rate is one of the largest, especially between followup operations. Nearly 12 percent of all the occupied units enumerated in a followup operation and placed in the Census 2000 Sample were missing an answer to this question, compared with less than 2 percent of the C2SS households interviewed during CATI/CAPI operations. The census allocation rate for mail return data was 4.1 percent and the C2SS rate was 1.5 percent, so it is very unlikely that the difference seen in the self-response distributions were the result of item imputation. The high missing data rate for this question in the Census 2000 followup operations is odd. Was this the result of proxy respondents not knowing or not wanting to provide this information for a neighbor, or was it that enumerators just did not ask the question? Regardless, the C2SS distribution for this item is likely more accurate if only because it is more complete and restricted to non-proxy information. The overall nonresponse for occupied units, considering both the unit level and the item level, was 14.7 percent for the Census 2000 Sample and 7.0 in C2SS.

5.6 House Heating Fuel

5.6.1 Description of Item

This item is used as a basic indicator of the adequacy of the American housing stock and provides information useful for estimating energy consumption. For a more complete list of federal uses, refer to Appendix C.

The question on **House Heating Fuel** was asked only of occupied units and was worded identically on the C2SS and Census 2000 long form questionnaires and in the C2SS CATI and CAPI instruments. Census 2000 enumerators were given a flash card for this item to help respondents select from the nine response option categories during followup operations, while the C2SS CAPI interviewers were not. Both the CATI and CAPI interviewers treated the question as open-ended but coded the respondent's answer into the same list of response categories that were on both the C2SS mail questionnaire and the Census 2000 long forms, probing if necessary to distinguish among categories.



5.6.2 National Level Comparisons

Little difference between the Census 2000 Sample and the C2SS is seen in the **House Heating Fuel** national distributions. The only difference worth noting is for *utility gas*, with the Census 2000 Sample estimating a higher percentage of use. The other differences found to be statistically significant do not appear to be meaningful, as attested to by the low level of gross differences for a table with nine categories. The county-level and the mode distributions tell us more about these results.

Table 6a. House Heating Fuel, National-Level Distributions (C2SS compared with the Census 2000 Sample)

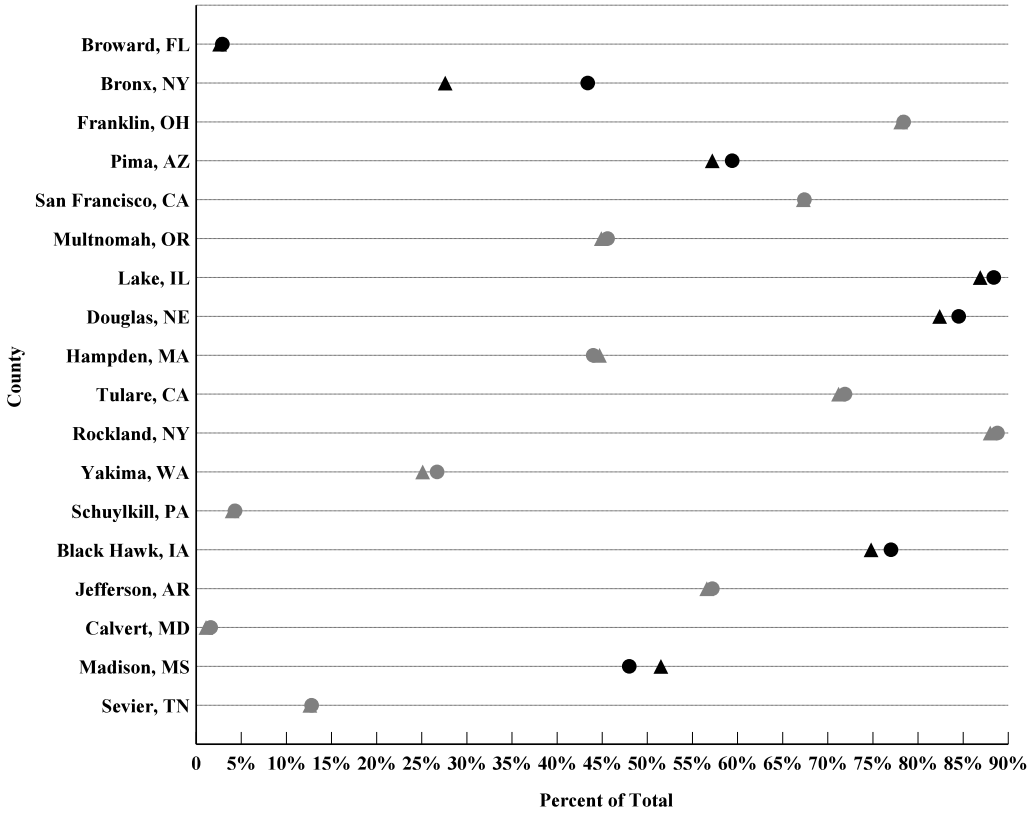
House Heating Fuel	Census 2000 Sample Estimate (in percent)	C2SS Estimate (in percent)	Difference (C2SS-Census) (in percentage points)	Margin of Error of Difference (in percentage points)	Is the Difference Statistically Significant?
Total occupied units	105,480,101	104,819,002	-661,099		
Utility gas	51.2	50.2	-1.0	± 0.4	Yes
Bottled, tank, or LP gas	6.5	6.5	-0.1	± 0.2	No
Electricity	30.4	30.8	0.4	± 0.3	Yes
Fuel oil, kerosene, etc.	9.0	9.4	0.4	± 0.2	Yes
Coal or coke	0.1	0.2	0.0	± 0.0	Yes
Wood	1.7	1.7	0.1	± 0.1	No
Solar energy	0.0	0.0	-0.0	± 0.0	No
Other fuel	0.4	0.5	0.1	± 0.0	Yes
No fuel used	0.7	0.8	0.1	± 0.0	Yes
Gross differences	x	x	2.2	x	x

KEY: Estimates are rounded to one decimal place; a value of 0.0 indicates an estimate of less than 0.05
Gross differences = the sum of the absolute values of the column differences.

5.6.3 County Level Comparisons

Figure 6 illustrates the pairs of county-level estimates of the percent of households in the 18 counties estimated to use *utility gas* most to heat their homes. Of the 8 counties with significant *utility gas* differences, only one, Madison, MS, showed a C2SS estimate higher than the Census 2000 Sample. The largest discrepancy between the C2SS and the Census 2000 Sample estimates of *utility gas* use was seen in the Bronx, NY, where the C2SS estimate was 15.7 percentage points lower than the Census 2000 Sample estimate. Because of the wide range of results for the counties, the scale of Figure 6 was extended from 50 percentage points to 90 percentage points.

Figure 6. Percent of Occupied Units using Utility Gas Most for Heating C2SS and the Census 2000 Sample County-Level Estimates



KEY: 1. Census 2000 Sample county-level estimates are shown as circles; C2SS county-level estimates are shown as triangles.
2. Whenever the differences between the two estimates was determined to be statistically significant, the symbols for both the Census 2000 Sample and the C2SS estimates are bolded.

Appendix E, Table 6 provides the comparison results of all **House Heating Fuel** categories for the 18 sample counties that were found to be statistically significant. Thirty estimates of a total of 162 measuring the fuel used for heat in the 18 counties differed significantly between the C2SS and the Census 2000 Sample. Only 12 of the 30 differed by more than 2 percentage points. With the exception of the Bronx, the differing counties tended to be the smaller, more rural ones. The direction of the differences in the use of *electricity* was the opposite of the *utility gas* result, with 8 of the 9 counties having higher C2SS estimates of *electricity* use than the Census 2000 Sample. Once again the Bronx results showed the opposite. Offsetting the large difference in *utility gas* usage in the Bronx seen in Figure 6 is the even larger difference in *fuel oil, kerosene, etc.*, with a C2SS estimate higher than the census by 23.9 percentage points, the largest comparison difference found in this study.

5.6.4 Analysis

The rather close agreement in the **House Heating Fuel** distributions at the national level mask a problem brought to light by the county comparisons. In areas with high percentages of large old multiunit structures occupied by renters, disconcertingly different **House Heating Fuel**

distributions may have occurred between the Census 2000 Sample data and the C2SS. Evidence of this can be seen in the extremely large differences in the **House Heating Fuel** distributions in Bronx, NY (Appendix E, Table 6). As with the **Year Structure Built** question, in areas consisting largely of large and very old rental apartment buildings, most occupants probably do not know the answer to the **House Heating Fuel** question. As part of the ACS 3-Year Comparison Studies, expert knowledge of the Bronx housing stock and the heating fuels provided point to high levels of response error in the Census 2000 Sample followup results, with the C2SS estimates more accurately reflecting the area (Salvo, Lobo and Calabrese, 2004).

As we have seen in the analysis of most of the housing profile estimates so far, the mail return distributions for the Census 2000 Sample and the C2SS are very similar. **House Heating Fuel** self-response differences are the lowest seen, although the characteristic has, like **Units in Structure** and **Rooms**, nine tabulated categories. Regardless, the largest differences in both the mail and the followup distributions are seen in the percent of households reporting *utility gas* as the most used heating fuel. The category differs by only 1.0 percentage point overall, with the Census 2000 Sample having the higher estimate, but when comparing only self-response units the C2SS has the higher estimate. It is the Census 2000 followup data that is responsible for the higher Census 2000 Sample *utility gas* estimate, showing a level of usage that is 2.4 percentage points higher than seen in the C2SS followup data. The slightly higher *electricity* and *fuel oil* estimates overall in the C2SS are also mainly the result of higher rates of use reported in the C2SS followup operations compared with the census followup operations.

The slightly higher C2SS *utility gas* rate for the self-response occupied units may be related to its being the first fuel listed of nine. There is evidence that selecting a single **House Heating Fuel** category is difficult for some, and this raises the possibility that some of the differences may be due to the way that the C2SS and Census 2000 data capture methods treated multiple answers to this question. As described earlier, the C2SS capture method was a data entry keying of answers from mail return questionnaires, while Census 2000 data capture system created digital images of the paper questionnaires and used optical mark recognition (OMR) for precoded answers and optical character recognition (OCR) with keying backup for write-in entries. Only one answer was allowed to the **House Heating Fuel** question. If and when more than one answer was given and the correct one could not be determined, the C2SS keyers were to key the first one marked in the list. When the Census 2000 OMR interpretive software was unable to select an answer from multiple marks it did not capture an answer.

The slightly higher *utility gas* estimate for self-response units in C2SS may be related to the "key the first box" capture procedures, at least in part. Recent analysis of raw Census 2000 capture files showed that the **House Heating Fuel** item was, by far, the single-response item that most often had more than one response category marked on the Census 2000 long form (Love, 2004b). The study estimated that about 2.6 percent of mail return long forms with responses to this item actually had more than one category marked. Even the rate for enumerator-filled forms was slightly over 2 percent. If C2SS self-respondents had similar levels of difficulty selecting a single answer to this question and one of their selections was *utility gas*, the survey's data capture procedures would select *utility* gas as the answer, tending to produce higher estimates for this category than would the census procedure, which would impute an answer. No multiple

responses were possible in the automated instruments used in C2SS followup operations. We do not know the extent to which the CATI and CAPI interviewers had to help respondents arrive at a single response. Perhaps more than one response to this question should be permitted.

Table 6b. House Heating Fuel, Differences in National-Level Distributions by Mode (C2SS compared with the Census 2000 Sample)

House Heating Fuel	C2SS Estimate minus Census 2000 Sample Estimate			
	Occupied Units			Vacant Units
Universe	Mail	Followup	Total Occupied	Followup
Utility gas	0.7	-2.4	-1.0	n/a
Bottled, tank, or LP gas	0.0	-0.2	-0.1	n/a
Electricity	-0.6	0.8	0.4	n/a
Fuel oil, kerosene, etc.	0.1	1.1	0.4	n/a
Coal or coke	0.0	0.0	0.0	n/a
Wood	-0.1	0.4	0.1	n/a
Solar energy	0.0	0.0	0.0	n/a
Other fuel	0.0	0.2	0.1	n/a
No fuel used	0.0	0.1	0.1	n/a
Gross differences	1.5	5.2	2.2	x

KEY: Estimates are rounded to one decimal place; a value of 0.0 indicates an estimate of less than 0.05
Gross differences = the sum of the absolute values of the column differences.

The amount of imputation needed for **House Heating Fuel** was considerably less in the C2SS than in the Census 2000 Sample – 2.1 percent versus 7.4 percent. The allocation levels needed to correct for missing followup data differ even more, with a Census 2000 Sample rate of 10.1 percent and a C2SS rate of 2.8 percent (Appendix A, Table 6). The overall level of nonresponse to this item, including occupied unit nonresponse, was 15.9 percent for the Census 2000 Sample and 7.5 percent for C2SS.

5.7 Selected Indicators of Housing Quality (Selected Characteristics)

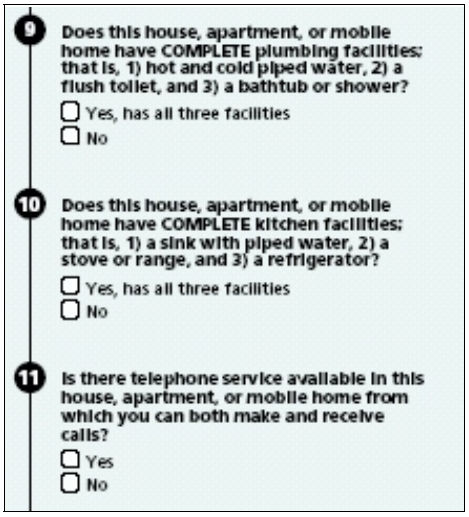
5.7.1 Description of Item

These items are used as indicators of housing quality and are needed by federal agencies to identify areas eligible for public assistance programs and rehabilitation loans. For a more complete list of federal uses, refer to Appendix C.

The **Selected Characteristics** questions appeared in the order shown in Table 7 on the Census 2000 long forms, the C2SS mail questionnaire, and in the C2SS CATI and CAPI instruments. The complete plumbing and kitchen questions, however, were worded slightly differently. The C2SS asked “does this house, ... have complete plumbing facilities,” while the census asked “do you have complete plumbing facilities in this house...”. The telephone

availability question was worded identically on the Census 2000 long forms and the C2SS mail questionnaires and CATI and CAPI instruments.

The complete plumbing and kitchen questions were asked for all housing units, vacant as well as occupied, and the wording of each question included a description of the three facilities that were required to be considered complete. The answer categories are simply "Yes" or "No". The telephone service question, also requiring only a "Yes" or a "No" response, was asked only of occupied housing units.



5.7.2 National Level Comparisons

The estimates of **Selected Characteristics** were shown only for occupied housing units in the profile tables and in Table 7 below, although data on the lack of complete plumbing or a complete kitchen were also collected for vacant units by both the C2SS and the Census 2000 Sample. Although the differences between the Census 2000 Sample and the C2SS estimates are very small, so are the estimates themselves. The universe for these items tend to differ more between the Census 2000 Sample and the C2SS than do the **Selected Characteristics.**

Table 7. Selected Characteristics, National-Level Distributions (C2SS compared with the Census 2000 Sample)

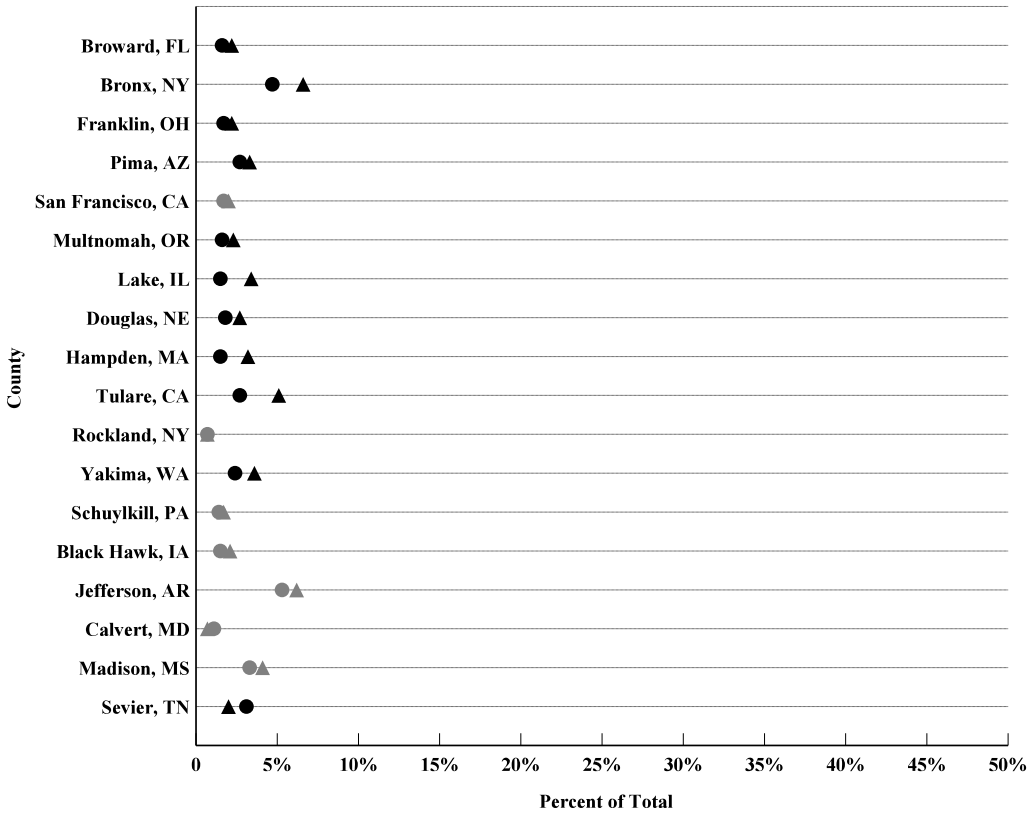
Selected Characteristics	Census 2000 Sample Estimate (in percent)	C2SS Estimate (in percent)	Difference (C2SS-Census) (in percentage points)	Margin of Error of Difference (in percentage points)	Is the Difference Statistically Significant?
Total occupied units	105,480,101	104,819,002	-661,099		
Lacking complete plumbing facilities	0.6	0.5	-0.1	± 0.0	Yes
Lacking complete kitchen facilities	0.7	0.6	-0.1	± 0.0	Yes
No telephone service available	2.4	3.0	0.6	± 0.1	Yes
Gross differences	x	x	0.8	x	x

KEY: Estimates are rounded to one decimal place; a value of 0.0 indicates an estimate of less than 0.05
Gross differences = the sum of the absolute values of the column differences.

5.7.3 County Level Comparisons

Figure 7 illustrates the pairs of estimates for the 18 counties of the percent of occupied units with *no telephone service available.* Of the eleven counties with significant differences in this estimate, only Sevier, TN showed a C2SS estimate lower than the Census 2000 sample.

Figure 7. Percent of Occupied Units with No Telephone Available C2SS and the Census 2000 Sample County-Level Estimates



KEY: 1. Census 2000 Sample county-level estimates are shown as circles; C2SS county-level estimates are shown as triangles.
2. Whenever the differences between the two estimates was determined to be statistically significant, the symbols for both the Census 2000 Sample and the C2SS estimates are bolded.

Appendix E, Table 7 identifies the 18 counties and their individual significant percentage point differences between the C2SS and Census 2000 sample for the **Selected Characteristics** of *lacking complete plumbing facilities*, *lacking complete kitchen facilities*, and with *no telephone service* available. Occupied units lacking complete plumbing and kitchens have become rare events, especially in non-rural areas, and errors tend to overstate, not understate, the lack of completeness. Every one of the 13 significant county-level differences in these two characteristics shows a Census 2000 sample estimate that is higher than the C2SS estimate.

5.7.4 Analysis

The three **Selected Characteristics** estimates are in close agreement at both the national and the county levels of comparison. The statistically significant differences between the Census 2000 Sample and the C2SS are all below the yard-stick set for this study. However, the differences are quite large when you consider that the estimates themself are quite small, at least in the case of the plumbing and kitchen facilities. The estimates of units *lacking complete plumbing facilities* and *lacking complete kitchen facilities* are becoming more and more problematic.

Housing units lacking complete facilities are now very rare, and many negative responses to these two questions may be due to respondents misunderstanding the questions. The two questions are asked in a complex way, a single statement with many parts, and can be confusing. The differences in these characteristics between the Census 2000 Sample and the C2SS are most likely response error.

The lack of available telephone service impacts many more households, but it may also be subject to mounting misinterpretation of what "availability" means as the nature of telephone service and people's perception of it changes. Cell phones and mobile phone numbers are becoming for many the primary method of voice communication, especially for younger adults and households with teenagers. Perhaps the higher percentage of households answering "No" to this question in the C2SS is reflecting that change, especially since the survey's data represent an average for an entire year. It is also possible that some respondents may answer "No" because they are opposed to anyone calling back to ask them more questions.

The three **Selected Characteristics** are among the items with the lowest overall levels of allocation in both the C2SS and the Census 2000 Sample. However, when dealing with rare events such as these, particularly when the results may involve possible response error, even low item allocation rates may impact the final estimates. Appendix A, Tables 7a, 7b, and 7c, show these rates by occupancy status and mode. Again, the unit nonresponse rates should be added to the allocation rates to get an overall measure of nonresponse to these items.

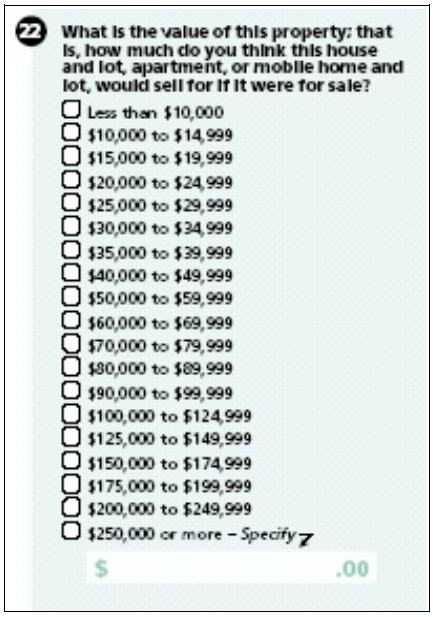
5.8 Property Value

5.8.1 Description of Item

This item is used by the Departments of Housing and Urban Development and Health and Human Services to develop housing assistance plans for elderly, low-income, and handicapped individuals. For a more complete list of federal uses, refer to Appendix C.

The wording of the **Value** question was the same for the C2SS and the Census 2000 long form, but there were important differences between the way responses were recorded. The Census 2000 long form questionnaires had 24 response option categories consisting of ranges of values while the C2SS mail form had only 19, followed by a write-in space for responses above $250,000. The CATI and CAPI survey instruments treated every **Value** answer as a numeric write-in and not as a ranged response category. When a respondent did not provide an exact answer, the interviewer asked for a value range and entered in the instrument the midpoint of the range as the response. All numeric entries in the C2SS were assigned to the same response option categories that appeared on the Census 2000 long form during data processing.

Census 2000 enumerators were provided a flash card for this item to help respondents select an answer from one of the 24 categories. A flash card was not used in the C2SS CAPI followup because the answer was not provided as a ranged category.



5.8.2 National Level Comparisons

Value of the property is asked only for the universe of owner-occupied housing units and vacant units that are for sale only. The housing profile table and Table 8a reflect data collected only from a subgroup identified as "specified owner-occupied units". This universe is made up of single family homes (1 unit detached or attached) on less than 10 acres without a business or medical office on the property. When **Value** is tabulated for vacant units the universe is restricted to "specified" vacant units that are for sale only, a "specified" vacant unit defined as a single family unit on less than 10 acres.

Surprisingly, given the variation in the way some answers were recorded, only one significant categorical difference in the national distribution of **Value** in Table 8a is greater than 0.5 percentage points. These are specified owner-occupied units valued from *$300,000 to $499,999*, which were found to be a larger percent of the housing inventory by the C2SS than by the Census 2000 Sample. The overall gross differences for the **Value** comparisons is the smallest of any housing profile table except **Selected Characteristics**.

Table 8a. Value, National-Level Distributions (C2SS compared with the Census 2000 Sample)

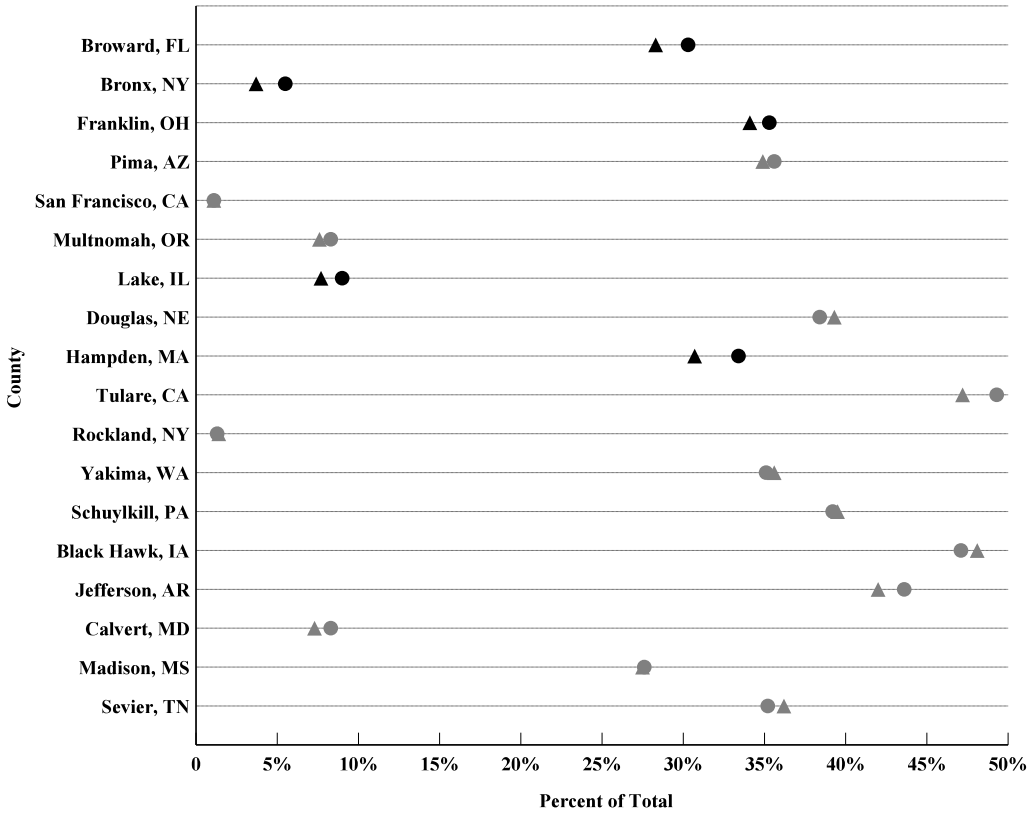
Value	Census 2000 Sample Estimate (in percent)	C2SS Estimate (in percent)	Difference (C2SS-Census) (in percentage points)	Margin of Error of Difference (in percentage points)	Is the Difference Statistically Significant?
Specified owner-occupied units	55,212,108	55,003,077	-209,031		
Less than $50,000	9.9	9.5	-0.3	± 0.3	Yes
$50,000 to $99,999	30.4	30.1	-0.3	± 0.3	No
$100,000 to $149,999	23.7	23.8	0.1	± 0.3	No
$150,000 to $199,999	14.6	14.6	0.0	± 0.2	No
$200,000 to $299,999	11.9	11.6	-0.3	± 0.2	Yes
$300,000 to $499,999	6.5	7.2	0.7	± 0.1	Yes
$500,000 to $999,999	2.4	2.5	0.1	± 0.1	Yes
$1,000,000 to more	0.6	0.5	-0.0	± 0.0	Yes
Gross differences	x	x	1.8	x	x

KEY: Estimates are rounded to one decimal place; a value of 0.0 indicates an estimate of less than 0.05
Gross differences = the sum of the absolute values of the column differences.

5.8.3 County Level Comparisons

Figure 8 illustrates the pairs of county-level Census 2000 Sample and C2SS estimates of the percent of specified owner-occupied units in the 18 counties valued from *$50,000 to $99,999*. This category did not have the largest national difference, but all 5 of the 18 counties with significant percentage differences showed the Census 2000 sample with higher estimates.

Figure 8. Percent of Specified Owner-Occupied Units Valued from $50,000 to $99.999 C2SS and the Census 2000 Sample County-Level Estimates



KEY: 1. Census 2000 Sample county-level estimates are shown as circles; C2SS county-level estimates are shown as triangles.
2. Whenever the differences between the two estimates was determined to be statistically significant, the symbols for both the Census 2000 Sample and the C2SS estimates are bolded.

Appendix E, Table 8 identifies the 18 counties and their individual significant percentage point differences between the C2SS and Census 2000 Sample for the eight **Value** categories shown in Table 8a. Five counties showed significant differences in the percent of specified owner-occupied units valued from *$300,000 to $499,999,* the value category with the largest national difference. The estimates in 4 of the 5 counties showed the C2SS with a higher percentage of these units than the Census 2000 sample.

The C2SS estimates track well with the Census 2000 Sample estimates across the counties. None of the 18 counties had more than three categories differing significantly between the two data sources.

5.8.4 Analysis

The national comparisons of the **Value** distributions between the Census 2000 Sample and the C2SS are not following the general pattern seen in the previous housing profile comparisons. The categories shown in Table 8a are arrived at by collapsing the census questionnaire precoded range categories. Most of the C2SS data were not precoded answers but dollar responses to the

Value question collected during followup operations by CATI and CAPI instruments and mail responses of more than $250,000. This difference alone could be expected to result in slightly different distributions, since asking **Value** as a write-in has been assumed more difficult for respondents than asking them to pick a precoded range of values. Although not shown in Table 8a, there is little difference in the estimated percentage of specified owner-occupied housing units valued at $250,000 or more. The C2SS percentage of properties valued at $250,000 or more was 21.8 percent and the Census 2000 Sample percent was 21.4. The units valued from *$300,000 to $499,999* show the largest difference in the two national distributions, and most of this difference is in data from self-response units, the C2SS having a higher estimate than the Census 2000 Sample. This is the only housing profile distribution in which estimates based on data collected from self-responding households seem to differ more than estimates based on data from followup households, but the differences are not major.

There are surprisingly few large differences in the two distributions of **Value**. The universe of specified owner-occupied units is itself significantly higher in the Census 2000 Sample than in C2SS, a phenomenon that may be related not only to the higher census estimate of occupied units but also to the ACS current residence rule. This rule may have a tendency to decrease the estimate of owner-occupied units and increase the estimate of renter-occupied units over the course of a year since people can qualify as current residents in places other than where they usually live. Their usual, perhaps owned, residence would be considered vacant, while their current residence may be rented. The lowest **Value** category – properties worth *less than $50,000* – represents a higher proportion of units in the Census 2000 Sample than in the C2SS sample, and is due primarily to differences in the followup data distributions. The census followup estimates, like the self-response estimates, are based completely on ranged response category check box entries while the C2SS followup estimates are based on dollar amount responses later coded during processing into the 24 census detailed categories that appeared on the census long form questionnaires.

Table 8b. Value, Differences in National-Level Distributions by Mode and Occupancy Status (C2SS compared with the Census 2000 Sample)

Value	C2SS Estimate minus Census 2000 Sample Estimate			
	Occupied Units			Vacant Units
Universe	Mail	Followup	Total Occupied	Followup
Less than $50,000	-0.5	-1.2	-0.3	-3.0
$50,000 to $99,999	-0.9	0.5	-0.3	2.7
$100,000 to $149,999	0.3	0.4	0.1	-1.1
$150,000 to $199,999	0.2	0.1	0.0	-0.6
$200,000 to $299,999	-0.4	0.2	-0.3	0.2
$300,000 to $499,999	1.0	0.3	0.7	1.1
$500,000 to $999,999	0.3	-0.1	0.1	0.8
$1,000,000 to more	0.0	-0.1	0.0	-0.1
Gross differences	3.6	2.9	1.8	9.6

KEY: Estimates are rounded to one decimal place; a value of 0.0 indicates an estimate of less than 0.05
Gross differences = the sum of the absolute values of the column differences.

The differences in the Census 2000 Sample and C2SS **Value** distributions for vacant units are disturbing. If the **Value** profile table had included these results, several categories would probably have shown larger and more meaningful differences. Neither the C2SS nor the Census 2000 Sample did a complete job of collecting this information for vacant units.

The rate of allocation of **Value** to the specified owner-occupied universe of units was about 12 percent for the census sample and nearly 9 percent in the C2SS. These rates were each about a percentage point lower than the allocation rates for all occupied units (see Table 8a, Appendix A). The allocation rate for the C2SS CATI and CAPI operations, however, were slightly higher than the Census 2000 Sample rate for both occupied and vacant units. Based on the analysis of the previous housing items, we have come to expect that the C2SS followup operations will collect more complete housing data than the census. According to the estimates analyzed so far in this report, only the **Year Structure Built** data have not met that expectation. The **Value** question, like **Year Structure Built**, is usually considered one of the more uncomfortable questions for respondents to answer because it often requires them to guess. Owners knew the value of their home when they purchased it, but their knowledge degrades with time. But this should be true also for census respondents, and perhaps even more so when the long form enumeration is conducted with proxy respondents. The inordinately high C2SS missing data rate is likely the result of too easy acceptance of a "don't know" response by C2SS interviewers as with the **Year Structure Built** question, and the entry of a "D" as the response in the instruments.

When comparing allocation rates between national followup distributions, the failure of 20 percent of the occupied long form housing units to meet the minimum data requirement to be included in the Census 2000 Sample must be taken into account. The missing data they

represent are not reflected in the allocation rates. Similarly, the 8 percent of the occupied C2SS followup units that were noninterviews are not reflected. The overall nonresponse to **Value** for occupied units in the Census 2000 Sample is 21.8 percent and is 15.1 in C2SS. Overall nonresponse to **Value** for vacant units was 34.0 percent in the census and 24.2 percent in C2SS. Appendix A, Tables 8b, 8c, and 8d also include allocation rates for items involved in determining the universe in profile Table 8a above, i.e., tenure, business on property, and acreage, as well as **Units in Structure** (Appendix A, Table 1).

A final thought on **Value** concerning the use of response options that consist of specific value ranges is offered after comparing the C2SS and Census 2000 Sample distributions based on followup data. Are people more inclined to inflate their response to this question when easily answered categorized dollar ranges are provided than when the question is asked in an open-ended manner and the response is requested as a write-in dollar entry? These results seem to support that possibility. Perhaps further research is needed to determine the best way to ask the **Value** question in the ACS.

5.9 Mortgage Status and Selected Monthly Owner Costs

5.9.1 Description of Item

This item is used by the Department of Housing and Human Development in many of its housing assistance programs. The Department of Health and Human Services uses this derived measure to assess the need for housing assistance for elderly, handicapped, and low-income homeowners. For a more complete list of federal uses, refer to Appendix C.

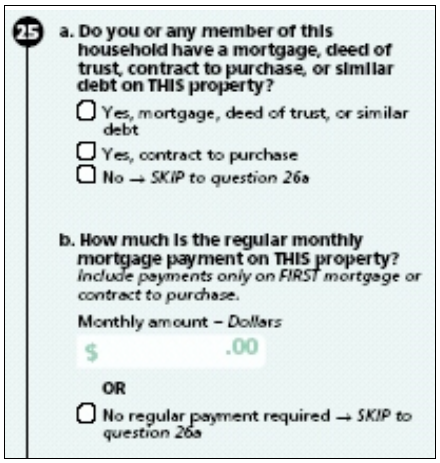
Mortgage Status and the items involved in the computation of **Selected Monthly Owner Costs** (SMOC) are asked only of occupied units owned or being bought by a member of the household occupying the unit. The determination of **SMOC** is based on all mortgage payments – first, second or junior, and home equity – real estate taxes, homeowners insurance premiums, condominium fees and mobile home costs, if applicable, and all utility costs. Responses to each of these items are in the form of numeric dollar write-in entries on the Census 2000 mail and enumerator long forms, the C2SS mail questionnaire, and in the C2SS CATI and CAPI instruments. The number of digits allowed in the responses to the individual questions agree across all these data sources. Only the question that asks about first or primary mortgages appears below. Facsimiles of all the other items that are responsible for this housing profile estimate can be found in Appendix B.

The **SMOC** profile computation in Table 9a is derived from these ten monetary entries for the specified owner-occupied universe. This universe was defined in the preceding section on **Value.** The questions responsible for these data were worded slightly differently on the Census 2000 long form questionnaire and the C2SS mail questionnaire. On the Census 2000 long forms all mortgage status and non-utility cost questions were addressed to "Person 1," (e.g. "Do you have a second mortgage or a home equity loan on this property?"), while in the C2SS the wording was more inclusive (e.g. "Do you or any member of this household have a second

mortgage or a home equity loan on this property?"). The census placed the more inclusive language in an introductory instruction to the mortgage section of the questionnaire.[10]

A major difference exists in the reference period used to collect the costs for two main utilities. The Census 2000 long form asked for "annual cost" of each of the four utilities questions – electricity, gas, water and sewer, and oil, coal, kerosene, wood, etc. The C2SS, using ACS methods, asked respondents what their costs for electricity and gas were "last month," and asked for the cost of water and sewer, and for oil, coal, kerosene, wood, etc. "in the past 12 months".

Table 9b is derived from the estimates displayed in Table 9a and **Household Income**. The **SMOC** value for each specified owner-occupied household is divided by the household's total income and expressed as a percent. The results are assigned to the applicable category.


25 a. Do you or any member of this household have a mortgage, deed of trust, contract to purchase, or similar debt on THIS property?
☐ Yes, mortgage, deed of trust, or similar debt
☐ Yes, contract to purchase
☐ No → SKIP to question 26a

b. How much is the regular monthly mortgage payment on THIS property? Include payments only on FIRST mortgage or contract to purchase.
Monthly amount – Dollars
$ .00
OR
☐ No regular payment required → SKIP to question 26a

5.9.2 National Level Comparisons

Mortgage Status and **Selected Monthly Owner Costs** are compared at the national level in Table 9a. The largest and most important difference is seen in specified owner-occupied units *with a mortgage*, with a 1.4 percentage point difference attributed to a higher Census 2000 Sample estimate. Although five of the seven **SMOC** categories differ significantly at the national level, only one – *$1,000 to $1,499* – differed by more than 0.5 percentage points. As noted previously in the results section on **Value**, the universe of specified owner-occupied units is 0.4 percent larger in the Census 2000 Sample than in C2SS.

[10] "Answer questions 47a-53 if you or someone in this household owns or is buying this house, apartment, or mobile home; otherwise, skip to questions for Person 2."

Table 9a. Mortgage Status and Selected Monthly Owner Costs, National-Level Distributions (C2SS compared with the Census 2000 Sample)

Mortgage Status and SMOC	Census 2000 Sample Estimate (in percent)	C2SS Estimate (in percent)	Difference (C2SS-Census) (in percentage points)	Margin of Error of Difference (in percentage points)	Is the Difference Statistically Significant?
Specified owner-occupied units	55,212,108	55,003,077	-209,031		
With a mortgage	70.0	68.6	-1.4	± 0.6	Yes
Less than $300	0.5	0.5	0.0	± 0.0	No
$300 to $499	3.9	4.1	0.2	± 0.1	Yes
$500 to $699	9.0	9.0	0.1	± 0.1	No
$700 to $999	17.4	17.0	-0.4	± 0.2	Yes
$1,000 to $1,499	21.2	20.4	-0.8	± 0.3	Yes
$1,500 to $1,999	10.1	9.8	-0.3	± 0.1	Yes
$2,000 or more	8.1	7.9	-0.2	± 0.1	Yes
Not mortgaged	30.0	31.4	1.4	± 0.3	Yes
Gross differences	x	x	3.4	x	x

KEY: Estimates are rounded to one decimal place; a value of 0.0 indicates an estimate of less than 0.05
Gross differences = the sum of the absolute values of the column differences.

The Table 9b distributions of **Selected Monthly Owner Costs as a Percentage of Household Income** show only small and unimportant differences in the percent categories, and the largest difference – in the category *less than 20 percent* – is not statistically significant. The derived measure could not be computed for a higher percentage of Census 2000 Sample units than for C2SS units due to a larger estimate of households with no **Income** reported or imputed, with negative incomes, or with no **SMOC** reported or imputed.

Table 9b. Selected Monthly Owner Costs as a Percentage of Household Income, National-Level Distributions (C2SS compared with the Census 2000 Sample)

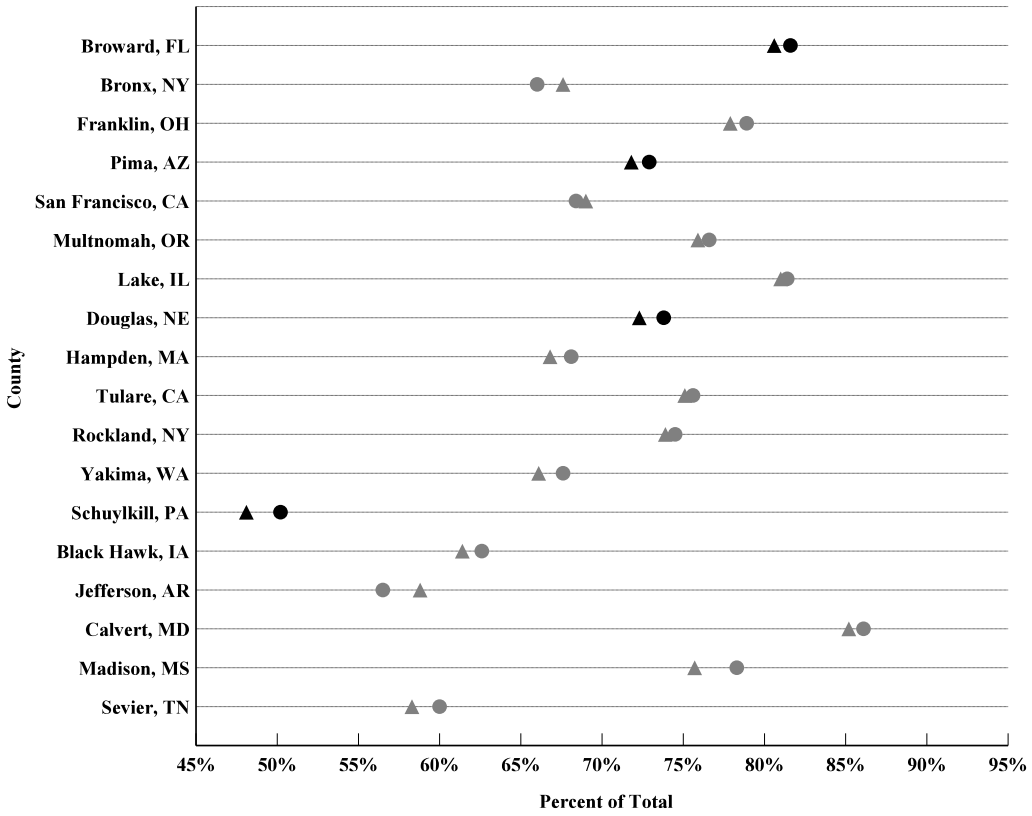
Selected Monthly Owner Costs as Percentage of Household Income	Census 2000 Sample Estimate (in percent)	C2SS Estimate (in percent)	Difference (C2SS-Census) (in percentage points)	Margin of Error of Difference (in percentage points)	Is the Difference Statistically Significant?
Specified owner-occupied units	55,212,108	55,003,077	-209,031		
Less than 20.0 percent	54.0	54.5	0.5	± 0.6	No
20.0 to 24.9 percent	13.9	13.7	-0.2	± 0.2	Yes
25.0 to 29.9 percent	9.4	9.6	0.2	± 0.1	Yes
30.0 to 34.9 percent	6.0	6.0	0.0	± 0.1	No
35.0 percent or more	15.8	15.6	-0.2	± 0.2	Yes
Not computed	0.8	0.5	-0.3	± 0.0	Yes
Gross differences	x	x	1.4	x	x

KEY: Estimates are rounded to one decimal place; a value of 0.0 indicates an estimate of less than 0.05
Gross differences = the sum of the absolute values of the column differences.

5.9.3 County Level Comparisons

Figure 9 illustrates the pairs of estimates for specified owner-occupied units *with a mortgage* in the 18 comparison counties. These estimates differed significantly in only four of the counties. The individual county estimates of **SMOC** categories also did not mirror the national comparisons. The scale of Figure 9 was shifted from 0 to 50 percent to 45 percent to 95 percent to accommodate the county results. The category with the largest national difference – *$1,000 to $1,499* – differed significantly in only one of the 18 counties (Franklin). It was the **SMOC** category *$1,500 to $1,999* that differed most often at the county level, in six of the 18 counties. No county exhibited more than three significant category differences, and five counties had no significant differences between the C2SS and the Census 2000 sample result.

Figure 9. Percent of Specified Owner-Occupied Units with a Mortgage C2SS and the Census 2000 Sample County-Level Estimates



KEY: 1. Census 2000 Sample county-level estimates are shown as circles; C2SS county-level estimates are shown as triangles.
2. Whenever the differences between the two estimates was determined to be statistically significant, the symbols for both the Census 2000 Sample and the C2SS estimates are bolded.

Appendix E, Table 9a identifies the 18 counties and their individual significant percentage point differences between the C2SS and Census 2000 sample for the same seven **SMOC** categories and **Mortgage Status** shown in profile analysis Table 9a. Table 9b in Appendix E shows the county-level comparison results for profile analysis Table 9b. As in national comparison, the *not computed* category is the most telling. This rate differed significantly in 9 of the 18 counties, with the Census 2000 sample having a higher rate in all but one case. Only 5 counties had at least one category range that differed between the C2SS and the Census 2000 sample.

5.9.4 Analysis

The reason for the 1.4 percentage point difference in units *with a mortgage*, higher in the Census 2000 Sample than in the C2SS, is not obvious and should be studied in more depth. Several items are involved in determining a mortgaged unit, and even more are involved in determining a *specified* one. It is based primarily on the answer to the **Tenure** question, with the tenure edit checking all the mortgage-related items for consistency. Most of the difference is occurring in the data collected on mail return questionnaires, as is evident in mode Table 9c below. We are not used to seeing distributions of data collected by mail differ to the extent seen

with this characteristic. The percent of units with a mortgage may be one of the characteristics of the mail response households that differ the most between households that self-responded to the census but not to the C2SS. Or there may be a yet undiscovered deviation in all the related edits that arrive at slightly different interpretations of responses.

Given the number of items involved in the computation of **SMOC**, it would not have been surprising to see much greater differences in the cost categories in Table 9a. Nationally, the largest difference is the *$1,000 to $1,499* category. Like *with a mortgage*, most of this difference is occurring in the data from mail returns. When the **SMOC** categories are displayed by mode, 5 of the 7 categories show households responding by mail with higher costs in the census than in C2SS, with the opposite observed for followup households.

Table 9c. Mortgage Status and Selected Monthly Owner Costs, Differences in National-Level Distributions by Mode (C2SS compared with the Census 2000 Sample)

Mortgage Status and SMOC	C2SS Estimate minus Census 2000 Sample Estimate			
	Occupied Units			Vacant Units
Universe	Mail	Followup	Total Occupied	Followup
With a mortgage	-2.9	0.6	-1.4	n/a
Less than $300	0.0	0.0	0.0	n/a
$300 to $499	-0.1	0.4	0.2	n/a
$500 to $699	-0.4	0.5	0.1	n/a
$700 to $999	-1.1	0.5	-0.4	n/a
$1,000 to $1,499	-1.1	-0.2	-0.8	n/a
$1,500 to $1,999	-0.3	0.0	-0.3	n/a
$2,000 or more	0.1	-0.6	-0.2	n/a
Not mortgaged	2.9	-0.6	1.4	n/a
Gross differences	6.0	2.8	3.4	x

KEY: Estimates are rounded to one decimal place; a value of 0.0 indicates an estimate of less than 0.05
Gross differences = the sum of the absolute values of the column differences.

It is possible that the differences are reflecting the differences in the interview period since the C2SS **SMOC** estimates represent information collected throughout the entire year 2000. This might be so if, over the second half of the year, significant numbers of households with high monthly owner costs refinanced their mortgages and lowered their mortgage costs. Under those circumstances, the C2SS percentages of households in the higher cost categories could be expected to be lower than the Census 2000 Sample estimate.

The most likely reason for the observed variation in **SMOC** , however, is probably the difference in the reference period for the two largest utility costs – *gas* and *electricity*. The C2SS's *electricity* and *gas* costs are collected for "last month," a short time frame that most likely corresponds with the billing cycle. The reference period is recent and not subject to large recall problems, and does not require that a series of monthly bills be added or an annual figure be guessed at, as do the responses to the Census 2000 *gas* and *electricity* questions. **SMOC** is

calculated on a household basis by adding all the annual costs collected, dividing them by 12 to get a monthly cost, and then adding the costs that are collected on a monthly basis. No census utility costs are collected on a monthly basis, so every estimate made by respondents of annual utility costs gets divided by 12. The C2SS **SMOC** costs are likely to be the more accurate estimate for this reason.

The differences in the county-level estimates of **SMOC** may be influenced not only by the overall differences in interview and reference periods but also by the more specific seasonality of utility costs driven by area temperatures.

Variations in these statistics may also be the result of the very high rates of imputation for some of the items involved in the derived measure. Table 9a in Appendix A shows the allocation rate released by American FactFinder for **Selected Monthly Owner Costs** for specified owner-occupied units with a mortgage and without a mortgage. Just under 60 percent of these units in the Census 2000 sample had at least one allocation made to a **SMOC** component, while over 35 percent of the comparable units in the C2SS had at least one allocation to a **SMOC** component. If you consider the additive effect of unit nonresponse on these estimates the overall nonresponse rate is nearly 68 percent in the Census 2000 sample and nearly 41 percent in C2SS. Appendix A, Tables 9b through 9j, includes allocation rates for many of the individual items involved in the computation of **SMOC**. The C2SS rates, although also unacceptably high for some of the items, are still quite a bit lower than the census rates in all instances.

Table 9d. Selected Monthly Owner Costs as a Percentage of Household Income, Differences in National-Level Distributions by Mode (C2SS compared with the Census 2000 Sample)

SMOC as a Percent of Household Income	C2SS Estimate minus Census 2000 Sample Estimate			
	Occupied Units			Vacant Units
Universe	Mail	Followup	Total Occupied	Followup
Less than 20.0 percent	1.3	1.2	0.5	n/a
20.0 to 24.9 percent	-0.2	0.1	-0.2	n/a
25.0 to 29.9 percent	0.0	0.6	0.2	n/a
30.0 to 34.9 percent	-0.1	0.1	0.0	n/a
35.0 percent or more	-0.8	-1.0	-0.2	n/a
Not computed	-0.2	-0.9	-0.3	n/a
Gross differences	2.6	3.9	1.4	x

KEY: Estimates are rounded to one decimal place; a value of 0.0 indicates an estimate of less than 0.05
Gross differences = the sum of the absolute values of the column differences.

Differences in Table 9b are also influenced by estimates of **Median Income** and **Average Household Income**. These income measures derived from Census 2000 Sample data were higher than comparable estimates from the C2SS (see Report 5: Comparison of Selected Economic Characteristics). C2SS produced higher estimates of households with incomes below $35,000 and lower estimates for all other household income levels. The lower C2SS denominators for **SMOC as a Percent of Household Income** measure would tend to increase

the C2SS rates tallied in Table 9b. The significantly higher **SMOC** statistics in the Census 2000 Sample, when divided by the higher Census 2000 Sample household income estimates would tend to lower the derivation of **SMOC** as a percent of income rates. The results in Table 9b seem to bear this out.

It is also likely that the Census 2000 Sample estimates for **SMOC as a Percent of Household Income** are being overstated, depending on whether **Income** is proportionately higher than **SMOC.**

Although most of the differences seen in Table 9b have been combined and confounded with differences in household income between the Census 2000 sample and C2SS, this is not true for the *not computed* line in the table. **SMOC** cannot be computed when no component of household income is reported or imputed, when the income reported is a loss (resulting in a zero in the denominator or a negative result) or when no costs are reported or imputed. Not being able to compute this measure is another indicator of how often at least one of those conditions is present. The Census 2000 Sample *not computed* rate is higher than in C2SS and primarily appears to be the result of the lack of data collected during followup.

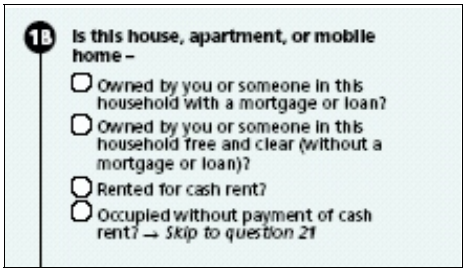
5.10 Gross Rent

5.10.1 Description of Item

This item was used to establish the Department of Housing and Urban Development's Section 8 Fair Market Rents which are used in housing programs that help Americans afford decent, safe, and clean housing. For a more complete list of federal uses, refer to Appendix C.

Gross Rent is derived from data collected by the Monthly Rent question consisting of a single numeric write-in entry on the Census 2000 mail and enumerator long forms, the C2SS mail questionnaire, and the CATI and CAPI instruments, and the four cost of utilities questions also involved in the **SMOC** computations and described in Section 5.9.1 above. The wording of the **Monthly Rent** question differs, however. The census question reads, "What is the monthly rent," while the C2SS version reads, "What is the monthly rent for this house, apartment, or mobile home?"

Monthly Rent is asked of all occupied units for which rent is paid, and also collected for all vacant units that are for rent. The universe on which the **Gross Rent** amounts shown in the profile tables and in Table 10 below is specified renter-occupied units. This universe includes all renter-occupied units except single family units on 10 acres or more.



5.10.1 National Level Comparisons

Only four of the seven Gross Rent categories differ significantly at the national level, and all differences are less than 1 percentage point. The only differences of any note in analysis Table 10a occur in the estimates of **Gross Rent** of *less than $200* a month and in the *no cash rent* category of specified renter-occupied units. The universe of specified renter-occupied units is 1.8 percent larger in the C2SS than in the Census 2000 Sample, a significantly higher estimate that may be related to the current residence rule used in C2SS.

Table 10a. Gross Rent, National-Level Distributions (C2SS compared with the Census 2000 Sample)

Gross Rent	Census 2000 Sample Estimate (in percent)	C2SS Estimate (in percent)	Difference (C2SS-Census) (in percentage points)	Margin of Error of Difference (in percentage points)	Is the Difference Statistically Significant?
Specified renter-occupied units	35,199,502	35,829,687	630,185		
Less than $200	5.2	4.5	-0.8	± 0.1	Yes
$200 to $299	5.2	4.8	-0.4	± 0.1	Yes
$300 to $499	22.0	21.6	-0.4	± 0.3	Yes
$500 to $749	33.7	33.9	0.2	± 0.5	No
$750 to $999	17.2	17.8	0.6	± 0.3	Yes
$1,000 to $1,499	8.7	8.7	-0.0	± 0.2	No
$1,500 or more	2.9	2.9	-0.0	± 0.1	No
No cash rent	5.2	5.8	0.7	± 0.2	Yes
Gross differences	x	x	3.1	x	x

KEY: Estimates are rounded to one decimal place; a value of 0.0 indicates an estimate of less than 0.05
Gross differences = the sum of the absolute values of the column differences.

The Table 10b distributions of **Gross Rent as a Percentage of Household Income** show meaningful differences between the Census 2000 Sample and the C2SS for units with a **Gross Rent** of *less than 15.0 percent* of **Household Income**, the Census 2000 Sample having the higher percent, and the category *35.0 percent or more*, the C2SS having the higher percent.

Table 10b. Gross Rent as a Percentage of Household Income, National-Level Distributions (C2SS compared with the Census 2000 Sample)

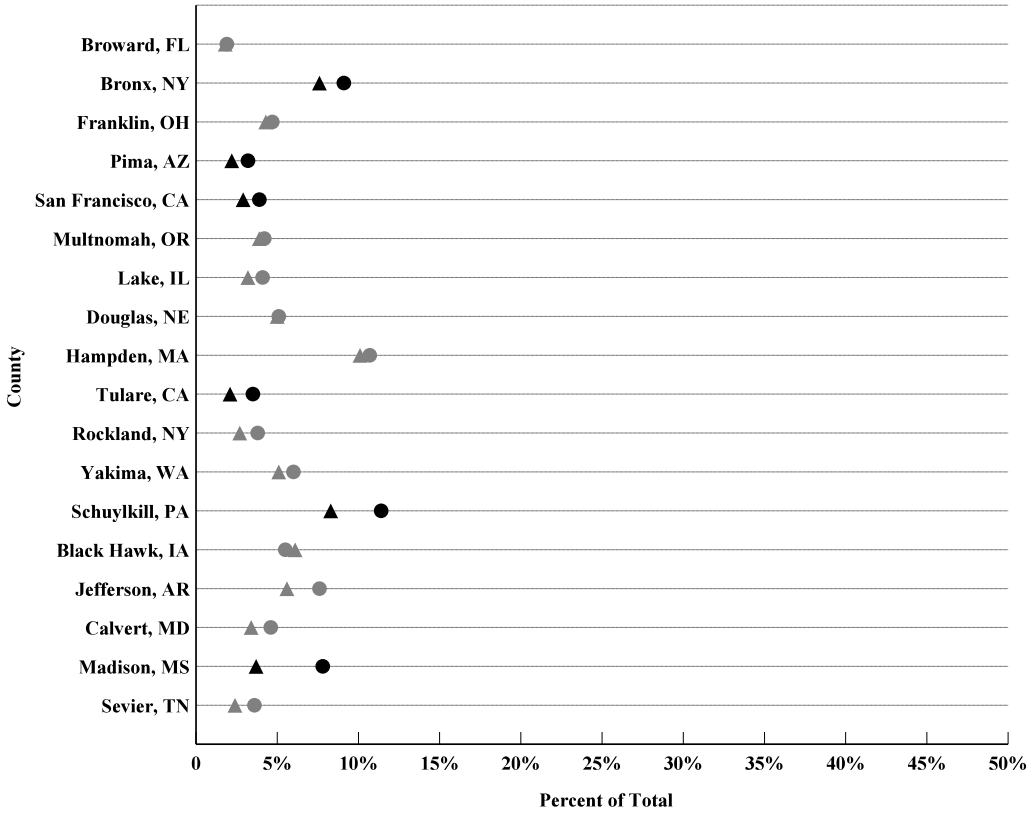
Gross Rent as a Percent of Household Income	Census 2000 (in percent)	C2SS Estimate (in percent)	Difference (C2SS-Census) (in percentage points)	Margin of Error of Difference (in percentage points)	Is the Difference Statistically Significant?
Specified renter-occupied units	35,199,502	35,829,687	630,185		
Less than 15.0 percent	18.1	16.5	-1.6	± 0.3	Yes
15.0 to 19.9 percent	14.3	14.2	-0.1	± 0.2	No
20.0 to 24.9 percent	12.8	12.9	0.2	± 0.2	No
25.0 to 29.9 percent	10.4	10.8	0.4	± 0.2	Yes
30.0 to 34.9 percent	7.3	7.7	0.4	± 0.2	Yes
35.0 percent or more	29.5	30.6	1.1	± 0.5	Yes
Not computed	7.5	7.3	-0.2	± 0.2	Yes
Gross differences	x	x	4.0	x	x

KEY: Estimates are rounded to one decimal place; a value of 0.0 indicates an estimate of less than 0.05
Gross differences = the sum of the absolute values of the column differences.

5.10.3 Comparisons – County Level

Figure 10 illustrates the comparison county pairs of estimates of specified renter-occupied units with a Gross Rent of *less than $200* a month. Six of the 18 counties differed significantly in their estimates of the percent of units in this lowest cost category, the Census 2000 sample showing the higher result in each case.

Figure 10. Percent of Specified Renter-Occupied Units with Gross Rent of Less than $200 C2SS and the Census 2000 Sample County-Level Estimates



KEY: 1. Census 2000 Sample county-level estimates are shown as circles; C2SS county-level estimates are shown as triangles.
2. Whenever the differences between the two estimates was determined to be statistically significant, the symbols for both the Census 2000 Sample and the C2SS estimates are bolded.

Appendix E, Table 10a identifies the 18 counties and their individual significant percentage point differences between the C2SS and Census 2000 sample for all **Gross Rent** categories and *no cash rent*. Unlike the county-level result for **SMOC**, 17 out of 18 counties had at least one **Gross Rent** category that different significantly, most often the estimate of specified renter-occupied units with monthly costs ranging from *$200 to $299.* The individual county comparisons also did not show *no cash rent* as a source of significant differences.

Table 10b in Appendix E shows the significant results for the county-level comparisons for analysis Table 10b, the comparison of **Gross Rent as a Percent of Income**. The percent of specified renter-occupied units with cost-to-income rates of *less than 15 percent* – the lowest category – differed significantly in 9 of the 18 counties, and consistently showed a higher Census 2000 Sample estimate. The largest national difference was also in this category. The significant differences occur in 9 of the 10 counties with the largest populations, which may be primarily the result of the larger sample sizes. The *not computed* rate differs in 7 of the 18 counties, with the Census 2000 Sample in each case having the higher rate.

5.10.4 Analysis

The Census 2000 sample data show higher estimates of specified renter-occupied units with lower costs. This is the reverse of what we saw in analysis Table 9a for **Mortgage Status** and **SMOC.** The C2SS also estimated a considerably larger number of specified renter-occupied units than did the Census 2000 Sample, a phenomenon that should be studied further by comparing the Census 2000 Sample and C2SS estimates with those of the American Housing Survey (AHS) and the New York City Housing and Vacancy Survey (NYCHVS).

The higher *no cash rent* estimate in the C2SS is not directly related to the other differences, since it is based primarily on the setting of **Tenure**, but it does change the underlying distribution on which the **Gross Rent** results are based.

Unlike the **Mortage Status** and **SMOC** distributions, the differences in the **Gross Rent** distributions seem to occur to the same extent in both the mail and the followup response data, with only slightly more gross differences in the mail subset. This observation, and the seemingly inverse relationship between differences in **SMOC** and **Gross Rent** may mean that the four utility questions are not the primary cause of the inconsistency seen between levels of **SMOC** and **Gross Rent** in the Census 2000 Sample and C2SS. The low variation in **SMOC** for renters may be an indication that most renters do not pay utility costs separately from their rent. If this is true, the **Gross Rent** differences would be due primarily to data coming from the **Monthly Rent** item and from the estimates on the specified renter-occupied universe itself. The C2SS distribution may be reflecting increases in rent over the second half of the year 2000, while the Census 2000 sample is only reflecting rents paid in April, May, and June of 2000.

Table 10c. Gross Rent, Differences in National-Level Distributions by Mode (C2SS compared with the Census 2000 Sample)

Gross Rent	C2SS Estimate minus Census 2000 Sample Estimate			
	Occupied Units			Vacant Units
Universe	Mail	Followup	Total Occupied	Followup
Less than $200	-0.9	-0.4	-0.8	n/a
$200 to $299	-0.5	-0.2	-0.4	n/a
$300 to $499	-0.7	-0.7	-0.4	n/a
$500 to $749	0.1	-0.1	0.2	n/a
$750 to $999	0.6	0.7	0.6	n/a
$1,000 to $1,499	0.4	-0.2	0.0	n/a
$1,500 or more	0.4	-0.2	0.0	n/a
No cash rent	0.6	1.1	0.7	n/a
Gross differences	4.2	3.6	3.1	x

KEY: Estimates are rounded to one decimal place; a value of 0.0 indicates an estimate of less than 0.05
Gross differences = the sum of the absolute values of the column differences.

The Census 2000 Sample allocation rate for the American FactFinder-released **Gross Rent** measure is nearly 38 percent while the C2SS rate is 20 percent (Appendix A, Table 10a). Like the **SMOC** rates, this reflects the percent of specified renter-occupied units for which at least one of the items involved in the computation of **Gross Rent** was allocated. Most of the Census 2000 Sample allocation rates to the **Monthly Rent** item for modes and status subgroups are at least two or three times the rates for the C2SS **Monthly Rent** item (Appendix A, Table 10b). The differences in the final estimates may be due in part to the high amounts of imputation needed for the Census 2000 Sample.

Table 10b is derived from the estimates displayed in Table 10a and the aggregated **Household Income**. The **Gross Rent** value for each specified renter-occupied household is divided by the household's total income and expressed as a percent. The results are then tallied into the categories shown in Table 10b. The important differences seen in Table 10a have been combined and confounded with differences in **Household Income** between the Census 2000 sample and C2SS. The two tails of the distributions in Table 10b are showing the differences in opposite directions of about the same size.

The differences in **Household Income** between the Census 2000 sample and the C2SS were discussed in the previous section. C2SS produced higher estimates of households with incomes *below $35,000* and lower estimates for all other household income levels. The higher **Gross Rent** numerators in C2SS for all categories except the lowest will raise the survey's **Gross Rent as a Percent of Household Income**, while the higher census incomes except in the lowest income categories would tend to lower the **Gross Rent as a Percent of Household Income** rate. The results in Table 10b seem to support this.

Table 10d. Gross Rent as a Percentage of Household Income, Differences in National-Level Distributions by Mode (C2SS compared with the Census 2000 Sample)

Gross Rent as a Percent of Household Income	C2SS Estimate minus Census 2000 Sample Estimate			
	Occupied Units			Vacant Units
Universe	Mail	Followup	Total Occupied	Followup
Less than 15.0 percent	-1.4	-1.9	-1.6	n/a
15.0 to 19.9 percent	0.0	0.1	-0.1	n/a
20.0 to 24.9 percent	0.1	0.5	0.2	n/a
25.0 to 29.9 percent	0.1	0.9	0.4	n/a
30.0 to 34.9 percent	0.3	0.5	0.4	n/a
35.0 percent or more	0.6	0.8	1.1	n/a
Not computed	0.3	-0.9	-0.2	n/a
Gross differences	2.8	8.8	4.0	x

KEY: Estimates are rounded to one decimal place; a value of 0.0 indicates an estimate of less than 0.05
Gross differences = the sum of the absolute values of the column differences.

The gross differences between the mode distributions for this derived measure are the highest seen in this study of housing profile estimates. The extremely high allocation rates for **Gross**

Rent, combined with the nearly as high allocation rates for **Household Income** are probably responsible for the high level of gross differences between the Census 2000 Sample and the C2SS estimates seen in Table 10d. Both allocation rates are the result of more missing followup data than missing self-response data. The differences in the self-response distributions of **Gross Rent as a Percent of Income** are possibly reflecting the influence of higher income estimates in the Census 2000 Sample.

6. CONCLUSIONS

Eighty-six estimates from the Housing Characteristics profile tables for the Census 2000 Sample and the C2SS were compared and analyzed at the national level for this report. Of those, 63 estimates, or 73 percent of the total comparisons, tested as different beyond sampling error. Although this may seem to imply that the two surveys are far apart in their view of the nation's housing, the distributions are actually remarkably similar. The very large sample sizes involved in producing these sets of estimates contribute to the number of estimates found to "differ significantly," but only 23 of these comparisons differed by more than one-half of one percentage point, and only 8 estimates differed by more than 1 percentage point. The greatest difference seen was 1.9 percentage points between the estimates of units having four rooms. At the county level, only about 29 percent of the differences between the Census 2000 Sample and the C2SS estimates were statistically significant, but the differences themselves were quite a bit larger than the national-level differences. This is to be expected since the county samples are considerably smaller, producing estimates with higher standard errors. County-level differences must be larger for them to be considered beyond sampling error. However, only slightly more than one-fourth of the statistically significant county-level comparisons differed by more than 2 percentage points.

Some national Census 2000 Sample housing estimates showed extremely high levels of total nonresponse, the result of large amounts of missing information that is most likely not missing at random. It is very possible that some amount of bias may have been introduced into the Census 2000 Sample results since the questionnaires for 20 percent of the long form households enumerated in followup operations did not contain sufficient information to be placed in the census sample. In addition, the information collected for 10 percent of the followup long form households that were placed in the census sample was provided by respondents other than a household member.

Differences between the distributions of housing characteristics produced by the Census 2000 Sample and the C2SS were expected, but we did not find these differences to be of a size or nature that would preclude ACS estimates from being used in place of decennial census sample housing estimates. The study has noted the large variation between the way decennial census data collection sequentially distributes over the census time frame and the ACS continuous collection methods that are conducted concurrently every month. Because of these fundamental differences, it is very likely that some of the housing characteristics estimated by the C2SS are not comparable to the Census 2000 Sample estimates of the same characteristics. We would expect that characteristics that undergo change over the year, or that tend to vary by season,

would be measured differently by the ACS methods than by a decennial census sample, but that they may also be measured more consistently and accurately.

There are certainly areas of housing data collection in the ACS that need to be improved. For example, the housing content edits used in the C2SS were, for the most part, the same ones used in the processing of the Census 2000 Sample and were often adopted from the sample edits used in previous censuses. For some housing items, there were deviations in the Census 2000 Sample and C2SS edits which may be responsible for some differences in the results. Alternative ways of imputing for missing data should also be explored, since it is quite possible that methods that have been adopted from the decennial census process may not be the best way to correct for ACS item nonresponse. The ACS edits for several of the housing questions should be thoroughly reviewed and new ones specified that will more accurately correct for missing data before the 2005 ACS data are processed and the estimates released in 2006. This review should be repeated if future testing results in changes to question structure, wording, or response categories for the 2008 ACS. Further, the collection of information from vacant housing units must also be improved.

The overall conclusion reached by this comparison study is that the housing estimates derived using the ACS methods and design are highly acceptable for use in all the ways that decennial sample housing estimates have been used. The transition to estimates representing yearly averages and multi-year aggregates should not be difficult once the actual differences are understood.

7. REFERENCES

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Appendix A. Item Allocation Rates by Occupancy Status and Data Collection Mode

Census 2000 Supplementary Survey and 2001 Supplementary Survey

Table 1. Units in Structure, Comparison of Item Allocation Rates, by Occupancy Status and Data Collection Mode

Universe	Census 2000 Sample (percent)	C2SS (percent)	SS01 (percent)
Total Housing Units	4.1	1.4	1.2
Occupied Units	4.4	1.4	1.2
Self-Response	4.9	1.6	1.3
Enumerator/Interviewer	3.0	1.0	1.1
Vacant Units	1.6	1.8	1.4

KEY: Self-Response – Census 2000 Sample/Mail return response; C2SS Mail Return and Telephone Questionnaire Assistance responses
Enumerator/Interviewer – Census 2000 Sample NRFU and CIFU responses; C2SS CATI and CAPI responses

Table 2. Year Structure Built, Comparison of Item Allocation Rates, by Occupancy Status and Data Collection Mode

Universe	Census 2000 Sample	C2SS	SS01
Total Housing Units	12.7	14.9	15.3
Occupied Units	11.7	13.4	13.6
Self-Response	9.3	7.4	6.7
Enumerator/Interviewer	18.0	22.8	23.3
Vacant Units	23.0	29.1	30.6

KEY: Self-Response – Census 2000 Sample/Mail return response; C2SS Mail Return and Telephone Questionnaire Assistance responses
Enumerator/Interviewer – Census 2000 Sample NRFU and CIFU responses; C2SS CATI and CAPI responses.

Table 3. Number of Rooms, Comparison of Item Allocation Rates, by Occupancy Status and Data Collection Mode

Universe	Census 2000 Sample	C2SS	SS01
Total Housing Units	7.8	4.2	4.1
Occupied Units	6.2	2.6	2.3
Self-Response	6.2	3.4	3.1
Enumerator/Interviewer	6.4	1.4	1.2
Vacant Units	24.2	19.4	20.0

KEY: Self-Response – Census 2000 Sample/Mail return response; C2SS Mail Return and Telephone Questionnaire Assistance responses
Enumerator/Interviewer – Census 2000 Sample NRFU and CIFU responses; C2SS CATI and CAPI responses.

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Table 4. Year Householder Moved In, Comparison of Item Allocation Rates, by Data Collection Mode

Universe	Census 2000 Sample	C2SS	SS01
Occupied Units	6.2	3.7	3.3
Self-Response	4.8	4.2	3.7
Enumerator/Interviewer	9.6	2.9	2.8

KEY: Self-Response – Census 2000 Sample/Mail return response; C2SS Mail Return and Telephone Questionnaire Assistance responses
Enumerator/Interviewer – Census 2000 Sample NRFU and CIFU responses; C2SS CATI and CAPI responses.

Table 5. Vehicles Available, Comparison of Item Allocation Rates, by Data Collection Mode

Universe	Census 2000 Sample	C2SS	SS01
Occupied Units	6.2	1.6	1.3
Self-Response	4.1	1.5	1.1
Enumerator/Interviewer	11.7	1.6	1.5

KEY: Self-Response – Census 2000 Sample/Mail return response; C2SS Mail Return and Telephone Questionnaire Assistance responses
Enumerator/Interviewer – Census 2000 Sample NRFU and CIFU responses; C2SS CATI and CAPI responses.

Table 6. House Heating Fuel, Comparison of Item Allocation Rates, by Data Collection Mode

Universe	Census 2000 Sample	C2SS	SS01
Occupied Units	7.4	2.1	1.8
Self-Response	6.3	1.6	1.2
Enumerator/Interviewer	10.1	2.8	2.6

KEY: Self-Response – Census 2000 Sample/Mail return response; C2SS Mail Return and Telephone Questionnaire Assistance responses
Enumerator/Interviewer – Census 2000 Sample NRFU and CIFU responses; C2SS CATI and CAPI responses.

Table 7a. Complete Plumbing Facilities, Comparison of Item Allocation Rates, by Occupancy Status and Data Collection Mode

Universe	Census 2000 Sample	C2SS	SS01
Total Housing Units	3.9	1.7	1.4
Occupied Units	3.4	1.0	0.7
Self-Response	3.5	1.4	0.9
Enumerator/Interviewer	3.1	0.3	0.3
Vacant Units	8.7	8.7	7.9

KEY: Self-Response – Census 2000 Sample/Mail return response; C2SS Mail Return and Telephone Questionnaire Assistance responses
Enumerator/Interviewer – Census 2000 Sample NRFU and CIFU responses; C2SS CATI and CAPI responses.

Appendix A. Item Allocation Rates by Occupancy Status and Data Collection Mode

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Table 7b. Complete Kitchen Facilities, Comparison of Item Allocation Rates, by Occupancy Status and Data Collection Mode

Universe	Census 2000 Sample	C2SS	SS01
Total Housing Units	3.9	1.8	1.5
Occupied Units	3.4	0.9	0.7
Self-Response	3.5	1.3	0.9
Enumerator/Interviewer	3.1	0.3	0.3
Vacant Units	8.6	9.7	9.0

KEY: Self-Response – Census 2000 Sample/Mail return response; C2SS Mail Return and Telephone Questionnaire Assistance responses
Enumerator/Interviewer – Census 2000 Sample NRFU and CIFU responses; C2SS CATI and CAPI responses.

Table 7c. Telephone Services Available, Comparison of Item Allocation Rates, by Data Collection Mode

Universe	Census 2000 Sample	C2SS	SS01
Occupied Units	4.3	1.0	0.7
Self-Response	3.7	1.3	1.0
Enumerator/Interviewer	5.9	0.4	0.4

KEY: Self-Response – Census 2000 Sample/Mail return response; C2SS Mail Return and Telephone Questionnaire Assistance responses
Enumerator/Interviewer – Census 2000 Sample NRFU and CIFU responses; C2SS CATI and CAPI responses.

Table 8a. Value, Comparison of Item Allocation Rates, by Occupancy Status and Data Collection Mode

Universe	Census 2000 Sample	C2SS	SS01
Specified Owner-Occupied Units	12.2	8.5	7.8
Total Housing Units	13.4	9.9	9.3
Occupied Units	13.3	9.7	8.9
Self-Response	12.3	6.0	4.7
Enumerator/Interviewer	16.6	17.4	16.9
Vacant Units	21.9	24.2	28.8

KEY: Self-Response – Census 2000 Sample/Mail return response; C2SS Mail Return and Telephone Questionnaire Assistance responses
Enumerator/Interviewer – Census 2000 Sample NRFU and CIFU responses; C2SS CATI and CAPI responses.

Table 8b. Tenure, Comparison of Allocation Rates, by Data Collection Mode

Universe	Census 2000 Sample	C2SS	SS01
Occupied Units	4.3	1.4	1.1
Self-Response	3.7	1.6	1.2
Enumerator/Interviewer	5.7	1.0	0.9

KEY: Self-Response – Census 2000 Sample/Mail return response; C2SS Mail Return and Telephone Questionnaire Assistance responses
Enumerator/Interviewer – Census 2000 Sample NRFU and CIFU responses; C2SS CATI and CAPI responses.

Appendix A. Item Allocation Rates by Occupancy Status and Data Collection Mode

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Table 8c. Business on Property, Comparison of Item Allocation Rates, by Occupancy Status and Data Collection Mode

Universe	Census 2000 Sample	C2SS	SS01
Total Housing Units	8.0	10.5	10.2
Occupied Units	8.2	2.8	2.2
Self-Response	8.9	4.2	3.3
Enumerator/Interviewer	5.9	0.4	0.4
Vacant Units	5.8	91.4	90.7

KEY: Self-Response – Census 2000 Sample/Mail return response; C2SS Mail Return and Telephone Questionnaire Assistance responses
Enumerator/Interviewer – Census 2000 Sample NRFU and CIFU responses; C2SS CATI and CAPI responses.

Table 8d. Acreage, Comparison of Item Allocation Rates, by Occupancy Status and Data Collection Mode

Universe	Census 2000 Sample	C2SS	SS01
Total Housing Units	10.6	3.9	3.3
Occupied Units	10.6	3.6	3.0
Self-Response	11.7	4.5	3.5
Enumerator/Interviewer	7.2	2.0	2.1
Vacant Units	10.7	7.4	6.8

KEY: Self-Response – Census 2000 Sample/Mail return response; C2SS Mail Return and Telephone Questionnaire Assistance responses
Enumerator/Interviewer – Census 2000 Sample NRFU and CIFU responses; C2SS CATI and CAPI responses.

Table 9a. Mortgage Status and Selected Monthly Owner Costs, Comparison of Allocation Rates

Universe	Census 2000 Sample	C2SS	SS01
Specified Owner-Occupied Units	59.3	35.7	32.5
Units with a Mortgage	56.8	36.8	33.9
Units without a Mortgage	65.2	33.4	29.5

KEY: Self-Response – Census 2000 Sample/Mail return response; C2SS Mail Return and Telephone Questionnaire Assistance responses
Enumerator/Interviewer – Census 2000 Sample NRFU and CIFU responses; C2SS CATI and CAPI responses.

Table 9b. Mortgage Status, Comparison of Item Allocation Rates, by Data Collection Mode

Universe	Census 2000 Sample	C2SS	SS01
Occupied Units	6.0	2.0	1.5
Self-Response	4.9	2.1	1.5
Enumerator/Interviewer	9.6	1.8	1.6

KEY: Self-Response – Census 2000 Sample/Mail return response; C2SS Mail Return and Telephone Questionnaire Assistance responses
Enumerator/Interviewer – Census 2000 Sample NRFU and CIFU responses; C2SS CATI and CAPI responses.

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Table 9c. Mortgage Payment, Comparison of Item Allocation Rates, by Data Collection Mode

Universe	Census 2000 Sample	C2SS	SS01
Occupied Units	19.6	10.1	9.1
Self-Response	15.5	7.2	5.8
Enumerator/Interviewer	33.4	15.6	14.6

KEY: Self-Response – Census 2000 Sample/Mail return response; C2SS Mail Return and Telephone Questionnaire Assistance responses
Enumerator/Interviewer – Census 2000 Sample NRFU and CIFU responses; C2SS CATI and CAPI responses.

Table 9d. Real Estate Taxes, Comparison of Item Allocation Rates, by Data Collection Mode

Universe	Census 2000 Sample	C2SS	SS01
Occupied Units	32.0	20.8	19.7
Self-Response	27.0	13.7	11.5
Enumerator/Interviewer	49.6	35.4	35.2

KEY: Self-Response – Census 2000 Sample/Mail return response; C2SS Mail Return and Telephone Questionnaire Assistance responses
Enumerator/Interviewer – Census 2000 Sample NRFU and CIFU responses; C2SS CATI and CAPI responses.

Table 9e. Property Insurance, Comparison of Item Allocation Rates, by Data Collection Mode

Universe	Census 2000 Sample	C2SS	SS01
Occupied Units	36.6	24.5	24.0
Self-Response	31.0	18.3	16.4
Enumerator/Interviewer	56.2	37.6	38.3

KEY: Self-Response – Census 2000 Sample/Mail return response; C2SS Mail Return and Telephone Questionnaire Assistance responses
Enumerator/Interviewer – Census 2000 Sample NRFU and CIFU responses; C2SS CATI and CAPI responses.

Table 9f. Mobile Home Costs, Comparison of Item Allocation Rates, by Data Collection Mode

Universe	Census 2000 Sample	C2SS	SS01
Occupied Units	63.5	37.8	36.3
Self-Response	63.0	54.0	53.8
Enumerator/Interviewer	64.3	18.9	17.3

KEY: Self-Response – Census 2000 Sample/Mail return response; C2SS Mail Return and Telephone Questionnaire Assistance responses
Enumerator/Interviewer – Census 2000 Sample NRFU and CIFU responses; C2SS CATI and CAPI responses.

Appendix A. Item Allocation Rates by Occupancy Status and Data Collection Mode

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Table 9g. Electricity Cost, Comparison of Item Allocation Rates, by Data Collection Mode

Universe	Census 2000 Sample	C2SS	SS01
Occupied Units	17.1	6.9	6.6
Self-Response	13.6	4.3	3.3
Enumerator/Interviewer	26.1	11.0	11.1

KEY: Self-Response – Census 2000 Sample/Mail return response; C2SS Mail Return and Telephone Questionnaire Assistance responses
Enumerator/Interviewer – Census 2000 Sample NRFU and CIFU responses; C2SS CATI and CAPI responses.

Table 9h. Gas Cost, Comparison of Item Allocation Rates, by Data Collection Mode

Universe	Census 2000 Sample	C2SS	SS01
Occupied Units	23.9	11.5	10.2
Self-Response	23.6	11.8	10.1
Enumerator/Interviewer	24.7	11.0	10.3

KEY: Self-Response – Census 2000 Sample/Mail return response; C2SS Mail Return and Telephone Questionnaire Assistance responses
Enumerator/Interviewer – Census 2000 Sample NRFU and CIFU responses; C2SS CATI and CAPI responses.

Table 9i. Water and Sewer Cost, Comparison of Item Allocation Rates, by Data Collection Mode

Universe	Census 2000 Sample	C2SS	SS01
Occupied Units	19.6	8.3	7.6
Self-Response	17.9	6.8	5.5
Enumerator/Interviewer	23.9	10.6	10.7

KEY: Self-Response – Census 2000 Sample/Mail return response; C2SS Mail Return and Telephone Questionnaire Assistance responses
Enumerator/Interviewer – Census 2000 Sample NRFU and CIFU responses; C2SS CATI and CAPI responses.

Table 9j. Other Fuel Cost, Comparison of Item Allocation Rates, by Data Collection Mode

Universe	Census 2000 Sample	C2SS	SS01
Occupied Units	28.7	13.4	11.1
Self-Response	32.0	20.4	17.2
Enumerator/Interviewer	20.0	2.7	2.5

KEY: Self-Response – Census 2000 Sample/Mail return response; C2SS Mail Return and Telephone Questionnaire Assistance responses
Enumerator/Interviewer – Census 2000 Sample NRFU and CIFU responses; C2SS CATI and CAPI responses.

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Table 9k. Some Income Allocated, Comparison of Item Allocation Rates, by Data Collection Mode

Universe	Census 2000 Sample	C2SS	SS01
Households	37.6	31.1	29.7
Persons in Households	29.7	23.9	22.4
Self-Response	25.5	20.7	18.1
Enumerator/Interviewer	40.3	28.6	28.0

KEY: Self-Response – Census 2000 Sample/Mail return response; C2SS Mail Return and Telephone Questionnaire Assistance responses
Enumerator/Interviewer – Census 2000 Sample NRFU and CIFU responses; C2SS CATI and CAPI responses.

Table 10a. Gross Rent, Comparison of Allocation Rates

Universe	Census 2000 Sample	C2SS	SS01
Specified renter-occupied units	37.7	20.3	19.4

KEY: Self-Response – Census 2000 Sample/Mail return response; C2SS Mail Return and Telephone Questionnaire Assistance responses
Enumerator/Interviewer – Census 2000 Sample NRFU and CIFU responses; C2SS CATI and CAPI responses.

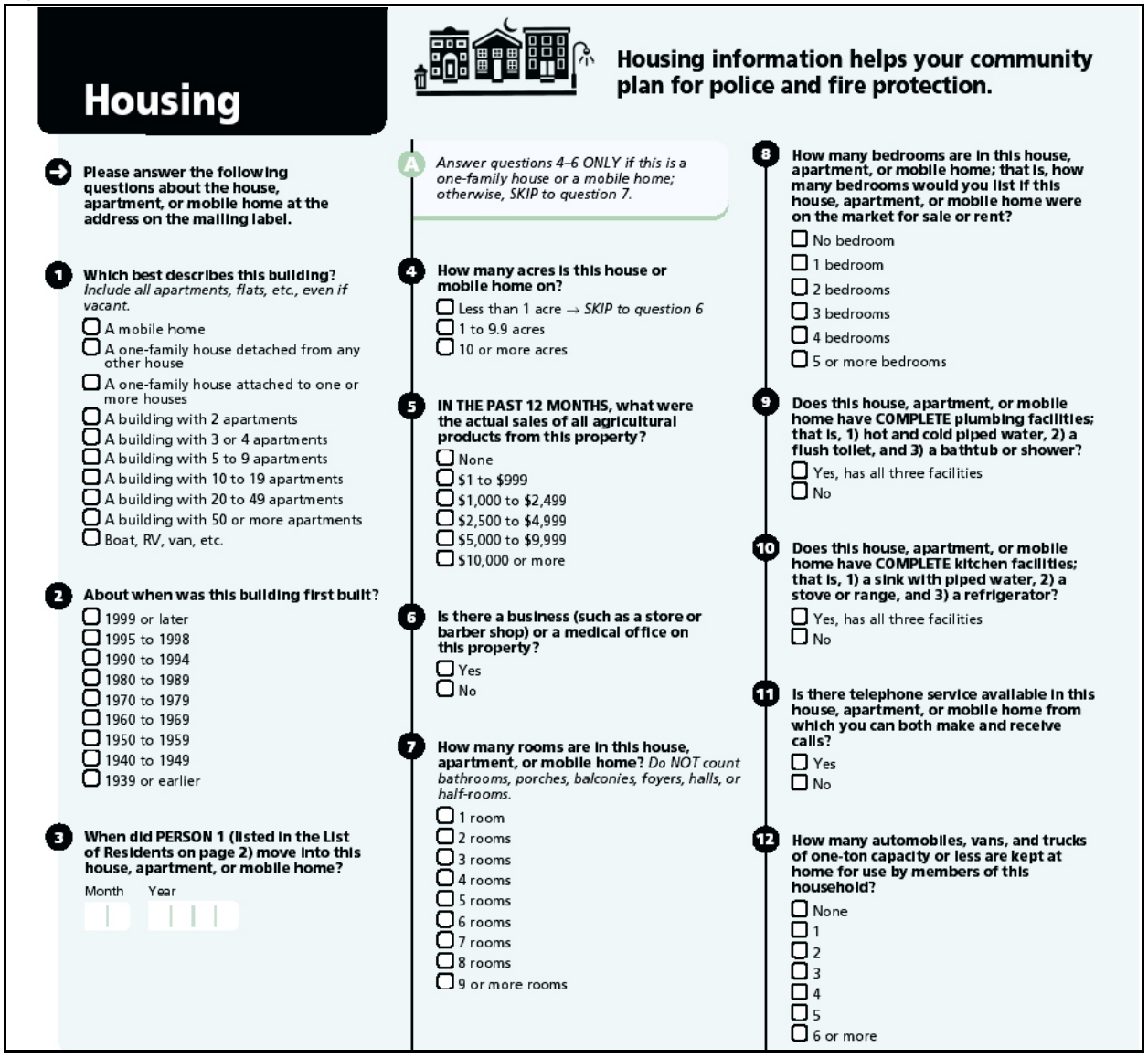
Table 10b. Monthly Rent, Comparison of Item Allocation Rates, by Occupancy Status and Data Collection Mode

Universe	Census 2000 Sample	C2SS	SS01
Total Housing Units	18.0	7.3	7.2
Occupied Units	15.6	5.3	5.2
Self-Response	13.2	4.2	3.9
Enumerator/Interviewer	19.2	6.3	6.4
Vacant Units	47.8	36.9	36.0

KEY: Self-Response – Census 2000 Sample/Mail return response; C2SS Mail Return and Telephone Questionnaire Assistance responses
Enumerator/Interviewer – Census 2000 Sample NRFU and CIFU responses; C2SS CATI and CAPI responses.

Appendix B: Facsimiles of C2SS and Census 2000 Questions

Figure 1a. C2SS Mail Form



Housing

Housing information helps your community plan for police and fire protection.

Please answer the following questions about the house, apartment, or mobile home at the address on the mailing label.

1 **Which best describes this building?** *Include all apartments, flats, etc., even if vacant.*

- ☐ A mobile home
- ☐ A one-family house detached from any other house
- ☐ A one-family house attached to one or more houses
- ☐ A building with 2 apartments
- ☐ A building with 3 or 4 apartments
- ☐ A building with 5 to 9 apartments
- ☐ A building with 10 to 19 apartments
- ☐ A building with 20 to 49 apartments
- ☐ A building with 50 or more apartments
- ☐ Boat, RV, van, etc.

2 **About when was this building first built?**

- ☐ 1999 or later
- ☐ 1995 to 1998
- ☐ 1990 to 1994
- ☐ 1980 to 1989
- ☐ 1970 to 1979
- ☐ 1960 to 1969
- ☐ 1950 to 1959
- ☐ 1940 to 1949
- ☐ 1939 or earlier

3 **When did PERSON 1 (listed in the List of Residents on page 2) move into this house, apartment, or mobile home?**

Month Year

A *Answer questions 4–6 ONLY if this is a one-family house or a mobile home; otherwise, SKIP to question 7.*

4 **How many acres is this house or mobile home on?**

- ☐ Less than 1 acre → *SKIP to question 6*
- ☐ 1 to 9.9 acres
- ☐ 10 or more acres

5 **IN THE PAST 12 MONTHS, what were the actual sales of all agricultural products from this property?**

- ☐ None
- ☐ $1 to $999
- ☐ $1,000 to $2,499
- ☐ $2,500 to $4,999
- ☐ $5,000 to $9,999
- ☐ $10,000 or more

6 **Is there a business (such as a store or barber shop) or a medical office on this property?**

- ☐ Yes
- ☐ No

7 **How many rooms are in this house, apartment, or mobile home?** *Do NOT count bathrooms, porches, balconies, foyers, halls, or half-rooms.*

- ☐ 1 room
- ☐ 2 rooms
- ☐ 3 rooms
- ☐ 4 rooms
- ☐ 5 rooms
- ☐ 6 rooms
- ☐ 7 rooms
- ☐ 8 rooms
- ☐ 9 or more rooms

8 **How many bedrooms are in this house, apartment, or mobile home; that is, how many bedrooms would you list if this house, apartment, or mobile home were on the market for sale or rent?**

- ☐ No bedroom
- ☐ 1 bedroom
- ☐ 2 bedrooms
- ☐ 3 bedrooms
- ☐ 4 bedrooms
- ☐ 5 or more bedrooms

9 **Does this house, apartment, or mobile home have COMPLETE plumbing facilities; that is, 1) hot and cold piped water, 2) a flush toilet, and 3) a bathtub or shower?**

- ☐ Yes, has all three facilities
- ☐ No

10 **Does this house, apartment, or mobile home have COMPLETE kitchen facilities; that is, 1) a sink with piped water, 2) a stove or range, and 3) a refrigerator?**

- ☐ Yes, has all three facilities
- ☐ No

11 **Is there telephone service available in this house, apartment, or mobile home from which you can both make and receive calls?**

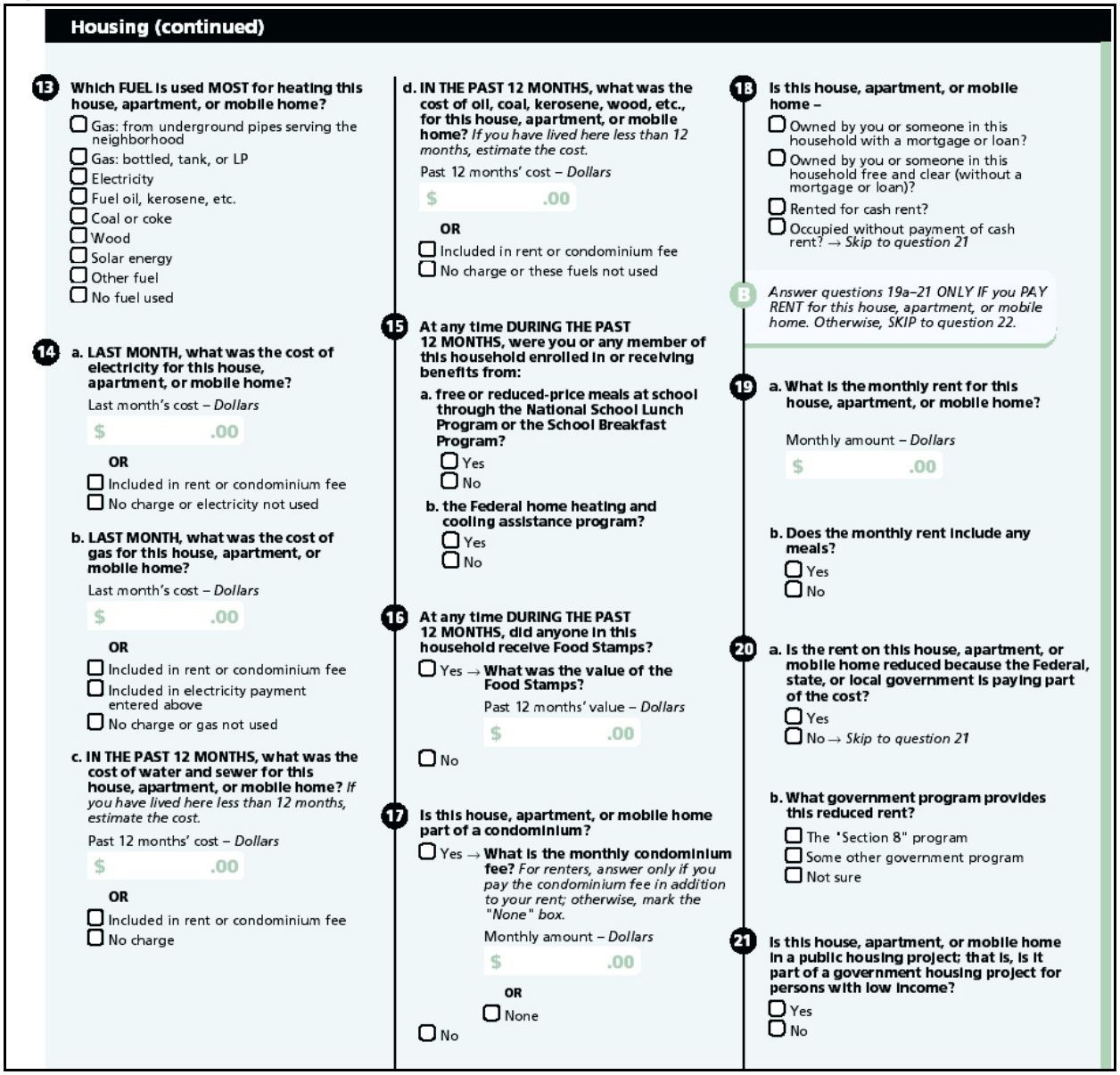
- ☐ Yes
- ☐ No

12 **How many automobiles, vans, and trucks of one-ton capacity or less are kept at home for use by members of this household?**

- ☐ None
- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6 or more

Appendix B: Facsimiles of C2SS and Census 2000 Questions

Figure 1a. C2SS Mail Form



Housing (continued)

13 **Which FUEL is used MOST for heating this house, apartment, or mobile home?**

- ☐ Gas: from underground pipes serving the neighborhood
- ☐ Gas: bottled, tank, or LP
- ☐ Electricity
- ☐ Fuel oil, kerosene, etc.
- ☐ Coal or coke
- ☐ Wood
- ☐ Solar energy
- ☐ Other fuel
- ☐ No fuel used

14 **a. LAST MONTH, what was the cost of electricity for this house, apartment, or mobile home?**

Last month's cost – *Dollars*

$ .00

OR

- ☐ Included in rent or condominium fee
- ☐ No charge or electricity not used

b. LAST MONTH, what was the cost of gas for this house, apartment, or mobile home?

Last month's cost – *Dollars*

$ .00

OR

- ☐ Included in rent or condominium fee
- ☐ Included in electricity payment entered above
- ☐ No charge or gas not used

c. IN THE PAST 12 MONTHS, what was the cost of water and sewer for this house, apartment, or mobile home? *If you have lived here less than 12 months, estimate the cost.*

Past 12 months' cost – *Dollars*

$ .00

OR

- ☐ Included in rent or condominium fee
- ☐ No charge

d. IN THE PAST 12 MONTHS, what was the cost of oil, coal, kerosene, wood, etc., for this house, apartment, or mobile home? *If you have lived here less than 12 months, estimate the cost.*

Past 12 months' cost – *Dollars*

$ .00

OR

- ☐ Included in rent or condominium fee
- ☐ No charge or these fuels not used

15 **At any time DURING THE PAST 12 MONTHS, were you or any member of this household enrolled in or receiving benefits from:**

a. free or reduced-price meals at school through the National School Lunch Program or the School Breakfast Program?

- ☐ Yes
- ☐ No

b. the Federal home heating and cooling assistance program?

- ☐ Yes
- ☐ No

16 **At any time DURING THE PAST 12 MONTHS, did anyone in this household receive Food Stamps?**

- ☐ Yes → **What was the value of the Food Stamps?**

  Past 12 months' value – *Dollars*

  $ .00
- ☐ No

17 **Is this house, apartment, or mobile home part of a condominium?**

- ☐ Yes → **What is the monthly condominium fee?** *For renters, answer only if you pay the condominium fee in addition to your rent; otherwise, mark the "None" box.*

  Monthly amount – *Dollars*

  $ .00

  OR

  ☐ None
- ☐ No

18 **Is this house, apartment, or mobile home –**

- ☐ Owned by you or someone in this household with a mortgage or loan?
- ☐ Owned by you or someone in this household free and clear (without a mortgage or loan)?
- ☐ Rented for cash rent?
- ☐ Occupied without payment of cash rent? → *Skip to question 21*

B *Answer questions 19a–21 ONLY IF you PAY RENT for this house, apartment, or mobile home. Otherwise, SKIP to question 22.*

19 **a. What is the monthly rent for this house, apartment, or mobile home?**

Monthly amount – *Dollars*

$ .00

b. Does the monthly rent include any meals?

- ☐ Yes
- ☐ No

20 **a. Is the rent on this house, apartment, or mobile home reduced because the Federal, state, or local government is paying part of the cost?**

- ☐ Yes
- ☐ No → *Skip to question 21*

b. What government program provides this reduced rent?

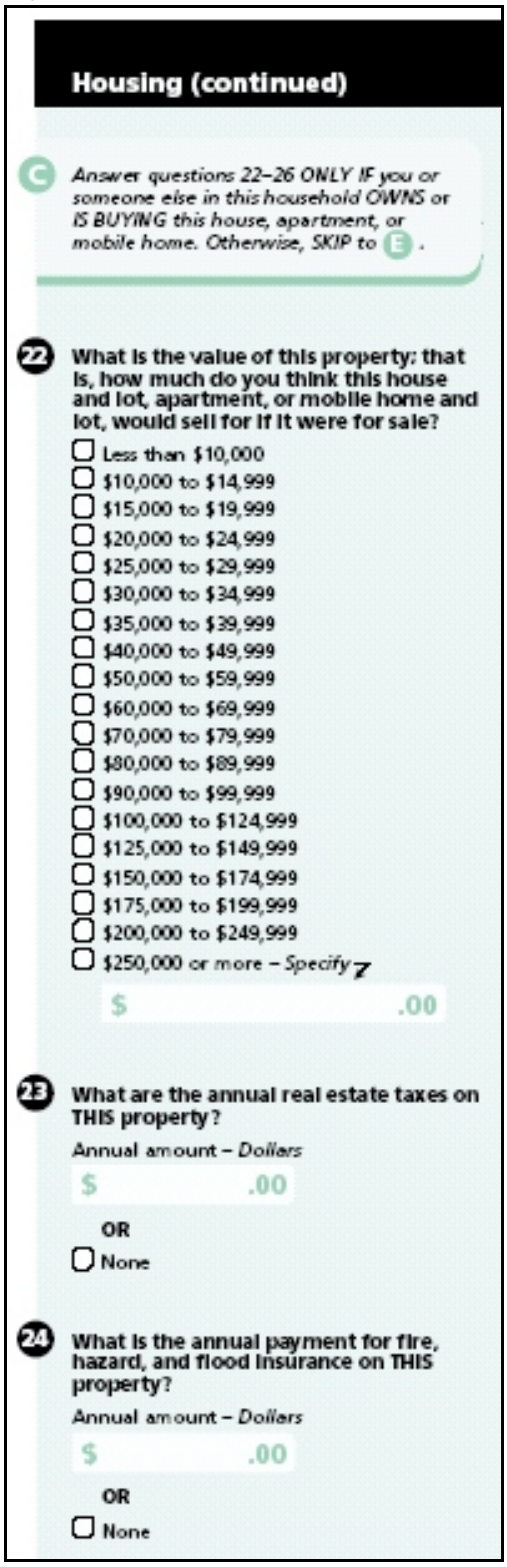
- ☐ The "Section 8" program
- ☐ Some other government program
- ☐ Not sure

21 **Is this house, apartment, or mobile home in a public housing project; that is, is it part of a government housing project for persons with low income?**

- ☐ Yes
- ☐ No

Appendix B: Facsimiles of C2SS and Census 2000 Questions

Figure 1a. C2SS Mail Form



Housing (continued)

C *Answer questions 22–26 ONLY IF you or someone else in this household OWNS or IS BUYING this house, apartment, or mobile home. Otherwise, SKIP to* E .

22 **What is the value of this property: that is, how much do you think this house and lot, apartment, or mobile home and lot, would sell for if it were for sale?**

- ☐ Less than $10,000
- ☐ $10,000 to $14,999
- ☐ $15,000 to $19,999
- ☐ $20,000 to $24,999
- ☐ $25,000 to $29,999
- ☐ $30,000 to $34,999
- ☐ $35,000 to $39,999
- ☐ $40,000 to $49,999
- ☐ $50,000 to $59,999
- ☐ $60,000 to $69,999
- ☐ $70,000 to $79,999
- ☐ $80,000 to $89,999
- ☐ $90,000 to $99,999
- ☐ $100,000 to $124,999
- ☐ $125,000 to $149,999
- ☐ $150,000 to $174,999
- ☐ $175,000 to $199,999
- ☐ $200,000 to $249,999
- ☐ $250,000 or more – *Specify*

$ .00

23 **What are the annual real estate taxes on THIS property?**

Annual amount – *Dollars*

$ .00

OR

☐ None

24 **What is the annual payment for fire, hazard, and flood insurance on THIS property?**

Annual amount – *Dollars*

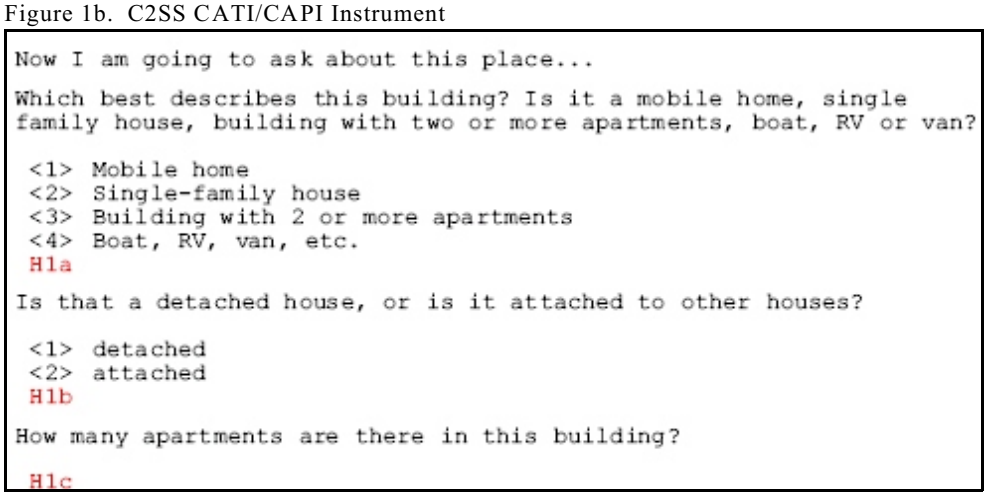
$ .00

OR

☐ None

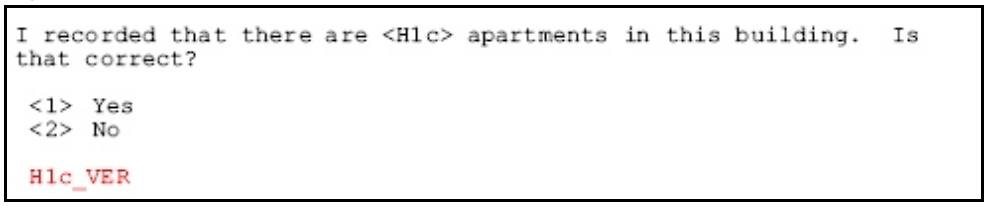
Appendix B: Facsimiles of C2SS and Census 2000 Questions

Figure 1b. C2SS CATI/CAPI Instrument



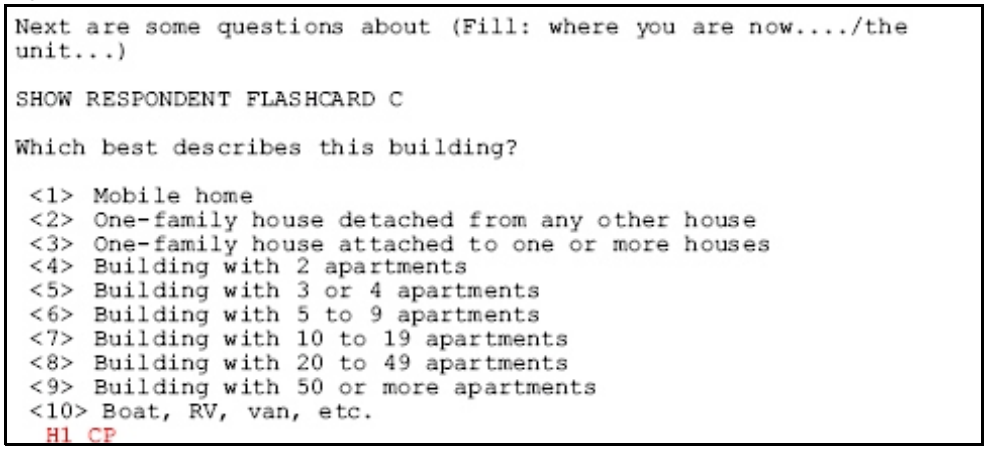
```
Now I am going to ask about this place...

Which best describes this building? Is it a mobile home, single
family house, building with two or more apartments, boat, RV or van?

 <1> Mobile home
 <2> Single-family house
 <3> Building with 2 or more apartments
 <4> Boat, RV, van, etc.
 H1a

Is that a detached house, or is it attached to other houses?

 <1> detached
 <2> attached
 H1b

How many apartments are there in this building?

 H1c
```

Figure 1b. C2SS CATI/CAPI Instrument



```
I recorded that there are <H1c> apartments in this building.  Is
that correct?

 <1> Yes
 <2> No

 H1c_VER
```

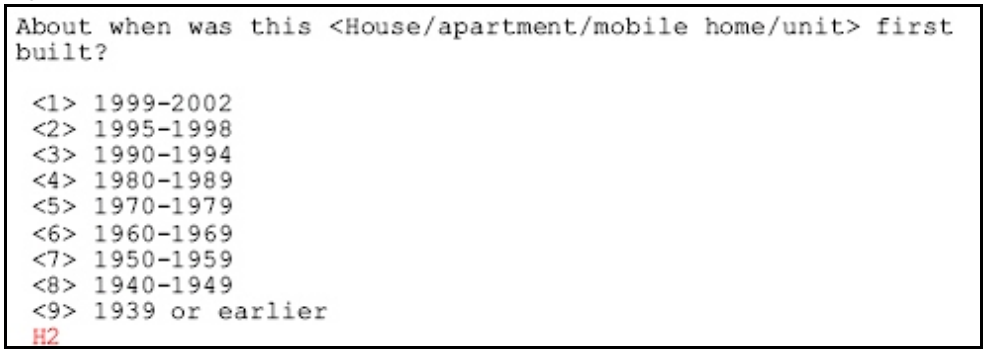
Figure 1b. C2SS CATI/CAPI Instrument



```
Next are some questions about (Fill: where you are now..../the
unit...)

SHOW RESPONDENT FLASHCARD C

Which best describes this building?

 <1> Mobile home
 <2> One-family house detached from any other house
 <3> One-family house attached to one or more houses
 <4> Building with 2 apartments
 <5> Building with 3 or 4 apartments
 <6> Building with 5 to 9 apartments
 <7> Building with 10 to 19 apartments
 <8> Building with 20 to 49 apartments
 <9> Building with 50 or more apartments
 <10> Boat, RV, van, etc.
  H1_CP
```

Appendix B: Facsimiles of C2SS and Census 2000 Questions

Figure 1b. C2SS CATI/CAPI Instrument



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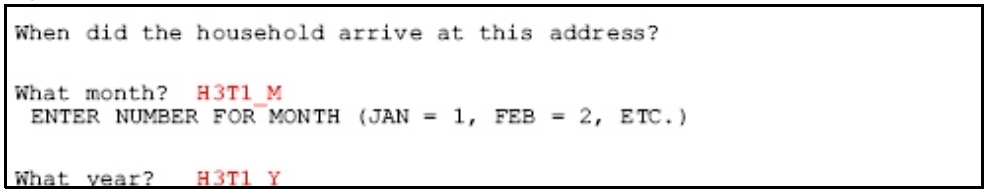

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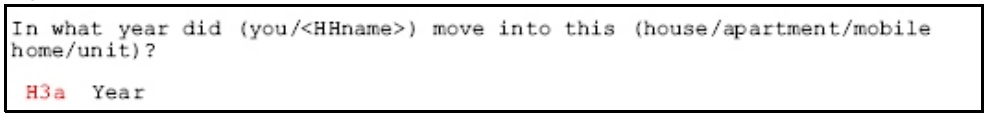

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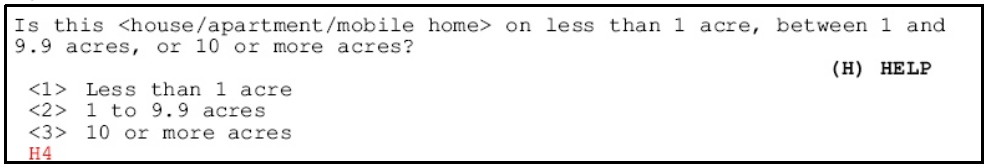

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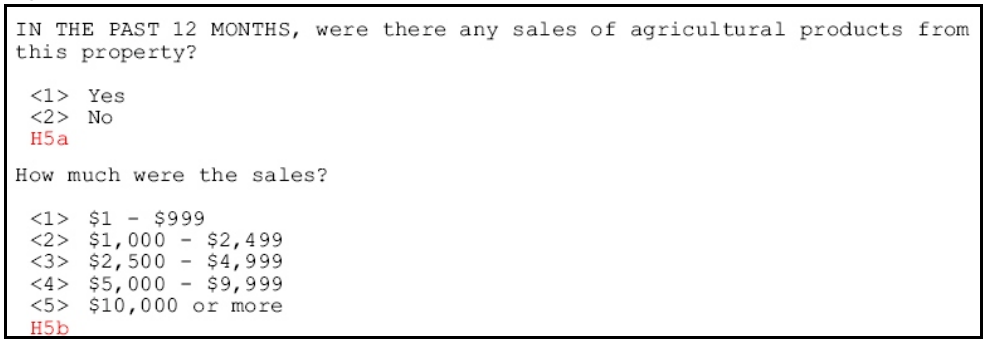
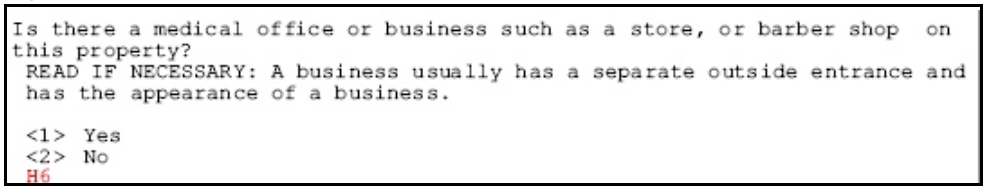


Appendix B: Facsimiles of C2SS and Census 2000 Questions

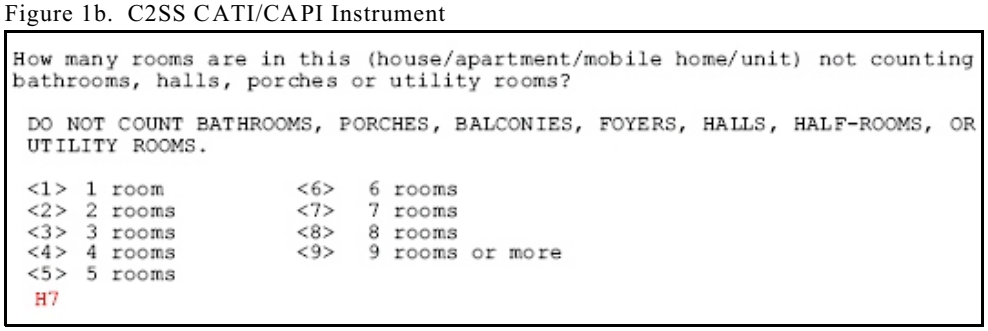
Figure 1b. C2SS CATI/CAPI Instrument



```
Is there a medical office or business such as a store, or barber shop  on
this property?
 READ IF NECESSARY: A business usually has a separate outside entrance and
 has the appearance of a business.

 <1> Yes
 <2> No
 H6
```

Figure 1b. C2SS CATI/CAPI Instrument

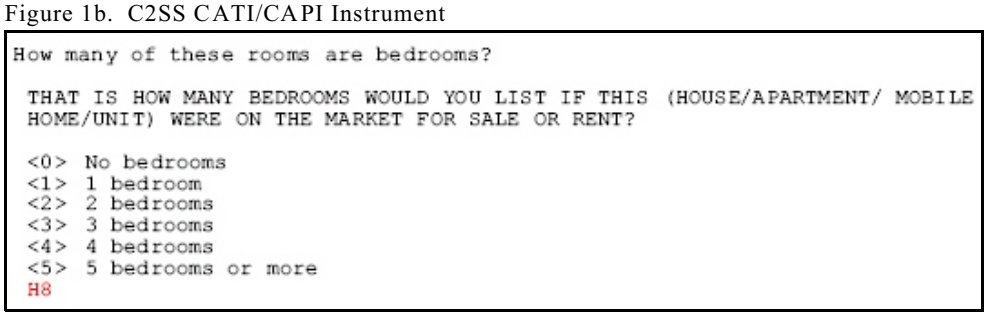


```
How many rooms are in this (house/apartment/mobile home/unit) not counting
bathrooms, halls, porches or utility rooms?

 DO NOT COUNT BATHROOMS, PORCHES, BALCONIES, FOYERS, HALLS, HALF-ROOMS, OR
 UTILITY ROOMS.

 <1> 1 room          <6>  6 rooms
 <2> 2 rooms         <7>  7 rooms
 <3> 3 rooms         <8>  8 rooms
 <4> 4 rooms         <9>  9 rooms or more
 <5> 5 rooms
 H7
```

Figure 1b. C2SS CATI/CAPI Instrument

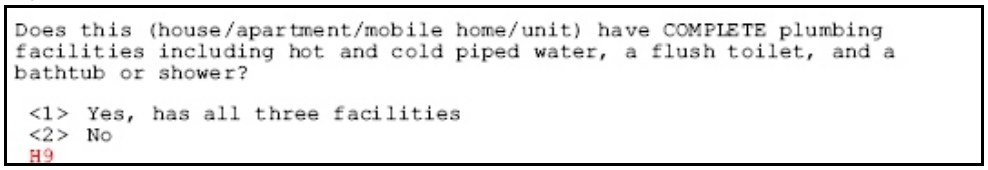


```
How many of these rooms are bedrooms?

 THAT IS HOW MANY BEDROOMS WOULD YOU LIST IF THIS (HOUSE/APARTMENT/ MOBILE
 HOME/UNIT) WERE ON THE MARKET FOR SALE OR RENT?

 <0> No bedrooms
 <1> 1 bedroom
 <2> 2 bedrooms
 <3> 3 bedrooms
 <4> 4 bedrooms
 <5> 5 bedrooms or more
 H8
```

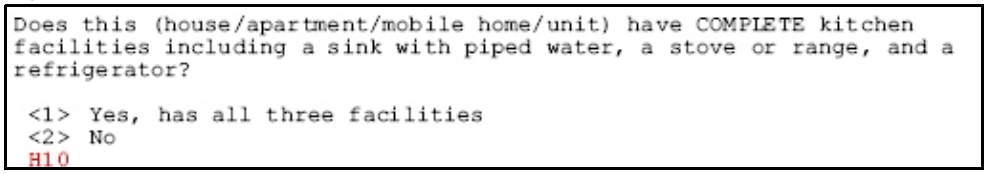
Figure 1b. C2SS CATI/CAPI Instrument



```
Does this (house/apartment/mobile home/unit) have COMPLETE plumbing
facilities including hot and cold piped water, a flush toilet, and a
bathtub or shower?

 <1> Yes, has all three facilities
 <2> No
 H9
```

Figure 1b. C2SS CATI/CAPI Instrument

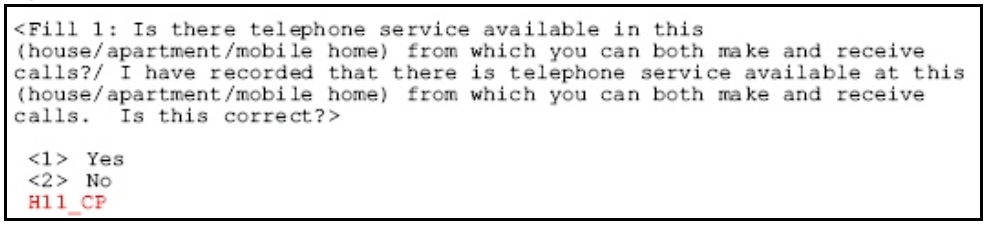


```
Does this (house/apartment/mobile home/unit) have COMPLETE kitchen
facilities including a sink with piped water, a stove or range, and a
refrigerator?

 <1> Yes, has all three facilities
 <2> No
 H10
```

Appendix B: Facsimiles of C2SS and Census 2000 Questions

Figure 1b. C2SS CATI/CAPI Instrument



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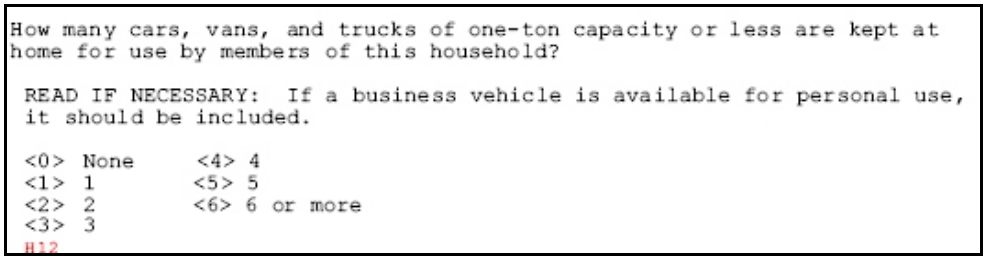

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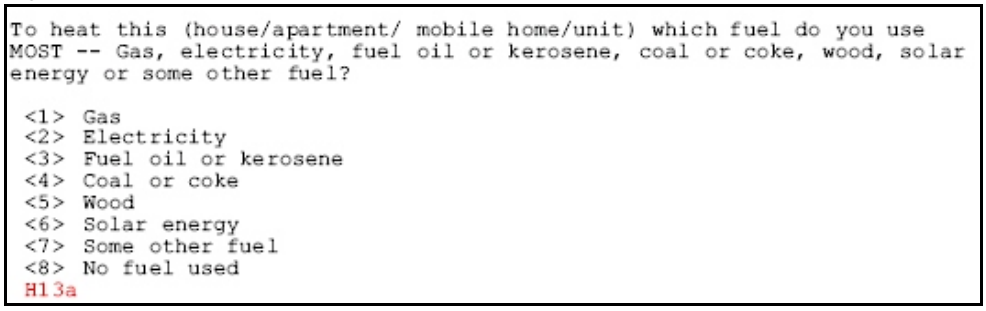

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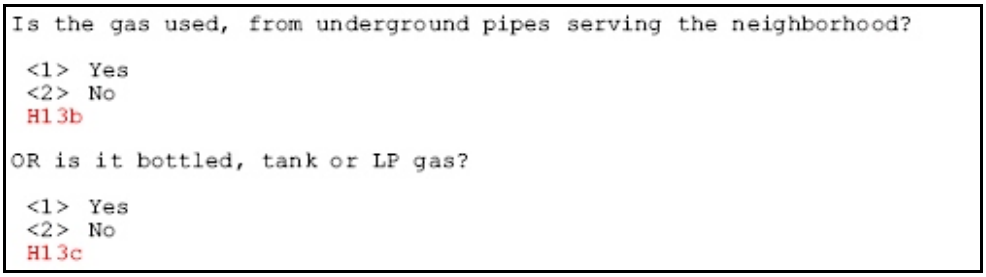

Appendix B: Facsimiles of C2SS and Census 2000 Questions

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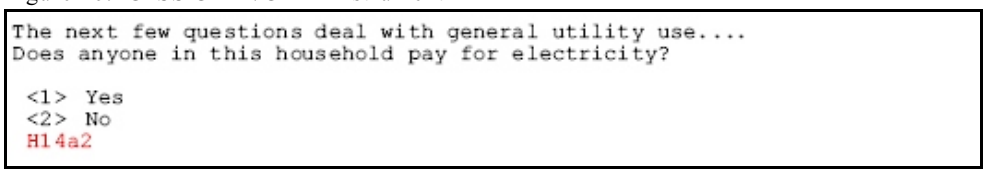

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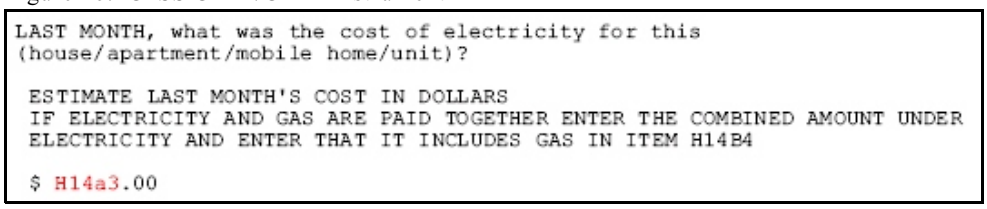

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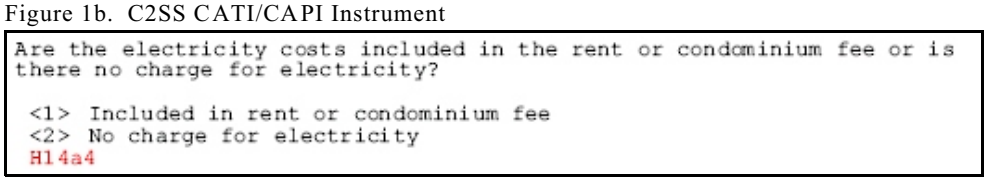

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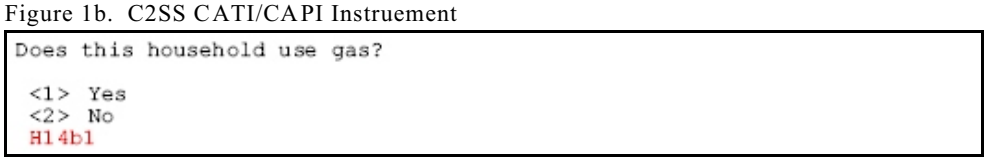

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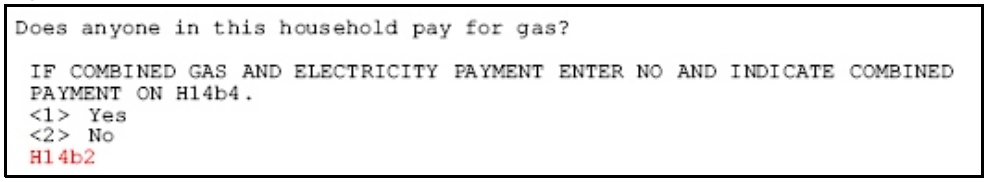

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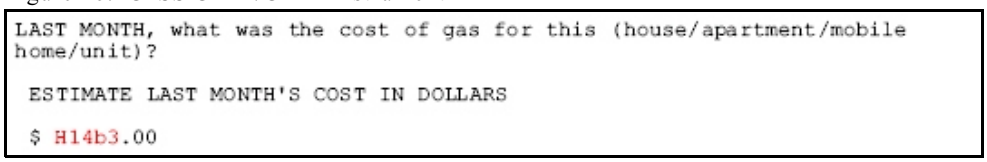

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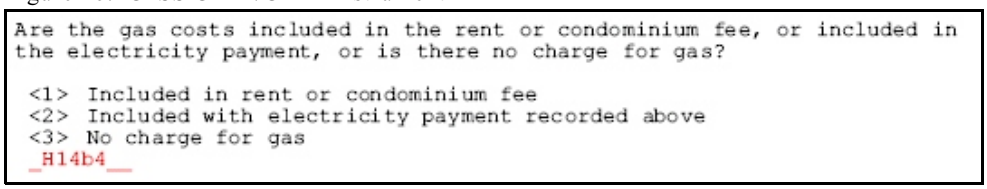

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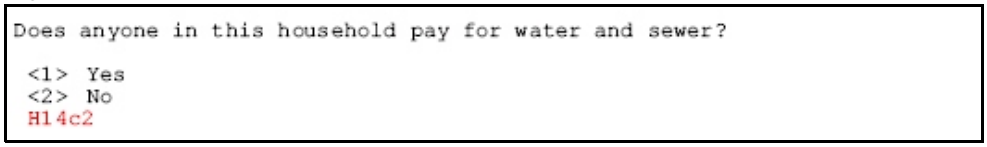

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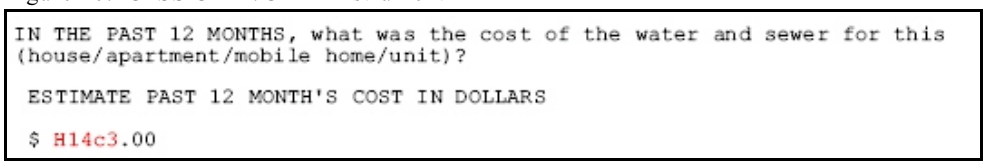

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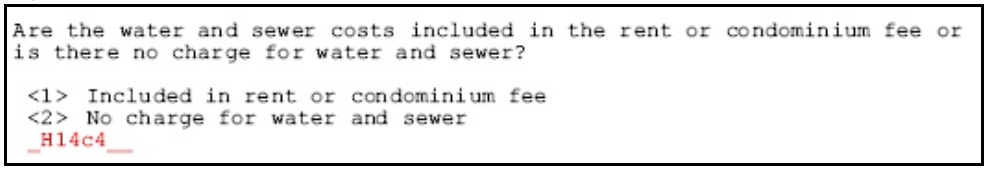

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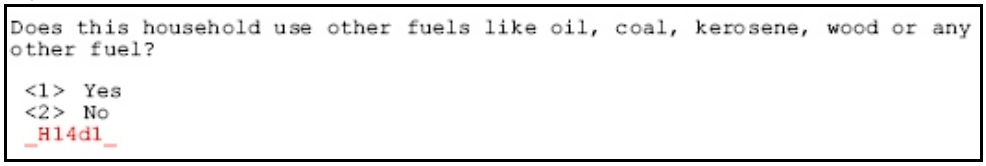

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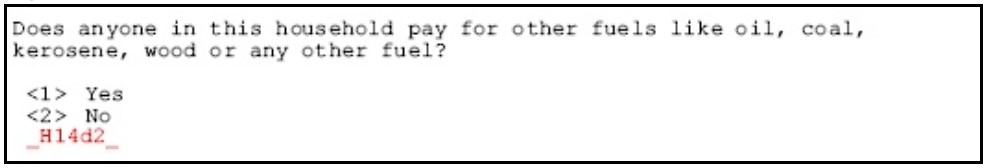

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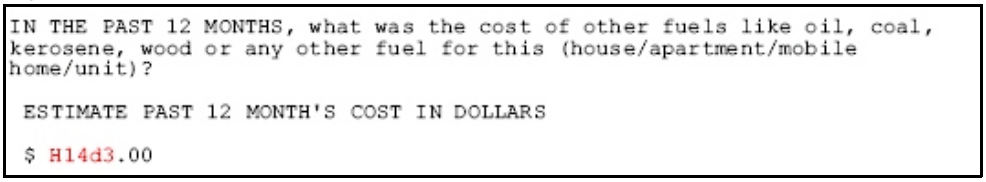

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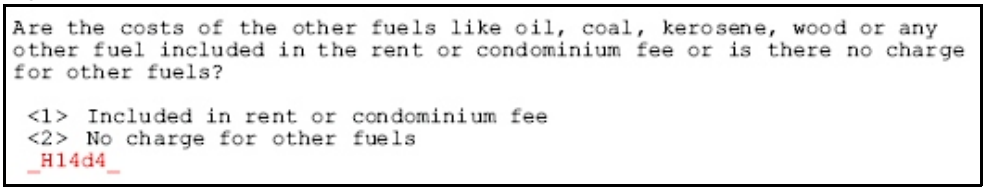

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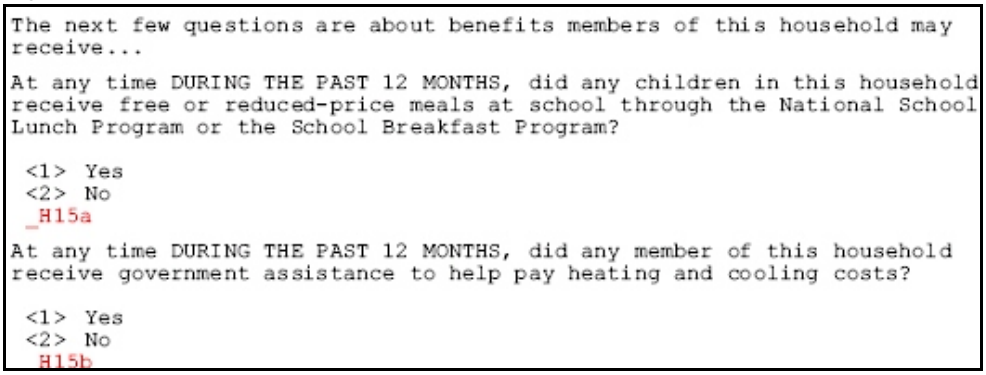

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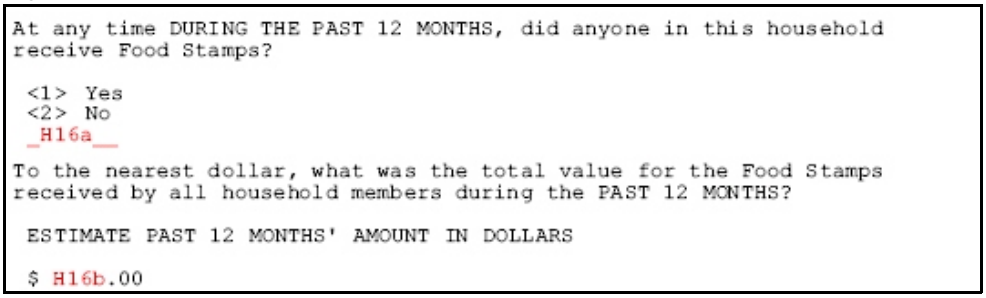

Appendix B: Facsimiles of C2SS and Census 2000 Questions

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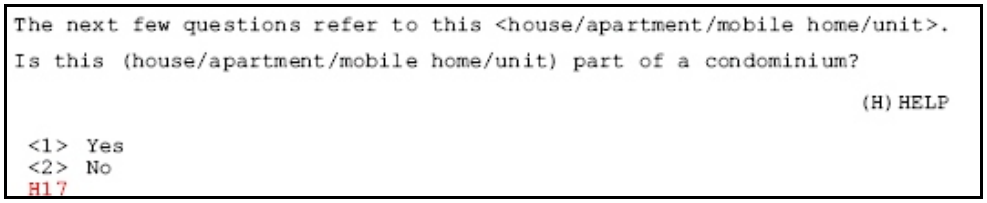

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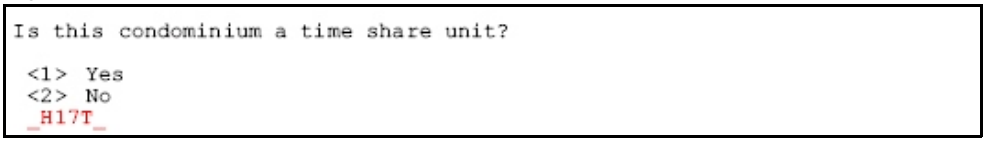


Figure 1b. C2SS CATI/CAPI Instrument

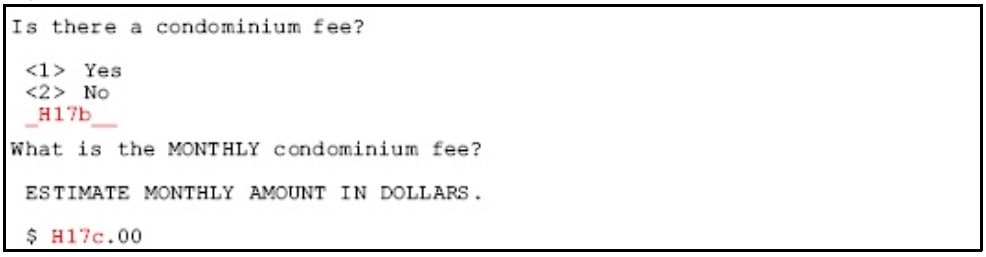
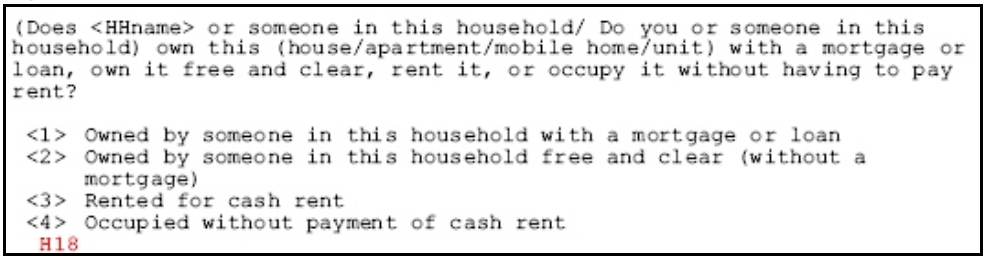


Figure 1b. C2SS CATI/CAPI Instrument



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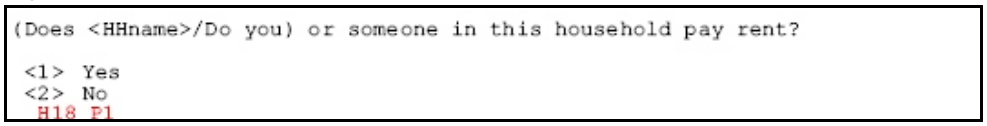
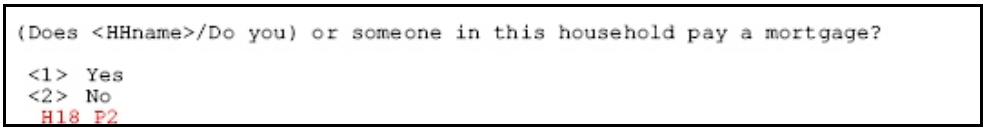


Figure 1b. C2SS CATI/CAPI Instrument



Appendix B: Facsimiles of C2SS and Census 2000 Questions

Figure 1b. C2SS CATI/CAPI Instrument

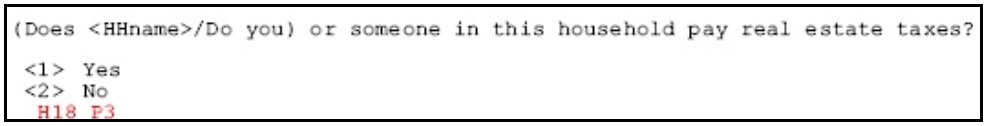
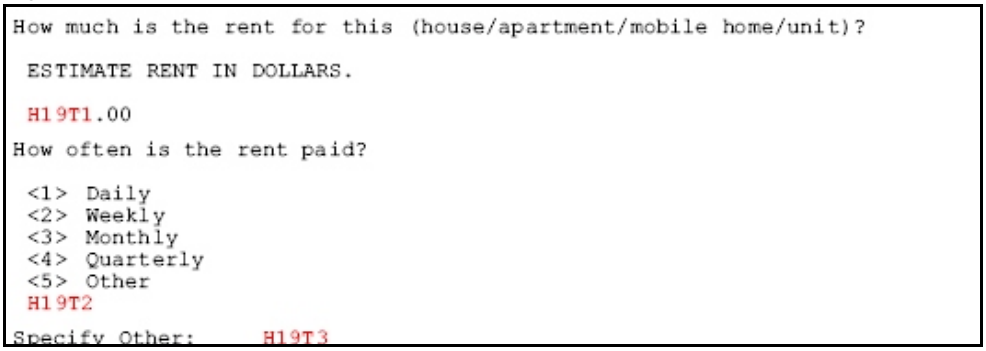


Figure 1b. C2SS CATI/CAPI Instrument



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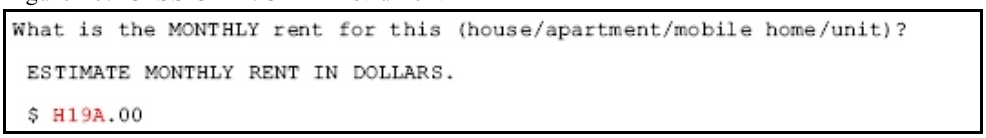

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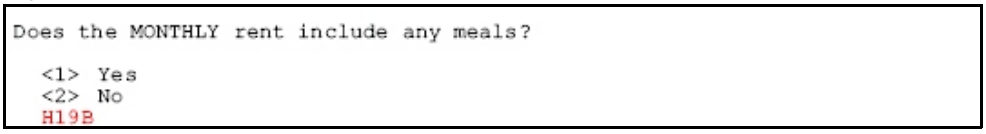


Figure 1b. C2SS CATI/CAPI Instrument

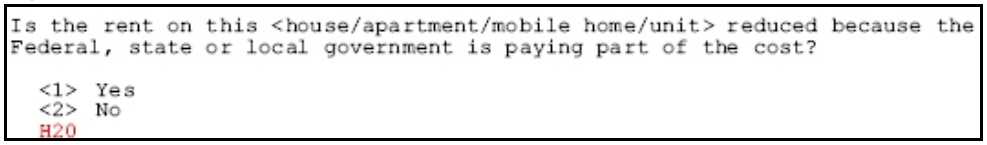
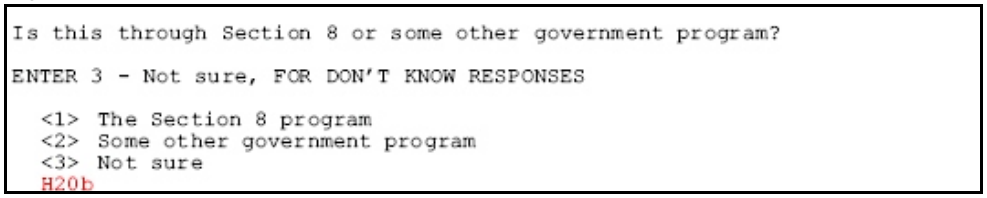


Figure 1b. C2SS CATI/CAPI Instument



Appendix B: Facsimiles of C2SS and Census 2000 Questions

Figure 1b. C2SS CATI/CAPI Instrument

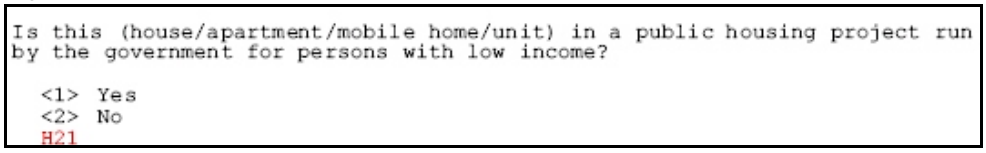


Figure 1b. C2SS CATI/CAPI Instrument

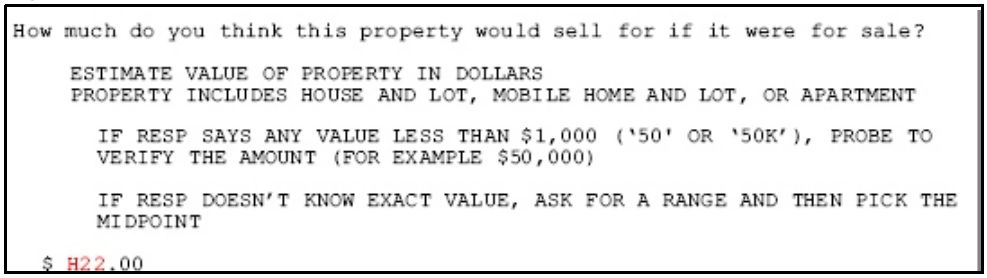


Figure 1b. C2SS CATI/CAPI Instrument

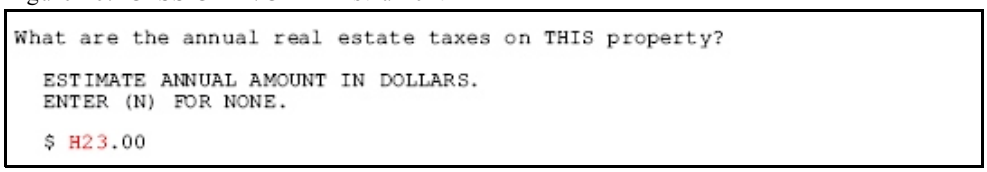


Figure 1b. C2SS CATI/CAPI Instrument

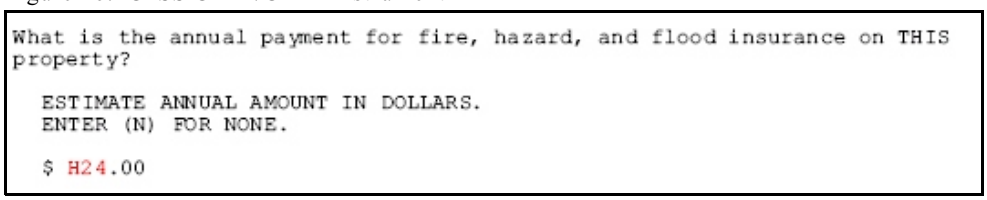
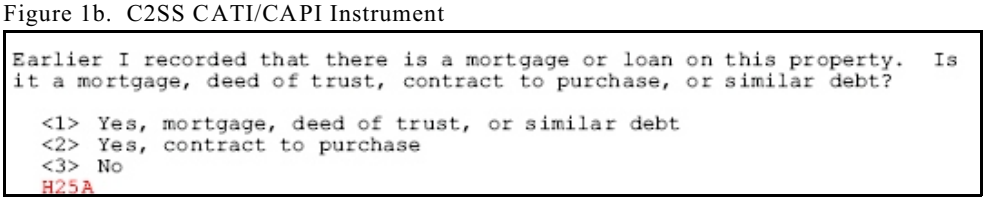


Figure 1b. C2SS CATI/CAPI Instrument



Appendix B: Facsimiles of C2SS and Census 2000 Questions

Figure 1b. C2SS CATI/CAPI Instrument

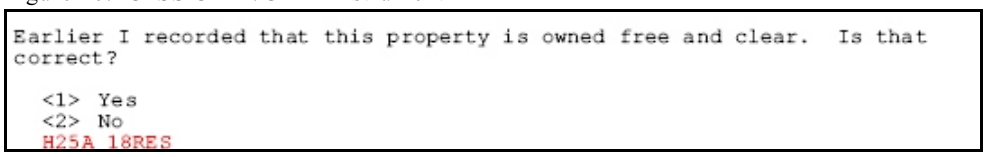


Figure 1b. C2SS CATI/CAPI Instrument

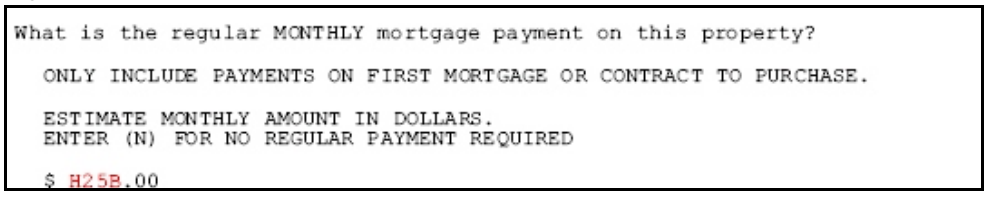


Figure 1b. C2SS CATI/CAPI Instrument

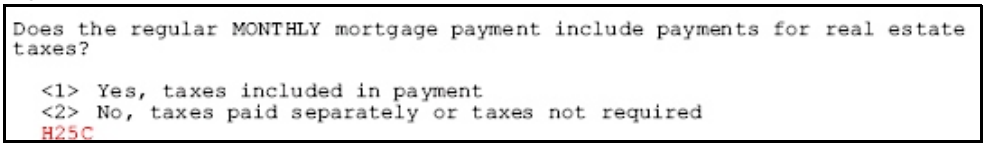


Figure 1b. C2SS CATI/CAPI Instrument

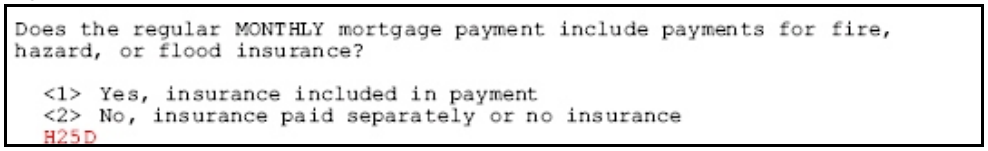


Figure 1b. C2SS CATI/CAPI Instrument

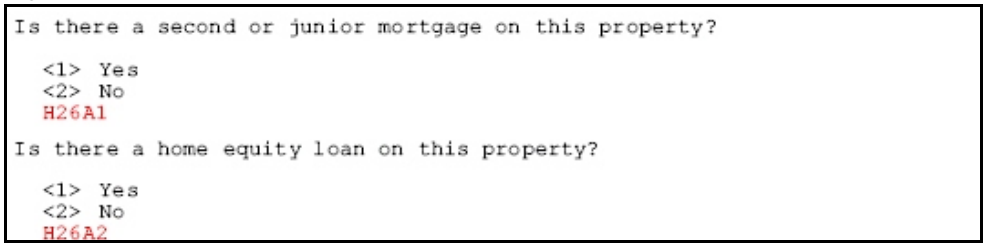
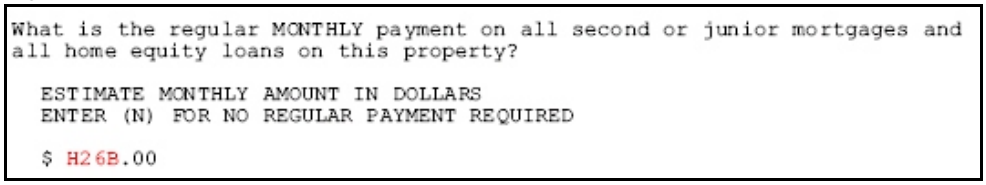
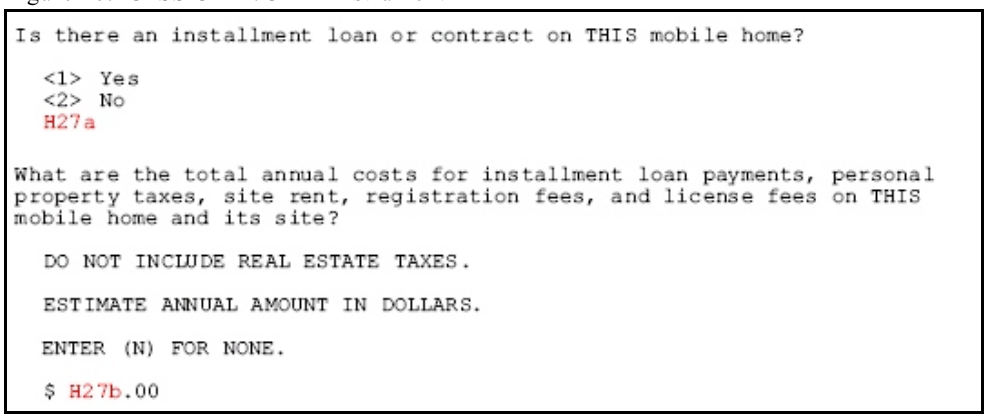


Figure 1b. C2SS CATI/CAPI Instrument



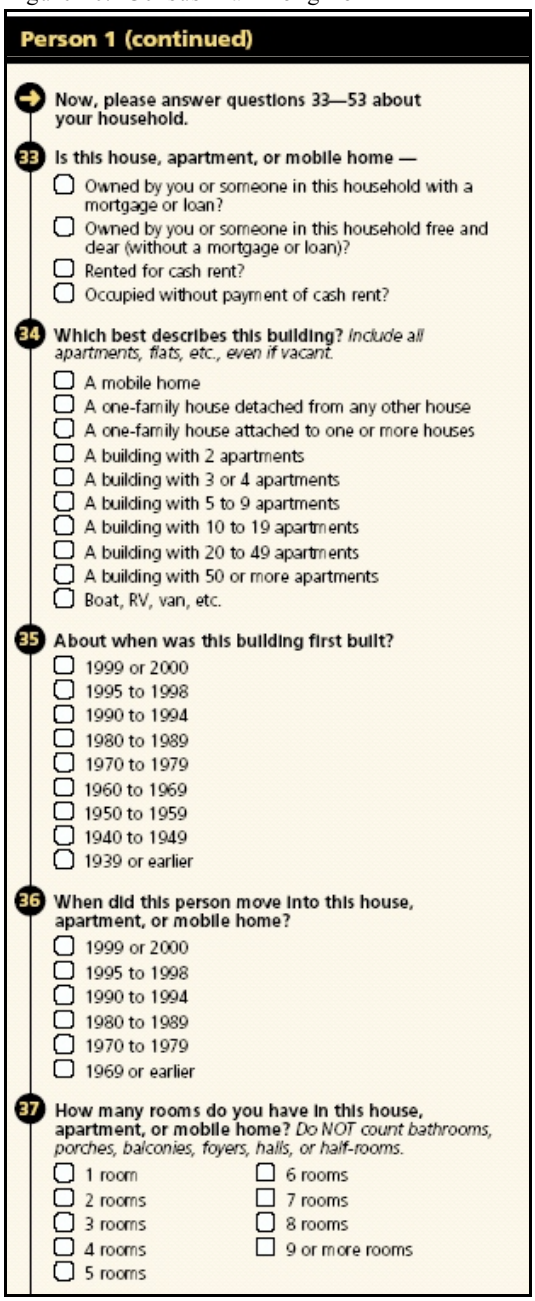
Appendix B: Facsimiles of C2SS and Census 2000 Questions

Figure 1b. C2SS CATI/CAPI Instrument



Appendix B: Facsimiles of C2SS and Census 2000 Questions

Figure 1c. Census Mail Long Form



Person 1 (continued)

Now, please answer questions 33—53 about your household.

33 **Is this house, apartment, or mobile home —**

- ☐ Owned by you or someone in this household with a mortgage or loan?
- ☐ Owned by you or someone in this household free and clear (without a mortgage or loan)?
- ☐ Rented for cash rent?
- ☐ Occupied without payment of cash rent?

34 **Which best describes this building?** *Include all apartments, flats, etc., even if vacant.*

- ☐ A mobile home
- ☐ A one-family house detached from any other house
- ☐ A one-family house attached to one or more houses
- ☐ A building with 2 apartments
- ☐ A building with 3 or 4 apartments
- ☐ A building with 5 to 9 apartments
- ☐ A building with 10 to 19 apartments
- ☐ A building with 20 to 49 apartments
- ☐ A building with 50 or more apartments
- ☐ Boat, RV, van, etc.

35 **About when was this building first built?**

- ☐ 1999 or 2000
- ☐ 1995 to 1998
- ☐ 1990 to 1994
- ☐ 1980 to 1989
- ☐ 1970 to 1979
- ☐ 1960 to 1969
- ☐ 1950 to 1959
- ☐ 1940 to 1949
- ☐ 1939 or earlier

36 **When did this person move into this house, apartment, or mobile home?**

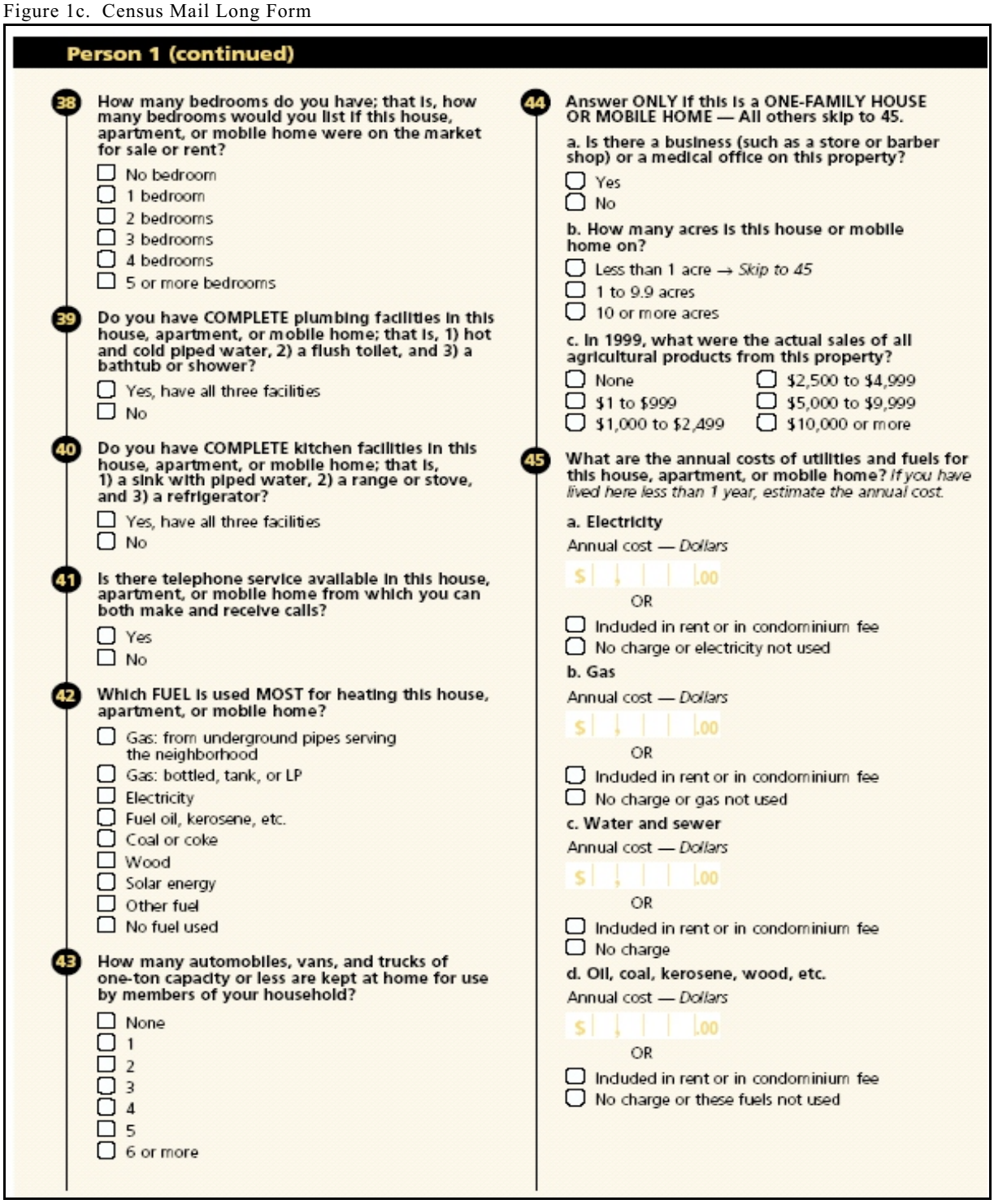
- ☐ 1999 or 2000
- ☐ 1995 to 1998
- ☐ 1990 to 1994
- ☐ 1980 to 1989
- ☐ 1970 to 1979
- ☐ 1969 or earlier

37 **How many rooms do you have in this house, apartment, or mobile home?** *Do NOT count bathrooms, porches, balconies, foyers, halls, or half-rooms.*

- ☐ 1 room
- ☐ 2 rooms
- ☐ 3 rooms
- ☐ 4 rooms
- ☐ 5 rooms
- ☐ 6 rooms
- ☐ 7 rooms
- ☐ 8 rooms
- ☐ 9 or more rooms

Appendix B: Facsimiles of C2SS and Census 2000 Questions

Figure 1c. Census Mail Long Form



Person 1 (continued)

38 How many bedrooms do you have; that is, how many bedrooms would you list if this house, apartment, or mobile home were on the market for sale or rent?

- ☐ No bedroom
- ☐ 1 bedroom
- ☐ 2 bedrooms
- ☐ 3 bedrooms
- ☐ 4 bedrooms
- ☐ 5 or more bedrooms

39 Do you have COMPLETE plumbing facilities in this house, apartment, or mobile home; that is, 1) hot and cold piped water, 2) a flush toilet, and 3) a bathtub or shower?

- ☐ Yes, have all three facilities
- ☐ No

40 Do you have COMPLETE kitchen facilities in this house, apartment, or mobile home; that is, 1) a sink with piped water, 2) a range or stove, and 3) a refrigerator?

- ☐ Yes, have all three facilities
- ☐ No

41 Is there telephone service available in this house, apartment, or mobile home from which you can both make and receive calls?

- ☐ Yes
- ☐ No

42 Which FUEL is used MOST for heating this house, apartment, or mobile home?

- ☐ Gas: from underground pipes serving the neighborhood
- ☐ Gas: bottled, tank, or LP
- ☐ Electricity
- ☐ Fuel oil, kerosene, etc.
- ☐ Coal or coke
- ☐ Wood
- ☐ Solar energy
- ☐ Other fuel
- ☐ No fuel used

43 How many automobiles, vans, and trucks of one-ton capacity or less are kept at home for use by members of your household?

- ☐ None
- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6 or more

44 Answer ONLY if this is a ONE-FAMILY HOUSE OR MOBILE HOME — All others skip to 45.

a. Is there a business (such as a store or barber shop) or a medical office on this property?

- ☐ Yes
- ☐ No

b. How many acres is this house or mobile home on?

- ☐ Less than 1 acre → *Skip to 45*
- ☐ 1 to 9.9 acres
- ☐ 10 or more acres

c. In 1999, what were the actual sales of all agricultural products from this property?

- ☐ None
- ☐ $1 to $999
- ☐ $1,000 to $2,499
- ☐ $2,500 to $4,999
- ☐ $5,000 to $9,999
- ☐ $10,000 or more

45 What are the annual costs of utilities and fuels for this house, apartment, or mobile home? *If you have lived here less than 1 year, estimate the annual cost.*

a. Electricity

Annual cost — *Dollars*

$ .00

OR

- ☐ Included in rent or in condominium fee
- ☐ No charge or electricity not used

b. Gas

Annual cost — *Dollars*

$ .00

OR

- ☐ Included in rent or in condominium fee
- ☐ No charge or gas not used

c. Water and sewer

Annual cost — *Dollars*

$ .00

OR

- ☐ Included in rent or in condominium fee
- ☐ No charge

d. Oil, coal, kerosene, wood, etc.

Annual cost — *Dollars*

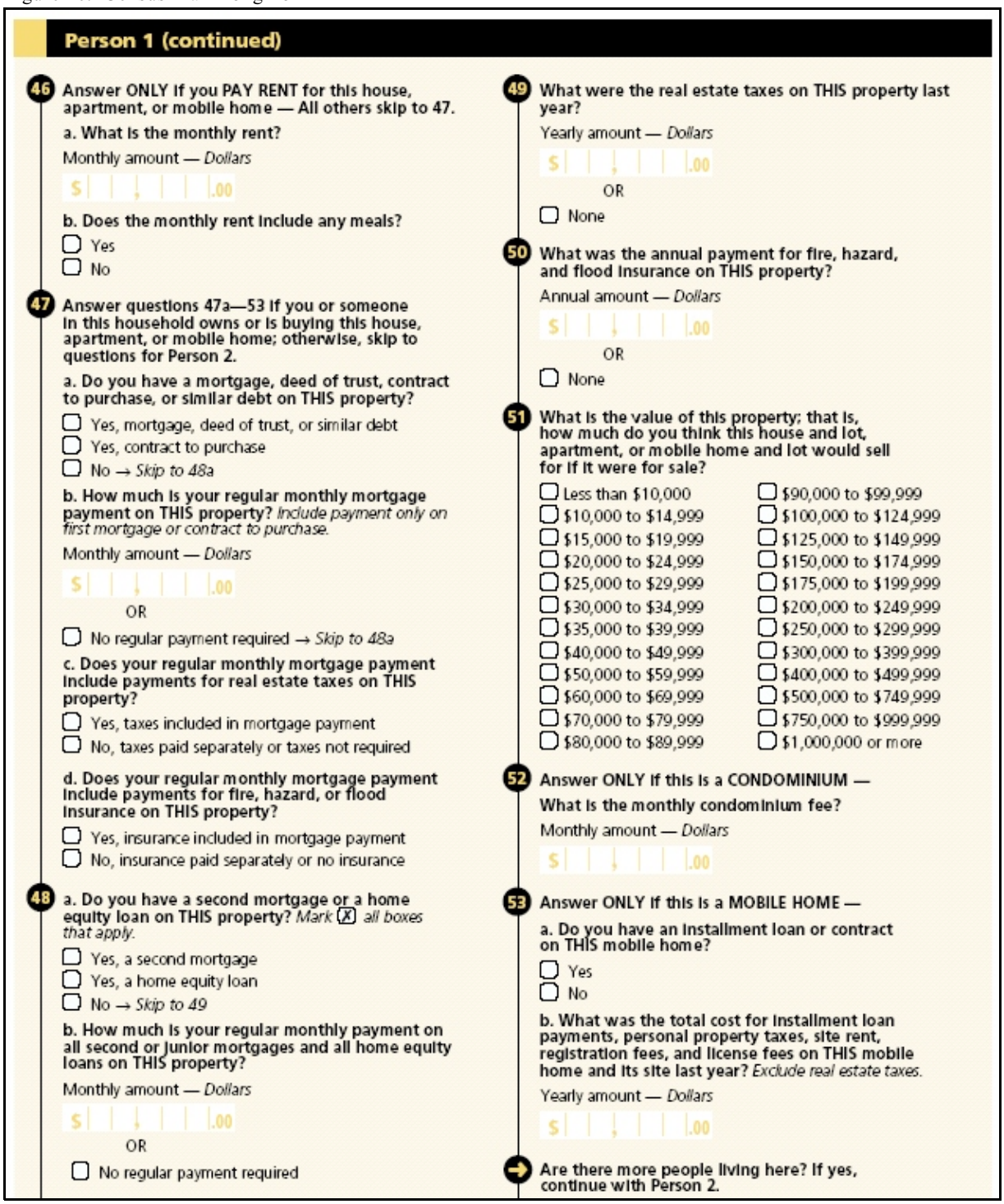
$ .00

OR

- ☐ Included in rent or in condominium fee
- ☐ No charge or these fuels not used

Appendix B: Facsimiles of C2SS and Census 2000 Questions

Figure 1c. Census Mail Long Form



Person 1 (continued)

46 Answer ONLY if you PAY RENT for this house, apartment, or mobile home — All others skip to 47.

a. What is the monthly rent?

Monthly amount — *Dollars*

$ .00

b. Does the monthly rent include any meals?

- ☐ Yes
- ☐ No

47 Answer questions 47a—53 if you or someone in this household owns or is buying this house, apartment, or mobile home; otherwise, skip to questions for Person 2.

a. Do you have a mortgage, deed of trust, contract to purchase, or similar debt on THIS property?

- ☐ Yes, mortgage, deed of trust, or similar debt
- ☐ Yes, contract to purchase
- ☐ No → *Skip to 48a*

b. How much is your regular monthly mortgage payment on THIS property? *Include payment only on first mortgage or contract to purchase.*

Monthly amount — *Dollars*

$ .00

OR

☐ No regular payment required → *Skip to 48a*

c. Does your regular monthly mortgage payment include payments for real estate taxes on THIS property?

- ☐ Yes, taxes included in mortgage payment
- ☐ No, taxes paid separately or taxes not required

d. Does your regular monthly mortgage payment include payments for fire, hazard, or flood insurance on THIS property?

- ☐ Yes, insurance included in mortgage payment
- ☐ No, insurance paid separately or no insurance

48 a. Do you have a second mortgage or a home equity loan on THIS property? *Mark ☒ all boxes that apply.*

- ☐ Yes, a second mortgage
- ☐ Yes, a home equity loan
- ☐ No → *Skip to 49*

b. How much is your regular monthly payment on all second or junior mortgages and all home equity loans on THIS property?

Monthly amount — *Dollars*

$ .00

OR

☐ No regular payment required

49 What were the real estate taxes on THIS property last year?

Yearly amount — *Dollars*

$ .00

OR

☐ None

50 What was the annual payment for fire, hazard, and flood insurance on THIS property?

Annual amount — *Dollars*

$ .00

OR

☐ None

51 What is the value of this property; that is, how much do you think this house and lot, apartment, or mobile home and lot would sell for if it were for sale?

☐ Less than $10,000	☐ $90,000 to $99,999
☐ $10,000 to $14,999	☐ $100,000 to $124,999
☐ $15,000 to $19,999	☐ $125,000 to $149,999
☐ $20,000 to $24,999	☐ $150,000 to $174,999
☐ $25,000 to $29,999	☐ $175,000 to $199,999
☐ $30,000 to $34,999	☐ $200,000 to $249,999
☐ $35,000 to $39,999	☐ $250,000 to $299,999
☐ $40,000 to $49,999	☐ $300,000 to $399,999
☐ $50,000 to $59,999	☐ $400,000 to $499,999
☐ $60,000 to $69,999	☐ $500,000 to $749,999
☐ $70,000 to $79,999	☐ $750,000 to $999,999
☐ $80,000 to $89,999	☐ $1,000,000 or more

52 Answer ONLY if this is a CONDOMINIUM —

What is the monthly condominium fee?

Monthly amount — *Dollars*

$ .00

53 Answer ONLY if this is a MOBILE HOME —

a. Do you have an installment loan or contract on THIS mobile home?

- ☐ Yes
- ☐ No

b. What was the total cost for installment loan payments, personal property taxes, site rent, registration fees, and license fees on THIS mobile home and its site last year? *Exclude real estate taxes.*

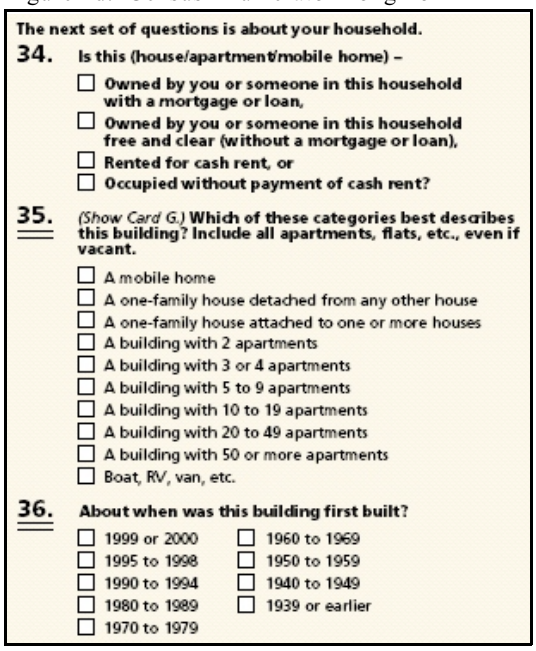
Yearly amount — *Dollars*

$ .00

➔ Are there more people living here? If yes, continue with Person 2.

Appendix B: Facsimiles of C2SS and Census 2000 Questions

Figure 1d. Census Enumerator Long Form



The next set of questions is about your household.

34. **Is this (house/apartment/mobile home) –**

- ☐ **Owned by you or someone in this household with a mortgage or loan,**
- ☐ **Owned by you or someone in this household free and clear (without a mortgage or loan),**
- ☐ **Rented for cash rent, or**
- ☐ **Occupied without payment of cash rent?**

35. *(Show Card G.)* **Which of these categories best describes this building? Include all apartments, flats, etc., even if vacant.**

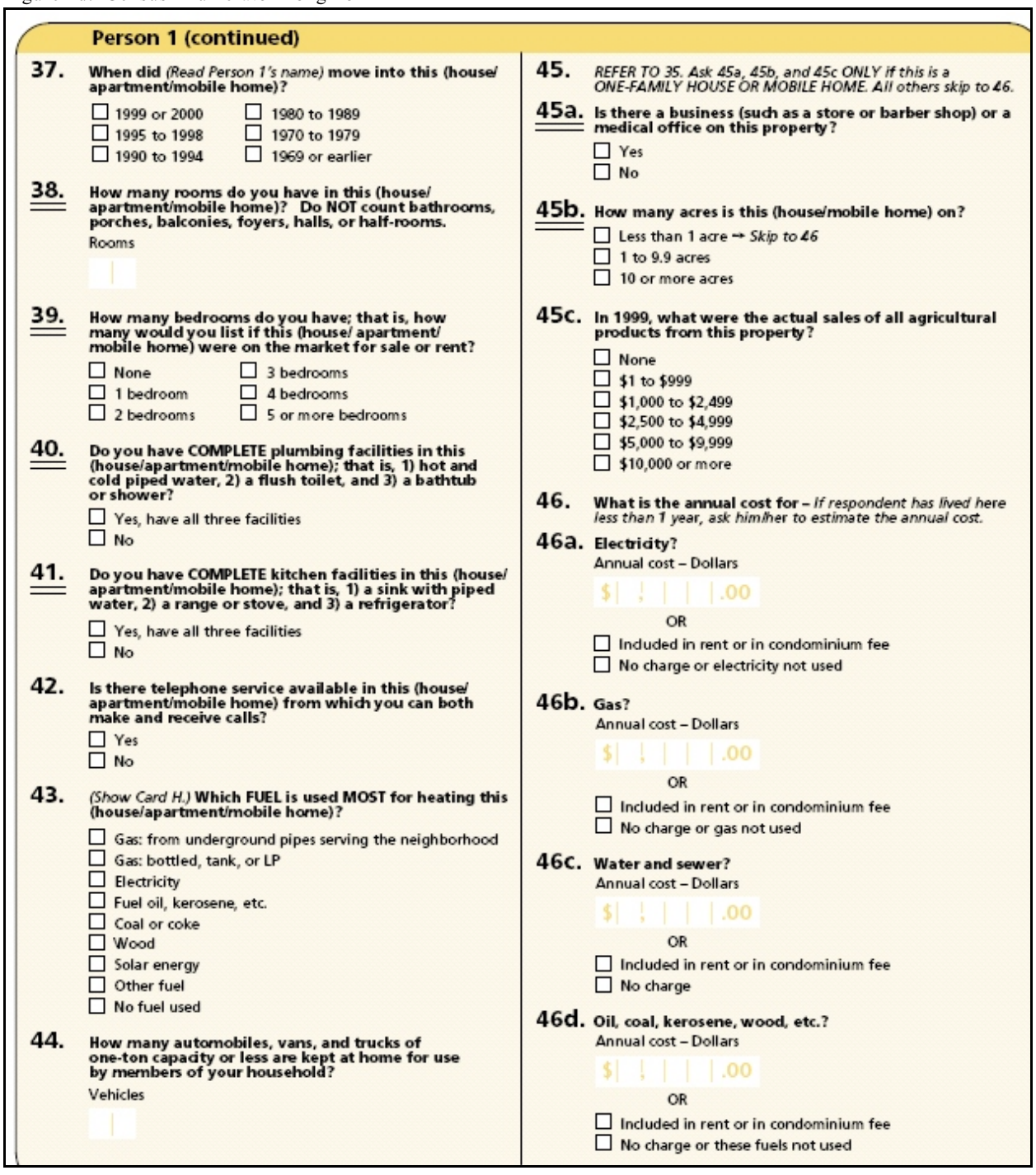
- ☐ A mobile home
- ☐ A one-family house detached from any other house
- ☐ A one-family house attached to one or more houses
- ☐ A building with 2 apartments
- ☐ A building with 3 or 4 apartments
- ☐ A building with 5 to 9 apartments
- ☐ A building with 10 to 19 apartments
- ☐ A building with 20 to 49 apartments
- ☐ A building with 50 or more apartments
- ☐ Boat, RV, van, etc.

36. **About when was this building first built?**

- ☐ 1999 or 2000
- ☐ 1995 to 1998
- ☐ 1990 to 1994
- ☐ 1980 to 1989
- ☐ 1970 to 1979
- ☐ 1960 to 1969
- ☐ 1950 to 1959
- ☐ 1940 to 1949
- ☐ 1939 or earlier

Appendix B: Facsimiles of C2SS and Census 2000 Questions

Figure 1d. Census Enumerator Long Form



Person 1 (continued)

37. **When did** *(Read Person 1's name)* **move into this (house/ apartment/mobile home)?**

- ☐ 1999 or 2000
- ☐ 1995 to 1998
- ☐ 1990 to 1994
- ☐ 1980 to 1989
- ☐ 1970 to 1979
- ☐ 1969 or earlier

38. **How many rooms do you have in this (house/ apartment/mobile home)? Do NOT count bathrooms, porches, balconies, foyers, halls, or half-rooms.**

Rooms

39. **How many bedrooms do you have; that is, how many would you list if this (house/ apartment/ mobile home) were on the market for sale or rent?**

- ☐ None
- ☐ 1 bedroom
- ☐ 2 bedrooms
- ☐ 3 bedrooms
- ☐ 4 bedrooms
- ☐ 5 or more bedrooms

40. **Do you have COMPLETE plumbing facilities in this (house/apartment/mobile home); that is, 1) hot and cold piped water, 2) a flush toilet, and 3) a bathtub or shower?**

- ☐ Yes, have all three facilities
- ☐ No

41. **Do you have COMPLETE kitchen facilities in this (house/ apartment/mobile home); that is, 1) a sink with piped water, 2) a range or stove, and 3) a refrigerator?**

- ☐ Yes, have all three facilities
- ☐ No

42. **Is there telephone service available in this (house/ apartment/mobile home) from which you can both make and receive calls?**

- ☐ Yes
- ☐ No

43. *(Show Card H.)* **Which FUEL is used MOST for heating this (house/apartment/mobile home)?**

- ☐ Gas: from underground pipes serving the neighborhood
- ☐ Gas: bottled, tank, or LP
- ☐ Electricity
- ☐ Fuel oil, kerosene, etc.
- ☐ Coal or coke
- ☐ Wood
- ☐ Solar energy
- ☐ Other fuel
- ☐ No fuel used

44. **How many automobiles, vans, and trucks of one-ton capacity or less are kept at home for use by members of your household?**

Vehicles

45. *REFER TO 35. Ask 45a, 45b, and 45c ONLY if this is a ONE-FAMILY HOUSE OR MOBILE HOME. All others skip to 46.*

45a. **Is there a business (such as a store or barber shop) or a medical office on this property?**

- ☐ Yes
- ☐ No

45b. **How many acres is this (house/mobile home) on?**

- ☐ Less than 1 acre → *Skip to 46*
- ☐ 1 to 9.9 acres
- ☐ 10 or more acres

45c. **In 1999, what were the actual sales of all agricultural products from this property?**

- ☐ None
- ☐ $1 to $999
- ☐ $1,000 to $2,499
- ☐ $2,500 to $4,999
- ☐ $5,000 to $9,999
- ☐ $10,000 or more

46. **What is the annual cost for –** *If respondent has lived here less than 1 year, ask him/her to estimate the annual cost.*

46a. **Electricity?**

Annual cost – Dollars

$ .00

OR

- ☐ Included in rent or in condominium fee
- ☐ No charge or electricity not used

46b. **Gas?**

Annual cost – Dollars

$ .00

OR

- ☐ Included in rent or in condominium fee
- ☐ No charge or gas not used

46c. **Water and sewer?**

Annual cost – Dollars

$ .00

OR

- ☐ Included in rent or in condominium fee
- ☐ No charge

46d. **Oil, coal, kerosene, wood, etc.?**

Annual cost – Dollars

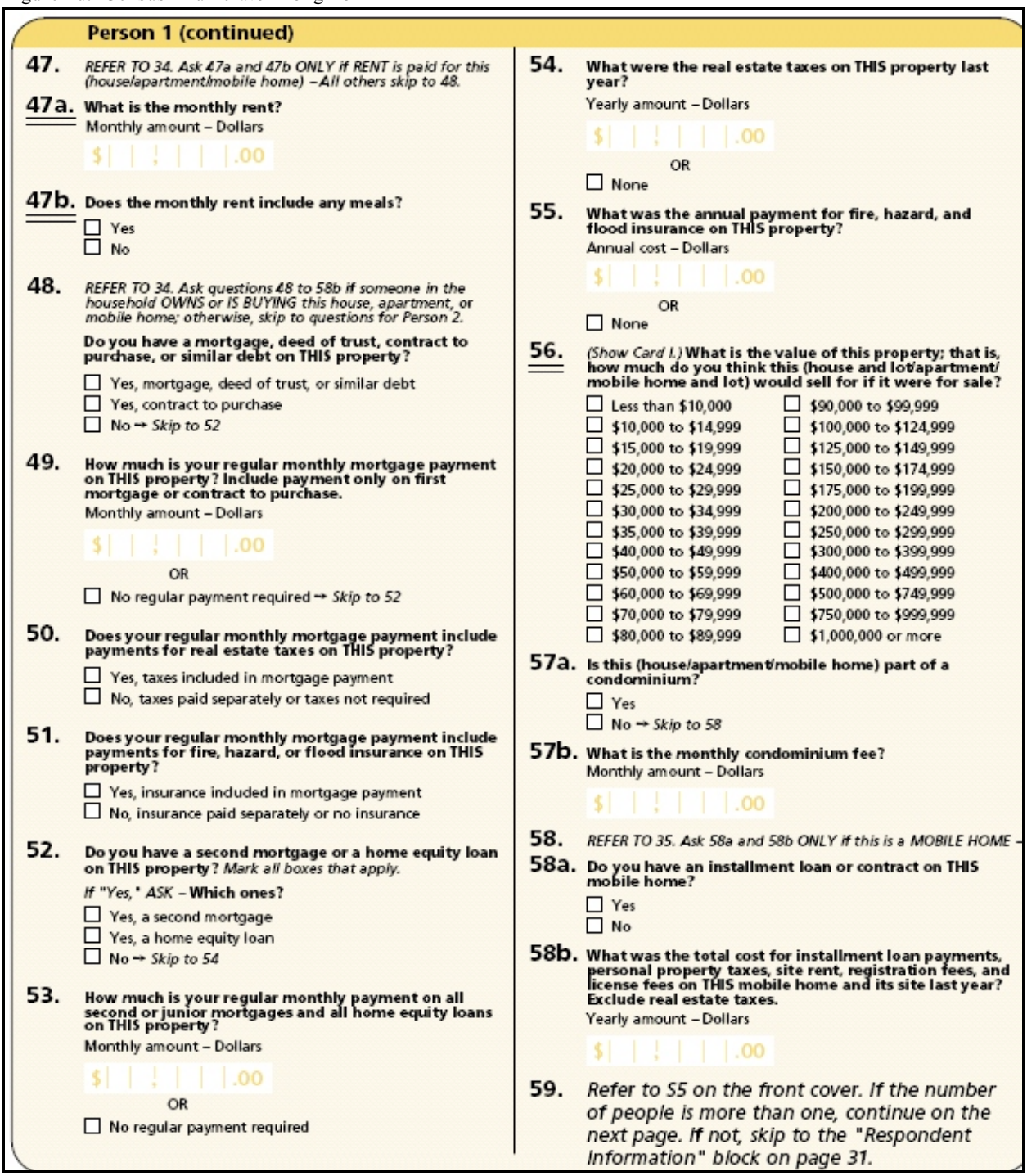
$ .00

OR

- ☐ Included in rent or in condominium fee
- ☐ No charge or these fuels not used

Appendix B: Facsimiles of C2SS and Census 2000 Questions

Figure 1d. Census Enumerator Long Form



Person 1 (continued)

47. *REFER TO 34. Ask 47a and 47b ONLY if RENT is paid for this (house/apartment/mobile home) – All others skip to 48.*

47a. **What is the monthly rent?**
Monthly amount – Dollars
$| | , | | | .00

47b. **Does the monthly rent include any meals?**
☐ Yes
☐ No

48. *REFER TO 34. Ask questions 48 to 58b if someone in the household OWNS or IS BUYING this house, apartment, or mobile home; otherwise, skip to questions for Person 2.*

Do you have a mortgage, deed of trust, contract to purchase, or similar debt on THIS property?
☐ Yes, mortgage, deed of trust, or similar debt
☐ Yes, contract to purchase
☐ No → *Skip to 52*

49. **How much is your regular monthly mortgage payment on THIS property? Include payment only on first mortgage or contract to purchase.**
Monthly amount – Dollars
$| | , | | | .00
OR
☐ No regular payment required → *Skip to 52*

50. **Does your regular monthly mortgage payment include payments for real estate taxes on THIS property?**
☐ Yes, taxes included in mortgage payment
☐ No, taxes paid separately or taxes not required

51. **Does your regular monthly mortgage payment include payments for fire, hazard, or flood insurance on THIS property?**
☐ Yes, insurance included in mortgage payment
☐ No, insurance paid separately or no insurance

52. **Do you have a second mortgage or a home equity loan on THIS property?** *Mark all boxes that apply.*
If "Yes," ASK – **Which ones?**
☐ Yes, a second mortgage
☐ Yes, a home equity loan
☐ No → *Skip to 54*

53. **How much is your regular monthly payment on all second or junior mortgages and all home equity loans on THIS property?**
Monthly amount – Dollars
$| | , | | | .00
OR
☐ No regular payment required

54. **What were the real estate taxes on THIS property last year?**
Yearly amount – Dollars
$| | , | | | .00
OR
☐ None

55. **What was the annual payment for fire, hazard, and flood insurance on THIS property?**
Annual cost – Dollars
$| | , | | | .00
OR
☐ None

56. *(Show Card I.)* **What is the value of this property; that is, how much do you think this (house and lot/apartment/mobile home and lot) would sell for if it were for sale?**

☐ Less than $10,000	☐ $90,000 to $99,999
☐ $10,000 to $14,999	☐ $100,000 to $124,999
☐ $15,000 to $19,999	☐ $125,000 to $149,999
☐ $20,000 to $24,999	☐ $150,000 to $174,999
☐ $25,000 to $29,999	☐ $175,000 to $199,999
☐ $30,000 to $34,999	☐ $200,000 to $249,999
☐ $35,000 to $39,999	☐ $250,000 to $299,999
☐ $40,000 to $49,999	☐ $300,000 to $399,999
☐ $50,000 to $59,999	☐ $400,000 to $499,999
☐ $60,000 to $69,999	☐ $500,000 to $749,999
☐ $70,000 to $79,999	☐ $750,000 to $999,999
☐ $80,000 to $89,999	☐ $1,000,000 or more

57a. **Is this (house/apartment/mobile home) part of a condominium?**
☐ Yes
☐ No → *Skip to 58*

57b. **What is the monthly condominium fee?**
Monthly amount – Dollars
$| | , | | | .00

58. *REFER TO 35. Ask 58a and 58b ONLY if this is a MOBILE HOME –*

58a. **Do you have an installment loan or contract on THIS mobile home?**
☐ Yes
☐ No

58b. **What was the total cost for installment loan payments, personal property taxes, site rent, registration fees, and license fees on THIS mobile home and its site last year? Exclude real estate taxes.**
Yearly amount – Dollars
$| | , | | | .00

59. *Refer to S5 on the front cover. If the number of people is more than one, continue on the next page. If not, skip to the "Respondent Information" block on page 31.*

Appendix C. Federal Uses of Selected Physical and Financial Housing Characteristics

Selected Housing Items	Federal Uses of the Data
Units in Structure	■ Used as an integral component by the Dept. of Housing and Urban Development to set Fair Market Rents for all areas of the country ■ Serves as a basic identifier of housing for many Federal programs when combined with items such as tenure (whether a home is owned or rented), income, and year structure built ■ Required by the Dept. of Health and Human Services to profile housing unit types for the Low-Income Home Energy Assistance Program
Year Structure Built	■ Used as an integral component by the Dept. of Housing and Urban Development to set Fair Market Rents for all areas of the country ■ Used by several Federal agencies in formulas for allocating funds, determining substandard housing, and constructing surveys ■ Required for the Dept. of Housing and Urban Development's Community Development Block Grant Program, HOME, and Public Housing Modernization allocation formulas ■ Used in the Dept. of Energy's National Energy Modeling System which forecasts future energy use and in its mandated Residential Energy Consumption Survey ■ Used with other census data to develop the Bureau of Economic Analysis' state per capita income estimates which are used in allocation formulas or eligibility criteria of over 20 Federal programs ■ Used by the Federal Reserve Board to implement the Home Mortgage Disclosure Act, which requires lending institutions to disclose lending practices to guard against unfair housing practices

Appendix C. Federal Uses of Selected Physical and Financial Housing Characteristics

Selected Housing Items	Federal Uses of the Data
Rooms	■ Mandated by law to be used in the Dept. of Housing and Urban Development's Public Housing Modernization Formula ■ Used, in conjunction with other census data, by the Bureau of Economic Analysis to develop its state per capita income estimates which are used in the allocation formulas or eligibility criteria of more than 20 Federal programs such as Medicaid ■ Provides benchmark statistics that measure progress toward the Congressional declaration of goals for a national housing policy: a decent home and suitable living environment for every American family
For occupied Housing units:	
Year household moved into unit	■ Used as an integral component by the Dept. of Housing and Urban Development in the development of Fair Market Rents for all areas of the country ■ Needed by Federal agencies, such as the Depts. of Health and Human Services and Housing and Urban Development, to calculate turnover among specified population groups such as the elderly and minority households ■ Needed to evaluate the effectiveness of lending practices and homeowner insurance procedures under the Fair Housing Act
Vehicles available	■ Provides, in combination with place of work and journey to work, data that are essential for transportation programs under the Intermodal Surface Transportation Efficiency Act of 1991 ■ Used by the Dept. of Transportation and the Environmental Protection Agency to develop policies and to plan a number of transportation programs ■ Needed by the Dept. of Energy to estimate and forecast energy consumption of motor vehicles and to plan and establish programs as part of the Alternative Fueled Vehicles Program

Appendix C. Federal Uses of Selected Physical and Financial Housing Characteristics

Selected Housing Items	Federal Uses of the Data
House heating fuel	■ Used as a basic indicator of the adequacy of the American housing stock ■ Provides information on energy supply and consumption ■ Used by the Dept. of Energy to design the legislatively mandated Residential Energy Consumption Survey, which provides information on residential and commercial energy use ■ Assists the Environmental Protection Agency in assessing the adequacy of energy resources to meet present and future needs of the general public
Selected characteristics:	
Complete plumbing facilities	■ Used as an integral component by the Dept. of Housing and Urban Development in the development of Fair Market Rents for all areas of the country ■ Needed by Federal agencies to identify areas eligible for public assistance programs and rehabilitation loans ■ Used by public health officials to locate areas in danger of ground water contamination and waterborne diseases ■ Used by the Dept. of Housing and Urban Development to assess the quality of the housing stock and in its HOME Allocations and Comprehensive Housing Affordability Strategies (CHAS)
Complete kitchen facilities	■ Used by the Dept. of Housing and Urban Development as an integral component in the development of Fair Market Rents for all areas of the country ■ Needed by Federal agencies to identify areas eligible for housing assistance and rehabilitation loans ■ Used as an indicator of housing quality ■ Used to assess the Community Development Block Grant Program, which gives grants to states and local governments to rehabilitate privately-owned property that is intended to be rented as residences

Appendix C. Federal Uses of Selected Physical and Financial Housing Characteristics

Selected Housing Items	Federal Uses of the Data
Telephone service available	■ Used by the Dept. of Health and Human Services to assess the level of need among elderly, low-income, and handicapped households ■ Considered valuable to a number of agencies in evaluating how well their policies meet the public's needs ■ Used by the Dept. of Justice to enforce requirements under the Voting Rights Act ■ Required under the Communications Act, the Federal Communications Commission uses data about the number of households having a telephone to measure the extent of universal access to telephone service ■ Used by the Administration on Aging as a measure of social isolation, which is one of the factors cited in the Older Americans Act as a source of "greatest social need"
Specified owner-occupied units:	
Value	■ Used by the Departments of Housing and Urban Development and Health and Human Services to develop housing assistance plans for elderly, low-income, and handicapped individuals ■ Needed by the Dept. of Transportation to develop transportation plans, policies, and programs ■ Used by the Bureau of Economic Analysis in preparing the value of housing services for the National Income and Product Accounts ■ Incorporated in annual reports of the President to the Congress on housing production, occupancy, and tenure, and in analyses of housing needs ■ Helps the Federal Reserve Board to assess the fairness of home lending practices

Appendix C. Federal Uses of Selected Physical and Financial Housing Characteristics

Selected Housing Items	Federal Uses of the Data
Selected Monthly owner costs	■ Used by the Dept. of Housing and Urban Development in many of its housing assistance programs ■ Used by the Dept. of Health and Human Services to assess the need for housing assistance for elderly, handicapped, and low-income homeowners ■ Needed by the Dept. of Energy to help study energy supply and use by using data on utility costs ■ Provides benchmark statistics to measure progress toward the Congressional declaration of goals for national housing policy: a decent home and suitable living environment for every American family ■ Used to maintain the Dept. of Energy's National Energy Information System which analyzes current residential energy supply and consumption in order to forecast future needs
Specified renter-occupied units:	
Gross Rent	■ Used to establish the Dept. of Housing and Urban Development's Section 8 Fair Market Rents which are used in housing programs that help Americans afford decent, safe, and clean housing ■ Used by the Departments of Health and Human Services and Agriculture to allocate funds to help low- and moderate-income families whose rents exceed 30 percent of their household income ■ Used to develop the Bureau of Economic Analysis' state per capita income estimates which are used in allocation formulas or eligibility criteria of more than 20 Federal programs

Appendix D:
Characteristics of Counties Used in Sub-national Comparisons

These counties represent areas with populations that meet the 65,000 minimum required for yearly data-release. They are a diverse set of areas that were chosen to be test sites because they vary geographically and demographically. They reflect both urban and rural areas and range in household population size from 70,533 in Sevier, TN to over 1.6 million in Broward, FL. Population density also varies from 20 persons per square kilometer in Yakima, WA to nearly 12,000 persons per square kilometers in Bronx, NY. Demographically, the sites include areas with minority populations of only 2 percent (Schuylkill County, PA) to minority populations of 86 percent (the Bronx, NY). A wide range of housing types are also represented. The percent of units in multi-unit structures in these 18 counties range from only 5 percent in Calvert County, MD to 90 percent in the Bronx, and with these differences come variations in the percent of owner- and renter-occupied units.

The table below presents a few geographic, demographic, and housing characteristics for the 18 counties used in this report. They are based on complete Census 2000 counts.

ACS Test Site	Square Kilo-meters	Census 2000 Household Population	Density[1]	Percent White, Non-Hispanic	Percent Multi-unit	Percent Renter Occupied	Percent Vacant
Sevier, TN	1534	70533	46	96	14	25	17
Madison, MS	1863	72615	39	60	21	32	7
Calvert, MD	557	73982	133	82	5	12	9
Jefferson, AR	2292	78989	34	47	14	34	14
Black Hawk, IA	1470	121535	83	87	22	30	5
Schuylkill, PA	2017	143110	71	98	15	22	11
Yakima, WA	11127	218844	20	55	20	38	7
Rockland, NY	451	279104	619	71	31	28	3
Tulare, CA	12495	361980	29	41	16	40	8
Hampden, MA	1602	441799	276	74	41	40	6
Douglas, NE	857	451878	527	78	29	37	6
Lake, IL	1160	623378	538	73	22	23	5
Multnomah, OR	1127	643798	571	76	36	44	6
San Francisco, CA	121	756976	6258	43	67	65	6
Pima, AZ	23794	821712	35	60	28	39	10
Franklin, OH	1399	1046872	749	74	38	44	8
Bronx, NY	109	1285415	11793	14	90	80	7
Broward, FL	3131	1603094	512	56	51	32	13

[1]Persons per square kilometer

Appendix E. Summary of County-Level Differences

Table 1. Units in Structure, Statistically Significant Differences in County-Level Estimates (ACS Minus Census 2000 Sample)

Total Housing Units	Sevier, TN	Madison, MS	Calvert, MD	Jefferson, AR	Black Hawk, IA	Schuylkill, PA	Yakima, WA	Rockland, NY	Tulare, CA	Hampden, MA	Douglas, NE	Lake, IL	Multnomah, OR	San Francisco, CA	Pima, AZ	Franklin, OH	Bronx, NY	Broward, FL
1-unit, detached						-1.8		-1.8		-1.6		-1.9			-1.6	-2.0		-2.5
1-unit, attached			-1.5	-0.8	1.0				-1.4							1.5	-1.1	-0.5
2 units		-0.8					1.0	1.7	1.7			0.7	1.1	2.8	0.5	2.4	1.1	1.6
3 or 4 units										1.3			0.5	-1.0				
5 to 9 units		2.1			1.2					1.0			1.0	-1.1	0.8			
10 to 19 units	-0.9											1.2			2.9	-0.8	-1.2	
20 or more units		-1.4		-1.1				-1.4	-0.8				-1.8	-1.4	-1.8	-1.0	1.3	1.3
Mobile home								0.5	0.8	-0.3		0.7						-0.2
Boat, RV, van, etc.							-0.2						-0.2		-0.3			

Table 2. Year Structure Built, Statistically Significant Differences in County-Level Estimates (ACS Minus Census 2000 Sample)

Total Housing Units	Sevier, TN	Madison, MS	Calvert, MD	Jefferson, AR	Black Hawk, IA	Schuylkill, PA	Yakima, WA	Rockland, NY	Tulare, CA	Hampden, MA	Douglas, NE	Lake, IL	Multnomah, OR	San Francisco, CA	Pima, AZ	Franklin, OH	Bronx, NY	Broward, FL
1999 or later	-2.2		-3.6		-0.5	-0.6				-0.3			-0.4	-0.3	-0.9	-0.5	-0.3	-0.4
1995 to 1998		-3.2							1.1			-0.9			-1.2	-0.8	-0.7	-0.5
1990 to 1994				-1.7				1.3									-0.9	
1980 to 1989			3.4	-4.8										0.6			-0.9	
1970 to 1979				4.1						-0.9	-1.1						-1.5	0.8
1960 to 1969								-2.6		-1.3				-0.8			-3.6	
1940 to 1959						-1.6				1.7	-1.2				1.6		-3.8	
1939 or earlier		1.6				2.0			1.8		3.0		1.3		-0.4	1.4	11.6	-0.2

Appendix E. Summary of County-Level Differences

Table 3a. Rooms, Statistically Significant Differences in County-Level Estimates (ACS Minus Census 2000 Sample)

Total Housing Units	Sevier, TN	Madison, MS	Calvert, MD	Jefferson, AR	Black Hawk, IA	Schuylkill, PA	Yakima, WA	Rockland, NY	Tulare, CA	Hampden, MA	Douglas, NE	Lake, IL	Multnomah, OR	San Francisco, CA	Pima, AZ	Franklin, OH	Bronx, NY	Broward, FL
1 room					-0.5		-1.2	-0.8			-0.5	-0.3	-0.6	-3.6	-0.7		-3.4	-0.8
2 rooms				-1.2	-0.8		-1.8		-3.2				-1.6	-1.3		-0.5	-4.7	-2.2
3 rooms	-2.6	-2.4							-3.0		1.2				0.7	1.3	2.2	1.5
4 rooms	2.8	4.3			1.9	1.2	5.6		3.0	3.0			2.5	1.7	2.1	1.9	4.2	4.5
5 rooms		5.2			2.0				3.4			1.4	1.0	1.1	1.0		1.6	
6 rooms		-3.6												1.3	-1.0	-0.9		
7 rooms				-1.6								-1.1		0.7	-0.8	-0.8		-0.6
8 rooms		-2.0	-5.1			-1.6				-0.7			-0.9		-0.7			-0.8
9 rooms or more					-1.6		-1.8	-1.4	-0.5						-0.6	-1.1	-0.3	-0.8

Table 3b. Occupants Per Room, Statistically Significant Differences in County-Level Estimates (ACS Minus Census 2000 Sample)

Occupied Housing Units	Sevier, TN	Madison, MS	Calvert, MD	Jefferson, AR	Black Hawk, IA	Schuylkill, PA	Yakima, WA	Rockland, NY	Tulare, CA	Hampden, MA	Douglas, NE	Lake, IL	Multnomah, OR	San Francisco, CA	Pima, AZ	Franklin, OH	Bronx, NY	Broward, FL
1.00 or less	1.2	1.9			0.7		2.3		6.3	0.9	1.4	0.9	1.4	3.2	1.4	0.4	6.9	2.2
1.01 to 1.50	-0.8										-0.5		-0.4				-0.9	-0.5
1.51 or more		-0.8			-0.5		-3.3	-0.9	-6.0	-0.6	-0.9	-0.6	-1.0	-3.0	-1.1	-0.4	-6.0	-1.7

Appendix E. Summary of County-Level Differences

Table 4. Year Householder Moved Into Unit, Statistically Significant Differences in County-Level Estimates (ACS Minus Census 2000 Sample)

Occupied Housing Units	Sevier, TN	Madison, MS	Calvert, MD	Jefferson, AR	Black Hawk, IA	Schuylkill, PA	Yakima, WA	Rockland, NY	Tulare, CA	Hampden, MA	Douglas, NE	Lake, IL	Multnomah, OR	San Francisco, CA	Pima, AZ	Franklin, OH	Bronx, NY	Broward, FL
1995 or later		3.3			2.2		2.2		3.8	1.8	1.4	2.0	1.5		1.0	1.4	2.4	2.3
1990 to 1994								-2.1					-1.5			-1.0		-0.8
1980 to 1989								1.7	-2.3			-1.6						
1970 to 1979		-2.0												0.6	-0.8			-0.7
1969 or earlier										-1.0		-0.9					-0.9	-0.5

Table 5. Vehicles Available, Statistically Significant Differences in County-Level Estimates (ACS Minus Census 2000 Sample)

Occupied Housing Units	Sevier, TN	Madison, MS	Calvert, MD	Jefferson, AR	Black Hawk, IA	Schuylkill, PA	Yakima, WA	Rockland, NY	Tulare, CA	Hampden, MA	Douglas, NE	Lake, IL	Multnomah, OR	San Francisco, CA	Pima, AZ	Franklin, OH	Bronx, NY	Broward, FL
No vehicles available				-3.2	-1.3	-1.8			-1.5		-0.9		-1.0	-1.7		-1.1	-1.5	-0.8
1								-2.4	2.0						1.2		1.6	
2				3.4										1.1	-1.0			
3 or more	5.1					2.5				0.8	1.5	1.3	1.1	0.5				

Appendix E. Summary of County-Level Differences

Table 6. House Heating Fuel, Statistically Significant Differences in County-Level Estimates (ACS Minus Census 2000 Sample)

Occupied Housing Units	Sevier, TN	Madison, MS	Calvert, MD	Jefferson, AR	Black Hawk, IA	Schuylkill, PA	Yakima, WA	Rockland, NY	Tulare, CA	Hampden, MA	Douglas, NE	Lake, IL	Multnomah, OR	San Francisco, CA	Pima, AZ	Franklin, OH	Bronx, NY	Broward, FL
Utility gas		3.6			-2.2						-2.0	-1.5			-2.2		-15.7	-0.3
Bottled, tank, or LP gas								0.4	-2.5	-0.7							-1.6	-0.2
Electricity					2.5		2.1		2.6	1.7	1.7	1.5			2.4		-4.7	0.5
Fuel oil, kerosene, etc.									0.3	-1.2							23.9	
Coal or coke																		
Wood																		
Solar energy																		
Other fuel																	-1.2	
No fuel used										-0.3			0.2	0.4	0.3		-0.6	

Table 7. Selected Characteristics, Statistically Significant Differences in County-Level Estimates (ACS Minus Census 2000 Sample)

Occupied Housing Units	Sevier, TN	Madison, MS	Calvert, MD	Jefferson, AR	Black Hawk, IA	Schuylkill, PA	Yakima, WA	Rockland, NY	Tulare, CA	Hampden, MA	Douglas, NE	Lake, IL	Multnomah, OR	San Francisco, CA	Pima, AZ	Franklin, OH	Bronx, NY	Broward, FL
Lacking complete plumbing facilities	-0.6			-0.5			-0.5		-0.6	-0.5				-0.4			-0.9	-0.1
Lacking complete kitchen facilities					-0.3		-0.7		-0.6					-0.9			-0.5	
No telephone service available	-1.1						1.2		2.4	1.7	1.0	1.9	0.7		0.7	0.5	1.9	0

Appendix E. Summary of County-Level Differences

Table 8. Value, Statistically Significant Differences in County-Level Estimates (ACS Minus Census 2000 Sample)

Specified Owner-Occupied Units	Sevier, TN	Madison, MS	Calvert, MD	Jefferson, AR	Black Hawk, IA	Schuylkill, PA	Yakima, WA	Rockland, NY	Tulare, CA	Hampden, MA	Douglas, NE	Lake, IL	Multnomah, OR	San Francisco, CA	Pima, AZ	Franklin, OH	Bronx, NY	Broward, FL
Less than $50,000										-0.4				-1.7				
$50,000 to $99,999										-2.7		-1.3				-1.2	-1.8	-2.1
$100,000 to $149,999							2.9			2.8								1.1
$150,000 to $199,999					2.6											1.1		
$200,000 to $299,999	-2.8				-1.8			-2.5						-4.0				
$300,000 to $499,999						-0.3		3.0							0.6		4.6	0.6
$500,000 to $999,999		2.6										1.4		6.1				
$1,000,000 or more																	-0.8	

Table 9a. Selected Monthly Owner Costs, Statistically Significant Differences in County-Level Estimates (ACS Minus Census 2000 Sample)

Specified Owner-Occupied Units	Sevier, TN	Madison, MS	Calvert, MD	Jefferson, AR	Black Hawk, IA	Schuylkill, PA	Yakima, WA	Rockland, NY	Tulare, CA	Hampden, MA	Douglas, NE	Lake, IL	Multnomah, OR	San Francisco, CA	Pima, AZ	Franklin, OH	Bronx, NY	Broward, FL
Housing units with a mortgage						-2.2					-1.6				-1.1			-1.0
Less than $300		-0.9														0.4		
$300 to $499				2.8				0.5	1.3									-0.4
$500 to $699								0.6			-1.3							
$700 to $999								-1.3										
$1,000 to $1,499																-1.8		
$1,500 to $1,999		-3.2		-1.1		-0.9	-2.9						-1.2				3.6	
$2,000 or more												1.3			0.5			

Appendix E. Summary of County-Level Differences

Table 9b. Selected Monthly Owner Costs as a Pct. of Household Inc, Statistically Significant Differences in County-Level Estimates (ACS Minus Census 2000 Sample)

Specified Owner-Occupied Units	Sevier, TN	Madison, MS	Calvert, MD	Jefferson, AR	Black Hawk, IA	Schuylkill, PA	Yakima, WA	Rockland, NY	Tulare, CA	Hampden, MA	Douglas, NE	Lake, IL	Multnomah, OR	San Francisco, CA	Pima, AZ	Franklin, OH	Bronx, NY	Broward, FL
Less than 20 percent											-2.1			-3.5				
20.0 to 24.9 percent																	2.7	
25.0 to 29.9 percent															0.8			
30.0 to 34.9 percent															-0.6			
35.0 percent or more					3.3						1.1			2.5	1.1			
Not computed		-0.7		-1.5	-0.7		-0.7	-0.4		-0.5	-0.3						-1.4	-0.3

Table 10a. Gross Rent, Statistically Significant Differences in County-Level Estimates (ACS Minus Census 2000 Sample)

Specified Renter-Occupied Units	Sevier, TN	Madison, MS	Calvert, MD	Jefferson, AR	Black Hawk, IA	Schuylkill, PA	Yakima, WA	Rockland, NY	Tulare, CA	Hampden, MA	Douglas, NE	Lake, IL	Multnomah, OR	San Francisco, CA	Pima, AZ	Franklin, OH	Bronx, NY	Broward, FL
Less than $200		-4.1				-3.1			-1.4					-1.0	-1.0		-1.6	
$200 to $299	-2.5		-3.3		-3.2		-1.5	2.1		-1.5					-0.7			
$300 to $499			-4.7													-1.7		-1.0
$500 to $749														-2.5				
$750 to $999												-2.8	1.8					
$1,000 to $1,499		4.4							-1.1				-1.2				0.9	1.6
$1,500 or more		-3.0									-0.5			2.0		-0.3		
No cash rent		-2.5										1.7					0.4	

Appendix E. Summary of County-Level Differences

Table 10b. Gross Rent as a Percentage of Household Income, Statistically Significant Differences in County-Level Estimates (ACS Minus Census 2000 Sample)

Specified Renter-Occupied Units	Sevier, TN	Madison, MS	Calvert, MD	Jefferson, AR	Black Hawk, IA	Schuylkill, PA	Yakima, WA	Rockland, NY	Tulare, CA	Hampden, MA	Douglas, NE	Lake, IL	Multnomah, OR	San Francisco, CA	Pima, AZ	Franklin, OH	Bronx, NY	Broward, FL
Less than 15 percent									-3.7	-3.3	-2.5	-2.8	-1.6		-1.8	-2.1	-2.3	-1.4
15.0 to 19.9 percent	-5.7			-3.4														
20.0 to 24.9 percent														1.2	-1.9		-0.8	
25.0 to 29.9 percent																	1.4	1.4
30.0 to 34.9 percent		-4.7					-2.3			1.6				1.3		1.0	1.0	
35.0 percent or more							5.1			4.1	3.5		2.5	-2.0	4.2		3.3	
Not computed		-4.8					-3.0	-2.0		-2.3					-1.5		-2.5	-1.1