

**SUPPORTING STATEMENT**  
**U.S. Department of Commerce**  
**U.S. Census Bureau**  
**2010 Census Coverage Measurement Final Housing Unit Followup, Final Housing Unit**  
**Followup Quality Control, and the Evaluation of Address Frame Accuracy and Quality**  
**OMB Control # 0607-XXXX**

**B. Collections of Information Employing Statistical Methods**

**1. Universe and Respondent Selection**

**Final Housing Unit Followup**

The 2010 Census Coverage Measurement (CCM) sample design is a general purpose sample designed to support the various objectives of the program, which includes the new objective of estimating components of census coverage (including erroneous enumerations and omissions). The CCM will continue to estimate net error for the 2010 Census. The CCM is designed to measure the coverage of housing units and persons, excluding group quarters and persons residing in group quarters. Remote areas of Alaska are out-of-scope for CCM.

The CCM sample consists of two parts. The Population Sample, P sample, and the Enumeration Sample, E sample, have traditionally defined the samples for dual system estimation, a statistical technique for measuring net coverage error. Both the P sample and the E sample measure the same housing unit and household population. However, the P-sample operations are conducted independent of the census. The E sample consists of census enumerations in the same sample areas as the P sample.

The CCM P-sample housing unit size is 170,000 for the nation and 7,500 for Puerto Rico. These sample sizes are reduced from earlier design plans as part of efforts to reduce nonsampling error in the CCM. The sample allocation retains the original housing unit sample sizes of 4,500 for the state of Hawaii and 10,500 for the American Indian Reservations. The remainder of the national sample is distributed to the other states roughly proportional to size, with smaller states getting about 1,000 housing units.

The CCM is a multi-phase sample designed to measure the net coverage and components of coverage for the household population and housing units in the 2010 Census. The CCM sample design comprises a number of distinct processes from forming block clusters, creating the sampling frame, selecting sample block clusters, and selecting addresses for the P and E samples. After the CCM block clusters are selected, an address list is created independent of the census for each CCM sample block cluster. The approximate CCM listing workload was 11,835 block clusters for the nation and 529 for Puerto Rico. Overall, the expected listing workload was approximately one million housing units. Following the independent listing, block cluster sample size is reduced to 6,148 for the nation and 268 for Puerto Rico. Then, housing units are selected for the Person Interview sample.

Table 1 summarizes the National and Puerto Rico universe size from Census 2000, along with the CCM expected listing workloads and the P-sample size. The E-sample size is expected to be the same as the P sample.

Table 1: 2010 CCM Universe and Sample Housing Unit Summary

Geography	2000 Census	Expected Listing Sample Size	Expected P-sample Size
U.S.	115,904,641	950,000	170,000
Puerto Rico	1,418,476	50,000	7,500
Total	117,323,117	1,000,000	177,500

The CCM sample design has several phases of sampling. In the first phase, we form block clusters from contiguous collection blocks. The block clusters in each state are classified by size into mutually exclusive and relatively homogeneous groups known as sampling strata. These strata are based on the block cluster size and whether the block cluster is located on an American Indian Reservation. The four major strata, which are the same as those used for the 2000 Accuracy and Coverage Evaluation (A.C.E.) first phase of sampling are (1) block clusters with 0 to 2 housing units (small stratum), (2) block clusters with 3 to 79 housing units (medium stratum), (3) block clusters with 80 or more housing units (large stratum), and (4) block clusters on American Indian Reservations with three or more housing units (American Indian Reservation stratum). Using 2000 Census data, the medium and large strata are further split into renter and owner block clusters, resulting in up to six sampling strata being formed in each state and Puerto Rico.

Block clusters with 80 or more housing units are selected with higher probability than medium block clusters in this phase because housing units in large block clusters will be subsampled in a later operation, bringing the overall probability of selection – the inverse of the sampling weight – for housing units in these block clusters more in line with the overall selection probabilities of housing units in medium block clusters. Block clusters from the renter strata are selected at a higher rate than block clusters from the owner strata. Within each sampling stratum, block clusters are sorted and a systematic sample is selected with equal probability.

Next, block clusters are reduced using different methods. The medium and large block clusters are randomly reduced to coincide with the reduced P-sample size. The small block clusters are reduced as originally planned to improve operational efficiency to reduce costs while also attempting to minimize the variance impact. Conducting interviewing and followup operations in block clusters of this size is more costly per housing unit than in medium or large block clusters. Using housing unit counts from the independent list and the updated census address list, we re-stratify the small block clusters selected in the first phase within each state by size and select systematic samples from each stratum with equal probability. All block clusters from the small sampling stratum with 10 or more housing units based on the updated information are retained. All block clusters from the small sampling stratum that are on American Indian

country are also retained (American Indian country includes American Indian Reservations and associated trust lands, as well as the American Indian statistical areas.)

In the third phase of CCM sampling (the sample used for Person Interview), we select a subsample of independent housing units within large block clusters to be in the P sample. If a block cluster contains 79 or fewer housing units, all the housing units are included in the CCM sample. For block clusters with 80 or more housing units, a subsample of these housing units is selected to facilitate data collection in the field and to reduce the impact of intraclass correlation on the variance. This phase of sampling results in more similar overall selection probabilities for housing units because the large block clusters have a higher probability of selection at the first phase. This subsampling is done by forming groups of adjacent housing units, called segments. A systematic sample of segments within each block cluster is selected. All housing units in the selected segments are included in the CCM sample.

For the third phase of CCM sampling, the sampling frame for the P-sample housing units is the result of the CCM initial housing unit matching and followup operation. The intent of this housing unit operation is to resolve differences between the independent housing unit list and an early census housing unit list that can result in housing units being removed from the independent listing, but no units can be added to the independent listing. In addition to sending the P sample to the Person Interview, a sample of census units that were missed during the independent listing operation will be sent to the Person Interview. If there are 79 or fewer of this type of census unit in the block cluster or selected segments, all of these census units are selected for interview. If there are 80 or more of these census units, then a systematic sample is selected for interview. The estimated workload is 27,000 units. While not part of the P sample, these census units are likely to be in the E sample. The P-sample persons result from the person interviewing in the P-sample housing units.

The sampling frame for the E-sample housing units consists of the housing units in CCM sample areas from the Census Unedited File (CUF), which is available after the P sample is selected. While these two samples are selected at different points in time, we attempt to geographically overlap them to the extent possible. The E-sample persons are the census enumerations in the E-sample housing units that have at least two characteristics, of which name can be one; they are referred to as census-defined enumerations. The Census Bureau expects a response rate of 90-95 percent for the FHUFU and FHUFU QC operations.

### **Final Housing Unit Followup Quality Control**

The Final Housing Unit Followup Quality Control interview universe will consist of a sample that is approximately 55 percent of the original FHUFU interviewers' workload (approximately 13,473 cases) and a 11 percent rework workload (2,695 cases).

### **Evaluation of Address Frame Accuracy and Quality**

The Evaluation of Address Frame Accuracy and Quality (AFAQ) will utilize CCM fieldwork results, and therefore leverage CCM methodology, for the majority of its objectives. Where additional fieldwork is required, as described in Supporting Statement A, the universe of cases of

interest (i.e., delete and duplicate actions from Address Canvassing, and potentially misgeocoded addresses) will be sampled by selecting complete random groups from the CCM universe.

## **2. Data Collection**

### **Final Housing Unit Followup**

The CCM Final Housing Unit Followup Form, Form D-1340, is used by interviewers to resolve discrepancies from matching the CCM address list and the census address lists. This form is translated into Spanish for use in Puerto Rico. The Spanish form is Form D-1340 (PR). Interviewers will contact a member (or proxy, as a last resort) of each housing unit being followed up to ensure the accuracy of the address lists. Interviewers will be provided the Housing Unit Reference list (see Attachments G and H) to aid in following up housing units. The interviewer will give each respondent in the 50 states and the District of Columbia a copy of the Form D-31(CCM-FHUFU), U.S. Confidentiality Notice; in Puerto Rico, the interviewer will give each respondent a copy of the Form D-31(CCM-FHUFU) PR, Puerto Rico Confidentiality Notice. The Confidentiality Notice explains that any information given to the Census Bureau will be held in strict confidence. It also informs each respondent that participation is mandatory.

### **Final Housing Unit Followup Quality Control**

For the Final Housing Unit Followup Quality Check (QC), approximately 55 percent of all housing units followed up will be identified for a Quality Check. The QC interviewers will locate the housing units identified for the quality check and compare the information collected by the initial interviewer to what they see on the ground. A single attempt will be made to contact a respondent for the quality check. If no one is available, the quality check will be completed by observation. Block clusters not passing the QC will be 100 percent verified to ensure the data quality of the Final Housing Unit Followup. QC interviewers will use the Final Housing Unit Followup Quality Control Form, Form D-1325, for block clusters in the United States, and the Form D-1325(PR) for block clusters in Puerto Rico.

### **Evaluation of Address Frame Accuracy and Quality**

The Evaluation of AFAQ will use a subset of CCM forms to followup on the universe of cases described in Supporting Statement A. No followup quality control will be needed for the evaluation.

## **3. Methods to Maximize Response**

The Final Housing Unit Followup contains the minimum number of questions necessary to obtain the data required for the 2010 CCM. The interviewer will make up to three attempts to obtain an interview and complete by observation if no respondent is available. The interviewer will explain the reason the Census Bureau is conducting this operation, and respondents will be informed of their legal responsibility to answer the questions. In addition, respondents will be assured that their answers are confidential.

The Evaluation of AFAQ only seeks to determine the correct status of living quarters. Field workers will employ the same methods above, as applicable, to maximize response.

#### **4 Testing of Procedures**

The Census Bureau developed the CCM approach for measuring the coverage of the population in the decennial census. It was used in the 2000 Decennial Census, and the approach was updated and refined for the 2008 Census Dress Rehearsal. However, the Final Housing Unit Followup was dropped from the Dress Rehearsal due to budget cuts.

#### **5. Contacts for Statistical Aspects and Data Collection**

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#### ***Definition of Terms***

##### *Components of Census Coverage*

The four components of census coverage are census omissions (missed persons or housing units), erroneous inclusions (persons or housing units enumerated in the census that should not have been), correct enumerations, and whole person imputations (census person enumerations on which we did not collect sufficient information). Examples of erroneous inclusions are housing units built after Census Day and persons or housing units enumerated more than once (duplicates).

##### *Net Coverage Error*

This is the difference between the estimate of the true population count and the actual census count. A positive net error indicates an undercount, while a negative net error indicates an over count.

#### **List of Attachments**

- A. U.S. Final Housing Unit Followup Form, Form D-1340
- B. Puerto Rico Final Housing Unit Followup Form, Form D-1340 (PR)
- C. U.S. Final Housing Unit Followup Quality Control Form, Form D-1325
- D. Puerto Rico Final Housing Unit Followup Quality Control Form, Form D-1325 (PR)
- E. U.S. Confidentiality Notice, Form D-31(CCM-FHUFU)
- F. Puerto Rico Confidentiality Notice, Form D-31(CCM-FHUFU) PR
- G. U.S. Housing Unit Reference List, Form D-1340.REF
- H. Puerto Rico Housing Unit Reference List, Form D-1340.REF (PR)
- I. Definitions for Final Housing Unit Followup U.S. Flashcard, Form D-1028.4(CCM-FHUFU)
- J. Definitions for Final Housing Unit Followup Puerto Rico Flashcard, Form D-1028.4(CCM-FHUFU) PR