

FORWARD FROM 1990: DESIGNING THE 2000 CENSUS

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KEY WORDS: Research and development, decennial

The design of the Decennial Census of Population and Housing of the United States has remained basically the same for the past three censuses. The 1970, 1980, and 1990 censuses had many similar features, although improvements and adaptations took place over the decades:

- o Recent censuses were all based largely on a mail-out/mail-back data collection methodology, with the procedure being expanded and refined over time.
- o Each census used a short census form with basic population and housing characteristics, and a long form to collect data on a sample basis. The number and type of questions on the short and long forms have remained basically the same. In the 1970 census, two sample forms were used, but the 1980 and 1990 censuses employed a single sample form. Refinements in sample size and allocations have been made over time, as have improvements in question wording and concepts.
- o For each census, we developed a listing of addresses to control and document the enumeration. This process has evolved from a paper-based system in 1970 to a completely automated one for 1990. In a similar way, geographic support changed from a manual system, with people drawing maps, to an automation-based one: Our TIGER (Topologically Integrated Geographic Encoding and Reference) File is a computerized system to classify, control, and produce geographic information and products.
- o Concepts involving quality assurance, rules of residence and enumeration, and coverage evaluation have remained similar, although techniques became more sophisticated over time.
- o Approaches to data capture, processing and tabulation have remained constant, although vast improvements have been made to take advantage of technological advances which lead to more timely results and customer service.

The Research, Evaluation, and Experimental (REX)

Programs for each census were a major contributor to changes for the subsequent one. The generic objectives for any REX Program are to provide: 1) information to data users about the quality of census data, and 2) data for improving and changing methods and operations. As in the past, the 1990 REX Program will provide this information as we explore new designs for the 2000 census.

Early this decade, the Census Bureau was given the opportunity to study fundamental changes to the concepts, approaches, and methodologies that were the common basis for the design of every census since 1970. The motivations for change are many: Our changing society, new data needs, concerns about the quality of the 1990 census, and clear demands of us to assure consideration of new methods. It was recognized, however, that a decennial census is a major undertaking that requires long lead time for pretesting, developmental work, obtaining and incorporating customer and stakeholder feedback, and procurement of equipment and services. In fact, fundamental changes to the 1990 census were considered in the early 1980s, but funding was not granted until 1984, which did not allow time to develop the concepts. For the 2000 census, the Census Bureau received funding to begin research and development (R&D) on design changes beginning in 1991. This allowed creation of the Year 2000 Research and Development Staff (2KS) at the Census Bureau¹, and a Task Force for Designing the Year 2000 Census and Census Related Activities for 2000-2009 to begin technical and policy work on design changes for the next census.

The Task Force is composed of three committees:

- o The Technical Committee is responsible for the evaluation of design alternatives from the standpoint of technical feasibility. It is chaired by the Associate Director for Statistical Design, Methodology, and Standards, from the Bureau of the Census. Members of the Technical Committee are drawn from Census Bureau staff, and senior technical staff at three other agencies.
- o The Policy Committee is responsible for the review of possible design alternatives from the standpoint

This paper reports the general results of the research undertaken by Census Bureau staff. The views expressed are attributable to the author and do not necessarily reflect those of the Census Bureau.

of policy concerns about their direct, or indirect, effects on society at large, as manifested through agencies of the Federal Government. It is chaired by the Deputy Assistant Secretary for Statistical Affairs in the Department of Commerce. Members of the Committee are officials from Executive Branch departments and agencies who are stakeholders in the decennial census.

- The 2000 Census Advisory Committee is responsible for bringing to the attention of Federal executives public concerns of stakeholders for the decennial census from the society at large. It is chaired by the Executive Director of the Council of Professional Associations on Federal Statistics. Members of the Committee are organizations with substantial constituencies who have major interests in the decennial census, including the Congress.

By the time 2KS was established in 1991, the REX Program for the 1990 census was well underway. Fortunately, and not coincidentally, the REX Program had anticipated many of the needs of the R&D Program. The REX Program results have and will continue to be used as a foundation for considering the redesign of the 2000 census in several ways:

1. While the R&D Program is looking at a wide range of alternative designs for the 2000 census, many of them may contain features of the 1990 census. Therefore, information about the quality of the 1990 census features will help to focus on potential improvements.
2. The REX Program was an opportunity to try things that could not be developed in time for full use in 1990, but which we now can consider for 2000. For instance, one REX experiment tried different types of questionnaire designs. Those results have helped us plan a program of questionnaire simplification for the 2000 census. This example shows how 1990 REX provides a transition to consideration of major changes in the 2000 census.
3. The REX Program provides 1) data to evaluate alternative census designs, 2) hypotheses that R&D can address to improve methodologies, and 3) preliminary information that we can further develop in the course of identifying changes. The R&D Program will build on these products with new technical and policy pursuits.
4. The 1990 REX Program will identify major problems and major successes of the 1990 census, which can be used as criteria for selecting a design for the next census.

In order to explain specifically how the 1990 REX Program will contribute to the design of the 2000 census, the following section describes the process for researching changes to that design. Then the paper

describes some major ways that the REX results support evaluating those design changes.

PROCESS FOR SELECTING A DESIGN FOR THE 2000 CENSUS

The R&D Program for the 2000 census began in 1991 and will be completed in 1995. Its major product will be design specifications for the 2000 census. Note, however, that the R&D Program will also produce research plans for work to be done to address subsequent censuses; in particular, it will result in ideas to be pursued in the decade 2000-2009 as a basis for further changes. This possibility was acknowledged in chartering the R&D Program, and the Task Force, since even the 5 years allowed for the 2000 census R&D may not be sufficient to develop all promising ideas. Profound changes, such as basing census data or updates largely on administrative records, or more closely integrating the decennial census with ongoing demographic estimates and survey programs, may need longer lead times. Still, all of these possibilities will undergo evaluation and development to some degree during the early years of this decade. For ideas showing promise that cannot be fully developed in time for the 2000 census, we could develop and evaluate their potential in the 2000 census REX Program.

With regard to the 2000 census, the process of selecting a design is keyed to major milestones between 1991 and 1995:

December 1991—Identify all possible ways to accomplish the major features of a decennial census.

We are committed to a fully open process that will elicit and consider ideas from the full range of stakeholders in the 2000 census. Starting in December 1990, we held a series of focus groups to identify various ways to take the census in 2000. Census Bureau experts analyzed, categorized, supplemented, and fully defined these ideas during the fall of 1991. By the end of the year, we had what was intended to be a complete inventory of different ways ("options") that the major features of a decennial census could be done.

January 1992—The Technical Committee of the Task Force identified an initial set of 15 design alternatives and evaluation criteria.

February-May 1992—Review of designs and criteria.

A series of meetings with various stakeholder groups reviewed the internal set of designs through early May

1992. A major product of this review was new designs and new combinations of features. These groups also surfaced uncertainties--technical and policy issues that must be resolved in order to determine if the design should remain a candidate for the 2000 census.

June 1992--Document the full set of design alternatives; the critical components to be addressed; and the means of addressing them, including specific project proposals and milestones.

This past June, we reviewed all of the ideas about designs surfaced in the stakeholder meetings. The results of the review are provided in Appendix 1.

July 1992 through August 1993--Winnow down the full set of designs to a small number to be tested in a set of full-scale census tests in 1995.

During this time period, R&D activities and policy discussions will occur to address critical components of the candidate designs. Results will be reviewed externally; an important participant in this review will be the National Academy of Sciences' Committee on National Statistics Panel to Evaluate Alternative Census Methods. As these results become available, designs will be eliminated from consideration. The process of "winnowing down" is as follows:

The final selection of a design for the 2000 census will be from among those defined in September 1993, but may also be a combination of them to the extent that whole designs or selected components of designs are best applicable to different population groups or geographic areas.

Because of the long lead time necessary to plan any census, and because special major efforts will be involved in implementing a design that might be fundamentally different from previous censuses, any design eliminated from consideration from the 1995 census tests is no longer considered a candidate for the 2000 census.

Elimination of designs from consideration will be based on objective information on technical issues and informed consideration on policy issues. Such information will be gained from the conduct of projects associated with one or more alternative designs. While any one design has several critical technical or policy issues whose resolution might cause its elimination, it might be eliminated based on any single project. Between July 1992 and September 1993, such results will be obtained and analyzed. Appropriate Census Bureau staff, in consultation with staff of the Department of

Commerce and other agencies and entities as appropriate, will draft reports presenting the data, their analysis and interpretation, and recommendations with respect to the design or designs affected. The Committee on National Statistics Methods Panel will review the technical aspects of technical activities and advise on their validity, conclusions, and limitations.

These reports will be provided to the Chairs of the three Task Force Committees. Those persons will review the reports and work with the authors to clarify, expand, or otherwise amend the interpretations or recommendations. The recommendation will specifically address whether to drop a design or designs from consideration for the 1995 census tests; to maintain it intact as a candidate for testing; or to incorporate it or some part of it in another design. The report may also suggest that the design or some design components, while not promising for 2000, continue to be developed for the decade beyond 2000. The Chairs will then determine which of the Committees is appropriate for detailed review of the report and concurrence with the recommendations. Once that review takes place, they will prepare a final report and recommendations for concurrence by the Director of the Census Bureau and officials of the Department of Commerce.

Based on review by the appropriate Committee(s), the report of the three Chairs may include minority opinions that arose during the review.

September 1993--Select a small number of designs for the 1995 census tests.

Between now and September 1993, we will carry out an intensive program of technical research and policy considerations to winnow down the number of potential design alternatives. By September 1993, we will specify a small number of remaining designs so that planning and implementation of the 1995 census tests can begin.

January 1995--Final Task Force Report.

This is the official date for the Task Force to make its recommendations for potential designs. We expect most of this to have been known by December 1993.

December 1995--Select design for 2000 census.

Based on evaluation results from the 1995 census

tests, a final selection for 2000 will be made.

In order to winnow down designs, we must conduct a rapid, scientific review of both technical and policy issues related to each alternative design. Approaches for the policy issues are discussed in the paper "Strategic Issues for the 2000 Decennial Census Research and Development," by James L. Dinwiddie, Barbara Everitt Bryant, and Susan M. Miskura.

The technical issues to be researched fall into several broad categories. The remainder of this paper describes some of these broad categories, and how the 1990 REX Program will help determine the design of the 2000 census.

CATEGORIES OF TECHNICAL RESEARCH AND DEVELOPMENT

There are several research themes that cross the full range of alternative 2000 census designs under consideration. The 1990 REX Program can inform the evaluation of these themes in several ways. As examples, consider some of the fundamental changes being considered:

- o Many of the designs are based wholly or in part on new or expanded use of ADMINISTRATIVE RECORDS.
- o Most of the designs incorporate new uses of STATISTICAL SAMPLING AND ESTIMATION.
- o For any design, we will explore opportunities to incorporate NEW METHODOLOGIES AND TECHNOLOGIES FOR DATA COLLECTION AND PROCESSING.

ADMINISTRATIVE RECORDS

For the purpose of our research, administrative records are defined as sources of information collected for reasons other than taking the census, but with the potential to replace or supplement census data. Recent censuses, especially 1980 and 1990, made several uses of administrative records. Major uses of administrative records in recent censuses included:

- o Compilation of address lists for the census--For most urban areas of the country, address lists for mailing and controlling the census have initially come from commercial vendors and were updated several times by the Census Bureau and the U.S. Postal Service. In addition, control lists of "special places" such as college dormitories, shelters, jails and prisons, mobile home parks and the like were based on using appropriate administrative records. Whenever we used such records, the Census Bureau verified and updated the information using field visits.

- o Coverage improvement--Lists of persons or housing units likely to be missed have been used as a basis for follow-up to determine their enumeration status.
- o Census evaluation--Lists have been used as an independent source of information to estimate the coverage of the census. They have also been used to compare or validate the quality of characteristics data.
- o Basic enumeration--Under limited and specific circumstances, lists have been used to substitute for self-enumeration or an interview. This occurred when direct options were not available in enumerating institutions, prisons, and the like.

Several alternative designs for the 2000 census envision expanding the use of administrative records in fundamentally new ways. In all previous censuses, administrative records supplemented enumeration only after validation by census workers or knowledgeable program administrators. We are now considering the use of administrative records without such verification, to produce both counts and characteristics data. Proposals range from the extreme of basing the census entirely on administrative records, to substituting such data in lieu of enumeration when contact with a respondent or proxy cannot be made. The attraction of these methods is based on reduction of respondent burden and cost considerations. Further, were a system to produce data from records put in place, it would allow updating of information more frequently than from a decennial census.

Clearly, however, such a change is likely to be acceptable only if our research indicates that census results based on administrative records are of a suitable level of quality. There are critical issues of content, currency, and accuracy with respect to such records. The 1990 REX Program is providing insight into these issues, since it is analyzing the quality of the records used. Evaluations of Coverage Improvement Techniques and Sources of Census Error form the basis for further work.

The R&D Program will expand on these evaluations by researching new list sources. In addition, it will address issues of access, processing, and record linkage critical to greater use of administrative records in the census. We will also explore public perception and reaction to the expanded use of administrative records to produce Federal statistics.

STATISTICAL SAMPLING AND ESTIMATION

While all modern censuses have incorporated sampling to produce characteristics data, there has been almost no use of sampling to produce basic census counts. The one exception was the use of sampling to

improve the coverage of the 1970 census in correcting misclassification of occupied housing units as vacant, and by using a postal check in selected areas to impute additional units and persons. This approach was abandoned for the 1980 and 1990 censuses in favor of incorporating procedures to address these deficiencies during the census enumeration itself. In those latter censuses, count estimation was limited to imputation techniques applied for minute proportions of the population when data were incomplete in the later stages of processing.

While expansions of the use of sampling were identified for the 1990 census, time and resources were not available for their full development. But the 2000 R&D Program provides us an opportunity to actually research and test new uses of sampling and related statistical estimation techniques. Such methods are attractive for their potential to decrease the costs of enumeration, and redirect resources to improving the overall accuracy of the census.

With respect to sampling for the count, proposals include doing the census on a sample basis; sampling for nonresponse to an initial attempt at respondent contact; and using modeling and coverage measurement samples as a basis for producing census results.

There are legal and policy issues associated with these potential census features, and as those are addressed, we are proceeding with technical evaluations and development of alternatives. Much of this work is based on information gathered from the 1990 REX Program. For example, results from the 1990 census, along with information from the 1990 Post-Enumeration Survey (PES), form the basis for technical development of the uses of sampling. The results inform us about areas and population groups which were not adequately covered in the 1990 census. They provide a data base for simulating and evaluating various estimation techniques that might be applied in the future.

Major issues regarding the use of sampling in the census regard the error tradeoffs--whether the sampling error introduced can be offset by decreasing nonsampling error so that the overall results are as least as accurate. A key 1990 evaluation is the Coverage Sampling Research Project. This project sets a basis for identifying potential ways to decrease nonsampling error in the census.

The 2000 R&D Program will build on 1990 REX by exploring potential sample designs and their error properties. These studies will utilize 1990 data files and results to a large degree.

With respect to sampling for content, design changes for the 2000 census will include considerations of the use of multiple sample forms and various ways

that data collection may be spread out over the decade. The 1990 REX Program provides data to simulate various designs. In addition, evaluations of the use of census data provide requirements for the geographic levels and needed reliability for census data that might be collected under alternative sampling schemes.

NEW METHODOLOGIES AND TECHNOLOGIES FOR DATA COLLECTION AND PROCESSING

The design alternatives under consideration for the 2000 census are based on innovative or expanded uses of new data collection and processing methodologies and technologies. The 1990 REX Program provides results that are directly related to assessing candidate methods, and provides a benchmark for determining what improvements can be made.

In the area of data collection, we are looking to increase response rates by redesigning the census questionnaire and alerting respondents to the importance of participating. The 1990 census studies of mail-response behavior, and the Alternative Questionnaire Experiment, have directly affected work on questionnaire implementation and design. The 1990 experience with limited telephone data collection laid the groundwork for expanding the choice of media with which respondents can answer the census.

In the areas of data capture and processing, the R&D Program will be looking at capabilities such as imaging and Optical Character Recognition (OCR). These studies will build on various evaluations of processing and data quality in the 1990 census.

SUMMARY

These are only a few ways that the 1990 REX Program will be used to design the 2000 census. In addition to the use of administrative records, sampling and estimation, and new methodologies and technologies, the R&D Program will explore new approaches to census residence rules, cooperation with state and local governments, outreach and promotion, and the production and dissemination of data products. Developments in all of these areas are founded in the evaluation of the 1990 census. The 1990 REX Program is a key element in the evolution--perhaps sea change--in census taking in the next century.

¹ In fact, a small staff, the Twenty-First Century Staff, was created to begin preliminary work as early as 1987. That staff documented societal changes and trends that contributed to the motivation for the Research and Development (R&D) Program.

Summary Descriptions of Alternative Designs and Cooperative Ventures for the 2000 Census

(The attachments cited here are available from the author.)

This material is based on the review of 15 design alternatives identified by the Technical Committee of the Task Force in January 1992. That set of designs was discussed with about 25 groups of stakeholders between February and May 1992. Based on those meetings, the following actions were taken:

- o Three designs, those called "Cooperative," were removed from the inventory of 15 designs since they really addressed WHO should perform various census operations, rather than specifying design alternatives. The Cooperative category was broadened and is now displayed as ATTACHMENT 3 of this document. Attachment 3 shows various ways that entities outside the Census Bureau might conduct various census operations. It also documents cooperative and contracting activities from the 1990 census.
- o Two new designs were added. This resulted in the 14 designs displayed in ATTACHMENT 1; summary descriptions of these designs are presented below.
- o A number of suggestions at the review meetings addressed combining various "minimal content" designs with the two "Multiple Time" alternatives. These potential combinations are described in ATTACHMENT 2. As we investigate all the individual designs, we will use this display to identify any potential interactions for these combinations.
- o To respond to various requests to compare the designs for the 1970, 1980, and 1990 censuses, we prepared ATTACHMENT 4.

This display of design alternatives and combinations, therefore, has become the basis for research and development through the end of FY 93 to select a small number of designs for full-scale testing in the 1995 census tests. Throughout this period and in fact throughout all planning for the 2000 census, we will identify opportunities to use or expand the cooperative ventures displayed in Attachment 3.

The following are summary descriptions of the 14 alternate census designs and possible cooperative ventures for the 2000 census.

1990 VARIATIONS

1. MULTIPLE RESPONSE OPTIONS

This design is essentially the 1990 census with an array of additional modes for responding to the census offered to the public. In 1990, the mail was the primary method used to distribute and return questionnaires in most areas. This design would offer additional household-based modes such as use of the telephone, personal computer, FAX machine, video/text services, interactive cable TV, and so forth. Publicly available modes could include PCs or terminals in shopping malls, libraries, post offices, transportation hubs and business lobbies; partnerships with employers to allow employees to use telephone, PC, or FAX at work to respond; forms distribution exhibits or kiosks with drop boxes in these places; and walk in assistance centers. Attractions of this design are the potential for better public cooperation manifested in increased primary response rates, coverage, and quality. Concerns with this design include the added cost of these additional modes, operational complexity of deployment, and whether any of these modes will reach the traditionally undercounted populations.

2. HIGH TECH

This design is a high technology variation of the 1990 census because it includes extensive use of new data collection techniques and methodologies using administrative records and statistical estimation to complete the census. It would utilize all the primary response options noted in Design 1: Multiple Response Options, plus administrative records. Extensive use of administrative records is a critical and major additional feature of this design. This design calls for using administrative records data for last resort cases; for 100 percent nonresponse cases (if we learn that such substitution provides a better result than weighting); and a variety of other support activities. In 2000, we could improve the coverage and content of the census and reduce or contain the cost by using administrative records more extensively. This proposal further specifies that we conduct nonresponse follow-up on a sample basis and that we base the census results on an integrated coverage evaluation methodology. The attraction of this design is that it builds on known technology by adding significant innovations. The additional primary response options are expanded by adding the use of administrative records and sampling

for the count. The major issues are developing the required administrative records database and sampling methodology.

3. EXPANDED CONTENT

This design is similar to 1990, but would collect data on more topics and use multiple sample forms. The primary goal of this design is to improve the relevance of data collected by the census. An attribute unique to any census is that it provides a consistent set of data for all areas at the same point in time.

This design would attempt to identify all data needs of that type and seek to meet as many of those needs as possible. To help meet this goal without significantly increasing "average" burden on respondents (compared to 1990), the full set of items would be divided up among several sample forms (rather than just one, as in 1990). The major technical issues for this design are whether it can meet small-area data needs and cross-tabulation needs, and whether it is operationally feasible. The major policy issue for this design relates to the fundamental question of what data needs a census should meet.

4. TRUNCATED; MORE ESTIMATION

This design is similar to 1990. It is a one-time data collection effort administered by the Census Bureau. Content is similar to 1990 content. It utilizes an address list of housing units similar to that used in 1990, and a mailout/mailback initial data collection methodology. The key change from 1990 is that the nonresponse follow-up operation is truncated, though the amount of this truncation is subject to further study. This means that the operation is stopped at an agreed-upon point, not conducted on a sample basis. This could be anywhere on a range from simply not attempting to contact mailout/mailback nonrespondents to removing only the most difficult, final cases from the operation. Intrinsic to this design is the use of integrated coverage measurement techniques to produce the final, single set of results. The basic attractions of such innovations over the 1990 design are to reduce the large staffing and cost requirements of the traditional nonresponse follow-up operation in 2000, and to allow time for a "correction" of the count in the development of census results.

5. SAMPLE CENSUS

This design's major change from 1990 is sampling for the count prior to enumeration; it is a sample of the

entire mail-out universe and not just of the nonresponse follow-up operation. The basic attraction of such an approach to census-taking are to reduce staffing requirements and total costs in the next census, to reduce nonsampling error, and produce a high quality estimate at the conclusion of the census. Concerns with this design are the acceptability of the resulting level of overall error in the counts, and the legality and acceptability of sampling for the census count.

6. TARGET ENUMERATION BARRIERS

This design is similar to 1990, but would give primary emphasis to methods targeted at overcoming barriers to enumeration that exist for some groups and areas. This differs from previous census designs that first selected methods expected to do well for the majority of households, and then developed special methods (aimed at overcoming enumeration barriers for subgroups or subareas) within that framework. The likely attraction of this design would be reduced coverage errors, particularly reduced differential rates for demographic or geographic sub-groups. The major technical issues for this design relate to the existence/effectiveness of such targeted methods and (like Design 1) issues associated with the use of multiple primary response options. The major policy issues for this design are whether the methods (which may include some enumeration on a sample basis) are acceptable, and whether coverage improvement should be emphasized over other criteria (cost, operational feasibility, data quality, and the like) if such trade-offs must be made.

ADMINISTRATIVE RECORDS

7. ADMINISTRATIVE RECORDS ONLY

This design consists of taking a census by using Administrative Records only; we would not do any direct enumeration. An Administrative Records Only census depends on each person's "membership" in administrative records systems as the basis for enumeration. In this design, we would not do follow-up for coverage problems or for missing or inconsistent content. Coverage and content depend completely on administrative records systems and the data they contain. Issues of a full administrative records census based on the administrative records systems as they exist today include errors in coverage; acquisition of the needed data sets; linking and unduplication of the various administrative record sets; the residential location of individuals; and limited content data set. An

Administrative Records Census requires a file of residential addresses for control and enumeration where persons and housing are complete and current; matching/unduplication mechanisms exist and are accurate; the capability of moving persons from a reported address to the census day address and finally real time correction mechanisms to update the housing inventory and information. An administrative records census has the potential to reduce cost and eliminate the public reporting burden. The issues are the coverage and lack of content. Also, administrative records are collected and maintained under a variety of rules and regulations that may preclude the Census Bureau from obtaining key files.

8. ADMINISTRATIVE RECORDS WITH ENUMERATION SUPPORT

This design consists of a full census based only on administrative records with direct enumeration as needed to complete the enumeration in a satisfactory manner. Supplemental enumeration and follow-up for coverage problems or content will involve direct contact with respondents, but the basic coverage and data sets depend on administrative records systems and the data they contain. The content available in the administrative records will define the census content. In addition to the potential for cost and public burden reduction gained in an administrative records census, the attraction of this design is that by allowing enumeration as part of an administrative records census, some of the disadvantages of a pure administrative records census can be addressed. The issues are those of access to required files, and coverage and cost.

HEADCOUNT

9. VOTING RIGHTS DATA ONLY

This design is similar to Design 2: High Tech except it collects only those characteristics required by the Voting Rights Act. Design 2 introduces major changes to several fundamental aspects of 1990 such as multiple primary response options. In addition, the extensive use of statistical estimation technology is a major part of the design. A major departure from 1990 is the use of sampling for nonresponse as well as the use of administrative records to support enumeration. The attractions of this design are in the likely reduction of public burden and cost. It has significant content reduction, and is closer to simply fulfilling the constitutional mandate for the census.

10. REDISTRICTING COUNTS ONLY

This alternative design is similar to Design 4: Truncated; More Estimation except that it collects only reapportionment and redistricting counts. Design 4 utilizes a single sample form, and collects program administration, benchmark, and interpretative data, all beyond the data goals of this design. The attractions of such a design are in the likely reduction of public burden and cost. In its significant content reduction, it is closer to simply fulfilling the constitutional mandate for the census. And in its use of integrated coverage measurement, it is a "single number" census.

11. REDISTRICTING COUNTS ONLY; NO ESTIMATION

This is a basic headcount census design in which only population counts are collected and published at the block level to meet redistricting requirements. No coverage improvement operations would be conducted in this design and no statistical estimation would be performed for coverage measurement for possible adjustment. The attractions of this design are the reduction of public burden and cost. In its headcount only approach this design is closer to simply fulfilling the constitutional mandate for the census. Concerns with this design are the potential for significant coverage problems and the larger question of what the scope of a census should be.

12. REAPPORTIONMENT COUNTS ONLY; NO ESTIMATION

This design is the ultimate "bare bones" headcount census. Here only population counts are collected and a single population count number published to meet reapportionment requirements. No coverage improvement operations would be conducted in this design and no statistical estimation would be performed for coverage measurement for possible adjustment. The attractions of this design are the reduction of public burden and cost. This design is following a strict interpretation of the constitutional mandate for a census. Concerns with this design are the potential for significant coverage problems, the type and level of collection control required to only produce state counts, and the larger question of what the scope of a census should be.

MULTIPLE TIME

13. TWO-STAGE

In this design, the collection of 100 percent data (basic characteristics), presumably around a census day, would be followed in the census year with a second stage which would return to a sample of households to collect additional characteristics data. The attractions of this design are the potential for increased public cooperation in stage 1 due to the short content of the form, cost savings that would accompany the increased public cooperation, better coverage, and the potential for better execution of collection activities in the field as a result of less complex field procedures and efficient sample allocation from stage one. Concerns with this design include increased public burden of stage two returning to household after stage one and loss of positive effects from the media publicity blitz surrounding census data which may precipitate less cooperation in stage two resulting in lower response rates, less quality and coverage, and increased cost.

14. CONTINUOUS MEASUREMENT

This design is really a class of designs that feature a minimal-content census in the decennial year, and some type of ongoing data collection/production system throughout the decade. The ongoing system is not defined; what the design should be, balancing data needs and costs, is the subject of the R&D Program. We will consider designs that integrate demographic surveys, the use of administrative records, and count estimates programs to produce the most useful set of data at needed frequency, for needed geographic levels, at appropriate reliability. This design is attractive because it reduces operational spikes and may improve the data quality in the census year, and produces more frequent data. Issues involve potential cost increases from various activities.

COOPERATIVE VENTURES - USPS

A number of possible cooperative ventures center on new or expanded roles for the USPS in the census. possibilities (not mutually exclusive) include an increased role in building and maintaining a master address file, taking on all responsibility for such a file and ensuring delivery of a questionnaire to every housing unit, and taking on responsibility for obtaining data (or at least providing count data) for some or all households who do not mail back a completed form. The premise for such ventures is to take advantage of

the existing work force of postal carriers who visit most areas and households every day and thus have knowledge of housing units and their occupants. Such information could be used to ensure a more complete address list, ensure better delivery of questionnaires, and provide information (based on observation) on the number of persons in households for which questionnaires are not returned. Depending on which of these options (or combinations) are considered, key issues include the ability of the USPS to take on such work; the coverage completeness and data quality of the results; and the possible limitations this might place on the level of content for the census.

COOPERATIVE VENTURES - OTHER THAN USPS

A number of possible cooperative ventures may exist involving state and local governments, national and local organizations, and the private sector. For state and local governments, these include: 1) sharing initial and updated address lists with local officials so they can review and augment them more accurately than with the current methods of local review (where only block-level housing unit counts are provided to them); 2) having local officials provide administrative record information (primarily telephone numbers) to be added to the address list so as to facilitate data collection; 3) allowing states (and perhaps local governments) to add extra questions to the census forms to meet unique data needs; and 4) having states or local governments administer data collection for some areas or groups. For national and local organizations, ventures might include such things as cooperative or even contractual arrangements for: 1) recruiting, promotion, and outreach; 2) staffing assistance centers or other efforts to help respondents complete questionnaires; and 3) conducting data collection for selected populations (probably in predesignated areas). For the private sector, ventures could in theory include almost any aspect of the census, including address list preparation, printing and delivery of questionnaires, data collection, data processing, tabulation and publication, and evaluations studies. All of these ideas are based on the notion that these entities could offer special expertise, highly motivated staff, or other kinds of assistance to reduce the size or complexity of efforts that the Census Bureau traditionally must handle. Depending on which of these ventures we explore, there are a number of critical technical and policy issues to be researched, including legality, acceptability, coverage accuracy, data quality and consistency, costs, and management control.