CEMAF as a Census Method:

A Proposal for a Re-Designed Census and

a Re-Designed U.S. Census Bureau*

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Abstract

We propose a census based neither on door-to-door canvassing nor self-enumeration, but rather, on a combination of four elements: (1) administrative records; (2) the continuously updated Master Address File; (3) survey data; and (4) modeling techniques. We use the "Census-Enhanced Master Address File (CEMAF) as a descriptive term for our re-designed census. Our proposal for a re-designed census is largely based on "EMAF," a proposal for a re-designed population estimation system in the US and the body of work done on a census based on administrative records. However, it also is informed by advances in record linkage, imputation and microsimulation. We also provide recommendations about the administrative structure, legal and regulatory foundation, and working culture of the Census Bureau that are designed to support CEMAF. Thus, CEMAF is a proposal that includes not only a re-designed census, but a re-designed Census Bureau.

The proposal is designed to maintain accuracy, functionality, and usability while curtailing both increased non-response rates and costs, major problems facing the U.S. Census. It is guided by four principles: (1) Applied Demography; (2) Check and Balance; (3) Separation; and (4) the four essential features of a census. We use the earlier work on an administrative records census, record linkage, and modeling and the four principles to describe CEMAF and how it could be developed. The discussion focuses on technical, budgetary, administrative, and legal issues, but also touches upon others, such as privacy,

confidentiality, and public perception. We consider the major obstacles facing our proposal and provide ideas on how they may be overcome.

I. Introduction

There has been a fair amount of discussion about re-designing the U.S. Census and much of the driving force has to do with increasing non-response rates and increasing costs (see, e.g., Edmonston, 2001; Edmonston and Schultze, 1995; Cork, Cohen, and King, 2004; Weinberg, 2010). It is not often that somebody gets a chance to completely re-design the US Census and we are grateful for the opportunity to provide our proposal for this task, hypothetical as it may be. As can be seen in the title, we propose a census based neither on the current system, self-enumeration, nor its predecessor, door-to-door canvassing. Instead, we propose that it be built on a combination of four elements: (1) administrative records; (2) the continuously updated Master Address File; (3) survey data; and (4) modeling and imputation techniques. We use the "Census-Enhanced Master Address File (CEMAF) as a descriptive term for our re-designed census. The term CEMAF is derived from "EMAF" (Enhanced Master Address File), a proposal by Swanson and McKibben (2010) for a re-designed population estimation system. CEMAF is aimed at curtailing both increasing non-response rates and increasing costs while maintaining reasonable levels of accuracy, functionality, and usability.

Three of the four elements on which our CEMAF proposal is based stem from work done in regard to an Administrative Records Census (Alvey and Scheuren, 1982;

Judson, 2000; 2003; Judson and Bauder, 2002; Kliss and Alvey 1984; Prevost, 1996; Prevost and Leggieri, 1999; Scheuren, 1999) and the use of survey data, record linkage, and both modeling and imputation methods to augment census data (Allison, 2001; Blum, 1999; Fay, 2005; Fellegi and Sunter, 1969; Judson, 2007; Kalton, 1983; Liu, 2007, 2008; Myrskylä, 1991; Peterson, 1999; Rubin, 2004; Scheuren, 1999; Statistics Canada, 2009; Statistics Finland, 2004; Swanson and Knight, 1998; Thomsen and Holmøy, 1998; Weinberg, 2009). However, we have the advantage of being able to add an important accomplishment to this earlier work, the advent of MAF, a continuously updated Master Address File (Brown, Cohen, and Cork, 2008; Devine and Coleman, 2003; Hakanson, 2007; Swanson and McKibben, 2010; U.S. Census, 2004a, 2004b).

CEMAF is guided by four basic principles: (1) "Applied Demography," aiming at the precision and accuracy needed to make good decisions while minimizing cost and time (Swanson, Burch, and Tedrow, 1996); (2) "Check and Balance," viewing the census as an "Enclosure," not a "Commons" (Walashek and Swanson, 2006); (3) "Separation," having a political firewall between the Census Bureau and other elements of the federal government (El-Badry and Swanson, 2007; Maloney, 2009; Teitelbaum and Winter, 1998); and (4) the four essential features of a census, to include (a) individual enumeration, (b) universality within a defined territory, (c) simultaneity, and (d) periodicity (Anderson, 2000; Swanson, 2010; UN, 1992, 2007; UNECE, 2006; Wilmoth, 2004).

However hypothetical the task of a re-designing a census for 2020 may be, there clearly are reasons for considering such a task, including rising census costs and declining response rates (Edmonston and Schultze, 1995; Prevost and Leggieri, 1999).

While incomplete our proposal may be, we believe that it offers a means of combating rising costs and declining response rates, as well as other problems. This is important because as noted by El-Badry and Swanson (2007), among others (e.g., Starr, 1987), democratic societies like the United States are predicated on the use of numbers with valid social content and the deterioration of the decennial census subverts one of the fundamental, constitutional elements of this validity. In fact, as the Enumeration Clause of the U.S. Constitution (Art. I. § 2. cl. 3) makes clear, the primary purpose of the decennial census is to provide the basis for the apportionment of seats in the federal House of Representatives among the States. For example, as less people in Florida respond to the decennial census, Florida's population count for apportionment purposes declines and Florida may as a result lose one of its representatives.

In the following Section (II), we describe our four principles and then provide a summary of them. In Section III, we describe the technical aspects of CEMAF. As you may suspect, our proposal looks very different from what the United States now employs as a census method, which is "self-enumeration." However, as we point out, the transition from self-enumeration to CEMAF may not be any greater than the transition from door-to-door canvassing was to self-enumeration from legal, administrative, and methodological perspectives. Importantly, CEMAF uses existing data and methods. In Section IV, we discuss the constitutional and legal issues affecting CEMAF, which is based neither on traditional (face-to-face) enumeration nor self-enumeration (e.g., mail-out/mail-back). This discussion includes issues associated with the administrative, legal and regulatory, and working culture changes we recommend for the Census Bureau.

After describing our re-designed census and Census Bureau, and how these changes can be accomplished, we conclude with a summary (Section V).

II. The Four Principles

A. Applied Demography

In describing the Applied Demography Principle (ADP), we start with its counterpart, the basic demography perspective (Swanson and Pol, 2008; Swanson, Burch, and Tedrow, 1996). Basic demography is primarily concerned with offering convincing explanations of demographic phenomena, such as changes in fertility and mortality. It tends to view time and resources as barriers to surmount in order to maximize precision and explanatory power. Moreover, the substantive problems of basic demography are largely endogenously-defined.

Interestingly, there is a lot of evidence that the Census Bureau views the decennial census from the perspective of basic demography. The most telling is that it makes heroic efforts to 'count' each and every member of the population *(*Anderson and Fienberg, 1999; Choldin, 1994; Edmonston and Shultze, 1995; National Research Council, 1972; 1978, 1993, 1994, 2004a, 2004b). While the Census Bureau recognizes that counting everybody is an impossible task, it generally views it as an obstacle to be overcome instead of viewing this as a constraint that needs to be accommodated, (Carter, 2001; Hogan, 1993, 2000; Shepherd, 2007; U.S. Census Bureau, 1980, 1987, 1993, 2001a, 2010). This approach is a hallmark of basic demography: No matter what the cost and time, one must strive to render a precise measurement (Swanson, Burch, and Tedrow, 1996).

Not surprisingly, many who write about the Census Bureau's data generation procedures and methods, do so from a basic demography perspective (Anderson and Fienberg, 1999; Choldin, 1994; Edmonston and Shultze, 1995; National Research Council, 1972; 1978, 1993, 1994, 2004a, 2004b; U.S. Census Bureau, 1980, 1987, 1993, 2001a). That is, they, among others, tend to look at the Census Bureau as a scientific enterprise, which is useful in a limited context, but not when it spills over into discussions of the Bureau's legal, political and societal challenges.

We argue that in a broad sense, it is appropriate to consider the Census Bureau's data generation procedures and methods in accordance with the ADP. The guiding principle in applied demography is "only as much as necessary for the immediate problem at hand." (Swanson, Burch, and Tedrow, 1996). A rule-of-thumb variation on this principle would be the so-called 80/20 rule: That 80 percent of the benefit derives from the first 20 percent of effort. An implication is that the last 80 percent of effort may be wasted if the marginal gains in benefit are not absolutely necessary, if 80 percent performance is good enough. Properly applied, the rule can lead to efficiency; poorly applied, to mediocrity.

Both the basic demography perspective and the ADP can be succinctly represented in terms of the triple constraint (Rosenau 1981; Swanson 1986; Swanson, Burch, and Tedrow, 1996):

1. Performance specification - the explanatory/predictive precision sufficient to support a given decision-making situation;
2. Time - the schedule requirements under which the performance specification must be accomplished; and

3. Resources - the budget requirements under which the performance specification must be accomplished.

As a heuristic device, it is useful to view the triple constraint as if each of its three elements represent an axis in three dimensional space (Rosenau,1981; Swanson, Burch, and Tedrow, 1996). Using this perspective, for example, we can see that a high performance specification for the development of a number of the total population in a given area at a given point in time generally requires a great deal of time and resources (a complete census); a lower performance specification requires much less time and resources (a population estimate rather than a complete census).

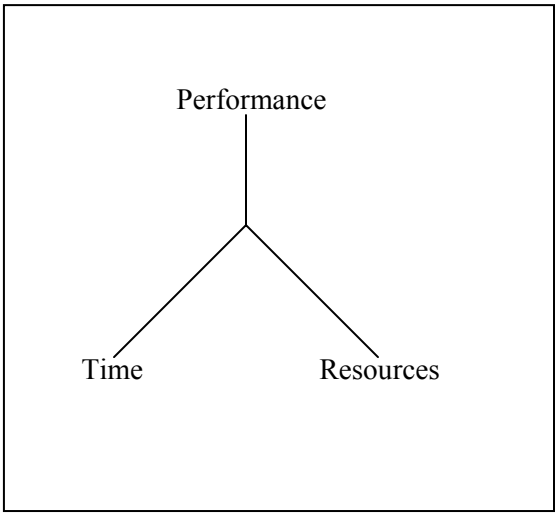


Figure 1. The Triple Constraint

While it would be inaccurate to draw a black and white contrast between applied and basic demography, it is true in terms of emphasis, that basic demography pursues an open-ended quest for ever better knowledge, more precise and reliable measurement, firmer empirical generalizations, better theoretical systems, and more refined techniques. For basic demography, the triple constraint perspective is embedded within a context that is distinctly different than that of the ADP. Under the basic demography perspective, the context involves the goal of maximizing the performance dimension, explanatory power and precision. Thus, it tends to view time and resources as barriers to surmount in order to maximize explanatory power and precision. Under the ADP, the context is to set the performance dimension at a level that is just sufficient to support a given decision-making process in order to minimize the use of time and resources.

Among other benefits, using the ADP reveals that a perfectly accurate census as not only unachievable, but also not necessarily a desirable goal. This serves to reduce the costs associated with striving towards what we view is an inappropriate goal -- perfect measurement. Instead, the ADP reorients the Bureau and its stakeholders to the more appropriate goal of trying to minimize costs while delivering numbers that are sufficiently accurate for their general use. Moreover, as observed in Edmonston and Schultze (1995: 55-56), rising costs have not produced a "better" census in terms of accuracy, which leads to the question, "is it appropriate to continue to attempt to improve measurement (especially in terms of reducing differential coverage and net undercounts) in future censuses given that these efforts have led to rising costs and not produced the desired results?"

Similar to stating that it would be inaccurate to draw a black and white contrast between basic and applied demography overall, it also is important to note here that the Census Bureau does not exclusively view the decennial census from the basic demography perspective. Some at the Census Bureau have applied the ADP to discussions of the decennial census, at least implicitly (Cantwell, Hogan, and Styles, 2005; Kincannon, 2003; Murdock, Kelley, and Jordan. 2006). Pursuing the use of the Applied Demography Principle would require the Census Bureau to develop guidelines developed in consultation with key stakeholders.

B. Check and Balance

Walashek and Swanson (2006) have described the decennial census as a "commons," where private benefits are gained at the expense of public costs. Their portrayal of the census follows Garrett Hardin's (1968) classic "Tragedy of the Commons" in which he describes herdsmen who increased their livestock to gain individual benefits at the expense of the common pasture, pushing the carrying capacity of the common grazing area too far and it collapsed. While the 'commons' as a metaphor can be pushed too far, it is nonetheless useful (National Research Council, 2002). Using this metaphor, Walashek and Swanson (2006) argue that like herdsmen, interest groups attempt to increase their share of the population to gain individual (interest group) benefits at the expense of the 'census commons' and that this leads to conflict over census counts, increased census costs, and declines in response rates, threatening a collapse of the census.

However, the census was not designed to be a commons; rather, it was designed to be an "enclosure" in the sense described by Hardin (1968). That is, the census was designed to have costs as well as benefits. The first step in the design of the census as an 'enclosure' was that delegates to the Constitutional Convention of 1787 agreed to give Congress the power to tax and levy tariffs. Article I. §8 of the U.S. Constitution provides: "The Congress shall have Power to lay and collect Taxes, Duties, Imposts and Excises." The second step was to decide how to levy taxes, which is found language in art. I, §2:

> "Representatives and direct Taxes shall be apportioned among the several States which may be included within this Union according to their respective Numbers."

If population was to be the determining factor for the number of representatives a state was allocated in the House of Representatives as well as the state's share of the cost in running the federal government, how was a state's population to be determined? The delegates debated how to resolve this problem, settled on the idea of a census, which was the third step. Thus, art. I, § 2 of the Constitution provides for a decennial census:

> "The actual Enumeration shall be made within three Years after the first Meeting of the Congress of the United States, and within every subsequent Term of ten years, in such Manner as they shall by Law direct."

Article I. § 2 was, therefore, carefully crafted to resolve several problems: how to keep federal power in balance with the power of the states as a whole; how to balance the power among the large and small states; and finally, how to balance the power between the nation's different regions. Article I also balanced the benefits and costs of larger populations with regards to each state's citizens; a larger congressional delegation also

meant having to provide more federal tax dollars. In effect, this balance prevented the census from being a commons. Instead, the census "enclosed" public benefits by protecting them from abuse by one interest over another. This was a conscious decision by the framers of the Constitution. As Madison (Rossiter, 2003) wrote in *The Federalist*:

> "…it is of great importance that the States should feel as little bias as possible, to swell or reduce the amount of their numbers. Were their share of representation alone to be governed by this rule, they would have an interest in exaggerating their inhabitants. Were the rule to decide their share of taxation alone, a contrary temptation would prevail….By extending the rule to both objects, the States will have opposite interests, which will control and balance each other, and produce the requisite impartiality…"

The "enclosed" census remained in effect until the adoption of the 16th Amendment in 1913. Short in wording but long in effect, the 16th Amendment simply states: "The Congress shall have the power to lay and collect taxes on income, from whatever source derived, without apportionment among the several States, and without regard to any census or enumeration." With the adoption of the 16th Amendment, the stage was set for census benefits to be private and census costs to be public. With the institution of an unapportioned federal income tax there was no longer a private cost to the residents of a state having a larger share of the U.S. population: The census became a commons.

The impact of the 16th Amendment was not immediate on the census. It served as a necessary, but not sufficient, condition for the Census Commons to be fully realized. The remaining conditions were put largely into place beginning with the 1960s when the reapportionment revolution occurred (McMillan, 2000) and the distribution of substantial amounts of federal funds became linked to census data (Citro, 2000; Murray, 1992; U.S. GAO, 1999; Walashek and Swanson, 2006). This meant that "populations" were linked

to increased private benefits without the balance of accompanying private costs. Not surprisingly, interest groups began to form around these populations and the process of linking federal funds to census data accelerated (Anderson and Fienberg, 1999, 2002; Choldin, 1994; Skerry, 2000; Walashek and Swanson, 2006).

This development was not anticipated by the Progressives in 1913 who had championed passage of the 16th Amendment and tended to see only the wealthy and the poor as special interest groups of note. An illustration of the huge private benefits at stake in the 21st Century is the appropriated federal block grants for Native American housing which in 2003 totaled $649 million with an additional $4,937 million for community development (Walashek and Swanson, 2006). It is easy to see why more than 100 Indian tribes, complaining of undercount, challenged the 2000 census results and conducted their own head counts. The tribes pointed out that the 2000 census counted 3,334 people at Warm Springs, Oregon, of which 3,018 were Indians. According to tribal registries, however, 3,522 tribal members live on the reservation, suggesting that the 2000 census missed 504 Warm Springs tribal members, for an error undercount rate of 14 percent (Walashek and Swanson, 2006): "We're being shorted on funding…the numbers [the Census Bureau] have are totally inaccurate. We're doing our census to get the money we're owned." This sentiment was not confined to residents of the Warm Springs Reservation.

As the preceding example illustrates, as recognition of these benefits has spread, the Census Commons has become more and more exploited. Evidence of this increasing exploitation can be found in a wide range of publications (Skerry, 2000; Anderson, 1988; Choldin, 1994; Citro, Cork, and Norwood, 2004; Edmonston and Schultze, 1995;

Anderson and Fienberg, 1999; Prewitt, 1987; Price Waterhouse Coopers, 2001; Rousch, 1996; U.S. Conference of Mayors, 1999; U.S. GAO, 1999). Thus, just as in Hardin's rendition of the "*Tragedy*," each herdsman attempted to increase his share of the pasture commons, so has each interest group attempted to increase its share of the Census Commons.

Fueled by the proliferation of federal programs distributing benefits using decennial census data and the knowledge that federal courts were now willing to consider apportionment cases, several lawsuits were filed against the Census Bureau following the 1970 census. Importantly, these suits relied upon knowledge of differential undercounts from 1940 to 1960 and although they were dismissed, the Census as a commons was now becoming evident. The decision of Baker v. Carr, 369 U.S. 186 (1962) by the Supreme Court ended the federal courts refusal to hear reapportionment lawsuits; some 16 years after the same court in Colegrove v. Green, 330 U.S. 549 (1946) held that the federal judiciary had no power to interfere with issues regarding apportionment of state legislatures. The plaintiff, Baker, complained that the population had shifted such that his district in Shelby County had about ten times as many residents as some of the rural districts. The result of this shift in population without reapportioning the congressional districts for the state legislature was that the votes of rural citizens were worth more than the votes of urban citizens. It was in *Baker* that the famous "one-person, one-vote" standard for legislative redistricting was established; that is individuals had to be weighted equally in legislative apportionment. The Supreme Court ruled that the Tennessee legislature had to be re-apportioned and the floodgates for reapportionment lawsuits opened (Walashek and Swanson, 2006).

It was no surprise that with the arrival of 1980 census data, came another flood of lawsuits (Anderson and Fienberg, 2002; Anderson, 1988; Mitroff, Mason, and Barraba, 1983). The flood of lawsuits was commented on in Carey v. Klutznick, 653 F. 2d 732 (2d Cir. 1981) *cert. denied,* 455 U.S. 999 (1982) noting that more than fifty challenges to the 1980 census were brought by various states and localities flooded district courts in 1980 and 1981. In these actions, the plaintiffs claimed that their particular locality was or was going to be disproportionately undercounted denying the locality the number of representatives it was due in the federal congress and its fair share of federal funding. They sued for statistical adjustment for the undercount (Cuomo v. Baldrige, 1987). One of these fifty-odd cases was filed in August of 1980 in the U.S. District Court, in the Southern District of New York. The plaintiffs, in Cuomo v. Baldrige, 674 F. Supp. 1089 (1987) sued the Secretary of Commerce and the Bureau of the Census seeking a judgment declaring that New York City and New York State were disproportionately undercounted in the 1980 census. They moved for a court order requiring the Bureau of the Census to statistically adjust the 1980 decennial census. District Judge Sprizzo dismissed the case holding that the state and city failed to establish the statistical adjustment of decennial census was technically feasible.

The 1990 census also was followed by lawsuits (Anderson and Fienberg, 2002; Pack, 1996) and yet more again following the 2000 census (Anderson and Fienberg, 2002; Citro, Cork, and Norwood, 2004; Wenjert, 2003). These lawsuits overwhelmingly were based on grounds that the census had undercounted some population (Anderson and Fienberg, 2002; Anderson, 1988; Freedman and Wachter, 2001)

An important illustration of these actions is provided by a suit filed in the 1990s, which made it to the Supreme Court. Justice O'Connor delivered the opinion in Franklin v. Massachusetts, 505 U.S. 788 (1992) on the issue of whether the decision by the Secretary of Commerce to allocate federal overseas employees to particular states for reapportionment purposes violated the Constitution. The Court found that since many, if not most of the federal overseas employees, particularly the military, have retained their ties to the states and, therefore, could and should be counted toward their states' representation in Congress. "Many," said the Court, " if not most of those temporarily stationed overseas considered themselves to be usual residents of the United States" (Franklin v. Massachusetts, 1992). Justice O'Conner stated that the Secretary of Commerce's judgment to include them in the population count for their state of residence does not hamper the underlying constitutional goal of equal representation and, in fact, actually promotes equality. She noted, that if some persons had not been counted because they temporarily reside outside the U.S., the votes of all those who reside in Washington State would not have been weighted equally to votes of those who reside in other States.

A successful action to have more people counted is not just an action that affects the census. It has a ripple effect throughout the decade leading to the next census because the census is the starting point for a set of annual estimates done by the Bureau that in themselves also distribute resources. For the 1980 census, Prevost and McKibben (1988) found that annual population estimates done by the Census Bureau affected the distribution of $40 billion in federal grants each year subsequent to the 1980 census. Murray (1992) found that formulas involving census population numbers were used in

the distribution of $58.7 billion in federal funds distributed to state and local governments in 1989.

Perhaps it is not a surprise that the focus by academics, stakeholders, the Census Bureau, and the Congress is largely on methodological developments as the solution to census conflicts – increasing census accuracy through advertising to increase participation, for example, or by using statistical adjustments to reduce differential net undercounts (Anderson and Fienberg, 2002; Anderson et al., 2000; Belin and Rolph, 1994; Brown et al., 1999; Brunell, 2001; Census Monitoring Board, 2001; Darga, 1999; Rolph, 1993; U.S. Census Bureau, 2001a; U.S. GAO, 2003; Wright, 1998; Wright and Hogan, 2000). In spite of methodological developments such as the de-coupling of the long form from the decennial census (Hough and Swanson, 1998, 2004; Salvo, Lobo, and Love, 2002; U.S. Census Bureau, 2004c)., however, nothing has occurred that would suggest to us that methodological developments will reduce litigation and other forms of conflict over census results. In fact, there is evidence to suggest that conflicts over census counts will only intensify. As conflicts intensify, it is likely that public confidence in the census will be further eroded and with erosion of public confidence comes higher levels of non-response (Dillman, 2000), which, in turn, bring about higher levels of non-response and increase the need for the wider use of existing statistical procedures and adjustments to compensate for those not responding, as well as calls for even more procedures and adjustments (Anderson et al., 2000; Brown et al, 1999; Edmonston and Schultze, 1995; Kalton, 1983; Freedman and Wachter, 2004). These additional procedures will require more funding, forcing the Census Bureau to make choices about methods that cannot provide optimal results for all populations. This will

lead to more litigation and other forms of conflict as the special interest groups struggle to get their populations into the Census Commons. Once glimpsed, the outcome of this downward spiral is not reassuring for the future of the census. Figure 2 provides a heuristic illustration of the feedback cycle that characterizes the Census Commons.

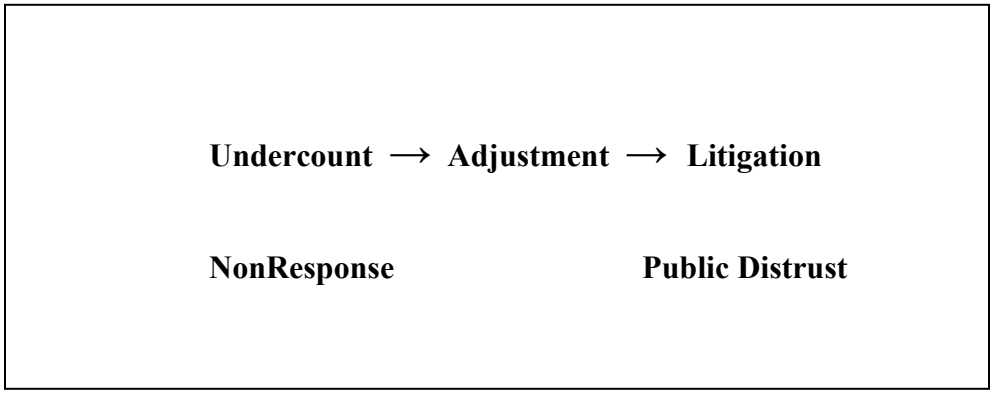


Figure 2. The Census Commons Feedback Cycle

As an example of the possible end result of the Census Commons feedback cycle for the United States, consider the case of the Netherlands, where public cooperation has been deemed to be so low that a legally mandated census scheduled to have taken place in 1981 was indefinitely postponed. With the last conventional census having been taken in 1971, the government and other users of census data (e.g., planners, market researchers, bureaucrats, and academics) were desperate for current data. So, as a substitute, the government authorized Statistics Netherlands to use a combination of survey results and administrative data to come up with a "census" for 2001 (Van der Laan, 2000). Similarly, justifications for cancelling the decennial census of England (Hope, 2010) are based in part on the country's ability to make up for lost census data with a combination of administrative records and survey data.

What can be done to avoid the "Tragedy of the Census Commons?" We return to this question later.

C. Separation

Along with others, we believe that having a political firewall between the Census Bureau and other elements of the federal government is important (El-Badry and Swanson, 2007; Maloney, 2009; Teitelbaum and Winter, 1998). As a branch of the executive and beholding to Congress for its funding, the Census Bureau is subject to the tides and currents of political processes (Anderson, 1988). This is neither nefarious nor illegal. It is simply the nature of our government. As examples, during the Republican administrations in the 1980s, the parent agency of the Census Bureau, the Department of Commerce, took the decision concerning statistical adjustment out of the hands of the Census Bureau, and by 1987 announced that there would be no statistical adjustment of the 1990 census (Choldin, 1994: 236-237). The winds changed with the democratic Clinton Administration. The Democrats were more than happy to sanction statistical adjustments for undercounts since the undercounted are primarily minorities, children and renters (Walashek and Swanson, 2006). In other words, if the census is statistically adjusted to account for minorities, children and renters, the population of the Democrats would increase and consequently, their representation and power in Congress.

Ultimately, the Democrats lost their fight to have the census statistically adjusted for purposes of apportionment. The Republican-controlled House of Representatives sued the Secretary of Commerce seeking a declaration that the use of statistical sampling violated the Census Act and Article I of the Constitution (Walashek and Swanson, 2006)

In 1999, the Supreme Court in Department of Commerce v. United States House of Representatives, 525 U.S. 316, 343, 119 S.Cr. 765 (1999) found that the Census Act prohibits the use of statistical sampling to determine the population for congressional apportionment. (Anderson and Fienberg, 2002; Anderson et al., 2000; U.S. Census Bureau, 2009a).

Choldin (1994: 237-238) discusses the two major deleterious effects of the Census Bureau's loss of autonomy, which began in 1979 due to the political controversy over census undercount adjustment: (1) injecting caution into the Bureau's scientific work and constraining the contacts that Bureau staff with outside colleagues; and (2) damage to the Census Bureau's reputation. The major entities encroaching on the Bureau's autonomy are the Office of Management and Budget, the Department of Commerce, and Congress.

To combat these and other problems, Teitelbaum and Winter (1998) proposed that a permanent and non-political oversight panel similar in structure and function to either the Federal Reserve Board or the Congressional Budget Office be established for the Census Bureau. These two agencies are called "independent agencies" because they function outside executive supervision. Independent agencies are established by statute. The Federal Trade Commission, an independent agency, for example was created by Congress in the Federal Trade Commission Act of 1914, 38 Stat. 717 (codified as amended at 15 U.S.C. §§41-58 (2006).

Independent agencies are organized differently than executive agencies in order to create a buffer between their purpose and politics. In 1935, the Supreme Court, in Humphrey's Executor v. United States, 295 U.S. 602 (1935) looked at some of the

differences between executive agencies and independent agencies. In *Humphrey*, the plaintiff sued to recover salary allegedly due Humphrey, a Federal Trade Commissioner, removed from office by the President of the United States. Humphrey was nominated by President Hoover and confirmed by the Senate as a member of the Federal Trade Commission. Unlike executive agencies such as the Census Bureau, which have a single director nominated by the President and confirmed by the Senate, Humphrey was to be one of five commissioners (U.S. Census Bureau, 2000). Of these five commissioners, §1 of the Federal Trade Commission Act provided that "[n]ot more than three of the commissioners shall be members of the same political party." and pursuant to the statute, the commissioners were to serve staggered terms of three, four, five, six and seven years and successors were to be appointed for terms of seven years, the Court stated. This initial staggered term structure meant that some of the commissioners were in office longer than the usual four-year presidential term making it nearly impossible for a sitting president to appoint all the commissioners from members of his own political party. In addition, since the Federal Trade Commission by statute must be bipartisan, the President is unable to fill vacancies with only members of his own political party. Most importantly, Congress restricted the President's power to remove a commissioner to those reasons listed in the statute, inefficiency, neglect of duty or malfeasance in office. In other words, the President cannot fire at will and fill the vacancies with commissioners of his own party. This limitation on the President's power to remove a commissioner from office was the issue before the *Humphrey's* court. Was it an unconstitutional interference with the President's executive power? Here is what the Supreme Court said:

> "The Federal Trade Commission is an administrative body created by Congress to carry into effect legislative policies embodied in the statute and to perform other

> specified duties as a legislative or as a judicial aid. Such a body cannot in any proper sense be characterized as an arm or an eye of the executive. Its duties are performed without executive leave, and, in the contemplation of the statue, must be free from executive control"(Humphrey's Ex'r v. United States, 1935).

The court noted that the President's power alone to remove is confined purely to executive officers. Officers of the kind under consideration in *Humphreys,* Federal Trade Commissioners, cannot be removed during the term for which the officer is appointed except for one or more of the causes named in the statute.

The independent agency status has certainly worked in terms of the Federal Reserve Board and Congressional Budget Office, both of which appear to carry out their missions in an effective and de-politicized manner. As was the case for both the Federal Reserve system and the Congressional Budget Office, such a move for the Census Bureau explicitly acknowledges that its constitutionally mandated activity, the decennial census, represents a political process that in spite of all of its flaws, serves important data needs, and that, as such, should be buffered from the excesses of political and bureaucratic demands.

Teitelbaum's and Winter's solution is not likely to be something that would occur quickly as can be seen by the progress of H.R. 1254, a bill introduced by Reps. Carolyn Maloney and several colleagues in the 1st session of the 111th Congress on March 3rd, 2009 (Maloney et al., 2009). This is as it should be - much debate and in-depth consideration by many parties over a course of years is needed before such an action would be taken.

The bill, "Restoring the Integrity of American Statistics Act of 2000," seeks to establish the Census Bureau as an independent establishment in the executive branch

effective January 1, 2012. It requires the Bureau Director to be appointed by the President without regard to political affiliation for a five-year term and provides for the appointment of an Inspector General for the Bureau. However, the last action on the bill was May 4, 2009 when it was referred to the House of Representative's Subcommittee on Information Policy, Census and National Archives (H.R. 1254, 2009). The bill will be reviewed by the subcommittee which may ultimately report the bill favorably or unfavorably to the House as a whole allowing it to receive consideration by the full body and move forward. Alternatively, like the majority of bills, the subcommittee may fail to consider the bill at all. If the bill does move forward, it must be passed by both the House and the Senate and then be signed by the President before it becomes law. H.R.1254 has until January 3, 2011, the end of the 111st Congressional session, to be passed on by the subcommittee or it will suffer the same fate as H.R. 7069. H.R. 7069 was introduced by Rep. Carolyn Maloney in the 110th Congress in 2008 proposing to establish the Census Bureau as an independent agency. The 100th Congress ended in January 2009 and H.R. 7069 along with it (H.R. 7069, 2008).

D. The Four Essential Elements of a Census

Whether conducted using a *de jure* basis or a *de facto* basis, there are four essential features of a population and housing census according to the UN (1992; 2007):

(1) individual enumeration;

(2) universality within a defined region;

(3) simultaneity; and

(4) defined periodicity.

In terms of essential feature number 1, "Individual enumeration," the UN (1992, 2007) states that separate information is collected regarding the characteristics of each individual, although information may be provided to an administrative register for other purposes. Moreover, access to administrative data for statistical purposes should be given by law and/or by agreement, so that:

(a) the data may be passed as individual records to the population register; or

(b) the registers may be temporarily linked to form a proxy population register.

"Simultaneity," the 3rd essential feature, refers to establishing a set census moment, or reference time, that is used to collect and record census data. The simultaneity feature is, of course, an ideal in that a census is subject to many factors that cause it to be conducted over a period of time (UNECE, 2006; United Nations,1992, 2007; Wilmoth, 2004). This period should be short, however, so that the reference point remains reasonable. Here is an example of this recommendation.

> "Information obtained on individuals and housing in a census should refer to a well defined and unique reference period. Ideally, data on all individuals and living quarters should be collected simultaneously. However, if data are not collected simultaneously, adjustment should be made so that the final data have the same reference period" (UNECE, 2006).

For essential feature number 4, "Universality within a defined territory," the UN (1992, 2007) states that all persons within the defined territory who meet the coverage rules are enumerated. In concept, the enumeration can be taken from a population register in which the fields for attributes are populated from subsidiary registers relating to specific topics.

Essentially, all U.S. censuses through 2000 have these four essential features. However, 2010 breaks with this tradition, especially in terms of simultaneity, because it relies upon the American Community Survey (ACS) as the substitute for the "long form." For the 2000 decennial census, each household received either a "short form" questionnaire or a "long form" questionnaire, required by law in Section 221 of Title 13, "The Census Act, 1954" (Heleen, 2000). The long form included the same six population questions and one housing question on the short form, plus 26 additional population questions and 20 additional housing questions. About 17% of households received the long form (U. S. Census Bureau, 2009a). Facing complaints regarding the ponderous length of the Census 2000 long form and low return rates due to privacy concerns, the House Subcommittee on Information Policy, Census and National Archives, chaired by Rep. Dan Miller (R-Florida) held hearings in 1998 and 2000 regarding eliminating the controversial form in time for the 2010 census (Subcommittee on the Census, 2000; 1998). As the hearings suggest, the long form was eliminated and replaced with the ACS.

The ACS is a U.S. Census Bureau product designed to provide accurate and timely demographic and economic indicators on an annual basis for both large and small geographic areas within the United States (Citro and Kalton, 2007; U. S. Census Bureau, 2004c). Operational plans called for ACS to serve not only as a substitute for the decennial census long-form, but as a means of providing annual data at the national, state, county, and subcounty levels (Cork, Cohen, and King, 2004; U. S. Census Bureau, 2001b, 2001c, 2003, 2007, 2009b). Like the long form before it, The Census Act, 13

U.S.C.§ 221 (2010) requires respondents to answer all questions to the best of their ability.

In addition to being highly ambitious, this approach represents a major change in how data are collected and interpreted (Citro and Kalton, 2007; Cork and Voss, 2006; Hough and Swanson, 1998, 2004, 2006; U.S. Census Bureau, 2009). Two of the major questions facing the ACS are its functionality and usability (Citro and Kalton, 2007), but an as yet unanswered question is how does one integrate ACS data, which, depending on the population of the area in question, are cumulated over one year for areas with a population of 65,000 or more), three years for areas with a population of between 20,000 and 65,000 and five years for areas with a population of less than 20,000), respectively (Cork and Voss, 2006; Swanson, 2010; U.S. Census Bureau, 2004c; U.S. GAO, 2004). Hough and Swanson (2010) find that the ACS does not do a good job of generating "Persons Per Household," a key demographic variable used by the Census Bureau to estimate populations in non-census years.

To summarize, trying to integrate the ACS into the decennial census means that one is attempting to link to the census, data collected in a series of temporal ranges of one, three and five years, in which the population is the cumulative assembly of "de facto" people; those actually living in households or group quarters within a given area for at least two months over the particular time period in question, which in turn is weighted by the estimated number of 'de jure' people, by age, race, sex, and Hispanic origin, found in each year of time range in question for the area in question, where the area is defined by its most recent boundaries relative to the temporal range and refined by a series of pre-operative and post-operative weights and other processes. The point of

this convoluted description is that achieving 'simultaneity,' one of the essential elements of a good census, is that it is a complex task with data collected by the ACS, as indicated by the UN in its discussion of a rolling census (United Nations, 2007). It is a complex task both to reconcile data within the ACS and to reconcile data between the ACS and the decennial census short form 100% count data (Swanson, 2010; U.S. GAO, 2004). We believe that the use of the ACS is not consistent with the Applied Demography Principle and at least one of the four essential features of a census, namely, simultaneity.

E. Summary: The Four Principles and Why they are Important

The *Applied Demography Principle* suggests that the census should achieve the precision and accuracy needed to make good decisions while minimizing cost rather than trying to achieve the impossible task of perfect measurement at great time consumption and cost. The *Check and Balance Principle* suggests that the census should be an "Enclosure," not a "Commons," where there are both benefits and costs to having more people. The *Separation Principle* suggests that there should be a political firewall between the Census Bureau and other elements of the federal government. Finally, the *Four Essential Features of a Census Principle* suggests that the census adhere to its historical features, especially 'simultaneity, which means that it should be a "snapshot" of the U.S. at a specific point in time.

The *Applied Demography Principle* is linked to the *Check and Balance Principle* largely through the idea of keeping costs under control. If the census provides both benefits and costs to having more people, then there is less pressure to achieve a perfect measurement, which means methodological "adjustment" fixes and the associated

litigation will be kept to a minimum. It also is linked to the *Separation Principle* via costs. If there is less political pressure to pursue actions that lead to litigation, then costs will tend to be lower. The *Applied Demography Principle* also is linked to the *Four Essential Features of Census Principle*, especially the Simultaneity Feature via cost containment. If the census is comprised only of 'simultaneous' data rather than a mixture of data collected at a fixed point in time and data collected over intervals that in some cases will be as long as five years, then costs also are contained.

III. CEMAF

A. Privacy and Confidentiality Concerns

Virtually all users desire accurate, timely and accessible data, with cost-effectiveness often, but not always, being an issue (Swanson, Burch, and Tedrow, 1996). Many tend to use aggregated data (Clark, 1986; Coale and Demeny, 1966; Dharmalingam, 2004; Li and Tuljapurkar, 2005; Pollard, 1973; Rogers, 1995; Rogers, Hummer, and Nam, 2000; Stockwell, Goza, and Balistreri, 2005; Suchindran, 2004; Treyz, Rickman, Hunt, and Greenwood, 1993). However, some users, particularly academic researchers, would prefer to use microdata. This is because many of these basic researchers are interested in hypotheses concerning individuals (Brandon and Hogan, 2004; Livingston, 2006; Mutchler and Baker, 2004; Ryan, Manlove, and Hofferth, 2006) and in using aggregated data to addresses their hypotheses about individuals, they have to deal with problems such as aggregation bias and the ecological fallacy (Freedman, 2004; and King, Rosen, and Tanner, 2005). Because microlevel data can be aggregated and aggregated data are not generally amenable to being disaggregated, what we believe is needed by all users is

a data system that provides current and historical sets of sub-county estimates of populations and their characteristics that can be rolled up to all higher administrative and statistical geographies for a given vintage to produce a "one number" hierarchy. It should be consistent not only with data both from decennial census counts and sample surveys done by the Census Bureau, but also with the principles underlying the Bureau's estimates program (U.S. Census Bureau, no date, reproduced in the Appendix). Further, the ideal foundation of these estimates would, we believe, be comprised of individual data on persons that are linked to households and other living arrangements in specific locations. What we have just described, of course, is something that does not exist for the United States – a national population register, a system that contains microlevel data that can be rolled up and linked both across time and with other data, such as the case found in Finland (Statistics Finland, 2004).

We do not believe that there are many who would argue against the utility of a national population file. We believe that this observation applies not only to researchers, but also to users in general. The issue here, of course, is that "utility" is not the over-riding factor. American traditions and values are not in favor of such a system, given concerns about government intrusion into privacy (El-Badry and Swanson, 2007; Habermann, 2006; Seltzer and Anderson, 2000; Siefert and Reylea, 2004).

In fact, Americans voiced their concerns about the government's intrusion into their privacy in the very first census in 1790 (Bohme and Pemberton, 1991). By 1850, census returns were no longer posted publically. The Secretary of the Interior, who had responsibility for the census, explained:

> "Information has been received at this office that in some cases unnecessary exposure has been made by the assistant marshals with reference to the business

> and pursuits, and other facts relating to individuals, merely to gratify curiosity, . . . No individual employed under sanction of the Government to obtain these facts has the right to promulgate or expose them without authority" (Bohme and Pemberton, 1991).

Twenty years later, public outcry over the census questions which asked whether they were paupers or convicts caused the Census Bureau to drop the questions in 1870 (Bohme and Pemberton, 1991). Privacy, that is, the freedom to give or withhold information**,** and confidentiality, the government's obligations once it possesses the data, have been the most frequently raised concerns in the Twentieth Century with regard to the census. One example occurred in 1940 when the public objected to census questions about personal wages and income. (Bohme and Pemberton, 1991).

Privacy concerns and the public and private need for census information met head on in 1954 when Title 13, the Census Act, was passed which made responses to all census questionnaires mandatory. Title 13 U.S.C. § 221, ch.7 states:

> "Whoever, being over eighteen years of age, refuses or willfully neglects, when requested by the Secretary. . . to answer, to the best of his knowledge, any of the questions . . . in connection with any census, shall be fined".

Title 18 U.S.C. § 3571 and § 3559 provides that anyone over 18 years old who refuses or willfully neglects to answer questions posed by census takers of a fine of not more than $5,000.

In the 1960's various congress members proposed legislation to address the privacy issues by limiting the mandatory questions to name, and address, age, relationship to the head of household, sex, marital status and visitors in the home at the time of the census (Bohme and Pemberton, 1991). The 1970's saw a shift in focus from the public's concern with answering intrusive questions on the census to what the government should be allowed to disseminate of the private information it was collecting—confidentiality

issues (Bohme and Pemberton, 1991). Finally, Congress passed the Privacy Act, 5 U.S.C. §552a (1974) which limited what personal information could be collected by federal agencies and under what circumstances personal information could be disseminated to other agencies and third parties.

The purpose of the Privacy Act was "to assure that personal information about individuals collected by Federal agencies is limited to that which is legally authorized and necessary and is maintained in a manner which precludes unwarranted intrusion upon individual privacy"(Office of Management and Budget, 1975). 5 U.S.C. §552a(b) prohibited federal agencies from disclosing without the consent of the individual:

> "No agency shall disclose any record which is contained in a system of records by any means of communication to any person, or to another agency, except pursuant to a written request by, or with the prior written consent of, the individual to whom the record applies."

However, the Privacy Act at §552a(b)(1) through (12) did provide for 12 exemptions from the "no disclosure without consent rule"; 11 of them permissive exemptions and one mandatory exemption for the requirements under the Freedom of Information Act (U.S. Dept of Justice, 2010). Two exemptions at §552a(b)(4) and (5) important for the Bureau of Census and CEMAF are:

- "to the Bureau of the Census for purposes of planning or carrying out a census or survey or related activity pursuant to the provisions of Title 13."
- "to the recipient who has provided the agency with advance adequate written assurance that the record will be used solely as a statistical research or reporting record, and the record is to be transferred in a form that is not individually identifiable."

Privacy and confidentiality continued to be a concern for the 1990 and 2000 census. In fact, the decline in the 1990 decennial census response rate compared to 1980 was

attributed partly to privacy issues (Gatewood, 2001: 46). Responding to the decline in response rates, the Census Bureau conducted four public opinion surveys to get a handle on the public's concern regarding privacy (Gatewood, 2001: 46). The surveys addressed three topics: trends in privacy attitudes; the effect of the census information environment on beliefs, attitudes, and privacy concerns, and the relationship between privacy attitudes and response behavior (Gatewood, 2001: 46).

> " Results related to trends in privacy concerns showed small, yet statistically significant, increases between 1995 and 2000 in the percentage who were very worried about their personal privacy and the loss of control over personnel information" (Gatewood, 2001: 47).

We see that public concerns over privacy and confidentiality issues over the decennial census started with the first census and have continued to modern times. If we factor in the definition of privacy given by U.S. Supreme Court Justice Louis Brandeis as "the right to be left alone" the Census Bureau steps over the line with regard to personal privacy every time a household receives a census form (Prevost and Leggieri, 1999:.8). As we pointed out previously, Americans value their privacy and government intrusion into their privacy is not easily accepted, even when the intrusion is once a decade, as is the case with the decennial census. It would be difficult to overcome these hurdles to launch a national population register.

From a legal standpoint, however, a hybrid approach, like the national housing register we propose here with the Census Enhanced Master Address File, (CEMAF) may be possible.

The U.S. Constitution, art. I. §2. cl. 3, gives Congress the authority to conduct the decennial census. in "such manner as they shall by Law direct." Congress in turn delegated this authority to the Secretary of Commerce in The Census Act, Title 13, § 5:

> "The Secretary shall prepare questionnaires, and shall determine the inquiries, and the number, form . . .of the census "

While Title 13, does not dictate what questions can or must be included in the decennial census, it does require the Secretary in 13 U.S.C. § 141(2)(f)(1) and (2) to notify Congress of general census subjects to be addressed three years before the decennial census and the actual questions to be asked two years before the decennial census. In other words, there is congressional monitoring from the public's elected representatives as to what questions are asked in the census; how much the government can intrude into its citizens privacy.

Nonetheless, the questions on the census and what the Census Bureau does with the information have been litigated. In 1901, United States v. Moriarity, 106 F. 886, 891 (S.D.N.Y.1901) the court found that the census is not limited to a headcount of the population and "does not prohibit the gathering of other statistics, if necessary and proper" (United States v. Moriarty, 1991). In 2000, the issue as to whether or not the questions on the census short or long form violate a citizens rights to privacy was addressed in Morales v. Daley, 116 F. Supp.2d 801, 820, (S.D. Tex 2000), *aff'd,* 275 F.3d 45 (5th Cir. 2001), *cert. denied,* 534 U.S. 1135(2002).

The plaintiffs in Morales claimed that the questions on the 2000 Census violated their rights under the First, Fourth and Fourteenth Amendments. Four plaintiffs had received the "short form" with eight questions and one received the long form with some 53 questions. The court addressed each question on each form separately and the constitutional violations claimed by the plaintiffs. The court dismissed each claim finding that no question on either form violated their constitutional rights whether the question concerned the number of people living in their housing, their relationship to

each other, whether they rented or owned, their mortgage, race, sex, age, place and date of birth, citizenship, modes of transportation, job or layoff information and income.

> ". . .[I]t is clear that the degree to which these questions intrude upon an individual's privacy is limited, given the methods used to collect the census data and the statutory assurance that the answers….will remain confidential. The degree to which the information is needed for the promotion of legitimate governmental interest has been found to be significant" (Morales v. Daley, 2000).

While a national population register may indeed be a hard sell to the American public, the Constitution gives Congress the authority to establish by law the form and the method the census can take. Given the significant legitimate governmental interest in the census information, it is not a stretch to imagine Congress establishing by statute a national housing register, the CEMAF for example, to collect the same data, provided, of course, that the method does not violate the American citizens' constitutional rights to privacy. The reason is that the Master Address File (MAF) is a file that could, with some enhancements, yield such information when coupled with the Bureau's record matching, extant data collection, and other capabilities. It is to this subject - the CEMAF - we now turn.

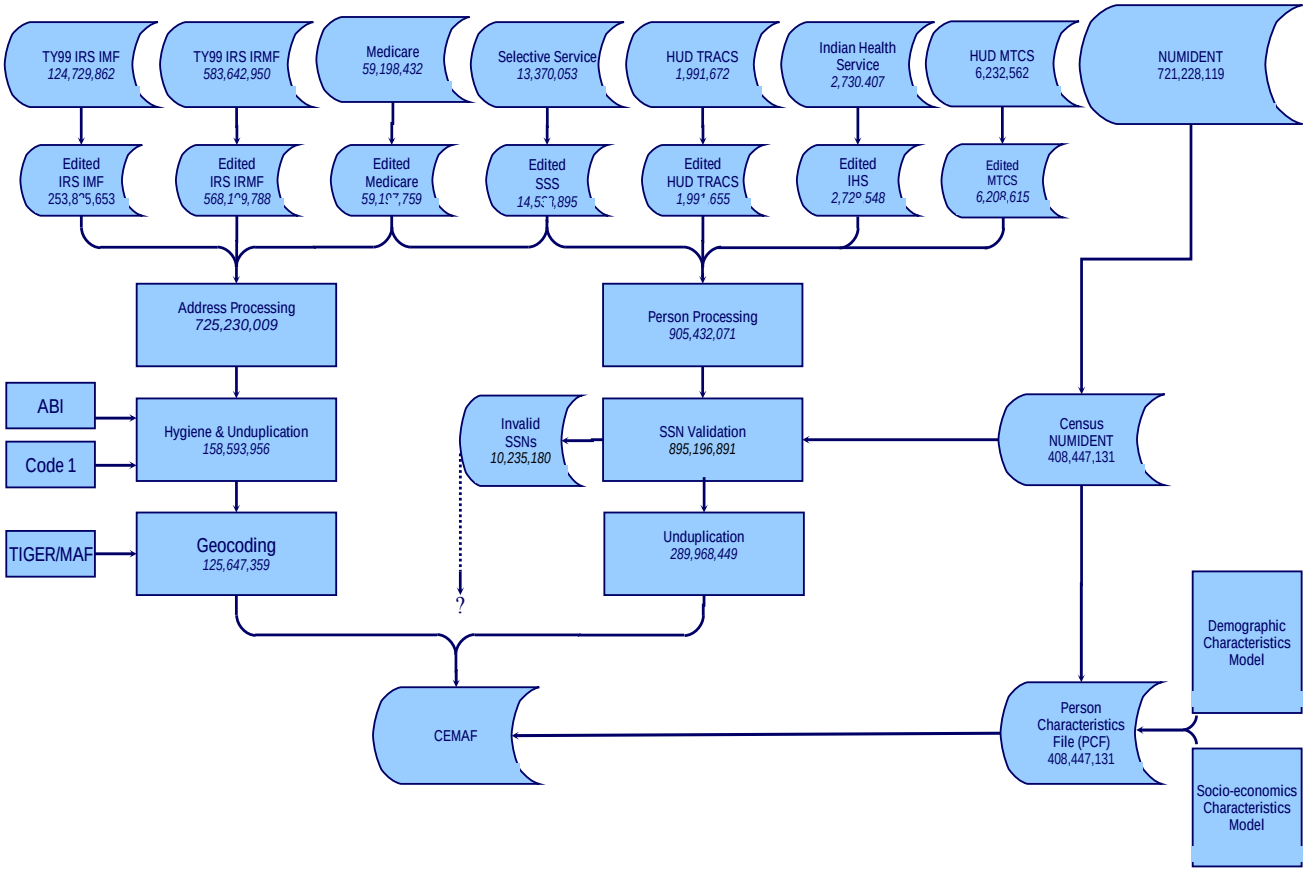
B. CEMAF: The Process

We believe that the Census Enhanced Master Address File – CEMAF - would contribute toward having not only population estimates that are timely, comprehensive, and internally consistent, but also estimates of housing, as well as demographic and socio-economic characteristics for the U. S. as a whole and its sub-areas. However, before we offer our suggestion regarding the enhancement of the MAF and its potential for meeting the needs of researchers and other users, it is important to acknowledge that

others have thought along similar lines. Here, we are thinking primarily of research into the development of an "administrative records census," which has been going on (and off) for at least 20 years (Alvey and Scheuren, 1982; Kliss and Alvey, 1984, Scheuren, 1999). Initially, much of this work was done within the U.S. Internal Revenue Service, but this broadened to include other agencies, including the Census Bureau (Prevost, 1996, 1999; Prevost and Leggieri, 1999; Judson, 2000, 2003; Judson and Bauder, 2002). Research and other activities in the U. S. related to administrative records censuses have also been commented on by researchers outside of the country (Redfern, 1986). However, it is still the case that the U.S. Census Bureau had not attempted to conduct a full-blown administrative records census (Bryan 2004a, Bryan 2004b, Bryan and Heuser 2004).

We also again acknowledge that our suggestion, although stemming directly from Swanson and McKibben (2010), goes back to a proposal by Wang (1999) for greater recognition of the utility of the MAF in regard to population estimates. Wang provided specific suggestions on how to overcome the problems associated with maintaining and updating the MAF such that the data were of high quality, including the development of an active federal-state-local program (similar to the one used for vital statistics) to update the MAF. Wang's (1999) suggestions, along with the ideas underlying an administrative records census provided by Judson (2003), led directly to the idea of viewing the MAF as the basis for developing EMAF, which is a housing unit register with population information (Swanson and McKibben, 2010). In turn, EMAF leads to CEMAF.

Exhibit 1. Schematic View of Technical aspects of CEMAF*



Terms used in Exhibit 1
CEMAF: Census Enhanced Master Address File
MAF/TIGER: Master Address File/Topologically Integrated Geographic Encoding and Reference System
IRS IMF: Individual Master 1040 File from the US Internal Revenue Service
IRS IRMF; IRS Information Returns Master File
HUD TRACS: Tenant Rental Assistance file from the Department of Housing and Urban Development (HUD)
HUD MTCS: HUD's Tenant Rental Assistance Certification System
NUMIDENT: the Social Security Administration's "Numerical Identification System" file, which contains the name of the applicant, place and date of birth, & other information since the first social security cards were issued in 1936
SSN: Social Security Number
Indian Health Service: Indian Health Service patient file
Medicare: Medicare enrollment database.
Selective Service: Selective Service (Military) Registration File
*Adapted from Judson (2003).

Exhibit 1 provides an overview of how CEMAF might be developed and maintained. It is designed to serve as a concedptual roadmap rather than a work plan.

As can be seen at the lower far left of Exhibit 1, the MAF/TIGER file is an input into CEMAF that goes through a geocoding process. Inputs into the MAP/TIGER geocoding process include processed ("Address Processing" in Exhibit 1), as well as edited and unduplicated addresses ("Editing and Unduplication" in Exhibit 1) that originate from the following sources:

- IRS individual Master 1040 File ("IRS IMF" in Exhibit 1);
- IRS Information Returns Master File ("IRS IRMF" in Exhibit 1);
- Medicare enrollment database ("Medicare" in Exhibit 1);
- Selective Service File ("Selective Service" in Exhibit 1);
- Tenant Rental Assistance file from the Department of Housing and Urban Development ("HUD TRACS" in Exhibit 1);
- Indian Health Service patient file ("Indian Health Service" in Exhibit 1); and
- HUD's Tenant Rental Assistance Certification System ("HUD MTCS" in Exhibit 1).

These same files also feed "Person Processing," where after being processed they are fed into "SSN Validation" as shown in Exhibit 1 and matched with the Census Bureau's extract ("Census NUMIDENT" in Exhibit 1) from the Social Security Administration's "Numerical Identification System" file ("Social Security NUMIDENT" in Exhibit 1), which contains the name of the applicant, place and date of birth, and other

information since the first social security cards were issued in 1936. The valid "Matched Person-Numident" records are then unduplicated (Unduplication) and, as indicated at the lower center of Exhibit 1, merged with the address records and enter CEMAF. The records that fail the validation processing of the "Person-Numident" merger, enter into a file that requires further processing ("Invalid SSNs" in Exhibit 1) with the idea that additional work would yield additional valid data to be merged with the address records so that they could enter CEMAF. The Census Bureau's NUMIDENT file also feeds into a Persons Characteristics File ("PCF" in Exhibit 1) that itself is informed by Census Bureau data sources, including the decennial census, the ACS, and modeling, which taken altogether represent the "Demographic Characteristics Model" and the "Socio-economic Characteristics Model" data files, as shown in Exhibit 1. While the merged "Person-Address-Numinent" file would be powerful, it needs information from the PCF so that the potential of CEMAF is fully realized. There are significant technical challenges facing not only the development of a functional PCF, but also its merger with the Person-Address-Numinent file.

Initial data from the "Demographic Characteristics Model" could be provided directly by Census 2000 short form data while the "Socio-economic Characteristics Model" data could be provided by a combination of Census 2000 long form data and imputation/modeling/ methods so that they are characteristics assigned to the short form records. In turn, they would be informed by the Census Numident Records, which would result in the PCF. From the PCF they would, in turn, inform the "Person-Address-Numident" so that individual and household/group quarters characteristics be assigned to individual addresses in the MAF.

It is worthwhile to note here that imputation modeling used by the Census Bureau today has been found to neither violate the Census Act as it reads today nor the U.S. Constitution's requirement of an "actual Enumeration" of the population. The issue was considered by the Supreme Court in Utah v. Evans, 536 U.S. 452 (2002). The Bureau, the court noted in *Utah*, derives most census information from what is, in effect, a nationwide list of addresses. If no one replies to a particular census form or the information is confusing, contradictory, or incomplete, the Census Bureau follows up with visits by its field personnel. If, despite the visits, the Bureau still cannot resolve the problems, it may then use "imputation" (Kalton, 1983) by which it infers that the address or unit about which it is uncertain has the same population characteristics as those of its geographically closest neighbor living in the same type of dwelling; i.e. an apartment or single family residence (Utah v. Evans, 2002). This is called "hot-deck imputation" noted the court, and refers to the way in which the Census Bureau fills in gaps in its information and resolves conflicts in the data. This type of imputation, said the court was not the extrapolation of the features of a large population from a small one, but the filling in of missing data as part of an effort to count individuals one by one. The *Utah* Supreme Court held that the use of "hot-deck imputation" violates neither the Census Act nor the constitutional requirement of an "actual Enumeration" of the population (Utah v. Evans, 2002).

Returning to the discussion of how CEMAF would work, once this initial CEMAF is constructed, it can be brought forward in time on a regular basis (e. g, once each year) using the processes identified in Exhibit 1. Here, it is useful to think about the

possibility of using microsimulation methods (see, e.g., Statistics Canada, 2009) as the means to accomplish bringing the CEMAF forward in time.

The microsimulation system would yield aggregated data that could be calibrated against survey and other empirical data that are regularly collected by the Census Bureau. This means that the parameters being used in the microsimulation would be adjusted until data from the CEMAF matched (with given tolerance levels) the empirical data. The re-calibration could include direct substitution in CEMAF addresses appearing in the survey sample for a given vintage (i.e., a given year), and imputation, simulation, and related estimation methods for those CEMAF addresses in the same vintage and area that are not in the survey. Data for addresses in the "old" CEMAF version could be so identified and remain attached to each record so that measures of change could be computed for individual address and person records. Thus, CEMAF would be an address register containing a combination of collected and estimated data centered on demographic characteristics (i.e., age, sex, race, household relationships) distinguished, as appropriate, by year.

To summarize, we picture CEMAF as an integrated file that contains not only existing MAF variables (e.g., geocode, address, and structure type), but also information on the occupancy status of housing units and the people within these units and non-household living arrangements (group quarters). Demographic and socio-economic characteristics would be generated using a combination of administrative records and survey data largely in conjunction with a combination of record matching, imputation and microsimulation methods.

C. Cost

The cost of the census has increased dramatically in the twentieth century (Brown, 2010). In 1960, the census cost $523 million in nominal dollars (Gathier, 2002; Government Accountability Office, 1998a:37). By 1990, the census cost rose to $2.6 billion nominal dollars and in 2000, the census cost $6.5 billion in nominal dollars (Gathier, 2002). Yet, in spite of the significant increase in cost, the response rate continued to decline through the 1990s until 2000 when there was a slight reversal (Gatewood, 2001:46,52) The numbers are not in yet, but the projected cost for the 2010 census was estimated by the Census Bureau to be $11.3 billion as of 2006 (U.S. GAO, 2006) and $14.7 billion by the Office of the Inspector General, U.S. Department of Commerce as of February, 2010 (U.S. Department of Commerce, 2010).

The Census Bureau states that 2/3rds of the census cost will be spent enumerating the people who did not respond by mail, costing approximately $75 million to enumerate each additional percentage point of households that require follow up by a census enumerator (U.S. Census 2010, 2010). CEMAF will be able to handle the increasing housing units for the future decennial censuses without a large increase in staff. In addition, the CEMAF will eliminate most of the cost of the door-to-door visits of census takers for nonresponse follow up.

Do these increasing costs and declining response rates justify the cost to develop the CEMAF? An idea of the potential cost to develop CEMAF is found in Redfern's (1986) discussion of the cost of converting from a traditional census to an administrative records census. Similar hints are found in Hope (2010). However, once developed (or converted, as the case may be), it appears that the costs for a national housing register could be less than the system currently being used in the U.S. for developing post-censal

estimates and decennial census counts. We use here the information from Statistics Finland (2004: 26) discussed earlier in regard to the comparative costs of registries and censuses. It also is worth noting here that local officials in Finland update the country's population and housing registries (Statistics Finland, 2004: 21). Thus, we see no major cost obstacle in following Wang's (1999) suggestion that state and local governments be funded to assist in maintaining CEMAF under the general supervision of the Census Bureau. Before such a major step is taken, however, it would be wise to research the various forms this could take. El-Badry and Swanson (2007) call for research on such a recommendation in terms of public involvement in administrative oversight of the Census Bureau.

In concluding this section, we again note that we are providing a conceptual roadmap rather than a work plan in terms of constructing CEMAF. The files and processes identified in Exhibit 1, for example, are likely to look different from those identified by the Census Bureau if it embarks on the construction of CEMAF and develops a full scale work plan for this task.

The history of the Census Bureau is one of under-funding (Lowenthal, 2009). For example, The U.S. Census Bureau was confronted with a shortfall of more than $50 million in the budget proposed by the Executive Branch for its FY 2007 operations (Lowenthal, 2006). This is not a new phenomenon and much of the impetus for reduced and otherwise tight budgets comes from the high costs of collecting data. In this regard, we believe that a decennial census such as we describe would reduce costs. For example, Statistics Finland (2004: 26) reports that it was pressured by the Ministry of Finance to move to a register-based system because of the recurring high costs associated with

taking a census. After it made the change following its 1980 census, Statistics Finland (2004: 26) reports that in terms of 2003 euro, the cost of its 2000 register-based census was less than one million euro while the traditional 1980 census costs were approximately 35 million euro. This evidence strongly suggests that CEMAF would assist the U.S. Census Bureau in containing costs.

We also note that another benefit of CEMAF is that it could largely negate and eliminate the need for many of the traditional demographic methods of population estimation and possibly reduce the number of sample surveys. The demographic methods largely use aggregate data and include the Housing Unit Method, regression methods, and component methods. Depending on how it is configured, CEMAF might also reduce the need for at least some of the sample surveys being done. As can be implied from the discussion of how CEMAF might be developed, there would likely be a need for accurate, efficient, and cost-effective record matching methods, as well as imputation and microsimulation methods. Of course, in addition to the benefit of reducing the number of methods needed to produce population estimates, there is the cost of migrating to new methods. These costs include acquiring new equipment, building new data files, creating new administrative, regulatory, and legal arrangements, and developing and extending new forms of technical expertise.

We believe that CEMAF would not only reduce costs in the long run, but also contribute toward having more timely, comprehensive, and internally consistent demographic, housing, and socio-economic data for the U. S. as a whole and its sub-areas. In regard to geography, we note that register-based-data are extremely flexible in that they can be geocoded to a specific location (as opposed to being assigned to an area

defined by administrative or statistical boundaries). This also means that EMAF can be overlaid with other features using GIS capabilities. The TIGER street address file comes immediately to mind in this regard. This would lead to an entirely new way of looking at the concept of a small area, in that boundaries could be drawn that are much finer than those allowed by the census defined block and more precise that than those allowed by the zip code tabulation area. This would allow much higher precision in defining areas for purposes of marketing and site location. Once up and running, this would also allow for greater ease in producing a consistent time series for areas in which administrative boundaries changed over time (e.g., school attendance zones).

When considering the ideas of Swanson and McKibben (2010) in the context of the decennial census, keep in mind the volume of records collected that could be used for purposes of "counting" the population, such as social security, Medicare, IRS tax returns, and so forth and the constitutional issues that are raised if the US moves away from "traditional enumeration" to the use of administrative records in combination with estimation methods as The Netherlands has been forced to do.

IV. Constitutional and Legal Issues Facing CEMAF

A. What is an “actual Enumeration”?

The Census Enhanced Master Address File method for conducting the census would use administrative records like federal income tax returns as one of its sources for

information. It would be an extremely useful source if income tax returns were mandatory regardless of income level. Using federal income tax returns to count the population for the census raises two questions: (1) can the government require federal income tax returns be filed regardless of income level? and (2) would the use of federal income tax returns to conduct the census be an "actual Enumeration" of the population as required by the U.S. Constitution? We address question 2 first.

Article 1 §2 of the Constitution states:

> "Representatives and direct taxes shall be apportioned among the several States which may be included within this union, according to their respective Numbers. The actual Enumeration shall be made within three years after the first meeting of the Congress of the United States, and within every subsequent term of ten years, in such manner as they shall by law direct."

The question as to what "actual Enumeration" means has been litigated in federal courts all the way to the Supreme Court. Does "actual Enumeration" mean that a physical head count of every person must be taken every ten years? If a physical head count isn't required, is the Census Bureau present method of mailout-mailback" forms, which allow the population to self enumerate, constitutional?

In 1999, the U.S. Supreme Court in Department of Commerce v. U.S. House of Representatives, 525 U.S. 316 (1999) looked at the question as what an "actual Enumeration" means. The Census Bureau wanted to use statistical sampling as one of its "Manners" of "actual Enumeration". The Supreme Court in *Department of Commerce* never reached the constitutional question as to whether statistical sampling is an "actual Enumeration" permitted by the Constitution because the court found that statistical sampling violated the Census Act. Why the Supreme Court came to this decision makes

a case for the use of administrative records like ~~mandatory~~ federal income tax returns as well as imputation and microsimulation methods to conduct the census.

Justice O'Connor delivered the opinion of the court. She noted that Congress used the authority given it in art. I. §1 to §2 to direct an "actual Enumeration" to enact the Census Act in 1954, 13 U.S.C. § 1 -402 (Department of Commerce v. U.S. House of Representatives, 1999). Congress, in the Census Act, delegated its authority to the Secretary of Commerce. In 1998, the Secretary through the Census Bureau, a part of the Department of Commerce, announced a plan to use statistical sampling in the 2000 decennial census to address a chronic and apparently growing problem of "undercounting" of minorities, children, and renters (Department of Commerce v. U.S. House of Representatives, 1999). The plaintiffs sued the Secretary arguing that statistical sampling was not an "actual Enumeration" of the population as directed by art. I. §2 and also challenging the legality of statistical sampling under Title 13 of the Census Act.

The Supreme Court held that amendments to the Census Act did not permit statistical sampling for purposes of apportionment. The Court also held that the amendments to the Census Act *required* the Secretary to use statistical sampling "in assembling the myriad demographic data that are collected in connection with the decennial census (Department of Commerce v. U.S. House of Representatives, 1999). Justice Stevens, dissenting, stated, on the contrary the 1976 amendments to Title 13 commanded the Secretary to use statistical sampling with two limitations: he need not do so for apportionment purposes and he need not do so if he considers it feasible. In other words, Justice Stevens disagreed that the Census Act prohibited the use of statistical sampling for determining the population for apportionment purposes. While Justice

Steven's opinion was not the Supreme Court's ruling with regard to the Census Act, he discusses the plaintiffs complaint that the use of statistical sampling violates the Constitution because it is not an "actual Enumeration" as required by art.I §2. Justice Stevens referred to the Supreme Court's 1992 decision *in* Franklin v. Massachusetts, 505 U.S. 788,804 (1992). In *Franklin*, he states, the Court held that the census is intended to serve "the constitutional goal of equal representation." That goal, he said, is best served by the use of a "Manner" to conduct an "actual Enumeration" that is most likely to be complete and accurate.

> "As we repeatedly emphasized in our recent decision in Wisconsin v. City of New York, 217 U.S. 1,3 (1996), our construction of that authorization must respect "the wide discretion bestowed by the Constitution upon Congress. Methodological improvements have been employed to ease the administrative burden of the census and increase the accuracy of the data collected. The 'mailout-mailback procedure now considered a traditional method of enumeration was itself an innovation of the 1970 census" (U.S. Department of Commerce v. U.S. House of Representatives, 525 U.S. 316, 364 (1999)).

Congress has permitted the Census Bureau to make these improvements to the methodology it uses to conduct the census; in its "Manner" of "actual Enumeration" because of changes it has made to Title 13 since it was first enacted in 1954. For example, in 1964, Congress chose to amend The Census Act to stop the impossible, expensive and time consuming method of requiring census enumerators to visit each household personally. Prior to 1964, the Census Acts of 1810 through 1954 required enumerators to "visit personally each dwelling house in his subdivisions" in order to obtain "every item of information and all particulars required for any census or survey conducted in connection with the census (Utah v. Evans, 2002). In 1964, Congress repealed § 25(c) of Title 13 removing the requirement that enumerators visit each dwelling personally which allowed the Bureau to mail out a form and have it completed

and mailed back by each household. This new "mailout-mailback" system was used for the first time in 1970 (Gathier, 2002; Tauber and Hansen, 1966; Department of Commerce v. U.S. House of Representatives, 1999; U.S. Census Bureau, 1976). "Requiring a face-to-face headcount would yield absurd results," said Justice Stevens, in *Department of Commerce* giving the example that enumerators unable to gain entry to a large and clearly occupied apartment complex would be required to note zero occupants. It was for this reason, he stated, that the 1970 census introduced the Postal Vacancy Check, a form of sampling not challenged in *Department of Commerce* which uses sample households to impute population figures that have been designated vacant but appear to be occupied (Department of Commerce v. U.S. House of Representatives, 1999).

Three years later, in Utah v. Evans, 526 U.S. 425 (2002) the Supreme Court was asked again to look at whether an alleged statistical sampling method called "hot deck imputation" used by the Bureau in 2000 for apportionment violated 13 U.S. C. §195. And once again, the question was before the Court as to whether this method was inconsistent with the Constitution's statement that an "actual Enumeration" be made. As discussed, the court found that the imputation method was not statistical sampling and did not violate either the Census Act or the Constitution.

To underline our position that the use of administrative records and specifically the use of federal income tax returns may well pass not only the Census Act test by the Supreme Court, but also the Constitution test, the *Utah* decision presents some compelling support. The State of Utah had sued because the imputation method had resulted in North Carolina's population being increased by .4% while increasing Utah's by only .2%. (Utah v. Evans, 2002). As a result, North Carolina received one more Representative and Utah received one less. In *Utah*, the State's

position was that "actual Enumeration" required the Bureau to seek out each individual, which prohibits the use of imputation. The Supreme Court did not agree. "The Constitution's text does not make the distinction that Utah seeks to draw. Rather, it uses a general word, 'enumeration' that refers to a counting process without describing the count's methodological details (Utah v. Evans, 2002). In fact, the Supreme Court noted that the word "actual" refers to the enumeration method the Founding Fathers wanted used for apportioning the Third Congress of the new United States. This "actual Enumeration" of the Third Congress was in contrast to the conjecture used to apportion for the First and Second Congresses of the new United States. The Founding Fathers figured that by the Third Congress, the nation would have had been able to organize an actual physical headcount of the population and not have to rely on estimation. The court held that the rest of the Enumeration Clause, "shall take place in such Manner as Congress itself shall be Law direct", suggests the breadth of Congress's authority to decide the method used, rather than its limitation, referencing their decision in *Wisconsin* (*Utah v. Evans*, 2002). The Court also noted that Congress enacted legislation to support the Census Bureau's interpretation that imputation was permissible in the Census Address Improvement Act of 1994 underlining our position that Congress, as necessary, can amend Title 13 to accommodate the use of CEMAF as a census method.

Utah v. Evans opened the door for constitutional arguments to support census methods like CEMAF. The Supreme Court stated that the decisions by the Founding Fathers in Article I, to use population rather than wealth for apportionment, to tie taxes and representation together, to insist on periodic recounts and to take from the States the power to determine the methods to be used for the Enumeration "all suggest a strong constitutional interest in accuracy. In fact, the court stated the interest in accuracy here favors the Bureau, which uses imputation as a last resort after other methods have

failed"(Utah v. Evans, 2002). The Supreme Court in *Utah* stated it wasn't going to try to foresee the methodological limits in the Census Clause but did narrow its decision to say that in the case before it, "[w]here all efforts have been made to reach every household, where the methods used consist not of statistical sampling but of inference, where that inference involves a tiny percent of the population, where the alternative is to make a far less accurate assessment of the population, and where consequently manipulation of the method is highly unlikely, those limits are not exceeded".

In fact, the decennial census has never been a face-to-face count of inhabitants (Cantwell et al., 2005). It has used a variety of sources. The very first census relied on information provided by members of the household rather than an enumerator's direct observation. All the decennial census have used the head of household as the primary respondent to census forms. If the head of household could not be found, enumerators used information from proxies like neighbors, landlords or postal workers. The CEMAF as a census method is a proxy count.

B. Can Congress Require Federal Tax Returns Regardless of Income?

We know from the discussion above that the Supreme Court has ruled that Congress has broad authority to conduct an "actual Enumeration" in a "Manner" that it chooses. Could it choose to conduct the decennial census by using federal income tax returns to not only report income but also as the decennial census questionnaire? In this case, filing a return would have to be mandatory regardless of income level. What are the obstacles to

requiring citizens, permanent residents and temporary workers to file a mandatory income tax return so it could be used for the decennial census?

There have been so many attempts by the public to challenge the right of the federal government to require federal income tax returns and tax the people that the IRS responded to the most common arguments in January 2010 in an 83 page document posted on its website called "The Truth About Frivolous Tax Arguments"(Internal Revenue Service, 2010).

The legal challenges have been on both constitutional and statutory grounds and been heard by federal courts all the way to the top. The arguments concern not only whether it is unconstitutional for the federal government to collect tax but also whether the federal government can make the filing of an income tax return mandatory. If an income tax return is made mandatory because it is to be used not only to tax individuals but also to count them for census purposes, problems arise. What about individuals who do not want to declare income gained illegally? If they have to file an income tax return and put down a false amount, is their Fifth Amendment right against self incrimination been violated? What about illegal immigrants? Can they be prosecuted if they file a federal income tax return and are using a bogus social security number?

1. Fifth Amendment Challenges

Individuals who refuse to file an income tax return argue that to file an income tax return calling for information that could lead to a conviction for criminal acts from which the income was derived, or for the crime of not paying the tax itself violates the Fifth Amendment right against self incrimination In 1989, John Cheek, an American Airlines pilot appealed his conviction of three counts of tax evasion, one count of false

claims against the government for income tax withheld, and six counts of willful failure to file individual tax returns. The 7th Circuit in U.S. v. Cheek, 882 F.2d 1263, 1968 n.2 (7th Cir. 1989) confirmed his convictions on the willful failure to file individual income tax returns stating, "[F]or the record, we note that the following beliefs, which are stock arguments of the tax protestor movement, have not been, nor ever will be considered objectively reasonable in this circuit." The court listed several constitutional arguments put forth by the defendant which it rejected including the belief that the 16th Amendment was improperly ratified and unconstitutional and that the tax laws violate the privilege against self-incrimination in the 5th Amendment. The case was later vacated and remanded back to the Circuit Court by the Supreme Court for erroneous jury instructions. His convictions were confirmed in U.S. v. Cheek, 3 F.3d 1057 (7th Cir. 1993). Sixty some years earlier, in 1927, Justice Oliver Wendell Holmes on the Supreme Court responded to a similar 5th Amendment argument. In United States v. Sullivan 274,263 U.S. 259 (1927). The defendant claimed he was exonerated from filing a return because he did not meet the gross income requirements since part of his income had come from business in violation of the National Prohibition Act. The lower Circuit Court of Appeals held that gains from illicit traffic in liquor were subject to the income tax but that the Fifth Amendment prohibition against self incrimination protected the defendant from the requirement of a return. Justice Holmes disagreed, holding that the defendant's gains were subject to tax under The Revenue Act of 1921, § 213(a) which states that gross income includes gains, profits and income derived from any source whatever - including illegal ones.

> "As the defendant's income was taxed, the statute, of course, required a return. In the decision that this was contrary to the Constitution we are of opinion that the

> protection of the Fifth Amendment was pressed too far. If the form of return provided called for answers that defendant was privileged from making he could have raised the objection in the return, but could not on that account refuse to make any return at all. . . . It would be an extreme if not an extravagant application of the Fifth Amendment to say that it authorized a man to refuse to state the amount of his income because it had been made in crime".

Would the Fifth Amendment argument against filing a federal income tax return hold if Congress made an income tax return mandatory regardless of income for census purposes? The Supreme Court looked at the question of compelled disclosure which may have an incriminating potential in California v. Byers, 402 U.S. 424,427,439 (1971) when Mr. Byers appealed his indictment for failing to stop and furnish his name and address after involvement in an automobile accident on the grounds that compliance would have violated his privilege against self incrimination. "Just as there is no constitutional right to refuse to file an income return, there is no constitutional right to flee the scene of an accident to avoid any possible legal involvement," said the Supreme Court:

> "Whenever the Court is confronted with the question of a compelled disclosure that has an incriminating potential, the judicial scrutiny is invariably a close one. Tension between the State's demand for disclosures and the protection of the right against self incrimination is likely to give rise to serious questions. Inevitably, these must be resolved in terms of balancing the public need, on the one hand, and the individual claim to constitutional protections, on the other; neither can be treated lightly. An organized society imposes many burdens on its constituents. It commands the filing of tax returns for income; it requires producers and distributors of consumer goods to file informational reports on the manufacturing process and the content of products, on the wage, hours and working conditions of employees. Those who borrow money on the public market or issue securities for sale to the public must file various information reports; industries must report periodically the volume and content of pollutants discharged into our waters and atmosphere. Comparable examples are legion. In each of these situations, there is some possibility of prosecution---often a very real one—for criminal offenses disclosed by or deriving from the information that the law compels a person to supply. Information revealed by these reports could well be "a link in the chain" of evidence leading to prosecution and conviction. But, under our holdings, the mere possibility of incrimination is insufficient to defeat the strong policies in

> favor of a disclosure called for by statutes like the one challenged here" (California v. Byers, 1971*)*.

The resolution for the possibility of prosecution for disclosures on mandatory federal income tax returns used for census purposes is discussed in *Byers*. The Court took the position that the state objective in the reporting requirement and the constitutional values protected by the Fifth Amendment could be accommodated by imposing a restriction on prosecutorial use of the disclosed information and its fruits (California v. Byers, *1971*). In fact, this is exactly what § 9 and §214 of Title 13 in the Census Act does. These sections mandate that the census information can only be used for statistical purposes. It states that information is immune from legal process and shall not without the consent of the individual be admitted as evidence, or used for any purpose in any action suit, or other judicial or administrative proceeding. For example, people cannot be deported based on information gathered in the census.

2. Statutory Challenges

What are some of the current laws that may hinder the initiation of mandatory filing of a federal income tax form for census purposes? The Internal Revenue Code, 26 U.S.C. § 6012 requires every individual to file returns with respect to income taxes under subtitle A. Defendant Kenneth M. Tedder argued to the 10th Circuit in 1986 in United States v. Tedder, 787 F.2d 540, 542 (1986) that the Privacy Act, which the IRS prints on its tax forms are part of an IRS scheme to defraud taxpayers into paying taxes they are not otherwise obligated to pay (United States v. Tedder, 1986) The 10th Circuit disagreed stating "[t]his argument is without merit as its premise---that the tax system is

somehow "voluntary" is incorrect. Persons who meet the requisite statutory definition are required to pay income taxes" (United States v. Tedder, 1986).

The Supreme Court has made it clear that individuals who meet a certain income level are required by law, The Internal Revenue Code, to file tax returns. The Internal Revenue Code can be amended by Congress to require all individuals, regardless of income level, to file income tax returns for census purposes. For those individuals with no tax liabilities, a special informational return for census purposes could be required.

As far as the 5th Amendment protection against self incrimination is concerned, The Census Act provides that individuals disclosing self-incriminating information for *census* purposes are immune from prosecution and legal processes. The Confidential Information Protection and Statistical Efficiency Act of 2002, 44 U.S.C.§3501 note (2002), in §512 prohibits any information acquired for exclusively statistical purposes to be disclosed by an agency in identifiable form, for any use other than exclusively statistical purposes without the consent of the individual. As discussed previously, The Privacy Act of 1974, 5 U.S.C. §552a (1974) prohibits the disclosure of information absent the written consent of the individual unless the disclosure falls under one of 12 statutory exceptions. One of those exceptions is that records can be disclosed for statistical purposes to the Census Bureau. In other words, the IRS can and does disclose its information to the Census Bureau. In fact, each year the Census Bureau obtains income tax return data from the Internal Revenue Service. "Access to the data is vital to the health insurance coverage estimates and these data are obtained and kept in the strictest confidentiality. No personal identifiers are included on the records used by the SAHIE program"(U.S. Census Bureau, 2009b). The SAHIE program measures the

Federal Poverty Level and family income with the IRS tax data (U.S. Census Bureau, 2009b). The Privacy Act only covers U.S. citizens and permanent residents, which would be an issue for temporary workers and illegal aliens if mandatory tax returns were required.

The Confidential Information Protection and Statistical Efficiency Act of 2002 authorized the sharing of *business* data among the Census Bureau, Bureau of Labor Statistics and Bureau of Economic Analysis and is the beginning for more efficient procedures for data sharing for statistical purposes among these agencies (Schildkraut, 2003). It also ensures that information supplied by individuals or organizations to any agency for statistical purposes under a pledge of confidentiality is used exclusively for statistical purposes. It is intended to address the public's concerns that providing data to the Census Bureau will not be used for unauthorized purposes or for legal actions against them.

The Computer Matching and Privacy Protection Act of 1988, 5 U.S.C. 552a(o)et seq (1988) amended the Privacy Act by adding certain protections for the subjects of Privacy Act records whose records are used in automated matching programs.

C. Social Security Numbers as National Identification Numbers

If federal income tax returns are made mandatory to use for census purposes, one of the issues will be the requirement under The Social Security Act, 42 U.S.C. §405(c)(2)(B)(i)(II) that every individual who is claimed as a dependent on the income tax return must have a social security number, including newborns. Deputy Commissioner J. B. Lockhart (2002) testified before the House Ways and Means

Subcommittee on Social Security on September 19, 2002 that the original purpose of the Social Security Number (SSN) was to track and accurately record a worker's earnings (Preserving the Integrity, 2002:11). However, it has since come to be used as a de facto identification number simply because almost every American citizen, permanent resident and temporary (working) resident already has one (Kouri, 2005).

How did our social security number become a de facto national identification number? In 1943, Executive Order 9396 required federal agencies to use the SSN in any new system for identifying individuals (Ashley, 2002; Preserving the Integrity, 2002:13). By 1962, the Internal Revenue Service starting using the SSN as a taxpayer identification number of individuals and in 1967 the U.S. Armed Forces began using it as an identifier (Ashley, 2002; Preserving the Integrity, 2002:13). In fact, the use of this unique number as an individual's identifier exploded in the 1960s and 1970s, when government agencies and the private companies began using automated data processing systems for record keeping (Ashley, 2002; Preserving the Integrity, 2002:13). In 1972, the law required SSNs to be issued to all noncitizens authorized to work in the United States, Today, a number is required for anyone applying or receiving federal benefits, required of anyone claimed as a dependent on a tax return (Ashley, 2002, Social Security Administration, 2010).

While the Social Security Act does not require a social security number, SSNs are used as identifiers by the government, nongovernmental entities and private organizations. Employee, patient, student and credit records are tracked using the SSN and the Internal Revenue Service requires any person who, after 1962 works as an employee for wages subject to Social Security taxes, Medicare taxes or U.S. federal

income tax withholdings to have a social security number pursuant to The Internal Revenue Code, 26 U.S.C. § 6109(d). The use of Social Security Numbers is not only widespread; it's encouraged. Companies may legally refuse to provide service to an individual who does not provide a SSN (Preserving the Integrity, 2002:14). States and political subdivisions of the state may, in the administration of any tax general public assistance, driver's license or motor vehicle registration law utilize the social security number for the purpose of establishing the identification of individuals pursuant to The Social Security Act, 42 U.S.C. §405(c)(2)(C)(i). Even ministers and members of religious orders who are exempt from paying Social Security taxes must have a SSN to apply for the exemption (IRS.gov, 2010)

In short, taking the step from using the social security number as a de facto national identification number to a de jure federal identification number is a short one. There are obstacles. The public is concerned over the lack of regulation to control the dissemination of the confidential information available with the Social Security Number. Identity theft has become another problem since the SSN is so interconnected with other identification like banking and credit cards (Ashley, 2002). The social security card does not contain any biometric identifiers, which makes it impossible to verify the person using the card.

From a legal standpoint, none of these problems are insurmountable. Congress took the first step toward establishing a policy limiting compulsory divulgence of the Social Security Number in the Privacy Act of 1974. 28 C.F.R. §16.53(a) was promulgated pursuant to the Privacy Act to provide a rule to protect confidentiality (Use and Collection of Social Security Numbers, 2009). The regulation provides that no

individual is to be denied any right, benefit or privilege as a result of refusing to provide their social security number. Furthermore individuals requested to provide their SSN must be informed as to whether providing their SSN is mandatory or voluntary; advised of any statutory authority that authorizes the collection of the SSNs and be informed of the uses that will be made of the number. However, this will not have an adverse impact on our proposal to use federal income tax returns which require a social security number by law. The Privacy Act restrictions are limited by the exemptions in 5 U.S.C. §552a note, Section 7(a)(2). The restrictions on compulsory disclosure of the SSN do not apply to (1) *any disclosure which is required by federal statue,* or (2) the disclosure of a SSN to any federal, state, local agency maintaining a system of records in existence and operating January 1, 1975, if such disclosure was required under stature or regulation adopted prior to such date to verify the identity of an individual.

Nonetheless, the public is, will and should be concerned with the use of SSNs as an identifier and the masses of personal information which the number accesses. The Social Security Act, 42 U.S.C. 405(c) (2)(C)(viii)(I) addresses this concern mandating that SSNs obtained by federal or state governmental bodies pursuant to federal laws enacted on or after October 1, 1990 are confidential, and no authorized person can disclose any such SSN. However, as is shown with the "Numident file," arrangements have been and can be made among federal agencies to share this information. On the opposite side of the fence, a bill introduced by Rep. Mike Coffman, Republican on May 19, 2009 , H.R. 2472 , Social Security Number Fraud and Identity Theft Prevention Act proposes to amend the Immigration and Nationality Act to authorize the Department of Homeland Security (DHS) the Secretary of Labor and the Attorney General to require

an individual to provide a SSNs for any record maintained by these agencies on any application, document or form provided or required under the immigration laws (H.R. 2472, 2009). The bill is proposed to place additional protections on the use of SSNs by allowing additional liberties to various governmental agencies using the numbers for fraud prevention and immigration enforcement purposes (H.R. 2472, 2009). The bill also makes individuals reportable to the DHS who are thought to be in violation of the immigration laws; those suspected of using SSNs of deceased or under-age individuals, those sharing a SSN among multiple individuals and individuals suspected of using fake names or SSNs. This bill was referred to subcommittee on June 12, 2009. There has been no further action (H.R. 2472, 2009).

There have also been constitutional challenges to the collection and dissemination of SSNs. Courts have not found a constitutionally protected privacy interest in the SSNs because of its broad dissemination in public and private records. In Michigan Department of State v. United States, 166 F. Supp. 2d 1228, 1232 (W.D. Mich. 2001) , the court found that requiring a SSN on a driver's license application is not unconstitutional. The court stated that the government interest in pursuing child support payments by accessing driver license data through social security numbers arguable outweighs an individual's interest in privacy. "The government's purpose is to improve the effectiveness of interstate CSE [child support enforcement programs]. On the other hand, the individual's interest is minimal in this case. While the individual legitimately wants to protect herself from problems of identity theft, there is nothing to suggest that federal agencies or other states' CSE agencies perpetrate or facilitate identity theft" (Department of State v. United States, 2001). In 1986, the Supreme Court in Bowen v. Roy, 476 U.S. 693, 703 (1986) held that requiring applicants to provide their SSN as a condition of eligibility for federal

benefits, such as food stamps, does not violate the First Amendment of the Constitution since such a requirement is neutral in religious terms.

What is revealed in these cases is that so far, the courts have not found that requiring social security numbers violates a citizen's constitutional protections. The legal road is paved for Congress to enact a federal statute establishing the social security number as the official national identification number and requiring all American citizens, permanent residents and temporary workers to have one. At the same time, Congress can legislate that all social security cards be issued with biometric identifiers. Overcoming the political challenges is another issue altogether. If everyone is required to have a social security number, everyone can file the mandatory federal tax return we proposed which opens the door a bit wider for the CEMAF as a census method.

D. The Check and Balance Fund

Article I, § 9, cl. 7 of the Constitution states that "No money shall be drawn from the Treasury but in Consequence of Appropriations by Law; and a regular Statement and Account of the Receipts and Expenditures of all public Money shall be published from time to time."

Since the 1980's, the federal Congress has used this Constitutional authority to pass appropriation bills which allocate nearly $400 billion in federal block grants each year to State, local and Indian governments (Office of Management and Budget, n.d.). These federal block grants are awarded in a lump sum with only general provisions on how it the money should be spent. .

The formula used to allocate block grants favors the small states. For example in 2009, under the State Homeland Security Grant Programs, Wyoming, the least populous state received a little over $6 million and California, the most populous state received about $105 million (Homeland Security, n.d.; Homeland Security, 2009)., Wyoming with 554,270 population , therefore, received about $11 per person while California with 36,961,664 received about $3 per person (U.S. Census Bureau, 2010b). Using this same congressional appropriations process of block grants, we propose an idea aimed at restoring the check and balance principle intended by the constitutional framers when they allocated representatives to the states based on their census populations and charged the states for their share of the support of the federal government based on the same population. Hand-in-hand with CEMAF, we propose what we call a "check and balance fund" be established. It would work like this:

> Step 1, rank order states by number of congressional representatives (in case of ties, the highest population) and then invert the number by giving the highest number to the state with the lowest number of representatives and so on.
>
> Step 2, take the inverse as a share of the total number of representatives (435) and use that share as the basis for distributing a fund designed to restore the balance between the cost and benefits of population for states.

So, the state with the highest number of representatives (California, with 53 congressmen), would get 0.00230 of $50 billion ($114,942,528.74) while the state with the lowest (Wyoming with 1 (several ties here) would get 0.12184 of $50 billion ($6,091,954,022.99). The spreadsheet we have developed to illustrate the "Check and Balance Fund" does not yet contain the fine points for distinguishing among states with the same number of representatives by using their census populations as a secondary step to allocate funds (i.e., first allocate using the two steps above and then for those states

that have the same number of representatives, set up a sub-allocation using by sharing the sum of dollars allocated to them using their share of the sum of their populations). However, this will be easy to implement.

To give a more detailed example of how the "Check and Balance Fund" would work in practice recall that Article I. §2 of the Constitution provided that "Representatives and direct Taxes would be apportioned among the several States . . . according to their respective Numbers." But all that changed in 1913 with the passage of the 16th Amendment which gave Congress the power to collect taxes on income without apportionment among the several States and without regard to any census or enumeration. As a result, California's share of the nation's population provides for an apportionment of 53 representatives. These 53 federal representatives provide California with the substantial benefit of representing California's interests in the House of Representatives in Washington D.C. If Article I still applied, California would also be responsible for an apportionment of the nation's costs based on its population. It would pay taxes into the federal coffers accordingly. However, in spite of the fact that California is apportioned 53 representatives based on its population, the state of California does not pay the corresponding apportionment of federal taxes based on its population. As a result, California has every incentive to overstate its population to receive not only those federal benefits derived from the number of its federal representatives, but those benefits from receiving a larger share of federal money. Why not inflate population if there are no direct federal costs that correlate to its population count? If California were to receive more money from the Check and Balance Fund if its population count was less; California would be weighing up the pros of having a higher

population count and thus more representatives in Congress with the cons of receiving less federal money from the fund. The Check and Balance Fund would resurrect the original checks and balances of Article I. We understand that to make this work, the fund would likely have to be more than $50 billion, but we use this for illustrative purposes - mandatory grants to state and local governments for 2009, for example, totaled $236 billion. Of this $236 billion; $114 billion represented discretionary grants to state and local governments –maybe $200 billion would be more appropriate.

V. Summary

In this paper we proposed a census based neither on door-to-door canvassing nor self-enumeration, but rather, on a combination of four elements: (1) administrative records; (2) the continuously updated Master Address File; (3) survey data; and (4) modeling techniques. We use the "Census-Enhanced Master Address File (CEMAF) as a descriptive term for our re-designed census as well as a redesigned Census Bureau. Our proposal for a re-designed census is largely based on "EMAF," a proposal for a re-designed population estimation system in the US and the body of work done on a census based on administrative records (Swanson and McKibben, 2010). However, it also is informed by advances in record linkage, imputation and microsimulation. We also provided recommendations for a redesigned Census Bureau that include the administrative structure, legal and regulatory foundation, and working culture of the Census Bureau that are designed to support CEMAF. Thus, CEMAF is a proposal that includes not only a re-designed census, but a re-designed Census Bureau.

The proposal is designed to maintain accuracy, functionality, and usability while curtailing both increased non-response rates and costs; major problems facing the U.S. Census. It is guided by four principles: (1) Applied Demography; (2) Check and Balance; (3) Separation; and (4) the Four Essential Features of a Census, to include (a) individual enumeration, (b) universality within a defined territory, (c) simultaneity, and (d) periodicity. We used the earlier work on an administrative records census, record linkage, and modeling and the four principles to conceptually describe CEMAF and how it could be developed. The discussion was focused on technical, budgetary, administrative, and legal issues, but we also touched upon others, such as the work culture of the census, privacy, confidentiality, and public perception. We considered the major obstacles facing our proposal and provided ideas on how they may be overcome.

Importantly, the technical aspects of CEMAF use existing data and methods. They will have to come together not only in familiar, but also unfamiliar, ways. However, we believe that the technical expertise and creativity that exists not only in the Census Bureau, but also in the general demographic, information technology, and statistical communities, are both deep and diverse, as is political savvy. Thus, as has been the case with other major changes in data and administrative and legal developments (e.g., the development of electronic tabulation machines by Herman Hollerith; the development of Title 13, the move from face-to-face enumeration to self-enumeration; the development of TIGER and MAF), we believe that CEMAF, while challenging, is technically, administratively, and politically feasible. Thus, in our sketched outline for answering these questions, we have left to others the thoughts required to fully answer them.

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Appendix. Principles underlying the US Census Bureau's estimates and projections programs.

I. Background

The U.S. Census Bureau's Population Estimates and Projections program is designed to fulfill the mandates of Title 13, Section 181, of the U.S. Code.

> During the intervals between each census of population required under section 141 of this title, the Secretary, to the extent feasible, shall annually produce and publish for each State, county, and local unit of general purpose government which has a population of fifty thousand or more, current data on total population and population characteristics and, to the extent feasible, shall biennially produce and publish for other local units of general purpose government current data on total population. Such data shall be produced and published for each State, county, and other local unit of general purpose government for which data is compiled in the most recent census of population taken under section 141 of this title. Such data may be produced by means of sampling or other methods, which the Secretary determines will produce current, comprehensive, and reliable data.

A. To satisfy this mandate, the program of population estimates has grown over the years to produce the following products annually:

1. Monthly estimates of the national population of the United States by age, sex, race, and Hispanic origin
2. Annual estimates of the population of states by age, sex, race, and Hispanic origin
3. Annual estimates of the population of counties by age, sex, race, and Hispanic origin
4. Annual estimates of the total population of functioning governmental units
5. Annual estimates of the number of housing units for states and counties.

B. In addition to meeting the mandates of Title 13, these estimate products are used for a variety of purposes, including the following:

1. Controls for federally sponsored surveys, including the Current Population Survey (CPS) and the American Community Survey (ACS)
2. Allocation of federal dollars totaling over $200 billion annually

3. Denominators for various indicators, including vital statistics, per capita income, and cancer incidence rates
4. Calculation of the number of clerks the Senate hires
5. Requirements of the Federal Election Commission
6. Denominators for poverty rate estimation at selected levels of geography
7. Program planning by federal, state, local, and private entities

II. **Implicit Assumptions**

Implementation of the annual program of intercensal estimates is guided by several implicit assumptions.

A. Timely release of the annual products is critical

1. The maximum lag time between estimate date and dissemination of last data product is 12 months.
2. Annual national and state population totals must be released within 6 months of estimate date to meet requirements of IRS Bonding Authority.
3. State estimates of the population aged 18 and older must be available within 6 months of estimate date to satisfy requirements of the Federal Election Commission.
4. National and state population controls to be used for the new calendar year CPS must be available by late January of the new calendar year.
5. Estimates of state and county characteristics must be available within 9 months to meet requirements for use as population controls for the American Community Survey.
6. Estimates of functioning governmental units should be available within 12 months of estimate date for use by HUD in funds allocation.

B. Each annual production consists of a time series of estimates from the last decennial census date to the estimate date and is produced using the latest available data and the current approved methodology.

1. Current-year data products contain revisions to the prior year's estimates that are caused by incorporating:
   a. Improved methodology.
   b. New data inputs.
   c. Revisions to prior year data inputs.

2. The term "vintage" is used to refer to the reference date of an estimates cycle. Estimates released with a reference date of July 2005 are referred to as the "vintage 2005" set of population

estimates and will include a consistent time series back to April 2000.

C. Within any vintage, all products use the same vintage of input data and must sum to the earlier released products of the same vintage for the same measurement.

   1. Since the national and state population totals are the first to be released, all subsequent estimate products must sum to the national and state totals that already appear for that vintage. This insures consistency within any vintage and means that the sum of the "parts" will always equal the previously released U.S., state, or county total.

   2. Since the national population estimates tabulated by characteristics are the first characteristics to be released, the sum of the state and county characteristics must equal the national characteristics of the same vintage.

D. Only one consistent set of products and related materials is developed within a vintage. That set of products is intended to serve all customers' needs and uses.

   1. The methodology and data inputs used to develop the population estimates used as denominators for vital statistics rates are consistent with those used to develop the population controls for the CPS and ACS.

   2. Custom data products are consistent with the publicly released data products. For example, the annual race estimates for counties use a bridged race algorithm developed by NCHS. However, while the race data conform to the bridging algorithms developed by NCHS, the estimates of total populations and populations by age and sex generally agree with the publicly released data products.

E. The population estimates begin with the most recent decennial-census enumerated count updated to July 1 of each year, and as such, are based on the usual-residence concept used in the most recent decennial census.

   1. The population estimates base for each estimate date is updated to include Count Question Resolution (CQR) changes to the decennial census base as well as geographic updates due to annexation and other geographic program changes.

2. The components of population change used to update the most recent census will be consistent with the best set of components available. Ongoing evaluation indicates that the coverage and the consistency of vital statistics and other administrative records data differ from those of decennial census data. Therefore, in the annual estimates, the size of the population based mainly on administrative records data differ from the size based mainly on census data.

F. States, counties, and units of local government have the right to challenge the population estimates prepared by the Census Bureau under the provisions of Title 15, The Code of Federal Regulations, Part 90. The results of accepted challenges will be incorporated into the following year's population estimates as long as the challenge is received by October 1 of the year in which the estimate was released.

III. Current Broad Methodological Assumptions

A. Prior to incorporating a new methodology or data set, it is desirable to thoroughly evaluate a set of estimates that use this new methodology or data set and compare it with the most recent decennial census results. When this is not possible, the methods are judged by the following criteria.

1. Soundness: The method should be based on solid reasoning – i.e., the formulas that embody the method should be mathematically valid and respect the attributes of the input data as they relate to the estimation task.

2. Integrity: A strategy that consistently applies the declared method is preferred to one that uses ad-hoc fixes to address particular challenges of the estimation task.

3. Parsimony: A simpler strategy is preferred to a more complex one.

4. Robustness: The method that produces the most reasonable estimates (defined below) across the full range of potential input-data values and in the presence of the random variation normally associated with those values while maintaining the orthodoxy and consistency of the estimates (also defined below) is preferred.

5. Adaptability: A technique that can be applied more broadly (e.g., across geographic summary levels), thus promoting the integration of the Census Bureau's estimates system, is preferred to a more product-specific remedy.

6. Transparency: A strategy that is more readily understandable and replicable by external parties is preferred. Moreover, a strategy that provides some explanatory information (i.e., how did the size or distribution of the population come to be this way) is preferred over one that is merely predictive.

7. Usability: The method must be executable along with all other current projects under current staffing levels in a way that allows the Census Bureau to meet current deadlines.

8. Flexibility: The preferred method will allow the production of estimates when a specific instance of the input data normally required by the method is unavailable or deemed unsuitable.

B. As a final test, the method should produce output data that have the following qualities.

1. Orthodoxy: The values of the population estimates should be appropriate (e.g., no negative population numbers, all population estimates in whole numbers).

2. Consistency: The values of the population estimates for all universes (e.g., resident, civilian, civilian non-institutionalized), geographies (e.g., national, state, county), and characteristics (e.g., age, sex, race, Hispanic origin) should not contradict one another.

3. Reasonableness: The values of the population estimates should approximate the real values as determined by the following assessments.
   a. Post-Censal Change: The reasonableness of the total change in the population since the last decennial census.
   b. Time-Series Change: The reasonableness of the annual change in the estimates since the last census.
   c. Demographic Appropriateness: The values of the estimates and the demographic rates they imply fall within acceptable limits when evaluated by general demographic principles (e.g., the appropriateness of the sex ratios, age progression, implied family size, life expectancies, total fertility rates, etc.).
   d. Comparability: The estimates appear realistic when compared with other indicators of the size and distribution of

the population (e.g., Medicare enrollment, school enrollment, housing unit estimates, etc.).

C. A consistent method is used for entities at the same level of geographic aggregation.

   1. The method adopted for state totals must be used for all states.

   2. The method adopted for counties within a state must be used for all counties within that state.

D. The Census Bureau develops the basic estimates for the nation, states, and counties by disaggregated race groups in order to meet the various custom race aggregations needed by users.

E. The cohort-component method is the preferred method for development of the national, state, and county-level total population estimates and population estimates by characteristics.

F. The distributive housing-unit method is the preferred method for the development of the functioning subcounty governmental-unit-level estimates.

G. State total population estimates are not developed independently. National population estimates are first developed; then county total population estimates are developed and controlled to the national total population estimates. The state total population estimates are the sum of the "nationally controlled" county total population estimates for the state.

H. Data on vital statistics and group quarters provided by members of the Federal State Cooperative Program for Population Estimates (FSCPE) are included in the process of developing state and county population estimates.

I. Although state members of the FSCPE are provided the opportunity to review the state and county population totals prior to final production, they must follow strict criteria and provide objective evidence when requesting modifications.

IV. **Current Specified Methodologies**

A. National level estimates will use the cohort-component technique applied to data from the latest decennial census as the base, data on births and deaths provided by the National Center for Health Statistics, and estimates of net international migration derived from data from the American Community Survey (ACS) See the url

<http://www.census.gov/popest/topics/methodology/2003_nat_char_meth.htmlhttp://www.census.gov/popest/topics/methodology/v2005_nat_char_meth.html>

For a detailed discussion of the methodology used to develop the most recent set of national population estimates by demographic characteristics.

B. State and county population estimates are developed using a demographic procedure called an "administrative records component of population change" method. A major assumption underlying this approach is that the components of population change are closely tracked by administrative data in a demographic change model. In order to apply the model, Census Bureau demographers estimate each component of population change separately. For the population residing in households, the components of population change are births, deaths, and net migration, including net international migration. For the non-household population, change is represented by the net change in the population living in group-quarters facilities.

Each component in our model represents data that are symptomatic of an aspect of population change. For example, birth certificates indicate additions to the population resulting from births, so these data are used to estimate the birth component for a county. Other components are derived from death certificates, Internal Revenue Service data (IRS), Medicare enrollment records, Armed Forces data, group-quarters population data, and data from the American Community Survey.

For a more detailed discussion of the development of county population totals see <http://www.census.gov/popest/topics/methodology/2003_st_co_meth.html

http://www.census.gov/popest/topics/methodology/2005_st_co_meth.html>

C. State population characteristics are currently developed in a two-stage process. Estimates by age and sex are developed first using a cohort-component procedure whereby estimates of net migration are developed using school enrollment data. These estimates are controlled both to the national-level estimates by age and sex as well as the previously developed state population totals.

The second step in the process distributes the state age and sex estimates into race by Hispanic origin categories. This is done by

preparing an initial set of state estimates by age, sex, race, and Hispanic origin that are controlled to the state age and sex estimates prepared in the first step and to the previously developed national estimates by age, sex, race, and Hispanic origin.

For a more detailed discussion of the development of the state population characteristics by age, sex, race, and Hispanic origin see

<http://www.census.gov/popest/topics/methodology/2003_st_char_meth.html
http://www.census.gov/popest/topics/methodology/2004_st_char_meth.html>

D. County population characteristics are developed using a proportional distribution method beginning with previously developed resident county population estimates by age (0-64 and 65+) and resident state population estimates by age, sex, race, and Hispanic origin. Then county-level estimates of age, sex, race, and Hispanic origin distributions are developed using information about post-censal change in the corresponding populations. Third, these distributions are applied to the original county estimates by age and state characteristics.

A detailed discussion of this method is provided at

<http://www.census.gov/popest/topics/methodology/2004_co_char_meth.htm>

V. Enhancement Priorities

A. Improve estimates of net international migration

1. Provide up-to-date, useful statistics and methodologies on the size, characteristics, and demographic impact of international migration to and from the United States for use in policy-making decisions and demographic and economic research.

2. Goals of immigration research
   a. Produce annual estimates of international migration
   b. Improve current migration-related survey questions on the ACS.

c. Conduct extensive evaluations to determine the best method to incorporate ACS data into the population estimates.

3. Activities

   a. Evaluate reasonableness of estimates of annual change in the foreign-born data from ACS at the national level.

   b. Produce revised estimates of net international migration at the national level.

   c. Produce new demographic and geographic distributions for migrants.

   d. Construct algorithms to estimate the migrant status of the foreign-born populations.

   e. Produce estimates of international migrants by migrant status (legal migrants, temporary migrants, quasi-legal migrants, unauthorized migrants, and emigrants).

E. Improve Estimates of Internal Migration

1. Improve the accuracy of the annual migration estimates by age, sex, race, and Hispanic origin for counties by maximizing the efficient use of available administrative data files, Census 2000 data, and the American Community Survey (ACS) data.

2. The ultimate goal is to implement a person-based migration model incorporating administrative data from files such as the IRS 1040 and 1099 records, Medicare records, a derived person-characteristic file developed from the Social Security Administrative NUMIDENT file, and other administrative data that can be merged into the database. The database will enable analysts to match administrative data with Census 2000 (100% and sample data), CPS, and ACS data in order to develop models that correct possible demographic and geographic biases inherent in the use of an administrative records database when estimating migration rates for counties.

F. Develop a new methodology for estimating subnational population characteristics

1. Replace the methodology that develops state estimates by age and sex based on school enrollment data with a method that is consistent with the best set of administrative data available and exploits the power of current computing capacity.

2. Develop a method that addresses current deficiencies in the age distributions of the population in selected states and counties, especially the age distribution of the population aged 18 to 24.

3. Develop a new method to estimate county population by age, sex, race, and Hispanic origin.

G. Develop procedures to systematically incorporate participation by State FSCPE Agencies in the production of state and county population estimates

1. Address issues of consistency

2. Establish criteria for incorporating state participation

VI. Other Enhancements

A. Improve the distributive housing unit approach at the subcounty level.
1. Develop procedures to update Census 2000 measures of vacancy and numbers of people per household (PPH or the Person Per Household measure) used in the estimates process.

2. Improve estimates of housing units.

3. Address inconsistencies between estimates developed using the distributive housing unit approach and those developed using the component approach.
   a. Develop improved procedures to estimate housing unit loss.
   b. Integrate enhancements from the Master Address File.

B. Address inconsistencies between data from the decennial census base and data on components of change from administrative records databases.

1. Address inconsistencies between Census 2000 data and NCHS data on race and Hispanic-origin characteristics.

2. Address unreasonable results from pairing NCHS mortality data with decennial census data and estimate results.

VII. Administrative Constraints

A. The methods developed must be capable of being implemented with current resources and within the current time frame for estimate production.

B. Production of the complete set of estimates must continue during any development stages.

C. Methods must be Transparent and Reproducible