

## **The History of Sample Design for the Annual Finance and Employment Surveys 1987-2003**

This document summarizes the sample design used in the annual surveys of government finance and employment conducted by the Governments Division of the Bureau of the Census, for the survey years 1987 to 2003. It is not intended to explain fully and with mathematical rigor the statistical procedures used to develop the sample of governments in place each survey year. Nor is it intended to describe the methodology used to estimate the financial measures. However, this summary will provide some insight into the sample design and the subsequent differing levels of detail available from one survey year to the next. Users wishing more information on the sampling, estimation, or imputation methodology applied to the data should contact the Governments Division.

A complete census of governments is conducted every five years, in years ending in “2” and “7.” For these census years, all measures of financial activity represent direct summations of the individual units of government canvassed in the census. There is no sampling, and no estimation methodology is applied to the aggregate measures of government finance and employment. Only two types of “adjustments” are made to the census of governments data. First, in both the finance and employment phases of the census, imputation procedures enable an accounting for units of government that did not respond to the census (unit nonresponse). Second, in the employment phase of the census, a full-time equivalent (FTE) employment statistic is derived by individual unit of government and function.<sup>1</sup> It should be noted that these two procedures also are applied to the sample survey’s annual data.

While the financial and employment statistics from a census of governments contain no sampling or estimation components, the census of governments years are important for the sampling process. This is because the census results represent the complete universe of governments from which the annual finance and employment samples are selected.

### **1987 Census of Governments**

In 1987, Governments Division conducted a complete census of governments. There were 83,186 local government units identified in the Government Organization Phase. These were canvassed during the Finance and Employment phases of the census. Government finance and employment measures for 1987 represented the aggregation of these units at the county area, state area, and national levels. Tabulations of data by type of local government also represented direct summations. There was no weighting applied to individual units, nor was any estimation methodology used to derive totals. The 1987 Census of Governments was the basis for the 1989 sample redesign and the smaller 1993 annual sample redesign, as described later.

### **1988 Annual Finance and Employment Surveys**

In 1988, the annual finance and employment surveys used a sample design that had been developed in 1984, based on the 1982 Census of Governments.<sup>2</sup> There were 81,781 local governments counted in the Organization Phase of the census. Both the annual finance and employment surveys used the same

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<sup>1</sup>Refer to the technical documentation about the survey of public employment for information on how this statistic is derived.

<sup>2</sup>This exact sample had been used the surveys of 1984 through 1986, also.

sample. The 1984 sample design produced finance and employment estimates nationally by type of government, by state area for each type of government, and for 410 county areas having 100,000 or more population (1980). For this particular design, the following criteria were used to determine certainty units (those governments with a 100% chance of being in the sample):

1. All counties, municipalities, and townships with one or more dependent school systems.
2. County governments with a population of 50,000 or more.
3. Municipal governments with a population of 25,000 or more.
4. All New England and Mid-Atlantic township governments with a population of 25,000 or more.
5. All school districts offering college level (postsecondary) education.
6. All school districts with an enrollment of 5,000 or more.
7. All transit special districts.
8. All special districts having outstanding long-term debt of \$10,000,000 or revenue or expenditure levels of \$5,000,000 or more.

In addition to these units being designated as certainty units, other units were selected to give county area and state by type of government estimates with a relative standard error of 3% or less on major financial items (long-term debt, total revenue, total expenditure, capital outlay, public welfare, highway expenditures, etc.). Capital outlay, public welfare, health and hospital expenditure, etc., were not controlled as tightly as total long-term debt, total revenue, and total expenditure. Noncertainty units were selected into the sample based on a probability assigned to the unit proportional to the size of the unit (as determined by either the long-term debt or total expenditure, whichever gave the larger probability of selection).

### **1989, 1990, and 1991 Annual Finance and Employment Surveys**

The 1987 Census of Governments, Finance Phase, was completed in time to use it for developing a new sample for the 1989 annual finance and employment surveys. This sample was used for three survey years – 1989, 1990, and 1991. Several changes were made to the previous sample design, in order to reduce the sample size to about 22,000 units. Conceptually, the sample was designed to yield state area estimates by type of government, as well as estimates of total local government economic activity in 319 county areas with a population of 150,000 or more (previously 410 county areas). For this design, the following criteria were used to determine certainty units:

1. All counties, municipalities, and townships with one or more dependent school systems.
2. County governments with a population of 75,000 or more.
3. Municipal governments with a population of 50,000 or more.
4. All New England and Mid-Atlantic townships with populations of 50,000 or more.
5. All school districts offering college level (postsecondary) education.
6. School districts with enrollments of 10,000 or more.
7. Special districts with long-term debt of \$20,000,000 or more OR total expenditure or revenue of \$10,000,000 or more, as reported in the 1987 Census of Governments.

These criteria differed from the previous (1984) sample design in that the population and enrollment cutoffs for items 2, 3, 4, and 6 were increased, and the former inclusion of all transit special districts governments was dropped. The procedures for sampling the noncertainty units did not change. Updates of new governmental units between 1987 and 1989 were made to the list of governments prior to sampling.

## **1992 Census of Governments**

The Organization Phase of the 1992 Census of Governments identified 84,955 local government units. These were canvassed during the Finance and Employment phases of the same census. Government finance and employment measures for 1992 represented the direct aggregation of these units at the county area, state area, and national levels. Tabulations of data by type of local government also represented direct summations. There was no weighting applied to individual units, nor was any estimation methodology used to derive totals.

The results of the 1992 Census of Governments were never used in a sample redesign for the annual finance and employment surveys. This is because the census was not completed in time to develop a new sample for the 1993 surveys.

## **1993 - 1999 Annual Finance Surveys 1993 - 1995 and 1998 Annual Employment Surveys**

For the 1993 annual surveys, the finance and employment sample was reduced to about 13,000 units. Since the 1992 census results were not available, the 1987 census was used for the 1993 redesign. Governments that came into existence after 1987 were accounted for in the sample, however. As a result of the smaller number of units, the sample no longer supported state by type of government estimates or county area estimates. The sample was designed to yield only state level estimates and national by type of government estimates. The criteria for determining certainty governments were as follows:

1. All counties, municipalities, and townships with one or more dependent school systems.
2. County governments with a population of 100,000 or more.
3. Municipal governments with a population of 50,000 or more.
4. All New England and Mid-Atlantic townships with populations of 50,000 or more.
5. All school districts providing college level (postsecondary) education.
6. School districts with enrollments of 10,000 or more.
7. All transit, gas, and electric special districts were included in the sample with certainty.

These criteria differed from the previous sample design in two ways. First, the population criterion for counties was increased to 100,000. Second, the special district size criteria were dropped and replaced by the "functional" criteria noted in #7 above. The procedure for obtaining the noncertainty sample remained the same. The sample was designed to give state level estimates of major finance variables with a relative standard error of about 3%. This smaller sample was used for both the annual finance and employment surveys, which continued to share the same sample.

This sample panel was used for the annual finance program for the survey years covering 1993 through 1999. For the annual employment program, however, this sample was used for the period 1993 through 1995, and 1998. No annual employment survey was conducted for 1996, when the reference period for the survey was being changed from the month of October to the month of March.

## **1997 Census of Governments**

The Organization Phase of the 1997 Census of Governments identified 87,453 local government units. These were subsequently canvassed during the Finance and Employment phases of the same census. Government finance and employment measures for 1997 represented the direct aggregation of these units at the county area, state area, and national levels. Tabulations of data by type of local government also represented direct summations. There was no weighting applied to individual units, nor was any

estimation methodology used to derive totals.

The 1997 Census of Governments, Organization Phase, became the basis for two sample designs – one for the annual employment program commencing with the 1999 survey, and another separate design for the annual finance survey commencing with the fiscal year 2000 program.

### **1999 - 2003 Annual Employment Surveys**

A sample designed specifically for the annual employment survey was developed from the 1997 Census of Governments and is being used for the survey years 1999 through 2003. The employment sample was designed to produce state by type of government estimates with a relative standard error of 3 percent or less on FTE employees and total payroll. The initial certainty criteria were:

1. All county governments with a 1997 population of 100,000 or more.
2. All municipalities with a 1997 population of 75,000 or more.
3. All townships in New England and Middle Atlantic states with a 1997 population of 50,000 or more.
4. All independent school districts with an enrollment of 10,000 or more.
5. All school districts providing college level (postsecondary) education.
6. All special districts with total FTE employment of 1,000 or more.

Initial certainty units in this employment survey sample differed somewhat from the previous combined finance/employment survey sample. The biggest differences were the removal of all governments with dependent school systems from the list of initial certainties and the use of an employment criterion, rather than financial criteria, for the special districts. Other changes were made to the population criteria for counties and municipalities.

Noncertainty units were selected for the sample based on a probability proportional to the size, as determined by FTE employment and total payroll of the unit. The sample size came to be slightly less than 11,000. This sample will be used for annual employment surveys in years 1999-2001 and 2003. A complete employment census will be done in 2002. A new employment sample will be designed for 2004.

### **2000 Annual Finance**

The sample for the 2000 annual finance survey was developed from the results of the 1997 Census of Governments. The sample was designed to produce state by type of government estimates with a relative standard error of 5 percent or less on 11 major financial items, as well as state estimates with a relative standard error of 3 percent or less on long-term debt, total revenue, and total expenditure. The initial certainty criteria for the 2000 finance sample were:

1. All county governments with a 1997 population of 100,000 or more.
2. All municipalities with a 1997 population of 75,000 or more.
3. All townships in New England and Middle Atlantic states with a 1997 population of 50,000 or more.
4. All independent school districts (these are collected as part of the Elementary-Secondary Education Statistics Program, annually).
5. All school districts providing college level (postsecondary) education.
6. All special districts that satisfy any of the three conditions below.
  - FTE employment of 1,000 or more;
  - Provide services in the areas of function code 92 (electric power), 93 (gas supply), or 94

(transit);

- \$20 million or more in debt outstanding (based on the 1997 census);
- \$10 million or more in total revenue or expenditure (based on 1997 census).

Noncertainty units were selected for the sample based on a probability proportional to the size, as determined by long-term debt and total expenditure of the unit. The sample size came to be about 25,000, which includes all 13,726 independent schools.

This sample is being used in 2000 only.

### **2001 and 2003 Annual Finance**

The fiscal year 2001 and 2003 survey coverage will consist of national finance estimates, by type of government. There will be no state area estimates. The national sample is being developed from the results of the 1997 Census of Governments. It is being designed as a subset of the annual finance sample being used for the fiscal year 2000 survey.

### **2002 Census of Governments**

There will be a complete census in 2002. It will include an Organization Phase, Employment Phase, and a Finance Phase. Government finance and employment measures for 2002 will represent the direct aggregation of these units at the county area, state area, and national levels. Tabulations of data by type of local government also will be direct summations. There will be no weighting applied to individual units, nor any estimation methodology used to derive totals.

### **Special Note on Census Year “Estimates”**

In addition to direct tabulations of finance and employment statistics for the census of governments years, there were sample surveys conducted to cover the same fiscal year period in census of governments years up to (but excluding) 1997. Thus in 1987 and 1992, estimates of government finance and public employment were developed and released. These estimates were derived from the sample in place at the time of each of the censuses. The 1987 finance and employment estimates used the same sample and estimation procedures applied to the 1986 finance and employment surveys. The 1992 finance and employment estimates used the same sample as did the 1991 finance and employment surveys. No annual finance and employment estimates were developed for 1997, nor are any planned for 2002.

The census results are considered the official statistics for the 1987 and 1992 survey periods.