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DOCUMENTATION OF THE SAMPLING AND ESTIMATION PROCEDURES FOR THE 1989 REDESIGN OF THE ANNUAL SURVEY OF LOCAL GOVERNMENTS

by

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Documentation of the Sampling and Estimation Procedures
for the 1989 Redesign of the Annual Survey of Local Governments

1. INTRODUCTION

The Annual Survey of Local Governments is used to collect annual data on the finances and employment of local governments. These data are published in the Government Finance (GF) and Government Employment (GE) series. Henry Wulf oversees the Finance Branch which issues the GF series. Alan Stevens is the branch chief for the Employment Branch which is responsible for the GE series.

The GF series covers the entire range of government finance activities: revenue, expenditure, debt, and assets. Reports in the series include summary data for city governments, county governments, public school systems, and all governments. The GE series reports provide statistics on the estimated number of civilian employees and their pay for the month of October for city governments, county governments, and all governments

Data for the annual surveys are obtained from the Federal government, all State governments, and a sample of local governments. Approximately 22,000 local units were selected from about 83,000 governments in the universe of local governments. The local governments were identified in the 1987 Census of Governments. Sampling was done from a modified list that included deletions and additions to the universe of governmental units that either came into or left existence since the census.

The sample is designed to provide estimates for each of the 319 county-type areas with a 1986 population of 150,000 or more and for the 212 balance of State-by-type of government groups. (These government groups are cities, counties, townships, special districts, and school districts.) The definition of the county-type areas to be included has changed since 1984. At that time all county-type areas with a 1980 census population of 100,000 or more were

determined to be county-type areas of interest for separate estimates. Note that the county-type areas also contribute to the State-by-type of government estimates. The 531 county-type areas and balance of State-by-type groups are called "specified counties".

This paper documents the sampling procedures, estimation procedures, and suggested plans for future improvements to the procedures. Section 2 gives an overview of the sampling. Section 3 gives the different methods of data collection and followup for the two data series served by this sample. Section 4 gives the estimation procedures that are used. Section 5 gives suggestions for improving the sampling and estimation in 1994.

After the sampling was completed, staff members decided to discontinue using the difference estimator and change to a regression estimate. In section 2, reference is made to a difference estimator since we used data based on the difference estimator to design the sample. Section 4 gives the procedures for using the regression estimator.

2. SAMPLING PROCEDURES

In 1989, the sample was designed to give a relative standard error of 3 percent or less for the major finance items of revenue, expenditure, and long-term debt for each of the 319 county-type areas and for the 212 State-by-type of government groups. Errors for other major finance items (capital outlay, cash and securities, education, public welfare, housing, utilities, highway, health and hospital, sanitation, and criminal justice expenditures) were also about 3 percent. Since cash and securities, public welfare, housing, and sanitation can vary so widely, these items were not controlled as tightly as the other variables. Sometimes, a much larger relative standard error was allowed if the absolute error was less than $1 million.

The noncertainty governments were selected for the sample based on a probability assigned to the government which was proportional to the size (as determined by expenditure and long-term debt) of the unit. Some governments were taken as initial certainties. Governments Division defined these certainties on the basis of size or importance. The criteria for their determinations are given in section 2.2. Additional local governments were added to the certainty group based on the relative magnitude of their expenditure or debt in the specified county. The procedure for determining additional certainties is discussed in section 2.4.

The order of the universe file is given in section 2.1. After the universe file was ready, counts of certainty governments and all local governments as well as a breakdown by type of government of these counts, were provided for each specified county. At that time, totals for utilities, criminal justice, health and hospitals, and highways were given for the same breakdowns within each specified county. After receiving these data, the initial sample sizes were given. The determination of the initial sample sizes for each specified county will be described in section 2.3. In section 2.5, the procedure for determining initial probabilities of selection for the noncertainty units is also given. Section 2.6 defines how the initial probabilities of selection are modified to get the final selection probabilities. Section 2.7 tells how to select the final sample using the final probabilities of selection. In Appendix A, there is a listing of the printouts that are currently used in the sampling process.

2.1 The Universe File

The sampling frame for the 1989 Annual Survey of Local Governments is the 1987 Census of Local Governments file. On this file were 78,773 local

governments identified by a 12-digit ID code. The first two digits of the code denote the state; the third digit, the type of government (1 = county, 2 = municipality, 3 = township, 4 = special district, 5 = school district); the fourth through sixth, the county area ID code; and digits 7-12, the specific government code. The data of interest from the census file are the ID code; size indicator (population for counties, cities, and townships; enrollment for school districts; function for special districts); and the amounts for total expenditure, direct general expenditure, total revenue, general revenue, long-term-debt outstanding, cash and securities, capital outlay, and expenditures for schools, highways, health and hospitals, criminal justice, housing and community development, sanitation, welfare, and utilities.

The order of the file for each state is as follows:

1. County or county-type areas with a 1986 population of 150,000 or more numerically by county code, followed by the governments in the balance of State by type of government;
2. Within specified county, by type of government (county, municipal, township, special district, and school district);
3. Within type of government by the following measures of size:
   - population for counties, municipalities, and townships
   - size of probability of selection within each special district function
   - enrollment for independent school districts.

2.2 Initial Certainties Criteria

In a meeting with Governments Division and Statistical Research Division staffs, the following decisions were made on the definitions of county-type areas and initial certainties. A county-type area is now all governments within a county or county-equivalent geographical area with a 1986 population of 150,000 or more. In 1984 a county-type area had a 1980 population of 100,000 or more. One major exception is that for the 1989 sample each State

had to have at least two county-type areas listed as specified counties. This meant that some county-type areas were included as specified counties even though they had 1986 populations of less than 150,000 and in a few cases even less than 100,000. For 1989, there were 329 county-type areas compared to 410 in 1984. There are 212 balance of State-by-type of government groups. This gives a total of 541 specified counties in 1989 compared to 621 in 1984.

The initial certainties include

1. All county governments serving counties with a 1986 population of 75,000 or more,
2. All municipalities with a 1986 population of 50,000 or more,
3. All townships in New England and the Middle Atlantic states (Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island and Vermont) with a 1986 population of 50,000 or more,
4. All independent school districts with an enrollment of 10,000 or more in the 1987 Census of Governments,
5. All county, city, or township governments with dependent school systems in the 1987 Census of Governments,
6. All school districts providing college level education in the 1987 Census of Governments,
7. All transit special districts in the 1987 Census of Governments,
8. All special district governments with long-term debt outstanding of $20 million or more, or with total revenue or total expenditure of $10 million or more in the 1987 Census of Governments.

2.3 Determination of Initial Sample Sizes

After the criteria for initial certainties were determined, Governments Division produced total and original certainty record counts for each specified county by type. Initial and final sample sizes from the 1984 sample redesign were obtained, as well as printouts of specified county and State-by-type variances for the important finance and employment variables. There were other printouts available with certainty totals and full totals for highway, health and hospital, criminal justice, and utilities expenditures.

The procedure for determining additional certainties and selection probabilities yields a higher sample size than initially set. Initial sample sizes are used mainly to start the certainty selection process. In the first step the most recently available relative standard errors for selected finance and employment variables were examined, and those specified counties that had high relative standard errors were noted. Next, the initial sample sizes from the 1984 sample redesign were either increased or decreased to adjust the variance. In all cases, the initial sample sizes were set at least to the number of initial certainty units plus 3 units. Another consideration in setting the initial sample sizes was the size of increase from the 1984 initial sample sizes to the 1984 final sample sizes. A final consideration was the proportion of utilities, criminal justice, health and highway expenditures that came from noncertainty governments for each type of expenditure.

Once these initial sample sizes were set for each specified county, they were given to a GOVs programmer, Ken Lederman, for use in determining additional certainties and initial probabilities of selection. Initial sample sizes for 1989 specified counties are given in Appendix B. Take-all counties are marked.

2.4 Additional Certainties

After the initial sample sizes, n_h^*, for each specified county h were determined, the additional certainty units were determined using two passes of the universe data file. On the first pass, governments in each specified county were added to the sample with certainty if either

A. its expenditure exceeded the ratio of total noncertainty expenditure for the entire specified county to total noncertainty sample size, i.e., $n_h^* - n_{1h}$ where n_{1h} is the number of initial certainties, or if

B. its debt exceeded the ratio of total noncertainty debt for the entire specified county to $n_h^* - n_{1h}$.

If either of these two conditions existed, the government became a certainty with a probability of selection of 1.0000. The number of certainty units added at this point was denoted n_{2h}.

This procedure was repeated for the remaining $n_h^* - n_{1h} - n_{2h}$ governmental units. That is, a government was added to certainty if either

A. its expenditure exceeded the ratio of the total noncertainty expenditure for the specified county to $n_h^* - n_{1h} - n_{2h}$, or if

B. its debt exceeded the ratio of total noncertainty debt for the specified county to $n_h^* - n_{1h} - n_{2h}$.

Again, these units received a probability of selection 1.0000. The number of certainty units added at this phase was n_{3h}. Therefore, at this point the number of certainty units for a specified county was $n_{1h} + n_{2h} + n_{3h}$. The number of noncertainty units was $n_h' = n_h^* - n_{1h} - n_{2h} - n_{3h}$.

2.5 Initial Probabilities of Selection

After the initial and additional certainties were identified, initial probabilities of selection were assigned to each noncertainty governmental unit. For each specified county, the probability of selection for a given governmental unit was either the total expenditure for the unit divided by the ratio of the total noncertainty expenditure for the specified county to n_h' (correct to 4 decimal places) or the total debt for the unit divided by the ratio of total noncertainty debt for the specified county to n_h', whichever was larger.

If the probability of selection was greater than or equal to .9000, it was changed to 1.0000. If the probability was less than .0200, it was changed to .0200. This probability of selection is denoted p_{hi} for the i-th governmental unit in the h-th specified county.

At this point, a printout of the universe with initial probabilities was obtained along with a printout of relative standard errors of major variables using the initial selection probabilities.

The universe listing was arranged as described in section 2.1. For each government, the following items were listed: ID code, specified county code, type of government code, population for counties, cities, and townships, enrollment for independent school districts, special district function, and certain 1987 census data items (total revenue; general revenue; total expenditure; direct general expenditure; cash and securities; total capital outlay; long-term debt outstanding; and school, highway, health and hospital, criminal justice, housing, welfare, sanitation, and utilities expenditures).

The printout of sampling errors for totals for each specified county contained

(1) the total of the selection probabilities in the specified county,

(2) the total of the noncertainty selection probabilities in the specified county,

(3) the total for each important data item (previously listed) for all governments and for certainty governments,

(4) the ratio of certainty government totals to all governments totals for each data item,

(5) the variance of an unbiased estimate of total, x_h', defined as follows for specified county h,

$$\sigma^2_{x_h'} = \sum_{i=1}^{N_{NC,h}} x^2_{hi}/p_{hi} - \left(\sum_{i=1}^{N_{NC,h}} x_{hi}\right)^2 \Big/ \sum_{i=1}^{N_{NC,h}} p_{hi}$$

where $N_{NC,h}$ is the number of noncertainty governments in specified county h;

x_{hi} is the value of the characteristic of interest for government i in specified county h;

p_{hi} is the selection probability for the i-th government in specified county h.

(6) the standard error of x_h', $\sigma_{x_h'} = \sqrt{\sigma^2_{x_h'}}$,

(7) the relative standard error of x'_{hi}, $V_{x_h'} = \sigma_{x_h'} / X_h$ where X_h is the total for specified county h.

Since one of the goals for the survey was relative standard errors of .03 on State-by-type of government totals, the items listed above were needed for each State-by-type of government breakdown. All State-by-type totals were calculated by summing the type of government of interest over all specified counties. The variance formula that was used is

$$\sigma^2_{X'_T} = \sum_{h=1}^{H} \left[\sum_{i=1}^{N_{NC}} x^{*2}_{hi} / p_{hi} - \left(\sum_{i=1}^{N_{NC}} x^*_{hi} \right)^2 / \sum_{i=1}^{N_{NC}} p_{hi} \right]$$

where

$$x^*_{hi} = \begin{cases} x_{hi} & \text{if i is the type of government under consideration,} \\ 0 & \text{otherwise.} \end{cases}$$

H = Number of specified counties in the State.

For State totals the variance formula that was used is the sum of the variances for each specified county, $\sigma_{X'}{}^2 = \sum_{h=1}^{H} \sigma^2_{x_h'}$.

2.6 Modification of the Initial Selection Probabilities

Using the specified county relative standard errors, modifications were made to the initial probabilities of selection in order to obtain estimates of the relative standard errors of 3 percent or below for debt, revenue, and expenditure. For all other variables, relative standard errors were near 3 percent. The printout of standard errors contained simple unbiased estimates of variance for 1987. This did not give an adequate picture of what the estimates might be in four or five years. It also failed to account for the use of a difference estimator rather than a simple unbiased estimator. In

order to account for growth and the use of a difference estimator, the ratio of the estimated relative standard error (for the 1984 redesign sample) of the difference estimator to the relative standard error of the simple unbiased estimator using 1986 data differenced to the 1982 census was multiplied by the 1987 relative standard error before testing to see if the relative standard error was less than 3 percent.

Relative standard errors for the balance of State-by-type estimates did not have to meet the 3 percent requirement since they are not published separately and no inferences are drawn from them. Since they do contribute to the State-by-type estimates which must have C.V.'s of 3 percent or less, care was taken to examine not only the variation within the specified county but also the variation between the specified counties. Sometimes, there were large variations in the selection probabilities given for a particular size government across all the specified counties in a State. This yielded a high State-by-type of government variance estimate.

Modifications to the initial probabilities of selection were basically of two types:

1. a change to an individual government's selection probability or
2. a factor to be multiplied times all noncertainty probabilities of selection in either a specified county, type of government within a specified county, or special district function within a specified county.

Typically, the second approach was used when there were several units that needed to be brought into certainty. The factor was obtained by dividing .9000 by the smallest probability of selection for the units coming into certainty. A factor was also used if the total number of noncertainty units was less than 2.0000. To get this factor, the sum of the noncertainty selection probabilities for the specified county was divided into 2.0000. Sometimes, when the State-by-type of government C.V.'s were too high, it was

an indication that a specified county's selection probabilities were too low compared to probabilities assigned to similar units in other specified counties in the State. A factor was applied to raise low probabilities closer to those for the State.

Sometimes an individual government had a selection probability that was acceptable for debt and total expenditure, but not for some of the detailed expenditures. For example, a special district that operates a hospital might have a high hospital expenditure compared to other special districts with a given total expenditure. The C.V. for hospital expenditures would be too high because a low selection probability would be attached to a government with high hospital expenditure. In these cases, the selection probability was raised.

After all modifications were made, the probabilities were once again adjusted to raise every p_{hi}'s below .0200 to .0200 and to raise p_{hi}'s over .9000 to certainty.

The process of examining the C.V.'s was done two times. A procedure for ensuring at least two noncertainty units per specified county was repeated until every specified county met the requirement, except for the specified counties for which all units were taken with certainty. The governments in the few specified counties that could not meet the above criteria, in spite of modifying probabilities of selection, were all taken with certainty. In addition to the initial take-all counties given in Appendix B, the following counties became take-alls: 06016, 10001, 10016, 10051, 10059, 11031, 11044, 19009, 19010, 19999-4, 25024, 29999-2, 32007, 34011, 34026, 39051, 43019, and 43047.

2.7 Selection of the Sample

After the final selection probabilities were assigned to each government on the universe file which was ordered as in section (2.1), the selection probabilities were cumulated, and a systematic sample of units was drawn using a random start of .2203. The selection process was done in the usual way: First, the first sample unit for which the cumulative total of the selection probabilities was greater than .2203 was included in the sample. Next, 1.0000 was added to .2203 and the next unit for which the cumulative total was greater than 1.2203 was selected for the sample. The procedure was repeated until the end of the cumulative total. All units with $p_{hi} = 1.0000$ were in the sample with certainty.

After the sample was identified, another listing of all of the units in the universe of local governments with their final selection probabilities, values of expenditure, revenue, debt, etc., identifiers, and a sample inclusion indicator was prepared. This listing is kept by SRD.

3. DATA COLLECTION

3.1 Finance Data

3.1.1 Mailout and Followup

In the initial data collection phase, data are obtained using three methods: mail canvass, field compilation, and central collection from State sources. For the general-purpose governments, about 99 percent of the governments are mailed questionnaires. For the 72 largest county governments and the 49 largest city governments, trained census representatives compile the data. In 34 States central source data are used for some or all local general-purpose governments. Sometimes the data from central sources and mail canvass are incomplete or questionable. If census examiners are unable to obtain corrected data from original sources, they attempt to obtain data from

secondary sources. If these efforts fail, census enumerators may be sent to the government to obtain important missing information.

For special district governments, the mail canvass procedures are used to obtain data from governments in States where a central source are not available. Central sources are available in 4 states for at least some of the special districts. As with general-purpose governments, questionable data are verified through contacts with the local officials.

For most school districts (except Alaska and the District of Columbia), data are available from a central source. Data for Alaska and the District of Columbia are obtained through questionnaires sent to the elementary and secondary school systems. For higher education, finance data are obtained from the Higher Education General Information Survey conducted by the Center for Education Statistics. When inadequate data are given, other sources, mainly different State offices, are contacted. Care is taken to avoid duplication and underreporting.

3.1.2 Editing and Imputation

All data from the mail canvass questionnaires, field enumeration, and central sources are reviewed for internal consistency and completeness. The computer edit also compares the new data from a government to reports from earlier times. Data that are improbable are verified with State and local government officials.

As reported in section 3.1.1, extensive efforts are taken to get the correct data from the respondent but if this is not possible, a secondary source is used. For nonrespondents, prior fiscal year data and secondary information from Moody's Investors Services, the American Hospital Association, the Bureau of Reclamation, and various State agencies are used.

3.2 Employment Data

3.2.1 Mail-out and Followup

The Federal civilian employment and payroll data are obtained from the U.S. Office of Personnel Management. All other data are based on information received in a mail canvass of State and local governments. An initial mail request is sent to the sample panel on or about November 1; a reminder card is mailed to nonrespondents during the last week of November; and a second questionnaire package is sent to nonrespondents at the end of December. Post Master Returns are readdressed and sent. A special Western Union Electronic Letter is sent to selected State agencies and large local governments who are still nonrespondent in mid-January. Any State agencies and large local governments that are nonrespondent for many consecutive years are called and urged to provide information.

3.2.2 Editing and Imputation

Prior year data are used for nonresponding State and local agencies. As in the finance survey, all questionnaires are screened for completeness and internal consistency prior to electronic data entry. Intensive computer editing is used to compare current year data to prior year data and to perform tests of reasonableness on reported information. Telephone followups to State and local officials are used to verify or correct problems noted by the editing process.

4. ESTIMATION PROCEDURES

In the publications for both finance and employment statistics, totals, ratios, and year-to-year changes are published. Procedures for calculating estimates for these statistics and their standard errors are given in this section. In previous years a difference estimator was used. This year, the staff decided to change to a regression estimator for most cases. For State-by-type groups with sample sizes under 20, a difference estimator was used.

Also, for debt and capital outlay, the simple unbiased estimator was used since these items have a low correlation from year to year.

The regression coefficients are calculated at a certain level of detail, denoted Level-0. Any characteristic more detailed than Level-0 is calculated using a regression estimate with a fixed regression coefficient (b_0), which is calculated at Level-0. Anything at an aggregate level higher than Level-0 is calculated by adding the appropriate Level-0 estimates. For example, we calculate regression coefficients (b_0) at the State-by-type of government level. We use the b_0 coefficients calculated at this level to calculate the specified county-level estimates. In order to get the State or national estimates, we simply add the appropriate State-by-type estimates. As another example, welfare expenditure is divided into categorical assistance programs, other cash assistance payments, vendor payments for medical care, and other vendor payments, welfare institutions, and other public welfare. If Level-0 is welfare expenditure, these detailed expenditure items are calculated using the b_0's calculated at the welfare expenditure level. Aggregates like social services and income maintenance expenditure, general expenditure, and total expenditure are derived by adding the appropriate Level-0 items, like welfare, hospitals, health, etc.

As stated previously, State-by-type is the level for most calculations. The procedure for estimating the regression coefficient is given in section 4.1. In section 4.2, the procedure for getting the State-by-type estimates of total is given. Section 4.3 gives the procedure for calculating variances. In section 4.4, the procedure for calculating specified county estimates is given. In section 4.5, the procedure for calculating the higher level aggregates and variances is given. Appendix C gives the Level-0 variables for the employment variables and Appendix D gives Level-0 variables for the finance variables.

4.1 Calculation of the Regression Coefficients

For each State-by-type of government group and Level-0 variable, the regression coefficient, $b_{o\tau}$ is calculated as follows: (Note $\tau = 1$ is for counties; $\tau = 2$, municipalities; $\tau = 3$, townships; $\tau = 4$, special districts; $\tau = 5$, school districts.)

$$b_{o\tau} = \frac{s_{x'_\tau y'_\tau}}{s^2_{y'_\tau}} \tag{4.1}$$

where

$$s^{2'}_{y_\tau} = \left[\sum_{i=1}^{n_{NC,\tau}} \left(\frac{y_{\tau i}}{p_i} \right)^2 - \frac{1}{n_{NC,\tau}} \left(\sum_{i}^{n_{NC,\tau}} \frac{y_{\tau i}}{p_i} \right)^2 \right] \left(\frac{n_{NC,\tau}}{n_{NC,\tau}-1} \right) \tag{4.2}$$

$$s_{x'_\tau y'_\tau} = \left[\sum_{i=1}^{n_{NC,\tau}} \left(\frac{x_{\tau i}}{p_i} \right)\left(\frac{y_{\tau i}}{p_i} \right) - \frac{1}{n_{NC,\tau}} \left(\sum_{i}^{n_{NC,\tau}} \frac{x_{\tau i}}{p_i} \right)\left(\sum_{i}^{n_{NC,\tau}} \frac{y_{\tau i}}{p_i} \right) \right] \left(\frac{n_{NC,\tau}}{n_{NC,\tau}-1} \right) \tag{4.3}$$

$x_{\tau i}$ = current value of the variable of interest for type of government τ and unit i,

$y_{\tau i}$ = similar to $x_{\tau i}$ but for the census value,

p_i = probability of selection of unit i, and

$n_{NC,\tau}$ = number of noncertainty sample units of specified type τ.

An alternative way to calculate the covariance is to form differences, $z_{\tau i} = x_{\tau i} - y_{\tau i}$, and substitute them for $y_{\tau i}$ into equation (4.2) to get $s^{2'}_{z_\tau}$. Substituting the $x_{\tau i}$ (current year's value for government i) into equation (4.2) gives $s^{2'}_{x_\tau}$. Then, the covariance can be calculated as follows:

$$s_{x'_\tau y'_\tau} = \left(s^2_{x'_\tau} + s^2_{y'_\tau} - s^2_{z'_\tau} \right) / 2 \tag{4.4}$$

4.2 State-by-Type Estimates of Total

4.2.1 Level-0 Variables

For the Level-0 variables, the state-by-type estimate of total is

$$x''_\tau = x'_\tau + b_{o\tau}\,(Y_\tau - y'_\tau) \qquad (4.5)$$

where

$x'_\tau = \sum_{i=1}^{n_\tau} \left(\frac{x_{\tau i}}{p_i}\right)$ = simple unbiased estimate of characteristic X for type τ.

n_τ is the number of sample units in type of government τ.

$$y'_\tau = \sum_{i=1}^{n_\tau} \left(\frac{y_{\tau i}}{p_i}\right)$$

$$Y_\tau = \sum_{i=1}^{N_\tau} y_{\tau i}$$

N_τ is the total number of units in type of government τ.

All other variables are defined in section 4.1.

For several State-by-Type estimates, the sample size was small, thus yielding a regression estimate with bias of order $1/\sqrt{n}$. The regression estimates for such cases were erratic, often negative or too large. It was decided that for these cases ($n_{NC,\tau} < 20$), a difference estimator with $b_{o\tau} = 1$ would be used. At times the difference estimator still yielded negative estimates, so the simple unbiased estimator with $b_{o\tau} = 1$ was used.

4.2.2 Detailed Variables

Estimates for the detailed variables use equation (4.5) also. The appropriate Level-0 regression coefficient is obtained from the Level-0 variable to which the detailed variable contributes. For example, if $a + b = c$, and c is the Level-0 variable which was used to get the regression coefficient, its coefficient, b_{0Tc}, is used to get estimates for a and b. All detailed variables sum into at least one Level-0 variable.

4.2.3 Aggregate Variables

In order to get totals like total general expenditure or total expenditure, the appropriate Level-0 estimates are added.

4.3 Variances for the State-by-Type Estimates of Total

4.3.1 Level-0 Variables

For Level-0 variables, the estimated variance of a total is

$$s^2_{x''_\tau} = \left[s^2_{x_\tau} - \frac{s^2_{x'_\tau y'_\tau}}{s^2_{y'_\tau}} \right] \qquad (4.6)$$

All variables have been previously defined.

Alternatively, if $z_{\tau i}$ is defined as $x_{\tau i} - b_{o\tau}\, y_{\tau i}$, then

$$x''_\tau = \sum_{i=1}^{n_{NC,\tau}} \frac{z_{\tau i}}{p_i} + b_{o\tau}\, Y_{\tau NC} + x'_{\tau C} \qquad (4.7)$$

$$= z'_\tau + b_{o\tau}\, Y_{\tau NC} + x'_{\tau C}$$

The estimated variance is then

$$s^2_{\bar{x}_\tau} = \left(\frac{n_{NC,\tau}}{n_{NC,\tau}-1}\right)\left[\sum_{i=1}^{n_{NC,\tau}}\left(\frac{z_{\tau i}}{p_i}\right)^2 - \frac{1}{n_{NC,\tau}}\left(\sum_{i=1}^{n_{NC,\tau}}\frac{z_{\tau i}}{p_i}\right)^2\right] \qquad (4.8)$$

The variance of the difference estimator which was used for State-by-Type areas with small sample sizes is estimated by

$$(s^2_{x'_\tau} + s^2_{y'_\tau} - 2\, s_{x'_\tau y'_\tau}) \qquad (4.9)$$

or using the $z_{\tau i}$'s with $b_{o\tau} = 1$, the variance can be calculated using equation 4.8.

4.3.2 Detailed Variables

In order to keep the processing costs down, variances for the detailed variables were not calculated.

4.3.3 Aggregates of Level-0 Variables

The variances for the aggregates of Level-0 variables are estimated more easily by using the $z_{\tau i}$'s defined in section 4.3.1. Equation (4.8) is used for the variance with

$$z_{\tau i} = \sum_{j=1}^{J} x_{\tau ij} - \sum_{j=1}^{J} b_{o\tau j}\, y_{\tau ij} \qquad (4.10)$$

where

$x_{\tau ij}$ is the value of characteristic j for the $i^{\underline{th}}$ unit in type of government τ using the current data;

$y_{\tau ij}$ is similarly defined but using census data; and

$b_{o\tau j}$ is the regression coefficient for characteristic j.

4.3.4 Relative Standard Errors

For all variables for which a variance is calculated, a standard error is also needed. The standard error is the square root of the variance. The relative standard error, which is the estimated standard error of the estimate divided by the estimate, is also calculated.

4.4. Specified County Estimates

Since estimates for specified counties are no longer published, the variances of the specified county-level variables are no longer calculated. This section shows how to calculate Level-0 specified county estimates, along with the more detailed variables, and aggregates. Since the specified county estimates are no longer published, this processing may be eliminated whenever processing costs must be contained.

4.4.1 Level-0 Variables

For a Level-0 variable, we use the values of b from the State-by-Type groups to get a specified county (h) estimate as follows:

$$x''_h = X_{County} + x'_{hM} + b_{oM}(Y_{hM} - y'_{hM}) + x'_{hT} + b_{oT}(Y_{hT} - y'_{hT})$$

$$+ x'_{hD} + b_{oD}\,(Y_{hD} - y'_{hD}) + x'_{hS} + b_{oS}\,(Y_{hS} - y'_{hS}) \qquad (4.11)$$

where b_{oM} is the regression coefficient calculated from State-by-municipalities.

b_{oT} is calculated from State-by-township.

b_{oD} is calculated from State-by-special district.

b_{oS} is calculated from State-by-schools.

$\hat{x}_{hM}$, $\hat{x}_{hT}$, $\hat{x}_{hD}$, and $\hat{x}_{hS}$ are the current year unbiased estimates for municipalities, townships, special districts and school systems, respectively, for specified county h.

$\hat{Y}_{hM}$, $\hat{Y}_{hT}$, $\hat{Y}_{hD}$, and $\hat{Y}_{hS}$ are similarly defined using census data

Y_{hM}, Y_{hT}, Y_{hD}, Y_{hS} are actual census totals for the 4 types of government for specified county h.

4.4.2 Detailed Variables

The detailed specified county variables are calculated using equation (4.11). The appropriate values of b_{oM}, b_{oT}, b_{oD}, and b_{oS} are obtained from the appropriate Level-0 variables.

Example: If we want to estimate a specified county's expenditure on elementary and secondary education, the appropriate $b_{o,S}$' would be the ones calculated from State-by-type total education expenditures.

4.4.3 Aggregates of Level-0 Variables

To get total current expenditures or other such aggregates, the appropriate Level-0 variables are added at the specified county level.

4.5 State and National Estimates

4.5.1 Estimates of Total

For Level-0 detailed and aggregate estimates of total, the State-by-type of government estimates are added to a State level. For a national estimate of a Level-0 detailed or aggregate variable, add the appropriate State estimates.

4.5.2 Variance Estimates

Variance estimates for State totals are obtained by adding the State-by-type of government variances for the estimated totals. Likewise, variances for national totals are obtained by adding the State variances.

4.5.3 Relative Standard Errors

A standard error of a State estimate is obtained by taking the square root of the estimated variance of the estimated total. The relative standard error is obtained by dividing the estimated standard error by the estimated total.

4.6 State and State-by-Type Estimates of Ratios and Associated Standard Errors

In some of the publications, estimates of ratios are published. For these cases, the ratio is simply the ratio of two variables from the current year, say X and U. Let the estimate of the ratio be x''/u'', where x'' and u'' are the regression estimators. The estimated variance of the ratio, x''/u'', is

$$s^2_{x''/u''} = \left(\frac{x''}{u''}\right)^2 \left[\frac{s^2_{x''}}{x''^2} + \frac{s^2_{u''}}{u''^2} - 2\frac{s_{x''u''}}{x''u''}\right] \qquad (4.12)$$

where x'',u'' are calculated using equation (4.5); and

$s^2_{x''}$, $s^2_{u''}$ are calculated using equation (4.5); and

$$s_{x'' u''} = \sum_{h=1}^{H} \frac{n_{NC,h}}{n_{NC,h}-1}\left[\sum_{i=1}^{n_{NC,h}}\left(\frac{z_{hi}}{p_{hi}}\right)\left(\frac{v_{hi}}{p_{hi}}\right) - \frac{1}{n_{NC,h}}\left(\sum_{i=1}^{n_{NC,h}}\frac{z_{hi}}{p_{hi}}\right)\left(\sum_{i=1}^{n_{NC,h}}\frac{v_{hi}}{p_{hi}}\right)\right]$$

where

z_{hi} is the difference for variable X between the current and census year data, i.e., $x_{hi} - b_{o\tau}\, y_{hi}$, and

v_{hi} is the difference for variable U between the current year's data and the census year's data.

All other variables are defined in previous sections. The estimated standard error is the square root of the variance, $s^2_{x''/u''}$, and the estimated relative standard error is the estimated standard error, $s_{x''/u''}$, divided by the estimate x''/u''.

4.7 State and State-by-Type Estimates of Rates of Change and Associated Standard Errors

In both the Finance and Employment series reports, percentage increases in various data items from one year to the next are calculated. The rate of change is calculated as follows:

$$d_t = \frac{x''_t - x''_{t-1}}{x''_{t-1}} \qquad (4.13)$$

where x''_t is the difference estimator for the variable of interest at the current time t, and

x''_{t-1} is the difference estimator for the same variable a year earlier at time t-1.

The variance of d_t is estimated using equation (4.13) with x''_t, substituted for x'' and x''_{t-1} substituted for u''. The same substitutions are also made for the variance and covariance calculations.

5. CONSIDERATIONS FOR THE FUTURE

During the 1989 redesign of the Annual Survey of Local Governments, it became evident that some changes in the design and estimation process could produce a more efficient sampling system and possibly more accurate estimates. Some research and thought should be given to the following proposals before the 1994 redesign.

5.1 Monitoring the Change in the Estimation Procedure

An examination of the ratios of the coefficient of variation for the previously used difference estimator to the coefficient of variation for the simple unbiased estimate revealed that for some variables, an estimator other than the difference estimator, perhaps even the simple unbiased, may be better. Consequently, staff members decided to change to the regression estimator. The regression estimator should be monitored closely this first year. Variance estimates should be examined to compare the regression and simple unbiased estimates.

Research should be done before 1991 to determine if we can obtain State regression coefficient estimates, rather than State-by-type estimates. This would eliminate the use of the difference estimator in most cases. Alaska, Delaware, Nevada, Rhode Island, and Virginia would still have to use either a difference or simple unbiased estimator.

5.2 Automation of the Sample Selection Process

During the selection of the sample, it became obvious that many of the clerical tasks can be computerized, thus cutting 2-3 weeks from the sampling process. One step that is easy to program involves a match to the latest available sample. After the C.V.'s have been calculated for each variable and specified county, the ratio of the difference estimator to the simple unbiased estimator, using the latest available variances from the previous redesign, are multiplied by the C.V.'s from the current census. (If a ratio from the previous sample is 0.0000, 999.9999, or not available because it is a new specified county, a 1.0000 is used for the ratio.) These adjusted C.V.'s are then checked to see if they are less than .03. If they are not, the standard error is multiplied by the ratio and checked to see if it is less than one million. If both of these tests fail, an adjustment to the probabilities of selection is needed. A computer can be used for the match, multiplication by the ratio, and screening for estimates failing the C.V. and absolute error requirements. This was done in the 1989 redesign for some of the later checks on adjusted selection probabilities. Therefore, it is feasible and should be initiated from the start. It should be noted that the balance-of-State by type of government specified counties do not have to meet these requirements, but State-by type estimates must be checked because they must meet the requirements.

The computer can also be used to check that at least 2 noncertainty governments are taken from each specified county. In the future when the above changes have been made, we will have to ensure that at least 2 noncertainty, non-school district governments are taken from each county-type area. Currently, the Finance Branch can get school finance data from State sources for all school districts in most States. Therefore, they do not

sample individual school districts in 48 States. (The Employment Branch does.) Consequently, in order to get variance estimates for the specified counties, they should have at least 2 noncertainty, non-school district governments from each county-type area. Unfortunately, this was not done in the 1989 redesign, and there are 10 county-type areas where the finance variances cannot be calculated. This number is down from 21 county-type areas in the 1984 redesign. In 1984, there were 18 specified counties that could not have employment variances calculated because they did not have noncertainty sample sizes of at least 2 governments. All employment variances can be calculated with the 1989 redesign.

Further research could reveal that it may be feasible to use a compromise initial selection probability based on not only debt and expenditure, but also perhaps an average of the other variables of interest. This may reduce the number of "hand" changes.

5.3 Possible Changes in the Sample Design

In order to keep the costs under control, all certainty levels and specified county definitions should be examined and adjusted for growth. The following table shows the percentage of governments and various detailed expenditures for various specified county cutoffs.

	Specified County Cutoff			
	100,000+	150,000+	200,000+	250,000+
Records	29.5%	23.4%	19.6%	16.9%
Expenditures:				
Criminal Justice	83.1	77.3	73.7	70.1
Highways	61.1	53.5	49.0	45.1
Health/Hospital	73.3	65.1	62.0	58.6
Utilities	76.7	68.1	64.7	61.9

From this table we can see that 16.9% of the governments account for 70.1% of the total criminal justice expenditure or 61.9% of the utilities expenditure. Lowering the specified county limits from 250,000 to 100,000 raises the criminal justice expenditure coverage in specified counties to 83.1% and the utilities to 76.7%, for example.

The following table shows the percentage decreases in the amounts covered by specified counties using various cutoff changes.

Change in Specified County Cutoff

	100 → 150+	100 → 250+	150 → 200+	150 → 250+
Record Count	-20.7%	-42.6%	-16.1%	-27.6%
Criminal Justice	- 7.0	-15.7	- 4.6	- 9.3
Highways	-12.3	-26.2	- 8.5	-15.8
Health/Hospital	-11.1	-20.0	- 4.9	-10.0
Utilities	-11.2	-19.3	- 5.1	- 9.1

This table shows that an increase in the certainty cutoff from 150,000 to 250,000 population would reduce the number of governments covered in the specified counties by about 28% over the current 150,000 level. Criminal justice and utilities expenditure coverage would only be reduced by 9%; health and hospitals would be reduced 10%; and highway expenditure would be reduced about 16%. As can be seen in the tables, county-areas with populations over 250,000 cover a large amount of the detailed expenditure items. These tables do not include the required two county-areas per State as we had in 1989.

The data should be inspected, and a possible reduction in the number of specified counties and an increase in the certainty cutoff levels should be considered if we want to maintain a total sample size of about 20,000.

5.4 Evaluation of Edit and Imputation Procedures

The edit and imputation procedures used in the annual finance and employment surveys should be examined. The use of SPEER should be considered in order to see if its interactive environment can decrease the time spent each year on the editing process.

The edit of the universe list prior to sampling should also be reviewed. Perhaps SPEER could be used here in order to prepare efficiently an accurate listing of governments with their finance data. Using the regression estimator disclosed several problems in the data which were caused by the current edit and imputation procedures. For example, the imputation of 0's for all special district nonrespondents in the 1987 Census of Local Governments affects the probabilities of selection for the unit as well as the census year value of the variable $y_{\tau i}$. The sample weights assigned to these special districts are usually large. Some units that were large and should have been in the sample with certainty are now reporting in the sample with a very large weight. All estimators are affected by this weighting problem.

Appendix A Printouts Used in Sampling

1. Tallies of Census Finance File for specified counties by type of government and balance of State-by-type. Within each cell, there are totals and initial certainty breakdowns. We also have separate printouts for counts of governments and breakdowns for utility, criminal justice, highway, and health and hospital expenditures.

2. CV ratios of difference estimator to simple unbiased using 1982 probabilities and 1986 finance data file. There is one printout for State totals and one for specified counties.

3. Sampling errors based on initial selection probabilities for simple unbiased estimates using census file for specified counties.

4. Same as (3) but for State-by-type of government.

5. 1987 Census data file with initial probabilities.

6. Update of (3) with final probabilities.

7. Update of (4) with final probabilities.

8. Update of (5) with final probabilities.

9. Sample counts by type of government.

Appendix B 1989 Initial Sample Sizes

	'89n*	
01 AL		
037	22	
045	8	
049	10	
051	6	Take-all
Balance		
Cos.	27	
Cities	57	
SD	65	
Schools	56	
02 AK		
002	4	Take-all
006	4	Take-all
Balance		
Cos.	8	Take-all
Cities	35	
SD	11	Take-all
03 AZ		
007	40	
010	13	
Balance		
Cos.	13	Take-all
Cities	21	
SD	25	
Schools	32	
04 AR		
060	14	
072	10	
Balance		
Cos.	38	
Cities	80	
SD	75	
Schools	58	

	'89n*	
05 CA		
001	43	
004	21	
007	32	
010	38	
015	36	
019	145	
021	35	
024	29	
027	30	
030	60	
033	46	
034	28	
036	48	
037	65	
038	8	Take-all
039	20	
040	19	
041	30	
042	23	
043	38	
044	22	
048	24	
049	24	
050	27	
054	35	
056	30	
Balance		
Cos.	32	Take-all
Cities	31	
SD	62	
Schools	52	
06 CO		
001	13	
003	24	
007	12	
016	10	
021	14	
030	25	
035	15	
Balance		
Cos.	32	
Cities	25	
SD	55	
Schools	41	

	89n*	
07 CT		
001	34	
002	34	
003	22	
005	35	
006	25	
Balance		
Cities	4	Take-all
Towns	42	Take-all
SD	48	
Schools	5	Take-all
08 DE		
002	19	
003	35	
Balance		
Cos.	1	Take-all
Cities	9	
SD	10	
Schools	5	Take-all
09 DC		
001	2	Take-all

	'89n*	
10 FL		
001	10	
005	15	
006	28	
013	14	
016	6	
017	9	Take-all
029	9	
036	15	
037	10	Take-all
041	14	
042	7	
048	11	
050	25	
051	8	
052	14	
053	10	
058	12	
059	10	
064	15	
Balance		
Cos.	24	
Cities	28	
SD	30	
Schools	40	
11 GA		
011	8	Take-all
025	11	
031	7	
033	8	
044	8	
060	12	
067	12	
106	6	Take-all
121	10	Take-all
Balance		
Cos.	50	
Cities	73	
SD	75	
Schools	41	

	'89n*	
12 HI		
001	6	Take-all
002	4	Take-all
Balance		
Cos.	2	Take-all
SD	6	Take-all
13 ID		
001	16	
014	17	
Balance		
Cos.	23	
Cities	38	
SD	75	
Schools	42	
14 IL		
010	40	
016	103	
022	65	
045	23	
049	60	
056	38	
060	40	
072	30	
081	28	
082	40	
084	30	
099	48	
101	33	
Balance		
Cos.	37	
Cities	60	
Towns	100	
SD	110	
Schools	110	

	'89n*	
15 IN		
002	15	
045	38	
049	23	
071	19	
082	9	
Balance		
Cos.	53	
Cities	75	
Towns	75	
SD	115	
Schools	95	
16 IA		
057	14	
077	16	
082	13	
Balance		
Cos.	61	
Cities	63	
SD	60	
Schools	83	
17 KS		
046	18	
087	14	
089	14	
105	11	
Balance		
Cos.	60	
Cities	82	
Towns	60	
SD	65	
Schools	90	
18 KY		
034	4	Take-all
056	12	
Balance		
Cos.	44	
Cities	45	
SD	49	
Schools	62	

	'89n*	
19 LA		
009	9	
010	8	
017	5	Take-all
026	8	Take-all
028	7	
036	3	Take-all
Balance		
Cos.	35	
Cities	32	
SD	10	
Schools	35	
20 ME		
003	26	
016	25	
Balance		
Cos.	7	
Cities	17	Take-all
Towns	180	
SD	66	
Schools	50	

	'89n*	
21 MD		
002	10	
003	2	Take-all
004	3	Take-all
013	6	Take-all
014	2	Take-all
016	8	
017	9	
Balance		
Cos.	17	Take-all
Cities	18	
SD	20	

	'89n*n	
22 MA		
001	25	
003	33	
005	45	
007	30	
009	66	
011	38	
012	37	
013	11	Take-all
014	70	
Balance		
Cos.	4	Take-all
Cities	3	Take-all
Towns	83	Take-all
SD	23	
Schools	11	

	'89n*	
23 MI		
011	26	
025	25	
033	14	
039	16	
041	25	
050	33	
061	20	
063	40	
070	20	
073	20	
081	23	
082	48	
Balance		
Cos.	25	
Cities	46	
Towns	89	
SD	27	
Schools	47	

	'89n*	
24 MN		
002	15	
019	20	
027	33	
062	20	
069	32	
Balance		
Cos.	33	
Cities	48	
Towns	62	
SD	41	
Schools	63	
25 MS		
024	12	
025	12	
Balance		
Cos.	51	
Cities	71	
SD	45	
Schools	69	
26 MO		
039	16	
048	24	
050	25	
092	15	
095	37	
096	7	Take-all
Balance		
Cos.	27	
Cities	48	
Towns	39	
SD	94	
Schools	38	
27 MT		
007	17	
056	18	
Balance		
Cos.	36	
Cities	30	
SD	48	
Schools	66	

	'89n*	
28 NE		
028	18	
055	12	
Balance		
Cos.	45	
Cities	52	
Towns	30	
SD	65	
Schools	85	
29 NV		
002	10	
016	10	
Balance		
Cos.	9	
Cities	7	
SD	22	
Schools	10	
30 NH		
006	30	
008	35	
Balance		
Cos.	8	Take-all
Cities	10	Take-all
Towns	45	
SD	28	
Schools	33	

	'89n*	
31 NJ		
001	28	
002	70	
003	40	
004	38	
007	26	
008	33	
009	26	
011	22	
012	33	
013	60	
014	48	
015	43	
016	24	
018	30	
020	29	
Balance		
Cos.	6	Take-all
Cities	19	
Towns	25	
SD	20	
Schools	15	
32 NM		
001	7	
007	7	
Balance		
Cos.	18	
Cities	26	
SD	21	
Schools	33	

	'89n*	
33 NY		
001	16	
004	20	
014	24	
015	25	
028	24	
030	40	
031	3	Take-all
032	14	
033	25	
034	14	
036	33	
042	24	
044	16	
046	26	
047	14	
052	40	
056	25	
060	50	
Balance		
Cos.	25	
Cities	19	
Towns	48	
SD	41	
Schools	35	
34 NC		
011	6	
026	7	
032	4	Take-all
034	8	Take-all
036	8	
041	7	
060	8	
092	9	
Balance		
Cos.	92	Take-all
Cities	55	
SD	43	

	'89n*
35 ND	
009	40
018	33
Balance	
Cos.	40
Cities	55
Towns	79
SD	62
Schools	74
36 OH	
009	17
018	40
025	27
031	30
043	25
047	23
048	20
050	18
057	26
076	27
077	24
078	30
Balance	
Cos.	35
Cities	50
Towns	74
SD	50
Schools	41

	'89n*
37 OK	
014	11
055	18
072	14
Balance	
Cos.	33
Cities	40
SD	50
Schools	45
38 OR	
003	35
020	21
024	23
026	13
034	22
Balance	
Cos.	19
Cities	39
SD	68
Schools	47

	'89n*	
39 PA		
002	75	
004	38	
006	53	
009	50	
010	30	
011	30	
015	45	
021	31	
022	28	
023	42	
025	37	
026	38	
035	21	
036	47	
039	32	
040	58	
046	60	
048	38	
051	11	
054	40	
063	46	
065	60	
067	50	
Balance		
Cos.	21	
Cities	45	
Towns	73	
SD	160	
Schools	60	
40 RI		
002	12	
004	22	
Balance		
Cities	1	Take-all
Towns	17	Take-all
SD	15	
Schools	2	Take-all

	'89n*	
41 SC		
010	13	
023	12	
032	11	
040	8	
042	15	
Balance		
Cos.	19	
Cities	33	
SD	50	
Schools	35	
42 SD		
050	24	
052	24	
Balance		
Cos.	37	
Cities	87	
Towns	58	
SD	28	
Schools	58	
43 TN		
019	11	
033	8	
047	9	
079	8	
Balance		
Cos.	91	Take-all
Cities	44	
SD	68	
Schools	8	

	'89n*
44 TX	
014	17
015	19
020	18
031	20
043	20
057	33
061	18
071	15
079	25
084	18
101	55
108	27
123	18
152	11
155	18
170	23
178	16
212	14
220	24
227	16
Balance	
Cos.	53
Cities	45
SD	62
Schools	120
45 UT	
006	18
018	22
025	19
029	15
Balance	
Cos.	12
Cities	27
SD	29
Schools	12
46 VT	
004	28
011	40
Balance	
Cos.	7
Cities	23
Towns	80
SD	28
Schools	87

	'89n*	
47 VA		
007	2	Take-all
021	2	Take-all
030	5	Take-all
044	3	Take-all
076	8	Take-all
121	2	Take-all
122	4	Take-all
127	3	Take-all
132	2	Take-all
Balance		
Cos.	90	Take-all
Cities	48	
SD	22	
48 WA		
006	17	
017	38	
018	20	
027	27	
031	22	
032	20	
039	25	
Balance		
Cos.	18	
Cities	28	
SD	72	
Schools	35	
49 WV		
006	8	
020	14	
Balance		
Cos.	24	
Cities	44	
SD	60	
Schools	30	

50 WI	
005	15
013	25
041	17
052	16
068	28
Balance	
Cos.	43
Cities	54
Towns	120
SD	40
Schools	82
51 WY	
011	9
013	9
Balance	
Cos.	13
Cities	33
SD	43
Schools	32

Appendix C Level-0 Variables for Employment

	Full-Time Employees	Part-Time Employees	Full-Time Payroll	Part-Time Payroll	Full-Time Equivalent
Elem.& Secondary -					
Instruc.					
Other					
Libraries					
Public Welfare					
Hospitals					
Health					
Highways					
Air Transportation					
Water Transportation					
Police Protection -					
Officers					
Other					
Fire Protection -					
Officers					
Other					
Correction					
Natural Resources					
Parks & Recreation					
Housing & Comm. Dev.					
Sewerage					
Solid Waste Management					
Finan. Admin.					
Judicial & Legal					
Other Gov't Admin.					
Water					
Electric					
Gas					
Transit					
All Other					

Appendix D Level-0 Variables for Finance

Revenue
- Intergov. rev. from Fed. Gov.
- State Gov.
- Local Gov.
- Taxes
- Current Charges, total
- Misc. General Rev. total
- Util. rev.
- Liquor Store Rev.

Capital Outlay
- Education
- Libraries
- Welfare
- Hospital
- Health
- Highways
- Air
- Parking
- Water Transportation
- Police
- Fire
- Correction
- Protective Inspection
- Nat. Res.
- Parks
- Housing
- Sewerage
- Sanitation
- Fin. Adm.
- Judicial
- General Public Bldgs.
- Other Governmental Admin.
- Gen. exp., nec
- Other exp.
  - Utility
- Liquor Stores

Current Exp.
- Education
- Libraries
- Welfare
- Hospital
- Health
- Highways
- Air
- Parking
- Water Transportation
- Transit Subsidies
- Police
- Fire
- Correction
- Protective Inspection
- Nat. Res.
- Parks
- Housing
- Sewerage
- Sanitation
- Fin. Adm.
- Judicial
- General Public Bldgs.
- Other Governmental Admin.
- Interest on General Debt
- Gen. exp. nec
- Other exp.
  - Utility
- Liquor Stores

Debt
- LTD outstanding
- STD outstanding
- LTD issued
- LTD retired

Cash & Securities
- Non-Insur. Trust
  - Cash & Securities