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By
Christine K. Ranney
Lee M. Day
and
Michael R. Hattery

Department of Agricultural Economics
Cornell University Agricultural Experiment Station
New York State College of Agriculture and Life Sciences
A Statutory College of the State University
Cornell University, Ithaca, New York 14853

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*The research reported here was conducted under contract with the New York State Legislative Commission on State-Local Relations.

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EXECUTIVE SUMMARY

The research reported here is the second phase of a research project funded under contract with the New York State Legislative Commission on State-Local Relations. Phase one, involving data from a sample of 240 jurisdictions, constructed level of service indices for a variety of services and utilized those indices to conclude that the presumed homogeneity of functions and service structures within counties, towns or villages does not exist. Further, the study did not reveal any clear-cut local government hierarchy of service provision as implied by the per capita aid formula.

The objective of this study, also financed by the Commission, is to develop and evaluate alternative methods of aid distribution based upon combinations of criteria specifically fiscal capacity, fiscal effort and revenue needs. Two general methods or strategies for distributing aid were developed and evaluated: 1) Need-Capacity (NC) and 2) Need-Capacity-Effort (NCE).

Both aid distribution strategies require estimates of need defined as the cost of providing a standard level of service. To predict need for all jurisdictions in the state we began by using the Phase One sample of 240 governmental units to estimate cost functions for each of 16 service categories. The cost functions estimated with Tobit Analysis were used to predict the cost of providing two standard levels of service for each jurisdiction (except NY city) in the state, the average level of service and a low level of service. The sum of the projected costs for 16 service categories and the actual expenditures for general government support became the estimate of needed revenues for each jurisdiction.

Sixteen simulations of aid distributions were performed to demonstrate the aid distribution under the two general strategies, Need-Capacity and Need-Capacity-Effort. The simulations involve two levels of need (average and a level of service exceeded by 75 percent of the jurisdictions), two tax rates (average and one standard deviation below average), and three different sets of weights on need-capacity relative to effort gaps.

Using a Need-Capacity strategy as a benchmark, the effect of adding effort as a criterion for distributing aid is to shift the distribution of aid toward counties and cities and away from towns and villages. The shift is exaggerated as higher weights are placed on effort. Lowering the standard tax rate shifts the distribution of aid toward counties and towns and away from cities and villages when effort is not included among the criteria, lowering the standard tax rate shifts the distribution toward towns and away from counties, cities, and villages. The shifts in the distribution of aid resulting from inclusion of effort as a criterion and from lowering the standard tax rate are similar for both average and low levels of service.

Using the current distribution of general purpose aid as a benchmark, all of the Need-Capacity and Need-Capacity-Effort approaches

involve substantial redistributions of aid away from cities, with counties and villages being the major beneficiaries.

In order to gain some further insights into the distributional effects of different strategies, we compared on a per capita basis the distribution of aid to the most needy jurisdictions with that of other jurisdictions. We defined the most needy jurisdictions as those 10 percent with the largest gap between needed revenues and available revenues. All aid distribution strategies investigated here gave markedly more aid to the most needy counties, cities, towns and villages than to the average county, city, town and village. Finally, we note that while counties make 63 percent of the actual operating expenditures for the 16 services analyzed here, they receive only 22 percent of the current aid distribution. The gap strategies, at average levels of service, provide between 34 and 52 percent of the aid to counties and thus represent a middle ground between the current distribution of aid and of expenditures. The gap strategies, providing between 14 and 21 percent of the aid to cities are more closely aligned with the distribution of expenditures than with the current distribution of aid.

Formulating the information on gainers and losers portrays the difficult tradeoffs facing decision makers on intergovernmental aid. All the Need-Capacity and Need-Capacity-Gap strategies analyzed here target aid distribution toward the most needy jurisdictions in contrast to the uniform rate per capita provided for each class of jurisdiction under the per capita aid grant formula. But all of the gap strategies analyzed here, compared to the status quo, involve substantial redistribution of aid away from cities, with counties and villages being the major beneficiaries.

The State of New York has a long history of assistance to local governments. In 1946 a system of shared taxes was replaced with a general purpose aid system where the amount of general purpose aid was detached from specific revenue sources. The distribution of major portions of general purpose aid to local governments was and still is based on population and class of government. The level of per capita aid and, presumably, the level of service provided per capita is highest for cities, followed by towns outside villages, villages, and counties, in descending order. Further, the constant per capita amount to all jurisdictions within a class, villages for example, presumes that the same types of service are provided by all governments of the same class. The validity of the implicit assumptions of the aid formula was challenged when first implemented in 1946 and continues to be challenged today.

Numerous commissions, committees and studies have investigated the aid distribution system in New York (NYS Legislative Commission on State-Local Relations). Criticisms have been of two types: 1) the failure to use multiple criteria for the distribution of aid (for example, fiscal capacity and fiscal effort in addition to need), and 2) the inadequacy of measures currently used under the need criterion. The research reported here addresses both criticisms.

The objective of this study is to develop and evaluate alternative methods of aid distribution based upon combinations of criteria, specifically, tax capacity, tax effort, and revenue needs. The development of a measure of need that accounts for differential service provision costs is a necessary first step. Cost functions for sixteen service areas are estimated for a sample of jurisdictions in the state. Given the estimated cost functions, a measure of need based on the cost of providing standard levels of each service is predicted for each jurisdiction in the state (except New York City). Alternative aid distribution methods are then simulated using estimated need along with measures of tax capacity and effort. Each step will be presented, in turn, preceded by a discussion of previous research on intergovernmental aid in New York and elsewhere.

The research reported here is the second phase of a research project funded under contract with the New York State Legislative Commission on State-Local Relations. Some of the data utilized for estimating the service area cost functions were collected in Phase One. A rather lengthy and comprehensive survey instrument, completed by local public officials, was administered in the Spring of 1985. For each service listed on the survey, local officials were asked whether or not they provided the service, how they produced it, how they financed it, and whether or not they thought the service was mandated.

Preliminary evaluation of the data from the sample of 240 New York jurisdictions (22 cities, 25 counties, 122 towns, and 71 villages) indicates that the presumed homogeneity of functions and service structures within cities, towns, villages or counties does not exist (Hattery, *et. al.*). In reality there is considerable variability in the level of services provided within types of government. Further, the study did not reveal any clear-cut local government hierarchy of service provision

as implied by the current formula. For example, it was found that some villages provided higher levels of services than some cities, yet all cities receive higher amounts of aid per capita than all villages under the current aid formula.

INTERGOVERNMENTAL AID

Many suggested alternative criteria for distributing aid are revealed in the literature on intergovernmental aid. Three major concepts can be distinguished from a large number of ways of measuring these concepts. The three concepts are fiscal capacity, effort, and need.

Fiscal capacity is conceived as the capacity to raise local revenues. It is sometimes referred to as tax capacity in recognition of the difficulty of measuring user fees especially when user fees bypass the local government accounting system and budget by going direct to a private producer. Often-suggested measures of fiscal capacity are per capita income, market value of assets, full value assessment, or capacity as measured by a representative tax system such as that used by the United States Advisory Commission on Intergovernmental Relations (1982).

Fiscal effort is a concept similar to plant utilization in manufacturing. It is the ratio of revenues raised to fiscal capacity, or the utilization rate of fiscal capacity. Often suggested measures are property tax rate, sales tax rate, or locally raised revenues divided by fiscal capacity.

Fiscal needs recognizes that not all services delivered by all units of government are essential, that some minimum level of service delivery is expected of all units of government, regardless of their fiscal capacity. Measures often suggested include minimum service levels perhaps as reflected by expenditures per capita; service needs for special populations reflected by such measures as percent poor, percent children, and percent elderly; higher costs of achieving specific levels of service output, e.g. higher input costs, especially labor costs in metropolitan areas.

These concepts can be used singly or in combination to represent quite different strategies or philosophies with respect to intergovernmental aid. But it is the combination strategies that appear most interesting in that they allow us to offer decision makers a variety of policy options and at the same time allow them to explore the effects of alternative weights or values on different segments of the American belief system.

The Massachusetts system, as described by Katharine Bradbury *et. al.*, is an example of a combination strategy, more specifically a needs-capacity strategy. The heart of the Needs-Capacity (NC) strategy is the calculation of a gap. The gap is calculated by subtracting from the needed revenues, that level of revenues that would be available if a community taxed its tax base at some average or standard rate. Needed revenues could be defined as the cost of providing some average or

standard level of services in the community. The gap between needed revenues and revenue capacity then becomes a measure of the need for intergovernmental aid. The need for intergovernmental aid, as distinguished from needed revenues, could be considered a needs-based distribution strategy for general purpose aid. If the gap is zero, the need for intergovernmental aid is zero. The key to this kind of needs-based aid strategy is a standard of comparison. Needed revenue is based not on the level of services provided by a jurisdiction but on expenditures required to provide some standard level of services.

The Needs-Capacity strategy does not provide a mechanism for rewarding high effort. If we can define an effort gap as the difference between some extraordinary effort and an average or standard effort, we could add the effort gap to the Need-Capacity gap to create a Need-Capacity-Effort Gap. Think for example of defining extraordinary tax effort as the difference between tax revenue when a community taxes its tax base(s) at some higher-than-average rate and that level of tax revenue it would receive if it taxed its taxbase(s) at an average or standard rate. The use of the Need-Capacity-Effort gap strategy in addition to considering the need for intergovernmental aid would provide an effort bonus to those jurisdictions that made an extraordinary effort to help themselves. This strategy along with the Need-Capacity strategy are evaluated in this paper.

ESTIMATION OF NEED

Both aid distribution strategies require estimates of need, defined here as the cost of providing a standard level of service. To predict need for all jurisdictions in the state we begin by utilizing the Phase One sample of 240 governmental units and estimate indirect cost functions for each of sixteen service areas.[1] In general form,

$$C_i = c_i(w_1, \ldots w_n, q_i, S), \qquad (1)$$

where the w_i, $i=1,\ldots,n$, are input prices, q_i is output for service area i, with $i=1,\ldots,16$, and S is a vector of characteristics of the jurisdiction assumed to affect cost. This cost function assumes cost minimizing behavior and is convenient to use because, at least theoretically, it is a function of observable variables.

Certainly, costs (or expenditures), input prices, and jurisdiction characteristics are directly observable. However, obtaining output measures for services is problematic. As a proxy for service output we calculated service indices based upon responses to the Phase One survey. By intent, the survey was organized in a service hierarchy or category scheme that provided the basis for aggregation into sixteen service areas: law enforcement, fire prevention and control, animal control, health services, social services, services to the aging, recreation and culture, planning, highway, sewer, sanitation, water, public

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[1]For a detailed description of the data collected in Phase One see Hattery, et. al.

transportation, community development, economic development, and natural resources. With some exceptions, the index for service area i (IND_i) is a simple summated scale of the presence (=1) or absence (=0) of provision of each service included in the service category.

The remaining variables for the cost functions come from four different sources. Cost or expenditure data by service category for the all jurisdictions in the state (except New York City) were acquired from the New York State Comptroller's Bureau of Municipal Research and Statistics within the Division of Municipal Affairs. The Comptroller's office requires each municipality within the state to file a financial statement annually, reflecting the previous year's revenues and expenditures. The fine level of detail of these data allowed calculation of $COST_i$, the cost for service area i, by aggregating FY 1984 operating expenditures matching the services included in our sixteen service areas.[2] Many other fiscal items were drawn from the Comptroller's database for all jurisdictions in the state either for estimation of the cost functions for the sample or for subsequent statewide simulation of alternative aid distributions. These fiscal items include: tax rate and base information, user fees by service area, revenues from other municipalities for services performed for those governments ($OTHREV_i$), fringe benefits, total population, and land area. Population and density variables are as reported in the 1980 Census, except for towns with village populations. For such towns, the village population has been deducted from the total. Hence, POPTOV and DENTOV reflect the adjustment for town-outside-village (TOV) residents.

Salary and wage data for 1984 were acquired from the New York State Public Employee Retirement System and Police and Firemen's Retirement System automated database. The wage per employee was calculated or estimated for each municipality.[3] The wage data was combined with fringe benefit expenditures per employee from the Comptroller's database to obtain a measure of labor cost per employee (LCOST), an input price. A measure for nonlabor cost per employee (NLCOST), the other input price calculated for the analysis, was obtained by subtracting total labor cost from total operating cost and dividing by the number of employees for each jurisdiction.

The final sources of data are the 1980 Census of Population and Housing and New York State Department of Transportation (NYSDOT). Items from census include, percent in poverty (POVERTY), percent over 65 years of age (ELDERLY), percent youth (YOUTH), education levels (ED), and housing characteristics (PLUMBING) for each municipality in New York State. NYSDOT provided information on road mileage (MILEAGE) for each jurisdiction (1984). These variables along with POPTOV, DENTOV, and OTHREVS are the components of S in (1), variables assumed to affect cost depending upon the service area.

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[2]See Appendix A for details.

[3]See Appendix A for details.

Given the variable definitions above, the final specification of the cost function for the ith service is

$$C_i = b_o + b_1 LCOST + b_2 NLCOST + b_3 DENTOV + b_4 POPTOV + b_5 POPTOV^2 + b_6 INDi + b_7 INDPOPi + b_8 TOWN + b_9 CITY + b_{10} VILLAGE + b_{11} OTHREV_i + \sum b_{(11+n)} S_n + u_i, \quad (2)$$

where the number of terms, n, in the summation depends upon service area. For example, MILEAGE would be included in S when estimating highway and perhaps other costs. Likewise, when estimating social service costs, the extent of poverty (POV) may be important. The values of these variables do not differ by service area, but whether they are included does differ by service area. TOWN, CITY, and VILLAGE are dummy variables for jurisdiction type. It was not possible to determine labor and nonlabor cost by service area. Hence, LCOST and NLCOST, as well as the variables in S, are not subscripted. Note that OTHREV is not included in S because we do observe it for each service area.

Because some service areas are not provided by some jurisdictions, the dependent variables are limited with a lower bound of zero. Thus, changes in the explanatory variables affect not only the cost level for jurisdictions providing services, but may also affect the number of jurisdictions that do or do not provide services. In such limited dependent variable cases, Ordinary Least Square (OLS) estimation yields inefficient estimates of the parameters and inaccurate estimates of the expected values of the dependent variable. Specifically, forecasts based on OLS estimates can be negative. Tobit analysis (Tobin, 1958) avoids these problems and is utilized for this study.

Preliminary Tobit analyses yielded projected cost estimates that were particularly high for low population municipalities. By estimating cost function for high and low population municipalities separately, we were able to obtain a much closer correspondence between actual and projected values for both groups. In general, a population level of 8,000 was used to sort municipalities into the low (< 8,000) or high (> 8,000) group. Appendix B provides details on how this particular population level was chosen for the sorting rule, on the exceptions to the rule, and on other factors of concern in the estimation process.

The Tobit estimates of the cost functions for jurisdictions with populations of more than 8,000 and less than 8,000 are presented in Tables I and II, respectively. A sequence of likelihood ratio tests were conducted to obtain the final specifications reported in the tables. All coefficients reported therein are significant at the 95 percent confidence level based on asymptotic t-statistics. The coefficients cannot be directly interpreted as marginal changes in total costs as would be the case if they were obtained from OLS. Note that for Planning, two equations were estimated, one for counties and one for towns, cities, and villages. For Health and Social Services, only counties were included because few towns, cities, or villages provided any of the services within the category. The state designates counties to administer most social services. A similar argument can be made for Health, although many towns, cities, and villages do provide some health

Table I: Tobit Estimates of Service Cost Functions for Municipalities with Population $\geq$ 8,000

SERVICE AREA	CONSTANT	LCOST	NLCOST	DENTOV	POPTOV	POPTOV2	IND	INDPOP	TOWN	CITY	VILLAGE	OTHREV	MILEAGE	BELOWPOV	R^2
Law	-67.0			0.9	-134.5	0.130		7.34					19.6		.97
Fire	-3,019.6					-0.034		6.51	1958.5	5152.0					.79
Animal[a]	31.0				1.4	-0.001									.30
Health[b]	46,224.0	-3,563.7	456.9	54.5				0.94	NA	NA	NA				.89
Social Services[b]	134,340.0	-3,176.9	376.7		-466.7		-3,605.9	29.78	NA	NA	NA				.98
Aging	120.4				4.0				-829.3	-1,320.6					.59
Recreation & Culture[a]	-3,271.1				51.1	-0.012		-0.34	2,943.0	3,461.0	3,017.4				.79
Highway	3.3				46.2	-0.019		-2.13					8.0		.87
Sewer	-1,738.1				33.1	-0.009	452.0	-1.31					-6.0		.84
Sanitation	-3,967.4				31.7	-0.106		4.39	2,865.9	3,120.8	3,582.2	6.24	3.3		.92
Water	-7,416.7					-0.026		4.99	7,991.5	7,924.8	7,179.8		4.9		.90
Transportation	-2,082.3				36.7	-0.022		2.98					-9.0		.71
Planning(Co)[bc]	-507.6	28.3			0.9		NA	NA	NA	NA	NA				.60
Planning(TVCi)[d]	-94.8	2.3					3.6	0.20	NA						.71
Community Development[a]	-90,007.5				26.6	-0.023		1.27	4,532.5	5,518.8	6,548.5			34,238.0	.53
Economic Development	-796.1					0.003							2.6		.70
Natural Resources	-30.4					0.003	46.98	-0.43	-157.5				0.6		.94

[a] Population cutoff is 5,750 rather than 8,000. [b] Includes all counties and no towns, villages, or cities. [c] No index available. [d] Counties excluded.

Table II: Tobit Estimates of Service Cost Functions for Municipalities with Population < 8,000[a]

SERVICE AREA	CONSTANT	LCOST	NLCOST	DENTOV	POPTOV	POPTOV2	IND	INDPOP	CITY[b]	VILLAGE[b]	OTHREV	MILEAGE	R^2
Law	-291.6	16.8	-1.6					3.9	185.5	75.9	0.0014		.7289
Fire	-20.5	1.8	-0.2			1.07			148.3		0.0011		.6568
Animal[c]	-1.6	0.1	-0.1	-0.001	1.05								.3858
Aging	-1.6	-0.2			2.20	-0.22	0.70			-2.9			.2538
Recreation & Culture[c]	-31.2	2.0	-0.2					0.5		13.0			.3215
Highway	-12.1	3.7	-0.5					4.4	93.9		0.0015	3.1	.7791
Sewer	-150.9			0.031		2.71	28.04						.7304
Sanitation	-37.5	2.0	-0.3	0.008				3.3			1.5893		.6203
Water	-246.6				33.14		40.53						.2447
Transportation	-29.4						15.35						.1540
Community Development[c]	-20.6						3.05		41.7	8.7			.1011
Economic Development	-5.2						1.39						.1257
Natural Resources	-17.8	0.4			3.24	-0.38	2.50						.2666

[a] Only thirteen of the sixteen services are reported here. As noted in the text the other three, Planning, Social Services, and Health are treated differently. The results for those services are reported in Table II.

[b] Only city and village dummy variables are included. No counties were included in this population size group. Therefore, the omitted dummy variable is TOWN.

[c] Population cutoff is 5,750 rather than 8,000.

services. For planning, no index was calculated for counties due to inconsistencies in the survey instruments between counties and towns, cities, and villages. Therefore, town-city-village and county planning costs were estimated with and without an index term, respectively. For these services, the split by population size was not undertaken. Therefore, the results for these services are included in Table I but not Table II. Because the primary purpose for estimating the cost functions is to forecast standard need levels for simulation purposes, only a general analysis of the Tobit results will be undertaken.

The Phase One finding, that there is considerable variation in service levels within and across jurisdiction types, is confirmed by the cost function estimates. To test the hypothesis that jurisdiction type does not systematically explain differences in service provision costs, dummy variables for municipal type (town, city, and village) were included in the cost function specifications, where appropriate. For high population jurisdictions, Table I shows that seven of the relevant fourteen services included at least one significant municipal-type variable. In Table II, seven of the thirteen service cost estimates for low population jurisdictions have at least one significant municipal-type variable. There is not an exact correspondence in terms of which service costs are significantly affected by municipal type between the two population size groups. Even within a size group the relative magnitudes differ a great deal across jurisdiction types and services.

Consider for example, the results for high population jurisdictions for Sanitation and Water services in Table I. For Sanitation, the results show that the cost for towns, cities and villages are $2,865.9, $3,120.8 and $3,582.2 thousand more than counties' costs, respectively. The order completely reverses for Water services with costs for towns of $7,991.5 thousand more than counties followed by cities with $7,924.8 thousand and villages with $7,179.8 thousand more than counties on average. Taken together, the results suggest that jurisdiction type is not an accurate single determinant of need.

Preliminary specifications of the cost functions included a number of variables (S) hypothesized to affect service provision costs depending upon the service area. As reported in the tables, the only two variables that significantly do so are MILEAGE and BELOWPOV. MILEAGE may be reflecting service level for those with positive coefficients among high population jurisdictions (Law, Highway, Sanitation, Water, Economic Development, and Natural Resources) and low population jurisdictions (Law, Fire, Highway and Sanitation). The negative coefficients of MILEAGE for the cost of providing Sewer and Transportation by high population jurisdictions may be reflecting some economics of size. With the exception of BELOWPOV, which has a large effect on the cost of Community Development services for high population jurisdictions, none of the socio-demographic variables such as percent elderly were significant. It may be the case that total population overwhelms differences in characteristics within the population in determining costs.

Finally, some combination of variables that may reflect service levels (POPTOV, IND, and INDPOP) is significant for all service categories and both population size groups. Of particular interest is the fact that at least one of the two terms based on our calculated service indices (IND and INDPOP) is significant for eleven of thirteen and thirteen out of sixteen of the service areas provided by low and high population jurisdictions, respectively. The significance of these terms is important because the specific values of each service area index is used as a proxy for the standard service levels for the simulations.

CALCULATING STANDARD NEED

The cost function estimates provide the basis for predicting the cost of providing two standard levels of each service for every jurisdiction in the state. The average standard level of service is based upon a weighted average service index (AVEIND) for each service. The low standard service level utilizes a weighted first quartile service index (QUAIND). Weights were used to correct for differences in the percentages of municipal types in the sample compared to the state. To predict the cost of providing the average (low) service level, AVEIND (QUAIND) and that value multiplied by actual population, AVEINDPOP (QUAINDPOP) replace IND and INDPOP for prediction purposes. Thus, AVEIND (QUAIND) and AVEINDPOP (QUAINDPOP), along with actual values for the remaining variables are multiplied by the corresponding estimated coefficients from Tables I and II and transformed through the Tobit framework to obtain C^{s}_{ij}, the cost to the jth jurisdiction of providing a average (low) standard level of the ith service. For a detailed description of the standard cost projection process and results see Appendix B. The method by which these standardized costs are utilized for projecting needed revenues is described in the following section on simulation.

SIMULATION

In the remainder of this paper we will be concerned with utilizing these cost estimates and other data from the financial accounting system to simulate the effects of alternative general strategies and specific policy options on the distribution of per capita aid. The two general strategies to be investigated are combination strategies: a Need-Capacity gap and a Need-Capacity-Effort gap. The policy options will include alternative standard tax rates and alternative weights on Need-Capacity and Effort gaps, and standard levels of service.

It is assumed that all jurisdictions are held harmless at the current dollar amounts of per capita aid and the simulations are concerned only with possible changes in the formula for the distribution of appropriations above the hold harmless level. The appropriations to be distributed under the new alternatives are assumed to be at the $100 million level but distributions for other appropriations can be derived.

The general framework of taxation will be held constant. For example, only counties and cities will be allowed to levy a sales tax.

City and county sales tax rates may change but the limit on local sales tax rates of 3 cents per dollar (with exceptions for a few jurisdictions) remains. New taxes are not considered. Rules about "prior rights" to sales taxes are retained. Both cities and counties are assumed to have and exercise a prior right to a 1.5-cent sales tax rate. Thus if a county contains a city and each chooses to exercise its prior rights, the city would collect 1.5 cents on sales within the city limits and the county would collect the remaining 1.5 cents. If the city in our example exercises its prior right, the county could be collecting 3 cents outside the city but only 1.5 cents inside the city. To ensure that the county taxes sales at the same rate in all jurisdictions, it is assumed that the county must distribute to the cities (if any), villages and towns in the "remainder" of the county, the additional 1.5 cents it collects in the remainder of the county. This distribution is based on the proportion of full value of taxable property in each jurisdiction, except in Tompkins County where population must be used. These rules are held constant.

The counties may elect to retain from 0 percent to 100 percent of sales tax revenues collected from the entire county (after the mandated distribution noted above). For purposes of this analysis it is assumed that the county is credited with 100 percent of the sales tax revenues collected from the entire county.

All jurisdictions retain the right to levy a tax on real property but the tax rate will be allowed to vary. All other taxes and fees are assumed to be held constant at the FY1984 levels, i.e., only the rates on real property and county and city sales tax rates will be allowed to vary.

The general procedure in that which follows will be to define and compute Needed Revenue and Revenue Capacity and use these calculations to compute a need capacity gap for each jurisdiction. An effort gap will be calculated for those jurisdictions making extraordinary effort to raise revenues and this effort gap will be added to the need capacity gap to form a need-capacity-effort gap strategy. Needed Revenue is defined as

$$NR_j = CGGj + \sum_{i=1}^{16} C_{ij}^s, \qquad (3)$$

where NR_j = Needed Revenue in the jth jurisdiction,

CGG_j = the total operating cost of general government support and debt service activities in the jth jurisdiction,

C_{ij}^s = the total operating cost of providing the ith service at the sth standard level, and

the C_{ij}^s are calculated as described in the previous section.

It should be noted that an accounting system designed for maintaining accountability does not include depreciation on buildings or other investments. Also, note that operating costs were predicted for

average levels of service and for low quartile levels of service, a level of service exceeded by 75 percent of the jurisdictions.

Revenue Capacity for jurisdiction j is defined as

$$RC_j = B_{1j}t_1^s + B_{2j}t_2^s + K_j, \quad (4)$$

where B_{1j} = the real property tax base at full value assessment in the jth jurisdiction

t_1^s = the standard real property tax rate

B_{2j} = the county (or city) sales tax base

t_2^s = the standard county (or city) sales tax rate

K_j = other income to the government of jurisdiction j, includes fees, user fees, other property taxes, federal and state aids and income derived from services performed for other governments.

Any analyst initiating work of this kind would be well advised to become acquainted with the idiosyncrasies of the state accounting system. In New York for example, county sales tax revenues may be distributed to cities, towns and villages via a sales tax credit against the property tax levied by the county in those jurisdictions. Thus county property tax revenues must be adjusted to include those sales tax credits before the revenue is divided by full-value assessment to obtain the property tax rate. In a similar fashion sales tax revenues for cities in the data base include county sales tax revenues distributed to the city by the county. Thus in calculating a sales tax base for the city the sales tax revenue for the city must be adjusted to include only sales tax revenues generated by the city sales tax before dividing by the city sales tax rate to obtain a city sales tax base. Also county sales tax revenues in the data base does not include the sales tax revenues distributed in cash to cities, towns, and villages. These sums are available, however, and were added to county sales tax revenues for the purpose of computing a county sales tax base. Further details on the required adjustments are presented in Appendix C.

Average tax rates were assumed as the initial definition of a standard tax rate. City sales tax rates were averaged over 61 cities including a zero for the 33 cities which chose not to levy a sales tax. County sales tax rates were averaged over 57 counties including a zero for four counties that chose not to levy a county sales tax.

Property tax rates were averaged over all 1606 jurisdictions. It might be argued that the property tax rate should be averaged within type of jurisdiction, that is within counties, cities, villages and towns. Note that cities typically levy higher tax rates than do other jurisdictions. To compute an average property tax rate for cities and to use that as the standard rate of utilization of the property tax base would appear to constitute a bias against cities. For example, for any given minimum level of service, the need-capacity gap would be smaller

for cities (because of the higher tax rate for cities) and the amount of aid received by cities would be proportionately lower. Thus the standard property tax rates were derived from the average across all 1606 jurisdictions.

The Need-Capacity gap is defined as

$$NCGAP = NR_j - RC_j \quad \text{s.t.} \quad NR_j > RC_j. \tag{5}$$

As a first step in developing another strategy for the distribution of general purpose aid an effort gap is calculated as

$$EGAP_j = OSR_j - (B_{1j}t_1^s + B_{2j}t_2^s), \tag{6}$$

$$\text{s.t.} \quad OSRj > B_{1j}t_1^s + B_{2j}t_2^s,$$

where: OSR_j = own source revenue or total revenue less state and federal aids,

$B_{1j}t_1^s$ = revenue from taxing the full value assessment of real property at a standard rate

$B_{2j}t_2^s$ = revenue generated by a sales tax when sales are taxed at a standard rate for that class of jurisdiction of which j is a part.

The Need-Capacity-Effort gap is defined as

$$NCEGAP_j = a_1 NCGAP_j + a_2 EGAP_j, \tag{7}$$

where a_1 = the weight to be attached to the need-capacity gap
a_2 = the weight to be attached to the extraordinary effort as measured by the effort gap.

Finally, within any particular strategy or policy option the distribution of general purpose aid to a jurisdiction is given by

$$AID_j = \frac{GAP_j}{\sum_j GAP} * \text{Appropriations}. \tag{8}$$

Using standard spreadsheet software, the effects of alternative strategies and policy options on the distribution of per capita aid are simulated.[4] Within the two general strategies, Need-Capacity and Need-Capacity-Effort, the alternatives were limited to two different tax rates (average and one standard deviation unit below average) and

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[4]The simulation procedures including an overview of the design of the spreadsheets are shown in Appendix D. The specific documentation of the spreadsheets is shown in Appendix E.

alternative weights on need-capacity and effort gaps, and the two standard levels of service, average and low.

The results of 16 simulations are presented in Tables III and IV. The eight reported in Table III assume that each jurisdiction provides a standard level of service defined as the average level provided by each service. The remaining eight simulations in Table IV assume a lower level of service--the lowest quartile--meaning that 75 percent of the jurisdictions provided a higher level of service.

Average Levels of Service. First consider the effect of adding effort as a criterion for distributing aid. Holding tax rates constant at the average level and then at one standard deviation below the average (low rate) implies comparing columns 1, 3, 5 and 7 of Table III for average rates and 2, 4, 6 and 8 for low tax rates. In each case adding an effort bonus shifts the distribution toward counties and cities and away from villages and towns. The shift is exaggerated as higher weights are placed on effort, compare for example columns 5 and 7 at average tax rates or columns 6 and 8 at low tax rates.

Lowering the standard tax rate shifts the distribution of aid toward counties and towns and away from cities and villages when effort is not included as a criterion. In contrast if effort is included among the criteria, lowering the standard tax rate shifts the distribution toward towns only and away from counties, cities and villages. This shift in distribution takes place at all weights on effort considered in this analysis.

The final two columns of Table III allow some interesting comparisons with each other and with different aid distribution strategies. First, note that while counties currently make 63 percent of the actual operating expenditures for the sixteen services, they receive only 12 percent of the current aid distribution. In contrast cities currently make 15 percent of the expenditures for services but receive 52 percent of the current aid distribution. The gap strategies providing between 34 and 52 percent of the aid to counties, represent a middle ground between the current distribution of aid and of expenditures. The gap strategies, providing between 14 and 21 percent of the aid to cities are more closely aligned with the distribution of expenditures than with the current distribution of aid.

Low Levels of Service. The effect of adding an effort bonus for low levels of service are the same as at an average level of service. As can be seen in Table IV the distribution of aid is shifted toward counties and cities and away from villages and towns. The shift is exaggerated by higher weights on effort.

Lowering the standard tax rate shifts the distribution of aid toward counties and towns and away from cities and villages when effort is not included. In contrast, when effort is included as a criterion, lowering the tax rate shifts the distribution toward towns only and away from counties, cities,and villages. This shift is true whenever effort is included and all weights on effort considered in this analysis. Thus the shifts in distributing of aid resulting from inclusion of effort as

Table III: Simulation Results for Alternative Aid Distribution Strategies
AVERAGE NEEDS

	(1) NC Avg. Rates	(2) NC Low Rates	(3) NCE Avg. Rates High Wt. on NC[a]	(4) NCE Low Rates High Wt. on NC[a]	(5) NCE Avg. Rates Equal Weights	(6) NCE Low Rates Equal Weights	(7) NCE Avg. Rates High Wt. on Effort[b]	(8) NCE Low Rates High Wt. on Effort[b]	(9) Current Aid Distribution	(10) Current Expenditures[c]
	Average Dollars									
County	604,843	624,622	786,603	747,693	851,893	796,960	905,979	840,085		
City	271,187	225,886	316,161	274,379	332,316	293,791	345,699	310,783		
Town	27,465	34,258	20,252	27,758	17,661	25,156	15,514	22,879		
Village	43,158	34,849	31,390	27,568	27,163	24,654	23,661	22,102		
	Percentages									
County	34	36	45	43	49	45	52	48	12	63
City	16	14	19	17	20	18	21	19	52	15
Town	25	31	19	25	16	23	14	21	27	16
Village	24	19	17	15	15	14	13	12	9	6

[a] Weight on NC = 2, weight on E = 1.

[b] Weight on NC = 1, weight on E = 2.

[c] Expenditures are total operating expenditures for 16 services analyzed in this report.

Table IV: Simulation Results for Alternative Aid Distribution Strategies
NEEDS = LOW QUARTILE

	(1) NC Avg. Rates	(2) NC Low Rates	(3) NCE Avg. Rates High Wt. on NC[a]	(4) NCE Low Rates High Wt. on NC[a]	(5) NCE Avg. Rates Equal Weights	(6) NCE Low Rates Equal Weights	(7) NCE Avg. Rates High Wt. on Effort[b]	(8) NCE Low Rates High Wt. on Effort[b]	(9) Current Aid Distribution	(10) Current Expenditures[c]
	Average Dollars									
County	530,346	555,536	767,718	722,715	843,505	783,146	902,994	833,358		
City	287,570	240,613	328,340	286,812	341,356	303,511	351,574	317,387		
Town	28,155	35,581	19,904	27,843	17,270	25,045	15,202	22,721		
Village	47,895	38,160	32,571	28,634	27,678	25,190	23,838	22,329		
	Percentages									
County	30	32	44	41	48	45	52	48	12	63
City	18	15	20	18	21	18	21	19	52	15
Town	26	33	18	25	16	23	14	21	27	16
Village	26	21	18	16	15	14	13	12	9	6

[a] Weight on NC = 2, weight on E = 1.

[b] Weight on NC = 1, weight on E = 2.

[c] Expenditures are total operating expenditures for 16 services analyzed in this report.

a criterion and from lowering the standard tax rate are similar for both average and low levels of service.

As with average levels of service the gap strategies for counties represent a middle ground between the distribution of expenditures and the current distribution of aid. For cities the distribution of aid with the gap strategies is more closely aligned with the distribution of expenditures than with the current distribution of aid.

Comparing Levels of Service. Lowering the level of service from an average level to that represented by the lowest quartile shifts the distribution of aid away from counties and toward cities, towns, and villages when effort is not included as a criteria for distributing aid. For example, for villages at average tax rates (col. 1) lowering the level of service increases the village's share of the assumed level of aid appropriation from 24 to 26 percent.

In contrast, if effort is included as a criterion, lowering the level of service shifts the distribution of aid away from counties and towns and toward cities and villages. The lone exception to that statement is with low tax rates when lowering the level of service shifts the distribution of aid away from counties and toward cities, towns, and villages.

Aid to the Most Needy. In order to gain some insight into the distributional effects of the different strategies it might be useful to define the most needy jurisdictions and compare on a per capita basis the distribution of aid to those jurisdictions with that to other jurisdictions. For example, let us define the measure of needy as need-capacity where the need is defined as the costs of each of the services at a standard level plus the costs of general government support and the capacity is defined as the income generated by taxing the tax base(s) at the standard tax rate plus all other income including federal and state aid. Further, we define the most needy as those 10 percent with the largest gap between needed revenues and available revenues. Note that a large gap between needed revenues and available revenues could arise from either high costs of providing a standard level of services or lower available revenues resulting from lower tax bases. It is useful to make these comparisons on a per capita basis as shown in Table V.

As expected all aid distribution strategies investigated here gave markedly more aid to the most needy of the counties, cities, villages and towns. But the ratio of aid for the most needy to that for the average jurisdiction was by no means uniform across strategies. For example, at average tax rates comparing columns 1, 3, 5 and 7 for counties, it is seen that the addition of an effort bonus lowers the ratio of the amount received by the most needy counties to that received by the average county and that tendency is exaggerated as the weight on effort increases. This statement is also true for cities, towns and villages. Using a comparison of columns 2, 4, 6 and 8 reveals the same conclusions for low tax rates. Clearly if the objective is to give the most aid to the most needy governments of each type the need-capacity gap is the preferred strategy followed in order by need-capacity-effort

Table V: Comparison of Effect of Alternative Strategies on Aid Distribution Per Capita to the Most Needy Jurisdictions

	(1) NC Avg. Rates	(2) NC Low Rates	(3) NCE Avg. Rates High Wt. on NC[a]	(4) NCE Low Rates High Wt. on NC[a]	(5) NCE Avg. Rates Equal Weights	(6) NCE Low Rates Equal Weights	(7) NCE Avg. Rates High Wt. on Effort[b]	(8) NCE Low Rates High Wt. on Effort[b]
Average 10% Most Needy Counties	30.40	23.54	16.66	14.55	11.72	10.95	7.63	7.80
Average All Counties	7.02	5.82	5.43	4.91	4.86	4.55	4.39	4.23
Average 10% Most Needy Cities	45.02	32.13	26.18	20.57	19.42	15.94	13.81	11.89
Average All Cities	15.78	12.46	12.25	10.54	10.99	9.77	9.94	9.10
Average 10% Most Needy Towns	23.41	19.11	13.25	12.09	9.60	9.29	6.58	6.83
Average All Towns	4.50	5.49	3.05	4.17	2.53	3.65	2.10	3.18
Average 10% Most Needy Villages	50.01	38.52	28.81	24.20	21.19	18.47	14.88	13.45
Average All Villages	8.48	7.48	6.66	6.24	6.00	5.74	5.46	5.30
			RATIOS					
Aid to Most Needy Counties/ Aid for Average County	4.33	4.01	3.07	2.96	2.41	2.41	1.74	1.84
Aid to Most Needy Cities/ Aid for Average City	2.86	2.58	2.14	1.95	1.77	1.63	1.39	1.31
Aid to Most Needy Towns/ Aid for Average Town	5.20	3.48	4.34	2.90	3.79	2.55	3.13	2.15
Aid to Most Needy Villages/ Aid for Average Village	5.90	5.15	4.33	3.88	3.53	3.22	2.73	2.54

[a] Weight on NC = 2, weight on E = 1.

[b] Weight on NC = 1, weight on E = 2.

with high weight on NC, NCE with equal weights and NCE with high weight on effort.

Making comparisons across types of governments, it will be noted that for all strategies cities (all cities) receive the largest per capita aid followed in order by villages, counties, and towns. But the spread from top to bottom, cities to towns is largest for NC strategies and decline as effort is added as a criteria and that decline in spread continues as effort receives a higher weight (compare columns 1, 3, 5 and 7 for average tax rates and 2, 4, 6 and 8 for low tax rates).

Although cities and villages would receive higher amounts of aid than counties on a per capita basis, the higher population in counties would mean that the aggregate amount of aid going to counties would far exceed that going to any other type of jurisdiction.

Tradeoffs. Formulating the information on gainers and losers as shown in Tables III, IV, and V portrays the difficult political tradeoffs facing decision makers regarding intergovernmental aid. Table V clearly demonstrates that all the need-capacity and need-capacity-effort strategies analyzed here target aid distribution toward the most needy jurisdictions in contrast to the uniform rate per capita provided to each class of jurisdiction under the per capita aid grant formulas. But on the other hand, compared to the status quo as reflected in column (9) of Table III, all of the need-capacity and need-capacity-effort approaches involve substantial redistribution of aid away from cities with counties and villages being the major beneficiaries. Because of this major departure from the status quo, it seems likely that the adoption of any of these strategies would be feasible only if the program were designed as an increment to the current aid distribution.

SUGGESTIONS FOR FUTURE RESEARCH

This research provides a framework for designing alternative methods for distributing state aid to local governments in New York State. The particular strength of this innovative methodology is the fact that all suggested alternatives rest on a solid foundation of service cost estimation. This foundation could be further strengthened with additional research. First, the current estimation procedure, with a cost function estimated for each service category, presumes that there are no tradeoffs between services when cost conditions change. A joint estimation procedure, wherein all service cost functions are estimated at the same time, would allow for interaction between services and is a logical next step for further research.

The "special treatment" required for Social Services and for Health is symptomatic of a larger issue that also indicates further research possibilities. Recall that we were able to estimate cost functions for these services only for counties. It has been suggested that counties should be dropped entirely from the general aid system and treated separately. That suggestion is not generally supported by the results reported here or in Phase One. In the earlier phase, counties were observed to provide unique levels of Social Services and Health

only, with no overlap with the levels provided by towns, cities, and villages. For all other services, counties were not unique and could not be distinquished from the other jurisdictions in terms of service levels. The estimation of the cost functions in this phase supports the observations and the results from both phases taken together suggest that it may be appropriate to continue to include counties in state aid programs but exclude Social Services and Health when estimating and calculating need. State-county financial arrangements regarding those two services could be handled separately.

Our suggestions for further research, therefore, are joint estimation referred to earlier, excluding Social Services and Health when determining need for state aid, or both. Any one of these suggestions would add interesting insights into alternative methods for distributing general purpose aid to localities in New York.[5]

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[5]Discussion with the Commission staff led to additional simulations which are presented in Appendix F.

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APPENDIX A

DATA DEVELOPMENT DOCUMENTATION

A. Development of Expenditure Aggregates for the Sixteen Services Areas

The 1984 operating expenditure data maintained by the Bureau of Municipal Research and Statistics within the New York State Comptroller's Division of Municipal Affairs was aggregated into 16 service areas through a joint effort of the Bureau and the project team to coincide with the service area indices created in the first phase of this project. The aggregation process attempted to match as closely as possible the services enumerated within a particular index with operating expenditures for those services. In each service area but Aging services, a group of Tab level data items (Tab is a summary level of data aggregation used by the Bureau) closely approximated the services combined in a particular index. In these situations the costs for the service area were calculated by using the tab level data items and adding/subtracting individual account code strings associated with services that needed to be included or deleted from the service cost grouping. This overall service area cost assignment process is summarized in the attached table titled "Expenditure Tabs" (Table A1). Seventeen municipalities failed to file a financial report with the Comptroller in 1984. These jurisdictions were excluded.

A point of clarification is necessary with respect to services performed for other local governments. The original intention was to subtract local intergovernmental revenues from the relevant service expenditures. The resulting expenditures would then reflect the cost of services performed within the jurisdiction. However problems developed in trying to execute this subtraction, in part, because these intergovernmental revenues capture more than operating costs (i.e. they include some capital recovery and profits). As a result some expenditure fields were driven negative. To solve this problem local intergovernmental revenues were not subtracted from the expenditure amounts, but were controlled for in the estimation process.

B. Estimation of Wage Amounts for Missing Data

The New York State Employee's Retirement System and Policemen's and Fireman's Retirement System data base was used to calculate an average wage or labor cost for municipalities. Some towns and villages are not participants in this retirement system. For those communities not on the system, an estimation technique was used to derive a wage figure. The estimates were derived by regressing wages for participating towns on population and a consumer price index relevant for the town's county. This equation was then used to estimate a wage for the towns not participating in the system. An identical procedure was used for villages not participating in the retirement system. This procedure had to be used for 133 towns (14%) and 118 villages (21%).

Table A1: Expenditure Tabs

Category	Definition	Tabs	Codes that need to be added	Codes that need to be subtracted
1	Law Enforcement (3100-3297) Traffic (3300-3397)	0311, 0313, 0314 0351, 0353, 0354	Allocation of Administration Communication & Training1	
2	Fire Prevention (3400-3497)	0341, 0343, 0344	Safety Inspection (3620) Allocation of Admn.,Communication & Training	
3	Animal control or Other public safety (3500-3997)	0391, 0393, 0394	Allocation of Admn. Communication & Training	3625; Rescue squads 3620; Safety Inspect. 3650; Clearance & Demolition
4&5	Health (4000-4997)	0401, 0403, 0404	1185; County Coroner 8822; Planned Parenthood 3625; Rescue squads	4082; WIC (our 6)
6	Social Services (6000-6010,6011-6197)	0601, 0603, 0604 0611, 0613, 0614	4082; WIC 8820; Prevent cruelty 6530; Private Soc. Serv. 6770; Foster grandparents	1892; Employees subsistence
7	Aging		6772: programs for aging	
8&9	Recreation & Culture (7000-7010, 7011-7397, 7400-7997)	0711, 0713, 0714 0741, 0743, 0744	7610; Program for Aging	2092 Employees subsistence
10	Highways (5000-5149,5157-5410)	0511, 0513, 0514	8170; street cleaning cat. 12	5410; sidewalk improve. to cat. 17
11	Sewer (8100-8159)	0811, 0813, 0814		
12	Sanitation (8160-8297)	0871, 0873, 0874		8170; street cleaning (our cat. 10)
13	Water (8300-8397)	0831, 0833, 0834		

Category	Definition	Tabs	Codes that need to be added	Codes that need to be subtracted
14	Other Utilities (8400-8497)	0821, 0823, 0824		
15	Public Transportation apparently = Other transportation (5411-5997)	0591, 0593, 0594		1792 Employees Subsistence
16	Planning & Zoning (apparently = General environment (8000-8097)	0801, 0803, 0804		8090; Environ. Control 8040; human rights 8080; Commissioner of utilities
17	Community Development (apparently = General environment (8620-8697)	0861, 0863, 0864	8989; Misc. Comm. Serv. 3650; Clearance & Demolition 8540; Public works 8610; Rent subsidies 8611; Emergency tenant protection 8612; Municipal housing 5410; Sidewalks (included in your cat. 19)	8660; Acquisition of Real Property 8662; Public Works, Facilities, Site Improvements
18	Economic Development apparently = CETA & related 6200-6397 & Econ. Dev. (6400-6997) and aging (7610)	0631, 0633, 0634 0641, 0643, 0644	8720; Redevelopment aging	6530; Priv. Soc. Serv. 6770; Foster grandparents 6772; program for aging 7610; program for aging 6785; Disaster Assis. (to unallocated) 6440; State Office Bldg. Project 6510; Vet. Services
19	Natural Resources apparently = Home & Community services, Other (8500-8619, 8700-8997)	0891, 0893, 0894	8090; Environ. control	8820; Prevention of cruelty to child (our cat. 6) 8822; Plan. Parenthood 8540; Public works 8610; Rent subsidy 8611; Emergency tenant 8612; mun. hsng. auth. 8720; Redvlpmt agency 8989; Misc. Home & Comm. Serv. 8510; Beautification 8520; Noise abatement

Category	Definition	Tabs	Codes that need to be added	Codes that need to be subtracted
				8810; Cemetaries 8550; Joint Drainage 8560; Shade Trees 8570; Garden Plots
	General Govt. (1000-1897 1900-1997)	0101, 0103, 0104 0191, 0193, 0194, 01960	8810; Cemetaries 8560; Shade tree lots 8570; Garden plots 6785; Disaster assistance 6510; Veterans service 6440; State Office Bldg. Project 8040; Human rights 8080; Comm. of utilities 8510; Beautification 8520; Noise abatement	1185; County Coroner
	Debt Services (9710-9770)	0916, 0936, 0946 0976, 0906, 0977		

1 After adjustments have been made to fields 1, 2 & 3 including subtraction of capital account code pulls, then:

$$\frac{\text{Field 1}}{\text{Field 1 + Field 2 + Field 3}}$$ (3010 + 3020 + 3030) should be added to Field 1.

Likewise, $$\frac{\text{Field 2}}{\text{Field 1 + Field 2 + Field 3}}$$ (3010 + 3020 + 3030) should be added to Field 2.

and, $$\frac{\text{Field 3}}{\text{Field 1 + Field 2 + Field 3}}$$ (3010 + 3020 + 3030) should be added to Field 3.

APPENDIX B

NEED PROJECTIONS: PROCESS AND RESULTS

Two activities, estimating cost relationships followed by projecting statewide needs, were pursued sequentially. These projected needs were then analyzed for reasonableness followed by another phase of estimation until a satisfactory set of statewide projections were achieved. In the remainder of this section, a review of the criteria for evaluating the reasonableness of statewide projections will be followed by a descriptive review of the actual iterations of estimation and projection results.

Two criteria were assessed in judging the quality of projections produced by the estimated cost equations. The two criteria were: projected per capita cost, and the aggregate of total projected statewide need. The application of each of these criteria will be discussed separately below.

Projected need per capita was used to evaluate the reasonableness of the projections. Projected need per capita was calculated by population size quartile for each municipal type. These figures were then gauged against acceptable levels of per capita local tax rates and intergovernmental aid for reasonableness. For example, if we consider the projection of needs statewide using an average level of service assumption, one might be willing to accept needs per capita as high as $1000 but not as high as $10,000 per capita. The former could translate into a local tax bill of approximately $2,800 for a family of four while the latter figure could translate into a local tax bill of $28,000 for the same family (assuming state and federal transfers are approximately 30 percent of local revenues and ignoring commercial, retail and industrial taxpayers). Used in this way, projected needs per capita provide an important criteria for evaluating the quality of estimation and the resulting projected municipal revenue needs.

Total projected need was also compared to total actual municipal operating expenditures statewide for the group of services in question. In general, it was expected that total projected need would exceed the comparable aggregate of actual expenditures for services. This was expected in particular under the average level of service assumption because total need would reflect the cost of bringing a significant percentage of municipalities up to the average level of service provision. However, it was also deemed unreasonable for total projected need to exceed actual operating costs by several times. Such a large level of aggregate projected need would indicate a doubling or trebling of available revenues which would reflect an unrealistic development of need in the current environment.

In general, the criteria noted above helped to identify the need for adjustments in estimating service revenue need. In the first set of estimations a single equation OLS model was assumed and used to estimate the cost equation across the full sample. In most service areas, a

large number or negative values resulted from using the OLS estimates to project need for all local governments in the state.

The use of single equation Tobit estimation for each service area eliminated the problem of negative projections, but it did not yield a satisfactory distribution of per capita need. In particular, per capita need for the smallest 25 percent of towns and villages were over $7,000 and $12,000 per capita respectively.[1] These values were clearly outside the bounds of reasonableness for local service provision. Experimentation with splitting the sample into two groups according to population size for use in Tobit estimation helped to solve this problem.

A population split was determined for each service by inspecting bivariate plots of total expenditures for the service area versus population. The plots were examined for the presence of a point at which relationship between expenditures and population exhibited a marked change. For ten of the 16 service areas the population split was found to be at a population of 8,000.[2] For three of the remaining six services the split was determined to be at a population of about 5,750.[3] For all three of the remaining service areas, Planning, Health, and Social Services, counties were split off as a separate group for estimation. In Health and Social Services, no need estimation of projection was done for towns, cities, and villages. For Health and Social Services 90 percent and 99 percent of expenditures respectively are made by counties with a substantial proportion of state revenue support. Substantial problems were encountered in trying to estimate city, town and village cost equations for these two services.[4] Other researchers have documented the existence of such segments or subgroups in analyzing local government service costs (Stinson and Lubov, 1982).

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[1] The per capita figures cited here are for the lower level of services assumption (first quartile values on the service indices). The per capita need values at the average of service assumption were $8,700 and $13,600 for towns and villages respectively. While not as high, per capita need values were too high for the second and third quartiles for both towns and villages. In general the need projections for county and city were acceptable on a per capita basis for all four quartile groups.

[2] The services with the sample split at 8,000 population are: Law Enforcement, Fire Prevention and Control, Aging Services, Highway, Sewerage, Sanitation, Water, Transportation, Economic Development, and Natural Resources.

[3] The services split for estimation at a population of 5,750 are: Animal Control, Recreation and Culture, and Community Development.

[4] Town, city and village Health and Social Services expenditures for 1984 were lumped in with the unestimated portion of need to compensate for their exclusion from estimated need projections.

As the estimation changes proceeded sequentially toward the final set of cost equations there was a simultaneous drop in the total projected need calculated from the cost equations. Initially the total projected need was approximately eighty percent higher than comparative total actual 1984 costs, while the final set of cost equations produced a total projected need that was about fifteen percent higher (using the higher or weighted average level of service assumption).

Characteristics of the Final Need Projections

Table B1 shows the distribution of projected need by municipal class for the Average Need, and Low Need options along with the population distribution, comparative total cost figures for 1984, and percentages for the current aid distribution. Both need options represent increases from actual costs in the totals. The Average Need option shows a higher level of need than the Low Need option in both the total and for each municipal class. The Average Need option shows an increase over actual expenditures for each municipal class except cities which declines by seven percent. The Low Need Option shows a total increase over actual expenditures for towns and villages and a decline for cities and counties of nine and two percent, respectively. With one exception, counties in the Average Need option, the above pattern of relationships holds for per capita need figures and the percentage of total need amounts in comparison with actual expenditures by class.

In general, the two need options show a modest pattern of shift away from counties and cities and toward towns and villages in comparison with actual expenditures. The options also show a remarkable shift in class percentages in comparison with the current state aid distribution. Both need options show a large shift away from cities and to a lesser extent towns and villages toward counties.

Table B2 shows the distribution of projected need in aggregate and per capita by municipal class, broken into quartile groupings by population size. Here "QUARTILE 1" represented the smallest 25 percent of the municipal class according to total population. Several observations are important from the table. First, one might suspect from the nature of the projection process that small towns and villages would capture a relatively large proportion of the total revenue need in the process of bringing their service provision up to the standard level (average or first quartile). The percent of total figures indicate no significant shift of need toward either the lowest or lower two quartiles of either towns or villages when compared with either the percent of population or the percent of actual costs expended by municipalities in these quartiles. Hence the suspicion that smaller towns and villages capture a relatively larger proportion of total need in bringing their services up to the standard level is not supported by the tabular analysis.

In comparison with actual expenditures, substantial shifts in need can be noted toward the lowest (first) county quartile, the lower two city quartiles, and the lowest and highest village quartiles.

TABLE B1

Population, Revenue Need Projection Options, and Actual Costs
By Municipal Class by Population Quartiles

MUNICIPAL CLASS	POPULATION	AVERAGE NEED	LOW NEED	ACTUAL COST[1] 1984
			Total $$	
			Per Capita $$	
			Column %	
		COUNTIES		
QUARTILE 1	478,002	334,350,352	380,221,911	231,256,198
	5%	699	795	484
		6%	8%	5%
QUARTILE 2	828,975	423,373,436	456,390,336	316,563,886
	8%	511	551	382
		8%	9%	6%
QUARTILE 3	1,622,784	777,477,866	762,511,061	626,444,293
	15%	479	470	386
		14%	15%	12%
QUARTILE 4	7,556,765	3,837,334,783	3,342,774,116	3,873,113,481
	72%	508	442	513
		71%	68%	77%
TOTAL	10,486,526	5,372,536,437	4,941,897,424	5,047,377,858
		CITIES		
QUARTILE 1	132,679	148,101,143	142,328,037	62,044,388
	5%	1,116	1,073	468
		13%	14%	5%
QUARTILE 2	250,371	215,254,111	205,284,676	103,026,229
	10%	860	820	411
		20%	20%	9%
QUARTILE 3	432,429	268,415,949	253,129,421	196,096,884
	17%	621	585	453
		24%	25%	17%
QUARTILE 4	1,658,387	471,859,382	430,718,389	819,516,018
	67%	285	260	494
		43%	42%	69%
TOTAL	2,473,866	1,103,630,584	1,031,460,523	1,180,683,519
		TOWNS		
QUARTILE 1	179,155	65,455,713	59,141,749	46,813,460
	3%	365	330	261
		4%	4%	4%
QUARTILE 2	364,421	85,571,843	75,903,872	73,169,615
	6%	235	208	201
		5%	5%	6%
QUARTILE 3	668,474	110,996,406	94,799,880	134,259,887
	11%	166	142	201
		6%	6%	10%
QUARTILE 4	5,029,553	1,542,799,484	1,432,173,733	1,047,732,127
	81%	307	285	208
		85%	86%	80%
TOTAL	6,241,603	1,804,823,446	1,662,019,234	1,301,975,089
		VILLAGES		
QUARTILE 1	71,029	27,544,705	23,829,295	11,832,447
	4%	388	335	167
		3%	3%	2%
QUARTILE 2	165,470	41,775,574	35,522,530	35,871,825
	9%	252	215	217
		5%	4%	7%
QUARTILE 3	345,517	64,895,969	53,690,628	92,528,792
	19%	188	155	268
		7%	6%	19%
QUARTILE 4	1,240,653	791,196,751	752,247,042	339,195,817
	68%	638	606	273
		85%	87%	71%
TOTAL	1,822,669	925,412,999	865,289,494	479,428,881

[1]Source: NYS Comptroller's Municipal Data Base as aggregated by authors.

TABLE B2

Revenue Need Projection Options, Actual Cost and Current Aid Distribution Percentages by Municipal Class

Municipal Class	Population	Average Need	Low Need	Actual Cost[1] 1984	Current Aid Distribution[2] (percent only)
COUNTY					
Total $$	10,486,526	5,372,536,437	4,941,897,424	5,047,377,858	
Per Capita $$		512	471	481	
Column %		58.36%	58.14%	63.02%	12%
CITY					
Total $$	2,473,866	1,103,630,584	1,031,460,523	1,180,683,519	
Per Capita $$		446	417	477	
Column %		11.99%	12.13%	14.74%	52%
TOWN					
Total $$	6,241,603	1,804,823,446	1,662,019,234	1,301,975,089	
Per Capita $$		289	266	209	
Column %		19.60%	19.55%	16.26%	27%
VILLAGE					
Total $	1,822,669	925,412,999	865,289,494	479,428,881	
Per Capita $$		508	475	263	
Column %		10.05%	10.18%	5.99%	9%
TOTAL		9,206,403,466	8,500,666,675	8,009,465,347	
% increase from actual costs		15%	6%		

[1]Source: NYS Comptroller's Municipal Data Base as aggregated by authors.

[2]These percentages are based on totals which include: Per Capita Revenue Sharing, Special City-Town-Village Aid, and Needs-Based Aid.
Source: Commission on State-Local Relations.

Substantial shifts in need can be noted away from the highest (fourth) city quartile and the third town and village quartile in comparison with actual expenditures.

APPENDIX C

ADJUSTING FOR COUNTY SALES TAX DISTRIBUTIONS

Four counties (Delaware, Herkimer, Oswego and Schenectady) did not levy a sales tax. The State Department of Taxation and Finance provided estimates of sales tax yield at a three-cent sales tax level for these counties which was used to calculate the sales tax base for those counties. For the remaining 53 counties, because of the "prior rights" issue and mandatory disbursements, a special "spreadsheet" was developed to calculate the county sales tax bases for each county.

The adjusted city sales tax revenue divided by the city sales tax rate was the city sales tax base for those 28 cities with a city sales tax. For the remaining 33 cities with no sales tax, a sales tax base was estimated using the data from 26 cities that have sales tax bases and are in counties with sales taxes.[1] It should be noted that a truly valid estimate of the sales tax base in cities without a sales tax requires a new data collection system whereby firms reporting state sales tax revenue to the state would be required to identify the specific site (jurisdiction) in which the sales tax revenue was generated.

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[1]The regression equation was: 6393679 + .0478** county sales tax base + 320785731 city population as a % of county population + 1527.9 city population. Where ** indicated significance at the .01 level of probability. This equation explained 63.5% of the variability.

APPENDIX D
SIMULATION PROCEDURES

The objective of the simulation activity is to demonstrate differences in the distribution among types of jurisdictions under alternative sets of assumptions. The simulations utilize nine templates of which only four are used extensively. The templates are designed to accommodate 1606 jurisdictions but lesser or larger numbers of jurisdictions are readily accommodated. The templates were designed for use on a microcomputer with 640K RAM and a 20 M-byte hard disk.

The remainder of this section is a description of the spreadsheets and procedures used to generate the distribution of funds presented in the body of this report. The spreadsheets are available on disks. Typed documentation is also available. Those who have access to computers with larger RAM and who envision a large number of simulations may want to consider investments in the combining of templates and development of macros which can streamline the simulation process.

Overview of Templates

Template I contains data on property and sales tax bases, own source income, and other income for each jurisdiction. Space is provided for bringing in alternative estimates of financial needs based on costs of providing specified levels of services. When standard tax rates and bases are typed into the table headings, Need-Capacity gaps and Need-Capacity-Effort gaps are calculated on a per capita basis for each jurisdiction. Changing the rates in the heading automatically changes the gap calculated for each jurisdiction. The standard tax rates are applied to the tax bases of the individual jurisdictions. The standard tax base is used only for the purpose of limiting the effort bonus to a standard tax base. The template is carried on four disks, identical except they contain data for different parts of the 1606 jurisdictions in the study. Jurisdictions in this template are organized by municipal class, counties, cities, towns and villages with jurisdictions within each class arranged by municipal identification number in ascending order.

Template IIA contains data on population for each jurisdiction. The calculations of Need-Capacity (NC) and Need-Capacity-Effort (NCE) gaps made in template I are brought into template IIA. These data are used to compute the distribution to each jurisdiction when a NC strategy is used with a specified level of (say) $100m of new revenue sharing appropriations. The template also performs a number of preliminary calculations for a NCE strategy.

Template IIB also contains population data for each jurisdiction and uses computations from IIA to develop the distributions to each jurisdiction with a NCE strategy where an effort bonus is provided for those jurisdictions making extraordinary tax efforts. In both IIA and IIB records are arranged as in Template I.

Template III was developed for a carrot-stick strategy that is not implemented here because it requires a statewide survey of services provided by local governments. Template IV is used to calculate tax collections, tax bases and average tax rates which are used in Template I. Record organization for Template IV is the same as for Template V, discussed below.

Template V is designed to calculate the mandatory disbursements from counties and the distributions of those disbursements to towns and villages whenever the sum of standard county and city sales tax rates exceed three cents. If for example the standard county sales tax rate is 2.5 cents and the standard city sales tax rate is 1.0 cent, Template V would be used to develop financial measures which are then inserted into Template I. Note that Template V has jurisdictions arranged in a different order with all cities, towns and villages records in a county listed below that county record. Data are sorted by municipal code in ascending order.

Template VI, referred to as transit file 1, or TRFILE-1 is provided to sort the reduced records for jurisdictions into the different orders required for specific templates above. Other templates, TRFILE-2, TRFILE-3 and TRFILE-4, are designed to put data into forms required for other templates especially templates I, IIA, IIB, and V. It is these latter four templates that are the core of the simulation process.

Getting Acquainted

The user with a minimum experience with Lotus 1-2-3 should study the Lotus Reference Manual. Specific references are taken from Release 2, Ch. 1. We draw special attention to activities:

1) /File Retrieve p. 90
2) /File Save p. 91
3) /Range unprotect p. 77
4) the use of the Edit key p. 7
5) entering formulas p. 16
6) /Copy p. 81
7) /File Combine p. 93
8) /Data Sort p. 140.

Somebody wishing to make major revisions in the master worksheets may want to study additional commands.

1) /Range Justify p. 73
2) /Worksheet Global Format p. 39
3) /Worksheet Global Format default commands p. 46
4) /Worksheet Global label prefix p. 40
5) /Worksheet Global protection p. 44
6) /Worksheet column-width set p. 42
7) /Range Format p. 62
8) /Range Protect p. 76

9) @ functions pp. 16, 17, 226-233
10) /Move p. 85
11) /Range Name Create pp. 68-69.

File or Column Names

The specific assumptions underlying the simulations are concerned with alternative tax rates for real property, county and city sales taxes, property and sales tax bases for each jurisdiction, new revenue sharing appropriations and general attitudes or strategies about the distribution of general purpose aid.

To facilitate references to specific files or columns in a template it is useful to develop file names of eight characters or less that are readily recognizable.

For example:

Property Tax Rate	=	PTAXRATE
County Sales Tax Rate	=	COSTRATE
City Sales Tax Rate	=	CISTRATE
Property Tax Base	=	PTAXBASE
County Sales Tax Base	=	COSTBASE
City Sales Tax Base	=	CISTBASE
New Revenue Sharing Appropriations	=	NURSAPPR
Need-Capacity Strategy	=	NC
Need-Capacity-Effort Strategy	=	NCE
Need-Capacity Gap	=	NCGAP
Need-Capacity-Effort Gap	=	NCEGAP

Because of the variety of assumptions about tax rates, fiscal needs, weight to be attached to different components of a strategy and in order to make efficient use of storage space by saving only special columns of a template it will be necessary to define some file names which are not so readily recognizable.

For example, we will use the first three characters to identify a particular template or disk, while the fourth character will identify a specific level of financial need. Thus:

RIA = Revenue Sharing Template 1, 1st quarter of jurisdictions
RIB = Revenue Sharing Template 1, second quarter of jurisdictions
RIC = Template 1, third quarter of jurisdictions
RID = Template 1, fourth quarter of jurisdictions
RSV = Revenue Sharing, Template V
IIA = Template IIA
IIB = Template IIB.

4th Character: Need

A = cost of avg level of each service
B = cost of lowest quartile index level for each service

D = average level of service without State and Federal Revenue sharing
E = low quartile level of service without State and Federal Revenue Sharing
F = average level of services without social services and health for counties
G = low level of services without health and social services

5th Character. Standard tax rates and bases

A = avg tax rate and average tax bases
G = avg tax rate - 1 Std, and average tax bases

6th Character: Column extracted to be used in another template

7th Character: weight on NC & effort Gaps in NCE strategy

1 = equal weights
2 = 2NC + 1E
3 = 3NC + 1E
4 = 1NC + 2E
5 = 1NC + 3E

8th Character: minimum per capita aid

A = 0 min/capita regardless of need or effort
B = $1/capita regardless of need or effort
C = $2/capita regardless of need or effort
D = $3/capita regardless of need or effort

Thus RICAAM refers to column M of revenue sharing Template I, third quarter of the jurisdictions when financial need is represented by the estimated cost of providing the state average level of services in each jurisdiction, and where state average sales and real property rates are assumed.

Specific tax rate and base information based on FY1984 data for New York are shown below.

Rates and Bases for Template I

AVG PTAXRATE = .007156 (averaged over 1606 jurisdictions)

AVG COSTRATE = .02500 (averaged over 57 counties)

AVG CISTRATE = .00795 (averaged over 61 cities)

low rates = avg - 1 std.

low PTAXRATE = .003139

low COSTRATE = .01994

low CISTRATE = .00305

AVG PTAXBASE (per capita) = 23,849.845 (1604 jurisdictions)

AVG COSTBASE (per capita) = 4,954.776

AVG CISTBASE (per capita) = 7,318.595

NURSAPPR for IIA and IIB Tables = $100,000,000.

Simulation Procedures

1) If the COSTRATE + CISTRATE >$.03, Begin with Template V (C:\123\RSV---)
If the sum is 3 cents or less, begin with step 8 below.

2) Type in CISTRATE = .00795 in Col. E of heading

3) Xtract Col. D, E and G (values only) in files: [1]
RSV?AD[2] (Col. D = MDISBFC = mandatory disbursements from county)
RSV?AE (Col. E = OTHRINC2 = other income)
RSV?AG (Col. G = STNCBCIC = sales tax not collected by county in cities)

4) Use /FR to retrieve TRFILE-2 (in ascending order of municipal code, col. A)
Use /FC to bring into Col. E, MDISBFC (entire file) from Col. D of V[3]
and xtract Col. N which will be saved as **C:\123\MDISFCPC**

5) Retrieve TRFILE-3 (in ascending order of municipal code)
Use /File Combine to bring into Col. D as add OTHRINC2 (entire file) from Template V
and xtract (values only) Col. I which will be saved as **C:\123\OTHINCPC** which includes V and other (other income per capita = OTHINPC).
Use /FC to add into Col. B, STNCBCIC (entire file) RSV?AG
and xtract Col. G which will be saved as **C:\123\STNCBCPC** (sales tax not collected by county per capita).

6) Retrieve TRFILE-1 (in ascending order of municipal code)
and using /File Combine
Copy into Col. N - C:\123\MDISFCPC (entire file)
Copy into Col. O - C:\123\STNCBCPC (entire file)
Copy into Col. Q - C:\123\OTHINCPC (entire file)
and use /Data Sort (S19 primary and T19 secondary, both in ascending order) to put in Template I order.

---

[1] If the costs to be used are for an average level of services (Need in step 8) the fourth character in the file name is "A".

[2] Since the tax rate entered in step 2 is the average sales tax rate and all other rates through step 12 will be average rates, the fifth character in the file name is "A".

[3] The reader will note that the rather awkward sentence structure reflects the order of steps to invoke the command.

and xtract Col. N, (values only) which will be saved as C:\123\DISFC

Col. O, (values only) which will be saved as C:\123\STNCBC

Col. Q, (values only) which will be saved as C:\123\OTHINC.

7) Create file TRFILE-4 in Template I order (see 6 above)
A = Jurisdiction Use /FC from TRFILE-1 (when in Template I order)
B = DISFC Use /FC C:\123\DISFC (entire file)
C = STNCBC Use /FC C:\123\STNCBC (entire file)
D = OTHINC Use /FC C:\123\OTHINC (entire file) & Save

8) Retrieve A:RIA-----
Use File Combine to copy into Col. B (B19..B420) from A:NEEDS, H19..H420.
Add into Col. E, B19..B420 from TRFILE-4
Add into Col. F, C19..C420 from TRFILE-4 and
Copy into Col. H, D19..D420 from TRFILE-4
(Need to copy rather than add because "other" income without that from V is already there)
Type in average tax rates and bases in table heading, column E
SAVE as A:RIA?A--- on new disk
Xtract NCGAP (values only) and Save as A:RIA?AM
Xtract NCEGAP (values only) and Save as A:RIA?AV

9) Retrieve RIB-----
Use /File Combine to copy into Col. B, H421..H822 from A:NEEDS
Copy into Col. H, D421..D822 from TRFILE-4
Type in Col. E of Heading the AVG PTAXRATE and AVG PTAXBASE
and SAVE as A:RIB?A--- on new disk
Xtract NCGAP (values only) and Save as A:RIB?AM
Xtract NCEGAP (values only) and Save as A:RIB?AV

10) Retrieve RIC-----
Use /FC to copy into Col. B, from H823..H1224 of A:NEEDS
Use /FC to copy into Col. H, D823..D1224 from TRFILE-4
Type into Col. E of heading the AVG PTAXRATE and the AVG PTAXBASE
SAVE as A:RIC?A--- on new disk
Xtract NCGAP (values only) and Save as A:RIC?AM
Xtract NCEGAP (values only) and Save as A:RIC?AV

11) Retrieve RID-----
Use /FC to copy into Col. B, from H1225..H1624 of A:NEEDS
and copy into Col. H, D1225..D1624 from TRFILE-4
Type in AVG PTAXRATE and AVG PTAXBASE in Col. E of heading
SAVE as A:RID?A--- on new disk
Xtract NCGAP (values only) and Save as A:RID?AM
Xtract NCEGAP (values only) and Save as A:RID?AV

12) Retrieve C:\123\IIA-----
with RIA?A--- in A drive
Use /FC to bring into B19..B420 from A:RIA?AM (add entire file)
and to bring into H19..H420 from A:RIA?AV (add entire file)

with RIB?A--- in A drive
Use /FC to bring into B421..B822 from A:RIB?AM (add entire file)
and to bring into H421..H822 from A:RIB?AV (add entire file)

with RIC?A--- in A drive
Use /FC to bring into B823..B1224 from A:RIC?AM (add entire file)
and to bring into H823..H1224 from A:RIC?AV (add entire file)

with RID?A--- in A drive.
Use /FC to bring into B1225..B1624 from A:RID?AM (add entire file)
and to bring into H1225..H1624 from A:RID?AV (add entire file)

and xtract REVSHNC
and Save as C:\123\IIA?AF1A
This gives the distribution of funds for NC strategy avg rates
and xtract NCEG*POP
and Save as C:\123\IIA?AI1A

Retrieve C:\123\IIB
and use /FC to bring into Col. B19..B1624, IIA?AI1A
then xtract REVSHNCE and
Save as C:\123\IIB?AE1A
This gives the distribution of funds for NCE avg rates, equal weights.

13)[4] Retrieve A:RIA-----
Use /FC to copy into Col. B (B19..B420) from A:NEEDS, H19..H420
Type in new set of standard tax rates
Low rates and average bases
Save as A:RIA?G--- on a new disk
xtract NCGAP (values only) and Save as A:RIA?GM
xtract NCEGAP (values only) and Save as A:RIA?GV

14) Retrieve A:RIB-----
Use /FC to copy into Col. B (B19..B420) from A:NEEDS, H421..H822
Type in a new low Property Tax Rate only avg PTX Base[5]
Save as A:RIB?G--- on a new disk
xtract NCGAP (values only) and Save as A:RIB?GM
xtract NCEGAP (values only) and Save as A:RIB?GV

---

[4] We essentially repeat steps 8-12 for a new set of standard tax rates. If costs are to remain those for an average level of service, the fourth character in steps 13-18 remains "A", e.g. A:RIAA.

[5] The jurisdictions in these templates cannot levy sales taxes.

15) Retrieve A:RIC-----
Use /FC to copy into Col. B (B19..B420) from A:NEEDS, H823..H1224
Type in a new Property Tax Rate only
Save as A:RIC?G--- on a new disk
xtract NCGAP (values only) and Save as A:RIC?GM
xtract NCEGAP (values only) and Save as A:RIC?GV

16) Retrieve A:RID-----
Use /FC to copy into Col. B (B19..B420) from A:NEEDS, H1225-H1624
Type in a new prop tax rate and avg PTX Base
Save as A:RID?G--- on a new disk
xtract NCGAP (values only) and Save as A:RID?GM
xtract NCEGAP (values only) and Save as A:RID?GV

17) Retrieve C:\123\IIA-----
With A:RIA?G--- in A drive
Use /FC to add into B19..B420 from A:RIA?GM (add entire file)
and to add into H19..H420 from A:RIA?GV (add entire file)

With A:RIB?G--- in A Drive
Use /FC to add into B421..B822 from A:RIB?GM (add entire file)
and to add into H421..H822 from A:RIB?GV (add entire file)
With A:RIC?G--- in A Drive
Use /FC to add into B823..B1224 from A:RIC?GM (add entire file)
and to add into H823..H1224 from A:RIC?GV (add entire file)

With A:RID?G--- in A Drive
Use /FC to add into B1225..B1624 from A:RID?GM (add entire file)
and to add into H1225..H1624 from A:RID?GV (add entire file)
and xtract REVSHNC and
Save as C:\123\IIA?GF1A
This gives the distribution of funds for NCGAP strategy with low tax rates

and xtract NCEG*POP and
Save as C:\123\IIA?GI1A

18) Retrieve C:\123\IIB-----
Use /FC to add into Col. B, B19..B1624, IIA?GI1A
xtract REVSHNCE and
Save as C:\123\IIB?GE1A
This gives the distribution of funds for NCE gap strategies with low tax rates, equal weights on NC and on Effort.

(Note, this gives us four options to this point as follows:)

1) IIA?AF1A
IIA?AG1A NCGap ? needs, avg rates, and O/CAID

2) IIB?AE1A
IIB?AF1A NCEGap ? needs, avg rates, equal weights and O/CAID

3) IIA?GF1A
IIA?GG1A NCGap ? needs, low rates, and O/CAID

4) IIB?GE1A
IIB?GF1A NCEGap ? needs, low rates, equal weights and O/CAID

19) Retrieve A:RIA?A--- (avg rates)[6]
Change formula in Col. V to
M19 + 2U19 and copy to V20..V420
and Xtract NCEGAP
Save as A:RIA?AV4A

20) Retrieve A:RIB?A---
change formula in Col. V to
M19 + 2U19 and copy to V20..V420
and Xtract NCEGAP
Save as A:RIB?AV4A

21) Retrieve A:RIC?A---
change formula in Col. V to
M19 + 2U19 and copy to V20..V420
and Xtract NCEGAP
Save as A:RIC?AV4A

22) Retrieve A:RID?A---
change formula in Col. V to
M19 + 2U19 and copy to V20..V420
and Xtract NCEGAP
Save as A:RID?AV4A

23) Retrieve C:\123\IIA-----
with RIA?A--- in A Drive
Use /FC to add into H19..H420
from A:RIA?AV4A (add entire file)
with RIB?A--- in A Drive
Use /FC to bring into H421..H822
from A:RIB?AV4A (add entire file)

with RIC?A--- in A Drive
Use /FC to bring into H823..H1224
from A:RIC?AV4A (add entire file)

with RID?A--- in A Drive
Use /FC to bring into H1225..H1624
from A:RID?AV4A (add entire file)

Xtract NCEG*POP
and Save as C:\123\IIA?AI4A

24) Retrieve C:\123\IIB-----
Use /FC to bring into Col. B. B19..B1624, IIA?AI4A (entire file)

Xtract REVSHNCE
and Save as C:\123\IIB?AE4A
This gives the distribution of funds for NCE strategy avg tax rates, low weight on NC (1), high weight (2) on Effort.

---

[6] If costs are for average level of services, the fourth character remains "A" for steps 19 to 24.

25) Retrieve A:RIA?A---[7] (average tax rates) working on high weight on N-C, low on effort
Change formula in Col. V to 2M19 + 1U19
and copy to V20..V420
Xtract NCEGAP (values only) and Save as A:RIA?AV2A

26) Retrieve RIB?A---
Change formula in Col. V to 2M19 + 1U19
and copy to V20..V420
Xtract NCEGAP (values only) and Save as A:RIB?AV2A

27) Retrieve RIC?A---
Change formula in Col. V to 2M19 + 1U19
and copy to V20..V420
Xtract NCEGAP (values only) and Save as A:RIC?AV2A

28) Retrieve RID?A---
Change formula in Col. V to 2M + 1U
and copy to V20..V420
Xtract NCEGAP (values only) and Save as A:RID?AV2A

29) Retrieve C:\123\IIA-----
With RIA?A in A Drive
Use /FC to bring RIA?AV2A (add entire file) into H19..H420

With RIB?A in A Drive
Use /FC to bring RIB?AV2A (add entire file) into H421..H822

With RIC?A in A Drive
Use /FC to bring RIC?AV2A (add entire file) into H823..H1224

With RID?A in A Drive
Use /FC to bring RID?AV2A (add entire file) into H1225..H1624

Xtract NCEG*POP and
Save as IIA?AI2A

30) Retrieve C:\123\IIB-----
Use /FC to bring into Col. B (B19..B1624), IIA?AI2A (entire file)

Then xtract REVSHNCE and
Save as IIB?AE2A

This gives the distribution of funds for NCE strategy with avg tax rates, high weight NC, and low weight (1) on Effort.

31) Retrieve RIA?G---[8] (low tax rates) working on low NC and high weight on effort
Change formula in Col. V to 1M19 + 2U19
and copy to V20..V420

---

[7] If costs are for an average level of services, then the fourth character remains "A" in steps 25 to 30.

[8] If costs are for an average level of services, then the fourth character in steps 31 to 36 remains "A".

Xtract NCEGAP (values only) and
Save as A:RIA?GV4A

32) Retrieve RIB?G---
Change formula in Col. V to 1M19 + 2U19
and copy to V20..V420
Xtract NCEGAP (values only) and
Save as A:RIB?GV4A

33) Retrieve RIC?G---
Change formula in Col. V to 1M19 + 2U19
and copy to V20..V420
Xtract NCEGAP (values only) and
Save as A:RIC?GV4A

34) Retrieve RID?G---
Change formula in Col. V to 1M19 + 2U19
and copy to V20..V420
Xtract NCEGAP (values only) and
Save as A:RID?GV4A

35) Retrieve C:\123\IIA-----
With RIA?G in A Drive
Use /FC to bring RIA?GV4A into H19..H420 (add entire file)

With RIB?G in A Drive
Use /FC to bring RIB?GV4A into H421..H822 (add entire file)

With RIC?G in A Drive
Use /FC to bring RIC?GV4A into H823..H1224 (add entire file)

With RID?G in A Drive
Use /FC to bring RID?GV4A into H1225..H1624 (add entire file)

Xtract NCEG*POP and
Save as IIA?GI4A

36) Retrieve C:\123\IIB-----
Bring into Col. B (B19..B1624) IIA?GI4A

Then xtract REVSHNCE and
Save as IIB?GE4A

This gives the distribution of funds for a NCE strategy with low tax rates, low weight (1) on NC and high weight (2) on Effort.

37) Retrieve A:RIA?G---[9] (working on low rates,high on NC and low on effort)
Change formula in Col. V to 2M19 + U19
and copy to V20..V420
Xtract NCEGAP range and
Save as A:RIA?GV2A

---

[9] If costs are for an average level of service, the fourth character in steps 37-42 remains "A".

38) Retrieve RIB?G---
Change formula in Col. V to 2M19 + U19
and copy to V20..V420
Xtract NCEGAP range and
Save as A:RIB?GV2A

39) Retrieve RIC?G---
Change formula in Col. V to 2M19 + U19
and copy to V20..V420
Xtract NCEGAP range and
Save as A:RIC?GV2A

40) Retrieve RID?G---
Change formula in Col. V to 2M19 + U19
and copy to V20..420
Xtract NCEGAP range and
Save as A:RID?GV2A

41) Retrieve C:\123\IIA-----
With RIA?G in A Drive
bring RIA?GV2A into H19..H420 (add entire file)

With RIB?G in A Drive
bring RIB?GV2A into H421..H822 (add entire file)

With RIC?G in A Drive
bring RIC?GV2A into H823..H1224 (add entire file)

With RID?G in A Drive
bring RID?GV2A into H1225..H1624 (add entire file)

Xtract NCEG*POP and
Save as IIA?GI2A.

42) Retrieve C:\123\IIB-----
bring into Col. B (B19..B1624), IIA?GI2A

Then xtract REVSHNCE and
Save as IIB?GE2A
This gives the distribution of funds for a NCE strategy with low tax rates, high weight (2) on N-C and low weight (1) on Effort.

NOTE: For lower levels of service, the fourth character of the file name will be B and the needs column brought into RIA, RIB, RIC, and RID disks will be from column J of A: NEEDS. For example, in steps 8 to 11 and 13 to 16, the columns brought in will be from col. J of NEEDS and the fourth character of file names will be B rather than A for all steps from 8 to 42.

APPENDIX E.
SPREADSHEET DESIGN

Template I Format
For RIA-----, RIB-----, RIC----- and RID-----

Title: Table RIA---1A: Per Capita Gap Calculations in State Revenue Sharing

Standard Needs
Standard Property Tax Rate
Standard Property Tax Base
Standard County Sales Tax Rate
Standard County Sales Tax Base
Standard City Sales Tax Rate
Standard City Sales Tax Base
New Revenue Sharing Appropriations

Column	Column Heading	Col. Format	Col. Width	Formula or Source
A	Jurisdiction	FO	14	
B	NEEDS	C3	14	Σ_{16} cost estimates & fields 14, 20, 21, 27 from Audit & Control
C	PROPTXBA (property tax base)	C3	14	Full value Assessment, Field 30, Audit & Control
D	COSATXBA (county sales tax base)	C3	14	From IV, Disk 2 Col J[1,2]
E	MDISBFC (mandatory disbursements from county)	C3	14	From V, Col. D[3], if EST > .03 or TRFile 1 - Col. N

---

[1] Independent estimates for Delaware, Herkimer, Oswego and Schenectady counties will be inserted by hand.

[2] If standard county sales tax rates + standard city sales tax rates $\leq .03$, then Template V will not be computed and Col. D becomes (Field 34 for each CO)/COSTR where COSTR is from p. 429 of special report.

[3] If standard county sales tax rates and standard city sales tax rates $\leq .03$, then Template V is not computed and there is no entry in Col. E.

F	STNCBCIC (sales tax not collected by county in cities when sum of sales tax rates >.03, S.T. city sales tax rates ≤.015)	C2	14	From V, Col. G or TRFile 1, Col. O if EST > .03
G	CISATXBA (city sales tax base)	C3	14	From IV, Disk 1, Col. F[4]
H	OTHERINC	C3	14	All other taxes, fees, user fees, intergov. income, Field 44-(Field 32 + Field 34) and from V, Col. E
I	TAXYSTTX (tax income at standard tax rates)	C3	14	$PTAXRATE*C19+$COSTRATE*D19 -E19-F19 and /copy from I19..I19 to I20..I75 and in I76 $PTAXRATE*C76+$CISTRATExG76 and /copy from I76..I76 to I77..I136 and in I137 $PTAXRATE*C137 and/copy from I137..I137 to I138..I420
J	TOTYSTTX (Total income at standard tax rates)	C3	14	+H19 + I19 and /copy from J19..J19 to J20..J420
K	POTNCGAP (potential need capacity gap)	C3	14	+B19 - J19 and /copy from K19..K19 to K20..K420
L	B > J (condition that need > capacity)	F2	6	+B19 > J19 and /copy from L19..L19 to L20..L420
M	NCGAP (need capacity gap)	C3	14	+K19*L19 and /copy from M19..M19 to M20..M420
N	OWNSOURY (own source income)	C3	14	Field 44 - (Field 36, 37, 38, 39)

[4] Independent estimates for 33 cities (with no sales taxes) will be inserted by hand.

O	N - I (own source - tax y at standard tax rates)	C3	14	+N19 - I19 and /copy from O19..O19 to O20..O420
P	N > I (condition that effort exceeds standard)	F2	6	+N19 > I19 and /copy from P19..P19 to P20..P420
Q	XTRAEFFT	C3	14	+O19*P19 and /copy from Q19..Q19 to Q20..Q420
R	STSBY (income at standard tax rates and stan- dard bases)	C3	14	in R19 $PTAXRATE*$PTAXBASE +$COSTRATE*$COSTBASE and /copy from R19..R19 to R20..R75 In R76 $PTAXRATE*$PTAXBASE +$CISTRATE*$CISTAXBASE and /copy from R76..R76 to R77..R136 In R137 $PTAXRATE*$PTAXBASE and /copy from R137..R137 to R138..R420
S	C	F6	9	+R19/I19 and /copy from S19..S19 to S20..S420
T	Condition (that if C>1, use C=1, if not use C)	F6	9	@IF(S19>1,1,S19) and copy from T19..T19 to T20..T420
U	EFFTGAP	C3	14	+ T19*Q19 and copy from U19..U19 to U20..U420
V	NCEGAP[5]	C3	14	+ M19+U19 and copy from V19..V19 to V20..V420
W				Blank

[5] Weights on NC and NCE Gaps can be changed, e.g. changing formula to 2M19+1U19 gives twice as much weight to NC Gap as to Effort Gap.

X & Y Range Name Table

Name	Range
CISTBASE	E11
CISTRATE	E10
COSTBASE	E9
COSTRATE	E8
PTXBASE	E7
PTXRATE	E6
Jurisdiction	A19..A420
NCEGAP	V19..V420
NCGAP	M19..M420

NOTE: For those jurisdictions that did not file a financial report, there are no data entries in this or other templates.

BRIEF DESCRIPTION OF TEMPLATE II
C:\123\IIA-----

Title: Table IIA---1A: Simulated Distribution of State Revenue Sharing Funds with N-C and N-C-E Strategies

Standard Needs
Standard Property Tax Rate
Standard Property Tax Base
Standard County Sales Tax Rate
Standard County Sales Tax Base
Standard City Sales Tax Rate
Standard City Sales Tax Base
New Revenue Sharing Appropriations
Minimum Per Capita Aid

Col.	Col. Heading	Col. Width	Col. Format	Formula or Source
A	Jurisdiction	14	FO	I tables Col. A
B	NCGAP (Need capacity gap)	14	C3	I tables Col. M
C	POP (population)	13	,0	From TRFILE-1 (when in Template I order)
D	NCG*POP (Need capacity gap* population)	22	C3	+ B19*C19 and copy from D19..D19 to D20..D1624 In row 1627: @SUM (D19..D1624)
E	MIN/CAID (minimun per capita aid)	14	C2	$MIN/CAID*C19 and copy from E19..E19 to E20..E1624 In row 1627: @SUM(E19..E1624)
F	REVSHNC (Revenue Share with Need-capacity gap strategy)	20	C2	($NURSAPPROP-$E$1627)*D19/$D$1627 and copy from F19..F19 to F20..F1624 and at bottom F1627:@AVG(F19..F75)) for counties F1628:@AVG(F76..F136) for cities F1629:@SUM(F137..F1068)/916 for towns[1] F1630:@SUM(F1069..F1624)/552 for villages[1]

[1] Note that only 916 towns and 552 villages filed financial statements.

G	RSNC/CAP (Revenue share Need-capacity gap per capita)	12	C2	+F19/C19 and copy from G19..G19 to G20..G1624 and at bottom G1627:@AVG(G19..G75) for counties G1628:@AVG(G76..G136) for cities G1629:@SUM(G137..G1068)/916 for towns[1] G1630:@SUM(G1069..G1624)/552 for villages[1]
H	NCEGAP (Need-capacity-effort gap)	14	C3	I tables Col. V
I	NCEG*POP (Need-capacity-effort gap*population)	22	C3	+C19*H19 and copy from I19..I19 to I20..I1624 in row 1627: @SUM(I19..I1624)
J	Blank			
K&L	Range Name Table			

Name	Range
Jurisdiction	A19..A1624
MIN/CAID	E13
NCEG*POP	I19..I1627
NURSAPPROP	E12
POP	C19..C1624
REVSHNC	F19..F1630
RSNCCP	G19..G1630

---

[1] Note that only 916 towns and 552 villages filed financial statements.

TEMPLATE II(B)
C:\123\IIB-----

Title: Table IIB---1A: Simulated Distribution of State Revenue Sharing with N-C-E Strategy

Standard Needs
Standard Property Tax Rate
Standard Property Tax Base
Standard County Sales Tax Rate
Standard County Sales Tax Base
Standard City Sales Tax Rate
Standard City Sales Tax Base
New Revenue Sharing Appropriations
Minimum Per Capita Aid

Col.	Col. Heading	Col. Width	Col. Format	Formula or Source
A	Jurisdiction	14	FO	II tables Column A
B	NCEGAP*POP [(Need-capacity-effort gap)*Population]	22	C3	IIA tables column I including I1627
C	POP (population)	13	,0	From TRFILE-I when in Temp. I order
D	MIN/CAID (minimum/capita aid)	14	C2	$MIN/CAID*C19 and copy from D19..D19 to D20..D1624 in row 1627: @SUM(D19..D1624)
E	REVSHNCE (revenue share need-capacity-effort)	20	C2	($NURSAPPROP-$D$1627)*B19/$B$1627 and /copy from E19..E19 to E20..E1624 In E1627:@AVG(E19..E75) E1628:@AVG(E76..E136) E1629:@SUM(E137..E1068)/916[1] E1630:@SUM(E1069..E1624)/552[1]
F	RSHNCE/C (Revenue share need-capacity-effort/capita)	20	C2	E19/C19 and /copy from F19..F19 to F20..F1624 In F1627:@AVG(F19..F75) F1628:@AVG(F76..F136) F1629:@SUM(F137..F1068)/916[1] F1630:@SUM(F1069..F1624)/552[1]
G	Blank			

---

1 Note that only 916 towns and 552 villages filed financial returns.

H&I Range Name Table

Name	Range
MIN/CAID	E13
NURSAPPROP	E12
REVSHNCE	E19..E1630
RSNCEPC	F19..F1630

Template III (TBLCSMS)
(for 243 Sample Jurisdictions)

Title: Table III001: Simulated Distribution of State Revenue Sharing Funds with a Carrot-Stick Strategy

Standard Needs
Standard Property Tax Rate
Standard Property Tax Base
Standard County Sales Tax Rate
Standard County Sales Tax Base
Standard City Sales Tax Rate
Standard City Sales Tax Base
New Revenue Sharing Appropriations

Col.	Col. Heading	Col. Format	Col. Width	Formula or Source
A	Jurisdiction	FO	14	
B	STSBY (Income at standard tax rates and standard bases)	C3	14	In B19: $PTAXRATE*$PTAXBASE + $COSTRATE*$COSTBASE and /copy from B19..B19 to B20..B43 In B44: $PTAXRATE*$PTAXBASE + + $CISTRATE*$CISTBASE and /copy from B44..B44 to B45..B65 In B66: $PTAXRATE*$PTAXBASE and /copy from B66..B66 to B67..B261
C	PROPTXBA (property tax base)	C3	14	Field 30 of Audit & Control tape
D	COSATXBA (county sales tax base)	C3	14	
E	CISATXBA (city sales tax base)	C3	14	
F	TAXYSTTX (tax income at standard tax rates)	C3	14	$PTAXRATE*C19+$COSTRATE*D19 and /copy from F19..F19 F20..F43 In F44: $PTAXRATE*C$$+$CISTRAT *E44 and /copy from F44..F44 to F45..F65 in F66: $PTAXRATE*C66 and /copy from F66..F66 to F67..F261

G	Needs	C3	14	Cost estimates and Audit & Control fields 14, 20, 21, 27
H	CSTEXISL (Cost of producing existing levels of service)	C3	14	Cost estimates
I	B > F	F2	6	+B19 > F19 and /copy from I19..I19 to I20..I261
J	I > H	F2	6	+I19 > H19 and /copy from J19..J19 to I20..I261
K	POTREVSH	C3	20	+I19(B19-F19) - J19(I19-H19) and /copy from K19..K19 to K20..K261
L	K > 0	F2	6	+K19 > 0 and /copy from L19..L19 to L20..L261
M	K*L (or CS or carrot stick)	C3	20	+K19*L19 and /copy from M19..M19 to M20..M261
N	POP (Population)	,0	13	
O	CS*POP (Carrot stick*Population)	C3	22	+M19*N19 and /copy from O19..O19 to O20..O261 and in 263 @SUM(O19..O261)
P	REVSHACS (Revenue Share with Carrot stick)	C2	20	$NURSAPPROP *O19/$O$263 and /copy from P19..P19 to P20..P261 and in P262 @AVG(P19..P43) 263 @AVG(P44..P65) 264 @AVG(P66..P189) 265 @AVG(P190..P261)
Q	RSCS/CAP	C2	12	P19/N19 and /copy from Q19..Q19 and in Q262 @AVG(Q19..Q43) 263 @AVG(Q44..Q65) 264 @AVG(Q66..Q189) 265 @AVG(Q190..Q261)

Template IV, Disk 1 (C:\123\TBLTCTBR)
Calculation of Tax Collections, Tax Bases, and
Average Tax Rates

Column	Column Heading	Col. Format	Col. Width	Formula or Source
A	Jurisdiction	F0	14	
B	CISTY (city sales tax collections on its own base)	C2	14	Field 34-Code pull 1120 (zero for 33 cities) In Row 1627: @AVG(B19..B1624)
C	CISTR (city sales tax rates)	C4	8	From p. 430 of 1984 Special Report
D	COSTR (county sales tax rates)(zero in 4 counties)	C4	8	From p. 429 of 1984 Special Report (also enter in city rows in that co. as a "carry on")
E	TOCOSTY (total county sales tax collection on its own base)	C2	14	Field 34 + Σ of code pulls 1120 for that county
F	CISTB (city sales tax base)	C3	14	+B19/C19 and copy from F19..F19 to F20..F1624 and in row 1627: @AVG(F19..F1624)
G	SCISTBIC (sum of city sales tax bases in the county)	C3	14	Enter by hand in the county row the Σ of all city sales tax bases in the county (Σ items in Col. F for that county)
H	SCOCISTR (Sum of co. and city tax rates in a county)	C3	14	Enter in each city row the sum of its city tax rate (Col. C) and the co. tax rate for that co. (Col. D)
I	H > .03 (to identify cities in which the sum of city sales tax rate + co. sales tax rate >.03	C4	8	H19>.03 and copy from I19..I19 to I20..I1624

J	COSTRISC (county sales tax rate in selected counties where H>.03 (will have entries in city rows only)	C4	8	D19*I19 and copy from J19..J19 to J20..J1624
K	RCCIC[1] [2] (rates counties collect in cities)	C4	8	Albany Co. In Row 20: @IF(D20-C20>.015, D20-C20, .015) and copy from K20..K20 to K21..K22 Allegany Co. No Entry Broome Co., Row 81: @IF(D82-C82>.015, D82-C82, .015) and copy from K107..K107 to K108..K108 Etc. for other counties

---

[1] Dutchess Co. has only a .01 sales tax and can collect that .01 tax in both Beacon and Poughkeepsie. Therefore the formulas are replaced by .01 in Dutchess Co.

[2] Four counties, Delaware, Herkimer, Oswego and Schenectady have no sales tax. Therefore the formulas are replaced by 0.000 in these counties (Delaware has no cities).

Template IV, Disk 2 (C:\123\TATCTBR2)

Column	Column Heading	Col. Format	Col. Width	Formula or Source
A	Jurisdiction	FO	14	
B	CISTR	C4	8	From p. 430 of 1984 Special Report or IV, Disk 1, Col.C
C	COSTR (county sales tax rate)(also has entries in city rows in that county as "carry on")	C4	8	From p. 429 of 1984 Special Report or IV, Disk 1, Col.D
D	CISTB (city sales tax base)	C3	14	Imported from IV, Disk 1, Col.F
E	TOCOSTY (total county sales tax income)	C2	14	Field 34 + Σ of code pulls 1120 for that county + Σ of code pull 1115 for that co.
F	RCCIC (rate co. collects in cities) (no entries in co., town & village rows) NOTE: need to edit to zero entries in cities of the 4 counties without a sales tax: Delaware, Herkimer, Fulton, and Schenectady	C4	8	From IV, Disk 1, Col. K
G	RCODCIC (rate co. doesn't collect in cities)	C4	8	Albany row 20: +C20-F20 and copy from G20..G20 to G21..G22 Allegany, No Entry Broome, row 81: +C106-F106 Cattaraugus, row 106 and copy from G106..G106 to G107..G107 Etc. for other counties
H	COSTNC (county sales tax not collected in cities where COSTR+ CISTR>.03)(there will be no entries in county, town, or village rows)	C2	14	+D19*G19 and copy from H19..H19 to H20..H1624

I	SCOSTNC (sum of co. sales tax not collected in cities)	C2	14	Enter by hand in the county row any figure found in col. H for that county. If 2 or more figures are found (i.e., 2 or more cities) sum them and enter in the county row above.
J	COSTB[1] (county sales tax base)(will have entries in all but 4 county rows, ERR in T&V rows and zero in city Rows)	C2	14	+(E19+I19)/C19 and copy from J19..J19 to J20..J1624

[1] Except for Nassau county where the base = E/C because it has an exception on the maximum rate of .03 and it has a city of Glen Cove with a .02 tax, giving total tax of .06 in Glen Cove.

Template IV, Disk 3
(TATCTBR3)

Column	Column Heading	Col. Format	Col. Width	Formula or Source
A	Jurisdiction	F0	14	
B	COSTB (county sales tax base)	C2	14	From IV, Disk 2, Col. J In row 1627: @AVG(B19..B1624)
C	SCISTBIC (sum of city sales tax bases in county)	C3	14	From IV, Disk 1, Col. G
D	COSTBOC (county sales tax base outside of cities)	C3	14	B19-C19 and copy from D19..D19 to D20..D1624
E	FVASSESS (full value assess-ments)	C2	14	From Field 30 In row 1627: @AVG(E19..E1624)
F	STAVFVIC (sum of town and village full value assessment in the county attached as a carry-on to each town and village full value assessment)	C2	14	e.g. Albany Co, Row 23: @SUM($E$23..$E$38) and copy from F23..F23 to F24..F38 e.g. Allegany Co, Row 40: @SUM ($E$40..$E$79) and copy from F40..F40 to F41..F79
G	TAVPSFVIC (town or village pro-portional share of town and village full value assessment in county) (will show ERR in city and county rows)	F6	10	E19/F19 and copy from G19..G19 to G20..G1624
H	PTAXREV (property tax reve-nue)	C2	14	enter Field 32 + code pull 1115 for counties
I	PTAXRATE (property tax rate)	C6	11	H19/E19 and copy from I19..I19 to I20..I1624 and in I1627: @AVG(I19..I1624)

TEMPLATE V (C:\123\RSV---)

Template V: Used to calculate mandatory disbursements from counties and mandatory disbursements to towns and villages when the sum of standard county sales tax rates and standard city sales tax rates > .03.

Template V is arranged by county with city, town and village records for that county listed under each county record.

Column	Column Heading	Col. Format	Col. Width	Formula or Source
A	Jurisdiction	F0	14	
B	COSTBOC (county sales tax base outside of cities)	C2	15	C:\123\SCISTBIC Col. D19..D1624
C	TAXPSFVIC[1] (town & village proportional share of town & village full value assessment in county)	C6	10	From IV, Disk 3, Col. G.
D	MDISBFC (mandatory disbursements from county) (will attach mandatory disbursements from counties not only to each county row but also to each T&V row in that county)	C2	12	In Albany Co, Row 19: $CISTRATE*$B$19 and copy from D19..D19 to D23..D38 No entry in Allegany Co. In Broome Co., Row 80: $CISTRATE*$B$80 and copy from D80..D80 to D82..D104 In Cattaraugus Co, Row 105: $CISTRATE*$B$105 and copy from D105..D105 to D108..D152 Etc.
E	OTHRINC2 (mandatory disbursements to other income in towns and villages)	C3	14	C19*D19 and copy from E19..E19 to E20..E1624
F	SCISTBIC (sum of city sales tax bases in county)	C3	14	From C:\123\SCISTBIC Col. B19..B1624

[1] In Tompkins County the disbursements to "remainder" of county are based on population.

G	STNCBCIC (sales tax not collected by county in cities because total >.03)	C3	14	In Albany Co.: (0.03-$CISTRATE)*F19 No entry in Allegany In Broome Co., row 80: (0.03-$CISTRATE)*F80 In Cattaraugus Co., row 105 (0.03-$CISTRATE)*F105 Etc.
H	CLASS	F0	7	From C:RSDATA, col. P
I	MUNIID	F0	8	From C:RSDATA, col. Q
J	Blank			
K&L	Range Name Table			

Name	Range
CISTRATE	E10
JURISDIC	A19..A1624
MDISFC	D19..D1630
OTHRINC2	E19..E1630
STNCBCIC	G19..G1630

C:\123\TRFILE-1
(for sorting only)

A = Jurisdictions	
B = PARNEEDS	V14+V20+V21+V27 from C:\RSDATA
C = PROPTXBA	From IV-3, Col. E
D = COSATXBA	From IV-2, Col. J
E = MDISBIC	From V, Col. D
F = STNCBCIC	From V, Col. G
G = CISATXBA	From C:\123\CISTB
H = OTHERINC	V44-V32-V34 from C:RSDATA, Col. K + (+ Import from V, Col. E)
I = OWNSOURY	From Col. M of C:\123\RSDATAI or col. I, TRFILE-2
J = POP[1]	From Col. F of C:\123\RSDATATI or col. J, TRFILE-2
K = PANEEDS/C	From Col. K of C:\123\TRFILE-2
L = PTABA/C	From Col. L of C:\123\TRFILE-2
M = COSATB/C	From Col. M of C:\123\TRFILE-2
N = MDISFC/C	From Col. N of C:\123\TRFILE-2
O = STNCBC/C	From Col. G of C:\123\TRFILE-3
P = CISTB/C	From Col. H of C:\123\TRFILE-3
Q = OTHINC/C	From Col. I of C:\123\TRFILE-3, from V + other
R = OWNSY/C	From Col. J of C:\123\TRFILE-3
S = Class	
T = MUNIID	

AVG/C	PTAX Base in L1628
AVG/C	COST Base in M1627
AVG/C	CIST Base in P1627

---

[1] Population for towns is town outside of village. The figure one instead of zero is entered in towns of Pelham and Rye, rows 1557 and 1559 to eliminate the ERR message. These same entries are used for Pelham and Rye in Templates IIA and IIB so that the distributions among jurisdictions are not effected.

C:\123\TRFILE-2
(A & C Order)[1]

A = Jurisdiction

B = PARNEEDS (doesn't include cost functions)

C = PROPTXBA From IV-3, Col. E

D = COSATXBA From IV-2, Col. J Delaware, Herkimer, Oswego and Schenectady typed in here.

E = MDISBFC (From V, Col. D)

F = STNCBCIC (From V, Col. G)

G = CISTATXBA From C\123\CISTB

H = OTHERINC From C:\123\RSDATATI Col. K

I = OWNSOURY From C:\123\RSDATATI, Col. M

J = POP[2]

K = PANEEDS/C B/j

L = PTABA/C C/j

M = COSATB/C D/j

N = MDISFC/C E/j Saved as MDISFCPC

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1 Jurisdictions are arranged with all cities, towns, and villages records within a county listed below that county record. Data are sorted by municipal code in ascending order.

2 Population for towns is town outside of village. The figure one instead of zero is entered in towns of Pelham and Rye, rows 1557 and 1559 to eliminate the ERR message. These same entries are used for Pelham and Rye in Templates IIA and IIB so that the distributions among jurisdictions are not effected.

C:\123\TRFILE-3
(A & C Order)[1]

A = Jurisdiction	
B = STNCBCIC	(From V, Col. D)
C = CISATXBA	From C:\123\CISTB
D = OTHERINC	C:\123\RSDATATI, Col. K + (from V, col. E) + V, Col. E
E = OWNSOURY	From C:\123\RSDATATI, Col. M
F = POP	From C:\123\RSDATATI, Col. F
G = STNCBC/C	B/F
H = CISTB/C	C/F
I = OTHINC/C	D/F
J = OWNSY/C	E/F

[1] Jurisdictions are arranged with all cities, towns, and villages records within a county listed below that county record. Data are sorted by municipal code in ascending order.

C:\123 RSDATATI
(A & C Order)[1]

A	Municode	T13		
B	Muniname	T16		
C	CISTR	C4	8	AVG in 1610 = .00795
D	COSTR	C4	8	AVG in 1610 = .02500
E	(PTAXBASE)	V30	FO	13
F	POP (V45)		FO	13
G	ignore			
H	V44	FO	13	
I	V32	FO	13	
J	V34	FO	13	
K	OTHERINC	FO	14	Formula H2-I2-J2 and copy
L	FED+SAID	FO	12	V36+V37+V38+V39
M	OWNSOURY	FO	10	H2-L2
N	Class			
O	MUNIID			

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[1] Jurisdictions are arranged with all cities, towns, and villages records within a county listed below that county record. Data are sorted by municipal code in ascending order.

C:\RSDATA[1]
(A & C Order)[2]

A	Municode
B	Muniname
C	V14
D	V20
E	V21
F	V27
G	V30
H	V32
I	V34
J	V36
K	V37
L	V38
M	V39
N	V44
O	V45
P	Class
Q	Muniid

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[1] NOTE: No State Aid for Row 33, 77, 106, 143, 248, 249, 468, 551, 592, 641, 712, 806, 865, 924, 930, 1244, 1271, 1534, 1543, 1602.

[2] Jurisdictions are arranged with all cities, towns, and villages records within a county listed below that county record. Data are sorted by municipal code in ascending order.

APPENDIX F
ADDITIONAL SIMULATIONS

This appendix contains the results of two additional simulations which grew out of discussions with the Commission staff. One simulation excludes Health and Social Services when calculating need. The second simulation excludes Federal and State Revenue Sharing when calculating available revenue. The first is an investigation of one of our suggestions for further research. The second recognizes the disappearance of Federal Revenue Sharing and at the same time explores the effects of completely replacing the current state general purpose aid program with one of the gap strategies.

Because discussions with Commission staff and with the Commission Working Group revealed concern about the political acceptability of the results presented in the body of this report, an additional factor was incorporated into the summaries for these two simulations. The additional factor was the number of nonzero recipients. It is presumed that the political acceptability tends to increase as the number of nonzero recipients increases and conversely political acceptability declines as the number of jurisdictions receiving zero aid increases.

The summaries of results with Health and Social Services excluded from the calculation of need are shown in Tables F1 and F2. Tables F3 and F4 contain the results when Federal and State Revenue Sharing are excluded from available income.

Not surprisingly, the elimination of Health and Social Services from the need calculation alters considerably the distribution of aid among classes of jurisdictions. These two services are expensive and mandated services for counties. The result is to shift aid away from counties and toward cities, towns and villages. The shift is most severe with the Need-Capacity strategies where the percent received by counties is nearly zero but comparisons with Tables III and IV in the body of the report indicate that the shift is maintained but to a smaller degree with Need-Capacity-Effort strategies. This shift away from counties and toward cities, towns and villages is more nearly aligned to the current aid distribution but the political acceptability, particularly for the Need-Capacity strategies is not likely to be very high. It will be noted that most of the counties and large numbers of towns and villages would receive absolutely no revenue sharing aid under the Need-Capacity strategies. It is only with Need-Capacity-Effort strategies that the number of nonzero recipients is very high. For example in Columns 6 and 8 of Table F1, 1578 of the 1606 jurisdictions would receive some aid and 17 of the 28 that would not receive aid did not file financial statements for FY1984 and hence did not have data in the data base for this study. But the percentage distribution of aid under these strategies is far removed from the current distribution of aid which gives 12 percent to counties and 52, 27 and 9 percent to cities, towns, and villages respectively.

Columns 3 and 4 with high weights on Need-Capacity might be considered to have some potential by those skilled in judging acceptability because of the high proportion of nonzero recipients.

TABLE F1: SIMULATION RESULTS FOR ALTERNATIVE AID DISTRIBUTION STRATEGIES, AVERAGE NEEDS, WITHOUT HEALTH AND SOCIAL SERVICES IN COUNTY NEEDS

	(1) NC AVG RATES	(2) NC LOW RATES	(3) NCE AVG RATES HIGH WT ON NC	(4) NCE LOW RATES HIGH WT ON NC	(5) NCE AVG RATES EQUAL WEIGHTS	(6) NCE LOW RATES EQUAL WEIGHTS	(7) NCE AVG RATES HIGH WT ON EFFORT	(8) NCE LOW RATES HIGH WT ON EFFORT
				Average Dollars				
County	652	4,220	571,136	491,804	724,431	638,633	836,769	751,087
City	413,720	349,931	386,551	344,123	379,250	342,374	373,900	341,035
Town	41,901	53,071	24,336	34,216	19,809	28,813	16,492	24,675
Village	65,842	53,987	38,102	34,327	30,776	28,524	25,407	24,079
				Percentages				
County	0	0	33	28	41	36	48	43
City	25	21	24	21	23	21	23	21
Town	38	49	23	32	18	27	15	23
Village	36	30	21	19	17	16	14	13
				Number of Nonzero Recipients				
County	2	3	56	57	56	57	56	57
City	51	54	61	61	61	61	61	61
Town	548	835	759	912	759	912	759	912
Village	325	437	522	548	522	548	522	548

TABLE F2: SIMULATION RESULTS FOR ALTERNATIVE AID DISTRIBUTION STRATEGIES, LOW NEEDS, WITHOUT HEALTH AND SOCIAL SERVICES IN COUNTY NEEDS

	(1) NC AVG RATES	(2) NC LOW RATES	(3) NCE AVG RATES HIGH WT ON NC	(4) NCE LOW RATES HIGH WT ON NC	(5) NCE AVG RATES EQUAL WEIGHTS	(6) NCE LOW RATES EQUAL WEIGHTS	(7) NCE AVG RATES HIGH WT ON EFFORT	(8) NCE LOW RATES HIGH WT ON EFFORT
Average Dollars								
County	4	3,885	598,609	515,379	746,199	658,283	851,124	764,542
City	412,166	351,332	384,615	344,453	377,822	342,531	372,993	341,101
Town	40,354	51,954	22,915	32,864	18,787	27,780	15,851	23,999
Village	68,647	55,719	37,879	34,141	30,414	28,224	25,108	23,825
Percentages								
County	0	0	34	29	43	38	49	44
City	25	21	23	21	23	21	23	21
Town	37	48	21	31	18	26	15	22
Village	38	31	21	19	17	16	14	13
Number of Nonzero Recipients								
County	1	3	56	57	56	57	56	57
City	50	53	61	61	61	61	61	61
Town	473	804	746	911	746	911	746	911
Village	290	385	522	547	522	547	522	547

TABLE F3. SIMULATION RESULTS FOR ALTERNATIVE AID DISTRIBUTION STRATEGIES, AVERAGE NEEDS, WITHOUT FEDERAL AND STATE REVENUE SHARING

	(1) NC AVG RATES	(2) NC LOW RATES	(3) NCE AVG RATES HIGH WT ON NC	(4) NCE LOW RATES HIGH WT ON NC	(5) NCE AVG RATES EQUAL WEIGHTS	(6) NCE LOW RATES EQUAL WEIGHTS	(7) NCE AVG RATES HIGH WT ON EFFORT	(8) NCE LOW RATES HIGH WT ON EFFORT
Average Dollars								
County	593,465	604,601	765,940	726,623	833,927	779,299	892,953	827,385
City	315,293	267,956	337,581	296,204	346,366	308,398	353,993	319,530
Town	27,290	34,032	20,362	27.615	17,815	25,097	15,605	22,798
Village	39,749	32,643	30,165	26,577	26,500	24,060	23,318	21,763
Percentages								
County	34	34	44	41	48	44	51	47
City	19	16	21	18	21	19	22	19
Town	25	31	19	26	17	23	15	21
Village	22	18	17	15	15	13	13	12
Number of Nonzero Recipients								
County	47	52	57	57	57	57	57	57
City	57	59	61	61	61	61	61	61
Town	610	865	780	912	780	912	780	912
Village	356	458	524	548	524	548	524	548

TABLE F4: SIMULATION RESULTS FOR ALTERNATIVE AID DISTRIBUTION STRATEGIES, NEEDS=LOW QUARTILE, WITHOUT FEDERAL AND STATE REVENUE SHARING

	(1) NC AVG RATES	(2) NC LOW RATES	(3) NCE AVG RATES HIGH WT ON NC	(4) NCE LOW RATES HIGH WT ON NC	(5) NCE AVG RATES EQUAL WEIGHTS	(6) NCE LOW RATES EQUAL WEIGHTS	(7) NCE AVG RATES HIGH WT ON EFFORT	(8) NCE LOW RATES HIGH WT ON EFFORT
				Average Dollars				
County	519,868	534,573	744,499	698,824	824,230	763,464	889,493	819,537
City	336,871	284,556	351,075	308,301	356,091	317,646	360,313	325,752
Town	27,865	35,565	20,010	27,904	17,405	25,129	15,264	22,722
Village	44,010	35,496	31,442	27,616	27,115	24,615	23,560	22,012
				Percentages				
County	30	30	42	40	47	44	51	47
City	21	17	21	19	22	19	22	20
Town	26	33	19	26	16	23	14	21
Village	24	20	17	15	15	14	13	12
				Number of Nonzero Recipients				
County	42	49	57	57	57	57	57	57
City	61	61	61	61	61	61	61	61
Town	542	840	758	912	758	912	758	912
Village	317	421	522	548	522	548	522	548

Further, Table V of the main body of the report reveals that Need-Capacity-Effort strategies, particularly with high weights on need-capacity provide moderately high aid to the most needy jurisdictions within each municipal class.

Tables F3 and F4 contain summaries of results when Federal and State Revenue Sharing aids are excluded from available income. The percentage distributions summarized in these two tables are only modestly different than Tables III and IV in the body of the report. But in comparison with F1 and F2, exclusion of Federal and State Revenue Sharing aids results in a return shift of aid away from cities, towns, and villages and toward counties. The number of nonzero recipients is similar in both sets of tables for all Need-Capacity-Effort strategies but the number of nonzero recipients for both counties and cities is higher for Need-Capacity strategies when revenue sharing aids are excluded from available incomes.

In summary, it appears that if the current distribution of state revenue sharing aid is to be the litmus test of political acceptability, the gap strategies will be found wanting. If higher amounts of aid to the neediest of jurisdictions regardless of class is to be the litmus test of acceptability, then the gap strategies investigated in this study may have some potential.