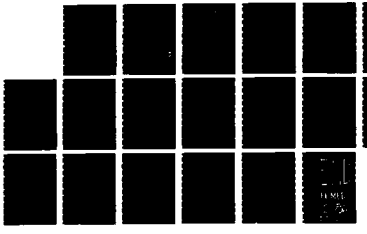
AD-A163 190 PROCEEDINGS OF AN ECONOMIC AND SOCIAL ANALYSIS WORKSHOP HELD ON 16-20 JUL (U) ARMY ENGINEER INST FOR WATER RESOURCES FORT BELVOIR VA D WALLIN SEP 85 IWR-85-PR-2A

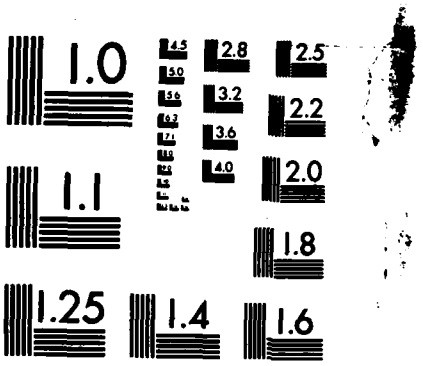
1/1

UNCLASSIFIED

F/G 5/3

NL





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

US Army Corps
of Engineers
Engineer Institute for
Water Resources

12

Municipal Fiscal Stress
(AN OVERVIEW)

Addendum to Proceedings of an Economic and Social Analysis Workshop, 16-20 July 1984, Chicago, Illinois

September 1985

Proceedings 85-PR-2a

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE	READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER: Proceedings 85-PR-2a	2. GOVT ACCESSION NO.: AD-A163 190
	3. RECIPIENT'S CATALOG NUMBER:
4. TITLE (and Subtitle): Addendum to Proceedings of Economic and Social Analysis Workshop, 16-20 July 1984 - Municipal Fiscal Stress - An Overview	5. TYPE OF REPORT & PERIOD COVERED: Addendum to Proceedings of Workshop
	6. PERFORMING ORG. REPORT NUMBER: 85-PR-2a
7. AUTHOR(s): David Wallin, Ph.D. Corps of Engineers, Chicago District	8. CONTRACT OR GRANT NUMBER(s):
9. PERFORMING ORGANIZATION NAME AND ADDRESS: Water Resources Support Center Institute for Water Resources Casey Building, Ft. Belvoir, VA 22060-5586	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS:
11. CONTROLLING OFFICE NAME AND ADDRESS: U.S. Army Corp of Engineers Office of the Chief of Engineers 20 Mass. Ave., Washington, DC 20314	12. REPORT DATE: September 1985
	13. NUMBER OF PAGES: 32
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office):	15. SECURITY CLASS. (of this report): Unclassified
	15a. DECLASSIFICATION/DOWNGRADING SCHEDULE:

16. DISTRIBUTION STATEMENT (of this Report)

Approved for Public Release - Distribution Unlimited

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

This paper was presented at the workshop but accidentally omitted from the published proceedings in April, 1985. (Report No. 85-PR-2)

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Municipal capability, local finances, fiscal stress, storm water control, fiscal impact, expenditures, methodology of project affordability.

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Paper presented at the Economic and Social Analysis Workshop held 16-20 July 1984 in Chicago, Illinois on the subject of planning Corps projects with emphasis on the importance of economic analysis in project formulation.

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

ADDENDUM TO PROCEEDINGS OF
SOCIAL ANALYSIS WORKSHOP
16-20 July 1984
Chicago, Illinois

Municipal Fiscal Stress Study

An Overview

by

Dave Wallin, Ph.D.
Chicago, Illinois

September 1985

Proceedings 85-PR-2a

PROLOGUE

Cook County, Illinois, contains the largest combined sewer service area in the nation, where sanitary wastes and stormwater runoff are carried together in single sewers covering an approximately 380 square mile area. During wet weather the system frequently overloads, and mixed sanitary sewage and urban runoff spill into the area's streams and rivers. In addition, street ponding and basement backups occur.

To reduce flood damages and improve water quality, a Chicago Underflow Plan (CUP) was prepared in the early 1970's. The plan included the TARP proposal to build tunnels and reservoirs which would improve drainage and serve as holding basins for combined sewer overflows. The first phase of TARP involved features primarily for water quality improvement, with the second phase being geared largely to flood control. Because of the high costs identified with TARP, the U.S. Army Corps of Engineers was directed by Congress to examine its second phase to determine whether a more cost-effective alternative to (or modification of) Phase II could be formulated. As part of the process for screening alternatives to Phase II TARP, it was necessary to examine the fiscal capability of the affected municipalities to undertake potential alternative stormwater control projects.

In January, 1981, the Chicago District developed the Plan-of-Study (P-o-S) and contracted with the Government Finance Research Center of the Municipal Finance Officers Association to undertake such a study. This paper provides an overview of the research that was conducted and gives a summary of the objectives, methodology, findings, conclusions, and applications.

Study Reports Issued

The results of the study have been documented in detail in a series of prior reports. These reports are as follows.

- Resource Guide on Municipal Fiscal Stress, (December, 1981). The Resource Guide details the analytical framework for the approach and shows how the methodology was derived for assessing fiscal impact and evaluating fiscal stress. In addition, the Resource Guide provides a background description of the Cook County area, explains local government finances in Illinois, and reviews the stormwater problem of the region.

- Individual Community Reports. Between December, 1981, and December, 1982, 51 reports were issued, each one showing the analysis of the results from applying the methodology to one of the affected communities.

- Municipal Fiscal Stress Study, Phase IV: The City of Chicago (February, 1983). This report describes the analysis of the fiscal capacity of Chicago to undertake various stormwater control projects.

- Comparative and Sensitivity Analysis: Municipal Fiscal Stress Study (April, 1983). This document compares and contrasts the results of the application of the methodology to the 51 suburbs. Comparisons are made of the communities' economic and fiscal character, and of their abilities to undertake stormwater alternatives. The sensitivity of the results of the analysis to some of the basic methodological assumptions is also examined.

- Final Report: Municipal Fiscal Stress Study (June, 1983). This final report summarizes the contents of the phone documents, the research, and its findings.

STUDY OBJECTIVES

The principal study objectives are: ~~enumerated below:~~

1. To develop a method for examining the future impact of various stormwater control expenditures on local government finances,

2. To develop quantitative indicates which measure and reflect the degrees of fiscal stress which may result from a municipality undertaking a stormwater control project; and

3. To develop a methodology which will permit consistent applications so that comparisons of project affordability could be made among all communities involved.

Commentary on Approach to the Study

The principal methodology used is based on an analytical model constructed for projecting future fiscal flows -- revenues, expenditures, and changes in debt -- and measuring their relationship to the underlying sources of revenue. Initially, "Base Case" projections of future finances are made assuming that stormwater control improvements will not be introduced. Next, to those projections are added the incremental costs of financing various stormwater control alternatives, the dollar cost of the latter being specified by the Chicago District. These alternative cost projections are then used to provide a basis for examining the fiscal stress -- the degree of incremental revenue-raising effort -- required to maintain a balance between a community's total outlays and receipts. The period examined is fiscal years 1983-1987 generally assuming that the improvements are initiated in 1983, take three years to complete, and become fully operational by 1986.

Such an analysis has inherent limitations, as well as advantages. Projections of complex phenomena require numerous assumptions regarding the initial values, the rates of growth in key variables, and the stability of the relationships among variables. On the other hand, such models do capture the dynamic quality of the interaction between variables and their movement through time, and they also make assumptions about relationships and behavior explicit.

Although the methodology is generally applicable to any type of government or type of outlay, its specific application is to examine the financial burdens and fiscal stress associated with various alternative solutions, to the stormwater control problem, which may be undertaken by individual municipalities in Cook County. This was done by applying the methodology individually to each of the 52 municipalities in the study and then assessing the degree of fiscal stress resulting from a hypothetical undertaking of the projects.

METHODOLOGY

Analytical Framework

To gain a realistic picture of the future impacts of stormwater alternatives on government finances and the financing burdens on the public, it was necessary to make projections of the change in the major revenue bases, the cost of furnishing other public services, the costs of stormwater projects, and how they will be financed.

This was done through the use of a model -- a set of mathematical relationships -- that relates the future behavior of economic and fiscal variables. The variables and their relationships attempt to reflect the essence of the projected budgetary actions of the various governments.

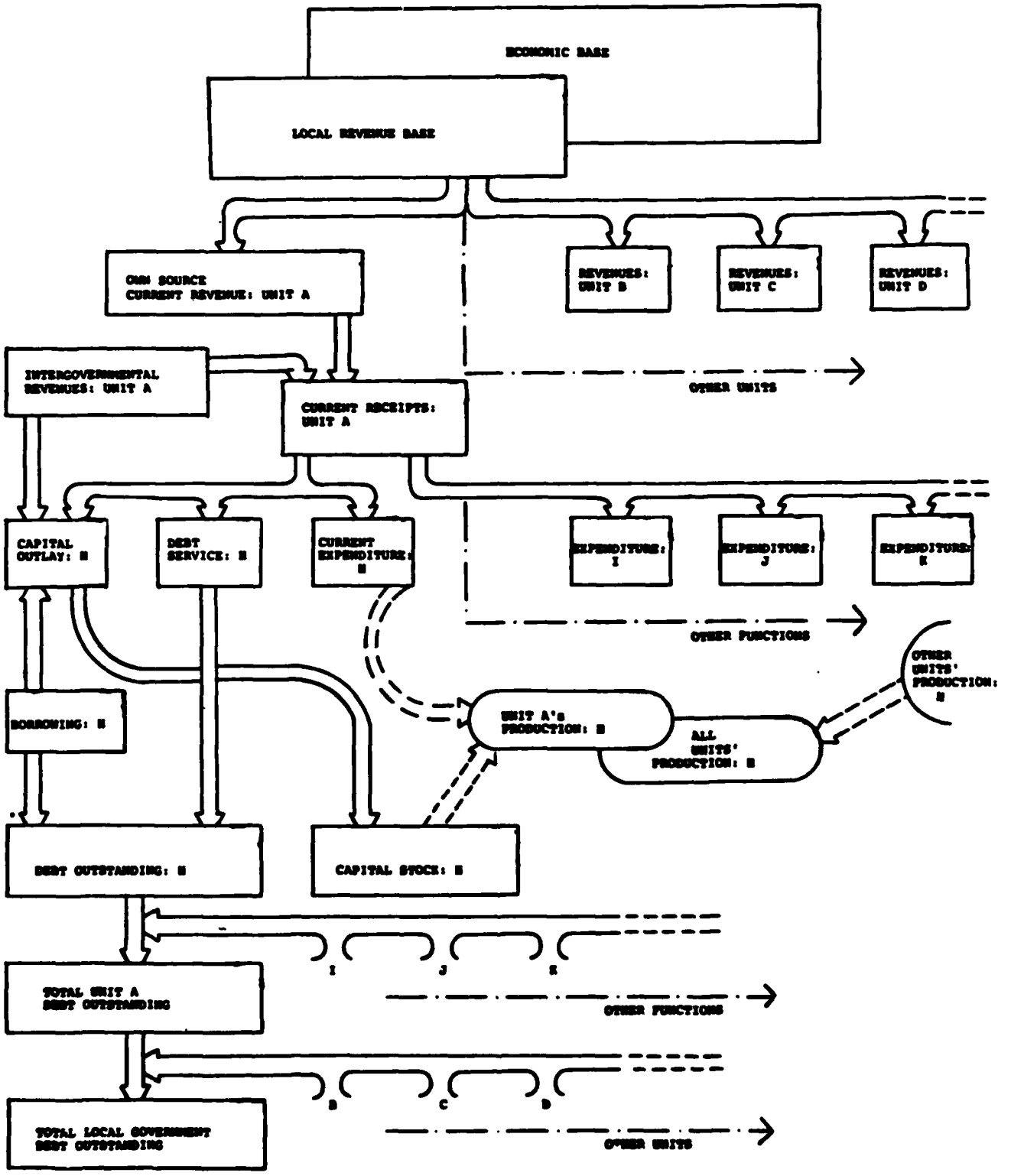
Figure 1 depicts the major components of the model of local government finances used in this study. Figure 1, overleaf, is a schematic diagram of how funds flow into, and out of, the local government sector as different types of services are financed and delivered. The diagram relates expenditures and revenues to the overall economic base of a municipality. It shows that a number of governmental units are tapping the economic base to raise revenues and finance a variety of functional expenditures.

The flow of resources begins with the economic base of a community and proceeds through the actual revenue base of a local government. The revenue base is that portion of the local economy which a government is legally empowered to tax or otherwise tap for funds. Moving down through the diagram, locally generated receipts are joined in the current and capital outlay budgets by inflows from intergovernmental payments and borrowing proceeds. As a result of borrowing to acquire capital stock, the units will incur debt, which, in turn, represents claims on future revenues in the form of debt service.

As shown in the figure, local government "A" is only one of the claimants to the local revenue base. While government "A" is raising revenues from local economic activity, other jurisdictions (units "B", "C", and "D", etc.) are doing likewise in support of the various expenditures functions ("I", "J", "K", etc.). Thus, the full burden of government spending -- on the resources that can support it -- must be viewed comprehensively. Since the local revenue base is, as a matter of law and practice, finite, the activities of other units will act as a constraint on the revenue-raising ability of unit "A".

FIGURE 1

FLOW OF FUNDS MODEL OF LOCAL GOVERNMENT FINANCES



The figure shows that current expenditures and capital stock combine to produce a level of service for a particular function (for example, "H"). The level of production of service "H" may be dependent upon expenditures for that service made by other local governmental units. Thus, in the real world, a community's provision of services and how much it spends in the process will depend in many cases on what overlapping and surrounding jurisdictions are doing as regards to that service.

The bottom of the figure shows that debt of the local government (direct debt) must be considered along with debt from other units (overlapping debt) that is also supported by the community's revenue base.

The model employed depends on the community maintaining a budget constraint. Essentially, that means it is assumed that local government budgets over time must be balanced. Furthermore, it was assumed that revenues will be raised only to the extent necessary to cover expenditure requirements and, aside from financing a given stormwater control project, that community services are maintained at constant real levels, after inflation is taken into account.

Using the model, projections were made of revenue, expenditures, and indebtedness in what is called the "Base Case" (i.e., in the absence of expenditures for a stormwater project). Next, given the dollar requirements of an alternative storm-water control project and by assuming a method of financing, it is possible to measure the incremental revenue requirements for the various projects and, then, the degrees of fiscal stress resulting from undertaking them.

Measures of Fiscal Stress

There are several potential measures of fiscal stress. For this study, the major focus is on the changes in required annual revenues and in the levels of indebtedness required to support various projects. In addition, a single index of fiscal stress was developed. This index, the revenue effort index (REI), was derived by comparing the amount of per capita revenues generated by a municipality from its own sources to its hypothetical per capita revenue capacity. The hypothetical capacity is based on the concept of a representative revenue system from which is derived a composite measure of the fiscal capacity of a unit to raise revenues from its own sources.

This composite measure of revenue effort is obtained by applying identical rates to three major economic activity mesures that serve as revenue bases. The rates used are the averages at which the sources are effectively "taxed" by all Cook County suburbs. The revenue bases are market value of real property, retail sales, and "area income" ("area income" is generated by a formula that includes per capita income and employment). The revenue effort index (REI) expresses actual revenues as a percentage of theoretical capacity. For the average Cook County suburban resident, the value is 100 (as of 1980, the Base year). REIs of less than 100 represent communities that are making a less than average effort in raising revenues; higher than 100 for communities exerting a greater than average level of effort.

In addition to expressing effort (REI) in terms of revenues raised directly by a municipality, an overall effort index can also be formed that includes all the revenue-raising requirements and capability of overlapping jurisdictions as well as the individual municipality. Thus, two types of REI are calculated: direct (for the municipality alone) and overall (for the sume of all local governments).

The REI allows comparisons of a single community's revenue effort over time, in the "Base Case" (without a stormwater project), and if it were to support a project. In addition to the absolute value of the index and changes over time, the required increases in the index which would result from alternative stormwater control projects are useful measures of stress. Furthermore, the REI permits ready comparisons between jurisdictions both in the Base Case and with alternative projects.

Description of the Model

The model is empirical -- based upon actual behavior and characteristics exhibited in 1980, the Base Year for the study. In addition, historical data for the years back to, and including, 1975 are used as a basis for interpreting 1980 behavior and likely behavior in the future.

To quantify this behavior and these characteristics, a number of variables were defined. Table 1 lists the variables that were used in the model developed for the study. Then, in order to make projections about future values of these variables, a series of assumptions were made explicit about:

- How municipal governments set their budgets;
- The relationships between variables; and
- Anticipated economic change.

Using these assumptions, projections of future finances were made, based on 1980 behavior, and under the assumed conditions for the projections period. The period examined was fiscal years 1983-1987, and initial ("Base Case") projections are made of revenues, expenditures, and indebtedness without a stormwater control project. When the annual costs of the various project alternatives are overlaid on these "Base Case" projections, values are obtained for the fiscal variables under the alternatives.

To permit the multiple and rapid manipulations needed to simulate the behavior of the variables during the projections period, a series of linked computer programs was created that converts the relationships among the variables into explicit mathematical operations. These programs ('the computer model") produce outputs that list fiscal variables and indicators by year, in the Base Case, and with the alternatives.

The computer model can be run on a single community or on a series of communities. The model also permits ready alteration of the growth assumptions so that outcomes can be examined under different assumed conditions for the projection period.

TABLE 1

MAJOR VARIABLES USED IN MODEL

Economic/Demographic

- Population
- Per Capita Income
- Retail Sales
- Market Value
- Employment

Revenues

- Property Tax
- Sales Tax
- Other Local Revenues
- State Aid
- Federal Aid

Expenditures

- Current Operating Expenditures
- Capital Outlays
- Debt Retirement
- Pension Fund Contributions

Debt and Assets

- Borrowing (long-term)
- Debt Outstanding

Stormwater Control Projects

- Capital Outlays
- Operating & Maintenance Expense

Overlapping Governments Enterprise Funds

- Overlapping Unit Property Taxes
- Overlapping Unit Debt
- Enterprise Fund Current Revenues
- Enterprise Fund Expenditures
- Enterprise Fund Debt

Data Collection and Assumptions

A primary concern in this study was the accumulation of valid and consistent data regarding the economy and finances of the municipalities, both individually and for the Cook County area in the aggregate. Data were derived from centrally collected sources of information (such as are provided by the Bureau of Census and the State Comptroller's office) and then checked with, for instance, local financial reports. Information gathered was discussed and clarified during interviews with municipal officials in each community.

Inasmuch as the assumptions regarding future growth are an important set of data used by the model, two major outlook scenarios were developed. The first outlook was developed in mid-1981 when inflation levels were high. This outlook is reflected in the series of individual Community Reports, for consistency and comparability of results, even though the economic prospects did change during the year-long period in which the reports were issued.

In late summer of 1982, a second outlook was developed on the initiative of the Economic Analysis Branch and based on a meeting that was held with a number of Chicago area economists and students of local government. This second outlook was used in the preparation of the report for the City of Chicago, as well as for the computations on which the comparative and sensitivity analysis of the suburban communities were based. The second outlook foresees less price inflation and much less growth in real property values than did the original forecast.

STUDY FINDINGS

This summary of findings is divided into two (2) major subsections:

- Suburban communities
- City of Chicago

A. Suburban Communities

In order to analyze the ability of a municipality to finance a particular service and how it might do so, it is necessary to understand the legal framework to which it owes its existence, the political climate in which is operates, the economic setting which undergirds its ability to raise local revenues, and the importance of funds from non-local sources. Details of these environmental aspects of local finance were provided in the Resource Guide.

Local Government in Cook County

Illinois has more local governments than any other State, and in Cook County there are over 500 taxing jurisdictions of which about 120 are municipalities. The remaining jurisdictions in the County are townships and special purpose districts that provide such services as education, parks, libraries, sewage treatment, and fire protection. The result is a crazy quilt of overlapping jurisdictional arrangements in which a County resident may support up to as many as 15 taxing entities.

Illinois provides broad home-rule powers to municipalities larger than 25,000 in populations, and smaller if approved by referendum. However, home-rule governments are not entirely independent fiscal entities, and their powers can be preempted by the State legislature. Non-home rule units are subject to limitations on debt and tax rates.

51 Suburbs in this Study

The focus of this sub-section is 51 Cook County communities that are predominatly in the "inner ring" of suburbs around Chicago. These municipalities are located in the older part of the metropolitan region that was developed using combined storm and sanitary sewers. The communities exhibit a substantial degree of variety in their economic and fiscal character. Table 2 summarizes some of these characteristics. As shown in this table, in per capita terms, the range of income, value of taxable property, and revenue-raising activities is broad. As previously mentioned, a separate Community Report has been prepared for each individual municipality providing detailed information and an analysis of its finances. When projections of economic and fiscal variables are made for future years under the assumed local government behavior and economic conditions, the revenue effort index (REI) for each year can be calculated. Figure 2 shows the distribution of REIs among the suburban communities that existed in 1980 and as calculated for the Base Case (without stormwater projects) in 1983 and 1987.

Alternative Projects

For each community, the Economic Analysis Branch provided four basic cost scenarios for addressing stormwater control problems. It is important to note that the scenarios do not relate to precise engineering alternatives, but rather they provide cost magnitudes that preliminary economic and hydraulic investigations suggest may be appropriate. For this analysis, it is assumed that all alternatives are constructed in three years in equal physical units and that operating and maintenance costs commence in the fourth year, after construction is completed. Although the alternatives may be financed from current revenues or through the issuance of long-term debt, it was generally assumed that the latter method would be used.

Table 3 summarizes the range of alternative project costs for the communities with the annual costs computed, assuming debt financing for simplicity. The alternatives are identified in the remainder of this discussion as follows: For each community, the most expensive option is designated as Alternative 1 and the least expensive as Alternative 4; with Alternatives 2 and 3 lying in between. This table also shows the percent increase in the revenue effort index that would be required to support an alternative project.

Project Feasibility

In order to make assessments of projects affordability, this study focuses on measures of fiscal stress. These measures include the revenue

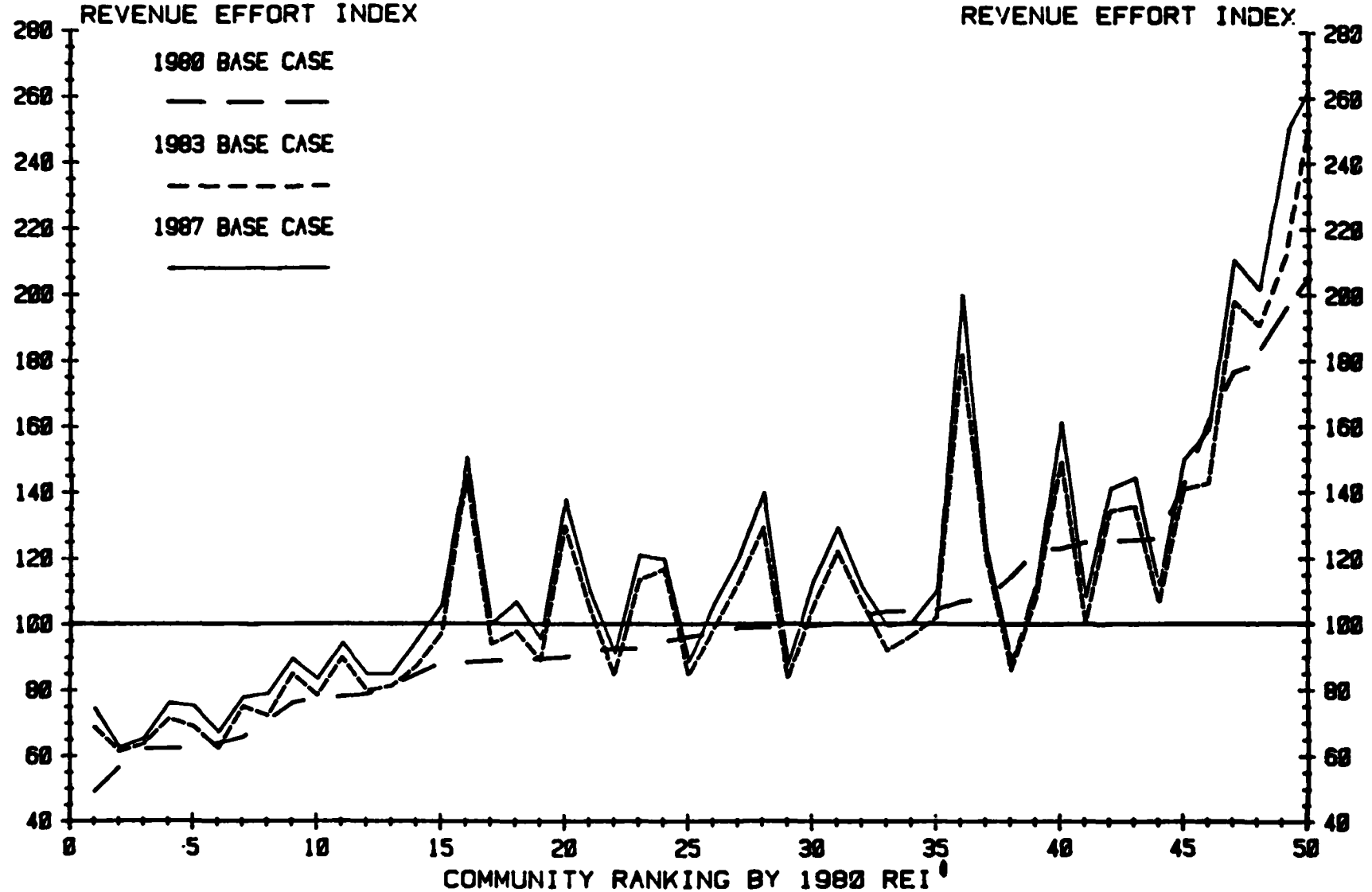
TABLE 2

ECONOMIC INDICATORS OF SUBURBAN COMMUNITIES - 1980

Community Ranked by Population	Population	Per Capita Income	Own Source Revenues	Intergovernmental Revenues	Per Capita Market Value	Per Capita Water/Sewer Revenue	Per Capita Direct Debt
GOLF	482	17094	315.87	60.60	65696.97	57.31	68.41
FOREST VIEW	764	10025	1690.06	205.45	157676.32	107.90	6.54
BEDFORD-PARK	988	10527	2096.79	202.03	719621.23	2916.30	0.00
KENILWORTH	2708	28925	330.80	39.94	41785.35	99.14	162.48
PHOENIX	2850	5127	92.24	278.68	6600.62	37.04	0.00
BURNHAM	4030	8916	110.99	37.76	15068.32	31.44	53.35
DIXMOOR	4175	6980	90.91	75.97	12181.11	65.21	0.00
POSEN	4642	7922	139.97	53.24	16521.25	55.62	9.91
HOMETOWN	5324	8035	86.85	63.08	7241.47	26.85	12.77
STICKNEY	5893	9144	176.13	68.92	28607.33	109.35	0.00
NORTH RIVERSIDE	6794	10328	413.18	55.37	36635.73	37.77	0.00
HARWOOD HTS	8228	9884	120.96	39.74	22480.24	50.19	0.00
BROADVIEW	8618	9589	406.67	55.65	39115.20	99.90	29.39
CALUMET PARK	8788	8576	175.65	119.84	18252.08	32.81	0.00
RIVERSIDE	9236	13341	264.65	68.88	17408.69	54.63	16.24
LYONS	9925	9619	176.26	67.70	18584.46	63.70	13.70
SUMMIT	10110	7770	179.99	132.24	15233.17	64.00	46.88
RIVER GROVE	10368	9639	166.17	55.14	18610.81	67.34	17.36
SCHILLER PARK	11458	9420	314.70	60.28	33279.69	65.62	87.28
LINCOLNWOOD	11921	18984	388.83	38.45	47151.38	60.31	18.87
RIVER FOREST	12392	16232	283.36	39.54	22207.46	51.42	23.40
WESTERN SPRINGS	12876	14773	210.10	38.57	18985.98	62.24	65.24
RIVERDALE	13233	9902	113.60	65.37	20491.63	75.18	0.00
LAGRANGE PARK	13359	13078	133.55	38.37	16587.27	68.09	0.00
MARKHAM	15172	7004	99.41	55.89	9081.66	60.16	11.47
FOREST PARK	15177	10858	264.34	66.83	18757.60	66.31	85.66
LAGRANGE	15681	12146	205.39	68.87	18288.88	64.23	12.75
NORRIDGE	16483	10092	128.05	36.17	20662.48	39.63	189.29
FRANKLIN PARK	17507	9186	292.11	62.67	31160.46	132.64	0.00
BROOKFIELD	19396	9790	173.08	62.55	12959.06	67.73	35.63
MELROSE PARK	20735	8819	209.60	64.30	33768.58	133.76	0.00
BLUE ISLAND	21855	8197	129.35	86.02	12279.93	52.69	0.00
MORTON GROVE	23747	12355	296.60	60.75	30332.29	63.93	131.17
ELMWOOD PARK	24016	10192	156.87	62.39	14390.79	66.72	11.65
DOLTON	24766	9760	129.01	61.89	14888.74	68.64	92.87
SOUTH HOLLAND	24977	10888	120.78	38.26	21078.92	63.17	23.22
MAYWOOD	27998	7058	198.09	131.72	8746.82	63.15	11.63
WILMETTE	28299	18012	201.84	60.38	31344.09	60.62	54.55
LANSING	29039	10110	152.64	35.89	16549.69	63.53	99.60
NILES	30363	10628	207.18	57.19	37543.59	53.41	0.99
HARVEY	35810	6460	151.59	72.11	11370.63	71.71	6.98
PARK RIDGE	38704	13191	196.68	68.38	20465.99	67.79	82.29
CALUMET CITY	39673	10117	181.29	66.93	16816.09	58.61	16.13
BERWYN	46849	9673	114.52	60.92	12520.86	36.57	13.55
MOUNT PROSPECT	52634	11698	189.52	61.60	22809.77	60.29	101.72
DES PLAINES	53568	10603	265.71	50.38	32080.67	50.05	116.39
OAK PARK	54887	10987	200.11	89.28	13212.46	50.95	176.09
SKOKIE	60278	13127	291.82	56.36	39058.37	57.35	136.20
CICERO	61232	8179	161.55	66.17	15288.39	72.90	0.00
ARLINGTON HTS	66116	12101	213.52	50.53	25938.69	36.93	269.02
EVANSTON	73706	11982	371.95	88.80	22304.46	79.33	381.92
MAXIMUM VALUE	73706	28925	2096.79	278.68	719621.23	2916.30	381.92
MINIMUM VALUE	482	5127	86.85	35.89	6600.62	26.85	0.00
STD DEVIATION	1893	3814	287.76	52.32	9972.44	400.87	70.99
MEAN (UNWGHTD)	21916	10918	281.22	68.37	28386.70	114.32	51.22
MEDIAN	15177	10092	189.52	58.53	18986.00	54.05	16.24

FIGURE 2

1980, 1983 AND 1987 REVENUE EFFORT INDICES FOR THE COMMUNITIES 1/



1/ All communities except Phoenix. Values for Phoenix are: 1980=177.98; 1983=503.78; 1987=591.20.

TABLE 3

PROJECT COSTS FOR THE 51 SUBURBAN COMMUNITIES — 1983

Community Ranked by Size	Alternative 1 Annual Project Costs	Alternative 1 Increase in REI BC83 to Alt 1 83	Alternative 4 Annual Project Costs	Alternative 4 Increase in REI BC83 to Alt 4 83
GOLF	$521.78	% 167.21	$137.66	% 44.12
FOREST VIEW	337.03	35.10	86.82	5.67
BEDFORD PARK	218.46	5.62	29.27	0.76
KENILWORTH	120.35	28.00	18.06	4.20
PHOENIX	282.99	95.84	46.35	15.70
BURNHAM	90.38	63.66	20.08	14.15
DIXMOOR	103.19	59.77	16.15	9.36
POSEN	88.85	54.64	13.91	8.56
HOMETOWN	66.46	59.86	10.20	9.18
STICKNEY	114.92	51.45	16.58	7.43
NORTH RIVERSIDE	123.21	25.38	33.86	6.88
HARWOOD HEIGHTS	79.30	59.34	15.84	11.85
BROADVIEW	54.92	12.73	7.86	1.82
CALUMET PARK	67.19	37.71	10.44	5.85
RIVERSIDE	131.21	41.01	24.80	7.75
LYONS	79.26	47.39	10.76	6.43
SUMMIT	115.73	57.43	14.65	7.27
RIVER GROVE	268.23	146.86	40.89	22.38
SCHILLER PARK	72.46	19.50	11.67	3.14
LINCOLNWOOD	135.89	37.45	22.66	6.25
RIVER FOREST	159.56	55.43	29.77	10.35
WESTERN SPRINGS	53.85	21.02	6.22	2.42
RIVERDALE	63.68	44.72	11.13	7.80
LAGRANGE PARK	108.62	58.39	20.09	10.82
MARKHAM	28.85	25.37	4.38	3.85
FOREST PARK	109.31	42.63	26.23	10.23
LAGRANGE	200.74	94.24	56.62	26.58
NORRIDGE	71.76	45.18	12.37	7.77
FRANKLIN PARK	62.29	16.37	9.34	2.46
BROOKFIELD	42.69	21.76	8.36	4.28
MELROSE PARK	64.86	15.77	12.98	3.15
BLUE ISLAND	45.69	29.60	7.48	4.86
MORTON GROVE	125.82	42.89	22.26	7.59
ELMWOOD PARK	110.00	57.17	14.67	7.63
DOLTON	40.47	19.14	6.65	3.15
SOUTH HOLLAND	51.22	31.74	9.51	5.89
MAYWOOD	18.18	7.00	2.40	0.92
WILMETTE	70.63	25.60	11.77	4.27
LANSING	41.84	22.85	6.82	3.72
NILES	85.36	29.83	13.43	4.69
HARVEY	60.71	28.74	13.78	6.52
PARK RIDGE	61.38	22.15	17.05	6.15
CALUMET CITY	35.53	19.47	6.77	3.71
BERWYN	71.47	33.33	9.89	4.61
MOUNT PROSPECT	34.34	17.49	4.20	2.15
DES PLAINES	59.19	19.52	10.60	3.49
OAK PARK	60.48	14.42	9.67	2.31
SKOKIE	134.43	38.27	33.50	9.53
CICERO	64.82	28.61	10.55	4.65
ARLINGTON HEIGHTS	58.54	18.58	9.88	3.13
EVANSTON	54.09	11.36	9.56	2.01
MAXIMUM VALUE	$537.03	% 167.21	$137.66	% 44.12
MINIMUM VALUE	18.18	5.62	2.40	0.76
STANDARD DEVIATION	102.25	30.68	22.37	7.09
MEAN	108.27	40.48	19.93	7.44

effort that would be required for a community to support an alternative project compared to the revenue effort in the neighboring suburbs. In addition, the associated increase in effort, the overall effort needed (when the effort expanded by overlapping units is included), and the levels of indebtedness that would result are important considerations in assessing project feasibility.

Table 4 shows the levels of revenue effort that would be required (under the conditions foreseen as most likely for the near future) in terms of the Revenue Effort Index (REI). The table shows the wide disparities in effort, as measured by the REI, among the communities in the Base Case. If stormwater control projects are undertaken, the range of revenue effort becomes even greater.

Under the most likely conditions, the increases in effort over the projected Base Case (shown earlier in Table 3) that would be necessary to support the most expensive projects range from 5.6 percent (in Bedford Park) to 167.2 percent (in River Grove). The least expensive alternatives would demand increases between 0.8 and 44.1 percent.

Measuring the increase in effort is one part of the problem; the more difficult task is to determine what degree of increase is acceptable or attainable before fiscal stress is encountered. Because the analysis must be tailored to individual community circumstances, a number of criteria were developed for assessing which alternatives could be supported by the different communities. These criteria include the notions that (a) a ten (10) percent increase in revenue effort (over that projected in the Base Case) might represent an upper limit of feasibility or (b) that achievement of a level of revenue effort the same as that of a typical suburb (in 1980) might be reasonable. The feasibility of utility financing through added water and sewer charges and constraints on debt capacity was also examined.

Under the above conditions, seven communities were identified as being unable to undertake any of the posited alternative projects. These communities are:

- Forest Park
- Golf
- LaGrange
- LaGrange Park
- Phoenix
- River Forest
- River Grove

One of those communities (Phoenix) could not undertake any of the alternatives without exceeding the debt limits for non-home rule governments.

On the other hand, eleven communities were identified as being able to sustain the most expensive alternative proposed for them, under one or more of the criteria used. These communities are:

TABLE 4

REVENUE EFFORT INDICES (REIs) FOR THE 51 SUBURBAN COMMUNITIES IN THE BASE CASE AND WITH ALTERNATIVES 1 AND 4

Community Ranked by Size	REVENUE EFFORT INDICES 1980 BASE CASE	1983 BASE CASE	1983 ALT 1	1983 ALT 4	1987 BASE CASE	1987 ALT 1	1987 ALT 4
GOLF	103.90	92.10	206.10	132.73	99.30	235.79	135.31
FOREST VIEW	124.84	100.54	135.83	106.24	108.14	139.11	113.14
BEDFORD PK	69.35	68.83	72.70	69.35	74.67	78.11	74.96
KENILWORTH	92.08	104.96	134.35	109.37	110.11	135.12	113.86
PHOENIX	177.98	503.78	986.62	582.87	591.20	1010.38	659.86
BURNHAM	98.95	112.65	184.36	128.59	120.17	183.85	134.32
DIXMOOR	106.99	181.61	290.15	198.60	199.86	296.65	215.01
POSEN	77.63	78.42	121.27	85.13	83.42	119.32	89.04
HOMETOWN	107.90	119.69	191.34	130.68	123.01	184.99	132.52
STICKNEY	76.25	85.07	128.84	91.39	89.57	126.46	94.89
N. RIVERSIDE	78.90	79.89	100.17	85.46	84.94	102.15	89.67
HARWOOD HTS	64.03	62.45	99.51	69.85	67.22	99.09	73.59
BROADVIEW	104.07	96.60	108.90	98.36	100.59	111.29	102.12
CALUMET PK	161.60	142.84	196.71	151.20	159.00	204.74	166.10
RIVERSIDE	179.30	190.93	269.24	205.73	201.84	270.39	214.80
LYONS	99.12	83.52	123.10	88.89	88.03	122.31	92.68
SUMMIT	104.59	102.11	160.75	109.53	110.19	160.74	116.58
RIVER GROVE	88.49	97.44	240.54	119.25	105.75	229.74	124.65
SCHILLER PK	102.68	106.53	127.30	109.88	111.06	129.13	113.98
LINCOLNWOOD	62.40	63.82	87.72	67.81	65.49	86.13	68.93
RVR FOREST	122.52	108.32	168.36	119.53	112.70	163.71	122.22
WSTRN SPGS	125.17	134.15	162.35	137.40	141.01	165.47	143.83
RIVERDALE	62.52	68.94	99.77	74.32	75.24	102.08	79.93
LAGRANGE PK	92.91	113.63	179.98	125.93	120.98	178.79	131.69
MARKHAM	89.81	89.16	111.78	92.59	95.52	114.67	98.43
FOREST PK	125.98	106.44	151.82	117.33	111.53	150.36	120.85
LAGRANGE	114.58	86.13	167.30	109.02	89.02	158.54	108.63
NORRIDGE	56.79	61.49	89.27	66.27	62.61	86.85	66.79
FRANKLIN PK	62.47	71.52	83.23	73.28	76.15	86.46	77.70
BROOKFIELD	142.55	141.06	171.76	147.10	150.03	176.83	155.30
MELROSE PK	78.13	90.02	104.22	92.86	94.32	106.52	96.76
BLUE ISLAND	84.98	87.40	113.27	91.65	95.29	117.65	98.97
MORTON GRV	89.60	97.90	139.89	105.33	106.81	143.15	113.24
ELMWOOD PK	125.51	135.70	213.28	146.05	144.28	212.57	153.39
DOLTON	90.24	129.81	154.65	133.90	137.69	159.66	141.31
S. HOLLAND	65.85	75.01	98.82	79.43	77.90	98.47	81.72
MAYWOOD	196.68	223.34	238.98	225.40	250.36	263.73	252.12
WILMETTE	97.55	98.71	123.98	102.92	106.03	128.15	109.17
LANSING	99.63	105.01	129.01	108.92	112.85	133.52	116.22
NILES	70.95	72.30	93.87	75.69	79.11	97.70	82.03
HARVEY	122.95	149.39	192.32	159.13	161.02	197.89	169.39
PARK RIDGE	95.05	119.69	191.34	130.68	123.01	184.99	132.52
CALUMET CITY	96.46	84.71	101.20	87.85	88.88	103.12	91.60
BERWYN	88.54	144.71	192.94	151.38	150.52	191.79	156.23
MT. PROSPECT	92.77	84.67	99.48	86.49	91.32	103.99	92.87
DES PLAINES	81.49	81.32	97.19	84.16	84.86	98.44	87.29
OAK PARK	205.82	249.95	285.99	255.72	261.50	292.23	266.42
SKOKIE	88.92	93.92	129.86	102.87	100.06	131.16	107.81
CICERO	100.07	122.11	157.05	127.79	129.28	159.60	134.18
ARLINGTN HTS	99.05	129.28	133.30	133.33	139.86	160.33	143.32
EVANSTON	176.56	197.82	220.29	201.79	210.56	229.71	213.78
MAX. VAL	205.82	503.78	986.62	582.87	591.20	1010.38	659.86
MIN. VAL	69.35	61.49	72.70	66.27	62.61	78.11	66.79
STD. DEVIATION	35.49	68.34	128.94	77.21	79.50	131.99	87.32
MEAN	103.98	118.10	168.07	127.02	126.82	170.15	134.57

- Bedford Park
- Des Plaines
- Franklin Park
- Harwood Heights
- Lincolnwood
- Maywood
- Mount Prospect
- Niles
- Norridge
- Riverdale
- South Holland

In addition to the potential for financing an alternative project out of general government revenues, this study has examined the option of enterprise fund financing.[1/] Considering a level of per capita water and sewer revenues ten (10) percent above the projected (suburban) average as an upper limit for feasibility, 22 communities could support one or more of the alternatives (generally the less expensive options) from this revenue source. These communities are:

Arlington Heights	Lansing
Berwyn	Lyons
Blue Island	Markham
Brookfield	Maywood
Burnham	Mount Prospect
Calumet Park	Norridge
Des Plaines	North Riverside
Dolton	Oak Park
Elmwood Park	Park Ridge
Harwood Heights	South Holland
Hometown	Western Springs

The remaining communities were identified as being able to undertake one (1) or more of the less expensive projects without signaling fiscal stress. Specific affordable alternative project cost levels were identified for each such community in the referenced individual Community Reports.

B. The City of Chicago

Much effort was expended on collecting data on the City's finances and in reconciling information from a number of sources. To enhance their interpretation of source material, GFRC staff interviewed a number of City officials in September, 1982. The data were then used in the analytical model to make projections of future revenues, expenditures, and indebtedness. Five alternative stormwater control cost scenarios provided by the Economics Analysis Branch, were examined for feasibility. The detailed results of this work were described in the referenced report issued in February, 1983, and entitled Municipal Fiscal Stress Study: Phase IV - The City of Chicago.

1/ Financing through user charges (water, sewer, utility, etc.) in order to generally attain self-supporting status.

Chicago Finances

Until 1979, even though the City showed some signs of distress found in other large cities, its fiscal condition was considered to be generally sound. However, fiscal problems in the City and the financial crisis surrounding the Board of Education in that year were followed by a lowering of the City's credit rating. Since that time, with the institution of new revenue sources and improved management procedures, a more stable situation exists. Not surprisingly, the City exerts a much greater level of effort in raising revenues from its own sources (in per capita terms) than the surrounding suburbs. Compared to a group of 29 similar large cities, Chicago exercises a moderate level of effort. However, in this context, it is important to note the inherent complexities of inter-city comparisons because sources of revenue and expenditure functions vary widely among them, as do their relationships to surrounding local governments.

Stormwater Projects

Five (5) alternative projects were proposed by the Economics Analysis Branch for Chicago, with total capital costs ranging from $96 million to $478 million. These options translate into 1983 per capita cost (if debt financed) of from $4.04 to $20.20. In arriving at conclusions regarding the fiscal feasibility of the stormwater control projects, several approaches were taken which are detailed in The City of Chicago report. The analyses first followed the methodology, applied uniformly to each of the 51 suburbs and the City in the study, where the index of relative effort and increases in the index were used to assess feasibility. In addition, for the City of Chicago, because of its significance in the region and its standing as an important national metropolis, further analyses were undertaken regarding the fiscal feasibility of the various alternative projects and how they would impact on the City's fiscal and credit capacity. This expanded analysis was based on a more detailed review of Chicago's fiscal effort in relation to its Cook County suburbs over time, and an examination of Chicago's fiscal standing relative to a group of comparable large cities. In each case, consideration was given to the options of financing through general revenues and through enterprise funds.

Fiscal Stress Associated with Five Alternatives

This section applies the analytical approach, detailed in the Resource Guide, previously used for the suburban communities. First, a series of measures of stress are examined including the potential for enterprise financing, and then the single index of stress is analyzed.

MULTIPLE MEASURES OF STRESS: Table 5 presents the various impacts of the annual costs of the five alternatives (assuming debt financing), expressed as percentages of selected measures of fiscal activity. The data for the denominator variables are based on the Base Case projections, using the expenditure-driven model. Again, it is important to recall all alternatives are debt financed.

TABLE 5

ANNUAL COSTS OF COE STORMWATER CONTROL ALTERNATIVES
(AND RELATED DEBT) AS PERCENTAGES OF SELECTED VARIABLES:
1983 AND 1987

Annual Cost as % of Base Case Values:

Year / Alternative	Total Direct and Overlapping General Own-Source Revenue	Direct Own-Source Revenue
1983		
1.	2.66%	4.66%
2.	2.13	3.72
3.	1.60	2.79
4.	1.06	1.86
5.	.53	.93
1987		
1.	2.15%	3.69%
2.	1.72	2.95
3.	1.29	2.21
4.	.86	1.48
5.	.43	.74

As is shown in the first column of Table 5, the annual cost for Alternative 1 would equal 2.7 percent of the total direct and overlapping general revenues raised by all local governments within the City in 1983. In other words, to finance the project, these revenues would need to be 2.7 percent higher than projected in the Base Case for that year. Correspondingly, in terms of the City, its general revenues in 1983 would need to be increased by 4.7 percent to finance the project.

By 1987, the burden of the annual costs for all alternatives would begin to decrease, because the major project costs are associated with fixed debt service. By 1987, Alternative 1's annual costs would represent 2.2 and 3.7 percent of total local government (including overlapping) own-source revenues, and Chicago's own-source direct revenues, respectively.

FISCAL STRESS - SINGLE INDEX ANALYSIS: To develop a single measure of the fiscal burden of the costs of the alternatives, the concept of a representative revenue system and revenue effort index was used. The basic concept is to create a composite measure of the fiscal capacity, in dollars per capita, of governments to raise revenues from their own resources. To do this, each of the economic activities that forms a basis for the three major forms of own-source revenue (property tax, retail sales, and other general revenues) is projected. These are, respectively, market value of real property, retail sales, and area income.

Table 6 presents the results of the representative revenue capacity and revenue effort index when applied to Chicago. As may be seen in columns 1 and 2, Chicago's capacity using the representative revenue system was well below its actual own-source revenues in 1980. Thus, the effort index was 199.2 in that year (column 3). In effect, this suggests that Chicago put forth almost twice as much "effort" as a typical suburb in raising revenues from its own sources in that year.

Under the Base Case, the revenue effort index for Chicago is projected to increase from 199.2 in 1980 to 252.6 by 1983 and 276.1 by 1987 -- compared to an average suburban level of 100 in 1980. Once the stormwater control alternative annual costs are added, revenue effort in each year must be even further increased. For example, implementation of Alternative 1 in 1983 would generate a revenue effort index of 264.4, while selection of Alternative 5 would produce an index value of 255.0.

The values for the Revenue Effort index are plotted in Figure 3 for the Base Case and the alternatives for the years 1980 and 1982 through 1987.

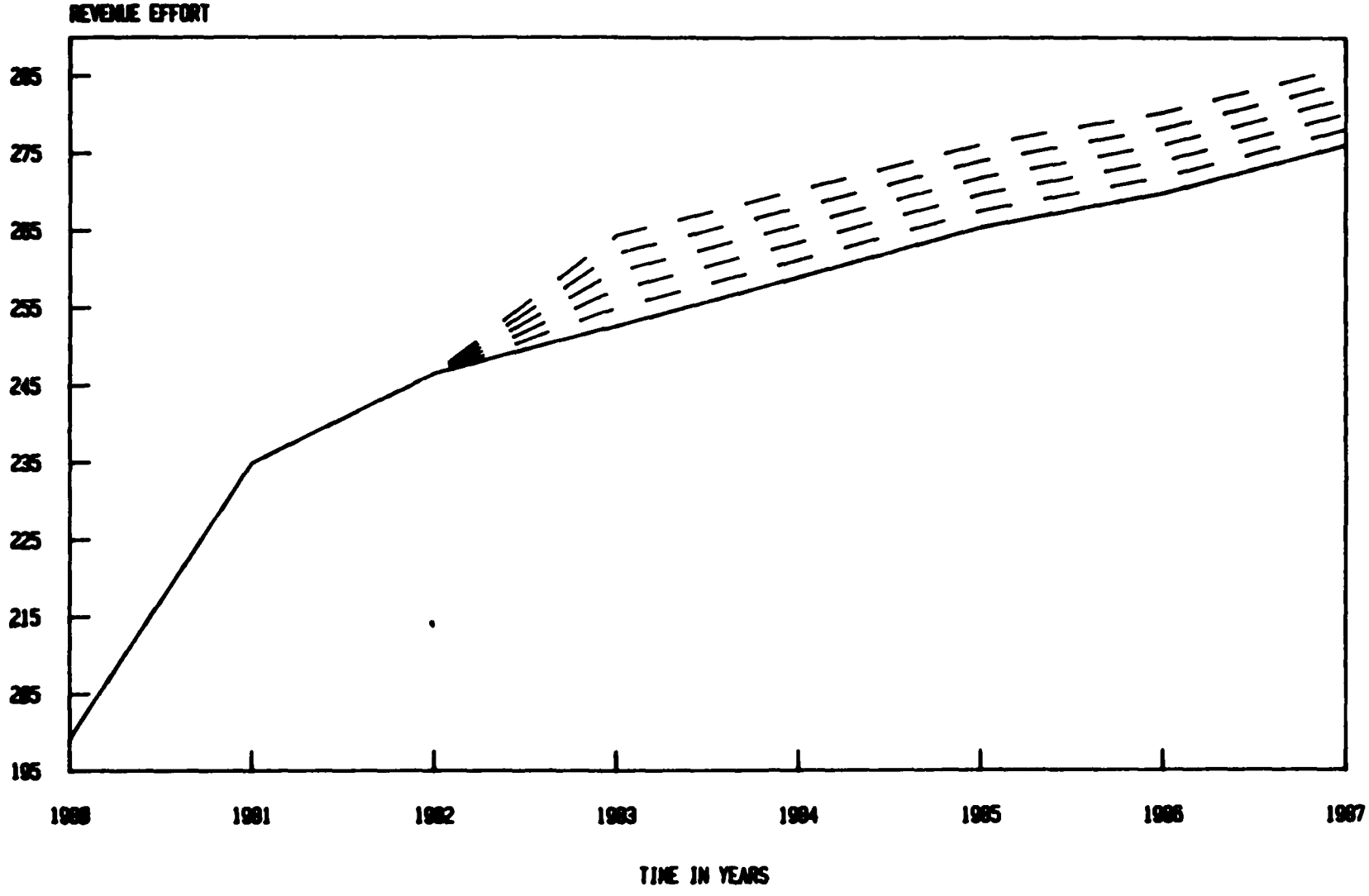
In interpreting these projections, it is vital to remember that under the expenditure-driven budget model, no real per capita growth in public services has been allowed to occur. In other words, the cost of government has gone up only to meet rising prices and take up part of the slack from reduced inter-governmental aid. Thus, in effect, the revenue efforts reflected in Table 6 and Figure 1 represent real increases in public goods only where one of the alternatives is present and, thus the only real increases in public spending are devoted exclusively to stormwater control projects.

TABLE 6
REVENUE EFFORT INDEX FOR CHICAGO
UNDER BASE CASE AND WITH ADDED ANNUAL COST
WITH STORMWATER CONTROL ALTERNATIVES
FOR 1980, 1983, and 1987

	(1) Representative Revenue Capacity	(2) Own Source Revenue	(3) Index (2) as % of (1)
1980 Actual	$ 148.74	$ 296.29	199.2
1983			
Base Case	$ 171.76	$ 433.95	252.6
+ Alternative 1		454.15	264.4
+ Alternative 2		450.11	262.1
+ Alternative 3		446.07	259.7
+ Alternative 4		442.03	257.4
+ Alternative 5		437.99	255.0
1987			
Base Case	$ 207.95	$ 574.13	276.1
+ Alternative 1		595.32	286.3
+ Alternative 2		591.08	284.2
+ Alternative 3		586.85	282.2
+ Alternative 4		582.61	280.2
+ Alternative 5		578.37	278.1

REVENUE EFFORT INDEX FOR CHICAGO

BASE CASE AND ALTERNATIVES - FIGURE 3



In summary, Chicago is estimated to exert about twice the average suburban level of revenue effort, but compared to other center cities it exercises a moderate level of effort. The City is projected to see its revenue effort increase substantially in the future under the assumed conditions. The annual costs of the alternative projects are fairly modest in per capita terms with the most expensive producing only a 4.7 percent increase in Chicago's projected revenue effort.

CONCLUSIONS

The material presented in this short section is again organized into two (2) main sub-divisions to reflect the underlying bifurcation of data for (a) the 51 suburban communities and (b) City of Chicago.

A. Suburban Communities

Table 7 summarizes the affordability of projects using various measures of stress as indicators of what might be acceptable for a storm-water control project supported by the community. As shown, 16 municipalities could support the most expensive project without exceeding the debt limit. They are:

- Bedford Park,
- Broadview,
- Calumet City,
- Des Plaines,
- Franklin Park,
- Lansing,
- Lincolnwood,
- Maywood,
- Melrose Park,
- Mount Prospect,
- Niles,
- Riverdale,
- Schiller Park,
- South Holland,
- Western Springs, and
- Wilmette.

One municipality (Phoenix) could not undertake any project without so doing. Considering the other criteria previously referenced (a 10 percent increase in projected REI, water/sewer revenues no more than 10 percent above average, and REIs of 100), eleven (11) communities could sustain the most expensive project under one or more of the measures. These communities are:

- Bedford Park,
- Des Plaines,
- Franklin Park,
- Harwood Heights,
- Lincolnwood,
- Maywood,
- Mount Prospect,
- Niles,

TABLE 7

PROJECT AFFORDABILITY ACCORDING TO VARIOUS CRITERIA
(Assuming Debt Financing and Most Probable Assumptions Scenario)

Affordability Criterion	Number of Communities Affording Alternative: Alternative 1	Alternative 2	Alternative 3	Alternative 4	Any Alternative	No Alternative
Project not exceeding a 10% increase in the 1983 Base Case REI	2	3	13	24	42	9
Project not exceeding a 1983 REI of 100	10	2	3	4	19	32
Project not exceeding the projected average Cook County water & sewer revenues per capita by more than 10%	1	3	9	9	22	29
Project under an overall REI of 100	1	0	0	0	1	50
TOTAL # OF COMMUNITIES UNDER AT LEAST 1 CRITERION	11	7	12	14	44	7
Project not exceeding the non-home rule debt limit	16	11	15	8	50	1

- Norridge,
- Riverdale, and
- South Holland.

However, Maywood's ability to support even the relatively small (in dollar terms) projects proposed for it is likely to be limited by its projected very high effort level relative to other communities.

Seven communities, by all measures, could afford none of the projects under the assumed conditions. These communities are:

- Forest Park,
- Golf,
- LaGrange,
- LaGrange Park,
- Phoenix,
- River Forest, and
- River Grove.

B. The City of Chicago

1. Compared to Cook County suburbs, Chicago has substantially lower values for most economic indicators. In 1980, per capita market value of real estate was 62 percent of the suburban community average. Per capita income was 64 percent of the suburban average, and per capita retail sales were 63 percent of the suburban average in that year. Only in the number of employees per capita does Chicago do better than the suburbs on average, with .42 workers per capita as compared to .39 in the suburbs. Consequently, the per capita value of the representative revenue base of the City is much lower than in an average suburban community.

Despite this evidently weaker revenue base (when viewed in per capita terms), the revenues raised by the City are much higher than in the suburbs -- as is to be expected given Chicago's older, densely urban character and the service needs of a population that includes many poorer residents. Thus, it is to be anticipated that Chicago would exhibit a revenue effort index that is higher than its suburban neighbors. This turns out to be the case. In 1980, Chicago had an (actual) index of 199.2 compared to the average Cook County suburban index of 100 for that year.

Because of the numerous overlapping local entities, the City of Chicago revenues and revenue effort are but part of the overall burden on the City's residents. Thus, similar measures were made to calculate an overall local government effort index. Overall, Chicago's effort index, when the burdens of overlapping governments are taken into account, is closer to the suburbs; the overall index was 139.6 in 1980, again compared to the suburban average of 100 in 1980.

2. Considering Chicago in relation to its suburban neighbors, the revenue effort index developed for this study suggests that the option of financing through general revenues may be limited if the existing and historical equilibrium in effort between Chciago and the suburbs were to be maintained. In comparison to the average suburban effort level in 1980 of 100, Chicago exhibited an effort index of 199, almost twice as large. For

1983, City own effort is projected to increase from 199 to 253. The annual costs of the alternatives in 1983 (see Table) are equivalent to from .9 and 4.7 percent of projected City own-source revenues, and the capital costs are projected to be between .2 and 1.1 percent of market value of real estate. Thus, while none of the alternatives would increase the projected effort more than 5 percent, this increase would come on top of the much greater increase already projected between 1980 and 1983. This projected Base Case increase is, therefore, likely to restrict the City's flexibility to undertake an additional stormwater project.

It is important for the reader to note that the above conclusions need to be understood as subject to several limitations:

- First, they depend on assumptions about future economic growth, construction phasing, and City budget behavior which may or may not occur. The general economic outlook foreseen is, on a per capita basis, for incomes gaining slightly faster than prices, but with the market value of taxable property lagging significantly.

- Secondly, the conclusions depend on comparisons with other large city jurisdictions whic are not entirely analogous in terms of service functions and overlapping governments. The City itself is responsible for raising only 45 percent of all the local government own-source revenues generated by Chicago citizens and, compared to many large cities, is responsible for a minimal number of municipal functions.

- Thirdly, the conclusions depend on the use of an index of effort which is valuable for ranking communities with similar functions at a given point in time. But, when subject to projection, the indices may lose validity, because they are benchmarked on a base-year activity of the comparison communities and not on projected activities, per se. Furthermore, if Chicago were to undertake an alternative stormwater project as part of a regional solution, then other suburban jurisdictions would also participate. This study does not address what conditions would pertain under those circumstances nor how the relative burdens might change.

In summary, the five alternative projects are evidently within the general capacity of the City as measured by a series of different indicators. However, the projected increases in revenue effort under the assumed conditions for the Base Case may limit the City's flexibility to undertake an additional stormwater control project from general revenues. Enterprise financing of an alternative may be the more promising approach.

APPLICATION OF FINDINGS

Introduction and Objectives

The primary purpose of this section is to prevent a methodology for selecting and sizing municipal storm-water control projects. Specifically, the objectives are to construct a procedure to select and size a storm-water control project for any affected community which will (a) maximize that community's related economic benefits, and (b) be within the cost constraint (threshold fiscal stress[1/] level) determined by the study referenced above.

The analysis and resulting methodology were developed within the following limiting assumptions:

- An exclusively economic analysis and related procedure is to be undertaken and developed, with all variables denominated in dollars.
- Intangible and non-quantifiable political and social considerations have been excluded from the proposed storm-water control project selection process.
- The storm-water control project has top fiscal priority in terms of its "call" on the funds of a given municipal treasury.

Underlying Rationale to Support Selection Methodology

It is instructive to briefly develop the line of thought and rationale which guided formulation of the methodology. Fundamentally, any proposed procedure utilized in this connection should directly aid, enhance and facilitate decision-making. That is, the results of using any such procedure should enable and permit clear, unequivocal selection or rejection of a range of alternative storm-water control projects.

Next, two analytical, procedural modes will be utilized. First, the traditional benefit/cost analysis will be employed to provide a method for identifying a project(s) which maximize(s) public net benefits (among the candidate options specified). Second, the procedure should prescribe an analytical refinement utilizing community fiscal stress data plus revenue-sharing credits which attend all or most funding associated with stormwater control projects.

Now, the conventional benefit/cost ratio analysis, of course, represents a compelling evaluation mechanism for public projects. Relative thereto, social benefits are clearly identified and weighed against con-

1/ The initial difficulties surrounding an inability to raise sufficient resources to finance municipal expenditures. In a financial sense, fiscal stress is best defined as a sustained imbalance between revenues and expenditures that requires either a material decrease in outlays, or increase in receipts, to bring the two into balance.

comitant social costs. To enhance the recognized virtues of this traditional analytical tool, the proposed procedure utilizes a second mode of analysis and evaluation: the factoring into the analysis of community fiscal stress data plus appropriate revenue-sharing credit estimates.

Relative to this second analytical treatment, it is important to recognize the following incremental benefits associated with this approach:

- The use of fiscal stress data permits a more realistic assessment of a community's ability to afford a given storm-water control project. That is, the determination of a fiscal stress spending level represents a cost constraint derived from a factual review of actual revenues and expenditures for a given community. Use of these data permits a closer approach to "local realism," relative to the affordability of a specified municipal project, since it identifies a finite spending level beyond which fiscal difficulty would be experienced by the municipality.

- The use of fiscal stress data leads to a more precise estimate, than the conventional analysis, of a community's ability to fund incremental spending. This precision translates, in turn, into more accuracy in the selection and sizing of a storm-water control project.

- The second mode factors into the evaluation the revenue-sharing credit which would be received by a community in connection with construction of a storm-water control project. Again, this represents a further advance in precision in assessing fiscal feasibility realistically.

As a consequence of the monetary refinements afforded by the use of fiscal stress and revenue-sharing data, this important observation should be made: the final determinations resulting from use of each of the two (2) analytical modes (conventional B/C analysis and fiscal stress plus revenue-sharing data) may reveal substantial variations, one from the other. Should this condition occur, it would directly affect decision-making in the selection and sizing of storm-water control projects.

Proposed Methodology

As noted, the proposed methodology is divided into two analytical modes:

- The conventional benefit/cost analysis

- The fiscal stress constraints and revenue-sharing credit

A series of relationships (detailed later) between (a) benefits and costs, and (b) between costs and fiscal stress spending levels, allowing for the revenue-sharing credit, have been constructed to test each remedial condition or alternative under consideration. By way of illustration, for a given community, a series of "test" relationships are erected to determine if a given project should be accepted or rejected.

The procedure requires the availability of estimated annualized dollar values for each of the following variables:

1. Increased flood protection (reduced flood damage) - Benefit.

2. Improved water quality - Benefit.

3. Storm-water control project - Cost.

   - Construction
   - Interest during construction
   - Operating and maintenance expenses

4. Threshold or minimum community spending level resulting in fiscal/stress.

5. Revenue-sharing credit.

The procedure requires that each of the twelve (12) specified remedial alternatives be examined by the procedure specified below. The procedure for each of the two analytical modes, referenced earlier, and the relationship "test" and related decision outcomes (acceptance or rejection of any given storm-water control project) are outlined below:

Mode I - Conventional Benefit/Cost Analysis

Step	Computation	Relationship/Decision
1.	Total Benefits (Vars. 1+2)-Total Cost (Var. 3).	If TB > TC, design is acceptance for that project.
2.	Same computations as in Step 1.	If TB < TC, decision is rejection for that project.
3.	Same computations as in Step 1.	If decision in Step 2 prevails, resize project to yield Step I decision.
4.	Same computations as in Step 1.	If resizing in Step 3 is infeasible for all analyzed projects, decision is rejection of all such projects.

Mode II - Fiscal Stress Constraints and Revenue-Sharing Credit

Step	Computation	Relationship/Decision
1.	Storm-water control project cost (Var. 3) (-) Threshold or minimum community spending level resulting in fiscal stress (Var. 4).	If TC $\overline{<}$ FS, decision is acceptance for that project.
2.	Same as above except that revenue-sharing credit (Var. 5) is to be added to Var. 4.	If TC $\overline{>}$ FS, decision is acceptance if recognition of revenue-sharing credit yields Step 1 relationship.
3.	Same as above.	If TC $\overline{>}$ FS, decision is rejection if recognition of revenue-sharing credit still yields condition where TC > FS.
4.	Same as above.	If decision in Step 3 prevails, resize project to yield Step 2 decision.

Finally, as noted previously, application of the procedure will likely result in different decision outcomes in the two modes. Again, this is due to the use of two important and very realistic refinements associated with Mode II: Fiscal stress spending level data and revenue-sharing credit.

In the last analysis, where conflicts in decision outcomes exist between mode analyses, the community interest is likely best served by assigning primacy to the Mode II decision outcomes.

END

FILMED

2-86

DTIC