

PPBS In Practice: Examples

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In Chapter II, justifying norms and an analytical framework for PPBS were presented. Two applications of PPBS will be examined in this chapter in order to determine the degree to which specifications of the rational calculus required by the PPBS procedure are carried out in practice. Examination of these actual PPBS applications should make clearer the PPBS concepts previously examined.

A. AN EDUCATION PLANNING-PROGRAMMING-BUDGETING SYSTEM

1. Introduction

An Education Planning-Programming-Budgeting System, which will be referred to as the Education PPBS, has been designed for and tested in county superintendent offices and public school districts of Bucks, Cameron, Elk, McKean, and Potter Counties of the Commonwealth of Pennsylvania. Primary responsibility for design of the system has rested with the Government Studies Center of the Fels Institute of Local and State Government, University of Pennsylvania in cooperation with the above mentioned public jurisdictions, Research for Better Schools, Inc., the Graduate School of Education of the University of Pennsylvania, and Management Science Center of the Wharton School of Finance and Commerce, University of Pennsylvania. The project staff has completed the general design of this Education PPBS and is now implementing the system with the cooperation of pilot school districts and county school offices. Modifications in the system will be made during implementation, and final systems and procedures documents will be available in May, 1969.

The following descriptions and discussions are based mainly on the *General Design for an Education Planning-Programming-Budgeting System* (159 pages),⁽¹⁾ and the *Procedures Manual*

(1) *General Design for an Education Planning-Programming-Budgeting System*, prepared by the

for an Education Planning-Programming-Budgeting System (302 pages including 50 forms),⁽²⁾ both prepared by the Government Studies Center of the Fels Institute of Local and State Government, University of Pennsylvania, and one year of this writer's participant observation.

The study was initiated in July, 1967. Since then members of the study team have completed seventeen reports and related working papers related to specific components of the Education PPBS.

Three versions of the system are planned so as to incorporate design innovations expected to evolve over the period of the study and beyond. Version I procedures involve fairly simple techniques and can be executed by manual calculations. Version II is a semi-automated version which incorporates broader decision options while still assuming relative simplicity in actual decision-making procedures. Version III is a more completely automated system in which both data processing and decision-aiding are done by more sophisticated procedures, such as computer simulation, where appropriate. The discussion below is based on the content of Version I of the Education PPBS procedures.

2. General Design of the Education PPBS

As previously stated, a PPBS structure implies a rational calculus with the terms and symbols of the calculus which must be empirically interpreted in its application. The PPBS procedures and manuals represent an important attempt to operationalize such a calculus. The empirical contents of a PPBS will differ depending on the public policy area covered by the system and on the system designer. The present example is designed for school systems by a University research institute; it is not designed by the school systems themselves. These facts must be remembered because the rules of empirical interpretation presently available for identifying the major elements of the Education PPB system are primarily judgmental, based on experiences and informed opinion. Thus, there is as yet no definite rule by which we can decide *a priori* on the universal content of an Education PPBS.

The major analytical elements of the Education PPBS described here are input forecasts, program structure, indicators, operational forecasts, multi-year plans, multi-year programs, and budget.

Government Studies Center, Fels Institute of Local and State Government, University of Pennsylvania, June 28, 1968.

(2) *Procedures Manual for an Education Planning-Programming-Budgeting System*, prepared by the Government Studies Center, Fels Institute of Local and State Government, University of Pennsylvania, September, 1968.

Input Forecasts. School operations are influenced by many environmental factors such as community attitudes toward education, community support, school-age population, and community resources. From these environmental factors, two are explicitly selected in the Education PPBS for forecasting; these are forecasts of expected student enrollment by grade and expected revenue by major source. Forecasts are made for each year of the five year PPBS period.

Program Structure. Educational activities of school districts and county offices are grouped into broad program categories. The general program structure of the Education PPBS takes into account common activities of school districts and county offices. The activities are grouped according to the following plan: Program Area, Program, Sub-program, and Sub-program Element. Program Areas and Programs currently in use are as follows:

1. Coordinative Program Area
 - a. Policy and Executive Program
 - b. Comprehensive Planning Program
 - c. Information and Liaison Program
 - d. Community Services Program
 - e. Coordinative Support Services Program
2. Instructional Program Area
 - a. Early Childhood Instruction Program
 - b. Elementary Instruction Program
 - c. Secondary Instruction Program
 - d. Vocational-Technical Instruction Program
 - e. Special Instruction Program
 - f. Continuing Instruction Program
 - g. Instructional Support Services Program
3. Health Program Area
 - a. Nursing Program
 - b. Medical Program
 - c. Dental Program
 - d. Psychological Program
 - e. Health Support Services Program
4. Business Program Area
 - a. General Services Program
 - b. Pupil Transportation

- c. Food Services Program
- d. Facilities Program
- e. Fixed Charges Program
- f. Business Support Services Program

In the design of the Education PPBS, it was recognized that there are at least seven major approaches to the classification of an organization's activities, each of which yields a different classification structure. These are: purpose, product, resources, organization, location, clients, and functions. While the logic of PPBS dictates that a purpose or product orientation should be the primary consideration in the classification of organizational activities, the other factors are also directly involved in planning the work of the educational organization. It is, however, extremely difficult to empirically determine a program structure which combines all of the approaches to the classification. As a practical matter, simplification was introduced.

In order to simplify program classification, the Education PPBS project adopted the following guidelines:

1. The program classification must be useful to the policy and executive personnel in the school district in multi-year planning.
2. The program classification must be adaptable to both small and large local school districts and to intermediate units or counties.
3. The program classification must be within the capacity of school districts to meet the data requirements necessary for determining or estimating cost of programs.
4. The program classification must allow for easy translation into the accounting and budgeting classification required by the Pennsylvania Department of Public Instruction.⁽³⁾

Clearly the program structure outlined above is the product of judgment by the project staff, who expect revisions during the implementation period. The structure, it should be stressed, is not the result of any formal systems analysis, although it was produced by the use of such a framework. Thus, at present, the program structure above is the one employed in the project for program analysis and planning.

In spite of the logical requirements under PPBS that goals and objectives should be formulated first and then appropriate programs selected, it seems that stating operational objectives is relatively more difficult than establishing a program structure upon which goals and objectives are explicitly formulated in an *ex post facto* fashion. This sequence results in large measure

(3) *General Design, op. cit.*, pp.120-121.

from reluctance to disregard the current resource investments and to express a set of objectives which is consistent with the usage of an "ideal type" school system.

Indicators. In the discussion of organizational goals and objectives and agents in Chapter II, it was stated that these goals and objectives could be expressed by a single variable. We have also noted that, since it is difficult in most cases to express goals and objectives as a single variable, some lower level variables are used to express them. They are called "evaluation criteria" or "indicators." In the Education PPBS, such variables are named "indicators." It was found that "one of the most difficult task in designing a PPB System is the task of providing measures of effectiveness in relation to goals and objectives."⁽⁴⁾ The study further noted that "theoretically, the ideal would be to find a single measure of the output of the system and to relate all activities to that final measure of effectiveness....(But) In the case of education...as a practical matter, there is no known way to produce a single, valid measure of educational output."⁽⁵⁾

Under these circumstances, several indicators of major variables were identified. These indicators are assumed to be subject to partial if not complete control of the school districts and county offices and, when interpreted by experienced administrators and policy officials, suggest possible needed action.

There are twelve indicators for the local school districts which serve as general reference points for estimating the present and future implications of present or planned programs. The initially adopted twelve indicators were:

1. Excess Enrollment (in terms of students per classroom)
2. Classroom Teachers per 1,000 Weighted Pupils
3. Mean Cumulative Course Offerings (Grades 7-12)
4. Professional Instructional Specialists per 1,000 Weighted Pupils
5. Total Dollar Expenditures for Curriculum Materials, Supplies and Library Books per Weighted Pupil
6. Net Total Expenditures per Weighted Pupil
7. Professional Staff Turnover Rate in Percent per Year
8. Percent of Professional Staff with Masters Degree or More
9. Percent Graduating Class Attending Post High School Education

(4) *Procedures Manual, op. cit.*, p.13.

(5) *Ibid.*

10. Drop-out Percent for Grades 10-12
11. Language Achievement - Deviation from Grade Level
12. Mathematics Achievement - Deviation from Grade Level⁽⁶⁾

There are some variations in the indicators for the intermediate units or counties. Indicators are classified as controllable and uncontrollable. The controllable indicators and objectives are reciprocal. Variations in indicators will change objectives, and change in the level of objectives will show variations in indicators. But, any change in the level of objectives cannot affect the level of uncontrollable indicators. Uncontrollable indicators thus serve only as some kind of signal according to which relevant objectives may be set or changed.

There are two classes of controllable indicators: calculated and assumed indicators, and output indicators. Calculated and assumed indicators are either calculated from given projections of pupils, revenues, etc., or else set by a policy decision, and output indicators are related to the "product" of the education process.

The functions of the indicators are: (1) to set priorities and objectives for new programs, (2) to decide between proposals for new programs, and (3) to evaluate the effectiveness of past programs. The indicators are intended to serve as aggregate measures of school system characteristics and performance rather than as performance measures of individual programs. Therefore, relationships between each program and the total system indicators must be established in some way. At this point, the degree of relationship can only be estimated in qualitative terms. In other words, the relationship between objectives and indicators, on the one hand, and between indicators and programs, on the other, are at present estimated in qualitative terms. Thus, the relationship between objectives and programs also is estimated in a qualitative manner. This does not mean, however, that each indicator is estimated in a loose manner. Indicators themselves are the product of a formal calculation.

Operational Forecasts. These are the forecasts of the financial and operational (staffing, facilities, equipment, etc.) implications of continuing and planned programs. Operational forecasts are made in the light of input forecasts of probable enrollments and revenues and provide a base for estimating the level of indicators. Determination of objectives, estimates of indicator levels, and operational forecasting affect each other and are mutually adjusted. The mutual adjustment process results in a technically and financially feasible program, which is claimed to be one of the desirable features of the PPBS process. The operational forecasting methods

(6) *Ibid.*, pp.47-53.

adopted by the Education PPBS include both judgmental estimates by school administrators and statistical procedures.

Multi-Year Plans. General five-year plans are prepared to provide the overall picture of where the school district expects to be in the future and how it intends to get there. The multi-year plans are summaries of policy guidelines, such as goals, objectives, and indicators, and the major actions to meet the guidelines. Major programs are also summarized in the plans.

Multi-Year Program. Five-year programs outline the broad allocation of resources among major programs in each of the five years, with identification of the technology or series of activities to be employed. The programs outline general relationships by which manpower, capital facilities, and equipment are combined in order to carry out the policy plans. The first year of the five-year program becomes the basis for preparation of the annual budget.

Budgets. The annual budget is the financial expression of the first year of the five-year plan and program. The approved budget provides specific authority to expend resources, while the five-year plan and program represent policy guideline but do not include specific authorization. Of course, the annual budget should be based on prior policy decisions and program analysis to be meaningful under the PPBS process. The format of the annual budget is not of direct importance to the PPB System, so long as there is a way of relating the first year of the five-year plan and program to the particular type of budget in use. A crosswalk is used for this purpose.

3. Outline of Education PPBS Procedure

Based on the elements outlined above, the Education PPBS follows a series of well-defined procedures which are undertaken in specific sequence during the planning period. The series consists of the steps described below. (See, Figure 1.) The following description indicates the role of the policy makers. Without active participation by the decision maker at appropriate points in the analytical steps and procedures, the whole system would become a mere exercise of analytical techniques. If the role of the decision makers in PPBS can be clearly understood, then it will also reduce the fear that a rational-deductive model of policy analysis and program formulation would take over the functions of the decision-making structure. The PPBS process is not a process of an automatic one-way deduction of goals and means: it helps managers to expand their data base and computational capability for decision making.

Step #1—Enrollment and Revenue Forecasts

An underlying assumption of the PPBS procedure is that the system is responsive to the

of the present status of the school districts and county offices. A review of the results will lead to the identification of problems, depending upon the educational philosophy of the superintendent and other policy officials.

Step #3—Establishment of Goals, Objectives, and Desired Indicator Levels

This is the most vital step, where the highest decision-making group's active participation is essential. Their decisions at this point will determine the whole shape of the subsequent planning activities. The highest decision-making group is expected to establish policy guidelines or goals, specific objectives, and desired indicator levels for the school district and county office over the five-year planning period.

The crucial role of the decision-making group is recognized, in the Education PPBS, in the following terms:

A basic assumption of the PPB System is that the appropriate decision-making group can establish goals and objectives for the educational activities under their control (at least in terms of the indicators) and can establish priorities between these objectives, i.e., can decide which should be emphasized during the allocation of resources. It is recognized that this is a fairly strong assumption and that the decision-making groups do not necessarily adopt objectives and priorities in the way in which system designers would like them to. The PPBS procedures, therefore, will allow for changes from time to time in the objectives and priorities. *Nevertheless, if a decision-making group refuses to establish desired indicator levels and priorities, a formal PPB System probably cannot be used.*

In the past, analysts have tended to deduce the objectives of the decision-making group by observing the programs they actually decide to implement. An underlying principle of PPBS is that a better, more effective set of programs will evolve if the decision-making group establish its objectives and priorities first.⁽⁷⁾ (Emphasis supplied)

One of the primary objections to the introduction of PPBS in particular, and a deductive-rational or a welfare function model in general, is based on the assumption that we cannot establish a complete set of values in a hierarchically and systematically structured

(7) *General Design, op. cit.*, pp.139-140.

manner.⁽⁸⁾ The truth of the matter is that PPBS does not attempt to establish a value structure or specify particular welfare functions. It simply asks the decision maker to decide on his domain of action, which is not necessarily expressed in terms of a value structure or a welfare function, but which can be expressed by specifying the scope and characteristics of the environment with which he would interact.

To return to the discussion of the Education PPBS process, the decision-making group must indicate their desired goals and objectives, at least in terms of indicators. They have to produce (1) a statement of the desired indicator levels, (2) a statement of the priorities between indicators, and (3) a list of constraints or guidelines. From what bases will the decision-making group derive such statements? They are the value system of the community, and current levels of indicators provided by formal as well as informal surveys of the environment. The manner of interpreting this environmental data is the sole responsibility of the decision-making group, although they would be assisted by the analysts. The techniques presently used to derive the desired indicator levels are judgmental and result from discussion among the decision-making group. More formal methods of ranking them are now under study.

Objectives and indicators are based, to a degree, on the existing programs, environmental factors, and indicators. At the initial stage of the PPBS process, it is sometimes inevitable that some objectives must be *deduced* from the observation of existing programs in an *ex post facto* teleological fashion. The difference between pre-PPBS and post-PPBS processes can be found in the treatment given to such deduced objectives. In the PPBS process, even such deduced objectives would be used for the next cycle of program planning, while past practices were not explicitly concerned with the logical priority of the objectives in program formulation.

Although it may be desirable to derive system objectives from higher level goals and values in order to coordinate the programs of the system with those of other systems in the society, in the absence of a comprehensive value structure or complete welfare functions, a system can decide its own objectives based on its "readings" of the environment and existing programs. There is the possibility, in such instances, of newly stated objectives being incremental variations on the previous ones. This means, then, that PPBS process does not exclude an

(8) See, David Braybrooke and Charles E. Lindblom, *A Strategy of Decision* (New York: Free Press, 1963).

incremental method. In fact, such a method is necessary. Therefore, it is an open question whether PPBS should use only the rational-deductive method or an incremental method. At present, it seems that it can use both methods depending upon the situation and it is quite likely that the incremental method will be used rather extensively at the level of objective setting until refined sets of forecasting techniques of environment and system operations are easily available.⁽⁹⁾

Step #4—Definition of Programs and Program Sets

The fourth step is concerned with defining potential programs. Logically, consideration of these programs is based on policy guidelines, environmental forecasts, and the problems and status of the educational unit. Programs are proposed in order to improve the operation of the educational unit and to eliminate or reduce the problem areas. These programs are then grouped into program sets.

A set of programs is the raw material with which the PPBS works, and the programs constitute available and potential technologies to be used in achieving desired objectives. Types of programs considered at this stage are limited to continuing and proposed.

How are programs formulated? The Education PPBS recognizes many sources which should be consulted for program ideas, including past proposals for change in the specific school district or county, the ten year development plan required of all school districts by the Commonwealth of Pennsylvania, research and development literature, work in other schools. It is the view of the Education PPBS developers that⁽¹⁰⁾

“thinking up” a program is a creative act which will have to be done by the decision-making group and the entire personnel of the system. It is also recognized that the PPB system cannot actually analyze every possible combination of all suggested programs so that some preliminary filtering on the basis of feasibility and desirability is necessary.

Since the techniques for identifying programs are largely creative, they are not formalized in a precise way. There is ample room for a discretionary decision by the policy makers even if they work under clearly formulated objectives. Two types of techniques for grouping programs into sets are discussed in the Education PPBS: “incremental” and “combinational.”⁽¹¹⁾ In the

(9) *Ibid.*, for a discussion of “disjointed incrementalism” in policy evaluation and proposal.

(10) *General Design, op. cit.*, p.143.

(11) *Ibid.*, p.144.

incremental techniques a specific, usually complete, program set is identified. Programs are then added or subtracted from this basic set one or two at a time in order to accomplish the objectives previously defined. Using the combinational techniques, completely new sets of programs may be defined, with little relation to the existing or other previously defined sets.

To the extent that relationships between objectives and program sets can be demonstrated by program analysis, program selection will be based on the results of such analysis. For an analysis to be meaningful, it must be based on certain theoretical knowledge which can predict and explain the phenomena under consideration. As long as such knowledge is lacking, program selection has to rely on the discretion of the decision-makers. If the PPBS cannot solve technological problems by analysis, it can at least show where discretion is needed.

Sources of technological knowledge include historical data, and one of the values claimed for operating a PPB system over a period of time is the accumulation of this historical input-output data.

Steps #3 and #4 of the Education PPBS may be interpreted as the specification regarding who should cope, and how they should cope, with both environmental and technological uncertainties, two of the primary sources of organizational uncertainty.

Step #5—Determination of Feasibility

Creation of a set of programs carried out by Step #4 is done without constraints as to the consideration of available resources and other legal requirements. The fifth step is an examination of programs together with available and potential resources; this is the determination of feasibility. Feasibility is determined in terms of financial and manpower resources. The appraisal of feasibility is to compare the requirements of a set of programs with the forecast of environmental conditions, especially those of manpower and revenue resources, and the constraints set before. Specifically, feasibility is determined by review of (1) revenues available, (2) manpower, (3) space and time requirements, and (4) legal and other constraints.⁽¹²⁾

The result of the feasibility analysis is either (1) an adjusted program set deemed feasible, (2) a statement that a particular program set is infeasible, or (3) recommendation for changes in constraints to make one or more program sets feasible.⁽¹³⁾ Determinations based on feasibility analysis are a two way operation; either program sets must be adjusted to available resources, or resources must be adjusted to potential program sets. In either case, cost-effectiveness analysis

(12) *Ibid.*, p.147.

(13) *Ibid.*, p.146.

must be performed, but the Education PPBS does not provide any formal procedure for the analysis. Rather, judgment of the decision-making group and the analysts is, at present, the dominant mode of analysis.

Step #6—Prediction of Effect of Program on Indicators

Educational objectives are achieved through the operation of adopted programs, and the degree of achievement of objectives will be recorded through the indicators. Conversely, a change in the level of indicators informs the decision-makers whether the objectives are achieved or not. Therefore, it must be determined how the feasible program sets will cause changes in the levels of indicators. The sixth step is to predict the way in which a particular program set will affect the indicators. Some of the indicator changes are easily predicted based on a given program set, but the others cannot be predicted without extensive knowledge of the learning process. If such knowledge is lacking, the prediction may have to be based on the judgment of experienced educators.

Step #7—Selection of Program Sets to Implement

At this step, a decision is made on the complete set of programs to be implemented. The decision is made by comparison of the goals, objectives, and desired indicator levels established earlier with the indicator levels predicted for the sets of programs. Even with the analytical advances possible under PPBS, school administrators have difficult decisions at this point. Hopefully, they will make informed judgments in deciding on the program sets to be implemented. Objectives and desired indicators must be revised here, in the light of feasible program sets. Thus, Steps #2 through #5 may have to be repeated several times until an adequate set of programs is defined.

Step #8—Preparation of Proposed Five-Year Plan and Program

This step is defined as "the preparation, review and acceptance of the five-year plan and programs by the highest decision-making group."⁽¹⁴⁾ This event will require recycling through previous steps.

Budget Preparation, Review, and Approval

The five-year plan and programs finally adopted form the base for budget preparation. The budget is prepared from the detailed specification of the first year of the five-year plan and programs. The budget then goes through the usual cycle of review, authorization, and implementation. If the planning and programming steps are carefully carried out, the process of

(14) *Procedures Manual.*, *op. cit.*, p.21.

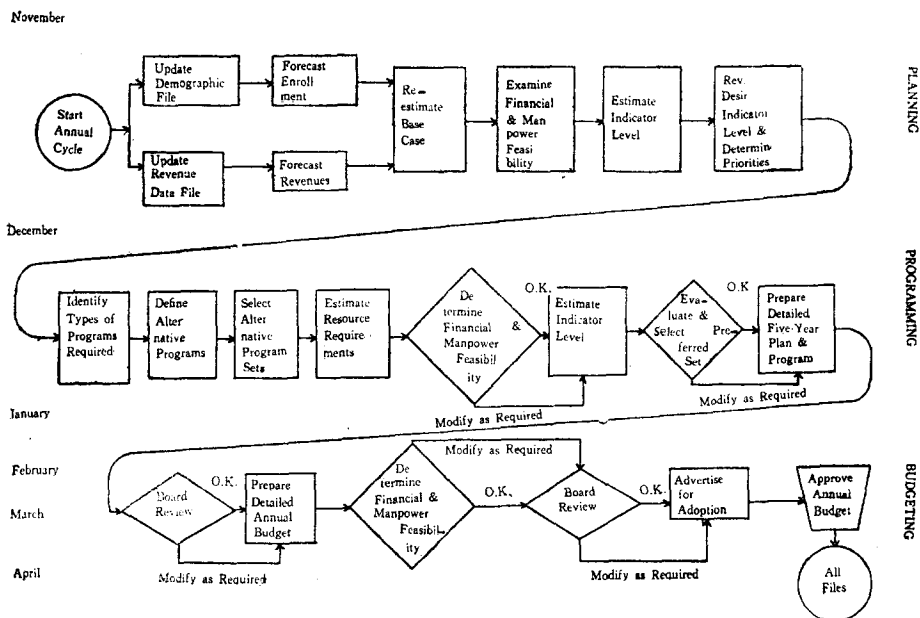


Fig. 2. Preliminary Design for an Education Planning-Programing-Budgeting System for Local Districts (Abridged)

budget preparation should be largely a matter of data processing.

4. An Illustration of the Annual PPBS Procedure-Local School Districts

As an illustration, the annual PPBS procedure for local school districts will be briefly outlined. (See, Figure 2.) The annual procedure contains instructions for preparing the five-year plan and program; it is set forth in an extremely detailed step-by-step instruction manual. The procedure is carried out in two basic sections: Analysis and Summarization of the Base Case; and Development of the Five-Year Plan and Programs.

Analysis and Summarization of the Base Case. This section deals with an analysis of the previous Five-Year Plan and Programs. The activities of this section are designed to provide a review of past and current achievements versus the expected achievement. This is basically a reassessment of the previous plan and programs in the light of changed environmental factors and results of internal operations. It is an attempt to discover what policy and program changes are suggested by the experience under existing programs and past changes in relevant factors.

Where PPBS is being introduced for the first time to a school system, there is no previous five-year plan and programs. During the initial implementation of PPBS, the base case to be analyzed is constructed from information provided in the current budget. Information about the base case is recorded on the following forms and reports:

1. Form #1: Enrollment Forecast Analysis
2. Form #2: New Enrollment Forecast
3. Form #3: Crosswalk
4. Form #4: Indicator Level - Summary
5. Form #5: Base Case - Summary
6. Form #6: Calculations and Projections of Indicators for Base Cases
7. Form #7: Adjusted Base Case - Summary
8. Form #8: Capital Improvement
9. Form #9: Capital Program Summary
10. Form #10: Program - Detail
11. Form #10.1: Program Problem Review
12. Form #11: Final Base Case - Summary
13. Form #12: Manpower Requirements - Final Base Case
14. Form #13: Revenue Forecast
15. Form #14: Financial Feasibility - Final Base Case
16. Report #1: Current Year to Y-5 Program Report

Forms #1 and #2—Enrollment Forecast and Analysis

This is a highly technical forecasting operation by which enrollment estimates are made. Since this is only one forecast, however, the school superintendent may wish to use other figures. Whatever particular forecasts are adopted as enrollment forecasts, this forecast becomes the basis for a whole series of calculations. For example, classroom capacities and manpower requirements cannot be calculated without an enrollment forecast.

Form #3—Crosswalk

Since the legally required budget and accounting classification in use and the program classification adopted for PPBS are different, a crosswalk is provided to convert the one to the other. The crosswalk has another important function in the initial development of the Education PPBS. Using the crosswalk, the cost of each program is tabulated from the current budget figures. Costs of salary, non-salary, capital outlay, and debt service of each program

for the current year are identified at this point.

Form #4—Indicator Level Summary

Some of the indicators are calculated using enrollment figures (adjusted) and expenditures of programs, but others must be tabulated from other data sources concerning educational programs under analysis.

Form #5—Base Case Summary

The base case presents the salary, non-salary, capital outlay, debt service, and total for each PPBS program for the current year. These figures are projected for each program from Y-1 through Y-5. Projection is made on the assumption that there will be no change in capital facilities and manpower requirements, and only inflationary factors are taken into account. Particular inflationary factors must be determined by the technical consideration and judgment of the decision-makers.

Form #6—Calculations and Projections of Indicators for Base Cases

The indicators are projected from the current year through Y-5 for the Base Case, Adjusted Base Case, and Final Base Case. As noted before, some of them can be calculated from the figures of enrollment forecasts and base case expenditures, but others have to be estimated from information available from other sources.

To the extent that a particular indicator is calculated from the figure of the base cases, any variation in the indicator level will help in the analysis of the effects of programs in each case.

Form #7—Adjusted Base Case - Summary

Calculation of the adjusted base case is made in order to determine variations in program expenditures that might occur because of variations in the number of teachers if the current teacher/pupil ratio is maintained and a particular enrollment forecast is assumed. The assumption is that if the current teacher/pupil ratio is maintained through Y-5, then the number of required teachers will vary depending upon changes in enrollment. If the number of teachers increase or decrease, then many program expenditures will also increase or decrease even if the current level of salaries is maintained. The adjusted base case thus serves as an intermediate step in the calculation of final program expenditures.

Form #8—Capital Improvement Report and Form #9—Capital Program Summary

These forms and reports are designed to record and describe variations in program expenditures that arise from capital improvement projects. All types of related costs are computed

and projected except the capital outlay itself, which is a "one-time" cost ascribed only to the year in which incurred.

Form #10—Program-Detail and Form #10.1—Program Problem Review

There are twenty-three programs in the Education PPBS for the local school districts. A sheet of program detail is prepared for each program. This form is intended to record a comprehensive description of each program. One of the most important and technically difficult parts of completing the form is to establish the indicators influenced by the program. If we cannot identify the indicators affected by the program with some confidence, the whole rationale of program analysis may break down. It is hoped that experienced educators can determine such relationships based on their experience until refined techniques are available.

Objectives must be listed for each program. Since the base cases have been developed during the initial implementation of the Education PPBS, from current budget figures, the list or statements of the objectives may be *ex post facto* teleological statements. In other words, program objectives are deduced by observing the programs derived from current budget figures. For that matter, some of the indicators have been calculated from the figures provided by the program costs. A reversed operation will be carried out during the planning and program formulation.

The detailed program description also contains "a listing of all subprograms, clientele served, staff and plant committed, and a description of the methods, procedures used to execute and control the program."

Form #11-Final Base Case - Summary

This is a summary of program costs, again projected over five years.

Form #12-Manpower Requirements - Final Base Case

Manpower requirements describe, in tabular form, increases and decreases of personnel. Variation comes from three sources: turnover, increase or decrease reflecting the changes in enrollment figures, and staffing associated with operation of capital improvements.

Form #13-Revenue Forecast

Revenue projections are made by source and by type. This is one of the two important environmental factors which is formally forecasted in the Education PPBS. Along with enrollment forecasts, the revenue forecast figures play a significant role in program analysis.

Form #14-Financial Feasibility - Final Base Case

The estimated total annual cost for the final base case is compared with the revenue estimates.

If a deficit exists in any of the five years, the increase required in real estate tax is calculated.

Report #1-Current Year to Y-5 Program Report

This is a comprehensive narrative report that summarizes the Final Base Case. It is presented to the board of school directors by the superintendent of schools. The report contains a brief explanation of the PPBS procedures leading to this report, discussion of the district goals, areas of primary concern for the next five years, financial considerations, revenue estimates, present indicator levels, and recommendations concerning objectives and indicator levels.

This report forms the base upon which the dialogue between the superintendent of schools and the board of school directors will be built. Although the overall characteristics of the PPBS structure can be described as a structure of rational calculation, the illustration of the Education PPBS demonstrates that rational calculation is difficult, at least at the present stage, in formulating objectives and selecting some of the indicators. At the same time, once certain values are assigned to the objectives and desirable indicator levels, the ensuing calculation can follow the logic of the PPBS calculus. A strong case for PPBS may be inferred from certain results in the above illustrations: through the PPBS process, the relationships between objectives (via indicators), programs, and program expenditures are made clearer, and the influence of environmental factors such as enrollment and revenue forecasts is specified in every aspect of program analysis. In other words, the implications of any change in any one element must be evaluated in conjunction with other elements of school operation.

The annual PPBS procedure described up to this point is carried out to establish the relationships among enrollment, revenue, goals, objectives, indicators, program costs and methods, and manpower requirements. Whether the superintendent of school should base his recommendations upon the analysis and summary of base case is an open question, because it might be possible for the superintendent to independently develop these elements and their levels. But we assume that it would be more reasonable for him to base his recommendations on his concrete analysis of base cases, and this approach is recommended in the Education PPBS. If he takes the suggested approach, then his option is limited to recommending some departures from the status quo of the base case.

Whatever approach is taken, the considerations and approval of this report and the recommendation concerning new objectives and indicator levels by the board of school directors lead to the development of a policy statement, which will be discussed below.

Five-Year Plan and Programs. An incremental approach, rather than "synoptic" approach

⁽¹⁵⁾ is suggested for plan and program formulation in the Education PPBS: "the cluster of activities in this section are concerned with programs which the school district proposes to under-take *in addition to those kept in the base case.*"⁽¹⁶⁾ (Emphasis supplied)

The forms and reports prepared in analysis and summarization of the base case provide the information necessary for preparation of the preliminary five-year plan and programs. Included in the five-year plan and programs are the policy statement, forecast of input variables, desired level of changes, description of high priority concerns and proposed programs, and a summary of all revenues and expenditures. As mentioned earlier, the first year of the approved Five-Year Plan and Programs becomes the basis for preparation of the annual budget. Information for the Five-Year Plan and Programs is recorded on the following forms and reports:

1. Report #2: Policy Guidelines
2. Form #15: Program Alternative - Proposed
3. Form #16: Proposed Program Alternatives - Summary
4. Form #17: Confirmed Revenue Forecast
5. Form #18: Proposed Alternative Program Set
6. Form #19: Detail Program Expenditure
7. Form #20: Capital Improvement Report
8. Form #21: Capital Program Summary
9. Form #22: School District Summary
10. Form #23: Calculations and Projections of Indicators - Five-Year Plan and Programs
11. Form #24: Manpower Requirements
12. Form #25: Revenue Forecasts
13. Report #3: Five-Year Plan and Programs

Report #2—Policy Guidelines Statement

The policy guidelines statement is a report to personnel in the school system on the results of the board of school directors' deliberations concerning Report #1. The board can retain or change any one or all of the existing goals, objectives, and indicator levels. The report will contain these judgments, and these judgments form the basis for developing the Five-Year Plan and Programs. This is the beginning of a reverse process of analysis and summarization

(15) Braybrook and Lindblom, *op. cit.*

(16) *Procedures Manuals, op. cit.*, p.29.

of base case case. During base case analysis, the objectives and indicator levels were inferred from the existing programs. Now, a search for appropriate programs starts from the established goals, objectives, and indicator levels. Possible contributions of PPBS may be found in this process.

Form #15—Program Alternative - Proposed

A proposed program alternative is any kind of program idea which is seen as a potential contribution to the achievement of newly stated objectives and indicator levels. Therefore, a proposed program alternative must contain a list of the objectives to be accomplished by the program and a description of the program including a list of all sub-programs, clientele served, staff and plant committed, and description of the methods, procedures and techniques used to execute and control the program. The projection of salary, non-salary, capital outlay, and debt service costs that are required in addition to the final base costs also will be developed.

Form #16—Proposed Program Alternatives - Summary

This is a procedure intended to select the program alternatives which are judged to contribute most to the top priority objectives of the school district. The list of alternatives is tentative at this point.

Form #17—Confirmed Revenue Forecast

The revenue forecast is re-examined due to the passage of time and confirmed for the purpose of determining the feasibility of program alternatives.

Form #18—Proposed Alternative Program Set

This form is prepared for each alternative program set. A set consists of any feasible combination of programs plus the final base case. The development of program sets is the responsibility of the superintendent. His judgment plays an important part in development.

The purpose of this process is to compare the costs of alternative program sets plus the final base case and then determine the feasibility of a program set. The superintendent eventually selects the preferred alternative program set from the feasible sets he has examined. This set contains the maximum number of high priority programs that can be funded under acceptable revenue constraints.

The relationship between objectives and program alternatives is established either directly or indirectly through indicators. Both methods are difficult to verify.

Form #19—Detailed Program Expenditure

The basic format and contents of this form are rather similar to Form #10—Program-Deail, but the procedures for establishing the relationships between objectives and programs are different. In the case of Form #10, the objectives were deduced from the analysis of programs, which in turn were derived from the existing budget figures, while in the case of Form #19, programs are the results of analysis of previously established objectives. Relevant indicators, methods, and expenditures are recorded in this form along with their projections.

Forms #20 and #21—Capital Improvement

The basic operation is similar to that used in preparing the base case.

Form #22—School District Summary

This is the summary of the total of detailed program expenditures and capital improvement costs.

Form #23—Calculations and Projections of Indicators Five-Year Plan and Programs

The Current, Desired, and Expected Level for each indicator is shown together for comparison. The current levels are those calculated for the Final Base Case. Desired levels are the reflections of the desires of the board of school directors. Finally, the expected levels are calculated from the figures of the Five-Year Plan and Programs and also from other sources.

Form #24—Manpower Requirements

Manpower requirements for the Five-Year Plan and Programs combine the manpower change resulting from selected program alternatives with those of the Final Base Case.

Form #25—Revenue Forecast

This is a final summary record of the revenue sources and the estimated amounts for the current year through Y-5 for each source.

Report #3—Five-Year Plan and Programs

The process of formulating the Five-Year Plan and Programs ends with this report. Included in the report are the recommendations of the superintendent to the board of school directors. Upon formal approval by the board of school directors, the recommended Five-Year Plan and Programs become official. The report also contains various important factors affecting the school district, including goals, objectives, indicator levels, and revenue recommendations.

5. Summary Discussion of the Education PPBS

The Education PPBS can be summarized by several features. First, it is more than a general statement of the desirable features of good budgetary practice. It incorporates detailed step-by-step operations of the PPBS procedure. Significantly, the Education PPBS shows that

governmental multi-year planning and budgeting can be spelled out, notwithstanding the doubts of some critics. Whether the Education PPBS has attained an empirical, positive, and logically deductive rational system is another matter.

Second, the general framework of PPBS usually presents the components of the system in a logical sequence, creating the impression that the process is a one-way sequential operation.

But, the Education PPBS demonstrates that the actual process of analysis need not start from an abstract definition of goals. As long as the process is operated within the logical framework of PPBS, a starting point of analysis or calculation has no great consequence for the resulting programs and financial plans. This suggests that a PPBS process need not be a strictly rational-deductive procedure in its sequence of operation. Still, the framework offers relevant elements of calculation. At the initial stage of introducing a PPBS, an incremental approach provides a relatively smooth transition to a new system of planning, programming, and budgeting.

Third, the determination of program structure is relatively an arbitrary decision. Consensus within the management group, possibly among important elements of the task environment is important. Such a program structure is used to reclassify the existing programs.

Fourth, the existing programs are used to derive indicator levels and operational objectives. Most of the indicators are, however, the system-level indicators, and the relationship between programs and indicator levels are not always certain. Some indicators are predetermined.

Fifth, environmental forecasts enable the administrators to anticipate indicator levels in future years. These current and expected indicator levels are used in deciding desired indicator levels. This is a way of expressing whether the decision-making group and school administrators are satisfied with the existing programs of the school district. Program alternatives are suggested by the level of gaps among the indicator levels. Designing program alternatives is creative, but indicator levels suggest at least the need for such program alternatives. Even though it is not always easy to determine the relationships between indicator changes and program changes, program alternatives are proposed to cause changes in the system-level indicators or attain the desired indicator levels.

Sixth, in spite of objectives being derived from the existing programs, in many programs, it is not easy to determine relationships between programs and objectives with any precision. In other words, cause and effect relationships are not certain. More extensive and intensive

research has to be conducted to determine such relationships, but it is frequently too expensive for a school district to conduct such research. Until more rigorous evidence and knowledge are provided by other research institutions, the school administrators have to use their own judgments to establish relationships between programs and objectives. In the absence of reasonably detailed knowledge of cause and effect relationships between programs and objectives, efficiency or cost-effectiveness tests will not be performed.

Seventh, as indicated in Chapter III, in the absence of a single indicator which can serve as the standard of over-all school performance, and with incomplete knowledge of the educational process, performance assessment of the school system must be left to the judgment of school administrators. The judgments must be made on some criteria other than efficiency and effectiveness. If we evaluate the indicators of the school district defined under the Education PPBS, many of them are not necessarily the reflection of intrinsic educational achievement. Excess enrollment, pupil-teacher ratio, expenditure per pupil, staff turnover, and drop-out rates are examples. These indicators are important because they are most visible to important task-environment elements such as the board of school directors, parents, and community. The tests are then political or organizational rather than economical or efficiency. The point is that we should not always expect to have good cost-effectiveness analysis or calculations of efficiency. As mentioned earlier, undue emphasis on cost-effectiveness analysis hinders the development of PPBS rather than encourages it. On the other hand, we cannot say that the absence of refined calculations, such as cost-effectiveness or the efficiency test, is evidence of failure to operate PPBS. Even without such refined calculations, the PPBS process enables school administrators to be more conscious of the implications of their present decisions. The operational steps are interconnected so that any one element or step must be altered or modified with knowledge of its consequences. This is no small advance toward better understanding of their decisions. Interdependence of the programs is made more explicit by making it clear that all programs must compete for the same organizational resources.

Eighth, the decision-making group or the superintendent of schools has to make many judgments in the process of PPBS. The necessity of these judgments shows how important the participants' contributions are to the PPBS process. Without active participation of the "agent", the PPBS cannot be implemented. No matter what the analysts can do to improve the judgments of the agents, and no matter how elaborate the calculational steps of PPBS are, the decision maker has to decide on the objectives, criteria, programs, and resource input levels.

These considerations are made under the assumption of an almost completely rational disposition of the agent. Even under such strong assumptions, we note variations of computational capacity depending upon the environment and technology. If the decision-makers are not rational, then the PPBS calculus cannot be used. What remains is the quest for a more rational decision maker, or norms of rationality.

We have shown that the steps of PPBS can be spelled out in sufficient detail to permit administrators to calculate their operations. One important contribution of PPBS, as demonstrated by the Education PPBS, is that PPBS as a procedural planning, forces the administrators to be more consistent in their performance planning. The procedural planning helps administrators to learn rational calculus.

The study team of the Education PPBS from the University of Pennsylvania has been conducting a series of training sessions for the personnel of the pilot school districts and county offices. The content of the training covers the detailed procedures of the Education PPBS. The PPBS process is far more complicated than line-item budget preparation, and requires substantial reorientation of personnel. One simple fact of PPBS as a calculus is that people must learn how to use it. This learning process alone will improve the capacity to handle the uncertainties of environment and technology. This, then, is a substantial contribution of PPBS toward rationality in government.

B. PPBS IN THE CITY OF PHILADELPHIA

1. Introduction

There are two general ways in which the basic structure of PPBS may be interpreted. Type one makes an almost literal interpretation of the PPBS structure in the sense that goals and objectives are formulated *de nouveau* from some philosophical orientation of the government or some higher level goals or values; appropriate programs then are formulated as a means of achieving the given objectives. This is the most common way by which authors of PPBS generally illustrate the structure and contents of PPBS for a particular jurisdiction or organization. This may be an attempt to stick to the ideals of a "rational-deductive" model of decision making.

Type two starts from the existing programs of an organization. From analysis and evaluation of existing programs and their reclassification, certain teleological statements of the objectives are made. In other words, goals and objectives are deduced by observing previously adopted

programs. There are, however, two modes in this type. One of them repeats the operation of deducing objectives from the adopted program even after the formal introduction of PPBS. Another mode attempts to revise the deduced objectives according to the perspectives and desires of the decision-making agent and then to formulate the programs which can contribute to the revised objectives. The programs formulated to meet the revised objectives become, in practice, the program alternatives. Whether such programs are formulated with the full knowledge that they will contribute to the objectives is an empirical question which is difficult to determine even if observations are made. But, the important distinction between the two modes of type-two interpretation can be found in the way they treat the relationship between objectives and programs.

This brief analysis suggests a comparison of the Education PPBS with the City of Philadelphia PPBS. While the Education PPBS completes the whole cycle of *adopted programs-deduced objectives-revised objectives-new programs*, the City of Philadelphia has not advanced much beyond the stage of *adopted programs-deduced objectives*. With this initial observation, the PPBS of the City of Philadelphia should be directly considered.

PPBS was introduced in the City of Philadelphia with the strong support of the Mayor; it was designed and implemented by the personnel of the City Government rather than relying on an outside research institute for a design. The overall approach taken by the City Government to the development of PPBS follows common suggestions of PPBS literature, and several benefits are claimed. The Mayor's Budget Message for 1967, in which he announced that the City of Philadelphia would adopt the planning-programming-budgeting system, stated that:

The advantages of PPBS are continuing cost-benefit analysis, cost-effectiveness analysis and systems analysis.

Properly administered, PPBS would make possible a precise definition of objectives, a concentration on long-term problems and consequences, examination of alternatives, a linkage of planning to budget decisions and an assurance of the most efficient allocation of each dollar in terms of desired benefits.⁽¹⁷⁾

The Mayor's Budget Message for 1968-1969 claimed additional advantages:

1. It will provide instant identification of a program.
2. It will enable us to respond instantly to a specific need.

(17) p.33.

3. It will eliminate duplication and provide better coordination.
4. It will provide for our City Government, in common with management today, with a fast and economical tool with which to conduct the people's business - a government whose innate purpose is not to create bureaucracy, but respond to the valid public need.⁽¹⁸⁾

In addition to these, the City of Philadelphia claimed one more peculiar advantage. The Director of Finance, in his memorandum of July 6, 1966 to the Mayor recommending the adoption of PPBS, cited that PPBS would assist Philadelphia in its relation with the Federal Government: the proposed PPB Unit would speak "the same language" as the Federal establishment. This "grantsmanship" aspect was reiterated in the Mayor's Budget Message for 1967, which stated that:

It would be good management for Philadelphia to be the first city to take advantage of this program to file application for Federal Grants with supporting documentation in the PPBS format, because this will eventually be the accepted procedure.⁽¹⁹⁾

The Mayor-the agent-thus recognized the need for a PPBS and accepted the supporting norms of PPBS. Whether he will use the PPBS as his system with full understanding and participation is a different matter.

2. Development of Program Structure

The primary responsibility for designing and implementing the City's PPBS has been carried out by the Chief of the Operating Budget Division, under the Deputy Finance Director and assisted by members of the fiscal analysis and cost analysis staffs.⁽²⁰⁾ The general approach taken by the City of Philadelphia was that it would proceed step by step in developing a PPBS. The decision was made at the outset that technical quantitative analysis would be the final step.

In the opinion of the Chief of the Operating Budget Division, there are two important components of PPBS: (1) structure and format; and (2) substantive content, or the product of analysis. Structure and format were developed first, primarily because the limited number of qualified analysis staffs in the City Government made it difficult to conduct formal analysis

(18) p. 5.

(19) p. 33.

(20) Graeme M. Taylor, "PPB in the City of Philadelphia," Management Analysis Center, Inc., prepared with the cooperation of the Budget Bureau, City of Philadelphia, on Behalf of the Ford Foundation and the State-Local Finance Project, George Washington University. (mimeo; n.d.)

of programs.⁽²¹⁾

The Budget Division has guided, directed, and retained a controlling hand in order to insure a uniform approach; a broad-scale training and city-wide program structure have contributed to this end. The agencies and departments were instructed to develop program elements within such a citywide framework. At the same time, the budget format and accounting code were redesigned. At present, an effort is being made to conduct program analysis.⁽²²⁾ The development of the program structure, budget format, and training will be described below.

The purpose of training for PPBS is mainly to create a group of personnel who understand the conceptual elements of PPBS to be used in that jurisdiction. In addition, it is desirable for these personnel to be well briefed on the norms and criteria of rational calculation. The first step the Philadelphia took in its effort to develop a PPBS was a basic training of personnel to be involved in the development of PPBS. Also, an orientation seminar was given for the agency heads. This was thought necessary in order to obtain a higher degree of cooperation and effort from all City agencies. Since training was conducted before any development of the PPBS process applicable to the City, the content of the training tended to emphasize the rationale of PPBS and its general outline. Such a basic indoctrination training is different from instruction on the specific rules and procedures of a fully designed operational PPBS. The initial training program involved three steps. The first was a two-day seminar in Washington for a group of 40 personnel from several agencies. The second was a one-week seminar provided by the City for a limited number of personnel from the departments and agencies who were to be involved in subsequent development. The content of the seminar included concepts of PPBS, the significance of PPBS to Philadelphia, the nature of program structure, and program analysis.⁽²³⁾ The third was a one-day seminar for agency heads.

After this training period, the Department of Finance identified the elements of PPBS to be adopted by the City of Philadelphia. They were program structure, objectives, alternative methods of achieving the objectives, a six-year projection of the program and financial plan,

(21) Interview with Mr. Richard Wall, Chief of Operating Budget Division, Department of Finance, City Government of Philadelphia on March 28, 1969.

(22) Richard E. Wall, "Notes for Presentation of Case History of PPB in Philadelphia," PPB Training Seminar, January, 26, 1968, pp. 2-3.

(23) City of Philadelphia, A Memorandum from the Deputy Finance Director (Budget) to the Agencies on the Subject of PPBS Training Program, January 23, 1967.

performance measurement, and a reporting system.⁽²⁴⁾

The approach taken by the City of Philadelphia in developing the program structure was to identify the major problem areas and to designate a program for each major problem area.⁽²⁵⁾ It is not very clear why the concept "problem" instead of goals or objectives was more appropriate for determining the program structure, but, it seems that, in the thinking of City officials, the objectives could be derived from the problems. In the opinion of one official who worked within this approach, PPBS is a problem solving; therefore, a program structure must be geared to problem areas instead of to abstract goals or objectives.⁽²⁶⁾ But, there still remains the question of how to identify the problems. Whether we call it a "goal" or "problem", a desired state of affairs must be identified. Identification of non-operational goals or problems tends to be arbitrary.

An overall city-wide program structure was developed by the Finance Department instead of leaving the determination of program structure to the individual departments and agencies. It was believed that the departments were not sufficiently capable to do the task and their thinking was "largely confined to their own departments and they would, therefore, overlook the City's major problem areas which involve several departments."⁽²⁷⁾

The outline of the program structure is suggested by the following passage:

A program structure will be developed for the entire City governmental operation which will include all quasi-public agencies involved in major City programs, and will include the Capital as well as the Operating programs of these agencies. The program structure will be composed of *major programs*, *subprograms*, and *program elements*, with *program subelements* as finer break downs of the program elements where necessary. Each segment of the program structure will be clearly defined and program objectives will be established initially for the program elements and subelements. Program objectives for major programs and subprograms will evolve over a period of time through public discussion by the top-level public officials.⁽²⁸⁾ (Emphasis supplied)

(24) City of Philadelphia, A Memorandum from the Director of Finance to All Departments, Boards, and Commissions on the Subject of Planning-Programming-Budgeting, January 17, 1967.

(25) City of Philadelphia, A Memorandum from the Chief of Operating Budget Division to the Deputy Finance Director (Budget) on the Subject of Planning, Programming, Budgeting, September 30, 1966, p. 2.

(26) Interview, see note 5 above.

(27) See, note 25 above, pp. 2-3.

(28) See, note 23.

Program alternatives and performance criteria were to evolve later. Since the program structure of the Philadelphia PPBS was initially not a delineation of some clearly stated goals and objectives, some arbitrary decisions might have been necessary. Actually, it appears that the Department of Finance was more or less concerned with devising a framework that could meaningfully re-classify the existing activities of the agencies. Since the effort was to re-classify the existing activities into a new structure, there was only limited controversy regarding the title of a particular program, but some disagreement was expected from the operating departments regarding what activities should fall in which program categories. An obvious solution to this continuing problem may be to rely on consensus or authoritative decisions. To resolve any differences regarding program classification, an extensive dialogue among the departments, the Managing Director's Office, and Finance Department during the development of each department's program structure was considered to be necessary.⁽²⁹⁾

There was a distinct contrast between the Finance Department and some personnel in the City Planning Commission in their approaches to construction of a program structure. The Finance Department, which was responsible for the development of the PPBS, approached the problem by developing a program structure first and expected an evolution of some meaningful objectives. On the other hand, some personnel of the City Planning Commission, who were not directly in charge of PPBS design, suggested that:

...a provisional program structure for a planning-programming-budgeting system for the City of Philadelphia should be responsive to the stated goals of the City government,... This implies that an initial step necessary to designing such a provisional program structure is that of defining, as specifically as possible, the goals and objectives of each program carried out by each department, board, commission, authority, etc. After this has been done, a provisional program structure can be set up and submitted to these departments, etc., for their approval. Using the stated objectives of each program(or program subelement) natural divisions will suggest themselves. I feel that the three major divisions of goals suggested by the language of the Philadelphia Home Rule Charter should be used.⁽³⁰⁾

The above passage stressed the goal orientation of a PPBS program structure, and it was contrasted with the approach of the Finance Department which was initially not concerned

(29) Taylor, *op. cit.*, p. 12.

(30) *Ibid.*, p. 15.

with the explicit objectives. Their difference was that one agency recommended a logical, but difficult step, while the other took a logically less rigorous, but easier step. In addition, the program structure of the City at the time PPBS was introduced was primarily a collection of program titles which made it difficult to establish any clear relationship with goals and objectives. But, both approaches were similar in one essential way: they did not suggest a new formulation of City government goals without considering the existing programs.

Aside from such general orientation and instructions regarding proper assignment of program elements to a subprogram, the Philadelphia PPBS does not yet have the specific instructions, forms, and procedures we found in the Education PPBS.

To understand how the City of Philadelphia is building its PPBS structure of calculation from a bare program structure, it is necessary to examine the use of the program structure. Essentially, it is a framework for reclassifying City activities in order to develop the objectives of City government. Development of program alternatives through more sophisticated program analysis could follow in a subsequent stage of development. The program structure adopted for the 1968-1969 Budget is shown below:

- a. Community Development
 - Housing
 - Economic Development
 - Institutional Development
 - Neighborhood Renewal
 - Urban Beautification
 - General Support
- b. Transportation
 - Mass Transit
 - Streets and Highways
 - Traffic Control and Enforcement
 - Off-Street Parking
- c. Judiciary and Law Enforcement
 - Crime Prevention
 - Patrol and Apprehension
 - Criminal Prosecution
 - Judiciary and Court Administration
 - Detention and Rehabilitation

d. Conservation of Health

Personal Health Protection and Promotion

Healthful Environment

Comprehensive Medical Care

e. Public Education

Higher Education

Supplemental Education

f. Cultural and Recreational

Provision of Cultural and Recreational Opportunities

g. Improvement of General Welfare

Child Care

Care of the Aged

Improvement of Intergroup Relations

Emergency Preparedness

General Assistance

Consumer Protection

Veteran's Affairs

h. Services to Property

Fire Protection

Water Services

Water Pollution Control

Sanitation Services

i. General Management and Support

Legislative

Administration and Management

Financial

Legal

Employee Development and Welfare

Voter Registration and Elections

Property and Records Management

Planning

These are the categories of major programs and subprograms. City agencies and departments developed their own program structure within this major program framework. Normally, the highest level of program structure within each operating agency is the program elements, which are the subcategory of subprograms. Under this framework, the activities of an agency

may be classified into several program elements which may belong to one or more subprograms, or one or more major programs. This kind of classification is what they require in order "to cut across the departmental lines." During the period of developing program element structures, the departments were advised by the Finance Department to ignore organizational lines and place emphasis on the end product or objectives of the agency's operations.⁽³¹⁾

In the absence of well-sequenced steps, the agencies segmented their activities into several elements and assigned or designated some objectives for the program elements. The establishment of relationships between objectives and program elements was not a one-way step, however. Departments were advised by the Finance Department that "it may be helpful for you to first decide the objectives of your agency, and then determine the major programs and subprograms to which achievement of these objectives contribute. This would then enable you to determine more clearly the breakdown of your agency's operations into program elements."⁽³²⁾ In addition, a description of program elements including the methods of operation and some performance measures were provided by the Departments. The features described thus far represent the structure of the PPBS in the City of Philadelphia.

There appears to have been no uniformity in the methods used by the departments to determine their program elements and objectives. Some of the departments started from an identification of objectives, but, most of them built up their programs from the existing activities and then assigned objectives. Generally, objectives were identified through formal and informal meetings of the department heads and division chiefs. Since no precise indicator levels were used, discussion and judgment were sufficient to generate some common understandings.⁽³³⁾

In some cases, the opinions and recommended standards of professional organizations have been crucial in the determination of departmental objectives. For example, the Free Library of Philadelphia and Department of Public Welfare have evaluated the general suggestions of

(31) City of Philadelphia, Operating Budget Memorandum 67-1, from the Deputy Finance Director (Budget) to all Offices, Departments, Boards, and Commissioners on the Subject of Instructions for Development Program Structure for Planning-Programming-Budgeting System, February 27, 1967, p.2.

(32) *Ibid.*

(33) Interviews with the officials of the following Departments: Office of Managing Director, Recreation, Water, Street, Police, Free Library of Philadelphia, and Public Welfare, from March 17 through March 28, 1969.

the professional associations with which their personnel are affiliated.⁽³⁴⁾

City officials are faced with the difficult task of explicitly identifying objectives. Such difficulty comes partly from the nature of public systems and partly from conceptual problems. The nature of public system requires that public officials must determine the needs and demands of the public, which is never easy. In this regard, the concept of task domain seems to be very useful. In terms of task domain and task environment, public officials can narrow down their area of activity and interaction, without considering broad consequences and abstract goals. In other words, this concept makes it easier to operationalize the goals.

In many departments, activities are easier to identify than the end products. Therefore, it is not always possible to identify agency products as the objectives. The Water and Street Departments, for example, had no difficulty in identifying their end products; but other agencies, such as Health and Welfare, did not have easily recognizable end products. A new format for budget presentation has resulted from installation of PPBS in the City of Philadelphia. There is a manual for using this format. The Mayor's operating budget for 1968—1969 was published in this new format using the program structure described above. Within each major program, information is provided in the Program Summary, Subprogram Summary, and Program Element. The Program Summary lists program title, goals, description, and cost summary by subprograms. Likewise, the Subprogram Summary lists the titles of the program and subprogram, goals, description, and cost by program element. The Program Element sheet contains more detailed information. It includes the titles of the program, subprogram, and program element; department, fund, objectives, description of methods and techniques, and cost summary by class. The Program Element sometimes also includes an enumeration of output or performance summary. Most of the objectives are, however, stated in non-quantifiable terms.

3. Summary Discussion

The City of Philadelphia PPBS has not made much progress in the design of an operational structure for PPBS calculation. At present, it seems that the norms of rationality have been reinforced or specified and a basic framework has been constructed, but the product is far from a fully developed system. City officials recognize the need for further development, however, and their step-by-step development is termed as an "evolutionary" rather than revolutionary process.

(34) *Ibid.*

In summary, the PPBS in the City of Philadelphia reaffirms the desirability of rational calculus, and general program structure has been set up. In the nature of their program structure, the program elements are the most essential components of the system. The program elements are considered to be "building blocks" of the program structure.⁽³⁵⁾

At the level of program elements, more concrete objectives are defined and evaluation criteria or indicators of performance are developed. It is also at this level that the technical rationality as well as cost-effectiveness of programs can be examined. Therefore, that portion of the program structure above the level of program elements constitutes a super-structure which does not have much operational significance, except perhaps the benefit of summary classification. Since the super-structure lacks operational significance, it is doubtful whether city-wide objectives can be evolved from the objectives of the individual program elements, beyond the current state of descriptive titles and narrative statements. If city-wide objectives and criteria can not be developed, then there can be no meaningful program analysis at the level of major programs.

The City of Philadelphia is still trying to develop a process for program analysis. As usual, a general idea of program analysis has been stated. The steps in analysis consist of establishing sound, specific, and quantified program objectives, and projecting, for the period of six years, the complete costs and estimated benefits of each alternative. In the development of detailed process, the City of Philadelphia at first attempted to conduct program analysis at the level of the major program areas, establishing a Program Analysis Committee for each major program (except education and support), taking each major program area as a total system, and applying program analysis to this system.⁽³⁶⁾ Later, they decided that program analysis at the level of major program areas was not feasible, given the scarce analytical resources, and lower level programs of limited scope have been selected for program analysis. No deadlines were set for completion of the studies, which means that program analysis will not be a regular element of formal PPBS for a while.⁽³⁷⁾

There appears to be two major reasons for the difficulty with analysis in Philadelphia. The first is the narrow interpretation of the concept "analysis", which has been associated only

(35) See, note 31.

(36) City of Philadelphia, Memorandum from the Director of Finance to All Offices, Departments, Boards, and Commissioners and Selected Agencies on "Establishing Program Analysis Committee," May 27, 1968.

(37) Taylor, *op. cit.*, p. 21.

with elaborate quantitative and mathematical techniques and methods. As long as program analysis is seen solely in terms of these techniques, the City may never be able to begin any analysis. In this connection, it is interesting to note that some of the officials interviewed had the opinion that "systems analysis" must be conducted for the major program areas, while "cost-effectiveness analysis" is appropriate for lower level programs such as program elements. This indicates that systems analysis is interpreted to be useful for higher level goals and their factorization, and cost-effectiveness analysis can be applied only at the level of subgoals; such common understanding corresponds with our analysis of modes of analysis in Chapter II and modified concepts of rationality in Chapter III.

The second reason for the difficulty of analysis in the City of Philadelphia lies in its program structure. The program structure of PPBS in the City of Philadelphia needs additional program managers higher than the department and agency heads. Department and agency heads can manage only program elements, and there are two additional levels above the program elements: subprograms and major programs. If the Mayor and his cabinet can act as the program managing-group for the purpose of PPBS operation, then program analysis can be conducted as long as the managing group evaluates the objectives and programs, even if the evaluation is based solely on personal judgment. At present, program structure is established in such a way that the participation of the Mayor is necessary in identifying objectives and programs. But, the Mayor or his cabinet does not act in this way. Therefore, somebody has to "guess" these objectives and their priorities. In order to make better guesses, the Program Analysis Committee is used, but the members are not the program managers. This highlights the point that some essential aspects of the PPBS process necessitate active participation of higher level officials.

A final note is that the City of Philadelphia's PPBS has not specified the function and process of input forecasts, and has not projected its operations into multi-year plans. Even in individual departments, there is no forecasting of critical environmental factors which significantly affect the operation of the program elements. There are statistical data used by the departments, but this data is not in a form useful for PPBS planning. The lack of such forecasting, coupled with the difficulty of revising objectives, practically negates any opportunity for development of program alternatives. Program alternatives are not yet a formal part of the Philadelphia PPBS.

Finally, and most important, a long-range projection of program costs was not made. The

City's experience has been that realistic, long-range projections of total operating costs will always show that the present tax structure will not be able to finance these costs for a five year period. Thus, it was thought that, "publication,...of long-range projections normally included in the PPBS budget would be political dynamite, and it would be foolish to require the operating departments to make long-range projections."⁽³⁸⁾ The PPBS in the City of Philadelphia is an example which strongly affirms the desirability of having a rational calculus, but has not developed a detailed process of calculation. Future studies of PPBS applications may be able to point out that some jurisdictions introduce PPBS without accepting its full implications.

At the beginning of this section, it was noted that one of the reasons which prompted the City of Philadelphia to introduce PPBS was the desire of City officials to speak the same "language" as the Federal agencies. But the City does not appear to have learned the advanced grammar or syntax. Of course, many individual officials are experts in the PPBS process, but the City as a whole cannot use the language to communicate with another level of organization, which is an age-old problem of organizations.*

(38) See, note 25.

* This is a third installment in a series of author's Ph. D. Dissertation, "An Analysis of the Structure of Planning Programming Budgeting System: Norms of Rationality and Administrative Programs in Government," University of Pennsylvania, 1961, Ch. IV,