# THE ESSENTIALS OF A PLANNING-PROGRAMMING-BUDGETING SYSTEM

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# THE ESSENTIALS OF A PLANNING PROGRAMMING BUDGETING SYSTEM

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The Planning Programming Budgeting System (PPBS) is an integrated management system that places emphasis on the use of analysis for program decision making. The purpose of PPBS is to provide management with a better analytical basis for making program decisions, and for putting such decisions into operation through an integration of the planning, programming and budgeting functions. The term management is used here in its broadest sense; it is used in the context of an organization's overall management and administration. Program decision making is a fundamental function of management. It involves making basic choices as to the direction of an organization's effort and allocating resources accordingly. This function consists first of defining the objectives of the organization, then deciding on the measures that will be taken in pursuit of those goals, and finally putting the selected courses of action into effect.

The PPBS is concerned primarily with major decision-making processes. Its concentration is on the management functions that precede actual operations. An organization can be viewed in a simplified way as carrying out its functions through five basic and sequential phases: (1) planning, (2) programming, (3) budgeting, (4) operations, and (5) evaluation. As its name indicates, PPBS is concerned with the first three of these phases. Each of these phases consists of a distinct but related function in the overall conduct of the organization's affairs.

1. Planning is an analytical activity carried out to aid in the selection of an organization's objectives and then to examine courses of action that could be taken in the pursuit of objectives. Planning, in effect, poses the question as to whether some particular course of action would contribute more to the attainment of the organization's goal than its various

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alternatives.

2. Programming is the function that converts plans into a specific action schedule for the organization. Programming consists of developing detailed resource requirements and the actions needed to implement plans.
3. Budgeting is the activity concerned with the preparation and justification of the organization's annual budget. The function of budgeting is to secure sufficient funds to put the program into operation.
4. Operations consist of the actual carrying out of the organization's program. Preparing for operations is the object of all of the other phases.
5. Evaluation is the function that evaluates the worth of operating programs. Through program evaluation the worth of programs in attaining goals is measured and appraised. The results of evaluations are used to modify current operations, if indicated, or in planning future programs.

II

A major objective of the PPBS is to unify the planning, programming and budgeting functions. Planning, which is conducted through analysis and research, becomes in PPBS a part of the program formulation process. Planning research to select particular courses of action provides the basis for the organization's overall program. Also, the annual budget is derived directly from the organization's approved program and financial plan. Planning, programming and budgeting, although each exercising specialized functions, become separate phases of a single effort, which is to set the course for the organization.

Under the PPBS, autonomy in the planning, programming or budgeting is meant to be minimized. Procedures and work flows established under the system prescribe direct links among these basic organizational functions. Increased concentration through research is placed on the function of selecting courses of action for the organization. The procedural aspects of PPBS provide that the results of the planning activity serve as the basis for the preparation of the organization's

overall program. The program therefore is derived directly from the results of the planning activity, and preparation of the budget being derived from the program is likewise not an independent activity.

III

It is difficult to reach general agreement on a definition of PPBS. This is primarily because PPBS has a number of distinct features or elements, each of which receive different degrees of emphasis depending upon the particular context. The Planning Programming Budget System is constituted basically of five elements, as follows:

(1) a program structure,

(2) an approved program document with projections for the future,

(3) a decision-making process,

(4) the use of analysis for decision-making purposes, and

(5) an information system adapted to the needs of PPBS.

Differences expressed as to the definition of PPBS usually come about by an emphasis being placed on one of these elements while ignoring or minimizing the importance of the others. All of the elements--the program structure, the program document, the decision-making process, the analytical approach and supporting information--are important. The most effective PPB system includes all five elements because they are interrelated and mutually supportive. As will be discussed in detail below, the program structure relates to the decision-making process. Also, issues for analysis are formulated in a way that refers to the program classification. Likewise, the use of analysis is made a part of the organization's decision-making procedures. The information system supports all of the other elements. In sum, the parts of the PPBS are related in an interlocking way in order to enhance the total effectiveness of the system.

Although the elements are interrelated it is still possible to adopt individual elements of PPBS in an organization. The use of analysis in decision-making, for example, could be adopted with good effect without the other elements. Likewise, a program depicting a set of organizational goals and lines of action over an extended time period would be beneficial. But the full benefits of the use of

analysis or the program structure would not be realized without the other elements.

The elements of the Planning Programming Budgeting System will be discussed in more detail below.

IV

A classification of the courses of action open to an organization for attaining its objectives is a program structure. This classification in program terms is designed to serve the needs of decision-making and for allocating the resources available to the organization. Program data in terms of benefits and resource allocations in the organization's multi-year program and financial plan should be displayed according to the program structure. The structure also serves as a framework for preparing program memoranda which justify proposed programs. Both of these documents will be discussed in more detail below.

The program structure represents a way of looking at an organization's efforts that is suited to the needs of program analysis and program decision-making. One of the major features of the program structure is its identification of major agency objectives with the courses of action selected to achieve those objectives. This feature serves to raise some very basic management questions as to what the agency is trying to achieve, and what measures are being taken to attain those objectives. A program structured by objectives keeps agency goals in the forefront in order to guide program analysis and management deliberations.

Organizational objectives or goals must, for the purposes of PPBS, be defined with sufficient precision to permit their alignment with the courses of action that directly contribute to their achievement. The structure provides that direct links be established between goals and the means for their achievement. Goal definitions therefore must be useful in an operational sense. They must provide sufficiently precise guidance to consider alternative courses of action.

The first order in the hierarchy of the program structure consists of major agency goals. These higher level agency goals or objectives are called Major Programs. This level in the program classification

can be referred to by different terms in different PPBS adaptations, such as program categories, program packages, program accounts and so forth, all of which are meant to indicate a higher level in the classification.

Individual courses of action selected to achieve the objectives of the major programs are referred to as program elements. Associating program elements in the structure with agency objectives is meant to raise questions as to whether some particular course of action, or some combination of such measures, serves the objectives of the organization more efficiently than would any of its alternatives.

In order to enhance its usefulness as an element of PPBS, the program structure should include certain features. These features are discussed in the outline below.

Output Orientation. The elements of a program structure are devised to represent the outputs of an organization. This feature is also referred to as an "end-product" orientation, meaning that program elements consist of unique combinations of real resources, all brought together to perform some specific task or mission in pursuit of defined objectives. The emphasis is placed on the task or mission. Real resources are the personnel, real estate, equipment, training facilities, supplies and other such input requirements necessary to carry out some particular task. For example, an early childhood development program, selected as a course of action in pursuit of an agency's educational goals, would imply needs for personnel, such as teachers and supporting staff; real estate facilities, such as classrooms and playgrounds; training personnel and facilities for teachers; schoolroom and playground equipment, and so on to include all resources, which together provide an educational service to the children. Real resources are identified and accounted for in the program, but only as they relate to end-products or particular courses of action. The focus is on end-products and the goals they serve rather than specific resources.

This output orientation is goal-focused and was adopted in PPBS as a more useful arrangement than the input type programs, which can still be seen in many organizations. Programming by inputs means that the focus is placed on the resources. Budgeting usually reflects a

resource orientation. In such cases, decisions are made and programs are presented in terms of types of items or resources, with only secondary or indirect attention paid to the function the resources are intended to serve.

Completeness. The program element list should be complete in the sense that all of the major courses of action selected by the organization should be represented. Every activity and expense should have a place in the program structure. No significant expense or cost being incurred or estimated to be incurred in the future should be omitted. Nor should any major course of action remain unidentified.

This principle of completeness must not result in an excessive amount of detail being included in the program structure. The structure is intended to assist in program decisions that are major so it is important that the program elements not be too numerous. The program document, the Program and Financial Plan, should be used as a working document for higher management. The courses of action depicted are meant to be major courses of action, and the agency objectives shown should be its principal objectives.

Suitability for Analysis. The program structure should present data in a way that is amenable to program analysis. Program analysis essentially consists of weighing alternative resource allocations. The process of program analysis involves determining the changes in program effectiveness that would result from postulated additions or reductions in allocations to particular elements. The program structure and its elements should permit the identification of agency courses of action, each of which is a suitable subject for analysis. Such courses of action or program elements should be represented in a way that permit the consideration of expansions or reductions in their levels. It should be possible, therefore, to associate some unit of measure or output unit to each program element. Such units can be viewed as planning units. For example, a program element representing pre-school activities should for analytical purposes include a unit of measure, which might be the number of children receiving the service or the number of classes established, depending upon the usefulness of the measure for planning and programming purposes.

Identification with Organizational Units. Decisions made as to the courses of action that an organization should take in pursuit of its goals must eventually be carried out by the operational units of the organization. This responsibility for operations should be reflected in the program structure. It should be clear from the list of program elements which organizational unit has the responsibility for carrying out each course of action. If more than one unit has responsibility, it should be so indicated. Units of the organization should be able to learn from the program document what their current responsibilities are and what is being planned for their units in the future.

Decision-Makers' Preferences. It is possible, and even likely, that several different program structures could be devised which meet all of the criteria discussed above. The final selection of program elements and the form of the structure should heavily reflect the preferences of management or the program decision-maker. As mentioned earlier, the PPBS is an aid to the decision-maker. It is not a substitute for the program decision-maker. The purpose of PPBS is to facilitate the mechanics of management; to present information in a way that is more meaningful to the decision-maker; and to sharpen the decision-maker's judgment through the use of analysis. Each decision-maker has his own style and his own point of view. The program structure can and should reflect this individuality. In order for the program structure to reflect such individual preferences, it should be developed with frequent consultation with the decision-makers. If a preference is shown to concentrate on certain aspects or certain kinds of decisions, the program structure should maintain the identification of such activities.

V

A principle of PPBS is that an organization's program should be explicit and formalized. What an organization intends to do should not have to be assumed or derived by implication. The Program and Financial Plan is the document that serves this function of formalizing the program. Program data should be precise, and to the maximum extent possible it should include quantitative data on program needs, resource inputs (including dollars), and program outputs.

The program document includes as an important feature a time horizon extending a number of years into the future. The program in this way presents a longer range view of an organization's activities. Program needs are projected into the future. Program costs and other resource requirements to deal with such needs also are estimated for the future. Likewise, program activities are projected for future operations, and the implications of current decisions on future operations are made clear by way of the program document's extended time period.

VI

The decision-making process of PPBS is essentially procedural. It establishes the functions, rules and timetables for the actions required by the PPBS. Developing the PPBS decision-making process involves establishing the responsibilities of the organizational units engaged in planning, programming and budget preparation. The basic objective of this element is to provide a procedure for the following sequential functions:

(1) for formulating new courses of action for the organization,

(2) for forwarding proposed courses of action through the organization for staff review and higher level analysis,

(3) for transmitting reviewed proposals to the decision-maker for approval, rejection or modification,

(4) if approved or approved with modification, for incorporating the decision into the overall agency program,

(5) for forwarding the approved program to the budget activity for the preparation of the budget.

A principle of the PPB system is that decision-making procedures be open and systematic with the rules known to all concerned. New ideas put in the form of new program proposals should be encouraged with the full knowledge of the units that would be affected. The system should be open in the sense that all interested units should be able to initiate proposals. Also, there should be adequate provision for staff review. Decisions as to new or changed courses of action should not come upon affected organizations as surprises.

The nature and status of program proposals should be matters of record in the decision procedure.

An important provision in the procedures established for PPBS is that the proper authority be identified and specified prior to the need for decision. There should be no uncertainty concerning from whom decisions should be coming. Major program decisions should be made by the director of the agency. There is no more important decision that the director faces than whether or not to approve some major course of action being proposed for the attainment of the organization's goals. The use of analysis, the program structure and the supporting information system all have as their basic purpose to assist decision-makers in this important function.

VII

The decision-making process involves the use of a number of documents. Starting with the planning phase, documentation is provided by the special study report. As discussed earlier, analysis is conducted for the purpose of making choices from among alternatives. All of the significant aspects of the analysis should be presented in its report. Significant aspects of an analysis would include: (1) the objective or the need for action, (2) the alternative measures that were considered, (3) estimates of the costs and benefits associated with each alternative, (4) descriptions and calculations of the risks and uncertainties associated with each alternative, and (5) the choice from among the alternatives, including the criteria used in the selection.

Courses of action are recommended to the director through special studies. With the director's approval, recommended courses of action are made part of another document, the Program and Financial Plan, while the analytical basis of the program is documented in the Program Memorandum. The Program Memorandum contains a description of the main problems and the alternatives considered.

Special studies should be conducted on a continuing basis. They can be started at any time and can take varying amounts of time to conclude depending upon the scope and difficulty of the analysis.

It is especially desirable, however, to schedule special studies so that they can be used to good advantage in the budget cycle. Results of special studies, even if incomplete, should be made available for the annual revision of the Program and Financial Plan and the Program Memoranda. For a more detailed discussion of the Special Study, see the discussion below on the role of analysis in the PPB system.

Although analytical activities need not be scheduled, other activities must be conducted or completed at specific times for the preparation of the budget. A revised Program and Financial Plan is prepared annually in sufficient time for management review and then to serve ultimately as the basis of the budget.

Questions arising in the course of the annual revision of the program are resolved through "issue papers." Issue papers serve the purpose of formalizing major questions at issue, documenting the considerations and recording the resolution of the question. The annual Program and Financial Plan is prepared on the basis of the resolved program issues, prior PFPs, and special studies. The Program and Financial Plan is prepared by program category and program element. It is a tabulation of data presenting needs, inputs, outputs and costs, projected over a period of time into the future. Needs might, for example, consist of data on the size and characteristics of the population to be served. To the extent possible data should be quantitative showing in such cases numbers of persons and their income status. Inputs are requirements for resources, in terms of personnel, equipment, real estate facilities and so on, according to the nature of the program element.

Outputs are the expected results of the program. Outputs, insofar as possible, should be quantitative measures of services or physical output units. In some cases, it will be possible to express outputs as ultimate benefits. Where such ultimate measures of benefit are not possible, it becomes necessary to fall back on performance or capacity measures. Costs in the PFP are presented for each program element, with summaries for intermediate groupings and major programs. Sources of financing, as appropriate, should also be indicated. Costs should be detailed by significant cost elements. Cost elements

should, in turn, be categorized and summarized according to whether they are research costs, capital expenditures or recurring expenses.

VIII

The use of program analysis to assist decision-makers is a key element of PPBS. As discussed earlier, analysis is closely related to the other elements of the system. The form of the program structure, for example, should be influenced very heavily by the needs of analysis. Direct links established by the program structure between objectives and the means for achieving objectives are meant to raise questions as to whether the agency's goals are the right ones and as to how effectively objectives are being pursued. The program structure establishes a framework for weighing alternatives, such as alternative strategies, alternative courses of action and alternative agency objectives.

Analysis is also related to the decision-making process. A major purpose of the decison-making process is to bring program analysis into the program formulation process. As mentioned earlier, one of the important features of PPBS is that it serves to unify the functions dealing with planning, programming and budgeting. Such a unification provides for the output of an agency's research to become proposals for new or changed programs. The Program Memorandum, discussed earlier as one of the major documents, is intended to include considerations which are important in analysis, in addition to describing the status of the program and its future. Program memoranda should include the following information.

(1) the objectives of the program being proposed,
(2) the costs or financial requirements of the program,
(3) the benefits that are expected as a result of the program,
(4) a description of uncertainties relating both to the cost and to benefit estimates, and
(5) the time when the costs are estimated to be incurred and when the benefits are expected to result, projected for each year over an extended period of time.

In addition, the information system is related to analysis. Data needs for analysis must be included in the PPBS information system.

The data system should associate resources with program elements in order to show the total cost implication of each of the agency's courses of action. The information system must also include data on needs and outputs as they relate to each program element.

IX

Analysis as used in PPBS is referred to by various names, such as: cost-effectiveness analysis, cost-benefit analysis, systems analysis, and cost-utility analysis. Although some writers will draw a distinction among these various terms, the approach is basically the same. All of these terms convey a certain analytical approach toward decision-making for purposes of program formulation and resource allocation.

System analysis, cost-benefit analysis and the other terms all convey an approach toward resolving complex problems of choice by methodically examining the costs, benefits, risks and timing of alternative course of action. This definition contains a number of parts worth clarifying. First, consider the use of the term "approach." System analysis is an approach to problems of choice. It is not necessarily a formalized method or rigorous technique. The methods used are to the large extent adapted to the problem at hand. There are guides and a series of steps in the conduct of an analysis, as will be discussed later. But there are no set procedures that can be specified beforehand and then followed to insure satisfactory analysis.

Another feature of cost-benefit analysis, which is reflected in its definition, is that it is carried out methodically. Cost-benefit analysis is intended to be open, systematic, and capable of being reproduced by another analyst using the same assumptions. Assumptions are made explicit and amenable to review. The calculations included in the analysis are documented for subsequent verification. A principle of systems analysis is that it should be conducted and documented in a way that permits a step by step review and evaluation of its conclusions.

The elements for analysis consist of costs, benefits, risks and timing. There are costs associated with proposed courses of action.

These costs must be estimated and the expected benefits must be made specific. There are uncertainties and risks both as to costs and benefits. Analyses are conducted of programs envisaged for the future, and the future carries with it uncertainties of various kinds and of varying degrees. Such uncertainties must in analysis be considered and treated explicitly. As indicated in the definition, the timing of costs and benefits must be taken into consideration in analysis. It is important to know when the requirement for additional resources will be felt. It is likewise important to estimate the times at which benefits are expected to occur.

Systems analysis is basically concerned with the examination of alternatives. Its approach provides for the search and invention of alternatives. This concept of alternatives is central to the whole approach. That there can be alternative ways of pursuing a particular objective is often difficult for organizations to accept. Too often through custom or tradition only a single way of carrying out an organization's function is recognized. The adoption of analysis through PPBS implies that a conscientious effort be made to search for new ways or alternative approaches. The search may be for alternatives that can accomplish the same objective but at lower cost; or for alternatives that at the same cost can achieve better results.

X

There are two basic approaches in the application of cost-benefit analysis. These approaches are referred to as the fixed budget approach and the fixed effectiveness approach.

The fixed budget approach assumes the availability of some given level of resources or funds. The question involved in this approach is this: With a fixed level of resources available, what course or combined courses of action should be taken in order to maximize benefits? The criterion for choice becomes the maximum benefits. The objective of the analysis is to weigh alternatives, in terms of their costs, benefits, risks and timing, in order to select measures that would do the most toward achieving agency goals, while still remaining within the constraints of fund availability.

Analysis taking the other -- the fixed effectiveness approach -- has a somewhat different objective. This approach assumes that some specific objective must be accomplished. The question involved in this approach is this: Considering that some specific objective must be accomplished, what course or combined courses of action should be taken in order to minimize the cost of achieving that objective? The criterion for choice becomes least cost. The objective of the analysis is to weigh alternatives in order to select measures that will achieve the goal specified with a minimal drain on the agency's resources. Although the approaches are different, both seek to optimize the use of resources.

As mentioned above, there is no formal procedure for conducting a cost-benefit analysis. There are, however, a series of steps through which studies normally proceed. These steps can serve as guides to the conduct of analysis. The steps are not discrete, but tend to fade from one into the next without clear demarcations. Presented in their sequence, these steps are as follows:

(1) Problem definition
(2) Specification of alternatives
(3) Costing alternatives
(4) Construction of a model to test the effectiveness of alternatives
(5) The criterion for choice

Although a study proceeds through these sequential steps eventually, in the process there is a considerable amount of iteration or looping back. For example, estimating the costs of alternatives might result in a renewed search for alternatives, especially if the original alternatives are shown to be too costly. Likewise in the testing model step, when alternatives may be found to be unsatisfactory in terms of their effectiveness, a redefinition of the problem may be indicated. Each step will be discussed in the following.

Problem Definition. This first phase of analysis is important. Here it must be made certain that the "right" question is being asked. Uncertainty or vagueness in the definition of the problem leads to

many difficulties and frustrations later in the study. The problem must be defined with sufficient precision to guide the selection of courses of action. Also the problem must be addressed to the proper level. Within the context of PPBS, analysis should be addressed to major program decisions, and not to lower level type questions. The program structure should be used as a framework for formulating questions for analysis. Every program element and every combination of program elements are the subject of analysis. Every program element can be viewed as a candidate for changed resource allocations or for replacement by a new measure.

Specification of Alternatives. The identification or development of alternatives is a key element of cost-benefit analysis. This phase is essentially unstructured and requires inventiveness and imagination on the part of the analyst. The detached nature of the analytical activity and its separation from day to day operations is intended to encourage the fresh look needed for developing new alternatives.

Alternatives take various forms, depending upon the objective of the analysis.

(1) Alternatives can be individual courses of action which are substitutable, one of which would be selected as the preferred course.

(2) Alternatives can be programs consisting of different mixes or combinations of courses of action from which some particular combination would be chosen.

(3) Alternatives can be different internal features of some particular course of action which would be examined in order to choose the internal arrangement that promises to yield the greater benefits or that promises to cost less.

Costing of Alternatives. Estimating the future costs of alternative courses of action that have been postulated for analysis is a specialized function. This function, referred to as systems cost analysis, involves a methodology to predict future resource requirements from past experience on analogous efforts. In order to serve the needs of systems analysis, cost analysis must incorporate a

number of specialized features. The more important of these features are the following:

(1) Total Costing. Completeness in costing is an important feature. A methodical examination to include the full costs associated with a particular course of action is fundamental to cost analysis. It reflects the view that decisions must not be based solely upon the cost of personnel services, or on the cost of major equipment, or be based on any other particular resource cost, no matter how critical its role may be. Instead, the cost of a line of action should reflect the total resource impact resulting from a decision for its adoption.

(2) Incremental Costing. Basically, the purpose of cost analysis is to calculate the additional resources that would be needed to achieve some additional capability or some added benefit. To estimate requirements for additional resources means dealing in increments, and incremental costing is used for this purpose. Incremental costs are the additional costs needed to add, augment or to continue to maintain certain lines of action in the future.

(3) Use of Statistical Techniques. Projecting costs beyond the range of current experience encourages the use of statistical methods. Data on past undertakings which are regarded as analogous for costing purposes are analyzed statistically in order to derive quantitative relationships between the costs of the line of action and its physical or performance attributes.

Establishing the Model to Test and Compare Benefits. The cost benefit model is an abstraction or simulation of real world conditions. Its purpose is to test the various alternative measures under postulated environmental conditions. Models can take a variety of forms. They can be large scale computerized models, narrative scenarios describing future operating environments, games permitting sequential reactions, or they may take a number of other forms as well.

Measures of effectiveness must be devised for the model which are suited to the weighing of alternatives. Devising benefit measures can be difficult. Often, particularly in the humanistic programs, social phenomena cannot be measured quantitatively and are even difficult at times to describe qualitatively. It is important to understand that cost-benefit analysis is not restricted to quantitative treatment. It should be regarded as a rule of analysis to enlarge to the fullest extent the factors that can realistically be treated quantitatively. Intangibles must also be included, but their treatment should be qualitative. Evaluative descriptions of effectiveness, goodness, preferredness and worth are essential and should be made a part of the analysis.

Criterion for Choice. From the model and the testing it provides, the alternatives under consideration can be ranked as to their preferredness according to some criterion. The problem definition at the start of the analysis goes far in providing guidance for the choice of criteria. For example, the criterion in a fixed budget analysis is the larger benefits attainable. The criterion for a fixed effectiveness case is the lower cost.

XI

Cost benefit analysis can be applied to different levels of an agency's program. These levels extend over a range of activities, from examining the internal makeup of individual measures to evaluating the entire program of the agency. A categorization of the levels of analysis appears below:

(1) Program element analysis. Program element analysis is used to examine individual measures, which are alternatives that can be employed for the same purpose. The object is to weigh the costs, benefits, risks and the timing of each alternative in order to make a choice from among them.

(2) Sensitivity Analysis. This type of analysis is confined to a single program element. Its purpose is to examine different arrangements or combinations of resources within the program element. Trade-off possibilities such as

between more educational television or more teachers can be subjected to sensitivity analysis.

Sensitivity analysis is considered in this context as a particular level of analysis which examines the internal structure of program elements. Sensitivity analysis can also, however, be regarded as an analytical technique applicable to all levels of analysis. As an analytical technique, it is used to gauge the effects of altering any variable, whether it be an underlying assumption of the total program, or variations in program load, such as the number of participants, or changes in any of the other performance or physical characteristics of individual elements, partial programs or total programs. As a technique, sensitivity analysis can be used either to determine changes in benefits that would result from program changes or changes in cost that would result from postulated changes in the program.

(3) Program Category Analysis. A program category or a major program includes a number of program elements having similar objectives. In program category analysis, the program element mix is examined.

(4) Total Program Analysis. This level of analysis is the most difficult. It includes the full spectrum of an agency's activities, both direct and support. The objective is to seek improved allocations of the agency's total resources in order to enhance its overall effectiveness. The total program is reflected in the Program and Financial Plan.

XII

Adoption of the Planning Programming Budgeting System requires the collection of certain kinds of data which should be supplied through a PPBS Information System. The PPBS Information System should make full use of currently available agency information and whatever data systems already exist. Duplication should, of course, be minimized. If efficiency in data collection so warrants, the various data systems can be consolidated.

The program structure exerts considerable influence on the form of the data requirements. The information system must reflect the end-product or output orientation of the program structure. Information on resources must be made available in a way that maintains the identity of each program element. In addition, the activities of organizational units must be capable of being identified with the program elements. Although it may be necessary for other purposes such as resource management, in the major program decision-making context it is not meaningful to gather aggregative data on specific items. For example, aggregative data on rent payments has little value in the PPBS context unless the rent payments can be associated with particular courses of action, which are in turn identifiable with program elements in the program structure.

Data needs for cost-benefit analysis are substantial. Descriptive data is needed of the physical and performance characteristics for each line of action in the program and for each line of action that may appear in future programs. Physical characteristics include primarily the types and number of people, equipment, real estate, etc., needed to carry out the course of action. Performance characteristics generally reflect the output of the program element. Performance characteristics might, depending upon the program, include numbers of students educated, amount of income distributed, number of physical examinations and so on.

Data for analysis is also needed to make projections of environmental conditions in future time periods, such as unemployment rates, job opportunities, population migrations, health conditions and so forth. Future courses of action must be evaluated in the analytical model within the context of future needs, and data concerning future needs should be supplied by the information system.

Cost and cost related data must also be included in the information system. Historical cost and cost related data are needed to develop cost estimating relationships to predict future costs.

In sum, the diverse needs for PPBS data are such that special provisions are usually necessary to secure the supporting data. The data needs of the various elements of PPBS are derived from the basic

principles of PPBS. The end-product approach of PPBS is reflected in data requirements. The extended time horizon with its needs for forecasting data is likewise an important requirement of the system. The use of analysis places heavy reliance on data relating to the costs and the effectiveness of alternative measures. All these considerations are reflected in the development and operation of an adequate data base for the Planning Programming Budgeting System.