

90th Congress }  
1st Session }

COMMITTEE PRINT

CRITERIA FOR EVALUATION IN PLANNING  
STATE AND LOCAL PROGRAMS

A STUDY

SUBMITTED BY THE

SUBCOMMITTEE ON  
INTERGOVERNMENTAL RELATIONS

(Pursuant to S. Res. 55, 90th Cong.)

TO THE

COMMITTEE ON GOVERNMENT OPERATIONS  
UNITED STATES SENATE



JULY 21, 1967

NCJRS

AUG 6 1977

ACQUISITIONS

Printed for the use of the Committee on Government Operations

U.S. GOVERNMENT PRINTING OFFICE  
WASHINGTON : 1967

42704

## FOREWORD

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Under the rules of the Senate, the Committee on Government Operations has as one of its basic functions the duty of studying intergovernmental relations between and among the United States, the States and municipalities. This responsibility has been assigned by the committee to its Subcommittee on Intergovernmental Relations.

The search for better ways—more efficient and effective ways—to improve the quality of American life is continuing at an accelerated pace. The President endorsed the implementation of an integrated planning, programing, budgeting system in August 1965 and directed major Federal agencies to install a PPB system. State governments and municipalities, encouraged by the Federal effort, have turned to consideration of PPB systems of their own design. By complementary planning activities, full value of grant-in-aid funds can be more nearly assured. Improvements in Federal aid requirements can assist in coordination of public services, but the direct tough decisions on coordination to improve the quality of American life for their citizens rests on the States and localities where the services are provided.

The Subcommittee on Intergovernmental Relations has undertaken, through a 3-year survey of local, State, and Federal officials, and through public hearings, to explore ways of improving the quality of American government at all levels. That improvement and innovation to meet new demands is called for, has been amply demonstrated through our researches in the field and the testimony before the subcommittee.

Congressional enactment over a long period of time, but especially in the last 6 years, of legislation establishing national programs to assist State and local governments in such areas as poverty, unemployment, urban blight, and education (to name just a few) has been accompanied by intergovernmental confusion and frustration which defeats the very objectives of the congressional mandates of aid to the States and localities. The federal system—of interdependent yet independent units of government at all levels—is a unique and at the time of its inception an innovative idea of government. The pressures of new relationships, of new shifts in responsibilities demand now that innovation again be called upon to reestablish "creative federalism."

Processes of an integrated system of planning, programing, and budgeting call for routine formulation of the objectives of public programs, and the setting forth of options for public action. The development of options is essentially an inventive and creative undertaking that points to innovation in State and local governments in the period ahead. Effectively designed and fully implemented planning, programing, and budgeting systems thus become a way to, and an essential part of, creative federalism.

III

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We have in the past measured public services by the dollars spent for salaries, buildings, materials, and like expenditure items. We clearly need better measures of these public-service outputs in terms of what is gained for the dollars spent. We stand in danger of frittering away the advantages of the bold and imaginative legislative programs that have been established unless we approach the problem of the administering of these programs with the same boldness and imagination. This calls for an examination of management practices, with no reluctance to discard shibboleths of tradition at the Federal Government level and at the State and local level as well.

Since the major portion of nonmilitary public expenditures lies in outlays for public services by State and local government, it is appropriate for these jurisdictions to direct critical attention to their organizational and managerial shortcomings. As President Johnson has said in his state of the Union message:

Each State and county and city needs to examine its capacity for government in today's world—as we are examining ours, and as I see you are examining yours. Some will need to reorganize and reshape their methods of administration—as we are doing. Others will need to revise their constitutions and their laws to bring them up to date—as we are doing. Above all, I think we must work together and find ways in which the multitudes of small jurisdictions can be brought together more efficiently.

A central part of the problem of effective management of State and local government resources, and of the Federal Government, for that matter, is manpower. No system of planning or programing can be effective without personnel adequately trained in modern techniques. Here again the President has recognized the stake of the Federal system in assisting the States and localities in meeting their manpower needs. He has recommended legislation aimed at providing such assistance, and this committee has before it proposed legislation providing for specific aid through a system of fellowships, training grants, and interchange of personnel to strengthen the Federal as well as State and local government. This approach, I believe, is the kind of imaginative proposal that will benefit all levels of government.

As a tool for improving the efficiency and effectiveness of State and local governments, PPB systems seem to hold a promise well worth pursuing.

The Council of State Governments, the International City Managers Association, the National Association of Counties, the National Governors Conference, the National League of Cities, and the U.S. Conference of Mayors have urged a demonstration to test the operation of PPB systems in States and local governments and are cooperating in its implementation. The demonstration, financed by the Ford Foundation through a grant to the State-Local Finances Project at George Washington University, calls upon five States, five cities, and five counties to explore together the problems of coordinating public services and of planning programs so that they may achieve public objectives effectively. Mr. Frank Bane, with his long and varied experience in State and local affairs, serves as chairman of the advisory board of the project, and staff coordination work is

directed by Dr. Selma J. Mushkin. This subcommittee will follow the demonstration project with considerable interest.

The implementation of PPB at the State and local level may very well shift the basis for consideration of Federal aid offering from: Are we getting all Federal grant funds that are available? to: (a) Are we seeking aids that will permit us to carry out effectively and efficiently our program objectives? and (b) Are we developing a coordinated, planned set of programs to meet the needs of our citizens?

The goals recently set forth by the Governors' Conference Committee on State Planning suggests the timeliness of this PPB effort:

Every Governor understands that we must develop more sophisticated ways of sorting facts, of facing issues, of opening options, to make better decisions if we, as States, are to continue as effective partners in our federal system. We must have means to survey where we are, what the gaps in our efforts are, what our goals should be, what the alternative means and ways to these goals are, what the costs and benefits are, what the relative priority between the various goals is. The list is well known, but for some reason, these questions have never excited the imagination.

Transmitted herewith for use of the committee and the States and municipalities is a "Criteria for Evaluation in Planning State and Local Programs," by Harry P. Hatry, deputy director of the State-Local Finances Project. It aims at clarifying and developing the fundamental concepts of the approach to governmental program planning included under the term "planning-programing-budgeting (PPB)" system. This paper represents an attempt at identifying specific criteria (i.e., measures of effectiveness) for use in evaluating alternative proposals for programs for carrying out major State and local governmental functions. It is intended for discussion purposes and to stimulate further research on specific criteria for public services. The listing of criteria contained in the paper represents a starting point in improving yardsticks for program measurement.

The emphasis in the paper is on nonmonetary criteria of evaluation, criteria of special relevance for State and local government program analyses, and for measuring the effectiveness of cooperative inter-governmental programs.

This paper represents the work of a competent specialist in program planning and systems analysis for State and local government. The conclusions are not necessarily those of the subcommittee or of the chairman. They are published as background material for future consideration by the committee, and as thoughtful presentations of possible approaches to the urgent need of assisting State and local governments in their search for more efficient management procedures.

EDMUND S. MUSKIE,

*Chairman, Subcommittee on Intergovernmental Relations.*

## PREFACE

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This paper aims at clarifying and developing some of the fundamental concepts of the approach to governmental program planning commonly included under the term "planning-programing-budgeting (PPB)" system. This paper represents a first attempt at identifying specific criteria (i.e., measures of effectiveness) for use in evaluating alternative proposals for programs for carrying out major State and local governmental functions.

To date there has been little written that attempts to identify specific criteria useful for government program analysis. This paper discusses the criteria problem and makes the rash attempt to identify meaningful criteria in the hope that it will stimulate further efforts both within individual governments and by professionals outside governments who are experienced in analytical techniques. The list of criteria provided here is far from being either exhaustive or definitive.

It is to be emphasized that for individual program analyses, considerable effort will still need to be applied to the determination of evaluation criteria appropriate to the specific problem. The list of criteria contained in section III of this paper can be used as a starting point.

The emphasis in this paper is on non-monetary criteria where the author feels the greatest effort is needed in State and local government program analyses.

The author wishes to express his appreciation to the following persons for their time spent in reviewing early drafts of this paper and for their most helpful suggestions: Alan J. Goldman, of the National Bureau of Standards; Prof. Jesse Burkhead, of Syracuse University; Joel Posner, of the International City Managers Association; Nestor Terleckyj, of the U.S. Bureau of the Budget; and John F. Cotton, of the State-Local Finances Project.

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# CRITERIA FOR EVALUATION IN PLANNING STATE AND LOCAL PROGRAMS

HARRY P. HATRY

## Introduction

In order to place the material in this report in clearer perspective the nature of planning-programing-budgeting systems is summarized.<sup>1</sup>

### BASIC PURPOSE OF PLANNING-PROGRAMING-BUDGETING (PPB) SYSTEMS

PPB systems are aimed at helping management make better decisions on the allocation of resources among alternative ways to attain government objectives. Its essence is the development and presentation of relevant information as to the full implications—the costs and benefits—of the major alternative courses of action.

PPB systems do not examine many aspects of government management. Such problems as budget implementation, the assessment and improvement of the work-efficiency of operation units, manpower selection, and the cost control of current operations are outside PPB. Cost accounting and non-fiscal performance reporting systems are very important in providing basic data required for PPB analyses (as well as for fiscal accounting and management control purposes); however, such systems are usually considered to be complementary to PPB rather than being directly part of it.

PPB systems hope to minimize the amount of piecemeal, fragmented, and last minute, program evaluation which tends to occur under present planning and budgeting practices.

There is actually little new in the individual concepts of PPB. The concepts of program and performance budgeting with their orientation toward workload data and toward program rather than object classification (such as personnel, equipment, and so forth) have been applied by a number of governments since at least 1949, when the Hoover Commission strongly recommended their use. The analytical methods, such as marginal analysis and cost-benefit analysis are familiar tools of the economic analysis. What is new is the combination of a number of concepts into a package and the systematic application of the package in total to government planning.

### MAJOR CHARACTERISTICS

The primary distinctive characteristics of PPB are:

1. It calls for an identification of the fundamental objectives of the government.

<sup>1</sup> This summary is drawn from Harry P. Hatry and John F. Cotton, "Program Planning for State, County, and City," State-local finances project, George Washington University, January 1967.

2. It requires explicit consideration of future year fiscal implications.

3. It calls for systematic analysis of alternative ways of meeting the governmental objectives. This characteristic is the crux of PPB. The selection of the appropriate criteria for the evaluation of each alternative against relevant objectives is the subject of the main body of this report.

Note that the terms "PPB" and "program budgeting" as traditionally used, are not equivalent. Typically the term "program budgeting" has been limited to budgeting systems emphasizing categorizations by programs without explicit provision for the systematic analysis and multiyear perspective of PPB.

#### MAJOR COMPONENTS OF A PPB SYSTEM

A PPB system typically has the following components:

##### 1. *An across-the-board governmental program structure*

One of the first steps performed in instituting PPB is the identification, at least tentatively, of the government's basic objectives. Based upon these, the government's activities are grouped into categories, which aim at grouping together activities (regardless of organizational placement) that contribute toward the same objectives. An abbreviated example of a PPB program structure is shown in the appendix.

##### 2. *A multiyear program and financial plan*

At any given point in time there should exist an approved multi-year plan which uses the program structure categories discussed above. The plan is in two major parts. The first part is the "financial plan." All pertinent costs are considered—including capital costs as well as noncapital costs, and associated support costs (such as employee benefits, associated vehicle and building maintenance costs) as well as direct costs. Major associated external revenues should be identified where appropriate and the expected net cost to the jurisdiction indicated. The program, or output part of the plan, should contain the major measures which indicate to the users of the plan the scope and magnitude of the approved programs. Five years in addition to the current fiscal year has typically been selected for presentation in these multiyear plans.

##### 3. *Program analyses*

The systematic identification and analysis of alternative ways to achieve government objectives is the cornerstone of PPB.

The analysis of a program issue should result in the identification and documentation of—

- (1) The fundamental governmental objectives involved;
- (2) The major feasible alternatives;
- (3) For each alternative the best available estimates of the total program costs for each year considered;
- (4) For each alternative the best available estimates of the benefits (and/or "penalties") relevant to the objectives for each year considered;
- (5) The major assumptions and uncertainties associated with the alternatives; and

(6) The impact of proposed programs on other programs, other agencies, other levels of government, and on private organizations.

The presentation and discussion of alternatives and of the costs and benefits of each goes considerably beyond the scope of typical budget justification material which describes specific budget funding requests and goes beyond the scope of material generally included in physical planning studies.

To be most useful, the analysis should indicate preferred program mixes at different funding levels since specific funding levels should seldom be chosen without explicit consideration of the change in costs and benefits (i.e., the "marginal" costs and benefits) in going from one level to another.

The analysis process should not ignore the political and legislative constraints that are relevant. The analysis should seek to optimize resource allocation within these constraints. However, analysis should be used to indicate the potential penalties arising from them. This will provide information to government decision makers suggesting how worth while it might be to try to overcome these constraints. In the short run these may indeed be firm constraints; for the long run, however, changes may be possible.

This type of analysis places emphasis on the preparation of quantitative information, but when this information is not available, qualitative materials should be included to place the issues in proper perspective.

In PPB, analysis can take many different forms and can be done at many levels of refinement. However, it is useful to distinguish two levels—a less-refined, less-rigorous analysis, and "in-depth" analysis. Each is briefly described below.

*Less "rigorous" analysis.*—This level of analysis is very like, at least initially, to be the most prevalent. Where in-depth studies are not attempted or prove of slight use, a considerably improved understanding of program alternatives can be achieved through less-rigorous, less-refined analysis. A great deal can be achieved for resource allocation problems through the identification and examination of the six elements listed above.

Although these elements are also essential for in-depth studies, their investigation even without the more rigorous analytical tools can provide considerable illumination.

Much of the real gain from existing PPB systems has probably been derived from the "dialog"—the questioning and response—among the decision makers, the proposal makers, and the program analysts. Much of the relevant analytical work done thus far in government PPB systems has resulted not from very sophisticated, technical analyses, but from penetrating questioning and the improved perspective obtained on the issues by applying this less rigorous level of analysis.

*"In-depth" analysis.*—A fully implemented PPB system should provide for the preparation of in-depth studies, often referred to as cost-benefit studies—also sometimes called cost-effectiveness or cost-utility analyses. These studies draw heavily upon the analytical tools of the professional disciplines, including mathematics, economics, operations research, engineering, and the computer sciences. They also seek the six elements listed above, but with a much closer examina-

tion. The studies attempt to identify, quantitatively to the extent possible, the cost and benefit implications of the range of feasible alternatives.

Cost-benefit analyses can seldom provide complete answers. They are intended primarily to provide information to decisionmakers concerning the major tradeoffs and implications existing among the alternatives considered. This information would then be available for use by decisionmakers, along with any other information available—e.g., that pertaining to political, psychological, and other factors which may not have been included in the cost-benefit study.

Program analysis, at either level, is not easy. It is still true that program analysis (or whatever it may be called) is still as much an art as a science. Probably the most important limitations on the undertaking of meaningful analyses are:

- (1) Problems in defining the real objectives;
- (2) The presence of multiple, incommensurable benefits;
- (3) Inadequacies of data relevant to the analysis, including information as to what effect each alternative course of action will have on the objectives as well as information describing where we are today; and
- (4) Difficulties in considering a time stream of costs and benefits and not simply the evaluation of costs and benefits for a single point in time.

#### 4. Program updating procedure

PPB requires explicit provision for the revision and updating of resource decisions. The system must be responsive to changing needs and changing information. The latest multiyear program and financial plan can form the "base" from which proposals for program changes can be made.

### CONCLUSION

PPB potentially can help State and local governments deal with public problems ahead of time, in a comprehensive manner, and can place in much improved perspective the principal issues on resource allocation. The visibility of relevant information (on costs and benefits of pertinent alternatives) provided by PPB is the key element.

There are considerable difficulties and potential misuses that can occur. Certainly, too much should not be expected of the system. It should never be expected that PPB will be able to give definitive answers, but rather considerably improved information pertinent to resource allocation and program selection decisions.

An integrated PPB system is designed to provide information that is so vital to decisionmaking in our complex governmental structure. It is primarily a tool for high level decisionmaking, it will not be worth while unless the high level management understands it, wants it, and uses it.

## SECTION I. THE CRITERIA PROBLEM

A major part of a program planning process is the attempt to estimate the contribution that each alternative program, or mix of programs, makes toward meeting fundamental governmental objectives. For the purpose of this paper, the terms "goals," "aims," "purposes," "missions," or "functions" may be substituted for "objectives." The need for evaluation criteria arises because funds and physical resources are scarce; there are not enough available to satisfy all needs and proposals. (The term "measures of effectiveness" is sometimes used by analysts instead of "criteria.") Thus the problem of choice arises, and evaluation of proposals is needed to make the best use of available resources. To perform this evaluation, it is necessary to identify specific criteria that can be used to evaluate performance against the governmental objectives.<sup>1</sup>

For example, if a governmental objective such as "to reduce crime" was identified, then it would be appropriate to use crime rates as the major criterion (but not necessarily the only criterion) for evaluating activities aiming at these objectives. That is, in comparisons between various proposals, each proposal's effect upon the anticipated future crime rates would need to be estimated.

As the example indicates, the selection of criteria depends upon the objectives that are formulated. Also the process of selecting the criteria will often suggest the need for revision of the objectives. Thus, the establishing of objectives and criteria are interacting processes. In this paper, the emphasis is on criteria; objectives are discussed and presented only briefly. Ideally, a thorough discussion of State and local government objectives would be undertaken first.

An important characteristic of both "objectives" and "criteria" as used in this paper is that they are intended to be "end" oriented rather than "means" oriented. That is, they are intended to reflect what is ultimately desired to be accomplished and for whom, not ways to accomplish such objectives.

For example, the phrase, "to disperse cultural facilities rather than concentrating them in a single locality" is a means "to provide adequate cultural opportunities to all." Use of the former phrase as the statement of objective rather than the latter would lead to somewhat different criteria, such as "the number of cultural facilities." Program analysis would better compare dispersal programs with centralized programs as alternative means to providing adequate cultural opportunities.

<sup>1</sup> The term "output measure" is also occasionally used instead of "criteria." However, when "output measure" is used, it often is used to encompass not only program evaluation criteria (the subject of this paper) but also indicators of the size of programs such as the number of cases handled, the number of fire stations, policemen, teachers, hospital beds, etc., which though of considerable interest are not major evaluation criteria in the sense used in this paper.



Also, the concept of objectives as used in this paper avoids inclusion of specific numerical magnitudes. For example, a statement of objectives such as "to reduce crime rates 10 percent" should be avoided. For program analysis it is seldom appropriate to prespecify magnitudes. The specific amount of improvement that should be sought should generally not be determined until after the alternatives have been evaluated as to the costs and benefits of each and after these tradeoffs are understood.

The criteria for program analyses ideally should have the following general properties:

(1) Each criterion should be relevant and important to the specific problem for which it is to be used. (This will depend upon the fundamental objectives to be satisfied.)

(2) Together the criteria used for a specific problem should consider all major effects relative to the objectives. Enough criteria should be evaluated to cover all major effects. The use of insufficient criteria can be very misleading.

For example, programs to improve housing conditions should in general consider not only the number of acres of slums removed but also the effects upon the persons removed (perhaps by including a second criterion: the number of persons still living in substandard dwelling units).

Although it would make the evaluation considerably easier to have only one criterion, or at least very few criteria, the important thing is to avoid excluding major considerations from an analysis.

As indicated in the previous example, probably any single objective if emphasized too much without considering other needs, could lead to excesses and result in even worse conditions. Other examples are: sole consideration of safety in moving traffic could result in excessive trip delay times; in the law enforcement area, sole concentration on crime rates might lead to programs that result in excess control of individual movement.

With all the criteria expressed in terms of one unit (such as the dollar) or two units (such as the dollar and some nonmonetary unit), neat, analytically optimizable solutions would usually be possible. However, forcing the analysis into oversimplified forms may hide many major considerations. Use of multiple evaluation criteria seems, in general, to be unavoidable.

(3) Each of the criteria ideally should be capable of meaningful quantification. This involves two major problems. The first is the measurement of the current and historical magnitudes of each of the criteria. This measurement is needed to give a clear picture of the magnitudes of the problem, to determine how well the jurisdiction is actually doing toward meeting its objectives, and to provide a basis for making projections into the future.

For the housing example used above we would want to be able to measure how many acres of slums and how many people are living in substandard dwelling units there currently are, and how many were living in such units previously.

The second problem is the estimation of the future magnitudes for these criteria for each of the alternative programs being considered. Projecting into the future is always hazardous. One of the most, if not the most, difficult problems in program analysis is the estimation of the effects on the criteria of the various courses of action. Historical

data are important both for measuring progress and for making inferences as to what has caused any changes that have occurred. This latter information is very important for preparing estimates of the effects of future courses of action.

In practice, it is very difficult, and probably impossible, to meet perfectly all three of these ideal properties of criteria. The list in section III is a first attempt to identify the major criteria that are likely to be pertinent for governmental programs. An explicit attempt has been made to make the list conform with the first two properties (that is, relevancy and coverage) given above for ideal criteria. However, the list is certainly far from definitive in either depth or coverage. It is also somewhat idealistic; the analysts' ability to estimate meaningfully the effects of alternative program upon the criteria (the third property given above) will undoubtedly be limited in many instances—particularly with current information systems.

On occasion, it may be necessary to utilize purely qualitative criteria such as, "In reducing crime, alternative A is more effective than alternative B but less effective than C." This ranking procedure might be partially quantified by having experts apply their judgments to some type of ranking scale. This would result in such a result as, "In reducing crime, alternative A has a value of 80 on the specially prepared ranking scale, B has a value of 65 and C a value of 85."

Thus in practice, even though criteria are not completely capable of being satisfactorily quantified, criteria that have the other two properties may still be useful.

The list of criteria in section III is hoped to be a reasonable starting point from which individual governments would develop a sound set of criteria appropriate to their own specific problems and governmental objectives. Many of these criteria are already in use. For an individual problem, the analysts will need to determine the specific criteria appropriate to that problem. The list in section III may help to suggest the appropriate ones. Each interested reader is encouraged to think through and work out what he feels to be an improved list.

With few exceptions, only nonmonetary criteria are listed in this paper. It is assumed that, in general, all problems will need to consider the actual monetary effects of each alternative course of action proposed. That is, one objective in all problems will be to keep monetary costs as low as possible for any level of program effectiveness aimed for. However, it is a premise of this paper that in the past too much emphasis has been placed upon attempting to translate all program effects into dollar terms. It is true that if this could be done meaningfully, the evaluation of alternative and final program selection would be eased considerably since the quantitative evaluations would all be expressed in the same unit—the dollar.

Realistically most governmental problems involve major objectives of a nondollar nature. Not only is it very difficult for analysts to assign dollar "values" to such nondollar objectives, but it is also questionable whether it would be desirable even if it could be done. Thus, questions of the value of such effects as reducing death rates, reducing illness incidences and severities, improving housing conditions, and increasing recreational opportunities should not become simply a problem of estimating the dollar values of these things.

The analysts should rather concentrate upon the estimation and presentation, for each alternative, of full information as to the actual dollar effects and the effects upon the nonmonetary criteria. This is the primary function of program analysis—and of “cost effectiveness,” “cost benefit,” “cost utility,” or “systems analysis,” terms which for the purpose of this paper are all assumed to be equivalent. Attempts to force the criteria into commensurability are in most cases not worth much effort. It should be left to the decisionmakers to provide the value judgments needed to make the final program decisions.<sup>2</sup>

<sup>2</sup> However, if the analysts can uncover some clues as to the worth that the jurisdiction's public does assign to such nonmonetary criteria, this information should also be provided to the decisionmakers (but not substituted for the basic information on the nonmonetary effects) to assist them in making their judgments. For example, various surveys of the public might give some information as to the degree to which persons currently might be willing to exchange money for changes in the nonmonetary criteria magnitudes. Highway tolls, for example, do indicate that the persons still using the highway are willing to pay at least the price of the toll for the advantages provided by the highway over alternate routes.

## SECTION II. DISCUSSION AND QUALIFICATIONS

The criteria listed in section III are subject to a number of substantial qualifications and warnings; these are discussed below:

### 1. *Criteria must relate to governmental objectives*

As has been already indicated, the problem of selecting the appropriate criteria is dependent upon the problem of specifying objectives correctly. Thus, for a traffic-control problem, if the problem had originally been stated solely in terms of “reducing the number of traffic accidents,” and if the analysts had limited themselves solely to this objective, the only criteria would have been the number of traffic accidents. Alternatives which, for example, restricted traffic flow such as by slowing down traffic considerably, would still tend to be the most “cost effective” since the rapidity of traffic movement was not implied in the statement of objectives and therefore was not included in the criteria.

For each major program area identified in the list, a brief statement is first given which summarizes the assumed objectives of the major program area. The criteria listed for the major program area should ideally provide a specific basis on which to evaluate the contribution that each alternative course of action makes to these objectives. If the reader prefers different statements of objectives, he is also likely to be led to somewhat different criteria.<sup>1</sup>

The specific objectives of a jurisdiction also depend upon the jurisdiction's own concept of the extent of the government's role in each program area. In many instances, there are likely to be considerable differences of opinion as to the proper role of the government. However, in general, such functions as law enforcement, fire protection, and water supply are usually assumed to be primarily governmental functions. Such other functions, however, as health, intellectual development, job opportunities, and leisure-time opportunities may rely heavily upon private sectors. Nevertheless, governments do have some role in most of these, usually at least having a part in helping the “needy” to reach certain minimum standards.

A related problem is that of the many and periodically changing ways in which government's role is divided among the various levels of government such as among city, county, State, and National, and, of increasing importance, special regional organizations.

The specific role played by the government in each individual jurisdiction must be considered in selection of the appropriate criteria.

In this paper no consideration is given to the question of “national objectives” such as national prestige and national security. It would

<sup>1</sup> Persons with different perspectives, different cultures, would probably develop a different set of objectives—thereby implying somewhat different criteria. For example, the caveman would probably insist upon a major program area entitled “Food Supply,” and one labeled “Mate Procurement.” (The latter would be a tough one for State and local governments.)

seem that for State and local governments such issues, though of considerable interest, are peripheral to these governments' functions.

State and local governments, however, must, of course, be concerned with the notions of individual liberty, privacy, freedom of choice, and democratic processes. The degree to which each program option may impinge upon these individual rights and processes should, of course, be considered in a complete evaluation.

### 2. *There are different "levels" of criteria*

One of the major difficulties in specifying criteria is that there are many different levels of criteria. The specific criteria that are appropriate will depend upon the specific problem at hand.

At the highest level we might say that all government programs aim at contributing "to the maintenance and improvement of the well-being of humanity." This overall objective is too general; it is very difficult to measure, is vague, and is not very useful for analysis. The objectives and related criteria presented in the list in section III are at a lower level. However, they are intended to provide the major criteria that should preferably be used in governmental program analyses. These criteria may still be at too high a level for many problems.

Thus, for example, if we are concerned with examining the desirable size and nature of public health nursing services, it is likely to be very difficult to relate some of these services directly to mortality rates, morbidity rates, or days of restricted activity. Preferably, estimates would be made of the effect of alternative levels and mixes of public health nursing services and other types of health service alternatives on each of these criteria. However, because of the difficulty in linking the nursing service programs to these criteria, it may be necessary to use some "indirect," "proxy," or "substitute" criteria. One expedient might be simply to estimate the caseload that can be handled by each public health nursing service program proposed.

Another example: For the objective, "to prevent (deter) crime," judging accused persons can be considered one of the pertinent types of activity. "Judging" itself can be said to have the following subobjectives:

- (a) To be fair.
- (b) To be swift.
- (c) For the guilty, to provide appropriate sentence (neither excessive nor overly lenient).

Alternative programs for "judging" could each be compared through criteria that reflected these subobjectives. Nevertheless, the crucial question would remain as to what extent meeting these criteria to various degrees would deter crime.

Such subcriteria as are indicated in these two examples are not included in the list in section-III, but may often be necessary for individual analyses.

Unfortunately, "program size" indicators such as discussed in the public health nursing example (i.e., caseload) tell little about the important effects, e.g., the effects upon community health that the program achieves. Presentation of only this information to the decision-makers leaves it completely to the decisionmakers to make subjective judgments as to the effects of the service. Presentation of the costs

and the program size indicator for each alternative is better than nothing, but leaves much to be desired.

It should be recognized that, in most cases, at least some information can be obtained relating programs to the major criteria.

For example, it may well be possible to examine current and past records of the jurisdiction and other jurisdictions and to relate to some extent the more fundamental health criteria to program size; inferences would then be made as to the probable future effects of the newly proposed programs. A second approach is to conduct experiments (controlled as much as is practical) in which characteristics other than those investigated are similar from one group to another. Pertinent information would be kept about these groups, and inferences subsequently would be drawn as to the effects of the program characteristics.

Such information gathering does, of course, cost money. Also, the experimental approach may take a long time before useful results become available—possibly too long for the immediate problem but still useful if similar problems are expected to be of concern when the results do become available. In the absence of analytical techniques that identify the best approach to given objectives, the jurisdiction probably can afford to (and indeed may have to) experiment to some extent.

The point is that the program analysis should not be quick to accept lower level criteria such as program size indicators as the only criteria on which he can obtain information.

### 3. *Criteria are grouped under seven major program areas*

The criteria presented in section III are grouped under each of seven "major program areas":

- (a) Personal safety.
- (b) Health.
- (c) Intellectual development and personal enrichment.
- (d) Satisfactory home and community environment.
- (e) Economic satisfaction and satisfactory work opportunities.
- (f) Satisfactory leisure-time opportunities.
- (g) Transportation-communication-location.

Together, these major program areas are intended to encompass the great majority of the activities of a governmental jurisdiction. Though many such classifications could be made, these appear to be a reasonable set for discussion of criteria for evaluation of governmental programs. The assumed components of these major program areas are shown in the appendix.

Many, if not most, analyses will at least initially concentrate upon but one part of one of these major program areas. In some of these analyses it may be necessary to utilize lower level criteria.

For example, for an issue raised on manpower training programs the criterion "percent of enrollees satisfactorily completing the training program" might be appropriate. However, as is already noted in "2", unqualified use of such a lower level criterion for program selection could be misleading. The more fundamental problem of government relevant to manpower training is to get unemployed (or underemployed) persons satisfactorily employed and self-sufficient. The mere fact of graduation from a training program does not mean reduced unemployment. Employment

and earning criteria, even if not feasible to use directly as criteria, should be recognized as being more truly the objectives of manpower training.

Most program-oriented categorizations of governmental programs (called program structures in PPB systems) will also contain a major category for general government activities. This will include such activities as the government's financial, legal, and legislative activities. No criteria are included in the list for these activities. The viewpoint of this paper is that these general government activities are primarily supporting services to the other, primary, government functions. That is, these activities are not themselves aimed at achieving fundamental governmental purposes.<sup>2</sup>

#### 4. More than one criterion will frequently be needed for individual problems

For each of the seven major program areas, several criteria are listed. In some cases there is some overlap and redundancy. However, for the most part, each of the criteria contains some potentially important aspect that is not contained in the other criteria. As has been already noted, the evaluation of program alternatives would be eased considerably if all criteria were commensurable, i.e., expressed in some common unit such as "dollars." However, practically speaking, few major program issues can be meaningfully evaluated solely in terms of a single criterion.<sup>3</sup> The analysts should concentrate upon providing as full and accurate information as possible as to the effects of each program alternative on each of the criteria, leaving it to the decision-makers to weight the criteria.<sup>4</sup>

#### 5. Interactions occur among program areas and among criteria

Though the list of criteria is divided into major program areas, this is not meant to imply that all program analysis problems will necessarily fall into one major program area, and only one. On the contrary, major governmental problems will frequently spill over into more than one program area.

For example, mass transit system proposals could have significant impact on many if not all of the listed major program areas: Traffic safety is directly affected by the substitution of a mass-transit system for individual automobiles; an inexpensive mass-transit system might permit low-income workers to consider job opportunities further away than he can currently afford; families who wished to live further out in the country might be able to do so with a convenient, rapid, inexpensive transit system; recreational opportunities previously too far away and too expensive to reach might be opened to certain segments of the public; individual health and intellectual development might be

<sup>2</sup> The point, however, can be made that these activities do contribute to the fundamental function of providing "democracy."

<sup>3</sup> However, frequently it may be reasonable to concentrate the analysis on one key, nonmonetary criterion, and treat the other criteria as study constraints or as relatively minor considerations. Even in these instances, however, two criteria, one monetary and the other nonmonetary, will need to be explicitly evaluated. As is indicated in the introduction to this paper, forcing a dollar value on a nonmonetary criterion does not in general seem a good practice.

<sup>4</sup> A technique occasionally used with multiple criteria is to have experts in the specific field estimate the relative weights of each criterion. By applying the prechosen weights, the multiple criteria can be combined into one index thus permitting a ranking on the same scale of all the alternatives. As with attempts to translate all nonmonetary criteria into monetary units, such a practice can too easily be misleading. It is the author's belief that if the analysts believe that the resulting information is meaningful, it may be provided to the decisionmaker, but the basic information as to each program alternative's effect upon each of the individual criteria before any weights are applied should always be provided so that meaningful information is not obscured.

furthered (indirectly) by the combination of the preceding effects; certain penalties could also occur, such as the transit system having an adverse effect on the physical attractiveness and living conditions of the areas where it is constructed; air pollution and noise effects would also occur.

Another example is that of education programs that in addition to contributing to individual intellectual development also lead to improved employability and reduction in unemployment.

Thus, specific programs may simultaneously have many complex and interacting effects on many program areas and many criteria.

It is important in program analyses to attempt to consider and evaluate all such effects to the extent that they might be important to the decisionmaking process.

#### 6. It will be necessary to distinguish "target groups"

An important aspect of program evaluation is the identification of the specific population groups that receive benefits (or penalties) from each program proposed. Though not specifically included in the list, it will often be appropriate to break down further certain of the criteria into subcriteria in order to distinguish specific clientele, or "target groups." For many issues a government will be interested in distinguishing the effects of alternative programs on specific population groups identified by such characteristics as age, sex, race, income, family size, education, occupation, geographical location, special handicaps, etc.

For example: For many health issues, distinctions by age, income level, family size, etc., may be required to evaluate the effects of various health programs on each category within such groups.

Another example: It will probably be necessary for many law-enforcement issues to distinguish crimes committed by adults from those by juveniles.

Though neither the objectives nor the illustrative criteria listed in section III explicitly single out "equal opportunity" objectives the use of target groups in the criteria will provide information on such objectives.

#### 7. Criteria need to be thoroughly defined

No attempt is made in this paper to define the listed criteria. However, when utilizing criteria it is important to have clear, thorough definitions. In almost all cases, misinterpretations (often subtle ones) can occur if complete definitions are not provided.

For example, for major types of crimes it is necessary to define each type of crime, e.g., does "larceny" include thefts of automobiles and bicycles; does it include thefts of any magnitude or only those beyond a specific dollar value?

Another example: What is meant by "restricted activity" when the number of days of restricted activity for health reasons per person per year is to be estimated?

Again, how is "poverty" defined when the number of persons and families in the jurisdiction's "poverty population" is estimated?

Or, what is meant by "substandard" when dwelling units are evaluated?

Definitions should generally specify such things as who is involved, how, what time period is to be covered by the criteria, what geographi-

cal location is included, etc. For example, for measuring restricted activity due to health reasons, it is necessary to know—

(a) What specifically is meant by "restricted activity"?

(b) Whether the whole population of the jurisdiction is involved or some specific segment such as "all males between the ages of 16 and 21 living in the North Smithtown" section of the city.

(c) Whether the magnitudes are to be on a "per person per year" basis or on some other.

Some attention should also be given to the influence of time which may affect the definitions. For example, wherever a dollar figure is involved in defining a criterion, price-level changes over time may alter the meaning. For example, if "larceny" is defined to include only thefts over \$50 at current price levels, price-level rises will automatically bring more thefts into the category even though there is no change in the total number of thefts of each type. Explicit provision will be needed for adjustments of the criterion, based upon price-level changes. Another type of change over time that may occur is change in the jurisdiction's boundaries, possibly requiring adjustments to make compatible the magnitudes assigned to the criteria for different years.

#### 8. Criteria can be expressed in different forms

Given that a certain factor is considered sufficiently important to be included as an evaluation criterion, there frequently will be a variety of forms in which the criteria can be expressed. Five such choices are noted below:

(a) Both "absolute" numbers and rates are called for by the criteria included in the list. Absolute numbers by themselves can present a misrepresentation of the situation. For example, the total number of various crimes or of traffic accidents, though, of course, of interest in themselves, do not reflect the associated levels of activity. Crime rates and traffic accident rates (the latter related to the volume of traffic) will give improved perspectives as to what is happening in those areas. Both forms are probably needed by the decisionmakers.

(b) Some of the criteria listed below call for "averages"; for example, "average waiting time for the use of certain recreational facilities." In such cases, the analysts will frequently also need to consider the distribution of waiting times as well as the average. There is danger that if only the average is considered, important information may be ignored.

For example, the average waiting time throughout the week on a city's golf courses may be 15 minutes, which, if it were applicable at all times, would probably be quite acceptable to the city's golfers. However, the distribution of waiting times for specific times of the week might show prolonged, perhaps several-hour, waits during certain hours of the weekends, probably causing considerable annoyance among golfers and suggesting the need for corrective action. Use of only the overall average would hide the pertinent information.

In the list in section III the dangers of the use of averages for waiting times of recreational facilities have been reduced considerably by requiring the calculation of the averages for specific key periods.

Wherever "averages" are considered for use in criteria, consideration should be given to the possibly important information that such criteria hide.

(c) In many instances it will be desirable to compare the magnitudes for the criteria with the magnitudes existing in other, similar jurisdictions, both the current magnitudes and those estimated for the future.

For example, local crime rates may be compared with those of other parts of the country (perhaps by using the FBI's uniform crime reports).

The relative conditions, such as displayed by the ratios of the jurisdiction's own crime rates to those of the Nation, or some segment of it, could be used as criteria. It may also be of interest to compare health, education, recreation, unemployment, and housing conditions to conditions elsewhere.

Care should be taken to ascertain that the figures are really comparable since definitions and reporting systems can differ substantially. For example, the crime reports referred to above have been criticized for lack of uniformity.

Too much concentration on "what the other fellow is doing" is not desirable; the absolute forms of the criteria (for example, the total amount of crime in the government's own jurisdiction) should not be neglected.<sup>5</sup>

The list of criteria given in section III does not specifically include comparisons with other jurisdictions. As appropriate, the criteria could readily be modified to reflect such comparisons.

(d) Certain criteria can be displayed either as the "total number" of something or as a "reduction (or increase) in the number" of this thing. For example, "total number of accidents from cause X" could also be shown as "reduction of the total number of accidents from cause X." The use of the term "reduction" implies that there is a base from which the alternatives are measured. When alternative courses of action are being compared, the "reduction" is simply the difference between the base and the number resulting from the alternative.

The "reduction" form is the more direct way of showing effects but does not indicate the level still existing. In the list of criteria in section III both forms are sometimes shown.

(e) Certain of the individual criteria might be combined in various ways to form a new, single criterion. For example, for health programs the "number of sick days" might be multiplied by the severity index (if there is one) to give a "severity-sick-days index." This procedure is sometimes followed in order to reduce the number of criteria for analytical simplification. The list of criteria in section III does not include examples of these combined criteria.

<sup>5</sup> It is also to be noted that the mere fact that the projected magnitudes for a criterion indicate a retrogressing situation (either relative to other jurisdictions or even relative to earlier years within the jurisdiction) does not in itself necessarily indicate that the jurisdiction's programs are poor. External conditions outside the control of the jurisdiction (such as a significant shift in the characteristics of the population due to immigration or the entry of a new disease virus from outside) can cause the retrogression. Selection of program alternatives should be made as to which alternative is best relative to the others, i.e., which minimizes the adverse situation, even though none of the alternatives is estimated to cause an absolute improvement in the conditions.

9. *Estimates of the criteria magnitudes are needed for each year of the plan*

Another aspect of the criteria problem arises from the necessity in program analysis to consider program impacts on each year for several years in the future. Though various pressures usually act to emphasize current and near future needs, good governmental planning obviously requires consideration of the longer range needs. In preparing its plan of action, a government needs to assure that the plan would provide desired goods and services in each year of the plan.

Different alternative courses of action will affect different years in different ways. One mix of programs may, for example, result in greater benefits for the near future, while another mix of programs might emphasize current investments that are expected to produce superior benefits in later years. Therefore, in deciding among courses of actions the magnitude of each criterion for each year is an important consideration.

The weighting of the importance of each particular year of the plan will probably be the province of the decisionmakers rather than the analysts. The main job of the analysts will be to provide as complete and accurate information as possible as to the nature and phasing of the program impacts, leaving it to the decisionmakers' judgments for the final weightings of one year versus another.

10. *A monetary criterion is always needed*

The one common criterion in all problems of choosing among alternative programs is the monetary (i.e., dollar) effects of each alternative. This criterion is not repeated for each major program area in the list of criteria given below, but should be assumed to be pertinent in each case. Primarily nonmonetary criteria are included in the list. In a few cases a monetary criterion seemed to be necessary as a proxy to reflect important social factors, and these are included in the list.

The term "monetary criterion" as used here refers to the actual dollar changes that would occur (for each alternative program mix as compared to some base)—but not including dollar values imputed to nonmonetary things. These dollar changes, whether affecting the Government's own financial picture or that of other sectors of the economy, should be considered in the evaluation. Effects on the various sectors, as well as on the various clientele groups, should be identified separately so that the decisionmakers have a clear perspective of the impacts.

Theoretically, all of the nonmonetary criteria listed below could be translated into dollar values by estimating, in some manner, the dollar "worth" to the government (or to some other specified group) of changes in the magnitudes of each of the criteria. For example, it might be estimated that the population of the jurisdiction would be willing to pay  $x$  dollars to reduce the number of criminal homicides per year from  $Y$  to  $Z$ . It is, however, a premise of this paper that such translations present some almost insurmountable obstacles (at least with the current state of the art of program analysis) and at best will represent the judgment of one limited group of persons at one point in time. Therefore, it is always desirable to display the values for the specific nondollar criteria, such as those listed in section III so that the actual decisionmakers have full information with which

to make their own judgments. Information that attempts to estimate the dollar "value" to specified targets groups for changes in the nondollar criteria can also be presented to the decisionmakers if the analysts believe such information to be useful. For those who insist upon translating all units into dollar terms, the list of criteria might at least be a guide to the major factors to which dollar values have to be attached.<sup>8</sup>

11. *The monetary criteria can be very complex*

Before we leave the subject of the monetary criteria as applied to program evaluation, the complexity of these criteria should be noted. The monetary effects of a program alternative can be of many types. These effects include the following elements (note that the term "cost" refers only to dollar costs):

(a) *Program costs.*—These are the governmental costs that are incurred in undertaking the activities called for by the program. These costs include the various administrative and other support-type costs as well as those directly incurred.

(b) *Program monetary effects within the Government.*—As a result of the activities called for by the program, certain Government costs may be increased or decreased. For example, a slum-clearance program might in future years result in reductions in fire and crime protection services for the cleared area; on the other hand it might lead to increased demand for park and recreation services. A slum-clearance program would also have some effect upon the tax base of the jurisdiction.

(c) *Program monetary effects outside the government.*—Many of the monetary effects of governmental programs will occur outside the jurisdiction, perhaps affecting the private sector of the economy or other jurisdictions. Changes in transportation systems or in housing, for example, will have considerable effect on many types of businesses in the area. Such effects may be important in many kinds of studies. Governments are generally interested, for example, in monetary measures of gross business and income in relation to persons and businesses within their jurisdictions. Specific examples of such economic measures include: manufacturing value added, retail and wholesale sales, amount of bank deposits, and industrial capital expenditures. (However, it should also be recognized that too much emphasis can be placed upon such measures. For example, attracting businesses into the area though increasing total sales and total earnings, could also adversely affect the overall physical attractiveness of the community.) Another example of effects upon the private sector is the effect upon insurance rates of illness, fire, and crime prevention programs.

<sup>8</sup> Occasionally, the criterion "added future earnings" is used to estimate the value of increasing life expectancy and the value of reducing illness. If this criterion is used alone or predominantly, the evaluation can be misleading. For example, elderly persons or others out of the labor market are at a significant disadvantage, as are housewives (depending upon the amount imputed as their "earnings"). The use of future earnings seems to imply that such factors as growth in "GNP" are the fundamental objectives whereas the value of merely increasing GNP (without, for example, considering per capita GNP and the standard of living) would not seem to be the critical issue in our current society. A very pertinent question is: How does the loss of the individual affect the individual and the remaining population. We know how it affects the individual—and the significant effect is not a monetary one. How it affects the remaining population is a very complex question. Individual population groups, such as those close to the decedents, the taxpayers, the insurance-paying public, the businessman who loses the decedents' spending power, etc., are each affected in different ways. For a more extensive discussion of these points see the Schnolling reference listed in the selected bibliography of this paper.

It is not desirable to add all of these dollar effects (i.e., (a) plus (b) plus (c)) to yield one overall monetary impact. The impact on each sector should be presented to avoid obscuring pertinent considerations.

It will not always be clear whether an item is a "program cost" or a "program monetary effect." (Other terms that have been used to distinguish these are "direct versus indirect" and "primary versus secondary.") However, the important thing is not the classification but the identification and consideration of these monetary effects if significant to the program at hand.<sup>7</sup>

Another major problem in handling monetary changes is the time pattern associated with the cash flow. As discussed in "9", the time pattern is of importance to a government. The use of a "discount" (i.e., interest) rate to translate actual net dollar flow (after consideration of both in-flows or out-flows) into a single "present value" is frequently recommended. This discounting procedure has the advantage of—

(a) Reducing the complexity of evaluation by replacing the several dollar figures (i.e., one for each year of the time period) by one number, the present value.

(b) Reflecting the time value of money in the sense that, in general, money this year is worth more than the same amount of money next year since potentially it can be put to work now and grow into a larger sum by next year.<sup>8</sup>

Unfortunately, however, despite the well-grounded economic basis for discounting (as the procedure is commonly called), there are some difficulties and drawbacks such as the following:

(a) First, there is considerable disagreement over the appropriate discount rate to be used. The range usually debated appears to be 4 to 10 percent. The rate chosen can have a significant effect upon the results if, for example, the competing programs have major differences in their expenditure patterns. Nevertheless, uncertainty as to the appropriate rate is not sufficient reason to avoid discounting.

(b) A more important concern to governments is found in the practical constraints in their annual funding capabilities. Major fluctuations in revenue needs from one year to the next may present insurmountable difficulties. It seems, therefore, that whether or not discounting is deemed appropriate, the actual (i.e., unadjusted by the discount rate) time-phased dollar flows should be shown to the decisionmakers. In addition, the discounted present values of the alternatives can be provided (perhaps for more than one discount rate). This suggested procedure applies to monetary flows both inside and outside the Government.

In most cases, the use of discounting will probably be of secondary concern relative to the many other problems of program analysis.

Nevertheless, as a practical matter, governmental decisionmakers are likely to have strong time preferences as to funding requirements

<sup>7</sup> Arguments as to whether such cost reductions should be considered as an offset to total costs or as an addition to "benefits" is important if cost-benefit ratios are being used as the primary evaluation criterion; however, reliance on such ratios is not good practice. The question as to whether to consider such cost reductions as belonging on the cost or benefit side should not affect a decision.

<sup>8</sup> Discounting is partly a substitute for the explicit consideration of all effects; that is, if the before-and-after sides of all facets of the economy were explicitly included, this procedure would directly show the time value of the money, and advantage (b) would not apply.

of their jurisdictions and need to be shown the time-phased monetary implications of the alternative courses of actions.

As has already been noted, the purpose of this discussion has been to indicate the scope and complexity potentially involved with the monetary criterion. Most of the remainder of this paper is directed at nonmonetary criteria.

#### 12. *The criteria are not intended for use in organizational evaluations*

The criteria discussed in this paper are not intended for the purpose of measuring the efficiency of the administrative organizations of a government (such as the police or fire department). The measurement of day-to-day operational performance, though important, is not the subject of this paper.<sup>9</sup> The criteria in this paper are intended for the purpose of evaluating proposed program alternatives, not of evaluating staffs' or departments' current operating efficiency.

#### 13. *Measurements of program size are also needed but not as evaluation criteria*

Governments that install a formal planning-programing-budgeting system, in addition to undertaking individual program analyses, will probably also prepare a multiyear program and financial plan. One of the main parts of this plan is an "output plan," a presentation that indicates the estimated outputs obtainable from the program plan for each year covered by the plan. At first glance, it might appear that the outputs contained in these output plans should be the evaluation criteria, the measures of effectiveness, utilized in the program analyses—such as those discussed and presented in this paper. In practice, however, the "outputs" contained in the formal multiyear plan will probably have to be somewhat different. They are more likely to be measurements that indicate the magnitude or size of the program rather than its effectiveness. "Effectiveness" is too intricate a subject to present simply as a string of numbers not accompanied by evaluative comments. However, certain common and fairly clearly understood effectiveness measures such as crime and accident rates would probably be appropriate and desirable for inclusion in the formal output plan. In any case, measurements indicating the magnitude of each program (for example, the number of persons treated in public hospitals, the number of miles of highway, the number of acres of playgrounds, etc.) will be information useful to readers of the government's formal multiyear program and financial plan.

This paper does not attempt to list the program-size measures that might be appropriate for use in a multiyear program and financial plan.

#### 14. *Criteria for government-citizen relations may be desirable*

For many of the services which a government provides to its citizens, the pleasantness, courtesy, quietness (e.g., in the case of waste collection), etc., involved in the provision of the service are factors in the overall quality of the service. To some extent these factors are more a problem of operational performance than of pro-

<sup>9</sup> Though some of the criteria discussed in this paper probably could be used in the measurement of organizational performance, they would seldom, by themselves be adequate for that purpose. The criteria in this paper are probably too aggregative; seldom will one government department or agency have full control over these criteria. More specific and more directly related criteria (for example, the average time that it takes to get the firetrucks away from the station after an alarm is received, the number of public assistance cases handled per caseworker per month, etc.) are needed to measure organizational efficiency. Such measures are useful in program analysis as planning factors from which estimates of overall program costs and effectiveness are built up, but are not the fundamental criteria sought for program evaluation purposes.

gram planning. Nevertheless, to the extent to which program planning is involved (for example, a proposal to provide training of policemen on police-citizen relations would be a program-planning problem), these factors need to be considered. Generally, however, they will be secondary to the fundamental purposes of the service. While measures for these factors are not presented in the illustrative criteria in section III, it may be appropriate for a particular jurisdiction to include such criteria for certain of its analyses.

*15. Uncertainties and political considerations are additional evaluation factors*

In addition to such nonmonetary criteria as are presented in section III, and the various monetary benefits and costs, other considerations enter into final program decisions. Such factors as the amounts of uncertainty and risks involved (which should be indicated and quantified in the analysis to the extent practicable) and various political considerations may also play important parts in the final decisions. These factors can also be considered evaluation criteria and should not be ignored. Wherever possible they should be discussed, and quantified to the extent practicable, in the analysis.<sup>10</sup>

*16. Criteria frequently will be difficult to measure*

As has already been indicated, it will undoubtedly be extremely difficult to get good historical information on many of these criteria and to make good estimates of the future magnitudes of the criteria for the various program alternatives.<sup>11</sup> In some of these cases, information systems can be feasibly developed to provide improved information in the future. In cases where this appears impossible, it will still be desirable to make crude estimates—based upon judgment if nothing else.

As already noted, at the very least, alternatives can be ranked on each criterion or, a more complex technique, experts can be asked to assign a value to each criterion for each alternative based upon an arbitrary scale (for example, 1 to 10). Public opinion polls, using appropriate sampling techniques, can be used to obtain information on various "intangible" criteria (though there are many difficulties in such polls). Even this information will often be helpful. If even qualitative estimates cannot reasonably be made, substitute criteria will be necessary.

It is to be emphasized that even though an important evaluation criterion resists quantification, this does not mean it should be ignored in the analysis. Relevant qualitative information should be provided; or at the very least the inability to say anything meaningful about the criterion should be clearly pointed out along with its possible implications. The decisionmakers will then at least be alerted to the problem.

<sup>10</sup> Note that good analysis in general will not make a decisionmaker's job easier. In fact to the extent that it provides him with additional considerations that previously were hidden, good analysis can actually make his job harder. Good analysis should, however, provide him with considerably improved information on which to base his decisions.

<sup>11</sup> For some criteria, it may be that "reported" data is known to be incomplete. In such cases, estimates of the unreported cases should also be made if this is at all possible. If not, the analysis or the definition of the criteria should at least make clear the omission. Examples of such unreported data are the incidences of various illnesses and of unreported crimes.

*17. Intangibles will always be with us*

The decisionmaker will inevitably be faced with major intangibles. In addition to the difficulties discussed in "16," certain important aspects of governmental (and perhaps personal) objectives are bound to be omitted from the criteria that are quantified or discussed qualitatively. Since even the type of criteria presented here falls short of indicating ultimate "value" or "utility," and even if all the listed criteria could be satisfactorily quantified, intangibles would still remain.

For example, though the number of families living in "sub-standard" dwelling units is a tangible figure, the "value" of reducing this number by various amounts is primarily intangible.

Most often the governmental executives will have to make these judgments themselves. There also will be times when such intangible issues should be put before the legislative branch or directly before the voters.

Program analysis, with the use of such criteria as are contained here, can only aim at improving the relevant information on the issue at hand. It does not need to, nor can it, provide the definitive answers on program selections.



### SECTION III. ILLUSTRATIVE LIST OF CRITERIA FOR THE EVALUATION OF PROPOSED PROGRAMS

#### I. PERSONAL SAFETY<sup>1</sup>

Objective: To reduce the amount and effects of external harm to individuals and in general to maintain an atmosphere of personal security from external events.

##### A. LAW ENFORCEMENT

Objective: To reduce the amount and effects of crime and in general to maintain an atmosphere of personal security from criminal behavior. (To some persons the punishment of criminals may be an important objective in itself as well a means to deter further crimes.)

1. Annual number of offenses for each major class of crime (or reduction from the base in the number of crimes).
2. Crime rates, as for example, the number per 1,000 inhabitants per year, for each major class of crime.
3. Crime rate index that includes all offenses of a particular type (e.g., "crimes of violence" or "crimes against property"), perhaps weighted as to seriousness of each class of offense.
4. Number and percent of populace committing "criminal" acts during the year. (This is a less common way to express the magnitude of the crime problem; it is criminal oriented rather than "crime oriented.")
5. Annual value of property lost (adjusted for price-level changes). This value might also be expressed as a percent of the total property value in the community.
6. An index of overall community "feeling of security" from crime, perhaps based on public opinion polls and/or opinions of experts.
7. Percent of reported crimes cleared by arrest and "assignment of guilt" by a court.
8. Average time between occurrence of a crime and the apprehension of the criminal.<sup>2</sup>
9. Number of apparently justified complaints of police excesses by private citizens, perhaps as adjudged by the police review board.
10. Number of persons subsequently found to be innocent who were punished and/or simply arrested.

<sup>1</sup> Criteria for personal safety are here presented for two subcategories: "Law Enforcement" and "Fire Prevention and Firefighting." Other subcategories could be identified such as "Traffic Safety" (in this paper relevant criteria for traffic issues are included under major program area VII) and "Protection From Natural and Manmade Disasters." The appendix illustrates the particular subcategories that might be included under this, as well as the other, major program areas.

<sup>2</sup> A major purpose of criterion 8 as used in this list is to reflect the psychological reduction in anxiety due to the length of this time period. Note that it is not the purpose of this or any of these criteria to evaluate the efficiency of the police organization.

*Notes*

(a) Criteria 1 through 6 are criteria for the evaluation of crime-prevention programs. Criteria 7 and 8 are aimed at evaluating crime control after crimes have occurred (i.e., when crime prevention has failed). Criteria 9 and 10 and to some extent 6 aim at the avoidance of law-enforcement practices that themselves have an adverse effect upon personal safety. Criterion 6 and to some extent 8 aim at indicating the presence of a fearful, insecure atmosphere in the locality.

(b) Some argue that the primary function of criminal apprehension and punishment is to prevent future crimes; and, therefore, that criteria 7 and 8 would not be sufficiently "end oriented", but rather "means" oriented, and would not be included in the list.

(c) For many analyses it would probably be appropriate to distinguish crime activity by the type of criminal, including such characteristics as age, sex, family income, etc. (juvenile delinquency is an obvious subcategory).

## B. FIRE PREVENTION AND FIREFIGHTING

Objective: To reduce the number of fires and loss due to fires.

1. Annual number of fires of various magnitudes (to be defined).
2. Fire rates, for example, number per 10,000 inhabitants per year.
3. Annual dollar value of property loss due to fire (adjusted for price level changes).
4. Annual dollar value of property lost due to fire per \$1 million of total property value in the locality.
5. Annual number of persons killed or injured to various degrees of seriousness due to fires.
6. Reduction in number of fires, in injuries, in lives lost, and in dollars of property loss from the base. (These are primarily different forms of criteria 1, 3, and 5 and can be substituted for them.) This reduction might in part be obtained by, for example, drawing inferences from the number of fire code violations (by type) found.<sup>3</sup>
7. Average time required to put out fires from the time they were first observed, for various classes of fires.

*Notes*

(a) Criteria 1 through 6 are intended for evaluation of fire prevention programs. Criteria 7 and to some extent 3, 4, and 5 can reflect the results of programs which aim at the control of fires after they have started. Criterion 7 also is a proxy for the anxiety related to duration of fires.

(b) It may be appropriate to distinguish among geographical areas within the jurisdiction.

## II. HEALTH

Objective: To provide for the physical and mental health of the citizenry, including reduction of the number, length, and severity of illnesses and disabilities.

<sup>3</sup> From current data on the violations found, estimates could be prepared of the number of additional violations that would be found and corrected if more fire-code inspectors were added. However, the more important (that is, the higher level) criterion is not the number of violations found and corrected but the reduction in the number of fires and in the loss of lives and property. To get to this higher level criterion, estimates would have to be made of the consequences of not finding and correcting such violations. This footnote is included to indicate the kinds of inferences that are likely to be needed in program analyses. Similar situations can be identified for many of the other criteria presented in this list.

1. Incidence of illness and prevalence (number and rates).<sup>4</sup> (Armed Forces rates of rejection for health reasons of persons from the jurisdiction could be used as a partial criterion.)

2. Annual mortality rates by major cause and for total population.<sup>5</sup>
3. Life expectancy by age groups.
4. Average number of days of restricted activity, bed confinement, and medically attended days per person per year. (Such terms as "restricted activity" need to be clearly and thoroughly defined. Also, probably more than one level of severity of illness should be identified.)
5. Average number of workdays per person lost due to illness per year.
6. Total and per capita number of school days lost owing to illness per year.
7. Number of illnesses prevented, deaths averted, and restricted-activity days averted per year as compared with the base. This is primarily a different form of such criteria as 1 through 6.
8. Average number of days of restricted activity, of bed confinement and of medically attended days per illness per year.
9. Number and percent of patient "cured" (of specific types of illnesses and various degrees of cure).
10. Some measure of the average degree of pain and suffering per illness. (Though there seems to be no such measure currently in use, some rough index of pain and suffering could probably be developed.)
11. Some measure, perhaps from a sampling of experts and of patients, as to the average amount of unpleasantness (including consideration of the environment in the care area) associated with the care and cure of illnesses.
12. Number or percent of persons with aftereffects, of different degrees, after "cure."
13. Number or percent of persons needing but unable to afford "appropriate health care"—both before receiving public assistance and after including any public assistance received.
14. Number or percent of persons needing but unable to receive "appropriate health care" because of insufficient facilities or services.
15. Some measure of the overall "vigor," the positive health, of the populace, rather than simply the absence of illness—such as "the average per capita energy capacity." Meaningful measures are needed.

*Notes*

(a) A number of subobjectives can be identified for this major program area. Those subobjectives and the criteria that attempt to measure each are as follows:

1. Prevention of illness—criteria 1 through 7.
2. "Cure" of patient when illness occurs including reduction of its duration—criteria 1 through 9.
3. Reduction of unpleasantness, suffering, anxiety, etc., associated with illness—criteria 10 and 11.
4. Reduction of aftereffects—criterion 12.

<sup>4</sup> Here and in the following material the term "illness" is also intended to cover disability and impairments.

<sup>5</sup> Suicide rates should be included; these are likely to provide some indication of the overall mental health of the community. Note that reducing mortality from certain causes would presumably increase mortality from other causes. Life expectancy, criterion 3, is thus a more important overall criterion.

5. Making necessary health care available to the "needy"—criteria 13 and 14.

Note, however, that during consideration of the overall problem of health, these subobjectives will often compete with each other. For example, with limited funds, they might be applied to programs aimed primarily at preventing an illness or at reducing its severity (or at some mix of these programs). Also note that criteria 1 through 7 are affected by programs that are directed at curing illnesses as well as those directed at preventing them.

(b) The criteria can be defined to distinguish among specific types of illnesses as well as to consider the aggregate effect on individuals of all possible illnesses. For certain problems the incidence of a specific disease may be of concern, whereas for other problems the incidence of illness per person per year, regardless of specific disease, might be the appropriate criterion. One such breakdown which is very likely to be desirable distinguishes mental health from physical health, though even here there will be interactions.

(c) Note that such common measures as "hospital-bed capacity" or "utilization rates of available medical facilities" are not included above since these are not fundamental indicators of the effectiveness of health programs.

(d) As with most of the major program areas, program analyses will need to consider the contributions of other sectors, including private institutions and activities undertaken by other jurisdictions.

(e) The role of governmental jurisdictions may emphasize health services for certain specific target groups such as the needy, and the very young. Therefore, it will frequently be appropriate to distinguish target groups by such characteristics as family income, race, family size, and age group.

(f) To further focus on the positive side of health, in addition to the use of criterion 15, such criteria as 4 might be replaced by such criteria as "average number of healthy days (appropriately defined) per person per year."

### III. INTELLECTUAL DEVELOPMENT

Objective: To provide satisfactory opportunities for intellectual development to the citizenry. See also notes (b) and (c) below.

1. Annual number and percent of persons satisfactorily completing various numbers of years of schooling.

2. Annual number and percent of dropouts at various educational levels.

3. Annual number and percent of each age group enrolled in educational institutions.

4. "Intellectual development attainment" measures, such as performance on various standardized achievement tests at different ages and educational levels.<sup>6</sup> Major educational areas, for example, reading skills, reasoning skills, and general knowledge, might be measured.

5. Performance on the achievement tests indicated in criterion 4 as related to intelligence tests (to indicate attainment relative to capacity).

<sup>6</sup> Armed Forces rejection rates—for intelligence reasons—of persons from the jurisdiction could be used to provide a partial measure.

6. Annual number and percent of students continuing their education at post-high-school educational institutions.

7. Participation in selected cultural and civic activities (and perhaps the number of persons who read newspapers, or at least certain parts of them).

#### Notes

(a) Criteria 1, 2, and 3 emphasize quantity of formal education received. Criteria 4, 5, 6, and 7 attempt to indicate the quality of education received. Since formal education is not the only means to intellectual development, criteria such as 4, 5, and 7 when various age groups are considered, should be applied to persons regardless of whether they are in school or not or how much formal education they have had. Criterion 6 also provides some information as to the success of education to stimulate intellectual curiosity. None of the criteria provides much help in measuring the development of individual creativity, if it can indeed be developed.

(b) Education not only affects intellectual development but also social development. The above criteria (with the minor exception of 7) fail to measure such things as "social adjustment," "responsible citizenship," and increased "personal pleasure." Such criteria as crime rates, juvenile delinquency rates, including school vandalism, etc., such as are used for major program area I, "personal safety," might be used to draw inferences on certain aspects of social adjustment.

(c) "Education" clearly may be a means to other ends (for example, to lower crime rates) as well as an end in itself. In fact some persons may consider education to be primarily a means to increase future dollar earnings and therefore would consider the above criteria solely as proxy measures for getting at earnings. If so, education programs would better be considered under major program area V, "economic satisfaction and satisfactory work opportunity for the individual." The perspective here is that education and, more broadly, intellectual development, has more than economic value to individuals and society, and is, therefore, an important end in itself. The objectives: to increase earnings, to increase job opportunities and job satisfaction, and to supply needed scarce skills are, in the categorization used in this paper, considered under major program area V. Education programs are some of the means to these ends and in this role would need to be considered in performing such program analyses.

(d) To estimate quality of formal education, frequently such "proxy" indicators are used as "annual expenditures per student," "professional-student ratios," "number of professionals with advanced degrees," "teacher salary levels," etc. These are less direct, lower level criteria than those given above, but nevertheless may be of some use if qualified sufficiently.

(e) The role of government in intellectual development varies considerably among jurisdictions.

(f) It will frequently be appropriate to distinguish target groups by such characteristics as: race, family income level, family size, and sex.

IV. SATISFACTORY HOME AND COMMUNITY ENVIRONMENT<sup>7</sup>

Objective: To provide opportunity for satisfactory living conditions.

## A. SATISFACTORY HOMES

Objective: To provide opportunities for satisfactory homes for the citizenry, including provision of a choice, at prices they can afford, of decent, safe, and sanitary dwellings in pleasant surroundings.

1. Number and percent of "substandard" dwelling units. More information would be provided by identifying more levels than just two. In any case, "substandard" should be fully defined; the definition should include consideration of crowding, physical deterioration, unsatisfactory sanitation, etc.

2. Number and percent of substandard units eliminated or prevented from becoming substandard. (This is essentially another form of 1.)

3. Acres of blighted areas eliminated and other areas prevented from becoming blighted areas.

4. Total number and percent of persons and families living in substandard dwelling units.

5. Number and percent of persons and families upgraded from one level of housing (for example, "substandard") to a higher level (for example, "standard") or prevented from degrading to a lower level. This is essentially another form of 4.

6. Measure of neighborhood physical attractiveness. (Perhaps (a) as indicated by the number of negative conditions estimated by neighborhood inspectors, including adverse physical appearance, excessive noise, lack of cleanliness, offensive odors, excessive traffic, etc.; or (b) an index based upon a public-opinion poll of persons passing through the neighborhood and/or experts.

7. Measure of neighborhood psychological attractiveness. Perhaps an index based upon a public-opinion survey of persons living in the neighborhood and/or experts.

8. Average, and distribution of, property values adjusted for price level changes. Expected changes, from year to year, in property values might also be used as a criterion.

9. Number of fires, other accidents, deaths, and injuries resulting from housing deficiencies.

*Notes*

(a) Important secondary effects (such as changes in crime and juvenile delinquency rates, in health conditions, in fire problems, and in job opportunities) are likely to result from changes in housing conditions and urban redevelopment. Criteria relating to these effects are included under the other major program areas.

(b) It will frequently be appropriate to distinguish target groups by such characteristics as family income, race, family size, and location.

(c) Criteria 1 through 5 aim at provision of housing, with 4 and 5 probably the most important, since they directly evaluate effects on people rather than things. Criteria 3 and 6 and probably 7 evaluate

<sup>7</sup> Two subcategories have been singled out for illustration: "Satisfactory homes" and "maintenance of a satisfactory water supply." Others such as "maintenance of satisfactory air environment," "noise abatement," and "sanitation," can also be identified as subcategories and require selection of appropriate criteria that also help to evaluate home and living conditions.

the physical attractiveness of the neighborhood. Criteria 7 and 8 are attempts at evaluating the overall quality of the housing and living conditions. Criterion 8 is included here rather than under major program area V, economic satisfaction, as a measure of the overall quality of the neighborhood; that is, property values are used as a proxy for the many features contributing to the attractiveness of the property. Criterion 9 measures the safeness of housing.

## B. MAINTENANCE OF A SATISFACTORY WATER SUPPLY

Objective: To provide sufficient water in adequate quality where and when needed.

1. Water-supply capability relative to average and to peak demand.

2. Number of days per year during which water shortages of various degrees occur. (Downtime for repairs should be included.)

3. Measure of "quality" of water (e.g., biological oxygen demand and percent of solid waste removed) supplied to homes or businesses. (If waste water is not recycled, the quality of the effluent fed back into streambeds, etc., could be used as a criterion.)

4. Measures of taste, appearance, and odor of water—perhaps based upon such factors as amount of chlorination or upon opinion samplings of water users.

5. Measures of hardness and temperature of water.

6. Annual number of illnesses and other incidents due to low quality water.

7. Annual number of complaints of water odors due to low quality water.

*Notes*

(a) Criteria 1 and 2 are measures of the sufficiency of the quantity of water supplied. Criteria 3 through 7 are measures of the quality.

(b) Each of the quantity measures is also dependent upon the minimum quality level established. That is, more water can generally be supplied if the quality requirements are reduced. Program analysis will need to consider such tradeoffs.

(c) The seasonal and diurnal effects of water supply and demand has to be considered in the analysis.

(d) It may be appropriate to distinguish individual user needs such as water for home consumption, for industrial use, for recreational needs, for irrigation, etc., each of which will have its own quantity and quality characteristics.

## V. ECONOMIC SATISFACTION AND SATISFACTORY WORK OPPORTUNITY FOR THE INDIVIDUAL

Objective: To permit each family and each person to meet basic economic-physical needs, while maintaining dignity and self-respect. To permit any employable person desiring employment to obtain satisfactory employment without loss of dignity and self-respect.

1. Annual number and percent of persons or families whose incomes before receiving public assistance placed them in the "poverty" class. More evaluation information would be provided by identifying more levels than just "poverty" and "not poverty." In any case, "poverty" should be fully defined; the definition should probably take into consideration such factors as family size, ages of persons

in the family, location, cost of living, etc. (Note that programs which reduce the cost of living are alternatives to programs which increase income.)

2. Average and distribution of per capita or per family income. (This criterion essentially supplements 1.)

3. Annual number and percent of persons or families whose incomes, considering any public assistance received, still places them in the "poverty" class.

4. Annual number and percent of persons or families whose economic condition is improved through public assistance (preferably further grouped by the amount of total public assistance per person or per family).

5. Some measure of the "standard of living" levels of all residents.

6. Number and percent of persons or families formerly in the "poverty" group that achieve self-sufficiency during the year.

7. Number and percent of persons in job market who are unemployed or underemployed (in terms of number of hours worked).

8. Number of persons previously "unemployed," or who would become unemployed, who are placed in jobs during the year. (This is essentially another form of criterion 6.)

9. Index of individual job satisfaction, perhaps based upon a sampling of the employed and/or upon expert opinion. Another measure would be the number of persons whose jobs did not appear to match the workers "capacities." Both current capacity as well as "potential" probably should be considered.

#### Notes

(a) This major program area can be considered to include two major subcategories: "welfare" and "employment" programs. These subcategories are both complementary to and competitive with each other in meeting the objective to achieve overall "economic satisfaction." However, the human need for worthwhile activity is probably not met by welfare but can be by employment. In addition other types of programs, e.g., general education, can contribute to the objectives. (Vocational-oriented education and training are here considered as being one type of "employment" program.)

(b) Criteria 1 through 5 emphasize the evaluation of economic satisfaction (regardless of employment condition) whereas 6 through 9 are work opportunity oriented.

(c) Criterion 9 is needed to measure the extent to which individuals are matched to satisfying, rather than just any, jobs.

(d) It will frequently be appropriate to distinguish target groups by such characteristics as family size, race, and age.

### VI. SATISFACTORY LEISURE-TIME OPPORTUNITIES

Objective: To provide year-around, leisure-time opportunities for the citizenry which are accessible, permit variety, are safe, physically attractive, avoid uncomfortable crowdedness, and are in general enjoyable.<sup>8</sup>

1. Number of acres of recreational land of various types per 1,000 population (perhaps as compared to "standards" that may be available). Or for indoor activities, some such measure as the number of

<sup>8</sup> Both in-door and out-door, and both active and inactive, type activities are to be covered by the criteria.

square-feet, or number of seats, per 1,000 population for each type of activity.

2. Number of percent of "potential users" within, say, one-half mile and/or a 10-minute walk of neighborhood recreational area (note that for some facilities such as large State parks, people who live farther away may account for more use of the facilities than persons living close by.)

3. Number of man-days usage per year for each public leisure-time activity (perhaps related to some usage standards).

4. Ratio of attendance to capacity, during specified critical periods for certain activities (both as a measure of attractiveness and "crowdedness" of the facilities).

5. Number of different leisure-time activities available.

6. Average waiting times, during specified key periods, for use of certain public facilities (such as golf, tennis, and boating) or average requests for attendance turned away such as at concerts, theater shows, etc.

7. Number of accidents in recreational areas related to usage, e.g., per 1,000 man-days usage per year.

8. Number of persons unable or unwilling to take advantage of available leisure-time opportunities who would if they could (categorized by the reason for their disuse of available opportunities).

9. Number of persons who would use currently unavailable leisure-time opportunities if made available.

10. Some measure of overall pleasurable and sufficiency of leisure-time opportunities, perhaps based upon a public opinion poll sample.

#### Notes

(a) For many analyses, such criteria as 1, 2, and 5 will need to consider private leisure-time facilities as well as public facilities.

(b) Criteria 1 through 6 and 9 are indicators of whether leisure-time opportunities are provided in sufficient quantity. Criteria 3, 4, and 8 are indicators (unfortunately, indirect ones) of the quality of the opportunities. Criterion 5 aims at measuring the amount of variety available. Criterion 7 measures the safeness of the activities. Criteria 3, 8, and 9 are also indicators of the "pleasurableness" of the opportunities (such things as overcrowdedness are not included in the concept of the term "quality" as used above and therefore "pleasurableness" is also used). Criterion 10 is an overall measure that probably encompasses all of the attributes. Note that except for criterion 10 the criteria do not attempt to measure what is achieved from the leisure-time activities; the degree of pleasure that is derived from each type and quality of activity is not addressed in 1 through 9.

(c) Criteria 8, 9, and 10 will be particularly difficult to measure. Well constructed surveys and polls will probably be needed to provide meaningful information.

(d) Leisure-time opportunities in addition to being considered ends in themselves (to satisfy the human need for recreation and pleasure) are also means to meet other major program area problems such as physical and mental health (major program area II) and crime and delinquency (major program area I). Effects on the criteria in these other program areas, therefore, have to be considered when evaluating leisure time program alternatives.

(e) It may be appropriate to distinguish target groups by such characteristics as age, family income level. (For example, recreational opportunities for the aged, for the poor, and for youth are likely to be of particular concern.)

VII. TRANSPORTATION—COMMUNICATION—LOCATION (SEE NOTE (a) FOR CLARIFICATION)

Objective: To transport needed amounts and types of "traffic" quickly, safely, and pleasurably.

1. Average time for performing specific tasks. The criterion "average trip time between selected locations" would be an appropriate form of this criteria if only physical transportation systems are being evaluated.

2. Average delay times at selected locations during selected parts of the day, week, and year.

3. Number of passenger-miles transported per day and the passenger-mile capacity of the system (probably categorized by the different types of transportation systems).

4. Number of transportation accidents, injuries, and deaths per year.

5. Transportation accident, injury and death rates, e.g., per so many passenger-miles or per trip.

6. Some measure, or measures, of the overall pleasantness of the travel or of such individual characteristics as physical attractiveness, noise, crowdedness, convenience, and comfort, perhaps indexes based upon a public opinion poll of travelers or opinions of "experts." (A proxy measure such as the average number of trees per mile of road, or the percentage of roadway that is landscaped might be helpful but could be quite misleading if not carefully qualified.)

*Notes*

(a) This major program area is intended to include all types of systems including communications and locational programs as well as automobile, rail, water, mass transit, and pedestrian physical movement. The former affect the amount of physical transportation required. The term "traffic" is meant to convey the concept of transmission of "messages" as well as physical objects and people. Physical transportation systems may be specific means to transmit messages of certain types but are not the only solution. For example, the function of shopping might be supported by a lengthy transportation system, by originally locating the shops near the users, or by audiovisual-telephone selection of goods with mass delivery provided by the shops. Thus, programs to avoid the need for physical movement of people or goods may be effective in reducing the overall problem.

(b) This major program area is not really an end in itself. Rather it is a means to satisfy other human needs, such as employment (commuter service), economic progress, accessibility to recreational areas, etc. However, because of its importance in most communities and the need to consider these "transport" systems in an integrated manner, identification as a separate major program area, with its own criteria, seems reasonable. In the evaluation of transport alternatives, however, these basic purposes of transport must be considered. For the same reason, such potential negative effects as air pollution and noise generation must also be considered.

(c) Criteria 1, 2, and 3, attempt to measure the adequacy of the transportation system to move needed traffic and to move it quickly enough. Criteria 4 and 5 measure the safety of the system. Criterion 6 attempts to indicate the pleasurable content in the system.

(d) It may be appropriate to distinguish user target groups by such characteristics as geographical location; income level; whether the users are commuters, shoppers, leisure-time activity seekers, commercial users, etc.; and whether they are acting as pedestrians, drivers, or passengers, or in other roles.

## SELECTED BIBLIOGRAPHY

Below are listed publications, which the author, even though not necessarily fully agreeing with the approaches used, feels are sufficiently informative and provocative to merit attention on the "criteria" problem.

1. "Goals for Dallas," Graduate Research Center of the Southwest, Dallas, Tex., 1966

Contains some very thoughtful statements of "goals" for the city of Dallas along with some excellent essays that discuss activities related to these goals. The "general goals" listed are similar in intent and composition to the "objectives" used in this paper; the "specific goals," it should be noted, are primarily "means"-oriented.

2. "Efficiency in Government Through Systems Analysis," Roland N. McKean, John Wiley & Sons, Inc., 1958.

This is one of the earliest and best works on "systems (i.e., program) analysis"; it contains an excellent general discussion of criteria as well as case studies on water-resources development (which use primarily monetary criteria).

3. "Measuring Benefits of Government Investments," edited by Robert Dorfman, the Brookings Institution, Washington, D.C., 1965.

This often-quoted volume contains provocative discussions of criteria in seven different program areas, including outdoor recreation, high school dropouts, urban renewal, syphilis control, and urban-highway investments.

4. "Economic Opportunity Act of 1964," Public Law 88-452, August 20, 1964.

Contains the congressional wording of objectives in the Federal "antipoverty" program. See, for example, section 204(e).

5. "Demonstration Cities and Metropolitan Development Act of 1966," Public Law 89-754, November 3, 1966.

Contains the congressional wording of objectives in the Federal "demonstration cities" program. See, for example, section 103(a).

6. "The Health of the American People," Forrest E. Linder, Scientific American, June 1966.

Contains an excellent survey of health criteria and the data on them being generated by the national health survey.

7. "Estimating the Cost of Illness," Dorothy P. Rice, Public Health Service Publication No. 947-6, May 1966, U.S. Government Printing Office, Washington, D.C.

Contains a thorough discussion of the economic costs of mortality along with extensive tables on "present values of lifetime earnings." Note however, the reservations to this approach in section II-10 of the present paper.

8. "Uniform Crime Reports for the United States," published annually by the Federal Bureau of Investigation, U.S. Government Printing Office, Washington, D.C.

Consists of definitions of, and statistics on, various crime criteria for various target groups and geographical locations.

9. "The Life You Save May Be Your Own," T. C. Schelling, paper prepared for the Second Conference on Government Expenditures, September 15-16, 1966, to be published by the Brookings Institution, Washington, D.C.

Contains a very thought-provoking discussion of the problem of the "value" of human life.

10. "How Much Is Air Pollution Costing Us in the United States?" Allen V. Kneese, paper prepared for the National Conference on Air Pollution, December 13, 1966, U.S. Public Health Service, Division of Air Pollution.

This is a good illustration of the wide range of effects which should be considered in the evaluation of one type of program—air pollution—and discusses some of the problems of such measurement.

## APPENDIX

### ILLUSTRATIVE PPB SYSTEM GOVERNMENT PROGRAM STRUCTURE

#### SUMMARY

- I. Personal safety.
- II. Health (physical and mental well-being).
- III. Intellectual development and personal enrichment.
- IV. Satisfactory home and community environment.
- V. Economic satisfaction and satisfactory work opportunities for the individual.
- VI. Satisfactory leisure-time opportunities.
- VII. Transportation-communication-location.
- VIII. General administration and support.

#### Notes

1. This program structure is for illustrative purposes only. Its underlying framework is the identification of the needs of the individual citizen.

2. It is not a complete program structure. More detail is used in some areas than others; many categories have not been subcategorized sufficiently. Each individual government jurisdiction needs to specify the primary governmental objectives of its activities and based upon this formulate its own specific program structure. The lower level program categories particularly are difficult to structure without reference to the specific governmental jurisdiction and its problems.

3. It is highly desirable to have a statement of objectives, in as specific terms as possible, for each element of the program structure.

4. Such activities as planning, research, and experimentation should be included with the program structure category to which they apply. If applicable to a whole program area (i.e., I through VIII above) it might be included under an "unassignable" category as shown below.

5. Categories shown in brackets are those which seem to fall readily into more than one location of the program structure. The brackets indicate the "secondary" location for these categories to avoid double counting when grand totals are prepared.

6. In many cases, it will be appropriate to include subcategories which distinguish particular "target groups." For example, consideration should be given to identification of certain programs by age, race, income level, geographical location, type of disability, etc. One illustration is shown under category IV A. For the most part, however, this program structure does not identify target groups.

7. The lowest level categories, not illustrated here, should identify the specific programs or activities.

- I. Personal safety (protection from personal harm and property loss):
  - A. Law enforcement (i.e., crime prevention and control):<sup>1</sup>
    1. Crime prevention.

<sup>1</sup> In addition, programs for juveniles should probably be distinguished from programs for adults. Subcategories for major types of crime might also be appropriate.



## I. Personal safety—Continued

## A. Law enforcement—Continued

2. Crime investigation.
3. Judging and assignment of punishment.
4. Punishment and safekeeping of criminals.
5. Rehabilitation of criminals:
  - (a) Probation.
  - (b) Parole.
  - (c) Rehabilitation while confined.

## B. Traffic safety:

1. Control.
2. Judging and punishment.
3. Accident prevention.

## C. Fire prevention and firefighting:

1. Prevention.
2. Fighting.

## D. Safety from animals.

## E. Protection from and control of the natural and manmade disasters:

1. Civil defense.
2. Flood prevention and control.
3. Miscellaneous emergencies/disaster control:
  - (a) National Guard.
  - (b) Emergency rescue squads.
  - (c) Other.

## F. Prevention of food and drug hazards, nonmotor vehicle accidents and occupational hazards.

## G. Unassignable research and planning, personal safety.

## H. Unassignable support, personal safety.

II. Health (physical and mental well-being):<sup>2</sup>

## A. Physical health:

1. Preventive medical services:
  - (a) Chronic diseases.
  - (b) Communicable diseases.
  - (c) Dental disorders.
  - (d) Other.
2. Treatment and rehabilitation:
  - (a) Communicable diseases.
  - (b) Dental disorders.
  - (c) General.
  - (d) Other.

## B. Mental health:

1. Mental retardation:
  - (a) Prevention.
  - (b) Treatment and rehabilitation.
2. Mental illness:
  - (a) Prevention.
  - (b) Treatment and rehabilitation.

## C. Drug and alcohol addiction prevention and control:

1. Drug addiction:
  - (a) Prevention.
  - (b) Treatment and rehabilitation.

<sup>2</sup> Subcategories distinguishing programs for various age groups and for specific diseases would be appropriate. Medical assistance/welfare programs should probably be included here as well as under VA (and placed in brackets in one place or the other).

## II. Health—Continued

## 2. Alcohol addiction:

- (a) Prevention.
- (b) Treatment and rehabilitation.

[D. Environmental health, included under IV C through G.]

E. Other.

F. Unassignable research and planning, health.

G. Unassignable support, health.

III. Intellectual development and personal enrichment.<sup>3</sup>

## A. Preschool education.

## B. Primary education:

## 1. Education for special groups:

- (a) Handicapped.
- (b) Culturally deprived:
  - (1) Tutorial assistance.
  - (2) Family orientation.
  - (3) Mass media.

## 2. General education.

## C. Secondary education.

## D. Higher education:

1. Junior colleges.
2. Liberal arts colleges.
3. Universities.
4. Specialized professional schools other than 5.
- [5. Medical and dental schools training functions, included under II].

## E. Adult education:

1. General.
- [2. Adult vocational education, included under V B.]

[F. Public libraries, included under VI C 2.]

[G. Museums and historical sites, included under VI C 1.]

[H. Vocational education other than III E 2, included under V B.]

## I. Other.

J. Unassignable research and planning, intellectual development and personal enrichment.

K. Unassignable support, intellectual development and personal enrichment.

## IV. Satisfactory home and community environment (creation of a livable and pleasant environment for the individual):

## A. Provision of satisfactory homes for dependent persons:

1. For children.
2. For youth.
3. For the aged.
4. Other dependent persons.

## B. Provision of satisfactory homes for others:

1. Upgrading existing housing.
2. Satisfactory supply of homes for low-income persons.
3. Information and counseling to home dwellers.
4. Enforcement of housing standards.
5. Land-use regulation.

<sup>3</sup> In many cases, neither State, county, nor city governments will control the bulk of the programs and expenditure for education. However, these are of such importance, and interrelate with all other program areas, that it may be advisable to retain this complete category. The jurisdictions would focus upon those areas which they control and those which seem to be neglected and for which government encouragement can be given.

## IV. Satisfactory home and community environment—Continued

- C. Maintenance of a satisfactory water supply:
    1. Water supply.
    2. Water sanitation.
    3. Storm drainage (this category might also be included under I E 2).
  - D. Solid waste collection and disposal:
    1. Garbage.
    2. Refuse.
  - E. Maintenance of satisfactory air environment (including air pollution control).
  - F. Pest control.
  - G. Noise abatement.
  - H. Local beautification.
  - I. Intracommunity relations.
  - J. Homemaking aid and information.
  - K. Other.
  - L. Unassignable research and planning, satisfactory home and community environment.
  - M. Unassignable support, satisfactory home and community environment.
- V. Economic satisfaction and satisfactory work opportunities for the individual:
- A. Financial assistance to the needy (other than for homes, which is included in IV B and C):
    1. Aid to the blind.
    2. Aid to the disabled.
    3. Aid to the aged.
    4. Aid to families with dependent children.
    5. Aid to the unemployed (other than above).
    6. Programs to reduce the cost of living.
  - B. Increased job opportunity:
    1. Job training.
    2. Employment services and counseling.
    3. Job creation.
    4. Combinations of 1, 2, and 3.
    5. Equal employment opportunity.
    6. Self-employment assistance.
  - C. Protection of the individual as an employee.
  - D. Aid to the individual as a businessman, including general economic development:
    1. Support for individual industries.
    2. General community promotion.
  - E. Protection of the individual as a consumer of goods and services (other than food and drug hazards contained in II A 1 (c)).
  - F. Judicial activities for protection of consumers and businessmen, alike.
  - G. Other.
  - H. Unassignable research and planning, economic satisfaction and satisfactory work opportunities for the individual.
  - I. Unassignable support, economic satisfaction and satisfactory work opportunities for the individual.

## VI. Satisfactory leisure-time opportunities:

- A. Provision of outdoor recreational opportunities:
    1. Parks and open space.
    2. Athletics and playgrounds.
    3. Zoo.
    4. Other.
  - B. Provision of indoor recreational opportunities:
    1. Recreation centers.
    2. Other.
  - C. Cultural activities:
    1. Museums and historical sites.
    2. Public libraries.
    3. Theaters.
    4. Music activities.
    5. Other.
  - D. Leisure-time activities specifically for senior citizens.
  - E. Other.
  - F. Unassignable research and planning, leisure-time opportunities.
  - G. Unassignable support, leisure-time opportunities.
- VII. Transportation-communication-location<sup>4</sup>
- A. Motor vehicle transport:
    1. Highways.
    2. Streets.
    3. Traffic safety, included under I B.]
    4. Parking.
  - B. Urban transit system.
  - C. Pedestrian.
  - D. Water transport.
  - E. Air transport.
  - F. Location programs.
  - G. Communications substitutes for transportation.
  - H. Unassignable research and planning, transportation-communication-location.
  - I. Unassignable support, transportation-communication-location.
- VIII. General administration and support:<sup>5</sup>
- A. General government management.
  - B. Financial:
    1. Expenditures.
    2. Revenues.
    3. General.

<sup>4</sup> The inclusion of the terms "communication" and "location" are to emphasize the need to consider the broader spatial relationships involved. Thus, the relative location of homes, jobs, and businesses, etc., will have a significant effect upon the transportation and communication systems needed. Such other categories as IV B 5 (land use regulation) will interact with this program area.

<sup>5</sup> Transportation activities predominantly concerned with one of the preceding program packages should be assigned to them. For example, park road activities would be included under VI A. Note: Transportation-communication-location is not really an end in itself but rather supports other objectives such as employment (commuter service), economic progress, recreation, etc. However, because of its importance in most communities and the need to consider transportation systems in an integrated manner, identification as a separate major program area seems justified. When evaluating alternatives, the fundamental purposes of transportation should be recognized.

<sup>6</sup> This category contains activities that cannot reasonably be assigned to the other major program areas. For example, the following should be assigned, to the extent possible, against the specific programs generating the need for these expenses: Research and planning, employment benefit expenses, maintenance of buildings and equipment, data processing costs, special purpose engineering, and associated capital costs.

## VIII. General administration and support—Continued

- C. Unassignable purchasing and property management.
- D. Personnel services for the government.
- E. Unassignable EDP.
- F. Legislative.
- G. Legal.
- H. Elections.
- I. Other.

**END**