

THE DEVELOPMENT AND USE OF SOCIAL ACCOUNTS AS
A MEANS OF EVALUATING THE EFFECTIVENESS OF
COMMUNITY SERVICES
- A Case Study of the Vancouver Police Department -

by

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ABSTRACT

The scope for physical planning and development in many older, more established cities in North America is rapidly declining. In these cities, the role of the planner is shifting to meet a new challenge, the improvement of the quality of life. One of the principal methods of improving the quality of life in cities has been the provision of community services. This is resulting in a new role for the planner, that of monitoring and evaluating the efficiency and effectiveness of community services.

The police service was taken as a vehicle for developing a method of evaluation for any community service in any city. The thesis identifies major police functions and assigns them to the police programs they are capable of supporting. A set of performance accounts is developed for each program consisting of input, output and impact accounts. The Input Account describes the resources allocated to each police program. The Output Account describes the productivity of these resources in carrying out the police functions. And, the Impact Account describes the effectiveness of these functions in bringing about the desired improvement in the quality of life. Moreover, the quantitative and qualitative indicators of input, output and impact contained in the accounts are related to five central questions of program evaluation.

Furthermore, the indicators of input, output and impact contained in the accounts are the data from which a mathematical model of the police organization, the community and the interrelationship between them can be constructed. This model will have the predictive power of anticipating the outcome of proposed

allocative decisions in advance of their actual implementation. Thus, the thesis develops a method not only for evaluating the past performance of previous allocative decisions but the anticipated performance of proposed allocative decisions as well.

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PREFACE

The Problem

Today planners face a major challenge. How can they accurately predict the multi-dimensional impact of plans, programs and policies upon urban residents and their quality of living? For example, a planner working for a municipal government may be called upon to draw up a set of recommendations for the reorganization of police services in a particular district of the city. One of his initial problems would be to determine the present efficiency and effectiveness of existing services and to estimate what consequences would likely result if they were to be significantly altered or extended. Planners working at other levels of government and concerned with other kinds of community services are faced with similar problems.

Community planners, government officials and politicians recognized the need for an improved information system to satisfy these requirements. During the last decade, they have made a concerted effort to develop more accurate and comprehensive statistics which could facilitate the comparison of actual performance against previously stated goals and objectives. While their individual efforts were extremely diverse in scope and method, they had a common purpose. Their primary aim was to provide decision makers with a broad array of social, economic, physical and psychological indicators that would allow them to monitor and, if possible, predict the outcome of plans, programs and policies upon the quality of life. Their efforts still continue.

The Social Indicator Movement

Most societies have developed some type of information system as an aid to formulating public policy and making decisions. Specific interest in

generating multi-dimensional indicators as the essential ingredient of such a system, however, is relatively new. This recent momentum to develop more comprehensive measures of societal progress has been labelled "the social indicator movement" (Brooks, 1972).

The term "social indicator" was coined by a team of social scientists headed by Raymond Bauer to be analogous to the term "economic indicator". The word "social", however, is actually a misnomer. Social indicators are much more comprehensive. They encompass not merely the social dimension of life, but the economic, the physical, and the psychological dimensions as well.

Since the initial benchmark publication of Bauer's Social Indicators in 1966, and Gross' Social Intelligence for America's Future in 1969, numerous writers have contributed to the vast and growing body of literature which addresses the problems of societal monitoring and, ultimately, societal control.

It is not surprising, therefore, that the claims of the social indicator movement are equally numerous. These include improving the descriptive reporting of social problems, developing a balance sheet for social agencies, analysing social trends and social change, assessing societal performance, anticipating alternative social futures, setting societal goals and priorities, acquiring socio-scientific knowledge for prediction and control, and the continuous monitoring of the quality of life (Brooks, 1972). More recently, however, these various themes have coalesced into four areas of specialization: (1) descriptive reporting, (2) program evaluation, (3) planned development and (4) societal control (Brooks, 1972).

The Focus of this Study

This study is concerned with the second and fourth areas of specialization within the social indicator movement: program evaluation and societal control.

The claim that social indicators are an aid to program evaluation is based upon an assumption. The assumption is that social indicators can provide the necessary data base for establishing a social accounting system, capable of measuring social costs and benefits, in much the same way as traditional financial accounting systems measure the expenditures and income of a corporation. If this assumption is realistic, social accounts could enable public agencies to record not only the cost of providing community services, but the benefits generated by consumption of these services as well.

The claim that social indicators are a tool of societal control is based upon a further assumption. This assumption is that data contained in social accounts will provide the raw materials from which mathematical models of a social agency and its interaction with the community can be constructed. Such models will enable planners to predict the optimal allocation of the agency's resources, that is, the distribution of resources among an agency's functions that will enable it to achieve maximization of its goals and objectives.

While these claims have received considerable attention in the literature, there has been no general move afoot to demonstrate the feasibility of these claims in an institutional setting. Moreover, little work has been done to develop a methodology which would make such a demonstration possible.

In short, for over a decade now, the discussion of social indicators has been restricted to abstract philosophical and conceptual issues.

There have been only incomplete and isolated attempts to define concepts in analytical terms and to tackle the practical problems inherent in their application.

The Community Service Chosen for Study

There are several important reasons why the Vancouver Police Department was chosen as the subject of study. First, if the goals of public safety and public health are taken to be the foundation of our social institutions, then the Police Department as the agency of public safety in the community is well qualified as a subject of evaluation and control. Furthermore, as the largest department in the city administration, in terms of manpower and financial budget, the Police Department is the major community service provided by the municipal government. Moreover, because of the serious and lasting consequences to persons and property which result from ineffective police operations, the actions of police are continuously under close scrutiny by the public. And, lastly, the Department is currently assessing the inadequacies of its present information system with a view to improving not only the collection and distribution of strategic information for carrying out police functions in the community, but also the identification of social indicators with which to assess and, ultimately, to predict the effectiveness of these functions in achieving organizational goals and objectives.

Benefits Likely to Accrue from the Study

The Vancouver Police Department is probably one of the most competent police organizations in Canada. Moreover, senior and middle management at

the Department are sufficiently enlightened and progressive in their thinking to recognize the need for and potential benefits to be derived from the development of social indicators as a tool for evaluation and control.

However, prior to initiation of this study, little or no groundwork had been done towards the development of indicators, the definition of key concepts essential for program evaluation, the conceptualization of a social accounting framework, or the development of scales, standards and objectives against which these indicators could be compared. In fact, a recent assessment of the existing information system at the Department concluded that even in terms of collecting and distributing strategic information necessary to operate in the field, there is no systematic organization of information at all. And, in particular, there is little or no information being developed for the evaluation of police programs or the formulation of police policy.

Furthermore, this assessment also revealed that little work has been done to articulate the mathematical models which could ultimately provide valuable guidance to planners attempting to maximize organizational goals and objectives.

Development of a set of social accounts for a public institution such as the Vancouver Police Department will have several possible benefits. It will provide considerable insight into whether the claims of social indicators, namely program evaluation and societal control, should be taken seriously or, alternatively, abandoned. It will pinpoint areas of further research where theoretical knowledge does not meet the rigors of applied social science. And, finally, it will produce, even if only partially successful, a useful framework for the evaluation of police services and a practical benchmark from which future refinement can begin.

The Relationship of the Study to Community Planning

A frequent question in any work of this kind is whether it falls within the jurisdiction of a particular field of study, in this case, community planning. Consequently, it is necessary to relate the study of program evaluation and societal control in the context of the Vancouver Police Department to the field of community planning.

In conceptual terms, a community can be perceived in several inter-related but nevertheless distinct dimensions. While the precise name and scope of each dimension will vary according to an individual's own experience, a representative paradigm of the community is one developed by Harland (1971). He perceives the community in four dimensions: social, economic, physical and psychological. In a similar manner, the subject matter of community planning may also be broken down into identical components for purpose of analysis. One can therefore speak of social planning, economic planning, physical planning, or (with slight modification of Harland's terminology) political planning. In the context of this perspective, the study of program evaluation and societal control in relation to the Vancouver Police Department can be seen as falling within the realm of social planning.

As a discipline, social planning appears to have evolved from a synthesis between physical planning and social work (Mayer, 1972). During the last decade, both professions attempted to define their own particular strategies of intervention. Out of this continuing dialogue, three accepted definitions of social planning emerged.

The first definition views social planning as being concerned with the development and delivery of social services to the community (Mayer, 1972).

The second definition equates social planning with the notion of comprehensiveness. In turn, this idea usually implies the integration of all public programs which are designed to improve living conditions in the community. Such improvement is often linked to some over-riding consideration such as social welfare (Mayer, 1972). And, finally, the third definition sees social planning as being the advocacy of the interest of disadvantaged minorities (Mayer, 1972).

If these are the legitimate and valid areas of concern of social planning, as currently envisaged today, then program evaluation and societal control in relation to the Vancouver Police Department fall within the jurisdiction of the first and second definitions. In the first instance, police programs are obviously a social service. And, in the second instance, the purpose of program evaluation and societal control is to monitor and, ultimately, to predict the effect of police programs upon the social welfare of the community.

Overview of the Study

The study is presented in eight chapters. Chapter 1 is the introduction. It defines the terms social indicators, social accounting, social accounting systems, program evaluation, societal control and resource allocation. It also explains the relationship between program evaluation and resource allocation for the social agency and, furthermore, suggests how data contained in social accounts can be used to construct mathematical models which may ultimately predict the outcome of alternative allocative decisions.

Chapter 2 contains a detailed description of the methodology employed in the study. It also defines the three types of accounts - input, output

and impact - necessary for evaluating police programs and predicting the outcome of alternative allocative decisions. Furthermore, it provides definitions of the key concepts which are necessary to identify and interpret the social indicators contained in the accounts.

Chapter 3 describes the three major programs of the Vancouver Police Department: crime prevention, public safety and apprehension and recovery programs. It also formulates the goals of each program and identifies those police functions through which each set of goals may be attained.

Chapter 4 identifies the entries and presents the format for the input account of police programs. A detailed illustration of the use and interpretation of the input account is postponed, however, until the following three chapters which provide a consolidated treatment of all three accounts - input, output and impact - in the context of each program. This is a logical organization of the material, since the input, output and impact accounts for each program must be considered together.

Chapters 5, 6 and 7 deal with the development of output and impact accounts for the crime prevention, public safety and apprehension and recovery programs, respectively, of the Vancouver Police Department. For each program, the entries and format of the output and impact accounts are described, a practical illustration of the use and interpretation of the consolidated accounts is given, and areas of future refinement and research are identified.

Finally, Chapter 8 provides a general summary of the study, its major conclusions and the direction future research should take.

CHAPTER 1

SOCIAL INDICATORS AS A TOOL FOR PROGRAM EVALUATION

1.1 Social Indicators Defined

Like most jargon used in the social sciences, the term "social indicators" has been subjected to various interpretations and as a result has become ambiguous. For this reason, it is necessary to set forth the specific interpretation of the term as used in this thesis.

The word "social" is taken as meaning "of or relating to the welfare of human beings as members of society" (Webster's New Collegiate Dictionary, 1973). The word "indicator", on the other hand, is taken as meaning "a sign, symptom or index of a serious condition" (Webster's New Collegiate Dictionary, 1973). Thus, for purposes of this thesis, social indicators are interpreted as being signs, symptoms or indices of the welfare of human beings as members of society.

It is clear from this definition of social indicators that human welfare is the focus of attention. Consequently, when approaching the subject of social indicators as a tool for program evaluation of the Vancouver Police Department, two important corollaries must be recognized. These are the notions of comprehensiveness and of relativity.

First, social indicators are comprehensive. This means that in order to provide an accurate and balanced picture of the human condition, social

indicators must be multi-dimensional. In particular, they must not be restricted to the economic dimension of life, but must also encompass the social, the physical and the psychological dimensions as well. Let us take as an example, the impact of a crime upon the victim. Three distinct dimensions of the victim's welfare may have been affected. These are the physical, the economic and the psychological. The physical in the sense that the victim may have suffered physical injury. The economic in the sense that the victim may have experienced loss of or damage to his personal property. And, psychological in the sense that the victim may have undergone an unpleasant to horrifying experience during the progress of the crime which may have a lasting effect upon his psychological well-being. Admittedly, once having isolated the individual dimensions of impact upon the victim, the analyst is in a better position to translate the total effect of the crime into purely economic terms. But the philosophy of the social indicator movement stresses that this temptation should be avoided (Bauer, 1966 and Gross, 1969).

Second, social indicators are relative. This means that in order for social indicators to have a useful interpretation they must be related to a scale, a standard, an objective, or some other base of comparison. For example, an index must be related to a scale, a measure must be related to a standard, and a statement of where we are must be related to where we want to go.

As an example, let us take the case of the length of time police require to respond to a citizen's request for assistance. In terms of police jargon, this length of time is referred to as "response time". Assuming the technical problem of obtaining this information has been overcome, let us suppose that

average response time for priority one calls (types of call, such as "robbery in progress", are grouped according to their degree of seriousness into priorities one, two and three) was found to be 7.5 minutes. If one has no standard against which to compare this indicator, it ceases to have any useful significance for program evaluation. An indicator, such as response time, must be compared to some notion of what is desirable or expected for it to have a useful role in assessing police performance. If, for instance, one has decided (on the basis of some feasible and desirable criteria) that average response time for priority one calls should be 5.0 minutes, then, quite clearly, the performance indicator has immediate implications. The acceptable standard is not being met. And, remedial action must be taken in order to improve average response time.

1.2 From Social Indicators to Social Accounting Systems

In this thesis, social accounts are merely defined as being an orderly arrangement or logical organization of social indicators in terms of some conceptual or schematic framework. The purpose of the arrangement or organization is simply to promote and facilitate the logical and useful interpretation of indicators as an aid to program evaluation.

The notion of social accounting systems is introduced in order to place the scope of the study in the broader perspective of the Criminal Justice System and society as a whole. In terms of social systems analysis, the Vancouver Police Department is the Enforcement Subsystem of the Criminal Justice System. The other two components of the Criminal Justice System, which are beyond the scope of this study, are the Court and Corrections Subsystems. Although, the Enforcement and Court Subsystems do interface in our

discussion of the police apprehension and recovery program in Chapter 7.

1.3 Social Accounting as a Means of Evaluation and Prediction

The underlying purpose of the study is not only the development of social accounts for the Police Department, but also the use of social accounts to monitor and, ultimately, to predict the effectiveness of allocative decisions. In this role, social accounts are often referred to as performance accounts.

Whether one is monitoring the effectiveness of past allocative decisions, or predicting the effectiveness of proposed allocative decisions, the central questions of program evaluation remain the same. The difference lies not in the process, but the manner in which the values in the accounts are developed. In the case of evaluating past allocative decisions, the values in the accounts are obtained from an information system. In the case of evaluating proposed allocative decisions, the values in the accounts are obtained from a mathematical model based on past values displayed in the accounts. Apart from this difference, and in no way should one discount the significance of this difference, the process of evaluation remains the same. In short, the questions are the same, the concepts are the same. But their use and interpretation are different.

1.4 The Process of Program Evaluation

This study must do more than merely identify indicators of police performance. It must also construct a social accounting framework that will

facilitate program evaluation, define the central questions of program evaluation, develop the scales, standards and objectives against which these indicators can be compared, interpret the indicators so as to gain useful insights into the operation of the police organization, and finally, suggest what appropriate remedial action should be taken to improve performance. Therefore, this study attempts a far more ambitious task than merely identifying an array of indicators which can, in some way, shape or form, be related to the Criminal Justice System.

One of the early tasks of this study, as indicated above, is to define the central questions of program evaluation. For, as was mentioned in a previous discussion, regardless of whether one is evaluating the effectiveness of former allocative decisions or predicting the effectiveness of proposed allocative decisions, the questions of program evaluation remain the same. But before these central questions can be defined, it is necessary to understand both the inter-relationship between a program and the functions through which it can obtain its goals, and between the three types of accounts - input, output and impact accounts - necessary for program evaluation.

After the police functions have been identified, they are grouped together according to the goals which they can support. Together, the set of functions which support a common goal are defined to be a program. (For a more complete discussion of this process, the reader is referred to Chapter 3, Section 3.5, pages 58 to 61.)

The relationship between the input, output and impact accounts is also critical to an understanding of the central questions of program evaluation. Input refers to the resources of the organization which are allocated to a particular function. These resources may be manpower, equipment or some other

specific commodity. Output, on the other hand, refers to the physical or intellectual activities which comprise an individual function. A function consists of one or more activities which frequently occur in a logical sequence or natural order. These activities are the output of the function. Finally, impact refers to the effectiveness of the functions supporting a particular program in achieving the goals of that program.

In brief, the central questions of program evaluation can be defined in terms of the resources allocated to functions supporting the program (information to be contained within the input account), the productivity of those resources in carrying out the functions (the information to be contained within the output account), and the effectiveness of these functions in achieving the goals of the program (the information to be contained within the impact account).

There appear to be five central questions pertinent to program evaluation. These are listed below in the order in which they are usually asked:

1. Is the program achieving its goals, and if so, to what degree?
2. What is the program's impact efficiency, that is, the relationship between resources allocated to the functions supporting the program and the program's effectiveness?
3. Are the functions supporting the program attaining their operating objectives, and if so, to what extent?
4. What is the output efficiency of each function supporting the program, that is, what is the relationship between the resources allocated to each function and the productivity of that function?
and
5. What is the effectiveness of each function supporting the program, that is, what is the relationship between the productivity of each

function and the contribution of that function towards the goals of the program?

In terms of a program's input, output and impact, the five central questions of program evaluation can be readily answered. The degree to which a program is achieving its goals (desirable impact) is determined by comparing actual impact against desirable impact. A program's impact efficiency, the relationship between the resources allocated to the program and the degree to which the program is achieving its goals, is determined by comparing input to actual impact. The extent to which a function is attaining its operating objectives (desirable output) is determined by comparing actual output against desirable output. A function's output efficiency, the relationship between the resources allocated to the function and the productivity of those resources, is determined by comparing input with actual output. And, finally, a function's effectiveness, the relationship between the productivity of that function and the contribution it makes towards achieving program goals, is determined by comparing actual output with actual impact.

In order to illustrate the practical implications of these questions, let us examine the public education function of the crime prevention program. The goal of this program, as its name implies, is the prevention of crime. The public education function may be considered as one of several alternative strategies which can be employed to achieve this goal. As a specific case, let us take the project of distributing crime prevention pamphlets to West End Vancouver residents on the ways and means of discouraging automobile thefts.

The total quantity of resources applied to this project was, in terms of dollars and cents, \$15,000. The operating objective of the project, that

is, the desired output, was to distribute these pamphlets to 30,000 residents of the West End Vancouver area. The goal of the project, that is, the desired impact, was to reduce the incidence of automobile theft in the area from 150 to 100, over the six month period following termination of the project.

The results, in terms of the five central questions of program evaluation were as follows. The goal of the project was exceeded. The reduction in automobile thefts in the area over the six month period after completion of the project declined from 150 to 75, a drop of 50 per cent. The project's impact efficiency, that is, the ratio of input to impact, was \$200.00 per automobile not stolen, or \$15,000.00 divided by 75. Furthermore, the operating objective, that is, desirable output, was fully met. Pamphlets were distributed to at least 30,000 residents of the West End. The project's output efficiency, that is, the ratio of input to output, was \$0.50 per pamphlet distributed to residents, or \$15,000.00 divided by 30,000. And, finally, the project's effectiveness, that is, the ratio of output to impact, was 400 pamphlets delivered per automobile not stolen, or 30,000 divided by 75.

Traditionally, social indicators have been thought of as goal-related, or measures of impact (Bauer, 1966; Gross, 1967 and Harland, 1971). However, it is clear from the foregoing discussion that the five central questions of program evaluation demand the development of not only measures of impact, but also measures of input and output as well. In fact, only the first question of program evaluation can be answered with measures of impact alone.

1.5 The Relationship between Program Evaluation and the Allocative Decision

Ultimately, it must be recognized that even program evaluation is merely a means to an end. And, in the context of this study, that end is the optimum

allocation of resources in such a way as to maximize the benefits accruing to society from the Vancouver Police Department. This leads us to a discussion of the problem of resource allocation.

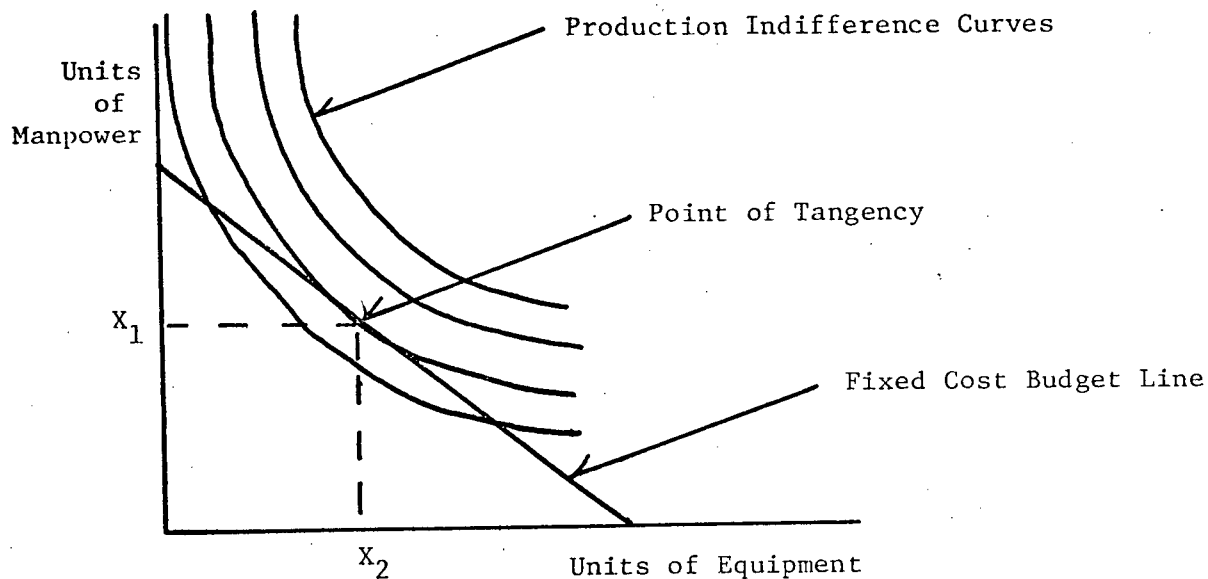
The final step in the whole process of program evaluation is the allocation or re-allocation of resources in such a manner as to incur minimum costs while maintaining a given level of performance, or to operate at peak performance given a fixed level of expenditure. This allocation decision exists at three different levels within the Vancouver Police Department: (1) among alternative types or combinations of resources; (2) among alternative police functions; and (3) among alternative police programs.

In order to illustrate this point, let us take an example of the allocative decision at each level.

Let us first consider the example of the allocative decision between the different types of resources which can be applied to a particular police function. This problem is analogous to that faced by the firm in traditional micro-economic analysis. Figure 1.1 on the following page illustrates this problem in geometric form, an adaptation of a treatment of the problem by Baumol (1965).

FIGURE 1.1

**Optimum Allocation of Operating Budget
between Manpower and Equipment
to Maximize Output of the Citizen
Complaint Function**



Source: Baumol, 1965, p. 258, Figure 3 (a)

The fixed cost budget line defines those combinations of manpower and equipment which can be purchased for a fixed cost. The production indifference curves represent those combinations of manpower and equipment which produce a constant level of output. These levels of output increase upwards and to the right. The point of tangency between the highest order production indifference curve and the fixed cost budget line determines that combination of manpower and equipment which will produce the maximum output for a given budget.

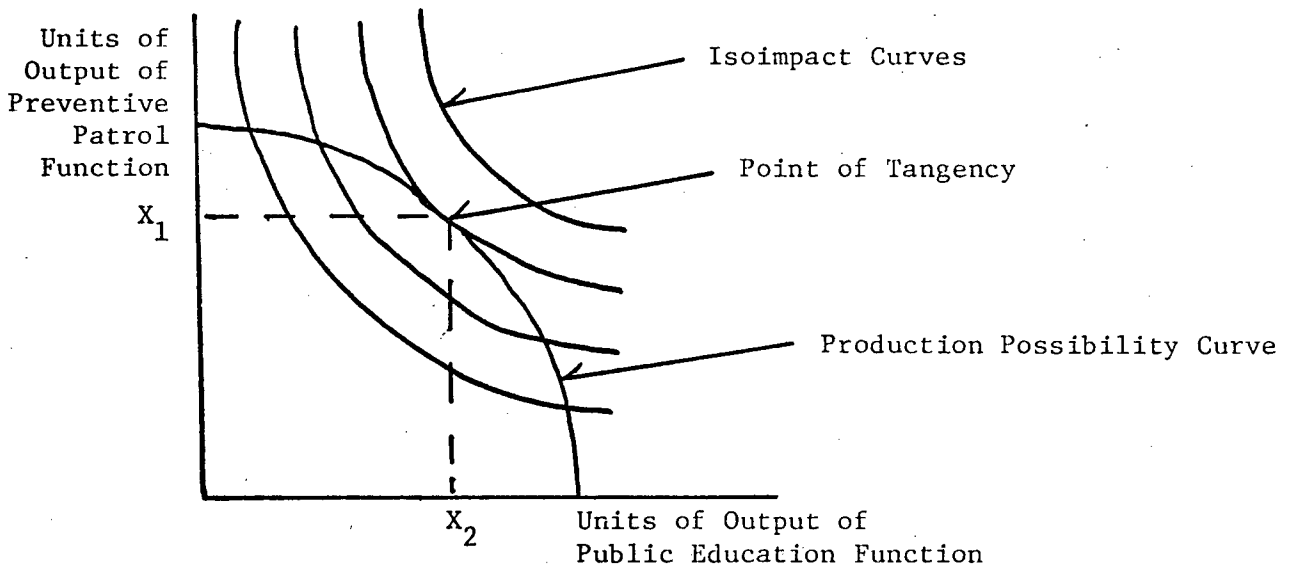
Similar illustrations can be given to determining the optimum allocation of resources at the two other levels of operation mentioned earlier, that is, the allocation of resources among the various functions used within the context of a particular police program, and the allocation of resources among the

various police programs used within the context of the enforcement system.

Let us now consider the allocative decision between the preventive patrol function and the public education function of the Crime Prevention Program. The question is, given that the total annual budget for the crime prevention program during the forthcoming year is \$100,000, what is the optimum allocation of funds between the preventive patrol and public education functions which will yield the maximum impact for the Crime Prevention Program. Figure 1.2 below illustrates this problem geometrically. It is an adaptation of a treatment of a similar problem by Bator (1957).

FIGURE 1.2

Optimum Allocation of Resources
between the Preventive Patrol Function
and the Public Education Function to Maximize Impact of
the Crime Prevention Program



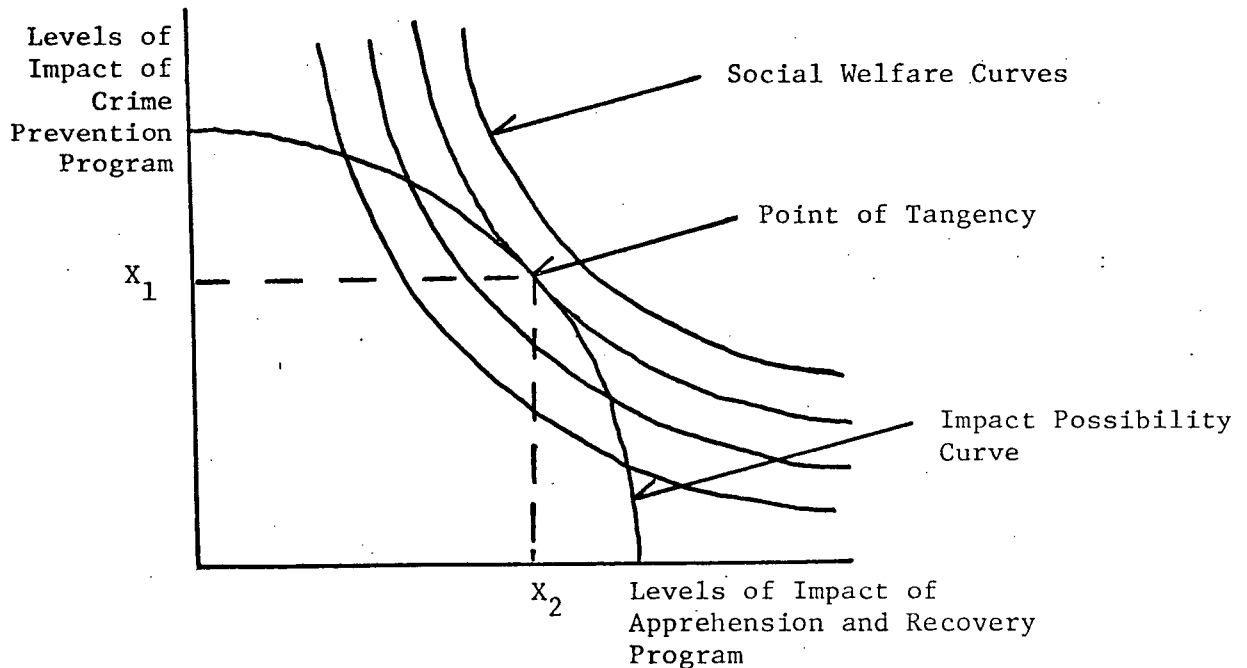
Source: Bator, 1957

The production possibility curve consists of a locus of points determined by the maximum feasible combinations of output of preventive patrol units and public education units. The isoimpact curves consist of the different, not necessarily feasible (only those combinations which lie within or upon the production possibility curve are feasible), combinations of preventive patrol output and public education output which will theoretically yield the same degree of impact for the Crime Prevention Program. These isoimpact curves represent increasing degrees of impact as they extend upward and to the right. The point of tangency between the production possibility curve and the highest order isoimpact curve determines the optimum allocation of police resources between the two functions to maximize the impact of the Crime Prevention Program. In terms of the Figure, X_1 units of output of the preventive patrol function, and X_2 units of output of the public education function should be produced in order to maximize the impact of the Crime Prevention Program. Since the cost of each unit of each function is known, the allocation of funds between the two functions is easily determined.

Finally, let us consider the example of the allocative decision among two police programs, the Apprehension and Recovery Program and the Crime Prevention Program. Figure 1.3 on the following page illustrates geometrically the nature of this decision.

FIGURE 1.3

Optimum Allocation of Resources
between the Crime Prevention and
Apprehension and Recovery Programs to
Maximize Social Welfare Generated by Police Operations



Source: Bator, 1957

The impact possibility curve represents the different feasible combinations of maximum impact of the crime prevention and apprehension and recovery programs. The social welfare curves represent the different levels of social welfare which can be attained through different combinations of crime prevention and criminal apprehension levels of impact. The point of tangency between the impact possibility curve and the highest order social welfare curve determines the impact levels of each program which will yield the maximum welfare to society. This is a slight modification of a treatment of this problem by Bator (1957).

It is quite conceivable that this stage of refinement and sophistication in program evaluation and resource allocation will not be attained for many

years to come. It is perhaps the role of social indicators in this evolutionary science of program evaluation to provide public policy and decision-makers with greater insights into the true nature and extent of the social costs and benefits upon which this type of analysis is based.

Admittedly, the concepts presented here are at a high level of abstraction and are mathematically complex, particularly if one deals beyond the relatively simple two-by-two case. Nevertheless, it is important to understand the ultimate goals of the evaluation process in terms of the broad concepts which this treatment contains. And, furthermore, it is important to recognize that the social indicator movement is dedicated to developing the more accurate and comprehensive estimates of costs and benefits which are necessary to operationalize these concepts.

1.6 Concluding Remarks

This chapter has provided the background information necessary to understand the chapters which follow.

Social indicators have been defined as the entries contained in social accounts. Social accounts can be broken down into three separate accounts which have been called the input, output and impact accounts. The input account provides information about the resources allocated to programs. The output account provides information about the productivity of these resources. And, the impact account provides information about the degree to which programs are achieving their goals.

The development of social accounts for community service organizations is an important step towards monitoring and predicting the effectiveness of allocative decisions. The process of determining the effectiveness of allocative decisions is called program evaluation. This process attempts to answer five central questions which remain the same whether one evaluates the actual effect of a past decision or the predicted effect of a proposed allocative decision. These five central questions are inextricably related to the information contained in the input, output and impact accounts of a program. Answering the five central questions of program evaluation provides insights which lead to an improved allocation of resources which is the ultimate purpose of the exercise.

The next chapter provides a detailed description and explanation of the methodology employed in the study.

CHAPTER 2

METHODOLOGY FOR PROGRAM EVALUATION

2.1 Introduction

The analytical tools which were used to develop social accounts for the Vancouver Police Department were drawn from several key areas in the literature, such as management science, planning theory, program budgeting, social systems analysis, and social indicator theory and research.

Several distinct analytical phases were involved in the development of social accounts for police. These were:

1. the identification of police programs and the formulation of program goals.
2. the identification of police functions and their assignment to particular police programs
3. the development of social accounting concepts and the analysis of functions for indicators of input, output and impact
4. the definition of the five central questions of program evaluation in terms of indicators of input, output and impact and
5. the interpretation of social accounts for each police program and the identification of areas in need of further refinement

2.2 Methodology: Phase 1

The first phase of the study consisted of identifying the programs of the Vancouver Police Department and formulating program goals.

The overriding mission of the Vancouver Police Department was taken to be public safety. Under the banner of public safety, the Department operated three programs: (1) the Crime Prevention Program, (2) the Public Safety Program, and (3) the Apprehension and Recovery Program.

For each of these programs, a series of goals were formulated, partly on the basis of discussions with senior officers of the Department, and partly on the basis of a perusal of current literature on the subject.

For example, the goals of the public safety program were formulated to be: (1) to protect persons from injury, (2) to aid persons in need of assistance, (3) to secure property against theft, (4) to protect property from damage, and (5) to maintain public order.

The findings of this phase of the study are contained in Chapter 3.

2.3 Methodology: Phase 2

The second phase of the study involved the identification of police functions and their assignment to particular police programs.

The first step in phase 2 of the methodology was to determine, from a

purely conceptual point of view, the structure of programs at the Department. It was necessary, in other words, to develop some pre-conceived notion of what was being looked for. Consequently, the hypothetical program structure, presented below in Table 2.1, was postulated to exist at the Department.

TABLE 2.1

Program Structure
at the Vancouver Police Department

I. Programs

A. Functions

1. Activities

Thus, each program at the Department was seen to contain various police functions which, in some cases, might be thought of as alternative strategies for achieving the goals of the program. And, in turn, each police function was seen to be comprised of one or more activities which, in some cases, might occur in a logical sequence or natural order.

For example, the Crime Prevention Program was ultimately seen to contain the public education, the youth counselling, the community relations, the preventive patrol and the enforcement functions. And, these functions were such that they could be legitimately considered as alternative strategies to achieve the goal of crime prevention. In addition, the enforcement function, for example, was seen to be comprised of several activities which occur in a natural order: (1) observation of an offense, (2) apprehension of the offender, (3) investigation of the offense, and (4) writing a formal report on the incident.

The second step in phase 2 of the methodology was to survey all activities of the Vancouver Police Department and to identify the police functions which these activities represented.

Ideally, each function was to be defined in such a way that it would be mutually exclusive of all other functions when considered independently, and mutually exhaustive with all other functions when considered in combination. These conditions were imposed so that if each function were to become an entry in a social account for police, the traditional financial accounting criteria of mutually exclusive and exhaustive entries would be upheld.

The police functions identified as a result of the study are listed below:

1. Citizen Complaint
2. Enforcement
3. Investigation
4. Preventive Patrol
5. Crowd Control
6. Escort Duty
7. Civil Disaster Co-ordination
8. Youth Counselling
9. Public Education
10. Community Policing

A detailed description of each function may be found in Chapter 3, Section 3.4, pages 53 to 58.

2.4 Methodology: Phase 3

This phase of the methodology was concerned with the development of social accounting concepts and the analysis of functions for indicators of input, output and impact.

Thus far, the programs of the Department had been identified and program goals had been formulated. In addition, the functions of the Department had also been identified and assigned to those programs whose goals they could support. It was recognized at this point, however, that the programs were merely a framework within which the functions were grouped. Therefore, only the functions themselves were the means through which program goals could be attained. This implied that the functions, not the programs, must become the real focus of attention during this phase of the study.

Several definitions of functions emerged during the study. Each reveals a different aspect of the concept. First, functions were defined to consist of a combination of one or more physical or mental activities which might, depending upon the particular case involved, occur in a logical sequence. Second, functions were defined as "activity streams" to connote a series of related activities, occurring in some natural order, which could be identified as relating to a particular function. And, lastly, functions were defined as a process which transformed inputs into outputs. It was from this final definition that the idea of input and output accounts was crystalized.

The idea that functions possess two identifiable properties, called inputs and outputs, is hardly new. In fact, these two properties of any productive process are at the very core of traditional micro-economic

analysis (Henderson and Quandt, 1958).

Inputs are defined as being any good or service which contributes to the production of any output (Henderson and Quandt, 1958). Alternatively, they may be defined as the human and material resources allocated to the performance of a particular function. For example, the two major resources, or inputs, involved in the production of the citizen complaint function, wherein police respond to citizens' requests for assistance, are manpower and vehicles. Considerable controversy still exists about the relative efficiency and effectiveness of the one-man versus the two-man patrol car (Gourley and Bristow, 1961). It is only by incorporating indicators of input into performance accounts for police that such controversy can ever finally be resolved. Furthermore, two of the five central questions of program evaluation require measures of input in order to be resolved.

In the context of program evaluation and its ultimate conclusion, resource allocation, inputs are the scarce resources over which the police agency has direct control. It is only by altering the quantity and quality of resources or the resource "mix" (combination of inputs) allocated to a particular function, that a public agency can have any control whatsoever over the production of its output and the generation of its impact.

The link between inputs and output is the production function (Henderson and Quandt, 1958). The production function defines the technological relationship between the resources allocated to a particular function and the resulting productivity or output. The public agency transforms inputs into output, subject to the physical and human constraints specified in the production function. The agency's production function gives mathematical

expression, at least conceptually, to the relationship between the quantities of inputs employed and the quantity of output produced. While traditional micro-economic production functions only incorporate quantitative measures of output, it is not inconceivable that at some time in the future the production function, particularly that applying to public agencies, may incorporate qualitative measures of output as well. In fact, that is one of the major propositions of this thesis.

When discussing a function's output, one must be careful to make the distinction between real output and output capacity. In the provision of a public service, one has control over the maximum volume of output, or output capacity, which that service can provide. One does not, however, have direct control over the demand for that service, or real output. A simple example will serve to illustrate this important distinction.

Assume that there are 25 one-man patrol units cruising around the city, assigned to the citizen complaint function. From experience, it has been determined that the average clearance time per call is 30 minutes. Clearance time is equal to travel time plus service time, or the length of time between when a patrol unit is assigned to a call, and when he radios the dispatcher at the conclusion of his assignment that he is "all-clear". From this information, it is possible to determine that the capacity of each one-man unit is 16 calls per eight-hour shift. Therefore, the total capacity of the 25 patrol units during that shift will be 400 calls, or 16 calls per unit times 25 patrol units. However, on this particular shift, only 310 calls were made to police requesting assistance. The question now becomes, what is the more legitimate measure of output, capacity or demand? Was output for that shift 400 calls or 310 calls? The assumption made in this thesis is that

output capacity represents potential, as opposed to real output. Regardless of what a function's output capacity may be, no real output is produced unless a demand is placed upon it. A further example may help crystalize this distinction.

The notion of output can be related, particularly in the case of a service industry, to the scientific definition of work. Work is measured in foot-pounds per hour. Let us assume that a man working a well has the capacity of lifting a full bucket of water weighing 10 pounds, through a distance of 20 feet up from the bottom of the well, a maximum of 12 times per hour. The man therefore has the capacity of doing 2400 foot-pounds of work per hour ($10 \times 20 \times 12 = 2400$). However, during a particular hour only 6 people come to the well asking for water. The question now is which is the more legitimate measure of the man's output during that hour? In other words, how much work has the man done during that hour? The answer seems quite clear. In spite of the fact that the man had a capacity of 2400 foot-pounds of work, he actually produced only 1200 foot-pounds of work ($10 \times 20 \times 6 = 1200$).

There are two points to be made here. The first is that there is an important distinction between output capacity and real output. And, this distinction has significant implications for the allocation of resources within the Vancouver Police Department. The second point is that in terms of the traditional micro-economic concepts of demand and supply, for a service industry, real output must be equated with demand, and output capacity must be equated with supply.

Functions have been described as a production process which transforms inputs, by means of a production function, into output. The function therefore

manifests itself in the form of output. Indeed, it is a function's output which makes it distinguishable from other functions, since inputs - manpower and vehicles - are almost identical for many police functions. Focus now shifts however, one step further, to the social welfare function which transforms a function's output into program impact.

Whereas the link between inputs and output was the production function, the link between output and impact is the social welfare function. It defines the mathematical relationship, at least conceptually, between a function's output and the impact generated by that output upon the welfare of human beings which comprise society.

A function's output may generate numerous impacts upon the social environment. And, depending upon one's goals and values, some of these impacts may be perceived as being favorable (reinforcing one's goals and values) and some of them may be perceived as being unfavorable (undermining one's goals and values). Whatever the case, when a function has among its total set of impacts, the goal (desirable impact) of a particular program, it is assumed that the function is one of the possible strategies which can be employed in attaining the goals of that program. In fact, this was the very rationale used to assign police functions to the programs whose goals they could support.

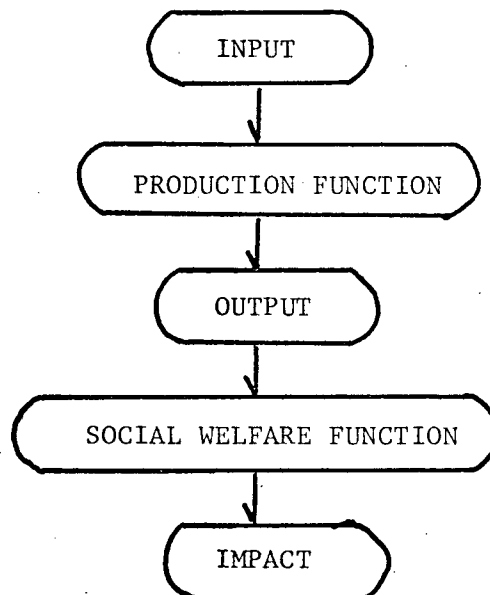
For example, a possible impact of the youth counselling function was the reduction of criminality among young people. Criminality is that presence of mind or mental attitude which enables a person to wilfully commit crime whenever the opportunity arises. Hence, one of the feasible impacts of youth counselling is crime prevention, the goal of the crime prevention program.

Thus, the youth counselling function was assigned to that program. Similarly, one of the possible impacts of the investigation function was seen to be the apprehension of suspects and the recovery of stolen property. Thus, the investigation function was assigned to the apprehension and recovery program. And, so on.

From the foregoing discussion, it is apparent that program goals are statements of the desirable impact of the functions assigned to them. The addition of the notion of impact to those of input and output provides a sense of conceptual completeness to the analytical framework within which each police function was to be studied. This framework is illustrated below in Figure 2.1.

FIGURE 2.1

Analytical Framework for the
Study of Police Functions



Generally, inputs and outputs and impacts have, theoretically at least, two types of entries. The first and probably the more familiar type are quantitative indicators which answer the question, how much? The second are qualitative indicators which answer the question, how good or how well?

In order to touch upon some concrete examples of these indicators, let us consider the citizen complaint function which, as one may recall, is concerned with police response to citizens' requests for assistance.

One of the obvious inputs to the citizen complaint function is manpower. Quantitatively (how much), manpower can be described in a variety of ways, such as the number of policemen, the number of manhours, or the cost of manhours (manhours times hourly wage rate) applied to that function over a specified reporting period. In addition, manpower can be described qualitatively (how good or how well), although such indicators are open to controversy and frequently not accepted by all. One such measure proposed in this thesis is the manpower proficiency index. This indicator of the quality (how good) of manpower is generated by a simple process. First, an inventory is taken of all those personal attributes of policemen held to be of importance in the execution of police duties. Examples of such attributes are rank, number of years experience, first aid training, language skills, special weapons and sharp shooters training, community relations skills, swimming certificate, and so on. Second, every man is rated on a ten point scale for each characteristic. Finally, the ratings for each man are aggregated, according to the relevant unit of analysis, and the resulting sum divided by the number of men, to yield a measure of average proficiency. The proficiency index is this measure of average proficiency. While this index is presently at what must be considered a rudimentary stage of development, it is a revealing example of the kind of

qualitative (how good) indicators of input which may be emerging in the future. A more detailed exposition of this concept will be presented in Chapter 4 which deals specifically with the input account.

Quantitative (how much) and qualitative (how well) indicators of output can also be developed for the citizen complaint function. Call-load, the frequency of requests for police assistance, is a qualitative measure of the real output of this function. Whereas response time, the length of time between when a citizen calls police for assistance and when the police unit arrives at the scene, is a qualitative measure of the output of this function.

It is also possible to develop both quantitative and qualitative measures of the impact of the citizen complaint function. As a component of the public safety program, this function has as its goal the provision of public safety. Its assignment to this program is based upon the assumption that the presence or intervention of police during crimes in progress will tend to reduce or mitigate the impact of crime upon its victims. Consequently, an appropriate indicator of the impact of this function would seem to be one that reflects the degree to which police presence or intervention during crimes in progress affects the seriousness of crime occurring in the city. Such an indicator is developed in this thesis. It is referred to as the public safety margin. While its development is discussed at great length in Chapter 5, a brief description of the concept here may be helpful in understanding what is meant by quantitative and qualitative measures of impact.

The public safety margin is closely related to the frequency and seriousness of crime occurring in the city. The frequency of different types of crimes is already recorded. And, the seriousness of different types of

crime can be measured according to a scheme devised by Wolfgang and Sellin (1964) which incorporates both the nature and extent of victimization and the type and magnitude of property loss associated with each crime. It is therefore assumed that the affect of police presence or intervention during crimes in progress can also be measured in terms of the same scale of seriousness.

Calculation of the public safety margin requires two measures of seriousness for each type of crime. This is to eliminate the natural variance in seriousness which occurs between different types of crime. For example, on the average, robbery will always be more serious than shoplifting, and homicide will always be more serious than common assault.

Let us consider calculation of the public safety margin for the specific crime of robbery. In order to make this calculation it is necessary to develop two separate measures of seriousness. First, calculate the average seriousness of 100 robberies which occurred in the absence of police intervention. Say this was determined to be 8.5 units of seriousness. Second, calculate the average seriousness of 100 robberies which occurred in the presence of police intervention. Say this was determined to be 5.5 units of seriousness. This procedure creates two measures of seriousness. The first relates to the average seriousness of robberies which occur in the absence of police intervention (8.5 units); and the second relates to the average seriousness of robberies which occur in the presence of police intervention (5.5 units). It is postulated in the thesis that the difference between the indices of seriousness is the public safety margin. In this case, the margin is equal to the first index minus the second index, or 8.5 units minus 5.5 units, which equals 3.0 units of seriousness.

It can be concluded from this discussion of Phase 3 of the methodology that a suitable framework for the organization and interpretation of performance indicators for the Vancouver Police Department can and has been developed. This framework consists of input, output and impact accounts for each of the three police programs. It has been further demonstrated that both qualitative and quantitative measures of input, output and impact can and have been developed. The question now becomes how do these accounts become related to the problem of program evaluation and resource allocation.

2.5 Methodology: Phase 4

The role of Phase 4 of the methodology was to define the five central questions of program evaluation in terms of indicators of input, output and impact.

Social indicators are traditionally defined as being numerical measures relating to societal goals and values (Bauer, 1966; Gross, 1967 and Harland, 1971). One might legitimately claim therefore that as defined in this thesis, only indicators of impact are bonafide social indicators. And, indeed, this may be so. The point is, however, that the collection of indicators of impact alone will enable us to answer only one of the five central questions of program evaluation. That question is, of course, is the program attaining its goals, and if so, to what degree? The remaining four questions require indicators of input and output in addition to indicators of impact.

At this point, it is perhaps useful to review the five central questions of program evaluation as outlined previously in Chapter 1. They are:

1. Is the program achieving its goals, and if so, to what degree?
2. What is the program's impact efficiency, that is, the relationship between resources allocated to the functions supporting the program and the program's effectiveness?
3. Are the functions supporting the program attaining their operating objectives, and if so, to what extent?
4. What is the output efficiency of each function supporting the program, that is, what is the relationship between the resources allocated to each function and the productivity of that function?
and
5. What is the effectiveness of each function supporting the program, that is, what is the relationship between the productivity of each function and the contribution of that function towards the goals of the program?

If these, then, are the five central questions of the evaluation process, it becomes evident that not only indicators of impact, but also indicators of input and output are necessary for the process to be complete. In fact, without the supporting framework which has been developed in this thesis, the claim of social indicators as a tool of program evaluation (Brooks, 1972) would be questionable. Furthermore, this discussion reveals that the relationship between indicators of input, output and impact to the five central questions of program evaluation must be clearly and precisely defined.

Figure 2.2 on the following page illustrates this relationship.

FIGURE 2.2

The Relationship between Indicators of Input, Output and Impact and the Five Central Questions of Program Evaluation

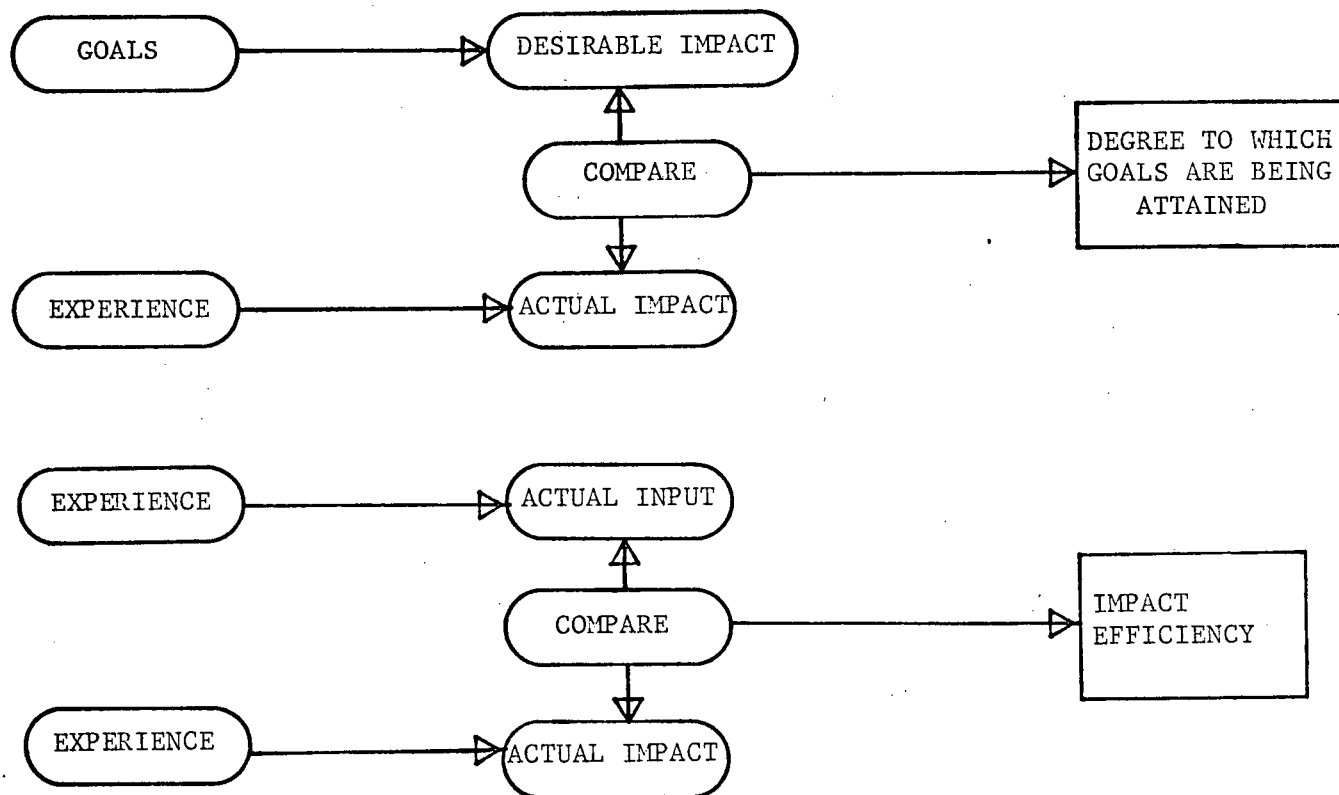
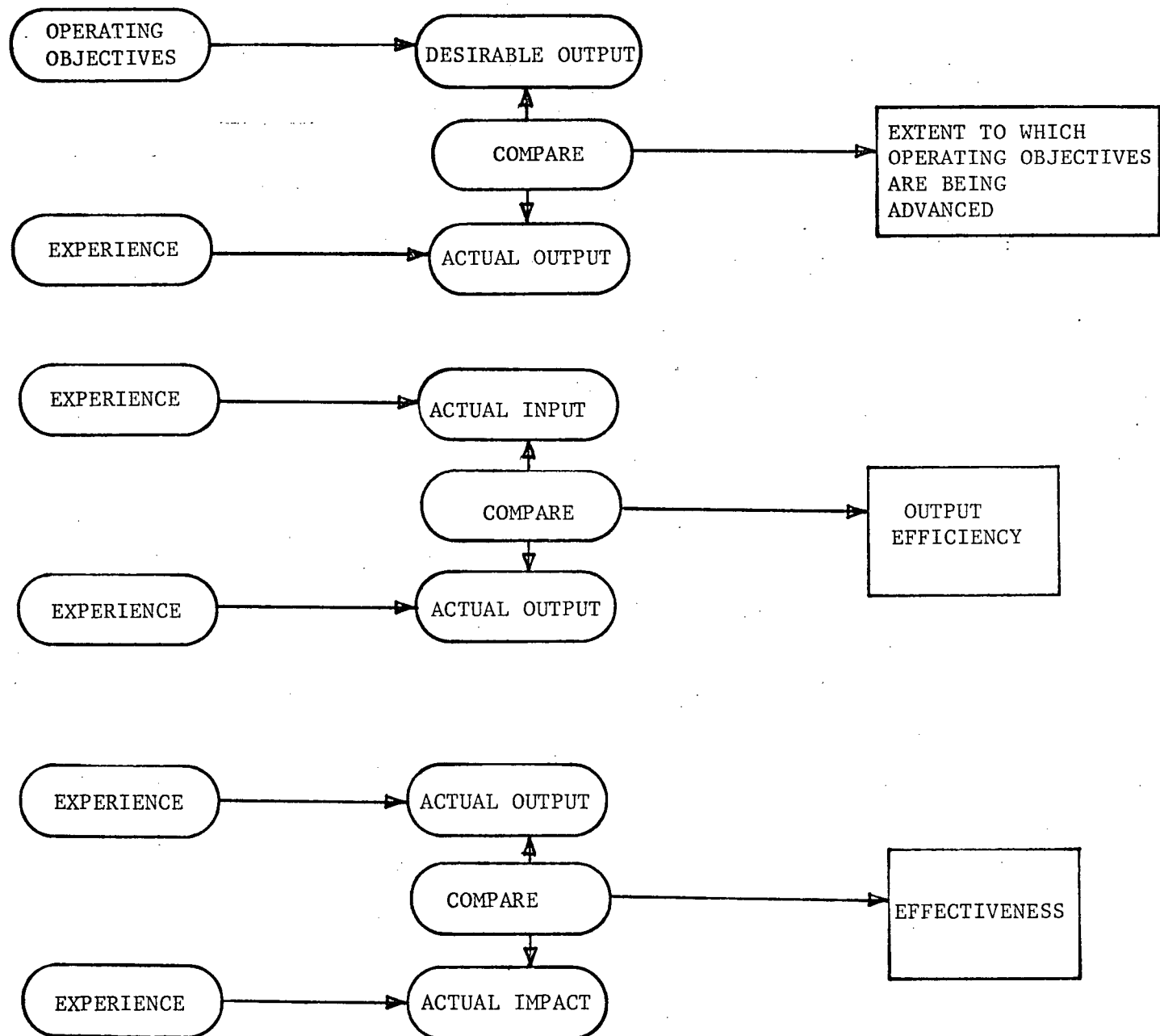


FIGURE 2.2 (Cont'd)

Let us consider the citizen complaint function in the public safety program as an example to illustrate not only how these questions are answered in terms of input, output and impact, but also the usefulness of these questions for the purpose of resource allocation. Ignoring for the moment the process by which operating objectives and program goals are established, let us assume that the following statement of operating objectives and goals has been articulated by senior management of the Department:

1. Goal: public safety margin should be 4.0 units of seriousness and
2. Operating Objective: response time for police should be 5.5 minutes

Indicators of input, output and impact contained in the performance accounts of the public safety program reveal the following values for the first and second quarter of 1974:

TABLE 2.2

Hypothetical Entries for the Input,
Output and Impact Accounts of the
Citizen Complaint Function of the
Public Safety Program

| <u>Period</u> | <u>Input Account</u> | <u>Output Account</u> | <u>Impact Account</u> |
|--------------------------|----------------------|-----------------------|-----------------------|
| January 1 to March 31 | 10 patrol units | 8.0 minutes | 1.5 units |
| April 1 to June 30 | 15 patrol units | 6.0 minutes | 3.0 units |

At the end of the first reporting period, the performance accounts contained the entries in the first line of Table 2.2. The average response time during this period was 8.0 minutes, or 2.5 minutes longer than the

operating objective of 5.5 minutes, established by management. The public safety margin during this same period was 1.5 units of seriousness, or 2.5 units less than the goal of 4.0 units, set by the Department.

As a result of this assessment, senior management decides to allocate an additional 5 patrol units to the citizen complaint function in order to bridge the gap between actual and desirable performance.

After a further three-month period, the performance accounts contain the entries in the second line of Table 2.2. The response time during the second period was 6.0 minutes, or only 0.5 minutes longer than the operating objective of 5.5 minutes. The public safety margin over this same period was 3.0 units of seriousness, or 1.0 units less than the goal of 4.0 units.

Without this knowledge of input, output and impact as illustrated here, it would be impossible to monitor the quality of output of the citizen complaint function (response time), or the impact of this function upon public safety (the public safety margin).

This same example can also serve to illustrate the notions of impact efficiency, output efficiency, and effectiveness which were defined in Figure 2.2.

The entries in the performance accounts also indicate the marginal impact efficiency of the public service function is 1 patrol unit per 0.3 units of seriousness. This means that an increase of 1 patrol unit allocated to the citizen complaint function will result in a 0.3 unit reduction in the public safety margin. It should be recognized at this point that impact

efficiency is a summary measure of both output efficiency and effectiveness. If impact efficiency is nearing zero, it indicates that an increase in patrol strength will not likely have any effect whatsoever upon the public safety margin. Breaking down impact efficiency into output efficiency and effectiveness merely enables the analyst to determine whether the bottleneck is occurring in the production function or the social welfare function. This is important for remedial action. If the bottleneck is in the production function, management may be able to locate the problem and take corrective action. On the other hand, if the bottleneck is in the social welfare function, it is less likely, even if the problem were to be identified, that the public agency will have the jurisdiction or capacity to act. This is simply because the agency has direct control over its internal operation, whereas it does not have such control over the operations of other agencies or the actions of the community at large.

The entries in the performance accounts indicate that the marginal output efficiency of the citizen complaint function is 1 minute of response time per 2.5 patrol units. This means that by increasing the number of patrol units by 2.5 the response time for this function can be reduced by 1 minute, assuming that call-load does not subsequently rise. It is important to monitor the marginal output efficiency of this function in order to determine when this indicator is nearing zero. At this point, allocation of additional number of patrol units to this function will have little or no effect upon response time.

The entries in the performance accounts also indicate the marginal effectiveness of the public service function is 0.75 units of seriousness per minute of response time. This means that a reduction in response time of

1 minute will have the effect of increasing the public safety margin by 0.75 units. It is important to monitor the marginal effectiveness of this function in attaining the goals of the Public Safety Program in order to determine when this indicator is nearing zero. When this occurs, any further reduction in response time will have little or no effect upon the public safety margin.

It may be concluded from this discussion of Phase 4 of the methodology that there is a strict relationship between indicators of input, output and impact and the five central questions of program evaluation. And, that this relationship has been formally defined in this thesis.

2.6 Methodology: Phase 5

The final phase of the methodology is concerned with the interpretation of the performance accounts for each of the three police programs: (1) the Crime Prevention Program, (2) the Public Safety Program, and (3) the Apprehension and Recovery Program. In addition, this phase of the study identifies areas in need of further refinement and research. Phase 5 of the study is reported in detail in Chapters 5,6 and 7.

2.7 Concluding Remarks

It is the actual indicators of input, output and impact which are to be recorded by the new police information system. But what is essential for the ease of program evaluation is the formulation of operating objectives and

program goals in terms of the same parameters as output and impact indicators.

For example, consider the output and impact indicators of the citizen complaint function discussed in Phase 4. Output for this function is measured in terms of call-load capacity and response time. Therefore, the operating objectives for that function should also be expressed in terms of the same parameters, that is, call-load and response time. Similarly, indicators of impact for the Public Safety Program are expressed in terms of the public safety margin, measured in units of seriousness on a scale of 10. Therefore, the goals of this program should also be expressed in terms of the same parameter, that is, the public safety margin. If operating objectives and program goals are expressed in terms of the same parameters as output and impact indicators, then the process of program evaluation is greatly facilitated.

The question may arise as to how operating objectives and program goals are established. It is envisaged that senior management of the Department, in consultation with the Vancouver Police Board, would establish operating objectives and program goals based upon their experience and judgement.

It must be appreciated that the motive behind management by objectives is to improve program performance by clearly expressing operating objectives and program goals in terms of concrete, tangible measures. However, one should also realize that if top priority objectives and goals are not being met, there are several choices open to management. One of these is to lower expectations of performance as manifested in the objectives and goals of police programs. But, on the other hand, it should also be understood that objectives and goals which are too easily met should be extended and upgraded, if they are to remain effective tools of management.

Since before this study commenced no indicators of input, output and impact had been formally identified for the Department, the significance of these indicators for program evaluation and resource allocation has only recently been recognized. Thus, the Department has not been in a position to formulate operating objectives and program goals in terms of indicators of output and impact. But it is hoped that as a result of this thesis, senior management at the Department will begin to recognize the potential of social indicators for program evaluation and resource allocation, and as a result begin to formulate operating objectives and program goals in terms of these indicators. This is not to say, however, that the indicators presented in this thesis should not be thoroughly questioned before they are accepted as valid, nor is it to be said that these indicators should not be tested and the assumptions upon which they are based continually reviewed.

CHAPTER 3

PROGRAM GOALS AND FUNCTIONS OF THE VANCOUVER POLICE DEPARTMENT

3.1 Introduction

The urban police force is, in most instances, a para-military organization characterized by strong internal controls and centralized decision making (Gourley and Bristow, 1961). The Vancouver Police Department is no exception. Traditionally, its organizational goals have been oriented towards public safety and apprehension. However, in recent years, there has been a gradual shift in emphasis from apprehension to crime prevention.

This chapter presents a sampling of traditional police goals, formulates the program goals of the Vancouver Police Department, identifies and describes the functions carried out by the Department, and finally, assigns these functions to programs according to whether a function is considered a feasible strategy for achieving the goals of a program.

3.2 Traditional Police Goals

A selective sample of police goals which have appeared in the literature is presented on the following page. An awareness of traditional police goals will allow the reader to view those formulated for the Vancouver Police Department in the perspective of what other police administrators and analysts

have seen as appropriate and valid missions for police in their communities.

A shortcoming of some of these goals is that they confuse police functions with police goals. That is to say, they fail to discriminate between the means to an end and the end itself. Those police goals which, in the opinion of the author, are probably police functions, are marked with an asterisk (*).

The International City Managers' Association drew up a set of five police goals (International City Managers' Association, 1961):

1. prevention of criminality
2. repression of crime
3. apprehension of offenders
4. recovery of property, and
5. regulation of non-criminal conduct*

Another set of police goals was conceived by Leahy (1966). He postulated seven goals for police:

1. prevention of crime
2. investigation of crimes*
3. apprehension of violators
4. presentation of criminal for adjudication*
5. services to the public*
6. enforcement of non-criminal ordinances*,
and
7. regulation of activity in public places*

Szanton (1967), another student of police systems, saw there to be four goals for police:

1. control and reduction of crime
2. movement and control of traffic*
3. maintenance of public order,
and
4. provision of public service*

Another perception of police goals was given by Whisenand (1968):

1. reduction of potential criminal behaviour
2. repression of crime
3. apprehension of offenders
4. recovery of stolen property
5. provision of minimum social control,
and
6. participation in the implementation of civil defense and disaster services*

A recent task force report on Correctional Services and Facilities in British Columbia concluded that there were three major police goals (Matheson et al, 1973):

1. law enforcement*
2. order maintenance,
and
3. public service*

Finally, another scholar in the field of police systems, Nilsson (1972), has suggested that there are two levels of police goals. The higher order goals he calls "missions", while the lower order goals he calls "objectives". His two-tier grouping of police goals is presented on the following page:

A. Missions

1. protection of life and property
2. maintenance of peace and order
3. public service*,
and
4. community support

B. Objectives

1. crime control
2. quasi-criminal control
3. public peace
4. traffic regulation*
5. public service*,
and
6. community support*

In the context of the program framework presented in this thesis, functions are the means to an end (the output), but they are not the end in themselves (the impact). Let us consider the statements presented above. The provision of public service, what is referred to in this thesis as the citizen complaint function, is what police do, but not why they do it. The purpose of this function is public safety, such as the protection of persons from physical injury and loss of property arising from criminal acts committed against them. In other words, public service is what police do, but public safety is why they do it.

The distinction between functions and goals is extremely important for the development of performance accounts for police. The reason is clear.

Goals lead the way to indicators of impact, whereas functions lead the way to indicators of output. If functions are taken to be goals, then surely indicators of output will be taken to be indicators of impact. In other words, what we are doing will be taken to be why we are doing it. If this occurs, the traditional social indicators referred to in the literature will be lost from sight. Society will lose its sense of direction. And, as a result, there will be great confusion in the attempt to develop performance accounts for social agencies and to formulate public policy.

It must be recognized, however, that in developing program goals, the author and senior members of the Vancouver Police Department have been open to the same possibilities of error as have the other writers whose goals have been cited in the text above. However, the fact that the possibility of confusing functions with goals was recognized in advance of goal formulation, may have reduced by some degree the likelihood that the goals formulated for the Department are open to the same criticism. The reader will be left to judge for himself.

3.3 Goals of the Vancouver Police Department

The overriding purpose of any police department is public safety (Gourley and Bristow, 1961). Within the Vancouver Police Department, there are three distinct programs which operate to support this overall mission. They are: (1) the Crime Prevention Program, (2) the Public Safety Program, and (3) the Apprehension and Recovery Program.

It will be recognized that these programs follow in a logical progression. The first is the Crime Prevention Program which is oriented towards preventing crime from actually occurring. However, once a crime has occurred, the Public Safety Program is initiated to reduce or mitigate the affect of the crime upon its victims. Finally, after the safety of the victims has been re-assured, the Apprehension and Recovery Program becomes operational in order to apprehend suspects or recover property stolen during the course of the crime.

For each of these programs, a set of goals has been formulated. These evolved out of a series of brainstorming sessions between the author and senior members of the Vancouver Police Department. The goals are listed under the name of the program to which they refer:

1. the Crime Prevention Program

- a) to repress criminal activity
- b) to reduce opportunities for crime
- c) to encourage community self-policing
- d) to retard the development of criminality, particularly in youth

2. the Public Safety Program

- a) to protect persons from injury
- b) to aid persons in need of assistance
- c) to secure property against theft
- d) to protect property from damage
- and
- e) to maintain public order

3. the Apprehension and Recovery Program

- a) to apprehend suspects

- b) to recover stolen property
- c) to seize contraband goods or property
- d) to obtain physical evidence, supported by analytical or expert documentation wherever necessary, and to secure material witnesses of crime, in order:
 - to justify legal arrest or summons of suspects
 - to warrant bringing the suspect to trial,
 - and
 - to support prosecution of the suspects in court

Goals are statements of the desired impact of police programs. As such, they are the foundations upon which social indicators are to be based (Bauer, 1966; Gross, 1967 and Harland, 1971). Furthermore, a central tenet of the social indicator movement is that goals should be expressed in terms of concrete, tangible numerical measures. In this thesis, these measures are referred to as indicators of impact. Thus, police goals must be expressed in terms of the same parameters and the same units of measurement as are indicators of impact. This is one of the tasks addressed in Chapters 5, 6 and 7.

3.4 Functions of the Vancouver Police Department

From a survey of all activities of the Vancouver Police Department, ten police functions were identified. Each of these was intended to represent an entry in the performance accounts for the Department. Thus, each was defined in such a way as to be mutually exclusive of all other functions when considered independently, and mutually exhaustive with all other functions when considered jointly.

The ten functions so identified were:

1. the public education function
2. the youth counselling function
3. the community policing function
4. the preventive patrol function
5. the enforcement function
6. the citizen complaint function
7. the crowd control function
8. the escort duty function
9. the civil disaster co-ordination function
10. the investigation function

While these functions have been named so as to be self-explanatory, a brief description of the types of activities associated with each function may help to lay aside any doubts as to their meaning.

The Public Education Function. This function is viewed as an effective vehicle for crime prevention and recognized as an alternative or complement to the more traditional crime prevention techniques, such as the preventive patrol and enforcement functions. A wide variety of media are employed in public education projects by police, ranging from the distribution of "Crime-Stop" bulletins, to personal door-to-door campaigns in residential neighbourhoods. While the media through which the message is conveyed may vary considerably, the message itself is usually the same: (1) be alert to crime which may be occurring in your neighbourhood, (2) report any suspicious persons or activities immediately to police, (3) keep your premises secure, and (4) always lock your vehicle when leaving it unoccupied.

The Youth Counselling Function. This function actually encompasses a wider scope of activities than its name suggests. First, it provides an advisory counselling service for parents whose juveniles have demonstrated a propensity towards anti-social, antagonistic or destructive behaviour. And, second, it provides police liason with high school students through policemen placed in residence at the schools. There the police advise teachers on how to tackle youth problems, advocate the police role in the community and in classroom discussions with students, and investigate citizen complaints against youth attending the school or living in the neighbourhood.

The Community Policing Function. The philosophy underlying this particular approach to crime prevention is that crime is not merely a police problem, but a problem with implications for the entire community. Therefore, the solution to crime should involve not only police participation, but also the participation of other social services as well. A further implication of this crime prevention strategy is that, at least in part, crime stems from psychological, social and economic problems which are outside the scope and beyond the realm of police jurisdiction and competence. And, unless these root causes can be identified, and appropriate remedial action be taken by various other social agencies, in concert with police, the possibility for long-term crime prevention is extremely low.

There are two major aspects of community policing as practiced by the Vancouver Police Department. One is that of encouraging the community to come forward with a proposed solution to their problem, rather than the imposition of a solution designed exclusively by police. However, the other aspect of community policing is a specific strategy of crime prevention. It involves two basic steps: (1) identification of the nature and scope of the

criminal problem in the community, and (2) development, in co-operation with other relevant social agencies, a co-ordinated program to reduce the frequency and seriousness of crime in that community, by attacking the root psychological, social and economic problems which foster crime. It is this second aspect of community policing which will be the focus of attention in this thesis.

The Preventive Patrol Function. This function refers to the physical demonstration of police presence for the purpose of preventing crime from occurring in a particular area of the city. It is frequently associated with that category of crimes known as "preventable" crimes, which includes robbery, breaking and entering, and theft. Although current thinking now tends to suggest that preventive patrol may be effective against any crime which could occur in a public place to which police have access on their rounds. This strategy could quite successfully be employed to reduce the frequency and seriousness of assaults and other disturbances which occur in local bars and cocktail lounges.

Preventive patrol may be used as a single strategy to repress crime in an area of the city, or it may be used in conjunction with other police strategies, such as community policing.

The Enforcement Function. This function usually concerns the on-site observation of an offense, and subsequent apprehension of the suspect, which may ultimately lead to his being arrested or being given a summons to appear in court at a later date. While the enforcement function is frequently associated with traffic violations, it may also occur in relation to more serious offenses, such as common assault or violation of municipal by-laws which regulate public activity in specific places, such as parks and beaches in the city.

The Citizen Complaint Function. This function incorporates all those activities related to police response to citizen requests for assistance. These requests may involve anything from a hold-up in progress to a parking complaint. It encompasses the activities of the emergency telephone answering service, the radio dispatcher and patrol units in the field.

The Crowd Control Function. This function encompasses all those activities related to police control of large crowds. These crowds may develop for a variety of reasons, such as major sporting events, public demonstrations, parades and exhibitions, rock concerts, visiting heads of state and political dignitaries, and so on. This function requires detail planning well in advance of the day of the event. Operationalization of this function may occur only 2 to 3 times a year and is usually unique to a particular event.

The Escort Duty Function. This function incorporates all those activities related to the escort of large sums of money, criminal suspects, important political figures, and so on. It usually requires detail planning of the route of travel from origin to destination. However, many routine escorts occur daily in transferring prisoners from jail to court, or from one place of confinement to another. This function may occur in conjunction with the crowd control function, and like that function, is usually unique to a particular event.

The Civil Disaster Co-ordination Function. This function relates to all police activities associated with the persuance of public safety in the event of a major urban disaster. The disaster could be an earthquake, particularly in the Vancouver area. It could be a large industrial fire threatening to spread toxic fumes over a large sector of the city. Or, it

could be the crash of a large passenger jetliner in a densely populated urban area. Contingency plans for many types of disasters are already on file at the Department to be immediately implemented whenever necessary.

The Investigation Function. This function incorporates such activities as interviewing witnesses to a crime, searching suspicious premises or vehicles for stolen property or evidence, checking suspicious persons on the street, in premises or vehicles, examining the scene of a crime, gathering evidence, staking out a location, and so on.

Identification of police functions is critical to the development of performance accounts for police. They are the means through which program goals can be attained. Awareness of what functions are available to effect program goals, and their relative efficiency and effectiveness in doing so, is essential if maximization of performance or minimization of cost of the police agency is to be realized. Furthermore, functions as processes have inherent within them indicators of output which are necessary if the questions of output efficiency and effectiveness, two of the five central questions of program evaluation, are to be answered.

3.5 Police Functions Assigned to Programs

The three programs for the Vancouver Police Department were conceived to be: (1) the Crime Prevention Program, (2) the Public Safety Program, and (3) the Apprehension and Recovery Program. The functions identified in the previous section were assigned to programs as follows:

1. the Crime Prevention Program

- a) the public education function
- b) the youth counselling function
- c) the community policing function
- d) the preventive patrol function (enforcement function)

2. the Public Safety Program

- a) the citizen complaint function
- b) the crowd control function
- c) the escort duty function
- d) the civil disaster co-ordination function

3. the Apprehension and Recovery Program

- a) the citizen complaint function
- b) the investigation function
- c) the preventive patrol function (enforcement function)

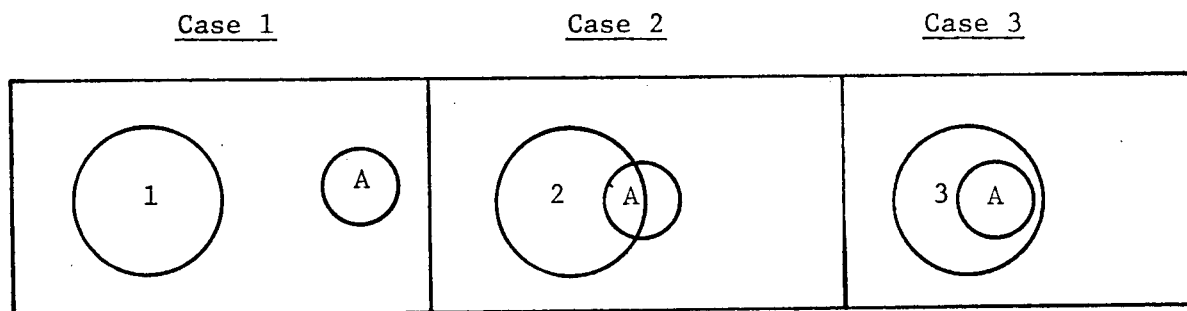
It should be noted that both the citizen complaint and preventive patrol functions are contained within two separate programs. This has been done deliberately and is related to the criteria by which functions were assigned to programs. Moreover, the preventive patrol function is considered to incorporate the enforcement function which is enclosed in parenthesis.

For purposes of this analysis, each function is conceived as possessing three distinct types of parameters: inputs, outputs, and impacts. Both quantitative and qualitative numerical measures of these parameters can be identified. These measures are called indicators of input, output and impact.

Disregarding indicators of input and output for the time being, it can be said that each function possesses an identifiable set of impacts. Furthermore, any one of these impacts may be considered desirable or undesirable, favorable or unfavorable depending upon one's goals and values. The desirable or favorable impacts of the police agency have been articulated, in terms of societal goals and values, in the program goals of the Department. In fact, a set of goals has been formulated for each police program. Wherever (in two-dimensional space, see Venn Diagrams below in Figure 3.1) a program's set of goals coincides with a function's set of possible impacts, that function has been assigned to the program. The operation of this criterion is illustrated in a series of Venn Diagrams contained in Figure 3.1 below.

FIGURE 3.1

Criterion for Assigning a Function
to a Police Program



- 1 = Set of Possible Impacts of Function 1
- 2 = Set of Possible Impacts of Function 2
- 3 = Set of Possible Impacts of Function 3
- A = Set of Goals of Program A

In Case 1, Function 1 was not assigned to Program A because there was no coincidence whatsoever between the set of possible impacts of Function 1 and the set of goals of Program A. In Cases 2 and 3, however, Functions 2 and 3 were assigned to Program A because there was coincidence between the set of possible impacts of Functions 2 and 3, and the set of goals of Program A.

There is unfortunately at least one weakness in this process. And that is the fact that the coincidence of functional impacts and program goals was determined intuitively, and not on the basis of empirical evidence. In all cases, the decision was made by the author, in consultation with senior management at the Department. Therefore, while the criterion employed is clear and its theoretical basis sound, there exists the possibility that future empirical verification of these assignments may prove some of them to be wrong. On the other hand, few hypotheses have been proven empirically which did not appear to be intuitively correct in the first instance.

3.6 Concluding Remarks

A possible shortcoming of traditional police goals as articulated in the literature is that some of them are police functions misinterpreted as police goals. The distinction between goals and functions is extremely important for the development of social accounts for police, since goals lead the way to indicators of impact, whereas functions lead the way to indicators of output.

Within the general context of public safety, three police programs were identified at the Vancouver Police Department: (1) the Crime Prevention Program, (2) the Public Safety Program, and (3) the Apprehension and Recovery Program.

Furthermore, ten police functions were identified by analysis of activities of the Department. These functions were assigned to the police programs, according to the criterion of whether or not they supported program goals.

The program structure established in this chapter, sets the stage for the more detailed discussion of performance accounts to follow.

CHAPTER 4

THE INPUT ACCOUNT FOR POLICE PROGRAMS AND SUPPORTING FUNCTIONS

4.1 Introduction

One of the major propositions of this thesis is that police functions are characterized by three parameters: inputs, output and impacts. In fact, the police function is the output. For each police function, inputs are transformed into output by means of a production function, and output is transformed into impacts by means of a social welfare function. The production functions and social welfare functions are unique to each function. But the inputs to each function are extremely similar.

Thus, in spite of the diverse nature of output and impacts from police functions, there is a common pool of resources from which all outputs are produced and from which all impacts are generated. Therefore, similar kinds of inputs can produce numerous and distinct types of output which, in turn, can generate a multiplicity of impacts.

Because the same kinds of inputs are common to all functions, it is appropriate to develop indicators of input in a general treatment separate from the discussion of police programs and supporting functions. And, since inputs are the first element in the logical progression from inputs to output to impacts, it is also appropriate that they be discussed first.

4.2 The Significance of Indicators of Input for the Development of Performance Accounts for Police

The input account, at first glance, may appear to be both traditional and inappropriate to a discussion of program evaluation. But one would be wrong on both counts. First, development of an input account for program evaluation demands more than a mere duplication of conventional financial accounts. In essence, it requires a new conceptual breakdown of resources in terms of what they are, and what they are used for. Second, indicators of input are essential if two of the five central questions of program evaluation, output efficiency and impact efficiency are to be answered. In fact, impact efficiency which is the ratio of input to impact is perhaps the single most important question of program evaluation, for it tells us what impact has been achieved relative to a given expenditure of resources.

This reveals the underlying principle behind the need for program evaluation, and that is the law of scarcity. If resources were unlimited, if an infinite amount of every commodity (inputs) were available, then it would not matter if labor and materials were combined unwisely. There would be no economic goods, no goods that are relatively scarce, and there would be no need for economizing, since all goods (inputs) would be free (Samuelson and Scott, 1971).

The law of scarcity applies not only to society in general, but also to the Vancouver Police Department in particular. In the general sense, the resources of society are limited, whereas in the particular sense the financial budget of the Vancouver Police Department is also limited. In the face of these constraints, the purpose of program evaluation is to achieve the greatest possible program impact with the smallest expenditure of resources.

It is one thing for a function to be achieving its operating objectives, it is yet another thing for that function to have a high output efficiency. Similarly, it is one thing for a function to be attaining the goals of a program, it is yet another thing for that function to have a high impact efficiency. The degree to which a function is achieving its operating objectives or attaining its program goals is an absolute measure of success. On the other hand, both output efficiency and impact efficiency relate the degree of success to the expenditure of resources. Impact efficiency, in particular, is at the very core of the program evaluation process. On this single measure, the relative merit of a particular function can be known. And, the derivation of this measure requires just as accurate an estimate of inputs as it does an estimate of impacts. Thus, indicators of input have a crucial role to play in the process of program evaluation, a role equal to that of indicators of impact. This is why indicators of input are vital to the program evaluation process and warrant more than a cursory footnote in the discussion of performance accounts for police.

4.3 Proposed Entries for the Input Accounts

The major thrust of this chapter is that accurate and comprehensive measures of the resources allocated to each police function is essential for effective program evaluation. The primary focus of this chapter is upon the development of quantitative measures of input, although a qualitative measure of human resources is proposed in the latter part of this section.

4.3.1 General Types of Entries

There are three traditional entries in conventional cost accounting. They are labor, materials and overhead. Labor generally refers to the cost of wages, salaries and fringe benefits. Materials generally refers to all specific non-human resources absorbed in the operation. And, overhead generally refers to all those items which represent either fixed costs to the operation or indivisible costs which elude allocation. These broad categories of resources will continue to have relevance in the proposed new input accounts. However, rather than having totals for the entire Department, there would be sub-totals for each police function.

The overriding principle upon which the new input accounts are to be based is that all variable or divisible costs should be charged directly to the operation of a specific police function. The cost of functions could then be aggregated for each program to provide an estimate of total program costs. The rationale behind this procedure is for costs to be aggregated in terms of police functions, that is, according to the same units of analysis as output and impact accounts. This is, of course, to facilitate program evaluation.

In order to gain perspective of the actual nature and magnitude of police costs and how they would relate to the proposed input accounts, an examination of recent annual budgets of the Vancouver and Metropolitan Toronto Police Departments is enlightening. These are presented on the following pages in Tables 4.1 and 4.2. The entries are ranked according to magnitude of cost, and expressed as a percentage of the total budget.

TABLE 4.1Vancouver Police Department,
Operating Budget, 1973

| <u>Entries</u> | <u>% of Total</u> | <u>Amount</u> |
|---|-------------------|---------------|
| Manpower | 87.9 | 13,513,426 |
| Detention Facilities | 4.0 | 609,754 |
| Transportation | 3.5 | 536,936 |
| Building Operation and Maintenance | 1.8 | 271,090 |
| Training Academy | 0.9 | 140,438 |
| Communications | 0.8 | 122,765 |
| Stationery, Printing and Office Expenses | 0.6 | 83,790 |
| Miscellaneous Expenses | 0.4 | 57,205 |
| Bicycle Registration Unit | 0.2 | 33,491 |
| Crime Detection Laboratory and Identification Unit | 0.1 | 8,300 |
| (Rounding Error Correction) | (-0.2) | |
| TOTAL ANNUAL OPERATING COSTS | 100.0 | 15,377,195 |

Source: Vancouver Police Department Annual Report, 1973

TABLE 4.2

Metropolitan Toronto Police Department
Operating Budget, 1971

| <u>Entries</u> | <u>% of Total</u> | <u>Amount</u> |
|------------------------------|-------------------|---------------|
| Manpower | 91.2 | 50,874,391 |
| Transportation | 3.8 | 2,090,944 |
| Office | 2.0 | 1,129,603 |
| Clothing and Equipment | 1.8 | 1,016,380 |
| Communications | 0.7 | 381,658 |
| Miscellaneous Expenses | 0.5 | 270,569 |
| TOTAL ANNUAL OPERATING COSTS | 100.0 | 55,763,545 |

Source: Metropolitan Toronto Police Department Annual Report, 1971

Let us analyse these budgets in terms of the three types of entries proposed for the new input accounts, namely, labor, materials and overhead.

Labor. It is relatively simple to deduce from these budgets the appropriate entry for labor. The total cost of salaries and fringe benefits for both police and clerical staff amounts to \$13,513,426 for the Vancouver Police, and \$50,874,391 for the Metropolitan Toronto Police, or 87.9 and 91.4 per cent of their total operating budgets, respectively. It would therefore appear from a cursory examination of these budgets, that the cost of manpower alone accounts for between 85 and 90 per cent of the total annual operating budget of police agencies. This has a significant implication for the development of measures of input, for since manpower is by far the most important single entry, it thus demands the greatest consideration in its treatment here.

Materials. The kinds of material resources most frequently associated with police functions are vehicles, radios, weapons and crime detection equipment. Therefore, in terms of the recent Vancouver Police budget, this entry would include such items as transportation, communications, crime detection laboratory and identification unit, as well as stationery, printing and office expenses, and building operation and maintenance. In terms of the recent Metropolitan Toronto Police budget, this entry would include such items as transportation, communications, clothing and equipment, and office. Each of these items can be expressed in terms of a general charge-out rate which can be used to allocate costs directly to the police function which absorbed them. The question of how these specific charge-out rates will be developed is addressed shortly.

Overhead. The purpose behind allocating specific operating costs by means of direct charges against the police functions which have incurred them, is to reduce or eliminate wherever possible the vague and nebulous overhead charges which often hide and frequently misallocate the true costs of a function's operation. The only entries in the recent police budgets which cannot or should not be included as direct user charges are items such as the Training Academy in the Vancouver Police budget, and the Miscellaneous Expenses in the Metropolitan Toronto Police budget. The criteria behind the "cannot or should not" will be explained shortly.

4.3.2 Specific Entries for the Input Account

There are three types of entries proposed for the input account. These are: (1) manpower, (2) direct expenses, and (3) overhead. Only manpower and direct expenses will be allocated directly to particular police

functions. Overhead will be considered as a general entry relating to the entire Department.

Manpower. Both quantitative and qualitative measures of input are proposed for the manpower entry.

The quantitative measures are the number of men, the number of manhours or the cost of men, that is, the number of manhours multiplied by the appropriate wage rates.

The qualitative measure of manpower is called the proficiency index. There are several reasons why such a measure should be developed for the police agency. First, a fact which has been mentioned previously, the cost of manpower may run as high as 90 per cent of the total departmental budget. Second, manpower is a highly variable commodity which differs widely in terms of potential, ability and skill. This is in contrast to most items which fall within the direct expense entry. These, such as vehicles, radios, weapons, and other kinds of supporting equipment, are extremely standardized in terms of their qualitative attributes. And, third, a factor which is actually a combination of points one and two, the quality of manpower allocated to a particular function may well have a significant affect upon the productivity and impact of that function.

One might counter with the argument that ranks provide an adequate qualitative measure of manpower. But this may not be accepted as a valid argument. While rank may be used as an approximate gauge of the quality of manpower available in the department, the primary purpose of rank in a paramilitary organization such as the police is to establish a command

structure. Furthermore, much of the actual workload of departmental programs is carried out in the field by members of almost equal rank, ie. third, second and first class constables.

Thus, there exists considerable justification for the development of a qualitative measure of manpower. In view of this, the proficiency index is proposed as one possible manner in which management can obtain a qualitative picture of the manpower being allocated to particular police functions, and in retrospect peruse the results.

There are several steps involved in developing a proficiency index. The first is to identify, on an a priori basis, those personal attributes believed to be significant for the performance of police duties. Such attributes might be: (1) St. John's Ambulance training, (2) sharp shooters badge, (3) academic standing in Training Academy examinations, (4) special weapons training, (5) Royal Life Saving Certificate, (6) foreign language skills, (7) number of years experience, (8) rank, (9) scope of experience in terms of the number of different positions held for at least 6 months duration, and so on.

The second step is to determine the appropriate scale for each attribute. Generally, there are two types of scales, the binary scale and the cardinal scale. The binary scale is used where there is a simple question of either the presence or the absence of a particular attribute. An example of this kind of attribute is the sharp shooters badge. Either an individual policeman has the badge (presence) or he hasn't (absence). In the event that he has the badge, he is awarded a one (1). In the event that he hasn't the badge, he is awarded a zero (0). The cardinal scale is used for cases where

there is a progression of values which an attribute may take. An example of this kind of attribute is the number of years experience. A particular policeman may have 1,2,3 ...n years of experience. In the event that he has 1 years experience, he is awarded a one (1). In the event that he has 2 years experience, he is awarded a two (2). In the event that he has 3 years experience, he is awarded a three (3), and so on up to n years of experience.

The third step may be omitted depending on the outlook of management. If this is the case, the proficiency index is calculated by summing the scale values of each of the attributes. If, on the other hand, management chooses to develop value weights for each attribute, it can do so in a number of ways. First, management can in the light of its own wisdom and experience, rank these attributes according to its perception of their relative importance, and give each attribute a weight inversely related to the assigned rank. Alternatively, management can assign a value weight directly to each attribute using one of two possible methods. The first method is to assign a weight of between 1 and 10 to each attribute. The second method is to define the value weight for a particular attribute to be given, and then express the value weights of the remaining attributes in terms of a multiple of the given weight. Or, finally, the relative importance of each attribute can be determined empirically by means of multiple correlation analysis. In this instance, an index of performance, based upon some agreed upon criteria, would be set as the dependent variable, with the various personal attributes set as the independent variables in a multiple correlation analysis. The resulting partial correlation coefficients could then be taken as the value weights for the various attributes.

The general equation for calculating the proficiency index may be expressed as follows:

$$P = \sum_{i=1}^n S_i W_i$$

where P = the proficiency index

S_i = the scale value of the i th attribute, and

W_i = the value weight of the i th attribute.

Once the proficiency index has been calculated for every policeman, the average proficiency index may be calculated for any unit of policemen, whether it be a squad, a division or the entire department. The use and interpretation of the proficiency index will be discussed in further detail in Section 4.4 of this chapter.

Direct Expense. A number of typical items for this entry have already been suggested in relation to the present recent budgets of the Vancouver and Metropolitan Toronto Police Departments. Attention now turns, however, to the specific items to be included in this entry, and the manner in which they shall be calculated. Before addressing this issue, however, one point must be made clear and, that is, that no qualitative measures of direct expense are going to be developed. In the opinion of the author, the name of each item to be contained within this entry provides sufficient qualitative information and precludes the need to develop additional qualitative measures. The reader will recall that the rationale behind the need for qualitative measures of manpower was that potential, skills and abilities differed widely between any two members of the force. This, however, is not the case with respect to direct expense items. For example, let us take

three specific items to be contained in the direct expense entry: vehicles, radios and weapons. The standard police vehicle is a four-door North American sedan. The standard police portable radio is a Marconi Mark II portable transmitter. The standard police weapon is a short-nosed, 38 calibre, Smith and Wesson handgun. There is no need to consider the qualitative differences between individual police vehicles, radios or weapons. The differences if they do exist, are so insignificant as to be meaningless to the type of analysis in which we are engaged here.

With respect to the direct expense entry for the input accounts, the general thrust of the argument is to reduce or eliminate wherever possible the vague and nebulous overhead charges which often hide and frequently misallocate the true costs of the operation of police functions. Thus, the purpose of the suggestions made here are to make general overhead charges as small as possible, and to translate such charges into direct user costs.

In order to do this, it is necessary to establish a two-fold criteria for determining appropriate items for consideration. This criteria is that (1) an item must be divisible, that is, its costs must be capable of being broken down into those respective units absorbed by specific police functions; and (2) an item must be a variable cost to the function, that is, management can vary the quantity of the item absorbed by a particular function at will.

For specific items to be charged directly to the functions which absorb them, it is necessary to establish appropriate charge-out rates for each individual item to be contained within the direct expense entry. Let us consider three specific examples contained within the 1973 budget of the

Vancouver Police Department: (1) detention facilities, (2) transportation, and (3) buildings operation and maintenance.

The general principle to be followed in developing charge-out rates for each item of the direct expense entry, is for next year's charge-out rates to be based on this year's costs and usage rates. Thus, using 1973 costs and rates of usage, the charge-out rates for 1974 can be calculated. Table 4.3 below presents actual cost data and hypothetical rates of usage for 1973, and the resulting 1974 charge-out rates, for the three cost items: detention facilities, transportation and building operation and maintenance.

TABLE 4.3

Calculation of 1974 Charge-Out
Rates for Three Specific Items
of the Direct Expense Entry

| <u>Items</u> | <u>(1) Costs</u> | <u>(2) Usage Rates</u> | <u>(1)/(2) = (3) Charge-Out Rates</u> |
|---------------------------------------|----------------------|----------------------------|---|
| Detention Facilities | \$609,754 | 6,083 Man-Days | \$100.24/Man-Day |
| Transportation | \$536,936 | 2,684,680 Miles | \$ 0.20/Miles |
| Building Operation and Maintenance | \$271,090 | 250,000 sq ft | \$ 1.08/sq ft |

Source: Vancouver Police Department Annual Report, 1973 (costs only)

Note: Usage rates are hypothetical

The 1974 charge-out rates are calculated by dividing 1973 costs by 1973 usage rates for each item. It can be seen from a perusal of the Table that charge-out rates differ among items not only in terms of magnitude of the charge, but also in terms of units of measurement. For instance, detention facilities are charged on the basis of man-days, transportation on the

basis of miles, and building operation and maintenance on the basis of square-feet.

To illustrate the end result of this procedure, let us compare an entry as it now is to an entry as it is proposed. In order to do this with a minimum of confusion, several simplifications are necessary. First, let us assume that there are only three police functions: the citizen complaint function, the investigation function and the community policing function. Second, let us assume that there are only three items in the direct expense entry: detention facilities, transportation and building operation and maintenance. Table 4.4 presents the direct expense entry as it now is. And, Table 4.5 presents the direct expense entry as it is proposed.

TABLE 4.4

Present Direct Expense
Entry

| <u>Items</u> | <u>Costs</u> |
|------------------------------------|----------------|
| Detention Facilities | \$609,754.00 |
| Transportation | \$536,936.00 |
| Building Operation and Maintenance | \$271,090.00 |
| TOTAL COST | \$1,417,780.00 |

Source: Vancouver Police Annual Report, 1973

(a) Usage

| <u>Police Functions</u> | <u>Detention Facilities (Man-Days)</u> | <u>Transportation (Miles)</u> | <u>Building Operation and Maintenance (Square-Feet)</u> |
|-------------------------|--|-----------------------------------|---|
| Citizen Complaint | 608 | 1,610,808 | 25,000 |
| Investigation | 4,258 | 805,404 | 125,000 |
| Community Policing | 1,217 | 268,468 | 100,000 |
| TOTAL USAGE | 6,083 | 2,684,680 | 250,000 |

(b) Cost

| <u>Police Functions</u> | <u>Detention Facilities (Dollars)</u> | <u>Transportation (Dollars)</u> | <u>Building Operation and Maintenance (Square-Feet)</u> | <u>TOTAL COST (Dollars)</u> |
|-------------------------|---|-------------------------------------|---|---------------------------------|
| Citizen Complaint | 60,945.32 | 322,161.60 | 27,109.00 | 410,215.92 |
| Investigation | 426,817.80 | 161,080.80 | 135,545.00 | 723,443.60 |
| Community Policing | 121,990.88 | 53,683.60 | 108,436.00 | 284,120.48 |
| TOTAL COST | 609,754.00 | 536,936.00 | 271,090.00 | 1,417,780.00 |

Source: Vancouver Police Department Annual Report, 1973 (costs only)

Note: Usage Rates are purely hypothetical

The advantage of the proposed direct expense entry presented in Table 4.5 is that it allows a functional breakdown of police costs. The cost of manpower, obtained from the manpower entry of the input account, and the sum of direct expenses, obtained from the direct expense entry of the input account, provide in dollar terms a measure of resource input for each police function. It is just such a measure which is essential if the process of program evaluation is to be complete and of maximum effectiveness. Complete in the sense that all of the five central questions of program evaluation can be answered. And, of maximum effectiveness in that impact efficiency, the ratio of input to impact, can be calculated.

Overhead. There will be a practical limit beyond which particular operating costs of the Department cannot or should not be charged directly to police functions. There appear to be three specific cases when this is so. First, when the cost of a particular item is not divisible among the various functions which make use of it, then it would not be possible to allocate, accurately, the total cost of the item among functions. An example of such an item would be the Chief Constable's salary. Second, when the cost of a particular item is fixed, not variable at the discretion of management, it should not be allocated to functions. An example of such an item would be the police training academy. And, third, when the cost of a particular item is so small that allocation to functions would prove unnecessarily costly. Most items now classified as miscellaneous would probably fall into this category. In each of these cases, costs should be considered as part of the general overhead of the Department, and no attempt should be made to allocate these costs to functions. Thus, the input accounts for police functions would not include an overhead entry.

4.4 Areas in Need of Further Refinement and Research

Of all three performance accounts being proposed in this thesis - the input, output and impact accounts - the input account will probably be the most easily implemented. All of the items it contains are already recorded in the existing accounting system. The difficulty will be in disaggregating the total costs of direct expense items and allocating them, accurately, to the police functions which use these items in the production of their output.

Manpower. To the extent that the organizational structure of the Department is consistent with the execution of police functions, the cost of manpower for each function may already be attainable. For instance, the Primary Investigation Squad of the Bureau of Field Operations deals almost exclusively with the citizen complaint function. Therefore, the total cost of manpower for that function is merely the total cost of manpower for that squad. However, there are many cases where such a coincidence of organizational unit and execution of police function does not occur. In such instances, time cards could be introduced which would record to the nearest half-hour the various police functions carried out by a particular squad of policemen. It is anticipated that most of the entries on time cards could easily be standardized because of the routine nature of many police activities. This procedure should not be considered superfluous or impractical. Most progressive organizations, engaged in much more varied and less readily definable tasks, already operate on a similar time card system as that being proposed here.

Direct Expense. In the case of this entry of the input account, the major difficulties will likely be the development of appropriate charge-out rates for those items which satisfy the criteria set forth for the direct expense

entry. And, the conceptualization and implementation of appropriate methods by which usage of such items can be recorded on a function by function basis. However, some headway has been made already. A criteria which indicates whether an item should be charged directly to functions has been proposed, and a technique to be used in developing charge-out rates has been suggested.

Overhead. In terms of the functional input accounts proposed in this chapter, the overhead entry is to be omitted. If the manpower and direct expense entries are developed as specified in the foregoing paragraphs, the overhead entry will contain those items which are inappropriate or insignificant for the purpose of program evaluation. As a separate entry in itself, however, the overhead of the Department can be compared to that of other police organizations as a measure of control.

4.5 Concluding Remarks

It is expected that the most convenient, and hence the most frequently used, input measure will be the total cost in dollar terms of all resources absorbed by police functions. Dollars provide an irresistible common denominator in terms of which all kinds and types of inputs may be aggregated to provide the much sought after total functional cost. Thus, it is anticipated that this will be the input measure most frequently used in calculating output efficiency and impact efficiency for purposes of program evaluation.

However, the non-monetary measures of input, such as the number of policemen, the proficiency index, and the number of patrol units on the street, will have an important part to play in the follow-up analysis of production

functions and social welfare functions which is essential if appropriate and speedy remedial action is to be taken in response to a negative program evaluation. The reason for this is that cost does not always reflect the true quantitative and qualitative aspect of resources input to a particular function. Costs, after all, are generally determined by in an economic market which may easily distort and bias the contribution that a particular input may have to a function's productivity or effectiveness. For example, all first class constables receive the same wage because of the collective bargaining process. However, the average proficiency of one squad of first class constables may be significantly higher than that of another, in spite of the fact that the total cost of manpower for each squad is the same. And, furthermore, the squad with a higher average proficiency may well have a higher productivity and hence effectiveness, than a squad with a lower average proficiency performing the same function.

A more case oriented demonstration of the use and interpretation of the input account will be made in the next three chapters. For in the context of program evaluation, and for purposes of this thesis we must restrict ourselves to that topic, the input account is not used alone, but in conjunction with the output and impact accounts. Thus, a consolidated set of all three accounts will be presented for each of the three police programs and their supporting functions in Chapters 5, 6 and 7 which follow immediately.

CHAPTER 5

THE CRIME PREVENTION PROGRAM AND ITS SUPPORTING FUNCTIONS

5.1 Introduction

There are three police programs which will be dealt with in this and two subsequent chapters. They are the Crime Prevention Program, the Public Safety Program, and the Apprehension and Recovery Program. In the context of the criminal process - prevention, crisis intervention and remedial or corrective strategies - the crime prevention program is logically the first in the sequence.

There are three purposes of this chapter. The first is to identify indicators of output for the functions contained within the Crime Prevention Program, and to identify indicators of the desirable impacts of these functions in the context of that program. The second is to illustrate how these measures can be employed to answer the five central questions of program evaluation, and the implications of the answers for resource allocation within the Vancouver Police Department. And, lastly, this chapter will attempt to pinpoint areas in need of further refinement and research if these concepts are to become fully operational.

The Crime Prevention Program of the Vancouver Police Department has four goals: (1) to repress criminal activity, (2) to reduce opportunities for crime, (3) to encourage community self-policing, and (4) to retard the

development of criminality, particularly in youth. Five functions of the Department were seen as alternative strategies for achieving the goals of the Crime Prevention Program. These were: (1) the public education function, (2) the youth counselling function, (3) the community policing function, (4) the preventive patrol function, and (5) the enforcement function. If the reader wishes to refresh his understanding of these functions, he is referred to Chapter 3, pages 54 to 56, where they have been described in detail.

5.2 Proposed Entries for the Output Account

In order to develop indicators of output for the functions of the Crime Prevention Program, the production functions of each of the police functions contained in the Program were carefully examined. Both quantitative and qualitative indicators of output were sought. As a result of this scrutiny, a number of indicators have been identified. They are discussed below under the heading of each function.

The Public Education Function. Many types of activities could fall under the guise of the public education function. In this it differs from most other police functions which usually consist of a routine set of activities which often occur in a logical sequence or natural progression. Such functions are the citizen complaint function, the preventive patrol function, the enforcement function and the investigation function, to name but a few. In contrast to these more conventional police functions, the public education function demands innovation and creative initiative and hence eludes a generalized treatment here. However, let us take three examples of the type of activities which fall within our definition of this function and examine each of them for indicators of output.

The first example is the distribution of "Crime-Stop" bulletins to residents of the Kitsilano area of Vancouver City. In this instance, the number of pamphlets distributed to residents is an obvious quantitative indicator of real output (for a discussion of the distinction between real output and output capacity, see Chapter 2, pages 30 to 31). Qualitative indicators of output for this type of activity, however, appear elusive.

The second example is a door-to-door community relations campaign by police members to residents of the West End area of the City. The purpose of this activity was to increase awareness of crime occurring in the area and to attempt to engender a spirit of community self-policing in the residents living there. In this case, the number of visits made by police is an obvious quantitative indicator of output of this activity. Again, however, qualitative indicators of output do not appear to readily present themselves.

The final example is a carefully composed press-release to local Vancouver newspapers warning of the recent upswing in the number of bicycles stolen throughout the City and advising bicycle owners of several practical precautions they may take in order to safeguard their bicycles from also being stolen. The number of lines of press coverage in local newspapers is a quantitative indicator of the real output of this activity. Qualitative indicators, once again, do not seem to be readily apparent.

The Youth Counselling Function. This police function, like the one before it, is not a traditional police activity. Therefore, as in the case of the public education function, the type of activities which fall within the definition of the youth counselling function may vary considerably from time

to time. However, as it is currently constituted, two types of activities are frequently associated with this function in the Department. The first of these is the advisory counselling sessions which are held with parents who are having difficulty in managing their juvenile offspring. In such cases, the total number of families with whom sessions have been held, and the total number of juveniles which were the subject of discussion at these sessions are possible quantitative indicators of output. The second type of activity associated with the youth counselling function is the classroom presentations made by members of the force in which they explain the role of police in the community to students at the school. In such instances, the total number of presentations, and the total number of students attending these presentations are possible quantitative indicators of output. In both types of activities, however, measurable qualitative indicators of output do not appear to be generated.

The Community Policing Function. Because of their continual on-street presence, police are in a unique position to identify and monitor the growth and development of many criminal and social problems which may emerge in various neighbourhoods of the City. Therefore, this function refers to police initiative in identifying criminal and social problems in the community, and convincing other social agencies that they must become involved if the problems are to be ultimately resolved. And, if no other appropriate agency steps forth to take the lead, police will ultimately co-ordinate and direct the comprehensive social program which has been drawn up by all participating agencies. Once the program is underway, police will normally assume their conventional functions in a supportive role within the program, such as enforcement. The output of the social program which is crystalized as the result of police initiative is not the output of the community policing function. Police

output for this function is actually measured in terms of the input of other social agencies. The question which output should answer is how active and how convincing have police been in drawing resources from other sectors of the community to combat the underlying social, economic and psychological causes of criminality in the City? If this view is correct, then, possible indicators of this function's output are the total number of comprehensive social programs active in the City which have been initiated by police, and the total dollar cost of resources being applied to these programs by other social service agencies.

The Preventive Patrol Function. The preventive patrol function, like the citizen complaint and investigation functions, is closely inter-related with the enforcement function. Perhaps it is the underlying threat of enforcement inherent in preventive patrol which acts as an effective deterrent against crime. Or, perhaps it is the fact that enforcement may come about as a result of preventive patrol. But, regardless of the basis for this inter-relationship, it should be understood that enforcement may form a part of the preventive patrol function.

Abstracting enforcement from preventive patrol for the time being, several quantitative indicators of output have been identified for the more comprehensive function. These are the total number of persons checked for identification, the total number of vehicles searched for stolen property or contraband goods, and the total number of premises checked for security during the patrol. Once again, qualitative indicators do not seem readily apparent.

The Enforcement Function. This function consists of three essential activities: (1) observation of an offense being committed; (2) apprehension of the offender at the scene; and (3) arresting the offender or issuing him a

summons. The quantitative indicator of output for the enforcement function appears to be the total number of arrests made or summons issued, while the qualitative indicator of output appears to be the percentage of total arrests and summons which result in convictions.

In conclusion, it should be recognized that the comprehensive nature of this study precludes the extensive analytical treatment that each of these functions justifies. In many cases, a single function could well require a full study in itself. The particular weaknesses of this presentation are the lack of qualitative indicators of output and the need for an examination of the interface and inter-relationship between functions. However, it was felt that at this stage of development of performance accounts for police that the more appropriate first step would be a broad brush treatment of the entire organization, before homing in on specific functions and particular problem areas.

The following section identifies indicators of desirable impact for the functions of the Crime Prevention Program.

5.3 Proposed Entries for the Impact Account

Each police function has a multiplicity of impacts, some of which may be considered desirable (program goals), and some of which may be considered undesirable. For example, one of the favorable impacts of the preventive patrol function is the reduction in criminal activity in the area being patrolled. This is one of the goals of the Crime Prevention Program. However,

one of the unfavorable impacts of this function is the harrassment of private citizens resulting from checking their identification and searching their vehicles, which is all part of the preventive patrol process. Within the time and scope of this thesis, it would be impossible to identify all and every impact of each function. It was therefore decided to discuss only those impacts which are directly linked to program goals, that is, those impacts which are considered in terms of society's values to be desirable.

A problem to be overcome in all social indicator research is that of being able to measure change - social, economic, physical and psychological changes - which may occur as a result of direct intervention or interaction with the social environment. One can readily conceptualize social indicators. There is no lack of creative talent here. But when it comes to the practical question of measuring, recording and collecting these indicators, many conceptualized indicators are found to be lacking.

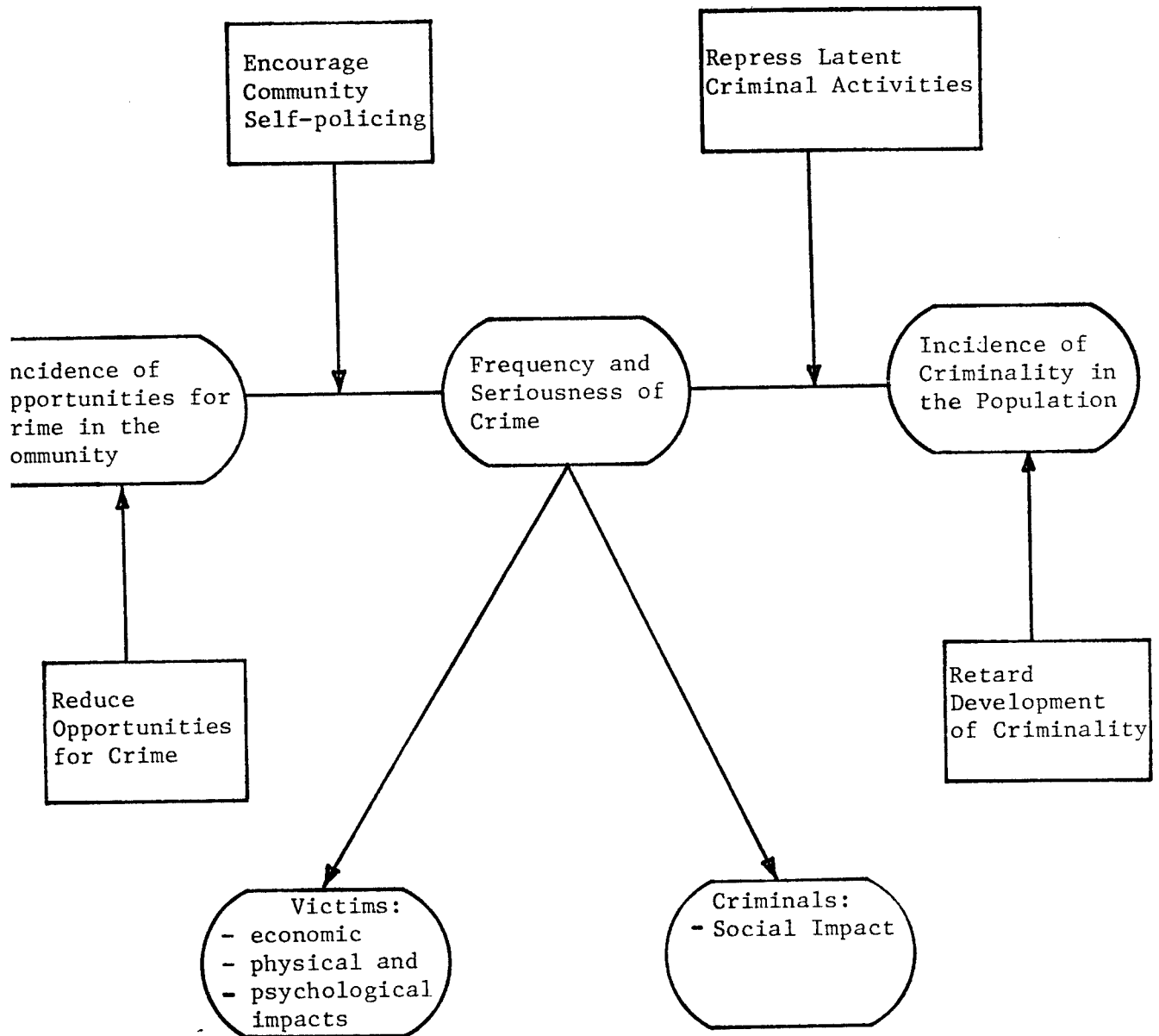
In order for measurement of social indicators to be possible, there must be some perceptible sign or manifestation of change. The key to measurement is perception. Man's ability to perceive change in the social environment is inextricably linked to his capacity to sense change. If he cannot see, hear, feel, smell or taste change, he is for all practical purposes unaware that change is actually occurring. True, there may be mechanical extensions of man's senses which will enable him to perceive change beyond the natural capacity of his organism, but in the arena of social measurement, the development of such mechanical aids is far, far into the future.

This discussion has relevance for measuring the impact of social programs, particularly the impact of the Crime Prevention Program of the Police Department.

None of the four desirable impacts of this program can be measured directly, precisely because of the issues raised in the preceding paragraphs. The physical and economic dimensions of change can be measured most of the time, the social dimension of change can be measured some of the time, but the psychological dimension of change cannot be measured most of the time. It is precisely this psychological element of change which remains elusive when attempting to measure the desirable impact of the Crime Prevention Program and its supporting functions. Figure 5.1 on the following page attempts to illustrate this point.

FIGURE 5.1

Social Linkages
in the Prevention of Crime

LEGEND

- = Social Elements
 → = Linkages
 = Goals of Crime Prevention Program

The first goal of the Crime Prevention Program is "to repress latent criminal activity". This goal relates to the desirable impact of the preventive patrol function, that of repressing latent crime. Here the key word is latent, meaning "present and capable of becoming though not now visible or active" (Webster's New Collegiate Dictionary, 1973). This refers to those cases where the opportunity for crime has already been perceived, and perhaps a plan has already been formulated, but the criminal act itself has not yet been carried out. Given existing techniques of perception and measurement, it is virtually impossible to measure whether or not a latent crime has been forestalled, indefinitely postponed or ultimately called off completely because of the demonstrated presence of police in the vicinity of the scene of the latent crime. The only measurable change is that which may occur in the frequency and seriousness of crime occurring in that area of the City.

The second goal of the Crime Prevention Program is "to reduce the opportunities for crime". This goal relates to the desirable impact of the public education function, that of increasing public awareness of the opportunities for crime in the community, and advising them of practical precautionary measures which can be taken in order to reduce or eliminate these opportunities. Let us take a specific example for purpose of illustration.

Assume that in recent weeks nurses going off the afternoon shift at St. Paul's Hospital in Vancouver have been molested and in more severe cases raped while walking home to their apartments in the West End of the City. One of the moves taken by police to reduce the frequency of such incidents was to distribute "Crime-Stop" bulletins to nurses working at St. Paul's Hospital and living in the West End. The bulletin warned them of the dangers in walking home alone after shift, and suggested several alternative ways of

getting home which would avoid placing them in such a vulnerable position.

At this point, however, the question is raised. How is one to measure the extent to which nurses who were sent the bulletin actually read it, took to heart the advice offered by police, and as a result acted to reduce the opportunity for molesting and rape in that area of the City. Once again, the analyst is forced to rely upon the frequency and seriousness of molestings and rapes in the area, subsequent to the public education campaign, as the only available measure of desirable impact.

The third goal of the Crime Prevention Program is "to promote and encourage community self-policing". This goal relates to the desirable impact of the public education function, that of making local citizens more alert to crime which may be occurring in their neighbourhood and of encouraging them to report promptly to police any suspicious persons or activities which they observe in their area. Let us take a specific example for purpose of illustration.

The incidence of residential break and entering, let us assume, is increasing rapidly in the West Point Grey area of the City. One of the steps taken by police to halt this trend is a door-to-door community relations campaign designed to alert local citizens to the problem in their area and to encourage them to report immediately to police any suspicious persons or activities which they may observe in their vicinity. In this case, one of the possible indicators of impact of this campaign is the resulting increase in the number of complaints received by police from residents of the area regarding suspicious persons and activities occurring in their neighbourhood. The ultimate impact of this function upon the incidence of residential break and entering in the area, however, will depend upon police response to these complaints.

The fourth and final goal of the Crime Prevention Program is "to retard the development of criminality, particularly in youth". This goal relates to the desirable impact of the youth counselling function, that of counselling young people in society. And, also, it relates to the desirable impact of the community policing function, that of addressing the social, economic and psychological root causes of criminality through a comprehensive social program. Criminality, it will be recalled, is the propensity, mental attitude or state of mind which allows an individual to commit criminal acts whenever the opportunity arises. Unfortunately, the presence or absence of criminality in the human psyche cannot as yet be measured. Thus, once again, the analyst is forced to fall back upon the crime rate as the only available measure of the desirable impact of the Crime Prevention Program.

In the foregoing discussion, it became apparent that there are only two indicators of the desirable impact of the Crime Prevention Program. These are the frequency and seriousness of crime occurring in the City, and the frequency of citizen complaints. The first indicator can be related to all goals of the program, while the second indicator can only be related to the third goal. Both indicators demand further qualification which is provided in the following paragraphs.

5.4 Factors Affecting the Crime Rate

The crime rate must be considered the primary indicator of the impact of the Crime Prevention Program. But behind this apparently straightforward index lie several significant factors which must be taken into consideration before an accurate interpretation of it can be made. These factors are:

(1) the reportability rate for different types of crime; (2) the relative seriousness of different crimes; (3) the area of the city in which the crime has occurred; and, (4) the period of time over which crime occurs.

5.4.1 The Level of Reportability

The reportability rate, for a particular type of crime, is the total frequency of that crime reported to police, as a percentage of the total frequency of that crime actually occurring. From an estimate of reportability, the probability that an offense will be reported to police, can be inferred.

Sellin and Wolfgang (1964) suggest that there are five broad classes of crime, according to the level of reportability: (1) consensual offenses, (2) conspiratorial offenses, (3) hidden individual offenses, (4) offenses whose reportability is affected by the extent of police activity; (5) offenses with serious bodily injury, loss of, or damage to property. The first three types of offense are considered to have "low" reportability, while only the fifth is considered to have "high" reportability. The lack of preciseness in estimating percentage reportability, is an indication of the lack of knowledge which exists concerning reportability rates of different types of crime. Until more accurate and reliable reportability rates are determined, the relationship between the crime rate, for a particular type of offense, and the actual frequency of occurrence of that offense, will remain in serious doubt. The crime rate for offenses involving relatively significant physical injury and property loss to the victim, may be an accurate indicator for those types of crime. Nevertheless, there is an urgent need to determine the degree of accuracy of reported crimes as measures of the actual frequency of crimes occurring.

5.4.2 The Seriousness of Crime

When evaluating the impact of crime upon the victim, three elements of impact appear to be significant: (1) the physical; (2) the economic; and (3) the psychological impacts. Psychological impact is listed third, because it is believed to arise from a combination of, or interaction with, the previous two. The psychological impact of crime may vary, according to the temperament or psychological make-up of the victim. However, the physical and economic impact of crime can be recorded in consistent units in order to arrive at a reliable index of the relative seriousness of crime. The least contentious scheme involves the weighting of crime according to its relative seriousness on a simple ordinal ranking scale.

The fact that current crime rates do not take into consideration the relative seriousness of reported crime means that any changes in the impact of crime upon its victims is not recorded. This is particularly important when the crime index contains a wide variety of crimes with significantly different levels of impact upon victims.

The point to be made is that crime prevention functions may have a considerable impact upon the level of seriousness of crime occurring in the city. However, if the crime index as currently constituted does not measure such changes, the erroneous conclusion will be that the crime prevention functions have no impact.

5.4.3 Areas in the City

Accurate and reliable monitors of the frequency and seriousness of crime, for particular areas within the city, are extremely important if the effectiveness

of specific crime prevention functions is to be correctly evaluated.

Ideally, the reporting of crime should be incorporated into a city-wide geocoding system which has already been developed for Vancouver by the municipal engineering department. The need for a geocoded system of crime reporting is so that the frequency and seriousness of crime can be measured for specific target areas of the city in which crime prevention functions are being carried out by police, and other social agencies.

5.4.4 The Period of Time Over Which Crime Occurs

Many factors have a significant influence upon the length of time between initiation of a police crime prevention function in a particular area of the city, and when the impact of that function upon crime in that area may be felt. The most obvious difference in the time lags of crime prevention functions can be illustrated by comparing the preventive patrol function and the youth counselling function.

Preventive patrol has the most immediate effect upon crime in its area of application. But, not only is the impact of its application immediate, but also the impact of its withdrawal. Thus, measurement of the effectiveness of the preventive patrol function must be extremely time oriented. An inappropriate choice of the time period of analysis might lead to the erroneous conclusion that preventive patrol had been ineffective, and hence police performance poor. Whereas what actually is reflected is the fact that this particular strategy of crime prevention has little, if no, lasting impact upon crime in an area.

On the other hand, the youth counselling strategy may be slow in showing results, but then the impact may be more lasting. In contrast to the preventive patrol strategy, youth counselling is slower at producing results, but then has a more lasting impact.

The point to be made, however, is that the time period of analysis is very critical when attempting to ascertain the true impact of a particular crime prevention strategy. The type of strategy largely determines the parameters which should be considered when choosing an appropriate time period of analysis.

In conclusion, it is evident from the foregoing discussion that several major refinements must be made in the crime index, as now constituted, in order for it to be an accurate and reliable indicator of impact for the Crime Prevention Program.

5.5 Factors Affecting the Frequency of Citizen Complaint

There are three factors which appear to have a significant effect upon the frequency of citizen complaints originating from a particular area of the City. These are: (1) population density, (2) socio-economic status, and (3) recent police activity in the area.

5.5.1 Population Density

For crime to occur is a necessary, but not sufficient condition for crime to be recorded. Initially, crime is either experienced or discovered by the

victim, or observed by a passer-by. The density of population in a particular area of the city has an influence upon the number of potential victims and the number of potential observers of crime. Thus, it would seem that the frequency of citizen complaints to police from a particular area of the city would be positively correlated with the population density of that area.

5.5.2 Socio-Economic Status

While the first step in the flow of information to police is the experience, discovery or observation of the event, the second is the perception of that event as a serious crime which should be reported to police. Socio-economic status of a neighbourhood has some influence on the perception of an event as a serious crime. Police often use the example of a drunk walking down the street of an upper class area of the city, as opposed to the same drunk walking down the street in the Skid Road area of town. In the first instance the incident is surely reported, in the second, it may go virtually unnoticed. Thus, it would seem that the frequency of citizen complaints to police from a particular area of the city would be positively correlated with the socio-economic status of the residents living there.

5.5.3 Nature of Recent Police Activity

Depending upon the nature of police activity in an area, this factor may be positively or inversely related to the frequency of citizen complaints originating from that area. If, on the one hand, residents become aware through their own perception of an increased police presence, then, the frequency of complaints to police from that area may fall. On the other hand, if a door-to-door public education campaign by police has encouraged residents

to be alert to suspicious persons or activities occurring in their neighbourhood and to report them immediately to police, then, the frequency of citizen complaints may rise. Thus, the nature of recent police activity in a particular area of the city, may have a significant effect upon the frequency of citizen complaints originating from that area.

It may be concluded, therefore, that the frequency of citizen complaints as an indicator of the impact of the Crime Prevention Program in a particular area of the city, must be carefully interpreted, keeping in mind these three important factors discussed above.

5.6 Use and Interpretation of Input, Output and Impact Accounts for the Crime Prevention Program

The process of program evaluation as defined in this thesis consists of six integral steps:

1. conceptualization of indicators of input, output and impact for each police function
2. expressing goals in terms of indicators of impact and operating objectives in terms of indicators of output, for each function
3. collecting indicators of input, output and impact for the reporting period under consideration
4. answering the five central questions of program evaluation
5. interpreting the results
and
6. confirming present allocation or re-allocating resources consistent with this interpretation.

In order to illustrate how this process operates for the Crime Prevention Program, let us consider a concrete example. Construction of the Granville Street Mall in Vancouver in 1974 focused attention on making that area of the city an attractive and appealing place for the general population. One of the problems in making the Mall a safer place to be was the high incidence of crime occurring in the area. To combat this problem, the Police Department decided to increase preventive patrol of the area from two to four constables per shift.

Table 5.1 below presents the performance accounts for the Granville Street area of the City for the first quarter of 1974.

TABLE 5.1

Hypothetical Entries for the Input,
Output and Impact Accounts of the
Crime Prevention Program, Preventive
Patrol Function: Granville Street Area,
January 1 to March 31, 1974 (Shift Averages)

| INPUT | OUTPUT | IMPACT |
|--|---|---|
| Manpower: 2 Constables Average Proficiency Index 7.5 Total Cost \$100.00 | Number of Persons Checked 30 Number of Rounds of the Beat 10 | Total Crime Reported to Police: - Frequency 100 - Average Degree of Seriousness 7.5 Total Complaints Made to Police: - Frequency 150 - Average Degree of Seriousness 2.5 |

After reviewing the accounts for the period January 1 to March 31, 1974, the police decide that there is need for improvement in the crime situation along the Granville Mall, and move to establish goals and operating objectives in terms of the indicators of impact and output entered in the accounts, as follows:

Goals

- the frequency of crime should be no more than 25 per shift
- the seriousness of crime should be no more than 6.5 per shift
- the frequency of complaints should be no more than 50 per shift
- the seriousness of complaints should be no more than 1.5 per shift

Operating Objectives

- at least 50 persons should be checked per shift
- at least 30 rounds of the beat should be made per shift

At the end of the second quarter of the year, the police evaluated their program on the basis of the performance accounts presented in Table 5.2 below.

TABLE 5.2

Hypothetical Entries for the Input,
Output and Impact Accounts of the
Crime Prevention Program, Preventive
Patrol Function: Granville Street Area,
April 1 to June 30, 1974 (Shift Averages)

| INPUT | OUTPUT | IMPACT |
|---------------------|---------------------|-----------------------|
| Manpower: | Number of Persons | Total Crime Reported |
| 4 Constables | Checked 40 | to Police: |
| Average Proficiency | Number of Rounds of | - Frequency 50 |
| Index 7.5 | the Beat 25 | - Average Degree of |
| Total Cost \$200.00 | | Seriousness 7.0 |
| | | Total Complaints Made |
| | | to Police: |
| | | - Frequency 100 |
| | | - Average Degree of |
| | | Seriousness 2.0 |

After a detailed review of the performance accounts, the police made the following conclusions.

Goals generally fell short of their target. During the second quarter, the frequency of crime was 50 per shift with an average seriousness of 7.0 as compared with the target of 25 per shift and an average seriousness of 6.5. Furthermore, the frequency of citizen complaints was an average of 100 per shift with an average seriousness of 2.0, as compared with the target of 50 per shift with an average seriousness of 1.5. (It should be noted here that seriousness of crime is measured on a maximum scale of 10, while seriousness of complaints is measured on a maximum scale of 3. Complaints are given a priority of 1, 2 or 3 according to their degree of seriousness. A weight is then assigned to each complaint, inversely related to its priority.)

Calculation of impact efficiency, that is, the ratio of input to impact, revealed that for every additional two dollars of input, the frequency of crime as well as the frequency of complaints dropped by two. Furthermore, an alternative measure of impact efficiency revealed that for every \$200.00 additional expenditure the seriousness of crime and of complaints dropped by one point.

Operating objectives generally fell short of their target. During this period, only an average of 40 persons per shift were being checked, as compared with the target of 50 persons; and, only an average of 25 rounds of the beat per shift were being made, as compared with the target of 30 rounds.

Output efficiency had risen in terms of one indicator and fallen in terms of another. In terms of the number of persons checked, output efficiency

dropped from 15 persons to 10 persons checked per constable. In terms of the number of rounds of the beat, output efficiency rose from 1 round to 1.25 rounds of the beat for every \$10.00 cost.

Selected measures of effectiveness revealed that for every additional person checked in the area the frequency of crime dropped by 5, for every additional round of the beat citizen complaints dropped by 3.

The police concluded from this program evaluation that their goals and operating objectives had not yet been fully attained, but that marginal impact efficiency was sufficient to suggest that a further augmentation of the quality or quantity of manpower allocated to the beat might yield improved results. They could not afford, however, to spend any more funds on this project as their budget was limited. They therefore decided to improve the quality of manpower allocated to the beat, since to increase the quantity would have forced them to overspend their budget. They thus allocated their four best police constables to patrol the area. This decision is reflected in the increase in the proficiency index from 7.5 to 8.5.

At the end of the third quarter of the year, the police again evaluated their program on the basis of the performance accounts presented in Table 5.3 on the following page.

TABLE 5.3

Hypothetical Entries for the Input,
Output and Impact Accounts of the
Crime Prevention Program, Preventive
Patrol Function: Granville Street Area,
July 1 to September 30, 1974 (Shift Averages)

| INPUT | OUTPUT | IMPACT |
|--|---|---|
| Manpower: 4 Constables Average Proficiency Index 8.5 Total Cost \$200.00 | Number of Persons Checked 50 Number of Rounds of the Beat 30 | Total Crime Reported to Police: - Frequency 25 - Average Degree of Seriousness 6.5 Total Complaints Made to Police: - Frequency 50 - Average Degree of Seriousness 1.5 |

As a result of their analysis of the performance accounts, the police concluded that by the end of the third quarter both goals and operating objectives had been achieved. Furthermore, marginal impact efficiency revealed that for every increase of 1.0 unit in the proficiency index, the frequency of crime dropped by 25 and the frequency of complaints dropped by 50.

This illustration shows how police would employ the proposed input, output and impact accounts to answer the five central questions of program evaluation, and how the answers were interpreted to result in a re-allocation of resources within the Department.

This illustration is not meant to imply that the indicators contained in the accounts are indeed valid. It must be emphasized that they are merely put forth as educated suggestions, and yet require empirical verification and

testing. In fact, the one indicator which might be seriously questioned even at this stage is the number of persons checked per shift. However, if one assumes that there is an unlimited number of people on the street which should be checked, then it becomes a more valid measure of productivity rather than merely the size of the street population.

5.7 Areas of Further Refinement and Research

What is actually being proposed in this analysis is to identify the parameters and to determine the nature of the relationship between them in the production functions and the social welfare functions of police programs. We know intuitively that there must be indicators of input, output and impact. We know that they are related in general mathematical terms as follows:

Output = f (Inputs), and

Impacts = f (Output), or

Impacts = f (Output) = f (Inputs).

We have even implied whether these parameters are positively or inversely correlated.

The next step in the development of performance accounts is to verify the indicators of input, output and impact, determine empirically the nature of the relationship among them, and thus construct the production and social welfare functions of police programs.

5.8 Concluding Remarks

Apart from the fact that most of the indicators proposed for the accounts were based upon educated speculation, several points have been made clear in this chapter:

1. indicators of input, output and impact can be conceived for police functions,
2. goals and operating objectives for police functions can, in a meaningful and useful sense, be described in terms of quantitative and qualitative indicators of impact and output, respectively, and
3. program evaluation is a useful tool for allocative decisions and requires that (1) and (2) above occur.

CHAPTER 6

THE PUBLIC SAFETY PROGRAM AND ITS SUPPORTING FUNCTIONS

This chapter deals with the second program of the Vancouver Police Department, the Public Safety Program. The previous chapter was concerned with the Crime Prevention Program and the following chapter will be concerned with the Apprehension and Recovery Program.

There are three purposes of this chapter. The first is to identify indicators of output for the citizen complaint function of the Public Safety Program, and to identify indicators of the desirable impacts of this function in the context of that Program. The second is to illustrate how these measures can be employed to answer the five central questions of program evaluation, and the implications of the answers for resource allocation within the Vancouver Police Department. And, lastly, this chapter will attempt to pinpoint areas in need of further refinement and research if these concepts are to become fully operational.

The Public Safety Program of the Vancouver Police Department has five goals: (1) to protect persons from injury, (2) to aid persons in need of assistance, (3) to secure property against theft, (4) to protect property from damage, and (5) to maintain public order. Four functions of the Department were seen as supporting the goals of this Program: (1) the citizen complaint function, (2) the crowd control function, (3) the escort duty function, and (4) the civil disaster co-ordination function.

If the reader wishes to refresh his understanding of these functions, he is referred to Chapter 3, pages 57 and 58, where they have been described in detail.

In contrast to the Crime Prevention Program, the functions of the Public Safety Program cannot be looked upon as alternative strategies for addressing the same problem. Rather, each function of the Public Safety Program is tailored to meet the special requirements of a particular situation. For example, police can choose which of the five functions supporting the Crime Prevention Program will be used to tackle a particular problem for which crime prevention may be a useful strategy. If there was trouble in the Dunbar area of the City with juvenile gangs, police are not restricted by the nature of the problem in choosing an appropriate strategy. In fact, police could choose one or a combination of crime prevention functions to cope with this problem with perhaps the same result. In other words, the circumstances of the problem in no way dictate to police what particular crime prevention functions must be employed to meet the problem. On the other hand, each of the four public safety functions are specifically tailored to meet the circumstances of a particular public safety problem.

The citizen complaint function is specifically designed to respond to the individual requests from private citizens for police assistance. The crowd control function is specifically designed to meet the threat to public safety arising out of the volatile atmosphere of dense crowds of people. The escort duty function is specifically designed to accommodate the dangers to specific persons or property which may come about from exposure to criminal elements in public areas or thoroughfares. And, the civil disaster co-ordination function is specifically designed to preserve human life and property in the

event of a major natural or technological disaster. Thus, each function is tailored to respond to the circumstances of a particular situation where public safety is being threatened. These functions should not, therefore, be looked upon as alternatives.

The citizen complaint function is one of the major functions of the Vancouver Police Department. In comparison, the functions of crowd control, escort duty and civil disaster co-ordination are less significant in terms of the daily operation of the Department because of their relatively low frequency of occurrence. Furthermore, the planning, implementation and evaluation of crowd control, escort duty and civil disaster co-ordination functions are generally unique to a particular incident. For these reasons, development of performance accounts for the citizen complaint function was seen as being a more relevant task than development of accounts for the other three functions of this Program. Thus, this chapter is devoted entirely to the citizen complaint function at the expense of these other functions.

6.2 Proposed Entries for the Output Account

In order to develop indicators of output for the citizen complaint function of the Public Safety Program, the production function of this service was thoroughly examined. The telephone answering personnel, the radio dispatchers, the police units in the field and the citizens in the community were all subjects of analysis. Both quantitative and qualitative indicators of output were sought. The results of the analysis are discussed below.

6.2.1 Quantitative Indicators of Output

The only quantitative indicator of output which was identified for the citizen complaint function is call-load, that is, the number of requests for police assistance. Call-load may be qualified in terms of the area of the city from which the calls originated, and the reporting period over which the calls were made.

There are two reasons why a planner working for police should be aware of call-load. First, police units should be allocated among working shifts of the day, and among police districts of the city, according to call-load. Second, the difference between actual call-load and call-load capacity for a particular working shift or police district will indicate whether the supply of police units is excessive, adequate or insufficient in relation to the demand for police service.

Let us assume that in the first instance, the average call-load for the 8:00 to 16:00 hours work shift has been calculated over the last six months to be as indicated below in Table 6.1.

TABLE 6.1

Average Call-load Per District:
Working Shift 8:00 to 16:00 Hours

| <u>District</u> | <u>Average Call-load</u> | <u>Percentage</u> |
|-----------------|--------------------------|-------------------|
| 1 | 80 | 27% |
| 2 | 70 | 23% |
| 3 | 55 | 18% |
| 4 | 95 | 32% |
| Totals | 300 | 100% |

The general principle to be followed here is that police units should be allocated in proportion to the magnitude of the call-load in each district. Thus, the 30 police units available for this shift should be allocated as follows: 8 units to District 1, 7 units to District 1, 6 units to District 3 and 9 units to District 4.

Some controversy does exist as to whether the allocation of police units should be based upon total call-load or peak call-load per shift. But this debate does not invalidate the general principle upon which the allocative decision for this police function is founded.

It is also critical for the planner working for police to be alert to the difference between actual call-load and call-load capacity. The divergence between actual call-load and call-load capacity indicates the gap between the demand for and the supply of police units in the field. This case is an example of the general distinction between real output (actual call-load) and output capacity (call-load capacity) which has already been discussed in some detail in Chapter 2, pages 30 and 31.

The real output of the citizen complaint function is actual call-load. It is related to the demand for police assistance in the community. Call-load can, to some degree, be influenced by police action. It can be affected by the success of the Crime Prevention Program, since demand for police service is usually related to the frequency and seriousness of criminal activity. And, it can also be affected by response time, that is, the speed with which police respond to citizen requests for assistance.

On the other hand, the output capacity of the citizen complaint function is call-load capacity. It is related to the supply of police units assigned to the citizen complaint function during a particular work shift or in a particular police district of the city. Call-load capacity, like actual call-load, can also be influenced by police action. The more efficient police become in carrying out the activities of the citizen complaint function, the greater will be call-load capacity.

Actual call-load is equal to the number of requests for police assistance. Call-load capacity is, on the other hand, equal to the maximum number of such requests which can be accommodated by the supply of police units allocated to the citizen complaint function. Thus, actual call-load can be readily ascertained from police records. However, call-load capacity can only be determined by a relatively complex series of calculations.

It was said in a previous paragraph that the more efficient police become in carrying out the activities which comprise the citizen complaint function, the greater will be the call-load capacity for that function. This was meant to imply that the call-load capacity for a particular work shift is related not only to the number of police units assigned to this function, but also to the speed with which police carry out their duties. The length of time for police to service a call is called service time. Service time is equal to travel time plus clearance time, where travel time is the number of minutes between assignment of a police unit to the call and arrival of the unit at the scene, and where clearance time is equal to the number of minutes between arrival of the unit at the scene and completion of the investigation of the complaint.

Let us consider an example of how call-load capacity is to be calculated. During an eight-hour work shift, 10 police units are assigned to the citizen complaint function for a particular sector of the city. Over the past six months, the average travel time per call has been calculated to be 10 minutes, and the average clearance time per call has been calculated to be 20 minutes. From this information the following calculations can be made:

1. average service time per call is equal to $(10 \text{ minutes} + 20 \text{ minutes} = 30 \text{ minutes})$ 30 minutes,
and
2. total manhours available during the eight-hour shift is equal to $(8 \text{ hours} \times 10 \text{ men} = 80 \text{ manhours})$ 80 manhours,
therefore
3. total estimated call-load capacity is equal to $(4800 \text{ man-minutes} / 30 \text{ minutes} = 160 \text{ calls})$ 160 calls per shift.

The accuracy of estimated call-load capacity will depend upon the standard deviation from average service time per call and the distribution of calls over the duration of the work shift.

The planner working for police should monitor call-load capacity in relation to average call-load and peak call-load for each police district in the city. Call-load capacity should be maintained somewhere between average call-load and peak call-load. Furthermore, the relationship between call-load capacity and average call-load and peak call-load should be kept about the same for each district.

In conclusion, there are two quantitative indicators of output for the citizen complaint function. They are actual call-load and call-load capacity. Actual call-load may be expressed as total, average or peak call-load. The relationship between call-load capacity per hour and average call-load per hour and peak call-load per hour are crucial to the success of the citizen complaint function and, hence, the performance of the Public Safety Program. The following section deals with qualitative indicators of output for the citizen complaint function.

6.2.2 Qualitative Indicators of Output

The previous section was concerned with the identification and interpretation of actual call-load and call-load capacity as quantitative indicators of output for the citizen complaint function. This section, on the other hand, is concerned with three indicators of the quality of output of this function. They are: (1) the speed of police response to citizen requests for assistance, (2) the appropriateness and adequacy of police coverage at the scene, and (3) the speed with which the police role is carried out at the scene.

The Speed of Police Response. The length of time between completion of the last digit of the police emergency number by the complainant and arrival of the first police unit at the scene is called total response time. It is this notion of response time which can be directly linked to the citizen's

perception of police performance. Total response time is, however, composed of several distinct time elements, each of which has special implications for remedial action. These composite elements are, in order of the sequence in which they occur:

1. answering time,
2. comprehension time,
3. dispatch time,
4. stacking time, and
5. travel time.

Thus, the following relationship exists between Total Response Time and its composite elements:

$$\begin{aligned} \text{Total Response Time} &= \text{Answering Time} + \text{Comprehension Time} \\ &+ \text{Dispatch Time} + \text{Stacking Time} + \text{Travel Time.} \end{aligned}$$

Answering Time. The Length of time between completion of the last digit of the police emergency telephone number by the complainant, and the initial verbal contact of the complainant with a member of the Police Emergency Telephone Center is called answering time. An increase in answering time may imply that additional trunk lines should be installed for the police emergency number, or that additional personnel should be recruited for the Telephone Center in order to handle in-coming calls more promptly.

Comprehension Time. The length of time between receipt of the complaint by Emergency Telephone Center personnel, and notification of the Dispatcher in the Radio Room of the address to which police units are to respond and the priority of the call is called comprehension time. As defined here, comprehension time is an indicator of the speed with which Emergency Telephone Center personnel are able to record two vital pieces of information: (1) the address to which police units are to respond, and (2) the priority of the call. Therefore speed is not the only measure of performance. Speed, alone, may give a biased picture of performance. To complement speed, the accuracy with which Emergency Telephone Center personnel determine address and priority should also be considered.

The order in which this information is relayed to the dispatcher is also important. It is critical for the dispatcher to know the address of the scene to which police have been requested to proceed, in order to ascertain the availability of police units in the general vicinity of the address. Since this is the most difficult task facing the dispatcher, the address of the scene should be given to him as soon as possible so that he is able to develop his strategy of deployment. The priority of the call is the second most important piece of information needed by the dispatcher. Once he has determined the general availability of police units in the vicinity of the scene, the priority of the call will indicate to him whether police units already assigned to previous calls should be re-assigned to this call. Thus, the order in which these two vital pieces of information are relayed to the dispatcher is also of some importance.

Of the two pieces of information, the address to which police are to proceed is perhaps the more obvious. However, the priority of the call is also of critical importance in determining the entire pace of response to the request for assistance. In fact, it is upon the ability of Emergency Telephone Center personnel to accurately ascertain the true priority of a call that the ultimate success of police action may depend.

Thus, while comprehension time is an indicator of the speed with which this particular phase of the operation is executed, the percentage of calls for which the address of the scene is accurately recorded, and the percentage of calls for which the priority is correctly determined should be used as complementary indicators of the performance of this phase of the operation.

Dispatch Time. The length of time between notification of the dispatcher of the call by Emergency Telephone Center personnel and assignment of the call to police units in the field by the dispatcher is called dispatch time. Should a police unit be available immediately to be assigned the call, travel time begins. Should a police unit not be available, stacking time commences.

Dispatch time can be related to call-load and the ability of the dispatcher. If the frequency of calls were stable, but dispatch time was increasing, one might question the efficiency of the dispatcher. However, if the frequency of calls were to increase concurrently with an increase in dispatch time, one would suspect that it was the increased volume of calls and not the ability of the dispatcher which was at the root of the increase in dispatch time. If

dispatch time is continuously higher than some predetermined standard, appropriate remedial action would be to assign additional dispatchers to the job, or to automate certain elements of the decision-making process inherent in this phase of the operation.

Stacking Time. The length of time between the first attempt of the dispatcher to assign the call to a police unit in the field, and the ultimate assignment of an available unit to the call is called stacking time. Stacking time reflects the availability of police units in the field relative to the call-load. As defined here, stacking time is an indicator of several related but distinct conditions in the field. For example, a rise in stacking time above some predetermined standard may reflect one or more of the following conditions: (1) an increase in travel time above the six-month floating average because of an inefficient deployment of police units over the geographical area of the city; (2) an increase in clearance time above the six-month floating average because of a rise in the seriousness of crime or a decline in police efficiency at the scene; or (3) a general deficiency in the supply of police units in the field relative to the demand for them.

Travel Time. The length of time between assignment of the call to a police unit by the dispatcher, and arrival of the first unit at the scene is called travel time. Travel time can be related to the density as well as the pattern of police units over the surface area of the city in relation to the spatial distribution of calls.

The number of police units assigned to a particular work shift will have an affect on availability which will be reflected in stacking time. This linkage has already been discussed. But the concept of density incorporates

not only the total number of police units available, but also their spatial distribution over the surface area of the city. To illustrate this notion of density, let us assume that the city is divided into 100 cells of equal area and that the probability of police having to attend a scene in any one of the cells is 0.01. If the present complement of 25 police units is evenly distributed over the 100 geographic cells in the city, there will be one police unit for every four cells. Hence, the probability that there is a police unit in any one cell is $(1/4 = 0.25)$ 0.25. Let us then assume that the present complement of 25 police units is augmented to a total of 50 units. The probability that there is a police unit in any one cell therefore rises to $(1/2 = 0.50)$ 0.50. Travel time will obviously be shorter if the police unit is already in or adjacent to the cell where the incident is occurring. Thus, a 50 per cent increase in the density of police units will have the affect of reducing average travel time by approximately 50 per cent.

In actual fact, of course, the probability of police having to attend a cell varies from cell to cell. This is the reasoning behind recommending that police units be allocated among work shifts and areas of the city in proportion to the call-load in each time-place cell.

In concluding our discussion of total response time and the various time elements which comprise it, emphasis should be given to the fact that response time is a qualitative indicator of output of the citizen complaint function. It indicates how well police are executing this particular function. In this light, response time has several practical implications. First, response time has a significant affect on public safety, for the more promptly police respond to requests for assistance, the less the seriousness of victimization will be. Second, response time has a deterrent affect in that knowledge of prompt response by police will tend to discourage criminal activity.

And, finally, the general public frequently associate their idea of police competence with response time. Hence, response time has implications for the image of police competence in the eyes of the public.

The Appropriateness and Adequacy of Police Coverage. One could conjure up many refined and sophisticated indicators of the appropriateness and adequacy of police response to a citizen's request for assistance. But one must temper his choice by two important considerations. First, the cost of retrieving the indicators must remain within reasonable limits. And, second, the indicators must have significant implications for the quality of police service provided at the scene. Given these constraints, two indicators appear to be pertinent here. One, the type of resources, and two, the number of resources applied at the scene. By type is meant either marked or unmarked police vehicles. And, by number is meant the number of police vehicles, and hence manpower, applied at the scene. In most cases, police units assigned to the citizen complaint function are one-man units. Thus, the quantity of manpower represented by each unit can be taken as constant.

The Type of Police Vehicle Dispatched to the Scene. On the surface the distinction between marked and unmarked vehicles may not seem important, but in certain circumstances an unmarked vehicle provides police with significant advantages. A recent example may help to illustrate this point. A fugitive was holding the wife of a local bank vice-president hostage for \$20,000 ransom at their home in the city. The police dispatcher, having been notified by an accountant at the bank of the situation, attempted to assign an unmarked unit to place the residence under surveillance and to provide assistance should the right opportunity present itself. However, no unmarked police unit was available at the time, and since the call demanded some

degree of urgency, a marked car was assigned to the scene. The fugative saw the marked car. Not only was he forewarned of imminent police action, but the site of the marked police car so distraught him that he almost murdered his hostage. Thus, use of the marked car put the life of the hostage in jeopardy, and alerted the fugative to the possibility of police intervention.

The Number of Police Units Deployed to the Scene. The number of police units assigned to a call, in contrast to the number of units which should, ideally, be deployed to the scene is also an important indicator of the quality of output of the citizen complaint function. Depending upon the seriousness of the call, a reporting unit and one or more covering units are assigned to the call. The discrepancy between the number of units which were assigned to the call, and the number of units which should have been assigned, has clear implications for the quality of service being provided to the community. Once again, an example will help to illustrate this point. A bank robbery is a serious crime not only because of the monetary loss to the bank, but also because of the psychological shock which accompanies such an episode and the potential physical injury to persons in and near the bank. From their past experience, police know that an adequate response to a bank alarm is a minimum of seven policemen. Any fewer units attending the scene, puts a constraint upon police strategy at the bank. Thus, if less than seven policemen are deployed to attend a bank alarm, it constitutes an inadequate police response to the call. It is perfectly feasible that such standards of police response could also be developed for other types of calls. Table 6.2 on the following page illustrates how qualitative indicators could be constructed from this information.

TABLE 6.2

Development of a Qualitative Indicator
of the Adequacy of Police Coverage by
Type of Call

| Type of Call | Minimum Number of Policemen | Actual Number of Policemen Deployed | Calls Receiving Inadequate Coverage | Total Number of Calls |
|---|--------------------------------|--|--|-----------------------------|
| Silent Alarm | 2 | 2 | 0 | 1 |
| Strongarming in Progress | 2 | 2 | 0 | 1 |
| Officer in Trouble | 3 | 2 | 1 | 1 |
| Purse Snatching | 3 | 2 | 1 | 1 |
| Bank Alarm | 7 | 5 | 1 | 1 |
| Totals | | | 3 | 5 |
| Calls Receiving Inadequate Coverage as a Percentage of the Total Number of Calls: $3/5 \times 100 = 60\%$ | | | | |

The percentage of total calls for which police response meets these minimum standards is an important qualitative indicator of output of the citizen complaint function. The examples used in Table 6.2 are simplified. In cases involving three or more policemen, one of the policemen is a supervisor. And in the other cases, a member of the dog squad should also be in attendance.

In conclusion, it can be said that at least two qualitative indicators (how well) of output of the citizen complaint function can be developed concerning the adequacy of resources applied at the scene.

The Speed with which the Problem is Resolved at the Scene. Once they have arrived at the scene, police carry out two activities. First, there is direct physical action which may be called crisis intervention. And, subsequently, there is an investigation of the incident which is necessary to obtain information upon which arrest and prosecution of the offender may be based and the recovery of stolen property may depend.

The length of time between arrival of police at the scene, and the termination of their role when they radio the dispatcher "clear for service" is called clearance time. It is not known what portion of clearance time is spent on investigation. However, it is known that clearance time as a whole will depend upon the seriousness of the call, and the adequacy of police resources deployed to the scene. Consequently, an increase in average clearance time per call may not imply a drop in police efficiency, but perhaps a rise in the seriousness of calls or an increase in the number of calls to which police response is inadequate.

In conclusion to this section, a list of indicators of output for the citizen complaint function is provided below:

Quantitative Indicators

1. average and peak call-load
2. call-load capacity

Qualitative Indicators

1. total response time
 - answering time
 - comprehension time
 - dispatch time

- stacking time
 - travel time
2. the appropriateness and adequacy of police coverage
 - the type of police vehicle dispatched
 - the number of police units deployed
 3. clearance time

The next section deals with a discussion of proposed entries for the impact account of the citizen complaint function.

6.3 Proposed Entries for the Impact Account

The three police programs, Crime Prevention, Public Safety and Apprehension and Recovery, can be related to a respective timeframe, namely, before, during and after crime has occurred. As such, the Public Safety Program is a form of crisis intervention designed to protect persons from injury, to aid persons in need of assistance, to secure property against theft, to protect property from damage, and to maintain public peace and order. The citizen complaint function of the Public Safety Program is based upon the assumption that police assistance, intervention or mere presence will have an ameliorating affect upon the impact of crime. The impact of crime can be measured in terms of the indicators of seriousness which have already been referred to several times throughout the thesis. And, furthermore, apart from the objective or empirical measure of the impact of crime, there is also the subjective impression of the complainant as to the performance of police in the execution of their duties. Consequently, when examining the impact of the citizen complaint function,

there are two aspects to be considered. The first aspect involves an empirical measurement of the effect of police intervention upon the seriousness of crime occurring in the city. And, the second aspect is concerned with obtaining feedback from the public about their evaluation of police performance.

6.3.1 The Effect of the Citizen Complaint Function Upon the Seriousness of Crime

Without a doubt the existence of the citizen complaint function acts as a general deterrent against crime occurring in the city. The widespread knowledge that police will promptly respond to requests for assistance must have an overall effect upon the frequency and perhaps the seriousness of crime. But this aspect of the citizen complaint function may be taken as given for purposes of our analysis.

The initial task facing the planner working for police is to develop some technique for ascertaining the effect of crime upon its victims. Once such a method has been devised, the planner will have a statistical tool with which he can tell police management the extent to which they are satisfying the goals of this function.

Consistent with the social indicator philosophy of comprehensiveness, the impact of crime upon its victims can be measured along four separate dimensions: the physical, the economic, the psychological and the social. Let us take each of them and examine them carefully.

The first dimension is the physical. Physical injury as a result of criminal victimization can readily be ascertained. A scale taking into

consideration the degree of suffering and the extent to which the victim's life was put in danger, can be developed for this dimension. A tentative list of categories which could form the basis for this scale are presented in Table 6.3. They are listed in order of their degree of seriousness as perceived by the author. Weights have also been arbitrarily assigned to each category, inversely related to their ordinal rank.

TABLE 6.3

Assessment of Physical Injury
Resulting from Crime

| <u>Extent of Injury</u> | <u>Assigned Weight</u> |
|--|------------------------|
| Minor Injury or Physical Intimidation | 1 |
| Treated but Discharged from Hospital | 2 |
| Hospitalized for One or More Days | 3 |
| Permanently Disabled | 4 |
| Killed | 5 |

The second dimension is the economic. Property loss as a result of theft or damage can easily be determined by the victim, the policeman attending the scene, or an insurance assessor. A scale based upon the total dollar value of property stolen or damaged can be developed for this dimension. A tentative list of categories which could form the basis for this scale is presented in Table 6.4. The weights assigned to each entry are merely meant to reflect the assumption that the economic impact of crime upon its victims is correlated with the total dollar value of property stolen, damaged or destroyed during the course of crime.

TABLE 6.4

Assessment of Property Loss
Resulting from Crime

| <u>Dollar Value</u> | <u>Assigned Weight</u> | <u>Dollar Value</u> | <u>Assigned Weight</u> |
|---------------------|------------------------|---------------------|------------------------|
| Under \$50 | 1 | \$1,001 - 5,000 | 6 |
| \$50 - 150 | 2 | \$5,001 - 10,000 | 7 |
| \$151 - 250 | 3 | \$10,001 - 25,000 | 8 |
| \$251 - 500 | 4 | \$25,001 - 100,000 | 9 |
| \$501 - 1,000 | 5 | \$100,001 or more | 10 |

The third dimension is the psychological. Whereas the physical and economic dimensions can be ascertained by an objective assessment of physical injury and property loss, the psychological dimension must be evaluated subjectively on the basis of the victim's emotional reaction to crime. While it is clearly understood that the psychological effect of crime upon the victim is closely related to actual or potential physical injury and property loss, it would appear that an additional, purely psychological element is present according to the nature of the crime itself. And, furthermore, this purely psychological element does not appear to be reflected in the more objective assessment of physical injury and property loss. An obvious example of such a case is rape. The physical injury and property loss resulting from this type of crime is frequently negligible, but one cannot question the fact that this crime has an extremely intense and often lasting traumatic effect upon the victim. A selected list of crimes is presented on the following page in Table 6.5. The weights assigned to them merely reflect their ordinal rank in terms of the author's perception of their relative psychological impact upon the victim.

TABLE 6.5Assessment of Psychological
Shock Resulting from Crime

| <u>Selected List of Crimes</u> | <u>Assigned Weight</u> |
|-----------------------------------|------------------------|
| Theft of Automobile | 1 |
| Residential Breaking and Entering | 2 |
| Common Assault | 3 |
| Robbery at Gunpoint | 4 |
| Rape | 5 |
| Homicide | 6 |

The final dimension of crime is the social dimension. This aspect of crime is more difficult to categorize than the other three, and even more difficult to evaluate. But there is no doubt that a social dimension of crime exists. Every time a crime occurs, a criminal is made or a habit of criminality is further reinforced. The family breadwinner, permanently disabled as a result of physical violence during the course of a crime, is no longer able to maintain the former social and economic status of his family. And, a father killed during a crime makes a wife a widow and a family fatherless. While it is not yet clear how these considerations might be categorized and weighted, one should be aware of their existence. Any measure of crime which fails to incorporate the social dimension of crime will be incomplete.

The major problem facing criminologists today is not identifying the dimensions of crime, or developing appropriate categories for each dimension, or even assigning weights to the categories, but rather how to incorporate all dimensions of crime into a single, summary index of seriousness. The only major contribution in this direction is that of Sellin and Wolfgang(1964). They isolated the elements of physical injury and property loss which result from crime. And, had each element rated on a magnitude scale of seriousness by

policemen, university students and court judges. The results from these surveys produced the weights attached to the elements of crime which are presented below in Table 6.6.

TABLE 6.6

Elements of Criminal Events
Weighted on a Magnitude Scale
of Seriousness by Policemen,
University Students and Court Judges

| <u>Elements Scored</u> | <u>Assigned Weight</u> |
|--|------------------------|
| I. Number of victims of bodily harm | |
| a) receiving minor injuries | 1 |
| b) treated and discharged | 4 |
| c) hospitalized | 7 |
| d) killed | 26 |
| II. Number of victims of forcible sexual intercourse | 10 |
| a) number of such victims intimidated by a weapon | 2 |
| III. Intimidation(except II above) | |
| a) physical or verbal only | 2 |
| b) by weapon | 4 |
| IV. Number of premises forcibly entered | 1 |
| V. Number of motor vehicles stolen | 2 |
| VI. Value of property stolen, damaged or destroyed(in dollars) | |
| a) under 10 | 1 |
| b) 10-250 | 2 |
| c) 251-2,000 | 3 |
| d) 2,001-9,000 | 4 |
| e) 9,001-30,000 | 5 |
| f) 30,001-80,000 | 6 |
| g) over 80,000 | 7 |

Source: Sellin and Wolfgang, 1964

It is important to understand the manner in which these weights were determined. The two most common techniques for constructing a psychological scale representing human psyche response to environmental stimuli are the category and magnitude scaling techniques. The category scale is constructed by asking the respondent to select a number running from 1 to 11 which most accurately describes in his mind the psychological weight of each criminal element. In contrast, the magnitude scale is constructed by asking the respondent to assign a number to each criminal element which is some multiple of a specific element which has been pre-assigned a standard weight. For example, if theft of auto had been pre-assigned the weight of 1, and the respondent felt that the crime of robbery was ten times more traumatic than theft of auto, he would assign the weight ($1 \times 10 = 10$) 10 to robbery.

Sellin and Wolfgang (1964) favored the use of the magnitude scale for several important reasons:

"... the relation between the magnitude and category scales shown in this study precisely duplicates the form of relation that has emerged in a variety of psychophysical studies where the physical scale was well known. In the area of psychophysics, a strong case has been made for the use of magnitude scales as appropriate characterizations of the mental effect of the stimulus ... the magnitude estimation scale values are a product of the rater rather than the experimenter, and as such have an inherent validity that cannot be claimed for the imposition of a fixed range of category values by the experimenter ... Another reason for choosing the magnitude scale is the inherently greater nuance that can be exhibited by the rater in his selection of responses."

Their reasoning points to the use of the magnitude scale as the more valid and accurate technique for measuring the psychological impact of criminal victimization. It was such a scale that was used to develop the weights presented in Table 6.6.

By 1968, the weighting scale for crime which had been developed by Sellin and Wolfgang for the United States had also been constructed for several other countries, such as Canada (Akman and Normandeau, 1968a), England (Akman and Normandeau, 1968b), and Belgian Congo (de Boeck and Houchon, 1968), Taiwan (Hsu, 1968), Indonesia (Normandeau and Saldanoer, 1968), Brazil (Reiss and Normandeau, 1968) and Mexico (Bell and Normandeau, 1968). In addition, Wolfgang (1968) has suggested to the Council of Europe that a standard weighted crime index for all European countries should soon be established.

The results of surveys in eight countries is presented in Table 6.7 on the following page. It reveals a noticeable degree of consistency among countries with a common value system, ethnic background, and religious and historical roots. For example, the set of weights for Canada, the United States and England are very similar. Also, the set of weights for Taiwan and Indonesia, and the weights for Brazil and Mexico, are similar as well.

In conclusion, several important observations and comments can be made about existing efforts to develop a weighted crime index. First, the scheme devised by Sellin and Wolfgang (1964) does include both physical injury and property loss, as well as certain psychological considerations which arise in such crimes as rape and residential break and entering. Second, because the weights derived for each element are all related to a standard weight pre-assigned to a specific element on the score sheet, the weights for each element are comparable and thus additive. This means that a single, summary index of crime is feasible for a particular reporting period or for a specific geographic area of the city. And, third, the movement to develop a

TABLE 6.7

Comparative Weights for Criminal Events
from Eight Different Countries

| | United States | Canada | England | Belgian Congo | China (Taiwan) | Indonesia | Brazil | Mexico |
|--|------------------|--------|---------|------------------|-------------------|-----------|--------|--------|
| Theft of \$1 (U.S.) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Theft of \$5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Theft of \$20 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Theft of \$50 | 2 | 2 | 1 | 3 | 1 | 1 | 2 | 2 |
| Theft of \$1,000 | 3 | 3 | 2 | 7 | 2 | 2 | 3 | 3 |
| Theft of \$5,000 | 4 | 5 | 4 | 23 | 2 | 2 | 4 | 5 |
| Burglary \$5 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 |
| Aggravated theft \$5 (unarmed) | 3 | 3 | 4 | 1 | 2 | 3 | 3 | 4 |
| Aggravated theft \$5 (armed) | 5 | 4 | 6 | 4 | 4 | 4 | 4 | 5 |
| Assault (causing death) | 26 | 28 | 51 | 117 | 8 | 9 | 15 | 17 |
| Assault (necessitating hospital admission) | 7 | 7 | 9 | 5 | 3 | 4 | 6 | 7 |
| Assault (necessitating medical treatment, followed by discharge) | 4 | 5 | 7 | 2 | 2 | 2 | 4 | 4 |
| Assault (minor) | 1 | 2 | 3 | 1 | 1 | 1 | 2 | 1 |
| Rape | 11 | 12 | 15 | 7 | 5 | 6 | 8 | 9 |
| Theft of car (vehicle recovered undamaged) | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| Breaking and entering | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 |
| Intimidation (involving verbal threats) | 2 | 2 | 3 | 1 | 1 | 2 | 2 | 3 |
| Intimidation (involving weapons) | 4 | 3 | 5 | 3 | 3 | 3 | 8 | 4 |

"Aggravated theft" = Theft involving violence

"Burglary 5 dollars" = Breaking and entering and stealing \$5

"Assault" = Involving physical force

weighted crime index which has been spearheaded by Sellin and Wolfgang is not an isolated and contentious effort. It is gaining acceptance in many countries of the world where the need for a more qualitative assessment of crime has been recognized as long overdue. Thus, for the planner working for police, there already exists a tool by which a weighted index of crime occurring in the city can be constructed. Granted, it may not live up to everybody's standards, however, neither does the automobile and we have been using it for decades without too much complaint.

Once the matter of developing a measure of the impact of crime upon its victims has been overcome, the planner working for police must address himself to formulating a series of questions which will, if answered, indicate to police management the degree to which they are satisfying their goals.

There appear to be three pertinent questions which the planner can put to police regarding the performance of the citizen complaint function:

1. does police intervention during the course of a crime in progress reduce or eliminate the impact of the crime upon its victims?
2. is the percentage of crimes in which police are able to intervene during progress of the crime increasing or decreasing?
3. in those cases where police are able to intervene during progress of the crime, are police increasing their ability to reduce or eliminate the impact of the crime upon the victim?

The first question demands that for each type of crime, a sample of 100 during which police intervene and a sample of 100 during which police are unable to intervene, be taken. The average weighted crime index for each set

of 100 cases can then be calculated. Then, the difference between these two averages can be determined, after which statistical analysis of variance will indicate whether the difference is statistically significant. This difference is referred to as the Public Safety Margin. Table 6.8 below presents data from a hypothetical example.

TABLE 6.8

Calculation of the Public Safety
Margin for Robbery

| <u>Type of Crime</u> | <u>Police Intervention</u> | <u>Number of Cases</u> | <u>Average Weighted Crime Index</u> |
|----------------------|----------------------------|------------------------|---|
| Robbery | Yes | 100 | 10.0 |
| Robbery | No | 100 | 15.0 |
| Public Safety Margin | | | + 5.0 |

In the hypothetical example, police intervention during robberies in progress does have the effect of reducing the impact of this crime upon victims. However, it should be emphasized that this may not be the case. The presence of police during a robbery in progress could cause the impact of crime upon victims to be more, rather than less, serious, particularly if the suspect is thrown into panic at the sight of police.

The second question can be answered quite simply by comparing the number of cases of a particular type of crime, say robbery, during which police are able to intervene, with the total number of cases of that crime which are occurring. The former as a percentage of the latter will indicate whether or not police are improving their ability to intervene before the suspect has fled the scene.

And, the third question involves a comparison of the average weighted crime index of cases during which police were able to intervene among progressive time periods. Such a comparison will indicate whether or not police are increasing their effectiveness at crisis intervention.

Thus, so far three entries have been proposed for the impact account of the citizen complaint function. They are:

1. the public safety margin
2. the percentage of total cases occurring during which police are able to intervene
and
3. the average weighted crime index for those cases during which police are able to intervene.

6.3.2 The Public Satisfaction With Police Service

The previous section dealt with the problem of developing a relatively objective measure of the impact of the citizen complaint function. This section deals with a more subjective indicator of the effectiveness of the citizen complaint function. It focuses upon the public satisfaction arising out of the execution of the citizen complaint function as perceived by the victim of crime or the complainants.

One of the difficulties in obtaining this kind of feedback from the public is that dissatisfaction is often more vocally expressed than satisfaction with police service. As a result, unsolicited public comment regarding the competence of police is usually extremely biased against police. There is a need,

therefore, to develop a more neutral media through which a more accurate indicator of the public's view of police performance can be obtained.

A telephone follow-up survey of those persons who have had recent contact with police as either victims or complainants could be conducted regularly. Such a survey vehicle would provide a more balanced impression of public satisfaction with police service. Furthermore, it would provide an alternative measurement of performance to the more empirical measures which have been proposed in the previous section.

This particular entry of the impact account of the citizen complaint function can be operationalized in terms of the degree of public satisfaction with police service based upon a ten-point scale. Table 6.9 below presents the type of scheme which could be developed to generate a reading for such a scale.

TABLE 6.9

Scale of Public Satisfaction
from Police Service

During your recent contact with police, how would you rate their performance:

| | | <u>Score</u> |
|-----------------|-----|--------------|
| 1. Poor | () | 1 |
| 2. Fair | () | 2 |
| 3. Satisfactory | (X) | 3 |
| 4. Good | () | 4 |
| 5. Excellent | () | 5 |

If a random survey of one hundred calls were taken, the maximum possible score would be $(100 \times 5) = 500$ points. Assuming that the actual score was found to be 300, the score for that particular reading would be $(300/500 \times 10 = 6.0)$ 6.0 points. This index of the degree of public satisfaction with police service can be calculated at regular intervals to provide management with some indication of the public's perception of police competence. To avoid any criticism that the survey is biased in favour of police, it should be carried out by an independent organization.

In summary, three indicators of the impact of the Public Safety Program have been identified:

1. the degree to which police intervention during crimes in progress reduce the seriousness of crime, referred to in the thesis as the Public Safety Margin;
2. the percentage of total crime occurring in the city where police are able to intervene while the crime is still in progress; and
3. the degree of public satisfaction arising from the execution of this police program.

The following section poses a hypothetical set of performance accounts in order to illustrate how indicators of input, output and impact facilitate program evaluation and ultimately lead to a re-allocation of resources.

6.4 Use and Interpretation of the Input, Output and Impact Accounts for the Public Safety Program

In Section 5.6 of the previous chapter, it was suggested that there are generally six integral steps involved in the process of program evaluation (see page 99). In summary form, these six steps are:

1. conceptualization of indicators,
2. expressing goals and operating objectives in terms of these indicators,
3. collecting the indicators and placing them in the accounts,
4. answering the five central questions of program evaluation,
5. interpreting the results, and
6. confirming present allocation or re-allocating resources.

Up to this point, only step one has been completed. The indicators of input, output and impact for the citizen complaint function of the Public Safety Program have been conceptualized. But the remaining five steps are still to be undertaken. In order to illustrate the practical application of program evaluation for the Public Safety Program, let us once again take a hypothetical but realistic example.

The City of Vancouver is, for purpose of delivering police services, divided into four districts with an Inspector in charge of each district. A new Inspector has recently been appointed to District 1 which encompasses the West End and central business area of the City. Upon being appointed officer in charge of the district, one of his first moves is to set goals and operating

objectives for the citizen complaint function in his district. He bases these goals and objectives upon the standards of police performance he has come to expect from his experience in other districts of the City. Furthermore, he attempts to express these goals and objectives in terms of the indicators of impact and output, respectively, which he has obtained from the police Planning and Research Unit. They are as follows:

Goals

- police units assigned to "in-progress" calls should arrive, in at least 50 per cent of all cases, before the offender has fled the scene
- the public safety margin should be at least 2.5 units of seriousness
- public satisfaction with police service should be at least 7.5 units of satisfaction

Operating Objectives

- call-load capacity per hour should be equal to at least 75 per cent of peak call-load per hour
- travel time should not exceed 5 minutes per call
- clearance time should not exceed 20 minutes per call
- adequate police coverage should be provided for at least 75 per cent of total call-load

Before proceeding with this illustration, it is necessary to state the four simplifying assumptions made in developing the accounts. First, all calls are considered to be "in-progress" calls. Second, each call results in one criminal charge being laid. Third, all calls are of equal priority. In reality, there are three priorities of calls, priority 1, 2 and 3, in order of decreasing importance. This assumption therefore eliminates the complex problem of dealing with calls of different priority. And, lastly, adequate

police coverage is considered to be one police unit for every call. In a real life situation, adequate police coverage could range from one to four or possibly five units, depending upon the circumstances of the call.

The performance accounts for the citizen complaint function of the Public Safety Program in District 1 for the first quarter of 1974 are presented in Table 6.10 on the following page. They suggest to the Inspector that in terms of the goals and operating objectives which he has set for his district, serious action will have to be taken in order to attain the standards of performance which these goals and objectives imply.

The Input Account has two entries, manpower and vehicles. Manpower consists of 5 constables with an average proficiency rating of 7.0 units and an average salary(not including benefits) of \$50.00 per shift. Each constable is assigned to a marked police vehicle with an estimated charge-out rate of \$5.00 per shift. Thus the total cost of inputs is $(\$250 + \$25.00 = \$275)$ \$275 per shift.

The Output Account has four sets of entries. The first set consists of peak call-load per hour, average call-load per hour, and call-load capacity per hour. Peak call-load per hour is the maximum number of calls for service occurring over any continuous 60 minute period during a working shift. Average call-load per hour is the total number of calls occurring over a

TABLE 6.10

Hypothetical Indicators of Input, Output and
Impact for the Public Safety Program, Citizen
Complaint Function: Shift Averages, District 1,
January 1 to March 31, 1974

| INPUT | OUTPUT | IMPACT |
|---|--|---|
| <p>Manpower:</p> <p>Constables 5</p> <p>Average Proficiency Index 7.0 units</p> <p>Cost \$250.00</p> <p>Vehicles:</p> <p>Marked Cars 5</p> <p>Cost \$25.00</p> <p>Total Cost \$275.00</p> | <p>Peak Call-load/Hour 16 calls</p> <p>Average Call-load/Hour 7.5 calls</p> <p>Call-load Capacity/Hour 7.5 calls</p> <p>Total Call-load 60 calls</p> <p>Total Call-load Capacity 60 calls</p> <p>Service Time 40 minutes</p> <p>Travel Time 10 minutes</p> <p>Clearance Time 30 minutes</p> <p>Percentage of Total Call-load receiving adequate police coverage 100 per cent</p> | <p>Total Crime Reported to Police:</p> <ul style="list-style-type: none"> - Frequency 60 charges - Average Degree of Seriousness 9.5 units <p>Percentage of "in-progress" calls where police arrive <u>before</u> the offender has fled the scene 30 per cent</p> <p>Average Seriousness of Reported Crime where police arrive <u>before</u> the offender has fled the scene 8.0 units</p> <p>Average Seriousness of Reported Crime where police arrive <u>after</u> the offender has fled the scene 9.5 units</p> <p>Public Safety Margin</p> <p>= (9.5 - 8.0)</p> <p>= 1.5 units</p> <p>Public Satisfaction with Police Service 6.0 units</p> |

working shift divided by eight, the number of hours in a shift. And, call-load capacity per hour is calculated by dividing the number of minutes in an hour by average service time per call, then multiplying the quotient by the total number of police units available during the shift. Service time is equal to travel time plus clearance time. The fact that call-load capacity per hour is equal to average call-load per hour indicates that there are just enough police units in the field to accommodate all requests during each hour. The difference between call-load capacity per hour and peak call-load per hour is a measure of the excess load placed upon police units during that hour of the shift when the maximum number of requests were received.

The second set consists of total call-load and total call-load capacity per shift. The fact that total call-load capacity per shift and total call-load per shift are equal indicates that there are just sufficient police units to accommodate all requests during each shift. In other words, there will be no carry over from one shift to the next.

The third set of entries consists of service time, travel time and clearance time. Service time is as its name implies the average length of time it takes a police unit to service a call. In other words, service time is the average length of time between deployment of a police unit to the scene and completion of his assignment there. Service time is therefore equal to travel time plus clearance time. It is the primary factor in determining call-load capacity.

The fourth and final entry in the Output Account is the percentage of total call-load receiving adequate police coverage. This entry is designed to reflect the divergence between the actual number of police units assigned to a call and the optimum number of units which should, according to standards of performance set by police, be assigned to that call. For example, a priority 1 call such as bank robbery in progress may require four police units at the scene, but somehow only two are available to attend. In the illustrated accounts, the simplifying assumption is made that adequate coverage for every call is one police unit. Thus, the percentage of calls receiving adequate police coverage is equal to call-load capacity divided by average call-load time 100, or $(60/60 \times 100 = 100)$ 100 per cent.

The Impact Account has four entries. The first is total crime reported to police. This is considered at two levels: frequency and degree of seriousness. Frequency is equal to the total number of criminal charges laid during each working shift. This usually reflects the fact that every call does not necessarily result in a criminal charge being laid. Degree of seriousness is the average Sellin and Wolfgang index for the total number of crimes occurring during each working shift. (The methodology for developing this index is described in Section 6.3.1, pages 124 to 133.)

The second entry in the Impact Account is the percentage of "in-progress" calls where police arrive before the offender has fled the scene. The idea here is that the probability of police being able to reduce the effect of the crime upon its victims is greatly increased, if police are able to arrive at the scene while the crime is still in progress.

The third set of entries are all related. It consists of the average seriousness of reported crime where police arrive before the offender has fled the scene, the average seriousness of reported crime where police arrive after the offender has fled the scene, and the public safety margin. The public safety margin is defined as being equal to the numerical difference between the other two entries. Development of the public safety margin was the subject of considerable discussion in this chapter, Section 6.3.1, pages 133 to 135.

The fourth entry of the Impact Account is the index of public satisfaction with police service. This index is developed from a random sampling of citizens who have, during the current reporting period, requested police assistance. This concept has been explained in detail in this chapter, Section 6.3.2, pages 135 to 137.

In his detailed assessment of the performance accounts for the first quarter of the year(see Table 6.10, page 141), the police Inspector in charge of District 1 made the following conclusions. Operating performance generally fell short of objectives. Call-load capacity per hour was only 47 per cent

of peak call-load per hour, which is 28 points below the target of 75 per cent of peak call-load per hour. Travel time was 5 minutes in excess of the target of 5 minutes per call. Clearance time was 10 minutes in excess of the target of 20 minutes per call. The percentage of "in-progress" calls for which police arrived before the suspect left the scene was 20 per cent short of the target of 50 per cent of such calls. However, adequate police coverage was provided in 100 per cent of actual call-load. In addition, goals also generally fell short of their mark. The Public Safety Margin was 1.0 unit short of the target of 2.5 units. And, the Public Satisfaction with police service was 1.5 units below the target of 7.5 units.

As a result of this assessment, the Inspector in charge of District 1 decides that he must first attempt to increase call-load capacity per hour without actually increasing the number of units in the field. Since call-load capacity per hour is equal to 60 minutes divided by average service time, a reduction in service time would have the desired result. The two most obvious means of reducing service time are by effecting a reduction in travel time and clearance time.

A reduction in travel time can be brought about by assigning units to gravitational points which center upon the geographical clustering of calls. This is because, mathematically, the shortest average distance between two or more points on a plane and any single reference point, is the geometric center of the points.

A reduction in clearance time may be effected by upgrading the proficiency of constables assigned to the citizen complaint function.

After having made these two changes immediately after the first quarter performance report, the Inspector reviewed the report for the second quarter in order to ascertain whether any significant changes had occurred. The performance accounts for the second quarter are illustrated in Table 6.11 on the following page.

The Input Account for the second quarter reveals no changes except for the 1.0 unit increase in the proficiency index of the constables assigned to the citizen complaint function during this period.

The Output Account for the second quarter, however, reveals some significant changes. Call-load capacity per hour rose 1.6 calls, from 7.5 calls to 9.1 calls per hour. Service time per call fell 7 minutes, from 40 minutes to 33 minutes per call. This resulted from a 2 minute reduction in travel time, and a 5 minute reduction in clearance time. The percentage of total call-load receiving adequate police coverage remains the same as in the previous reporting period.

TABLE 6.11

Hypothetical Indicators of Input, Output and
Impact for the Public Safety Program, Citizen
Complaint Function: Shift Averages, District 1,
April 1 to June 30, 1974

| INPUT | OUTPUT | IMPACT |
|---|---|---|
| <p>Manpower:</p> <p>Constables 5</p> <p>Average Proficiency Index 8.0</p> <p>Cost \$250.00</p> <p>Vehicles:</p> <p>Marked Cars 5</p> <p>Cost \$25.00</p> <p>Total Cost \$275.00</p> | <p>Peak Call-load/Hour 16 calls</p> <p>Average Call-load/Hour 7.5 calls</p> <p>Call-load Capacity/Hour 9.0 calls</p> <p>Total call-load 60 calls</p> <p>Total Call-load Capacity 73 calls</p> <p>Service Time 33 minutes</p> <p>Travel Time 8 minutes</p> <p>Clearance Time 25 minutes</p> <p>Percentage of Total Call-load receiving adequate police coverage 100 per cent</p> | <p>Total Crime Reported to Police:</p> <ul style="list-style-type: none"> - Frequency 60 charges - Average Degree of Seriousness 8.5 units <p>Percentage of "in-progress" calls where police arrive <u>before</u> the offender has fled the scene 40 per cent</p> <p>Average Seriousness of Reported Crime where police arrive <u>before</u> the offender has fled the scene 7.5 units</p> <p>Average Seriousness of Reported Crime where police arrive <u>after</u> the offender has fled the scene 9.5 units</p> <p>Public Safety Margin = (9.5 - 7.5) = 2.0 units</p> <p>Public Satisfaction with Police Service 7.0 units</p> |

The Impact Account has also evidenced some significant changes. While the frequency of crime has not changed, the average seriousness of crime has fallen from 9.0 units to 8.5 units. It is assumed that this occurred as a result of the increased percentage of "in-progress" calls for which police arrived before the offender fled the scene, and the reduction in the seriousness of crime where police arrived before the offender fled the scene. The former is assumed to have increased from 30 per cent in the first quarter to 40 per cent in the second quarter because of a decline in travel time. The latter is assumed to have fallen from 8.0 units in the first quarter, to 7.5 units in the second quarter because of the improved techniques of intervention and better judgement of constables with a higher proficiency index. Furthermore, the public safety margin rose from 1.5 units in the first quarter to 2.0 units in the second quarter. And, finally, public satisfaction with police service rose from 6.0 units to 7.0 units.

The Inspector in charge of District 1 next related the entries in the performance accounts for the second quarter to the goals and operating objectives which he had previously set for his district.

The percentage of "in-progress" calls where police arrive before the offender has fled the scene is 40 per cent, up from 30 per cent in the first quarter, but still 10 per cent of the goal of 50 per cent. The public safety margin is 2.0 units, up 0.5 units from the first quarter, but still 0.5 units from the goal of 2.5 units. And, public satisfaction with police service is 7.0 units, up from 6.0 units in the first quarter, but still 0.5 units short of the goal of 7.5 units.

Call-load capacity per hour is 56.81 per cent of actual peak call-load per hour, up from 46.88 per cent in the first quarter, but still 18.19 points short of the operating objective of 75.00 per cent. Travel time is 8 minutes, down from 10 minutes in the first quarter, but still short of the operating objective of 5 minutes per call by 3 minutes. Clearance time is 27 minutes, down from 30 minutes in the first quarter, but still 7 minutes in excess of the operating objective of 20 minutes per call.

Output efficiency has risen from \$4.58 to \$3.77 per call. This has been effected through the increased capacity in the citizen complaint function believed to have been brought about by the increased proficiency of the constables assigned to that function.

The marginal effectiveness of the citizen complaint function is such that a reduction in travel time of 1 minute results in an increase of 5 per cent in the number of "in-progress" calls for which police arrive before the suspect leaves the scene. Moreover, a further measure of marginal effectiveness indicates that a rise in proficiency of 1.0 unit brings about a drop of 0.5 units in the average seriousness of reported crime for which police arrived before the suspect(s) left the scene. In addition, a 1 minute decline in travel time results in a 0.5 unit rise in public satisfaction with police service. It is interesting to note that this would indicate that public satisfaction with police service, the subjective measure, is more sensitive to changes in travel time, than is the public safety margin, the more objective measure.

After assessing the performance accounts for the second quarter of the year, the Inspector in charge of District 1 decides that he has pushed his men as hard as he can and that in order to realize his goals and operating objectives for the Public Safety Program he must increase the resources allocated to the citizen complaint function. Not wishing to overcommit himself to a larger than necessary increase, he augments the resources of this function by one police unit.

Table 6.12 on the following page, illustrates the performance accounts for the third quarter of the year which reflect any changes which may have occurred as a result of the increased manpower assigned to the citizen complaint function.

The performance accounts for the third quarter of 1974 reveal a number of interesting developments to the Inspector. All goals set at the beginning of the year were met. Police units assigned to "in-progress" calls arrived, in 50 per cent of all cases, before the offender fled the scene. The public safety margin reached 2.5 units of seriousness. And, public satisfaction with police service rose to 7.5 units of satisfaction. Furthermore, operating objectives were almost completely met. Call-load capacity per hour rose to 75 per cent of peak call-load per hour. Travel time was right on target at 5 minutes per call. Clearance time was the same as during the second quarter, but still down 5 minutes from what it had been during the first quarter of the year.

(Other things being equal, clearance time is a function of manpower proficiency. Since proficiency remained the same for the third as for the second quarter, there was no reason to expect an improvement in clearance time during the third quarter.) And, lastly, adequate police coverage did not change. But it was well in excess of the operating objective set at the beginning of the year, even in the first quarter.

TABLE 6.12

Hypothetical Indicators of Input, Output and
Impact for the Public Safety Program, Citizen
Complaint Function: Shift Averages, District 1,
July 1 to September 30, 1974

| INPUT | OUTPUT | IMPACT |
|---|--|--|
| <p>Manpower:</p> <p>Constables 6</p> <p>Average Proficiency Index 8.0</p> <p>Cost \$300.00</p> <p>Vehicles:</p> <p>Marked Cars 6</p> <p>Cost \$30.00</p> <p>Total Cost \$330.00</p> | <p>Peak Call-load/Hour 16 calls</p> <p>Average Call-load/Hour 7.5 calls</p> <p>Call-load Capacity/Hour 12 calls</p> <p>Total Call-load 60 calls</p> <p>Total Call-load Capacity 96 calls</p> <p>Service Time 30 minutes</p> <p>Travel Time 5 minutes</p> <p>Clearance Time 20 minutes</p> <p>Percentage of Total Call-load receiving adequate police coverage 100 per cent</p> | <p>Total Crime Reported to Police:</p> <ul style="list-style-type: none"> - Frequency 60 charges - Average Degree of Seriousness 8.0 units <p>Percentage of "in-progress" calls where police arrive <u>before</u> the offender has fled the scene 50 per cent</p> <p>Average Seriousness of Reported Crime where police arrive <u>before</u> the offender has fled the scene 7.0 units</p> <p>Average Seriousness of Reported Crime where police arrive <u>after</u> the offender has fled the scene 9.5 units</p> <p>Public Safety Margin</p> <ul style="list-style-type: none"> = (9.5 - 7.0) = 2.5 units <p>Public Satisfaction with Police Service 7.5 units</p> |

The Output Efficiency of the citizen complaint function has risen from \$4.58 in the first quarter, to \$3.77 in the second, and to \$3.44 in the third quarter. The marginal output efficiency of the citizen complaint function between the second and the third quarters is such that an increase in one police unit has resulted in a 10 per cent increase in the number of "in-progress" calls where police arrive at the scene before the offender has fled.

The Marginal Effectiveness of the citizen complaint function is declining. Between the first and second quarters, a drop in travel time of 1 minute was thought to cause an increase of 5 percent in the number of "in-progress" calls where police arrive before the offender has fled the scene, and a 0.25 unit decline in the average seriousness of all reported crime. However, between the second and third quarters, a drop in travel time of 1 minute is thought to cause an increase of only 3.33 per cent in the number of "in-progress" calls where police arrive before the offender has fled the scene, and a 0.166 unit decline in the average seriousness of all reported crime.

The Marginal Impact Efficiency of either an increase in the level of proficiency of manpower by 1.0 unit, or an increase in the number of manpower by 1.0 unit, would appear to bring about a decline in the average seriousness of all reported crime of 0.5 units. In this sense, they may well be regarded as alternative means of achieving a similar end.

In conclusion, the illustration presented in this section of the chapter has served a useful purpose. It has shown how performance accounts can be a helpful tool for setting goals and operating objectives, monitoring the resources allocated to police services and the resulting changes in productivity and

effectiveness, providing insights into the most effective strategy for improving performance and, finally, evaluating whether police services are achieving their goals and meeting their operating objectives.

6.5 Areas of Further Refinement and Research

In reviewing this chapter, there emerge three particular areas which demand further refinement. The first is the logic of the indicators in relation to the police function with which they are related. The second is further refinement of the concepts themselves. Third is the development of statistically sound survey design in order to quantify the concepts which have been identified as performance indicators. And, finally, empirical testing of the casual linkages or hypotheses which are implied in the interpretation of the accounts.

But what is all this leading up to? There is one use of the accounts which has not been demonstrated in the illustration. This is the use of the data contained in the accounts for the purpose of developing a predictive mathematical model of the police organization, the community in which it operates, and the linkages between them both. It is an undeniable fact that gradually, over the years, the information contained in the accounts will enable the construction of an accurate and comprehensive predictive model for testing the effectiveness of proposed allocative decisions. This model will be comprised of the production functions and social welfare functions which have been referred to earlier in the study as providing the linkages between the input and output, and output and impact accounts. Once such a model is in operation, the planner

will no longer base his choice of a particular allocative pattern upon intuition or guesswork, but will make his decision with the aid of an empirical model which has predicted the most effective pattern of resource allocation.

6.6 Concluding Remarks

It is interesting to note that from a purely analytical point of view, the process of identifying entries for the performance accounts has merit. This process forces one to ask some rather penetrating questions, the answers to which are sometimes quite revealing.

There are only two direct means by which police can reduce the seriousness of crime upon its victims. The first is by increasing the percentage of "in-progress" calls for which police arrive before the suspect(s) leave(s) the scene. And, the second is by improving the methods and techniques of police intervention during a crime in progress. Thus, the only case where there is potential for the citizen complaint function to reduce or eliminate the seriousness of crime upon its victims is for police to arrive at the scene before crime is completed.

The only way the average seriousness of all reported crime can be lowered is for the percentage of "in-progress" calls to be maintained or increased, and for the percentage of "in-progress" calls where police arrive before the offender has fled the scene to also be maintained or increased. The first is closely related to the nature of the crime, but also to the role of the citizen in alerting police of criminal activity in progress. The second is

related to the ability of police to reduce response time to the point that they are arriving at the scene of "in-progress" calls (in the majority of cases) before the offender has fled.

The next chapter develops performance accounts for the Apprehension and Recovery Program.

CHAPTER 7

THE APPREHENSION AND RECOVERY PROGRAM AND ITS SUPPORTING FUNCTIONS

7.1 Introduction

The Apprehension and Recovery Program is the third and last police program to be dealt with. Viewed in the context of the criminal process - prevention, crisis intervention and remedial or corrective strategies - the Apprehension and Recovery Program is logically the last in the sequence. Once the crime has commenced, the preventive strategy is irrelevant. And, after the suspect has fled the scene and the crime completed, the opportunity for crisis intervention has passed. The one police strategy remaining with any possibility of attaining its goals is the Apprehension and Recovery Program.

The Apprehension and Recovery Program of the Vancouver Police Department has four goals:

1. to apprehend suspects
2. to recover stolen property
3. to seize contraband goods or property
and
4. to obtain physical evidence, supported by analytical or expert documentation wherever necessary, and to secure material witnesses of crime, in order:

- a) to justify legal arrest or summons of suspects
- b) to warrant bringing the suspects to trial,
and
- c) to support prosecution of the suspects in court

Three functions of the Department were seen as supporting the goals of the Apprehension and Recovery Program. They were:

- 1. the citizen complaint function
- 2. the investigation function
and
- 3. the preventive patrol function

Should the reader wish to refresh his memory of the description of these functions, he is referred to Chapter 3, pages 56 through to 58 where they have been defined in considerable detail.

The purpose of this chapter is fourfold. First, it is to identify indicators of output for the three police functions seen as supporting this program: the citizen complaint, the investigation and the preventive patrol functions. Second, it is to identify indicators of goal attainment for the Apprehension and Recovery Program. Third, it is to illustrate how the performance accounts for this program can be used as an aid to resource allocation and program evaluation. And, lastly this chapter will attempt to pinpoint areas in need of further refinement and research.

7.2 Proposed Entries for the Output Account of the Apprehension and Recovery Program

The entries contained in the output account for the Apprehension and Recovery Program vary according to function. But at this point in the discussion, this is hardly a new proposition. It was also the case for the Crime Prevention and Public Safety Programs previously discussed.

The three functions seen as supporting the goals of the Apprehension and Recovery Program are the citizen complaint, the investigation and the Preventive patrol functions. Each is discussed below under separate heading.

7.2.1 The Citizen Complaint Function and the Apprehension and Recovery Program

The first phase of the citizen complaint function is to ensure the safety and well-being of persons and property as a supporting function of the Public Safety Program. The second phase of the citizen complaint function is, on the other hand, to apprehend suspects and recover stolen property at or near the scene of the crime as a supporting function of the Apprehension and Recovery Program. The point at which the first phase ends and the second phase begins is often difficult to pinpoint exactly.

The indicators of output for the citizen complaint function have already been developed and discussed in considerable detail in Chapter 6, pages 108 through to 123. They were found to be:

1. actual call-load
2. call-load capacity

3. service time
 - a) response time
 - b) clearance time

and

4. the percentage of call-load receiving adequate coverage

It is clear that the output indicators of the citizen complaint function which were important to the Public Safety Program are equally as crucial to the Apprehension and Recovery Program. Total response time, the percentage of "in-progress" calls for which police arrive before the suspect leaves the scene, and the percentage of call-load receiving adequate coverage all have a significant bearing on the likelihood that the goals of the Apprehension and Recovery Program will be attained. It is interesting to note, however, that whereas the goals of the Public Safety Program cannot possibly be met if police arrive after the suspect has fled the scene, the goals of the Apprehension and Recovery Program may still be attained through the investigation function which follows.

7.2.2 The Investigation Function and the Apprehension and Recovery Program

While the citizen complaint function consists of a set of standardized activities which occur in a highly predictable sequence, the investigation function is made up of a group of almost random activities which may occur in any one of an infinite number of combinations.

There is often an imperceptible transition from the citizen complaint function to the investigation function at the scene of a crime. Generally, the patrolman who is assigned to the call, carries out an "initial investigation" at the scene. However, if for some reason the initial investigation is considered incomplete or inaccurate by either the N.C.O. supervising the patrolman or the departmental Quality Control Unit personnel, a "follow-up investigation" is usually requested. The follow-up investigation is preferably carried out by the patrolman who originally was assigned the call because of his familiarity with the background and circumstances of the case. On the other hand, if the crime which initiated the call falls within a recognized area of specialization of the Detective Division, it may be referred to the appropriate squad of that division.

Regardless of whether the investigation occurs at the scene immediately following the crime (initial investigation) or whether it takes place sometime thereafter (follow-up investigation), the various activities which comprise this function are basically the same.

While there does not appear to be any hard and fast rule as to the sequence of these activities, they could occur in the following order:

1. establish whether, in fact, an offense has actually occurred, and if so, determine what specific offense has occurred
2. visit to and examination of the scene of the crime
3. interview victims, witnesses and others thought to be in some way connected with the crime

4. question possible suspects
5. search vehicles and premises
6. stake-out and survey locations and premises
7. check departmental inventory of lost and stolen property
and
8. check Daily Crime Bulletins for possible suspects, crimes with
similar modus operandi, arrested persons and recovered property

These various activities could be carried out by uniformed patrolmen, plain-clothed detectives or undercover agents. Two important factors which often may have a bearing on activities carried out under this function are the proficiency of the investigator and the nature of the crime being investigated. Proficiency here refers to the concept of a proficiency index which was developed in Chapter 4, pages 70 through to 73. Basically this concept attempts to summarize the intelligence, skills and training, and perseverance and dedication of the investigator in a single numerical index. In addition, the nature of the crime, that is the background and circumstances surrounding the case, may also determine to a significant degree the particular activities of the investigation functions which are most rigorously pursued.

Given that these are the activities of the investigation function, the question then becomes, what indicators of output do these various activities suggest? Following the format established in previous chapters, quantitative indicators will be dealt with first, followed by qualitative indicators of output.

Quantitative Indicators. The first indicator of output for the investigation function would appear to be caseload. Essentially, caseload is to the investigation function what call-load is to the citizen complaint function. Caseload can be calculated at the end of each month to provide an up-to-date measure of the inventory of cases which must be terminated through the investigation function. Caseload should be broken down in the following manner:

Cases Brought Forward from previous month
 + Cases Opened during current month
 - Cases Closed during current month
 = Cases at month-end

It is important to note that the number of cases opened each month cannot be directly affected by the output of the investigation function. However, the number of cases closed during a month can be related to the productivity of the investigation function. Any changes should be examined statistically to determine whether or not they represent a change in the trend of the previous six months or some other appropriate standard. The allocation of additional manpower to the investigation function should only be considered if there is an upward shift in that trend.

In conjunction with caseload, one could also develop some standard of caseload capacity. Comparing the caseload capacity of policemen allocated to this function to the current actual caseload, will provide some indication of whether or not additional manpower is required in order to accomplish current goals, expressed in terms of the rate with which cases are brought to successful conclusion.

The second kind of quantitative indicators of output are indisputably measures of productivity or work done, but it is questionable whether or not they can be linked in a casual sense to performance. They are listed below:

- the number of visits to the scene of the crime
- the number of victims, witnesses and other associated with the crime who have been interviewed
- the number of suspects who have been questioned
- the number of vehicles and premises which have been searched

These indicators of productivity are more than likely related to the nature of the crimes occurring in the city, rather than to police performance. However, they are indicators of the work being done regardless of the reasons behind them.

Qualitative Indicators. It is probably worthwhile reiterating that the distinction between quantitative indicators and qualitative indicators of output is that the former refer to how much while the latter refer to how well the function is being carried out. There are five qualitative indicators of output which have been identified as a result of the study:

- case length
- case seriousness
- case complexity
- completeness of investigation
- acceptability of investigation reports

Case length relates to the average length of time it takes for police to bring to satisfactory conclusion an average case. Again, attempts to interpret this indicator as being anything but exactly what it really is should be avoided. Serious questions can be asked about whether it is

related only to the crime occurring in the city or also related, at least in some degree, to police performance. Whether or not this indicator is related to case seriousness or case complexity, or whether it can be related to police proficiency at investigation can only be confirmed after sufficient data have been collected to determine which of these hypotheses are supported by statistical inference.

Case seriousness is a qualitative indicator which can be developed from the Sellin and Wolfgang (1964) scheme previously discussed in connection with a qualitative indicator of crime (Chapter 6, pages 124 through 133). One of the first activities of the investigation function is to ascertain whether, in fact, a crime or crimes have occurred. Furthermore, investigators at the scene must also ascertain, in a much broader sense, the nature and impact of the crime upon the victims. From this information a qualitative index of the seriousness of the case can be developed based upon the Selling and Wolfgang (1964) scheme previously discussed. Such a measure could be called case seriousness and would provide a qualitative indicator to compliment the quantitative indicators of output which have already been suggested.

Case complexity is another qualitative indicator of output which could be developed to provide management with a slightly different view of the caseload currently under investigation. A measure such as the average number of charges per case could be interpreted as an indicator of the complexity of cases under investigation by police.

A final qualitative indicator of output for the investigation function is a measure of the completeness or thoroughness of the investigation. There appear to be two possible measures of this dimension. The first is an

empirical one, the second is more or less subjective in nature.

The first is based upon whether or not certain basic activities of the investigation function have been carried out with respect to each individual case. At this stage of evolution, there appear to be only four particular activities which should be included in the calculation of this index. They are (1) examination of the scene of the crime, (2) interviewing of victims of the crime, (3) interviewing of witnesses to the crime, and (4) questioning suspects initially identified by victims or witnesses at the scene. The reason for qualifying the last item with the phrase, "identified by victims or witnesses at the scene", is that numerous suspects may materialize during the course of an investigation, making a firm basis for comparison impossible.

Let us take a concrete example and illustrate how this indicator of completeness might be developed. A purse-snatching has occurred in the Kitsilano Area of Vancouver City. The victim was an elderly lady returning home from shopping. Witnesses to the crime included her two companions and three passers-by. There was only one suspect identified at the scene. In this case, investigators examined the scene of the crime, interviewed the victim and three of the witnesses, and questioned the suspect who was identified by the witnesses to the crime. In this example, Table 7.1 on the following page illustrates how the index of completeness would be developed.

TABLE 7.1

Development of Objective Measure of the
Completeness of the Investigation Function

| <u>Case 1: Purse-snatching</u> | <u>Actual Number Completed</u> | <u>Total Possible Number Completed</u> |
|--------------------------------|------------------------------------|--|
| Examination at the scene | 1 | 1 |
| Interviewing of victims | 1 | 1 |
| Interviewing of witnesses | 3 | 5 |
| Questioning of suspects | <u>1</u> | <u>1</u> |
| Totals | 6 | 8 |

Index of Completeness = $6/8 \times 100 = 75$ per cent

The second measure of completeness is a more subjective one. Each investigation report is examined initially by the shift supervisor and finally by quality control personnel. If, at either of these stages, the report is considered to be inaccurate or incomplete in any way, the faulty report is returned to the officer for follow-up. A simple indication of the percentage of investigation reports which are returned to the originating officer because they do not meet the standards of investigation set by the department would be a useful piece of information for management.

In summarizing the quantitative and qualitative indicators of output for the investigation function, the following list is presented in Table 7.2 on the following page.

TABLE 7.2

Indicators of Output for the Investigation
Function

Quantitative Indicators

- Caseload Capacity
- Actual Caseload
- Number of Visits to the Scene of Crime
- Number of Victims, Witnesses and Others interviewed
- Number of Suspects questioned
- Number of Vehicles and Premises searched

Qualitative Indicators

- Duration of Investigation
- Case Seriousness
- Case Complexity
- Completeness of Investigation
- Percentage of Investigation Reports rejected

In conclusion, it must be recognized that the investigation function contains mental as well as physical processes. However, the current technology of social measurement has serious limitations. Unless an activity exhibits a physical manifestation, in other words, reveals itself directly or indirectly in a physical deed or action, its occurrence must remain speculation.

Many activities of the investigation function may be regarded as intuitive, part of the creative thought process, and as such unmeasurable. As a result, the indicators of output of the investigation function set forth in this section only relate to those activities which exhibit a physical manifestation.

7.2.3 The Preventive Patrol Function and the Apprehension and Recovery Program

As stated in the introduction to this chapter, there are three police functions which support the goals of the Apprehension and Recovery Program. They are: (1) the citizen complaint function, (2) the investigation function, and (3) the preventive patrol function. It should be recalled that the criterion for including a function as a component of a program was that the activities of the function help to bring about achievement of the goals of the program. It is in this sense that these three police functions may be considered supportive of the Apprehension and Recovery Program.

Preventive patrol has been previously described as the physical demonstration of police presence. Those readers wishing to refresh their understanding of this police function should review Chapter 3, page 56 and Chapter 5, page 86, for a more thorough discussion of this function.

Entries of the preventive patrol function for the output account were also suggested in Chapter 5, page 86. They are listed on the following page in Table 7.3.

TABLE 7.3

Proposed Indicators of Output for the Preventive
Patrol Function

-
- the number of rounds of the beat walked during each shift
 - the number of miles of the area patrolled during each shift
 - the number of persons checked for identification and reason for being in the area
 - the number of vehicles checked for registration and searched for stolen or contraband goods
 - the number of premises checked for security
-

In conclusion, it can be said that the preventive patrol function is more a physical than a mental process. The motive behind preventive patrol and the style with which it is carried out can vary dramatically. It can range from the routine patrol of a designated area to a conscious and pre-meditated attempt to seek out those obscure corners of a neighbourhood where trouble is most likely to happen. It is unfortunate that, at this stage, there do not appear to be any qualitative indicators of output for the preventive patrol function which might reflect some of the subtleties of its execution.

7.3 Proposed Entries for the Impact Account of the Apprehension and Recovery Program

The Apprehension and Recovery Program of the police department is the last strategy in the sequence. It assumes that an offense has already been completed. Thus, it does not aim towards preventing crime, nor does it attempt

to intervene during crime in progress. Essentially, it is designed to bring the criminal to justice, and to recover stolen property or seize contraband goods.

The issue of goal attainment is always complex and ambiguous. For example, with respect to the Crime Prevention Program, one could justifiably ask: did police action truly prevent crime, or did it merely cause it to assume a less detectible form, or did it just divert it to another area of the city? Furthermore, with respect to the Public Safety Program, one also might legitimately ask: did police intervention actually reduce the seriousness of crime upon its victims, or did it perhaps really intensify the severity of crime, or did it have little or no effect whatsoever? One can say that the indicators of impact of the Apprehension and Recovery Program are relatively direct and indisputable. However, the difficulty with this third and last program is the interpretation of these indicators.

The translation of goal statements into measures of impact for the Apprehension and Recovery Program is fairly simple. It involves few subtleties and little supposition. Thus, the following indicators of impact are proposed for this program:

- the number of offenders identified at the scene
- the number of suspects arrested
- the number of suspects arrested and charged
- the number of suspects arrested, charged and convicted
- the number of offenders still at large
- the dollar value of stolen property
- the dollar value of stolen property recovered

- the dollar value of contraband goods estimated to be in the City
- the dollar value of contraband goods siezed

While the list of indicators of impact appears complicated, it can actually be broken down into three simple components: (1) suspects, (2) stolen property and (3) contraband goods. Of these, the indicators dealing with suspects are the most difficult to interpret.

Two factors important to the understanding of the indicators relating to suspects are the value of the indicators, that is, whether they should be considered positive or negative, and the actors involved in making the decisions which generate the indicators.

If the suspect is innocent, his arrest, which may include detention, may be considered at least inconvenience, if not outright harassment. On the other hand, if the suspect is guilty, his release before conviction is an indication of police ineffectiveness, among other things. The further through the Justice System, the more likely that the suspect is guilty and therefore that release before conviction is an indication of police ineffectiveness rather than harassment. Either way, however, the numerical difference between suspects arrested and suspects ultimately convicted must have a negative inference for police performance.

The other important indicator of impact relates to the number of offenders still at large. This is defined to be the numerical difference between the number of offenders identified at the scene of a crime and the number of

suspects arrested. This is also a negative indicator of police performance. Only, in this case, it is clearly an indicator of police ineffectiveness.

It is also important to recognize the different actors involved in various decision points throughout the Justice System. It is solely a police decision whether a suspect is actually arrested and whether an arrested suspect will be charged or released after 24-hours. However, once the suspect has been charged, several other actors become involved in the decision-making process of the Justice System. These are the City Prosecutor, the Provincial Court Judge, and in the case of a trial, a citizen jury. Thus, one could make a legitimate case that police are only one of the actors involved in the decision of whether or not the suspect is convicted or acquitted. However, police do have a major role in this process. Police have developed the case on which the charges are based, and on the basis of the case and the City Prosecutor's presentation of it, the Judge decides whether to uphold the charges or to dismiss them. Furthermore, during the court proceedings, police may be called upon to give testimony, critical testimony in many cases upon which the outcome of the proceedings may depend.

The two indicators relating to stolen property are more readily interpreted. Police performance can be expressed in terms of the dollar value of recovered stolen property as a percentage of the dollar value of all stolen property. The total dollar value of stolen property, in itself, would not be that revealing an indicator of impact.

Similarly, a statement of the total dollar value of contraband goods siezed by police in the City has little meaning unless compared with the total

dollar value of contraband goods estimated to be in the City. The former as a percentage of the latter would seem to be a more revealing statistic.

In conclusion, it can be said that eight out of the nine indicators of impact which have been identified (see pages 170 and 171), can be calculated from information already collected by the Department. The one indicator which will be difficult to measure is "the dollar value of contraband goods estimated to be in the City". However, the method by which it could be calculated is quite feasible. For example, probably the most significant contraband good available in Vancouver today is Heroin. The dollar value of Heroin can be calculated by estimating the number of users in the City, the average daily rate of intake, and the current market price of the drug. The product of these three figures will provide an estimate of the total dollar value of daily transactions in the drug.

7.4 Use and Interpretation of the Input, Output and Impact Accounts for the Apprehension and Recovery Program

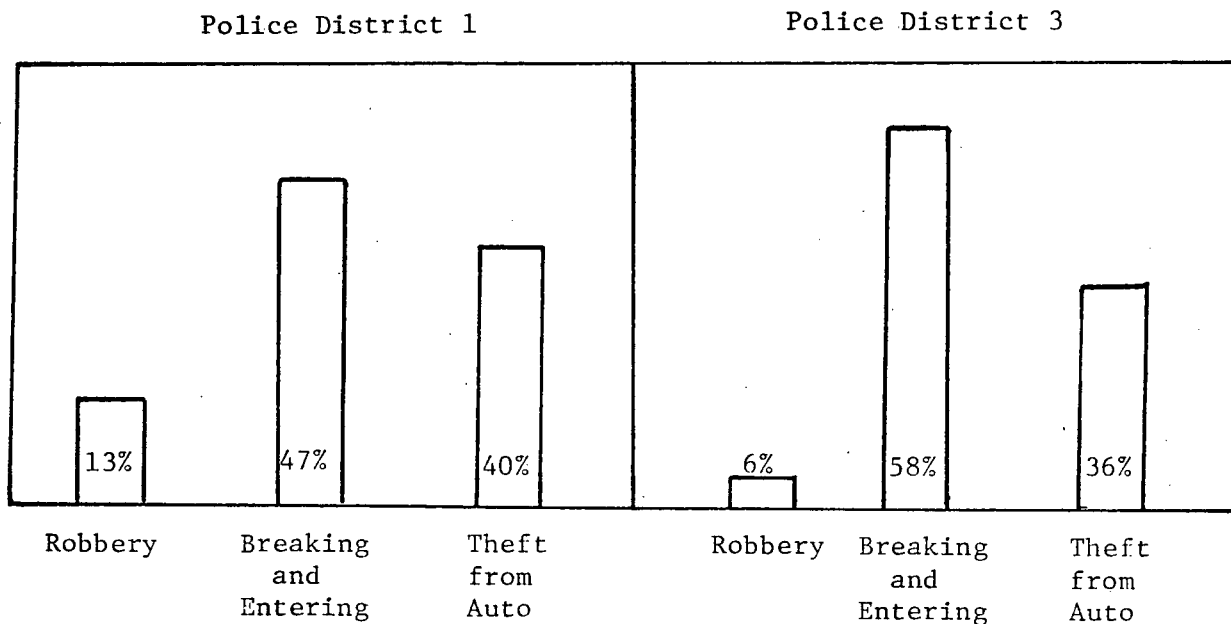
Now that indicators of output and impact have been identified, the time has come to offer a practical example of how performance accounts can assist management in evaluating the efficiency and effectiveness of the Apprehension and Recovery Program, and how such an evaluation may lead to a re-allocation of police resources and, as a result, improved efficiency and effectiveness.

Different areas of the city are often significantly different in physical, demographic, social and economic characteristics. Because of these kinds of differences, one might expect that the profile of crime in each area is also

significantly different. For purposes of illustration, let us take Police Districts 1 and 3 in the City of Vancouver. District 1 contains the West End and downtown business areas, while District 3 encompasses the south eastern residential area of the City. Figure 7.1 on the following page illustrates the profile of crime for Districts 1 and 3 in the form of a histogram of the percentage frequency distribution of three types of crime: robbery, breaking and entering, and theft from auto. One can see that there are significant differences in the profile of crime in each district. The greatest difference between the two districts is in the percentage frequency distribution of robbery. In District 3, robbery represents 6 per cent of the total number of crimes reported to police, while in District 1 robbery represents 13 per cent of the total or, in other words, over twice the percentage in District 3. There are also significant differences in the percentage frequency distribution of the other types of crime between the two districts. Breaking and entering is 47 per cent of the total crime reported in District 1, while it is 58 per cent in District 3. And, theft from auto is 40 per cent in District 1, but only 36 per cent in District 3. Thus there are sound logical reasons for expecting the profile of crime to be different among the four police districts in the City, and an analysis of empirical data for Districts 1 and 3 confirm this expectation. And why is this an important fact for the Apprehension and Recovery Program of the police department? Simply because of the hypothesis that each police function which supports the Apprehension and Recovery Program is more effective in clearing cases of a particular type of crime, and less effective in clearing cases of other types of crime.

FIGURE 7.1

Profile of Crime: A comparison
between Police Districts 1 and 3,
Percentage Frequency Distribution
for the Period January 1, 1973 to
December 31, 1974



Note: Histograms have been rounded to nearest 1/2 per cent

Source: Vancouver Police Department, Weekly Crime Reports

While this hypothesis has not been formally stated, let alone tested in the literature, the practical experience of police Inspectors in charge of each district unequivocally supports this supposition. Their argument runs as follows.

Let us first examine robbery in order to determine which of the three police functions supporting the Apprehension and Recovery Program is probably the most effective in apprehending offenders and recovering stolen property. Robberies are reported to police almost immediately, whereas breaking and entering or theft from auto are not. There are several reasons for this.

Robbery always involves a face to face encounter between victim and offender. Moreover, the victim is acutely aware of what is happening to him, since robbery always involves either violence or the threat of violence. Furthermore, because of the violent nature of the crime and because it often occurs in open public spaces such as a street corner or sidewalk, passersby are frequently witnesses to the crime and are able to report it to police while it is still in progress. Together, these factors act to make police aware of the crime either while it is still in progress or shortly thereafter. As a consequence, the offender is either at or near the scene of the robbery when police arrive at the scene in carrying out the citizen complaint function. If police arrive while the crime is still in progress, apprehension of the offender and recovery of the stolen property is almost assured. Even if the suspect has already fled the scene, police carrying out the citizen complaint function can effectively cordon off the area surrounding the scene and by a systematic search of the area locate the offender and obtain the stolen goods. Thus, for purposes of this example, it will be assumed that the citizen complaint function is probably the most effective function for clearing robbery cases.

The second type of crime to be examined is breaking and entering. In contrast to the crime of robbery, breaking and entering does not always involve a face to face encounter between the victim and the offender. Furthermore, apart from the initial breaking and entering of the premises, most of the activity involved in this type of crime occurs within a building and is therefore out of site from any passersby, including police. Both these functions act to retard discovery of the offense until long after the offender has fled the scene with the stolen property. Thus, when police finally arrive, there is little likelihood that the offender will be apprehended

or the stolen property recovered. The case is therefore referred to the investigation function for follow-up or continuing investigation. For these reasons, it is assumed for purposes of the example that the investigation function is probably the most effective in clearing breaking and entering cases.

The third, and last, crime to be examined is theft from auto. The potential for discovering clues or establishing motive in the case of a theft from auto are much less than in that of breaking and entering. Furthermore, because theft from auto occurs when the owner has left the vehicle and it is difficult for passersby to determine whether the vehicle is being opened by a possible thief or the rightful owner, the crime is often not discovered until some time after it has actually occurred. This makes it less likely to be cleared by the citizen complaint function. It may appear that the preventive patrol function is probably the most effective function for clearing theft from auto cases by default. But there are several positive factors in its favor. First, preventive patrol occurs along the street where cars are most likely to be parked or in parking lots near or adjacent to the street. Second, policemen are trained observers and can deduce criminal intent whereas a casual passerby may not. And third, prior to going out on patrol, police review recent crime trends in their district in order to determine which areas they should give special attention. If thefts from auto are on the rise, they quickly determine the areas being most heavily hit and give them special attention. Thus, these three factors operate to increase the probability that preventive patrol will perhaps be the most effective function for clearing theft from auto cases. On the other

hand, there is little likelihood that a theft from auto will be reported while in progress, thus ruling out the possibility of the citizen complaint function being productive. And, there is little evidence or motive upon which to base a fruitful investigation.

The foregoing discussion provides the rationale behind the assumption that each police function supporting the Apprehension and Recovery Program is more suited to clearing one type of crime than another. The implication for allocating police resources among the three functions of the Apprehension and Recovery Program is clear. Resources should be allocated among functions in proportion to the percentage frequency of crimes for which they are most aptly designed to clear.

In order to develop data which will rationally demonstrate how this proposition will work, it is necessary to construct a simple mathematical model which defines the relationship between a particular police function and the probability that it will clear a particular type of crime. Thus, data contained in the performance accounts which follow are based upon the mathematical probabilities stated below:

1. $P(R)_c = 2P(R)_i = 2P(R)_p$
2. $P(B \& E)_i = 2P(B \& E)_c = 2P(B \& E)_p$

and

3. $P(TfA)_p = 2P(TfA)_c = 2P(TfA)_i$

where R is robbery, B & E is breaking and entering, TfA is theft from auto, c is citizen complaint function, i is investigation function, and p is preventive patrol function.

Expressed in words, the first statement means that the probability a robbery will be cleared by the citizen complaint function is twice the probability that it will be cleared by either the investigation function or the preventive patrol function. The second and third statements can be interpreted in an analogous fashion.

Tables 7.4, 7.5 and 7.6 illustrate the format and content of a set of hypothetical performance accounts which have been developed upon the model described. In these illustrations it is assumed that the rate of transformation from input to output and from output to impact is a simple arithmetic progression, whereby a 10 per cent increase in input will lead to a 10 per cent increase in output which will, in turn, lead to a 10 per cent increase in impact. It is further assumed that the three types of crime occur in the following frequencies over a three month period: robbery, 100; breaking and entering, 500; and theft of auto, 400. It is also assumed that at the end of the three month period those cases which remain uncleared will be removed from the active caseload.

After briefly reviewing the performance account for the Apprehension and Recovery Program in Table 7.4 for the first quarter of 1974 (which is presented on the following page), the Inspector in charge of police District 1 decides that he should formulate goals for the program and establish operating objectives for the functions supporting the program in order to evaluate his progress over the coming year.

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TABLE 7.4

Indicators of Input, Output and Impact for
the Apprehension and Recovery Program in Police
District 1: Hypothetical Data for the Period
January 1 to March 31, 1974

| INPUT | | OUTPUT | IMPACT | | | |
|-----------------------------------|----------------------------------|-------------|--------------------|----------------------------|---|-------------------|
| | | | Type of Crime | Total Cases Reported | Cases Cleared by this Function | Clearance Rate |
| <u>Citizen Complaint Function</u> | | | | | | |
| 40 Constables | Peak Call-load/Hour | 80 calls | Robbery | 100 | 54 | 54% |
| 10 Vehicles | Average Call-load/Hour | 21 calls | Breaking and | 500 | 28 | 6% |
| \$2,150.00 per diem | Call-load Capacity/Hour | 80 calls | Entering | | | |
| \$193,500.00 (90 days) | Average Response Time | 7.5 minutes | Theft from Auto | 400 | 17 | 4% |
| | Average Service Time | 30 minutes | Subtotal | 1000 | 99 | 10% |
| | Average Travel Time | 5 minutes | | | | |
| | Average Clearance Time | 25 minutes | | | | |
| <u>Investigation Function</u> | | | | | | |
| 40 Constables | Actual Caseload | 901 Cases | Robbery | 100 | 13 | 13% |
| 10 Vehicles | Caseload Capacity | 240 Cases | Breaking and | 500 | 111 | 22% |
| \$2,150.00 per diem | Average Caseload | 2 weeks | Entering | | | |
| \$193,500.00 (90 days) | Number of Transactions/Case | 5 | Theft from auto | 400 | 17 | 4% |
| | Total Number of Transactions | 1200 | Subtotal | 1000 | 141 | 14% |
| <u>Preventive Patrol Function</u> | | | | | | |
| 40 Constables | Density of Police Coverage | | Robbery | 100 | 13 | 13% |
| 10 Vehicles | 10 miles/square mile | | Breaking and | 500 | 28 | 6% |
| \$2,150.00 per diem | Number of Transactions/Constable | 10 | Entering | | | |
| \$193,500.00 (90 days) | Total Number of Transactions | 400 | Theft from auto | 400 | 67 | 17% |
| | | | Subtotal | 1000 | 108 | 11% |
| <u>Program Totals</u> | | | | | | |
| 120 Constables | | | Robbery | 100 | 80 | 80% |
| 30 Vehicles | (non-additive) | | Breaking and | 500 | 167 | 34% |
| \$6,450.00 per diem | | | Entering | | | |
| \$580,500.00 (90 days) | | | Theft from Auto | 400 | 101 | 25% |
| | | | Total | 1000 | 348 | 35% |

Note: Cost per Constable per diem is assumed to be \$50.00
Cost per Vehicle per diem is assumed to be \$15.00

The Inspector believes that the ideal goal for the Apprehension and Recovery Program would be:

- to maximize the average clearance rate which, in turn, would maximize the percentage of offenders identified at the scene who are arrested, and maximize the percentage of arrested offenders who are ultimately convicted.

The clearance rate is the percentage of cases reported to police which have been cleared through arrest and conviction. It is therefore a fairly accurate and complete statement of the success of the Apprehension and Recovery Program, although it is perhaps more general than is desired, since it fails to indicate the exact point in the process which requires remedial or corrective action. The Inspector realizes, however, that such an ideal goal is unrealistic for he recognizes the practical limitations of the police effort. He therefore settles for a less impressive but more feasible program goal which is to raise the average clearance rate from 35 to 37 per cent.

There are three police functions which support the Apprehension and Recovery Program: the citizen complaint function, the investigation function, and the preventive patrol function. The next task for the Inspector is to establish operating objectives for these functions which will complement the goal formulated for the Apprehension and Recovery Program. (In reality, this task would not be so straightforward because two of these functions support more than one program. The citizen complaint function supports the Public Safety Program as well as the Apprehension and Recovery Program. And, the preventive patrol function supports the Crime Prevention Program as well as the Apprehension and Recovery Program. For this reason, the Inspector would have to decide where the trade-off between achieving the goals of the Apprehension and Recovery Program and the goals of the competing programs lie. This

practical stumbling block is discussed further in Chapter 8.)

After setting his goal for the Apprehension and Recovery Program, the Inspector once again examines the performance account for the first quarter to see what action he might take to help attain this goal.

He notices that the current average clearance rate for all crimes reported in his district (see Table 7.4 "Program Totals") is 35 per cent. He further recognizes that the citizen complaint function is the most effective police function in clearing robberies. This function cleared 54 per cent of all robberies reported to police, whereas the investigation and preventive patrol functions combined cleared only a total of 26 per cent. He also observes that the investigation function is the most effective police function in clearing breaking and entering cases. It cleared 22 per cent of all breaking and entering cases reported to police, while the citizen complaint and preventive patrol functions combined cleared only a total of 12 per cent. Furthermore, the Inspector noted that the preventive patrol function was the most effective police function in clearing theft from auto cases reported to police, whereas the citizen complaint and investigation functions combined cleared only a total of 8 per cent over the same period.

The Inspector also recognized that the clearance rate for robbery cases was the highest in his district at 80 per cent of all reported cases, that the clearance rate for breaking and entering cases was the second highest in his district at 34 per cent of all reported cases, and lastly, that the clearance rate for theft from auto cases was the lowest in his district at 25 per cent of all reported cases.

The Inspector therefore decides to shift his resources from the citizen complaint function to the investigation and preventive patrol functions, hoping to retain the current clearance rate for robberies and, at the same time, to increase the clearance rate for breaking and entering and theft from auto cases. As a result of this decision, he establishes operating objectives for the citizen complaint function, the investigation function and the preventive patrol function which he thinks will complement the goal of the Apprehension and Recovery Program. These operating objectives are as follows:

Citizen Complaint Function

- call-load capacity per hour should not fall below average call-load per hour
- average response time should not exceed 12.5 minutes
- average travel time should not exceed 10 minutes
- average clearance time should not exceed 25 minutes
- average service time should not exceed 35 minutes

Investigation Function

- to raise caseload capacity from 25 to 37 per cent of actual caseload
- to raise the total number of transactions from 1200 to 1800.

Preventive Patrol Function

- to raise the density of police coverage from 10 to 12 miles per square mile
- to raise the total number of transactions from 400 to 480

In order to attain these operating objectives, the Inspector transfers 14 constables and 3 vehicles from the citizen complaint function to the investigation and preventive patrol functions. He allocates 10 additional constables and 2 vehicles to the investigation function, thus raising its total complement of police resources to 50 constables and 12 vehicles. He also allocates 4 additional constables and 1 vehicle to the preventive patrol function raising its total complement of police resources to 44 constables and 11 vehicles. He then awaits the performance accounts for the second quarter in order to evaluate the effect of this allocative shift in resources.

When he receives the performance accounts for the Apprehension and Recovery Program for the second quarter of 1974 which are presented in Table 7.5 on the following page, the Inspector in charge of District 1 makes several important observations.

First of all he notices that in spite of a loss of 14 constables and 3 vehicles, the citizen complaint function is still meeting its operating objectives, although the clearance rate for robbery has dropped from 80 per cent in the first quarter to 67 per cent in the second quarter of 1974. The Inspector also notices that as a result of 10 additional constables and 2 additional vehicles the investigation function is moving forward to meet its operating objectives, and the clearance rate for breaking and entering has risen from 34 per cent in the first quarter to 38 per cent in the second quarter of the year. Furthermore, he observes that as a result of 4 additional constables and 1 additional vehicle the preventive patrol function is also

TABLE 7.5

Indicators of Input, Output and Impact for
the Apprehension and Recovery Program in Police
District 1: Hypothetical Data for the Period
April 1 to June 30, 1974

| INPUT | | OUTPUT | IMPACT | | | |
|-----------------------------------|----------------------------------|------------------|-----------------------------|---|-------------------|-----|
| | | Type of Crime | Total Cases Reported | Cases Cleared by this Function | Clearance Rate | |
| <u>Citizen Complaint Function</u> | | | | | | |
| 26 Constables | Peak Call-load/Hour | 80 calls | Robbery | 100 | 35 | 35% |
| 7 Vehicles | Average Call-load/Hour | 21 calls | Breaking and Entering | 500 | 18 | 4% |
| \$1,405.00 per diem | Call-load Capacity/Hour | 48 calls | Theft from Auto | 400 | 11 | 3% |
| \$127,855.00 (91 days) | Average Response Time | 10 minutes | Subtotal | 1000 | 64 | 6% |
| | Average Service Time | 32.5 minutes | | | | |
| | Average Travel Time | 7.5 minutes | | | | |
| | Average Clearance Time | 25 minutes | | | | |
| <u>Investigation Function</u> | | | | | | |
| 50 Constables | Actual Caseload | 936 Cases | Robbery | 100 | 17 | 17% |
| 12 Vehicles | Caseload Capacity | 300 Cases | Breaking and Entering | 500 | 139 | 28% |
| \$2,680.00 per diem | Average Caseload | 2 Weeks | Theft from auto | 400 | 21 | 5% |
| \$243,880.00 (91 days) | Number of Transactions/Case | 5 | Subtotal | 1000 | 177 | 18% |
| | Total Number of Transactions | 1500 | | | | |
| <u>Preventive Patrol Function</u> | | | | | | |
| 44 Constables | Density of Police Coverage | | Robbery | 100 | 15 | 15% |
| 11 Vehicles | 11 Miles/Square Mile | | Breaking and Entering | 500 | 31 | 6% |
| \$2,365.00 per diem | Number of Transactions/Constable | 10 | Theft from auto | 400 | 74 | 19% |
| \$215,215.00 (91 days) | Total Number of Transactions | 440 | Subtotal | 1000 | 120 | 12% |
| <u>Program Totals</u> | | | | | | |
| 120 Constables | (non-additive) | | Robbery | 100 | 67 | 67% |
| 30 Vehicles | | | Breaking and Entering | 500 | 188 | 38% |
| \$6,450.00 per diem | | | Theft from auto | 400 | 106 | 27% |
| \$586,950.00 (91 days) | | | Total | 1000 | 361 | 36% |
| | | | | | | |

Note: Cost per Constable per diem is assumed to be \$50.00
Cost per Vehicle per diem is assumed to be \$15.00

moving forward to meet its operating objectives, and the clearance rate for theft from auto has risen from 25 per cent in the first quarter to 27 per cent in the second quarter of 1974. And, finally, he concludes that as a result of the overall shift in police resources from the citizen complaint function to the investigation and preventive patrol functions, the average clearance rate for all crimes reported in his district has risen from 35 per cent in the first quarter to 36 per cent in the second quarter of the year. This means that there has been 13 more crimes cleared in the second quarter than in the previous quarter of the year.

As a result of these observations in the performance accounts, the Inspector concludes that his strategy is working and he decides to take it even further. He therefore further reduces the magnitude of police resources allocated to the citizen complaint function and transfers them to the other police functions. He transfers 14 constables and 4 vehicles from the citizen complaint function. Of these he allocates an additional 10 constables and 3 vehicles to the investigation function, bringing its total complement of police resources to 60 constables and 15 vehicles. And, of the resources remaining, he allocates an additional 4 constables and 1 vehicle to the preventive patrol function, bringing its total complement of resources to 48 constables and 12 vehicles. The Inspector then awaits the performance accounts for the third quarter of 1974 in order to assess the impact of this further shift in resources.

When the Inspector has received the performance accounts for the Apprehension and Recovery Program for the third quarter of 1974 which are presented in Table 7.6 on the following page, he makes some important observations.

TABLE 7.6

Indicators of Input, Output and Impact for
the Apprehension and Recovery Program in Police
District 1: Hypothetical Data for the Period
July 1 to September 30, 1974

| INPUT | | OUTPUT | IMPACT | | | |
|-----------------------------------|----------------------------------|---------------|----------------------|--------------------------------|----------------|-----|
| | | Type of Crime | Total Cases Reported | Cases Cleared by this Function | Clearance Rate | |
| <u>Citizen Complaint Function</u> | | | | | | |
| 12 Constables | Peak Call-load/Hour | 80 calls | Robbery | 100 | 16 | 16% |
| 3 Vehicles | Average Call-load/Hour | 21 calls | Breaking and | 500 | 8 | 2% |
| \$645.00 per diem | Call-load Capacity/Hour | 21 calls | Entering | | | |
| \$59,340.00 (92 days) | Average Response Time | 12.5 minutes | Theft from Auto | 400 | 5 | 1% |
| | Average Service Time | 35 minutes | Subtotal | 1000 | 29 | 3% |
| | Average Travel Times | 10 minutes | | | | |
| | Average Clearance Time | 25 minutes | | | | |
| <u>Investigation Function</u> | | | | | | |
| 60 Constables | Actual Caseload | 971 Cases | Robbery | 100 | 20 | 20% |
| 15 Vehicles | Caseload Capacity | 360 Cases | Breaking and | 500 | 167 | 33% |
| \$3,225.00 per diem | Average Caselength | 2 Weeks | Entering | | | |
| \$296,700.00 (92 days) | Number of Transactions/Case | 5 | Theft from Auto | 400 | 25 | 6% |
| | Total Number of Transactions | 1800 | Subtotal | 1000 | 212 | 21% |
| <u>Preventive Patrol Function</u> | | | | | | |
| 48 Constables | Density of Police Coverage | | Robbery | 100 | 16 | 16% |
| 12 Vehicles | 12 Miles/Square Mile | | Breaking and | 500 | 33 | 7% |
| \$2,580.00 per diem | Number of Transactions/Constable | 10 | Entering | | | |
| \$237,360.00 (92 days) | Total Number of Transactions | 480 | Theft from Auto | 400 | 81 | 20% |
| | | | Subtotal | 1000 | 130 | 13% |
| <u>Program Totals</u> | | | | | | |
| 120 Constables | (non-additive) | | Robbery | 100 | 52 | 52% |
| 30 Vehicles | | | Breaking and | 500 | 208 | 42% |
| \$6,450.00 per diem | | | Entering | | | |
| \$593,400.00 (92 days) | | | | Theft from Auto | 400 | 111 |
| | | | Total | 1000 | 371 | 37% |

Note: Cost per Constable per diem is assumed to be \$50.00
Cost per Vehicle per diem is assumed to be \$15.00

First of all he notices that in spite of a further loss of 14 constables and 4 vehicles, the citizen complaint function is just meeting its operating objectives, although the clearance rate for robbery has dropped again, this time from 67 per cent in the second quarter to 52 per cent in the third quarter of the year. The Inspector also notices that as a result of a further 10 additional constables and 2 additional vehicles, the investigation function is meeting its operating objectives exactly, and the clearance rate for breaking and entering has risen from 38 per cent in the second quarter to 42 per cent in the third quarter of 1974. Furthermore, he observes that as a result of a further 4 additional constables and 2 additional vehicles, the preventive patrol function is meeting its operating objectives precisely, and the clearance rate for theft from auto has risen from 27 per cent in the second quarter to 28 per cent in the third quarter of the year. And, finally, he concludes that as a result of the overall shift in police resources from the citizen complaint function to the investigation and preventive patrol functions, the average clearance rate for all crimes reported in his district has risen from 35 per cent in the first quarter to 37 per cent in the third quarter of the year. Thus, without increasing the total cost of his operation, the Inspector has increased the number of crimes cleared in Police District 1 from 348 cases in the first quarter to 371 cases in the third quarter, an increase of 23 cases per quarter.

The question may be asked, how did the Inspector know what set of operating objectives was necessary in order to achieve his goal, or how did he know what shift in police resources was necessary to attain these objectives? The answer is that the performance accounts will ultimately provide police with the raw data from which a mathematical model of the police organization, the

community and the interrelationship between them can be constructed.

This model will have considerable value in predicting in advance the outcome of a proposed set of operating objectives or a proposed shift in resources. Thus, these decisions will no longer be based only upon personal judgment and intuition, but also upon the predicted outcome of these decisions by the models.

In summary, the Inspector has achieved his stated goal by shifting police resources from one function to another without increasing the total cost of resources allocated to the Program. Furthermore, because of the performance accounts he was able to ascertain the effect of these resource shifts in advance and, as a result, confirm that his intuitive decision would have the desired results.

7.5 Concluding Remarks

The example used in this chapter contains three police functions, not only one as in previous examples. The juxtaposition of three functions in the accounts brings to the surface more than ever before the existence of a complex network of interrelationships between the entries.

This chapter concludes the development of consolidated performance accounts which was begun in Chapter 5. The purpose of these chapters was to illustrate the practical application of the concepts developed in the earlier chapters to the problems of planning the delivery of police services to a community.

The final chapter which follows provides a general summary of the thesis and a final statement of conclusions.

CHAPTER 8

GENERAL SUMMARY AND CONCLUSIONS

One of the principal methods of improving the quality of life in cities has been the provision of various kinds of community services, such as police, recreation, education, health, and personal and family counselling. The delivery of such services to the community raises the need for some accurate method of monitoring and evaluating the efficiency and effectiveness of these services in addressing the problems and meeting the needs which they were designed to effect.

In this context, the purpose of the thesis was to develop a method for evaluating and monitoring community services that could be applied to any service in any community. As a vehicle for developing this method of evaluation, the Vancouver Police Department was chosen because the police service is perhaps the most essential and most costly community service provided by municipal government in Canada today.

In order to achieve its purpose, the thesis identified major police functions and assigned them to the police goals they were capable of effecting. The functions grouped under police goals were then referred to as programs, such as the Public Safety Program, the Crime Prevention Program and the Apprehension and Recovery Program.

The programs were described by three performance accounts, called the input, output and impact accounts. The Input Account described the police resources allocated to a program. The Output Account described the productivity of these resources in carrying out police functions assigned to each program. And, the Impact Account described the effectiveness of these resources in bringing about the desired improvement in the quality of life, in other words, the goals of the program.

One important step which remains to be taken in the development of police performance accounts is the relationship between the program accounts when considered together. One critical factor which must be examined is the danger of sub-optimization. This refers to when the goals of one police program are being met at the expense of not achieving, or achieving to a lesser degree, the goals of another police program. When this occurs, and it can only occur when the goals of two programs are in conflict, a decision has to be made as to which set of goals has the higher priority in terms of the global goals of the organization and the community which it serves.

In order to illustrate this potential problem, let us examine the citizen complaint function as it relates to both the Public Safety Program and the Apprehension and Recovery Program.

To maximize goal attainment for the Apprehension and Recovery Program, the Inspector in charge of Police District 1 shifted considerable resources from the citizen complaint function to the investigation and preventive patrol functions. In the end, this shift of resources acted to increase the overall

clearance rate of the Apprehension and Recovery Program. However, in terms of the Public Safety Program whose goals are also supported by the citizen complaint function, the effect of this transfer of resources resulted in a significant increase in response time, thereby reducing the degree to which the goals of the Public Safety Program were being met.

In order to tackle this problem, the Inspector in Police District 1 must determine the priorities in his district between the goals of the Apprehension and Recovery Program and the goals of the Public Safety Program. This problem of sub-optimization can only be resolved by determining the appropriate trade-offs between the goals of competing programs. This use of performance accounts is a matter which must be addressed in any future examination of evaluation procedures.

Finally, it became apparent during the study that the raw data contained in the accounts would over a period of time enable the construction of a mathematical model of the police organization, the community, and the inter-relationship between them. This model would have considerable predictive power in anticipating the outcome of proposed allocative decisions in advance of their actually being undertaken. This would therefore provide planners and managers of police services with a means of evaluating the effectiveness of proposed changes in resource allocation and operating objectives before the changes are actually made. It would therefore provide a tool with which to determine the most effective allocation of resources and the most complementary set of operating objectives consistent with current police goals prior to implementation.

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