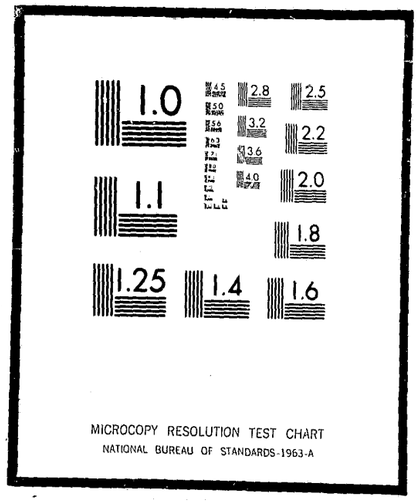

PHASE I NATIONAL EVALUATION OF SELECTED PATROL STRATEGIES, PART I -

SPECIALIZED PATROL OPERATIONS UNDER THE NATIONAL EVALUATION PROGRAM

Products 5 and 6 --

Study Designs for Local, Multiple Project and Field Experimental Evaluations of Specialized Patrol

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ABSTRACT

This report on specialized patrol presents several options for evaluating and monitoring projects at the individual departmental level and across several projects. It is intended to answer three crucial knowledge gaps identified by the Institute for Human Resources Research:

- Is specialized patrol more cost-effective than traditional patrol?
- Which specialized tactic, method, etc., is most cost-effective for a given crime type?
- Which major variables impact on specialized patrol effectiveness?

Using standardized measures and proposed methodologies, data can be collected and analyzed for about $16,000 per year by a local department. Collection and analysis of these same data for two years would cost about $420,000 across 10 projects, $1,900,000 across 50 projects. A recommended field study could address information gaps also. Over a 26-month period, this quasi-experimental design would cost $356,000 for one city, $512,000 for two cities and $824,000 for four cities. (All cited estimates exclude local department overhead.)

The proposed methodologies are relatively simple and straightforward. The local evaluation would permit departments to monitor and evaluate patrol activities and make informed decisions on resource allocations. The multiple project

assessment based on local evaluations and the field experiments would permit LEAA and local agencies to improve their planning substantially.

TABLE OF CONTENTS

LIST OF TABLES AND FIGURES

PREFACE AND ACKNOWLEDGEMENTS

The LEAA Evaluation Policy Task Force, a joint effort of State Planning Agencies (SPA) and Law Enforcement Assistance Administration (LEAA) representatives, has recommended that information on police methodology be produced through nationally coordinated evaluations under the National Evaluation Program.

On January 10, 1975, the Institute for Human Resources Research (IHRR) under LEAA Grant 75 NI 99-0067, began a Phase I study of the topic area, Selected Patrol Strategies: Specialized Patrol Operations. The purpose of this Phase I study is to assess specialized patrol operations.

This is the fifth in a series of reports prepared by IHRR. In previous reports, IHRR has reviewed the literature on specialized patrol, reported on the universe of their usage, described a representative sample of projects in some depth, classified projects into families, rated projects in terms of success or failure, and identified gaps in the knowledge on specialized patrol. This report represents two separate tasks, as defined in the LEAA scope of work: study designs for use by LEAA, regional and/or state law enforcement agencies and a design that can be used by individual local departments to monitor and evaluate their specialized patrol activities. All proposed study designs address cost-effectiveness comparisons between different types of specialized patrol and between specialized and traditional patrol.

We wish to acknowledge the assistance given us by the National Institute of Law Enforcement and Criminal Justice, LEAA Regional Offices, the State Planning Agencies, and the many local law enforcement officials and their staffs. All have given their assistance in locating and interpreting project information. Specifically, we wish to thank the following members of our Advisory Board:

- Sheriff Michael Canlis
- Mr. Joseph Lewis
- Dr. Elinor Ostrom
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We also wish to thank the following members of the LEAA staff for their assistance throughout this project:

- Dr. Richard Barnes
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SUMMARY

This is the fifth in a series of reports on specialized patrols prepared by the Institute for Human Resources Research (IHRR) for the National Evaluation Program of the National Institute of Law Enforcement and Criminal Justice, Law Enforcement Assistance Administration (LEAA). This report fulfills the tasks outlined for both Product 5 and Product 6 in the assigned scope of work. That is, it is intended to provide methodologies appropriate for monitoring and evaluating individual local specialized patrol projects and for collecting and analyzing data across projects. It is a companion volume to an IHRR summary report, "National Evaluation Program, Phase I Summary Report, Specialized Patrol Projects."

The IHRR study indicates that considerable resources are being devoted to specialized patrols in the United States. Over three-fourths of the police departments serving cities with a population of 50,000 or more persons are relying on a uniformed tactical, civilian dress and/or mechanical device tactic to combat serious crimes. Departments in many smaller cities, sheriffs and state and county police also rely on one or more of these specialized tactics, though to a lesser extent than departments in larger cities.

Given this reliance on specialized patrol, and the growing need to consider the cost-effectiveness of all public services, IHRR was particularly interested in determining answers to two basic questions:

- Is specialized patrol more cost-effective than traditional patrol?
- Which patrol tactic is most cost-effective for a given crime situation?

Neither of these questions can be answered on the basis of present evaluation findings. These basic questions, we believe, represent two major gaps in the knowledge on specialized patrol. Their existence denies administrators access to crucial information needed for resource allocation and monitoring.

Another crucial, but related, gap is the lack of knowledge about major variables that might impact on specialized patrol effectiveness.

This volume is devoted to recommended study designs, measurements, and other considerations that would fill these two major gaps in knowledge. That is, by various means, we suggest ways of answering the following questions:

- Is specialized patrol more cost-effective than traditional patrol in a given crime situation?
- Which specialized patrol tactic, visibility level, method, etc., is most cost-effective for a given target crime?
- Which variables (including those that are and are not under departmental control) impact on specialized patrol operations?

The proposed studies are designed to assist local departments to evaluate and monitor their own programs and also to provide for aggregate data collection and analysis across multiple projects.

The gaps in knowledge are discussed more fully in Chapter II in relation to a simple three-component systems model. We note that only one initiating/support (input) variable has been subjected to multiple evaluations--project objectives. A few studies have addressed some variables more directly related to the intervention processes (throughput), such as specialized patrol methods (e.g., stakeout, decoy) and various process measures (performance, efficiency, cost-effectiveness and morale); however, these evaluations have been infrequent and noncomprehensive in scope. Generally, evaluations have addressed two effectiveness (output) variables: arrests and crime reduction. However, the measures used to study these two variables are quite diverse and have led to noncomparability of results. Other output measures (clearances, convictions, displacement, citizen attitudes and/or participation) have received scant attention and, thus, add little to a sound knowledge base. In summary, we believe that no definitive conclusions can be made about the effectiveness of specialized patrols.

We note in Chapter II that there are many reasons for these gaps in knowledge. The most important of these are:

- Use of poor study designs
- Failure to use adequate comparison groups
- The use of noncomparable measures for studying the same phenomenon

Our proposed methodologies focus on overcoming these major deficiencies as well as other problems and issues related to evaluating specialized patrols.

In Chapter III, we discuss a number of problems and issues relevant to all methodologies proposed in this report. We discuss the feasibility of testing two hypotheses: (1) specialized patrol is more cost-effective than traditional patrol and (2) the average officer in specialized patrol is more cost-effective than if he were in traditional patrol. The latter, for reasons detailed in Chapter III, is the most easily tested of the two hypotheses.

A related issue is the personnel selection criteria. Since departments tend to pick superior patrolmen to serve on specialized patrol, a simple comparison of specialized vs traditional patrolmen is confounded by a selection bias. Four methods of choosing an adequate comparison group are presented. One is considered the most viable: the selection of a matched group of traditional patrolmen based on the selection criteria used for assignment to specialized patrol. Another option, a performance match of a specialized patrol group when they were traditional patrol vs their output as specialized patrolmen, could be used also to aid in the matching process. Various steps are recommended for the matching process.

Because of differences in duties assigned to specialized and traditional patrolmen, it will be important also to perform a workload analysis of both groups. Various formulas appear in Chapter III for making workload comparisons.

Also presented in Chapter III are methods for estimating the costs of specialized patrol and any chosen comparison group. The formula takes into account such variables as monthly salaries, fringe benefits, size of unit, costs of equipment, quarters and other costs. Also appropriate for all methodologies proposed in this report are a number of selected measures: performance measures; efficiency measures; cost-effectiveness measures; measures of job satisfaction and morale, etc. (See Chapter III.) At a minimum, we recommend that studies test the assumptions upon which projects are based and that they measure and/or control for the selections criteria, tactic and method (by type of crime), performance, efficiency, cost-effectiveness, satisfaction/morale, primary outputs (e.g., arrest and clearance rates, crime reduction) and secondary outputs (e.g., cases surviving the first judicial screening, displacement, citizen satisfaction/output).

Considering the various problems, issues, measures, etc., IHRR presents a methodology for implementing local project evaluation (Chapter IV). In addition to answering the basic questions regarding the cost-effectiveness of a given specialized patrol tactic and specialized vs traditional methods, this proposed strategy is intended to: (1) identify the effects of a given tactic on the community and (2) specify the

the types of monitoring statistics that should be gathered to assure that trends of effectiveness and efficiency factors are in a positive direction. Several basic steps are recommended:

- Establishment of an appropriate data collection system related to specialized patrol
- Identification of a matched set of traditional patrolmen
- Establishment of a data collection system relevant to the traditional patrol group
- Estimation of the cost per group
- Determination of need for citizen survey
- Collection of data on cost, effectiveness and workload over a period of time
- Performance of cost-effectiveness and workload analysis of specialized and traditional patrol groups.

The cost of each local evaluation is estimated at approximately $16,000 per year (excluding overhead). About $12,000 of this sum will be required for the employment of a junior analyst who will perform the data collection and analysis. Another $4,000 would probably be required for a limited citizen survey to be conducted by a local university.

These local evaluations should be most useful to the participating department. However, they will not answer the needs of LEAA, regional and state law enforcement agencies since they are isolated program evaluations. Aggregating the information from 50 or so local evaluation, of course, could provide LEAA and other agencies with much useful information.

Such aggregate data, as well as field experiments, could answer a number of questions regarding the success and failure of various tactics and could shed valuable insights into major variables that impact on specialized patrol effectiveness. For example, statistical techniques could be used to discover relationships between success and failure of different tactics and such exogenous variables as size of city, residential patterns and other demographic characteristics as well as relationships between success/failure and such endogenous variables as budget expenditures, size of specialized units, quality of crime analysis, general morale, and so on. These variables are enumerated in Chapter V.

In Chapter V, Section B, a design is presented for a multiple project assessment that would be based on the local evaluations described previously. IHRR recommends that LEAA gather the following types of data from at least 50 local projects: cost of traditional patrol, cost of specialized patrol, effectiveness of specialized patrol, and information on a number of endogenous and exogenous variables. This data would be collected and analyzed by an LEAA contractor to provide cost-effectivness comparisons of traditional and specialized patrols and an analysis of relationships among endogenous and exogeneous variables and effectiveness of patrol operations.

Several tasks would be required for this multiple project assessment:

- Design of a sampling plan of local jurisdictions
- Selection of specialized and comparison patrol groups

- Design of the data sampling scheme for selection of data from local departments
- Monitoring of the data collection
- Collection and analysis of the information
- Provision of general conclusions regarding the cost-effectiveness of specialized vs traditional patrol under a variety of conditions

The estimated cost for this multiple project assessment (n=50) is $1,900,000 for two years. A reduced sample (n=10) would cost an estimated $420,000 for two years. (These estimates exclude local departmental overhead.)

Another desirable means of filling information gaps is through the use of experimental field tests. A relatively inexpensive, feasible experiment is proposed in Section C, Chapter V. This design would answer the crucial questions identified in this report and do so, in all probability, with a comfortable level of confidence. Several steps are recommended for a full field test in a city already using two or more specialized patrol tactics:

- Standardization of data collection instruments, effectiveness measures, and evaluation procedures
- Assembling of historical data from existing crime statistics and arrest records (e.g., crime patterns, arrest patterns, officer productivity, citizen complaints)
- Survey of citizens
- Selection of five matched patrol subdivisions based on crime rates and designation of four as primary and secondary test areas (the fifth is designated a control area).

- Selection of experimental (specialized) and comparison (traditional) patrol groups
- Overlay of traditional with two variations of specialized patrols in two primary designated areas
- Comparison of effectiveness in different areas
- Reassignment of patrol variations in secondary areas
- Reassignment of specialized groups in different configurations in primary areas
- Final analysis

The final analysis of the field experiment would include a study of efficiency, cost, transferability, and the feasibility permitted by the planned variations.

The total estimated annual cost (excluding local overhead) of the recommended 26-month field experiment/analysis would be $356,000 for one city, $512,000 for two cities, and $824,000 for four cities.

Conducting the field experiments in three selected cities would permit testing each of the six identified tactics/methods of specialized patrol once.

I. INTRODUCTION

This is the fifth in a series of reports on specialized patrols prepared by the Institute for Human Resources Research (IHRR) for the National Evaluation Program of the National Institute of Law Enforcement and Criminal Justice, Law Enforcement Assistance Administration (LEAA). Our purpose here, as in previous reports, is to support the Phase 1 coordinated information-gathering effort of the National Evaluation Program. This report is a companion document to an IHRR summary report, "National Evaluation Program, Phase I Summary Report, Specialized Patrol Projects."

Previous IHRR reports have provided studies on specialized patrol projects throughout the country; and in the fourth product, significant gaps in knowledge were identified. It is the opinion of IHRR that the gaps in knowledge are inhibiting the decision process of police chiefs and State Planning Agencies (SPA's) on the subject of specialized patrol. It is, therefore, recommended that a future phase (Phase II) be considered to fill crucial identified gaps. This report includes a detailed description of a Phase II program to fill such gaps through individual local evaluation, multiple project assessments and field experiments.

Our study of specialized patrols indicates that specialized tactics--especially civilian dress, uniformed tactical, and mechanical devices--are heavily relied upon by police departments in cities with a population exceeding 50,000 persons. The choice of a given tactic seems to depend partly upon whether a department

believes a high or low visibility strategy, or a combination of both strategies will be most effective in combatting target crimes.

Specialized patrol projects were categorized by IHRR into three families based on visibility levels: Low Visibility, High Visibility, and High/Low Visibility. Increased apprehension is the prime mission of Low Visibility patrols (i.e., patrols relying on civilian dress and/or mechanical devices) while deterrence is the major mission of High Visibility patrols (i.e., patrols relying on a uniformed tactical tactic). Both deterrence and apprehension are prime missions of the High/Low Visibility patrols (i.e., those that rely on uniformed tactical and civilian dress and/or mechanical device tactics).

Regardless of the visibility level, all specialized patrols in our selected sample had much in common. These commonalities permit a general description of specialized patrols in terms of the processes and activities summarized in the following paragraph.

Specialized patrol personnel tend to be selected because of their high performance (e.g., arrest rates) in traditional patrol. As specialized patrolmen, they generally receive additional training relevant to designated tactics or activities. Planning and deployment for specialized activities are based largely on crime analysis. The personnel are generally monitored by their own unit. The span of control is typically one sergeant to eight officers. Interventions tend to focus on burglary, robbery, and other Part 1 offenses, with coverage of commercial and residential areas. The methods used to combat target crime are roving patrol; saturation patrol; surveillance;

stakeout; and, with civilian dress tactics, decoy and blending. Some patrols may engage in prevention activities (e.g., target hardening, public education). In all cases, the major objectives are crime reduction and increased apprehension of target criminals.

A further examination of a sample of projects representative of different visibility levels and tactics indicates that at least some projects in all family types were successful in reducing target crimes, increasing arrests, and achieving other objectives. Thus, the assumption that specialized patrols are effective seems to be generally well founded. The major gaps in information are whether or not these patrol types are more cost-effective than traditional patrol and which specialized tactic, or combination of tactics, is most cost-effective for a given type of crime.

In addition to these gaps in knowledge on the cost-effectiveness of specialized patrol tactics and operations, there is a general lack of knowledge about major variables that might impact on specialized patrols and their effectiveness. The major variables could have significant effects on the cost-effectiveness of a particular project.

With the deepening concerns over budget constraints and the need for more precision in making decisions in police departments, IHRR believes that the following steps should be taken to fill gaps in knowledge:

- LEAA should stimulate the use of cost-effectiveness comparison and monitoring of local projects to achieve better decision making

- LEAA should encourage experiments and data collection over many projects to develop knowledge of cost-effectiveness and of the impact which major variables may have on specialized patrol activities

This report provides detailed descriptions of how local departments can monitor their specialized patrol operations in terms of cost-effectiveness and how multiple project data collection and experiments can aid in departmental or SPA decision making.

NOTES AND REFERENCES

1. Institute for Human Resources Research, "Phase I National Evaluation of Selected Patrol Strategies: Specialized Patrol Operations Under the National Evaluation Program, Product 4: Assessment of the Knowledge on Specialized Patrol." Bethesda, Maryland, 1975.

II. GAPS IN KNOWLEDGE ABOUT SPECIALIZED PATROLS

During the progress of the IHRR study of specialized patrols, it became increasingly evident after examining many patrol projects that decision making and management monitoring were being conducted mainly by judgment rather than by systematic data analysis. Such judgment may have been accurate because of the experience of decision makers at management levels. However, inexpensive cost-effectiveness analysis used in conjunction with seasoned judgment would help assure that the most cost-effective patrol method is being used.

In this period of shrinking municipal budgets, it is particularly important to ensure that productivity and cost-effectiveness are being measured and being used in the planning and management process. Cost-effectiveness analysis and project monitoring depend on knowledge of patrol methods, significant variables, and relationships among them. These have been described in detail in the previous four reports by IHRR. The variables that related directly to patrol operations were placed within a systems model (Figure II-1). In addition to variables that affect the input, throughput, and output as shown in the model, there are many other variables in the planning, funding, interdepartmental relationships, etc., which are important to analysis. IHRR called these less direct variables "intervening variables," and these are listed in Table II-1. As noted in this Table II-1, some are within department control and others not.

FIGURE II-1

SPECIALIZED PATROL SYSTEMS MODEL

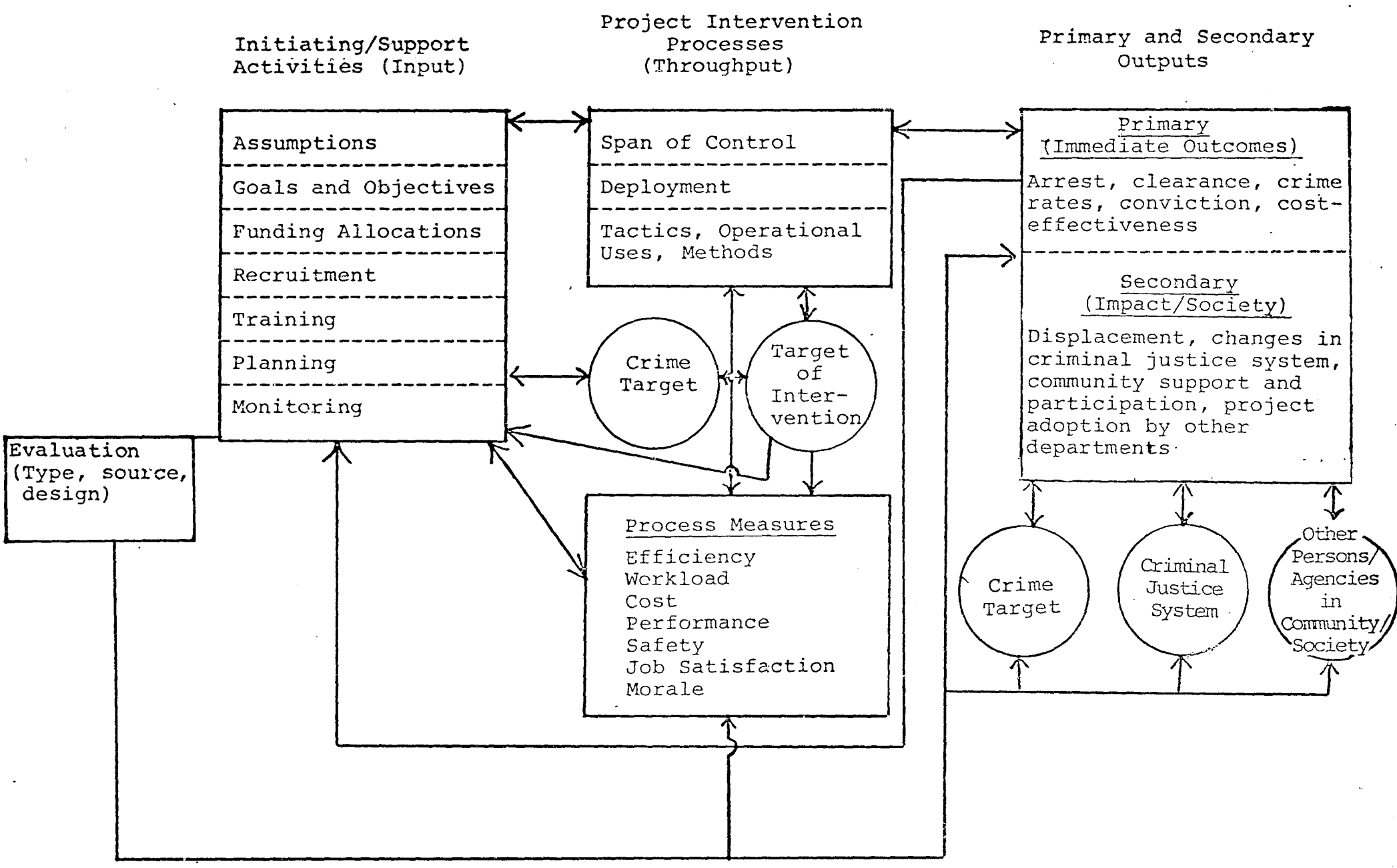


TABLE II-1

INTERVENING VARIABLES AFFECTING SPECIALIZED PATROLS

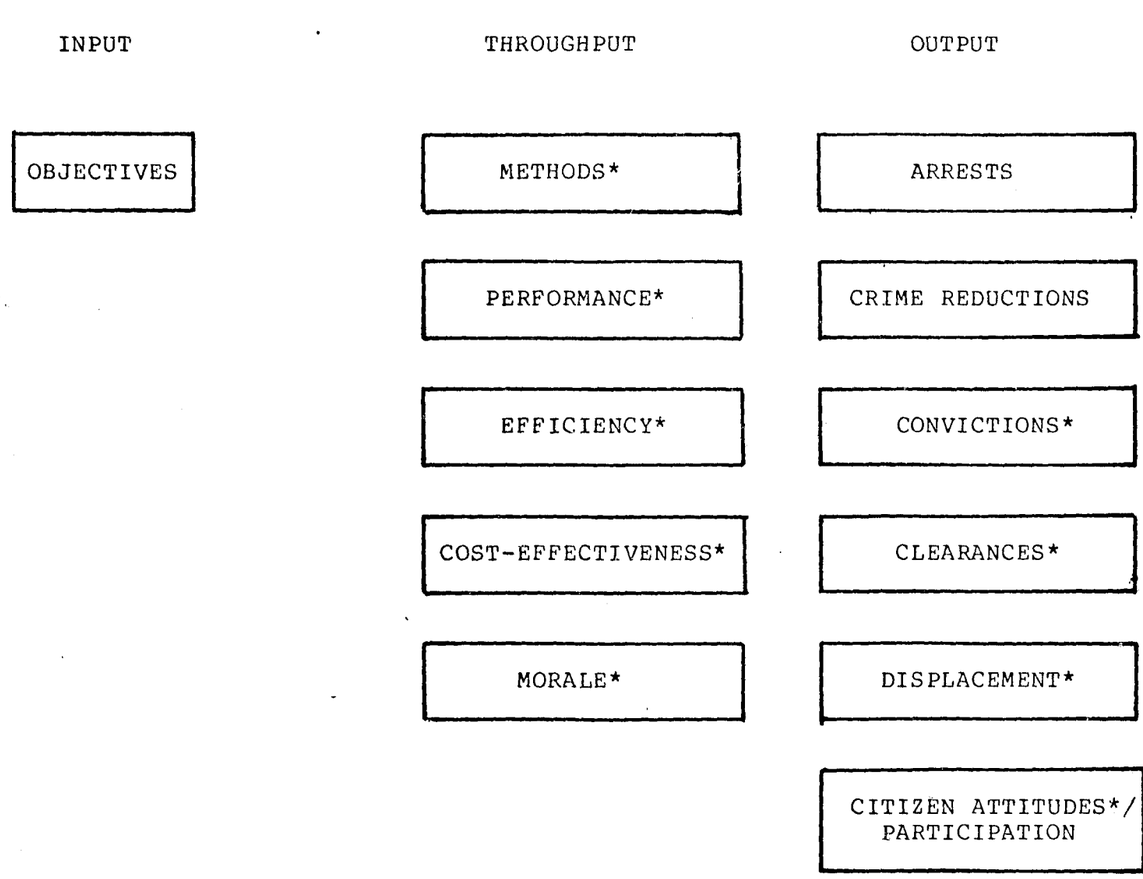
Under Department Control	Not Under Department Control
Funding Level (in part)	Funding Level (in part)
Planning . Goal Setting . Crime Analysis . Organization of Patrol . Deployment Practices . Manpower Allocations	Community Input into Planning
Recruitment/Selections Criteria	Societal Changes . Unemployment . Criminal Organization Changes
Training	Procedures of Courts, Prosecutors, etc.
Coordination	Relations of Police to Other Parts of Criminal Justice System
Monitoring	Citizen Reporting of Crimes
Span of Control	Community Attitudes Toward Patrol, PD
Police-Community Relations Efforts	SES, Size & Other Characteristics of Target Areas/Persons
Police Relations with Other Parts of Criminal Justice System	Characteristics of Criminals
Presence of Non-Patrol in Target Area	Strategies Used by "Target" Criminals
"Behavior" of Patrol	Media Coverage
Cooperation with Patrol Team	
Cooperation Between Patrol & Other PD Units	
Evaluation	

The amount of knowledge that IHRR was able to gather about the variables listed in Figure II-1 and Table II-1 was small. The IHRR survey of local departments indicates that only a few of the many variables have been evaluated. Those typically included in evaluations are listed in Figure II-2. On the input side of the model, only the objectives have been evaluated. On the throughput side, there have been a few analyses of methods such as stakeout and decoys and some evaluations of the process measures listed such as performance, efficiency, cost-effectiveness, and morale. The major focus has been on what IHRR has termed primary outputs such as arrest and crime reduction effectiveness measures. A few studies also addressed increases in clearance and conviction rates. The specialized patrols' impact on the communities they serve and the broader society (secondary outputs) has received only scant attention in local evaluations. Some very inadequate tests have been made of crime displacement and some evaluators have addressed citizen attitudes toward the patrols and/or their participation in prevention activities (e.g., target hardening, public education). Only rarely have these studies of citizens been based on adequate survey methodology. Except for citizen attitudes, we know of no instance where the intervening variables identified by IHRR have been addressed. The gaps in knowledge are wide indeed. IHRR feels that the most important gaps in knowledge have been created unnecessarily by:

- Use of poor study designs
- Failure to use adequate comparison groups in a cost-effectiveness framework

FIGURE II-2

VARIABLES STUDIED IN IHRR SURVEY EVALUATIONS



* = Measured only infrequently.

- The use of noncomparable measures for studying the same phenomenon

The study designs fail on many scores. Most important among these are the failure to control for the interventions of non-specialized personnel in the target areas assigned to specialized personnel, inadequate tests of displacement, the use of short-term measures and, especially, the failure to take into account the selection criteria for specialized patrol. Since departments often tend to choose the best performers to serve on specialized patrols, and evaluators have not utilized well-matched comparison groups, what has been studied primarily (but inadequately) is personnel selection rather than project assumptions or tactics. The picture is additionally confused by the use of many different performance and effectiveness measures, many of which are of questionable reliability and comprehensiveness.

One could write a lengthy text on ways of filling all the gaps in knowledge on specialized patrols. IHRR has taken a pragmatic approach rather than a comprehensive one in addressing this problem.

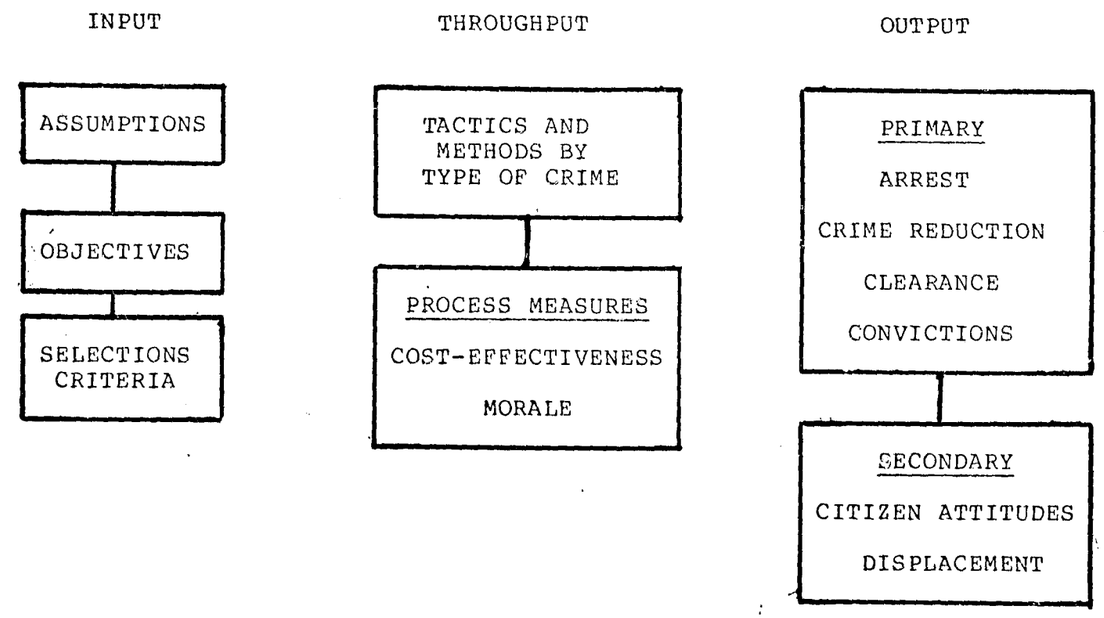
It seems to us that choices should be made, that one should first identify the most important gaps and set about to answer basic questions which will provide law enforcement personnel information they need to make decisions on crucial issues. This pragmatic approach also takes into consideration budget constraints and the exhorbitant cost of a study that would attempt to fill all the gaps.

In order to fill the most important gaps (identified in Figure II-3), IHRR believes three basic types of studies should receive first priority:

- Studies that will test the implicit assumption that specialized patrol will be more cost-effective than traditional patrol in certain crime situations
- Studies that will test the assumptions, tactics, and methods underlying the existence of project families and permit comparisons of the effectiveness (including cost-effectiveness) of different visibility levels, tactics, and methods by type of crime
- Studies that will test the effects and interactions of major variables that could affect specialized patrol operations.

FIGURE II-3

IMPORTANT KNOWLEDGE GAPS



III. EVALUATION AND MONITORING ISSUES

There are many problems and issues connected with the filling of significant information gaps on specialized patrol. These problems and issues are similar whether a local chief is monitoring his patrol operation or a central authority is attempting to analyze types of specialized patrol across several local departments.

A. Hypothesis Testing

A primary purpose of specialized patrol evaluation is to provide data on the following hypothesis for each appropriate crime situation:

H_1 : Specialized patrol is more cost-effective than traditional patrol

Since there is a variety of tactics of specialized patrol that could be used to test the above hypothesis, analysis is necessary to determine which tactic is most cost-effective for each crime situation. The law enforcement administrator can then consider cost-effectiveness when he decides how to allocate his resources.

However, there are problems to be considered. The methods of providing opportunities for action (e.g., arrests) are different between specialized and traditional patrol. In the traditional patrol, the response to the dispatcher is a main source of opportunities for action. Quite different is the specialized patrol officer who is working on a tactic rather than responding to a call. The basic opportunities per time period are different between the two systems. Thus, the hypothesis, H_1, while testable, would

be too costly for most local programs to measure validly. The following hypothesis, however, is testable within the resources available at the local level:

H_2 : The average officer in specialized patrol is more cost-effective than if he were in traditional patrol

This hypothesis recognizes that specialized patrol and traditional patrol are two distinctly different systems and that if an officer is placed in one system, he may have higher or lower productivity than when in another system. The system in which he has the highest productivity for the same crime will be the most cost-effective. Of course, it is assumed that the cost per officer will cover all costs to the units of cars, special equipment, quarters, etc. Thus, if the measures of effectiveness are measured on the average officer and cost allocated prorated to each officer, direct test of H_2 is possible.

B. Personnel Selection Bias

In most specialized patrol units, the personnel are hand picked and superior to the average traditional patrolman. The specialized patrolman is generally picked from regular patrol units because of his productivity and motivation. Thus, if one compared measures of effectiveness such as arrest rates between specialized and traditional patrol, there would be a personnel selection bias. It would not be valid to say that tactics are being compared when the real difference could be in the personnel. If specialized patrol were more effective, one could not be sure that the officers

would not have done as well or better in the traditional patrol in which they originally served.

There are a number of possible ways to remove or control for this bias:

1. Random selection of traditional patrol personnel for assignment to specialized patrol
2. Time series intervals, rotating personnel through both modes of patrol
3. Performance match of specialized patrol group when they were traditional patrolmen to their current output in the specialized unit
4. Choice of a matched group of traditional patrolmen based on the selection criteria used for assignment to specialized patrol and comparison of the performance of the two groups

Options 1 and 2 would probably be too disruptive organizationally since most large departments will already have existing specialized patrol units and procedures for assignment and transfer. Option 3 depends upon some very specific historical performance data that may be difficult to retrieve.

We, therefore, have selected Option 4 as the standard method for removing any personnel selection bias. Where it exists, the historical data needed for Option 3 could be used to aid in the matching process.

The matching would take the following steps:

The personnel in the specialized patrol unit will be analyzed on performance when they were traditional officers. If possible, this will be done with sampling of activity sheets. If this is not feasible, commanding officer judgment may be necessary.

↓

A current set of traditional patrol officers who have matched performance to the specialized patrol officers will be identified. This can be done by a combination of commanding officer judgment and sampling of activity sheets.

↓

For the test time period, performance data on the two groups will be collected and analyzed. (See Section C on Workload Analysis.)

C. Workload Analysis

Most comparisons of traditional and specialized patrol units are concerned with measurements of the impact type crime. The traditional patrolman has many duties in addition to working on impact crime and, generally, only about 30 percent of his time is spent on impact crime. Specialized patrol personnel are generally oriented to full-time work on certain types of crime. However, it is not unusual for a specialized patrol unit to assume some of the traditional patrol duties such as giving traffic tickets, picking up drunks, holds, etc. Thus, there is a problem in comparing specialized patrol and traditional patrol performance because the functions and workloads are different although each patrol type can handle the same crime problems.

Thus, it is necessary to collect a good deal of information about the activities of the specialized and traditional patrolmen in the sample. In both cases, it is necessary to know the amount of time that is devoted to impact crime and the amount of time that is used for other duties (including training). These data on time can be collected by sampling patrol activity sheets. The following formulas illustrate the method of comparison that could be used on a particular measure of effectiveness such as arrest rate.

Let T_1 = the average time per week that a specialized patrol devotes to an impact crime

T_2 = the average time per week that a traditional patrol devotes to an impact crime

R_1 = the weekly number of arrests by this specialized patrol for impact crime

R_2 = the weekly number of arrests by this traditional patrol for impact crime

$\frac{T_1}{R_1}$ is a measure of the interval of time between arrests by specialized patrolmen, considering only time devoted to the impact crime. This can be compared directly with $\frac{T_2}{R_2}$. For instance, assume the following figures:

T_1 = 40 hours

T_2 = 10 hours

R_1 = 5 impact crime arrests

R_2 = 1 impact crime arrest

$$\frac{T_1}{R_1} = \frac{40}{5} = 8 \text{ hours}$$

$$\frac{T_2}{R_2} = \frac{10}{1} = 10 \text{ hours},$$

indicating in this example that the specialized patrol tactic is more efficient in terms of the interval of time between arrests. The comparison of specialized patrol activities and traditional patrol activities has many additional complexities concerning workload. The arrests that a specialized civilian clothes unit makes on the street many not be possible by a uniformed officer. A hostage case handled by a specialized SWAT team may not be handled in the same way by a traditional patrol. Thus, the activities differ and this makes comparison difficult. The complexities of special cases, special training and noncrime activity must be taken into account in the evaluation.

D. Differences Among Projects.

The IHRR model identifies many input, throughput, and output variables that showed relatively little difference among visibility families. However, from project to project, there are variations in classifications such as:

- Method
- Organization and training
- Funding
- City characteristics
- Crime situation

These can bring about perturbations in the measures of effectiveness. If a sample of departments were large enough, the variations in the variables in each of the categories might balance out. If the sample were small, say under 30, there is the possibility of some non-normal distributions of error, which will bias the cost-effectiveness comparisons.

1. Cost Estimation. It will be necessary to provide guidelines for standard methods to estimate cost of operations. Our findings indicate that there has been little costing of patrol operations and new techniques will be needed. The methods to be used for costing will have to be clear for most staff personnel to follow. The following formulas are simple and appropriate to illustrate the method.

$i = 1, 2, 3, \ldots n$ the index i designates the rank of the personnel

A_i = the average monthly salary of those in rank i

B_i = the average monthly fringe benefits in rank i

C_i = the number of people in rank i in the unit

D = the cost of automobiles (current price)

E = the cost of special equipment and supplies by month

F = the number of automobiles assigned to the unit

G = the number of years that automobiles are kept

H = the estimated monthly cost of quarters

I = all other costs

$$\text{Total monthly cost} = \sum_{i=1}^{n} C_i(A_i + B_i) + \frac{F \cdot D}{G} + E + H + I$$

If both specialized patrol and traditional patrol costs were estimated following a standardized costing system such as presented, the costs could be compared. The data on factors A through I listed above should be available.

The following section summarizes some types of measures that could be standardized in order to assist in determining project costs and effectiveness.[1]

E. Selected Measures

What to measure and how to measure are, of course, crucial questions facing any evaluation. The following discussion considers the process measures of most immediate concern to police administrators. An exhaustive list and discussion of all measures that IHRR found related to specialized patrol operations can be found in the IHRR Product 3 report.[1]

The accuracy and/or meaningfulness of many of the process measures will depend, of course, upon the accuracy of the police records, the reliability of questionnaire data, the choice of comparison groups, and other considerations.

In the following sections, we will consider the preferred (P) and acceptable (A) measures of:

- Performance
- Efficiency
- Cost-effectiveness
- Safety
- Job satisfaction
- Morale

1. Performance Measures. In measuring performance, it would be most useful to consider:

- Comparing specialized patrol personnel's performance "before" and "after" their assignment to the specialized unit and/or with a "matched" group of traditional patrolmen; in either case, comparisons should include performance only in "matched" situations (e.g., where probability of arrest is constant with a specified number of man-hours).
- Comparing performance of groups by type of crime or subcategories of crimes (e.g., for purse snatching vs commercial robberies).
- Comparing performance by type of method (e.g., stakeout) and type of crime.

Given an adequate basis for comparison and assessment, one might use the following as criteria for measuring performance:

Victimization (A)

- Number of crimes committed
  - Felony
  - Misdemeanor
  - Specific types of crime (e.g., purse snatching)
  - Target crime associated

Reported Crimes (P)

- Number of crimes reported
  - Felony
  - Misdemeanor
  - Specific types of crime
  - Target crime associated

Arrests (P)

- Number of arrests
  - Felony
  - Misdemeanor
  - Specific types of crime
  - Target crime associated

Quality of Arrests

- Number of arrests prosecuted (A)
  - Felony
  - Misdemeanor
  - Specific types of crime
  - Target crime associated
- Number of arrests surviving the first judicial screening (P)
  - Felony
  - Misdemeanor
  - Specific types of crime
  - Target crime associated
- Number of arrests resulting in conviction for original or lesser charge (A)
  - Felony
  - Misdemeanor
  - Specific types of crime
  - Target crime associated

In-Progress Arrests (A)

- Number of "in-progress" arrests
  - Felony
  - Misdemeanor
  - Specific types of crime
  - Target crime associated

Crimes Cleared

- Percent of reported crimes cleared (P)
  - Felony
  - Misdemeanor
  - Specific types of crime
  - Target crime associated
- Percent of crimes reported cleared by arrest (A)
  - Felony
  - Misdemeanor
  - Specific types of crime
  - Target crime associated
- Percent of crimes committed cleared (investigation) (A)
  - Felony
  - Misdemeanor
  - Specific types of crime
  - Target crime associated

Workload Measures

- Number of field interrogations conducted (A)
- Number of moving traffic citations issued (P)
- Number of parking traffic citations issued (P)
- Number of vehicles stopped and checked (A)
- Number of businesses inspected (A)
- Number of residences inspected (A)
- Number of targets "hardened" (percent) (A)
- Value of stolen property recovered (percent) (A)
- Number of stolen autos recovered (percent) (A)
- Number of stolen autos recovered undamaged (percent) (A)
- Percent of field interrogations resulting in arrests (number) (A)
- Percent of field interrogations resulting in felony arrests (number) (P)
- Percent of field interrogations resulting in target crime associated arrests (number) (A)
- Number of vehicles stopped and checked resulting in arrests (number) (A)
- Percent of vehicles stopped and checked resulting in felony arrests (number) (A)
- Percent of vehicles stopped and checked resulting in target crime associated arrests (number) (P)

2. Efficiency Measures. These measures are intended to relate the amount of service output produced to the amount of input used to produce it. Inputs are commonly expressed in terms of resources or effort (e.g., funds, manpower).

Two principal resource input measures are proposed:

- Patrol man-hours (P)
- Total costs of specialized patrol activity (P)

Patrol man-hours is the major factor input into the specialized patrol activity. Because specialized patrol is commonly heavily labor-intensive, this expresses the bulk of the inputs. However, it excludes other factor inputs (e.g., cars, special equipment, etc.).

Total costs is a superior expression of resource inputs as it includes the monetary value of all factor inputs, including costs of personnel, cars, special equipment, etc. Use of this measure can present problems in comparing effectiveness among different jurisdictions due to differences in salary levels and methods of computing total costs. However, this comparability problem can be handled by adjusting salary levels using an indexing procedure and specifying what costs are to be included in "total costs."*

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*A simple indexing procedure would be to adjust each jurisdiction's salary costs by the following formula:

Define:

AS_n = Average patrolman's salary for the nation

AS_1 = Average patrolman's salary for this locale

$\frac{AS_1}{AS_n}$ = Index number of S_1

TS_1 = Total salary for this local

The jurisdiction's adjusted salary costs are then:

$$\frac{TS_1}{\frac{AS_1}{AS_n}}$$

There are numerous ways to employ efficiency measures. However, it would be most useful to consider the following set: (crime, arrest and clearance rates may be used for all crimes, and clearance rates may be used for all crimes, felonies only, misdemeanors only, specific types of crime only, specific types of crime such as purse snatching, or target crime only):

Victimization	Cost per crime committed (A) Patrol man-hours per crime committed (A)
Reported Crimes	Cost per crime reported (A) Patrol man-hours per arrest (P)
Arrests	Cost per arrest (P) Patrol man-hours per arrest (P)
Quality Arrests	Cost per arrest prosecuted (A) Patrol man-hours per arrest prosecuted (A) Cost per arrest surviving first judicial screening (P) Patrol man-hours per arrest surviving first judicial screening (P) Cost per arrest resulting in conviction for original or lesser charge (A) Patrol man-hours per arrest resulting in conviction for original or lesser charge (A)
Crime Cleared	Cost per reported crime cleared (P) Patrol man-hours per reported crime cleared (P) Cost per reported crime cleared by arrest (A) Patrol man-hours per reported crime cleared by arrest (A)

3. Cost-Effectiveness Measures. These measures are intended to relate the effectiveness produced to the amount of dollars used to produce it. All inputs are expressed in terms of a single measure--dollar costs. Ideally, effectiveness should also be expressed in terms of a single measure constituting a composite value of the total effectiveness achieved for the costs. However, this is rarely possible to achieve in practice because there are multiple effectiveness measures used in evaluating police patrol

activities and they are incommensurable (i.e., nonadditive). For example, one cannot add arrests, convictions, clearances, etc. to obtain a composite effectiveness measure; nor is it clear how these can be weighted and added (although this could be attempted). For this reason, multiple cost-effectiveness measures must be used where costs are related to several effectiveness measures in turn.

One could argue that distortions are introduced when total costs of a specialized patrol activity are related to only one of several effectiveness measures; actually, only those costs attributable to patrol activities effecting that measure should be included. Practically speaking, however, one cannot segregate costs attributable to effects on crime committed, arrests, quality arrests, clearances, etc. Therefore, we favor using total costs of the specialized patrol activity.

It would be most useful to consider the following cost-effectiveness measures (crime, arrest and clearance rates may be used for all crimes, felonies only, misdemeanors only, specific types of crime, or target crimes only):

$$\frac{\text{total cost}}{\text{number of crimes committed (victimization)}} \quad \text{(A)}$$

$$\frac{\text{total costs}}{\text{number of crimes reported}} \quad \text{(A)}$$

$$\frac{\text{total costs}}{\text{number of arrests}} \quad \text{(P)}$$

$$\frac{\text{total costs}}{\text{number of arrests prosecuted}} \quad \text{(A)}$$

$$\frac{\text{total costs}}{\text{number of arrests surviving first judicial screening}} \quad \text{(P)}$$

$$\frac{\text{total costs}}{\text{number of arrests resulting in conviction for original or lesser charge}} \quad \text{(A)}$$

$$\frac{\text{total costs}}{\text{number of crimes cleared}} \quad \text{(A)}$$

The above measures may appear to exclude consideration of the other activities by specialized patrol units, including workload measures pertaining to traffic operations and crime prevention. However, a close inspection of the workload measures will demonstrate that essentially all the performance and workload measures contribute to this set of cost-effectiveness measures.

4. Safety (A). The following data could be used to measure whether or not the specialized patrol operates at an acceptable level of safety for its personnel:

- Number of deaths among personnel attributable to specialized patrol activities
- Number of line-of-duty injuries

Comparisons of these measures by man-hour for specialized and traditional patrolmen would be useful.

5. Job Satisfaction and Morale. A review of the literature indicates that specialization can affect job satisfaction and morale. The effects may be positive or negative, depending upon a number of conditions, and may extend to units other than the specialized patrol. Satisfaction with work and good morale may well enhance communication, coordination, and cohesiveness and, in general, contribute to performance and efficiency. Dissatisfaction and poor morale may contribute to quite opposite results.

The measurement of job satisfaction and morale--within specialized as well as other departmental units--could provide much useful data for departments, especially if they were willing to probe for reasons for content or discontent.

a. Job satisfaction. Satisfaction or dissatisfaction within specialized patrol and/or other units might be measured in two ways: through a review of police department records and an attitude survey.

i. Record review. Several indications of job satisfaction could be obtained through simple calculations of data retained in police files. These types of data include:

- Attrition rates
- Requests for transfer to other unit
- Absenteeism (e.g., sick leave)
- Minor rule infractions

ii. Attitude survey. A carefully-designed questionnaire could provide an understanding of the reasons for satisfaction or dissatisfaction within the specialized unit. For example, it might tap attitudes toward factors known to contribute to job satisfaction (and morale) such as feelings of cohesiveness, improved training and an enhanced flow of communications up and down the channels of control. Another questionnaire could be devised for other parts of the department to determine if the specialization has positively or negatively affected job satisfaction in other units and, if so, why.

b. Morale. The same type of measures described for job satisfaction could also be used to assess morale within the specialized unit and other departmental units. Added to these might be interaction measures to determine cohesiveness within the specialized unit and coordination within the specialized patrol and/or between the patrol and other units. Such interaction measures could test the assumption that specialization can positively or negatively affect cohesiveness and/or coordination.[2]

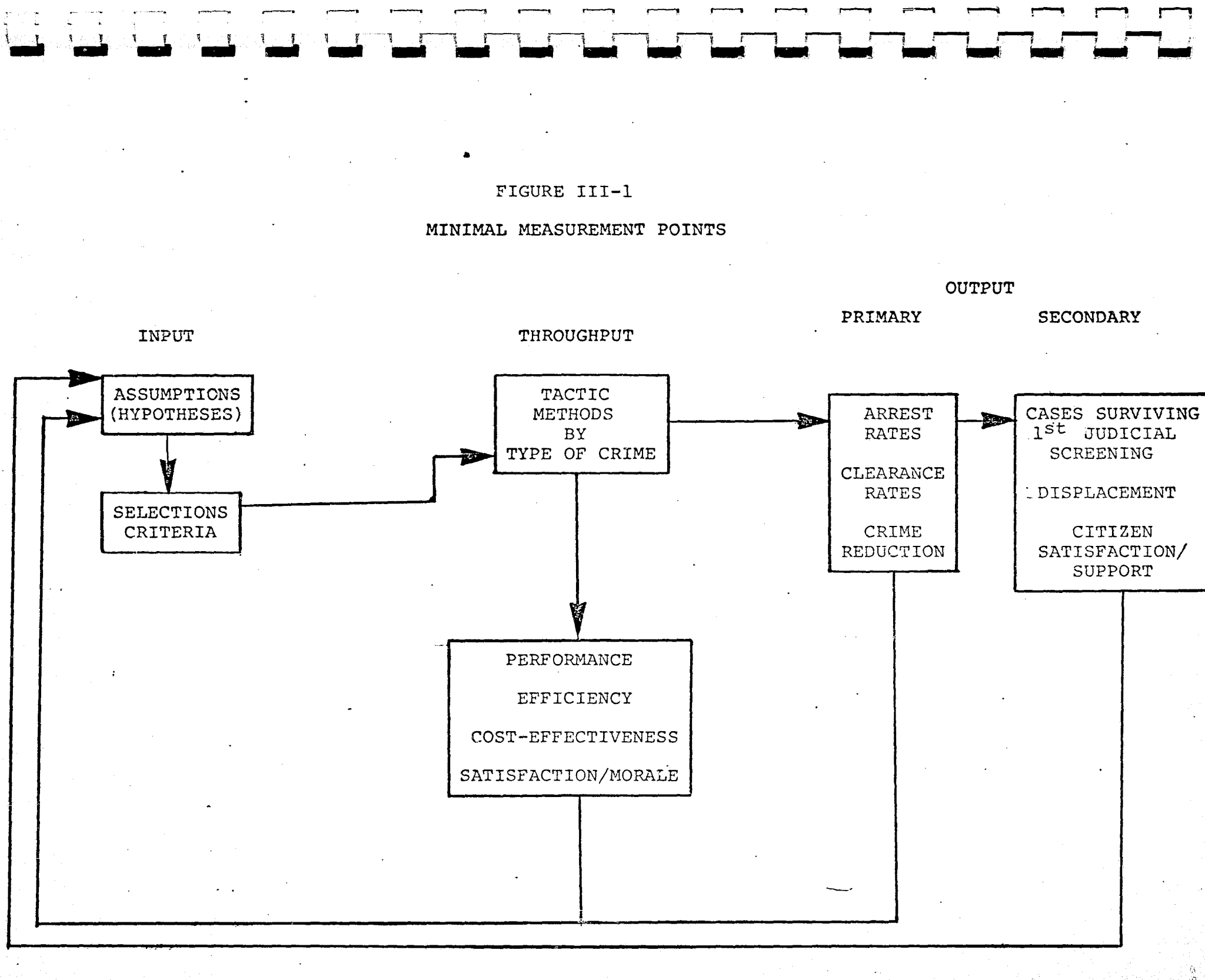
Having obtained measures of job satisfaction and morale, one might examine the relationship between these process impact scores and measurements of performance, efficiency and cost-effectiveness or their relationship to the output measures described in previous sections. Given an adequate study design, correlational techniques could be applied in order to determine relationships between job satisfaction and/or morale and other process measures as well as chosen output measures.

F. Minimum Acceptable Measurement

IHRR by no means recommends that a local official or police administrator employ all these measurements. Figure III-1 presents a recommended list of measures within the reach of most departments and suggests an appropriate systems framework. However, across many departments, it is probable that most of the recommended measures will be used by some departments. Amassing data from many departments should provide some information on all or most of the variables discussed in the previous sections.

FIGURE III-1

MINIMAL MEASUREMENT POINTS



NOTES AND REFERENCES

1. Institute for Human Resources Research, "Phase I National Evaluation of Selected Patrol Strategies: Specialized Patrol Operations Under the National Evaluation Program, Product 3: Project Families, Synthesis Framework, and Measurement." Prepared Under LEAA Grant No. 75-NI-99-0067. Bethesda, Maryland, 1975.

2. Many texts on group dynamics are available: social interaction measures cited in these texts should be selected to fit departmental needs for particular types of information.

IV. LOCAL PROJECT EVALUATION

In its field visits and telephone interviews, IHRR was impressed with the fact that many local jurisdictions were not collecting data to evaluate their specialized patrol activities. Conversations with Deputy Chief-level management provided indications of great interest, but the complexities that we have noted in the previous chapter proved to be obstacles in establishing a data analysis system.

Local jurisdiction management requires evaluation to answer four main questions:

- For a particular crime situation, is it cost-effective to use specialized tactical units or to use the traditional patrol?
- Which tactic and level of visibility is the most cost-effective to use?
- What effects are being experienced in the community with the use of a particular tactic?
- What monitoring statistics should be gathered to assure that the effectiveness and efficiency levels are maintained?

Each of these questions will be discussed in detail in the following sections.

A. Cost-Effectiveness Comparison to Traditional Patrol

The previous sections of this report have identified methods of cost and effectiveness measurement. These techniques can be used directly at the local level to compare a specialized tactic to a traditional patrol. The following steps are recommended:

CONTINUED

1 OF 2

- Step 1--Assuming that a specialized patrol unit is in being, establish a data collection system to measure arrest rate, number of arrests surviving first judicial screening, clearance rate and workload statistics. These are collected by sampling activity reports on a random sample basis, when necessary.

- Step 2--Identify a matched set of traditional patrol officers (see Chapter III, Section B). This can be done with the performance reports and management judgment.

- Step 3--Establish a data collection system for the matched traditional patrol for the same variables as in Step 1.

- Step 4--Estimate total cost for each patrol group using the techniques illustrated in preveous sections of this report.

- Step 5--Determine if the interaction with citizens will be strong enough to warrant setting up a citizen fear and respect survey method, which could be run by a local university.

- Step 6--Collect data on cost, effectiveness, and workload for as long a time as possible.

- Step 7--For the specialized group and the traditional patrol group, perform a cost-effectiveness analysis on the measures of effectiveness by type of crime as illustrated in the previous chapter. In addition, compare the workload statistics for the two patrol methods.

Table IV-1 illustrates how an analysis might appear in a local jurisdiction, just analyzing arrest performance. Similar statistics would be gathered for other measures.

It appears that with regard to arrest, specialized patrol is far more cost-effective than traditional patrol for crime type A. However, with crime type B, the traditional patrol is more cost-effective. For crime type C, there is only a slight difference. Next, the workload of the two groups in activities other than impact crime arrests should be compared. An example of such an analysis appears in Table IV-2.

TABLE IV-1

ILLUSTRATION OF CITY X
COMPARISON OF TRADITIONAL AND CIVILIAN DRESS
BY COST-EFFECTIVENESS

BASIC DATA FROM ONE-YEAR TEST PERIOD ENDING 7/1/75

IMPACT CRIME TYPE	INTERVAL BETWEEN ARRESTS		AVERAGE COST/ARREST	
	SPECIALIZED PATROL	TRADITIONAL PATROL	SPECIALIZED PATROL	TRADITIONAL PATROL
A	6.3	3.1	94	55
B	2.1	3.6	21	32
C	7.1	6.8	56	55

TABLE IV-2

AVERAGE MONTHLY WORKLOAD ANALYSIS FOR SPECIALIZED PATROL
VS MATCHED TRADITIONAL PATROL

MEASURES	TRADITIONAL PATROL	SPECIALIZED PATROL
TRAFFIC CITATIONS	200	150
FELONY WARRANTS	5	30
DRUNKS	260	51
HOLDS	55	60

This comparison shows that in addition to the intended mission of the specialized patrol, they are doing other duties as they have time. This should be taken into account in the evaluation.

The commanding officer can assess the information presented in the evaluation and make a decision whether there is more to be gained from these men returning to traditional patrol or allowing the specialized patrol unit to operate. For instance, if crime type A is an important local issue, the added productivity of specialized patrols with respect to that crime may be considered of critical importance.

B. Comparisons with Other Specialized Patrols

At the present time, there are no comparative data available. The comparisons of cost and effectiveness of traditional patrols and specialized patrols in Section A depend on obtaining actual data by sampling activity reports. Thus, if two specialized patrol tactics are to be compared, tests on both will have to be conducted over a sufficient time period and both must occur during the same period of time. The method of data collection on each would follow the steps in Section A of this chapter.

C. Community Reactions

The use of survey methods to gain insight into community fear (or feelings of safety) and citizen respect is not widespread. However, it is particularly important with specialized patrol to assess the community attitude and feelings of safety. The use of a random-dial telephone survey should put this type of survey within the economic reach of most departments.[1]

D. Necessasry Monitoring Statistics

Management monitoring of specialized patrol activities consists mainly of making sure that the training is having a pay-off and that over time the effectiveness does not deteriorate. Thus, if a set of sensitive measures of effectiveness are estimated every month or quarter, the manager can determine if any changes are occurring in the specialized patrol operation that warrant attention.

The total cost should not be needed on a monthly or quarterly basis unless the size of the unit is changing rapidly. The same effectiveness measures that were recommended for cost-effectiveness comparison are recommended for monitoring. These include, by type of impact crime:

- Arrest rate
- Number of arrests surviving first judicial screening
- Clearance rates
- Reported crime rate
- Citizen fear and respect measures
- Workload statistics

In addition, many other acceptable measures can be used to keep track of input and throughput. These include such measures as:

- Job satisfaction and morale
- Officer attitude surveys
- Cost per arrest
- Cost per arrest surviving first judicial screening
- Cost per reported crime cleared

E. Cost of Local Evaluation

The cost that will be incurred by a local department in collecting the data and making reports, such as those illustrated in this report, is made up of two components (excluding overhead):

- The cost-effectiveness analysis and data collection will require a junior analyst to work in the planning division at about $12,000 a year (including fringe benefits)
- The surveys that might be conducted to guage community reaction to specialized patrol should be within an estimated department budget of $4,000 making use of local university talent. This price should provide an annual telephone-interview survey of 500 people.

NOTES AND REFERENCES

1. Kenneth Webb and Harry Hatry, Obtaining Citizen Feedback, The Application of Citizen Surveys to Local Governments (Washington, D.C.: Urban Institute, 1973).

V. MULTIPLE PROJECTS AND EXPERIMENTS

A. The Need for Multiple Projects and Experiments

Previous sections of this report have discussed the technical problems in evaluating specialized patrol. Chapter IV outlined the needs and techniques for local evaluation and monitoring of specialized patrols. The most important gap in knowledge about specialized patrols concerns success or failure of particular techniques.

In judging success or failure of a specialized patrol project, one must have alternatives to which it can be compared. It is possible that all the objectives set forth for a specialized patrol could be met, and still, the project may not be cost-effective in comparison to other approaches. To be more specific, particular crime situations can be addressed by either the traditional patrol or by the specialized patrol unit. One may be more cost-effective than the other on a comparative basis. Other aspects must be taken into consideration, however. For instance, a SWAT team may be oriented to take care of hostage and barricade cases. The traditional patrol is also capable of taking care of such cases. The SWAT team is trained to be more effective in terms of reducing injuries and deaths. The political importance and humane considerations of this effectiveness can outweigh the higher costs and must be made part of the evaluation process. The costs, effectiveness, and implications of each patrol approach should be known so that informed decisions can be made.

The second most significant gap in knowledge is the relationship of success or failure of particular projects with the many endogenous and exogenous variables that are peculiar to each project. The variables that can have a profound effect on success or failure include:

- City and precinct characteristics (exogenous variables)
  - Crime rates and patterns
  - Unemployment
  - Racial patterns
  - Level of income
  - Level of education
  - Business types
  - Residential patterns
  - Activity of the press
  - Cooperation level of citizens
  - Size of city
- Departmental characteristics (endogenous variables)
  - Budget
  - Size of specialized units
  - Organization of the units
  - Quality of training of the officers
  - Span of control
  - Methods of personnel selection
  - Extent of overtime personnel
  - Quality of crime analysis
  - Interaction and exchange of information among divisions
  - Quality and quantity of equipment

- Quality of management monitoring
- General morale

Using the model shown in Chapter II (Figure II-1) as an analytic tool, IHRR found that many endogenous variables related to specialized patrols did not vary significantly from project to project; and they did not seem to correlate with success or failure. This does not prove that the effectiveness of the specialized patrol is not sensitive to these variables. For instance, span of control seemed to be about the same in all projects. It is possible, however, that varying the span of control could produce variations in the effectiveness. The possibility simply has not been tested.

In summary, the IHRR investigations have isolated two fundamental gaps in knowledge or crucial questions that have yet to be answered:

- Under which crime situations are specialized patrol techniques more cost-effective than the use of traditional patrol?
- What variations in endogenous and exogeneous variables effect the effectiveness (output) of the specialized patrols and by how much?

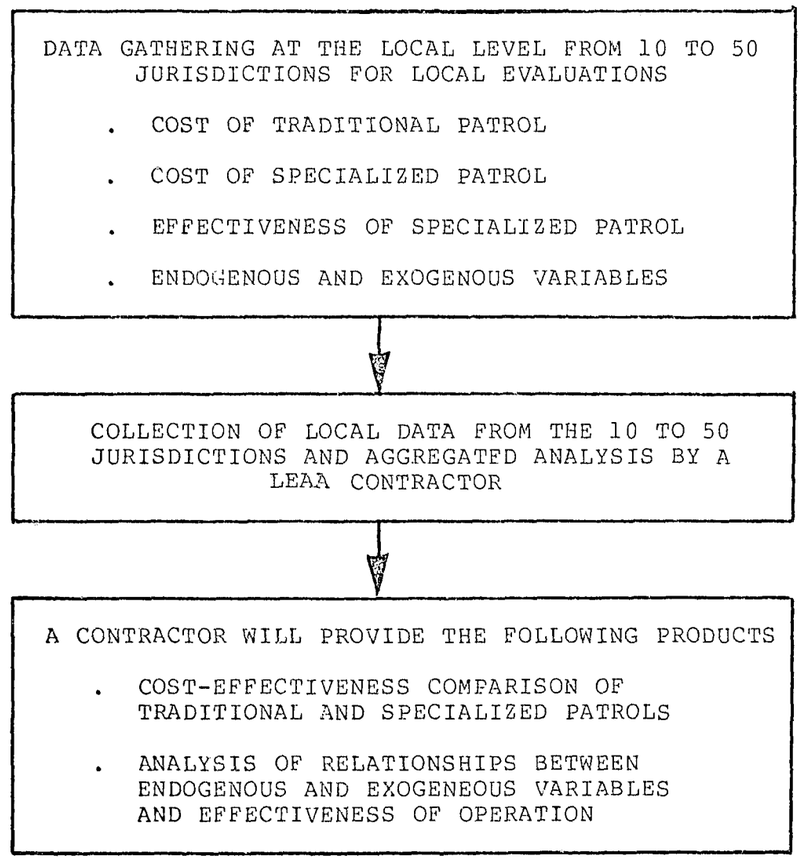
In the following section, two different types of studies--or "options"--will be described as means for answering these basic questions.

B. A Program for Multiple Project Assessment and Stimulating Local Evaluation

The design presented in this section for filling important gaps has been more-or-less touched on in other parts of this report. This cross-referencing has occurred because the general

scheme is to create a national data base from the local evaluations. The data base permits analysis of the two basic questions or gaps in knowledge discussed at the conclusion of the last section.

1. Methodology. The methodology discussed in this section is based on sampling of local departments. In order to assure that the methodology is clearly presented, the following procedural flow chart shows how the two gaps in knowledge are filled.



The design of local level evaluation (Chapter IV) was such as to permit the collected data from the local jurisdictions to be

the data base for a multiple project analysis of the most important gaps in knowledge.

The following discussion will be concerned with the second and third steps of the flow chart just presented. In fulfilling these steps, it is recommended that a contractor be employed to design the detailed methodology for filling the gaps in knowledge and the related details of local evaluation. The following are the tasks to be performed along with some preliminary approaches to these tasks.

a. Task 1--Design a sampling plan of local jurisdictions. The Phase I IHRR survey of local jurisdictions regarding their use of specialized patrol will provide a sufficient sampling frame to perform the sampling. Nomination for LEAA funding of evaluation would be contingent on departments' interest and the fact that they may have a current specialized patrol operation. The selection of jurisdictions could be structured to provide regional estimates as well as national estimates. It is possible that there are regional differences in police departments and, thus, regional differences in the effectiveness of specialized and traditional patrol.

b. Task 2--Selection of traditional patrol officers matched to the specialized patrol officers. The performance records of traditional patrolmen who are now in specialized patrol should form a basis of information to select a matching set of records from the current nonspecialized traditional patrol. However, this type of information can sometimes be incomplete or inadequate,

and the expert opinion of commanding officers may be needed to supplement the performance records. Methods will need to be devised to gather expert opinion in a systematic, objective, and standardized way across projects.

c. Task 3--Design the data sampling scheme for the selection of data at the local department. The main problem is the gathering of time of service data for each crime and workload type. Generally, existing activity sheets and dispatching records will provide these data.

d. Task 4--Monitor the data collection. It is anticipated that a junior analyst hired at each location to gather the data and perform the analysis will work fairly independently. However, to ensure that the data collected are as error free as possible and are based on standard techniques, the work should be monitored by a contractor.

e. Task 5--Collecting and analyzing the data. For sufficient size samples of jurisdictions, the definitions of the effectiveness measures and the cost components permit the aggregation of the data so that the same definitions apply to aggregated data. For instance, the total cost of a matched traditional patrol or a specialized patrol as developed in Chapter III, Section D-1, is:

$$\sum_{i=1}^{n} C_i(A_i + B_i) + \frac{F \cdot D}{G} + E + H + I$$

If this were to be aggregated over several jurisdictions and averaged for a tactic, the formula would read:

$$\frac{\sum_{j=1}^{j=N}\left[\sum_{i=1}^{n} C_i(A_i + B_i) + \frac{F \cdot D}{G} + E + H + I\right]}{N}$$

Where j = 1, 2, . . . N is the subset of sampled tactics. The effectiveness measures aggregate the average in the same manner. Thus, the contractor will collect the data on cost and effectiveness from each of the jurisdictions and aggregate them into subsets of information.

f. Task 6--Provide general conclusions about cost-effectiveness comparisons of specialized patrol and traditional patrol under a variety of conditions. The visibility level and the tactic of specialized patrol delineate families of specialized patrol. Each specialized family and tactic may be cost-effective compared to traditional patrol under certain crime situations and values for combinations of other related variables. The analysis of the data base composed of data from a sample of local evaluations should start with a detailed subgrouping of the sample points into homogeneous sets. The following factors are among those that can be used as criteria for homogenous grouping:

- Visibility level
- Tactic
- Region
- Particular measures of effectiveness
- Cost
- Size of specialized patrol
- Additional exogeneous and endogenous variables

The main reasons for grouping into subsets is to discover if there are relationships between effectiveness and cost-effectiveness measures and other factors. During this analysis, multiple regression analysis could be used to determine statistically significant relationships.

After the relationships have been determined, the data on jurisdictions can be arranged into homogeneous subsets. For instance, assume that the analysis shows that there are differences among tactics in cost-effectiveness by different measures of effectiveness (e.g., burglary arrests). The homogeneous groups could be represented by the cost-effectiveness data in Table V-1.

TABLE V-1

COST-EFFECTIVENESS COMPARISONS OF TACTICS
AGAINST CRIME TYPE A
(Averaged for N Jurisdictions)

COST-EFFECTIVENESS MEASURES	TACTIC		
	CIVILIAN DRESS	UNIFORMED TACTICAL	TRADITIONAL
COST PER ARREST	51	67	94
COST PER CLEARANCE BY ARREST	108	192	160

The data in the cells can then be analyzed by comparing the cost-effectiveness of the set of specialized patrol data as compared to the set of matched traditional patrol data. The product of this analysis will be knowledge about the cost-effectiveness of specialized patrol as compared to traditional patrol in terms of these variables.

Similar analyses can be conducted using other variables of interest.

2. Cost of Data Collection and Analysis. The cost of the program described in the previous section is directly proportional to the number of jurisdictions sampled. The local project evaluation and monitoring described in Chapter IV is intended to be within a range of funding suitable for departments with 50,000 or more people to serve. On the other hand, in addition to serving the needs of the local department for local monitoring and assessment, the data can be used for multiple project analysis. It is assumed that if LEAA funded local evaluation projects of this type, it would serve to stimulate local evaluation and provide a necessary data base on multiple projects. The cost per year, as shown in Chapter IV, Section E, would be about $16,000 a year (excluding local overhead) covering data gathering, cost-effectiveness analysis, and public survey. The larger the sample, the more information in the data base.

In addition to the cost of local department data collection, a cost will be incurred to LEAA for an analysis group to monitor the collection of data and perform the multiple project analysis. Two optional annual cost statements are presented in Table V-2.

TABLE V-2

MULTIPLE PROJECT ANALYSIS COSTS (ANNUAL)

COST CATEGORY	ANNUAL COST	
	10 IN SAMPLE	50 IN SAMPLE
LOCAL DATA COLLECTION a/	$160,000	$800,000
ANALYSIS GROUP b/	50,000	150,000
TOTAL COST	$210,000	$950,000

a/ excludes overhead
b/ includes overhead

3. Recommended LEAA Action. The LEAA should fund the evaluation and monitoring of specialized patrols in at least 10 local jurisdictions. This would not be enough to select jurisdictions randomly by regional strata. However, the value of the effort could be assessed after 10 samplings. It would be possible to add more jurisdictions to gain more information. Aggregation of small numbers of samplings should be done with great care; distortion my be introduced that could be quite misleading.

C. A Field Experiment

The method of filling gaps in information set forth in the previous Section B is a statistical data gathering approach. The approach depends on information from existing special patrol projects. A large sample of projects would provide data on many variables and variations.

Another method that could be used is a controlled field experiment where variables could be controlled and manipulated to produce cost-effectiveness comparisons. Such approaches, generally, are expensive in terms of time and money.

A potential approach that is not so expensive is to allow two or more test variables to vary within the design of the experiment. The use of this technique is presented next.

1. Recommended Design. Since the number of potential comparisons is so great, an efficient experimental design is needed if a Phase II series of controlled experiments is going to be feasible. The design should:

- Yield valid cost-effectiveness comparisons between specialized patrol and traditional patrol or team policing

- Permit valid cost-effectiveness comparisons between alternative specialized patrol methods

In identifying the universe of specialized patrol operations, IHRR found that most large police agencies already employ two or more specialized patrol methods. We have taken advantage of this in developing an experimental configuration.

The design proposed for this field experiment is a quasi-experimental one termed a "Multiple Time-Series Design."[1] The experimental effect is demonstrated twice: once against the pre-experimental measurements in its own series and, again, against the control measurements in its own time series. The essence of this technique is the periodic measurement of variables and introduction of an experimental change. Change is determined by discontinuities in the historical trend and comparative discontinuities in trends between experimental and control subdivisions (e.g., precincts).

Measurements are made for each of the five designated areas (A, B, C, D, E) for each of the seven six-month time periods. Four of the time periods cover the two years immediately prior to initiation of the field experiment project; three cover the period during which the experiments are actually conducted. These measurements encompass all independent and dependent variables deemed of significance,[2] as discussed in Product 3 and illustrated in this chapter. Intervening variables are explained, measured, or held constant as appropriate.

Further, comparisons are made between specialized patrol personnel and traditional patrol personnel.

Each test would yield the following information:

- Cost-effectiveness comparisons between two specialized patrol tactics and a form of traditional patrol
- Productivity comparisons between two sets of specialized patrolmen and a matched group of traditional patrolmen.

2. Task Chronology. The following steps are recommended in conducting a full field test in a city already using two or more specialized patrol tactics. The overall schedule and test design is shown in Table V-3.

Step 1--Standardize data collection instruments, measurements of effectiveness, and evaluation procedures

Step 2--Assemble historic data from existing crime statistics and arrest records on:

- Crime patterns
- Arrest patterns
- Officer productivity (specialized and traditional)*
- Citizen complaints

Step 3--Conduct a survey to collect data on citizen and businessmen's sense of well being and attitudes toward police, target hardening, and victimization rate.3

Step 4--Select five matched high crime subdivisions such as individual scout car beats, pairs of beats, precincts, etc. Designate two patrol subdivisions primary test Areas A and B, designate two patrol subdivisions secondary test Areas D and E, designate the remaining subdivision control Area C.

Step 5--Select a matched group of exceptional traditional patrolmen for comparison with specialized patrolmen (see Chapter III for detailed method of selection).

Step 6--Overlay traditional patrol operations in Area A with one variation of specialized patrol (a). Overlay traditional patrol operations in Area B with a second specialized patrol variation (b).

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* In some jurisdictions, team policing can be substituted for traditional patrol.

TABLE V-3

SCHEDULE OF TASKS IN THE EXPERIMENT*

Steps	Test Period	Patrol Subdivisions				
		A	B	C	D	E
1, 2, 3, 4, 5	4 months					
6	1st 6-month test period	a	b			
7	2nd 6-month test period				a	b
9	3rd 6-month test period	b	a			
10	4 months					
Total Steps	26 months					

Where:

a = Specialized patrol method a
b = Specialized patrol method b

*Traditional patrol in the various subdivisions would continue as usual using the same personnel that patrolled the areas prior to the experiment.

Step 7--Compare Areas A, B, C, D, and E based on preselected, standardized effectiveness measures (reported crime rate, victimization rate, etc.). Compare personnel a and b based on preselected, standardized performance measures (total arrests, felony arrests, arrests surviving the first judicial screening, etc.).

Step 8--Reassign variation a to secondary Area D and variation b to secondary Area E. Continue the comparisons outlined in Step 8. Additionally, measure the residual effects of a and b on the two primary test areas.

Step 9--Reassign unit a to primary Area B and unit b to primary Area A. This configuration places tactic a in the identical area occupied by tactic b during the same 6-month period the previous year (and conversely). This permits a more valid comparison by minimizing geographic, demographic, and seasonal influences on the experiment.

Step 10--Final analysis

There are a number of advantages to a Phase II comprised of a series of such experiments:

- Efficiency--The return for the evaluation dollar in the above experiment would be impressive. Each experiment would yield:
  - Cost-effectiveness comparison of the effects of tactic a and traditional patrol on similar and identical areas
  - Cost-effectiveness comparisons of the effects of tactic b and traditional patrol on similar and identical areas
  - Cost-effectiveness comparisons of the effects of tactic a and b on similar and identical areas
  - Productivity comparisons between specialized personnel a, specialized personnel b, exceptional traditional patrolmen, and average traditional patrolmen
- Cost--By selecting cities where the desired specialized patrol operations are already established, the cost of establishing and monitoring units is avoided.
- Acceptance--By selecting high crime areas where some form of specialized operations were likely to occur even without the experiment, the police administrator

can be both responsive and innovative. In effect, he will be doing what would have been done anyway.

- Flexibility--The police administrator need only devote equal resources of a and b to the experiment, not entire units. Specialized patrol personnel not needed for the experiment can continue to be used as usual to address crime problems in other parts of the city.

3. Cost of the Experimental Field Test. The cost of a field experiment similar to the description in Section 2 will include the following annual components of cost at the local jurisdiction:

	Cost per Year
. A junior analyst (including fringe benefits)	$12,000
. Two data collection clerks (including fringe benefits)	16,000
. Total local costs	$28,000

The above staff would be required for 24 of the 26 months of the project. Thus, the cost of local staff over the entire project is $56,000 (excluding overhead).

In addition to the local staff at the jurisdiction where the test is being made, an analysis group will be needed. The cost of this group will vary with the number of experiments; but for one project (including overhead), it will cost about $140,000 a year (or about $300,000 for the life of the project). Several options are presented in Table V-4.

4. Recommended LEAA Action. It is recommended that at least one of the test designs be implemented. The knowledge and experience gained in implementing the test will permit an assessment with regard to the benefits of such test results in terms of decision making.

TABLE V-4

FIELD EXPERIMENT COSTS

COST CATETORY	OPTION		
	ONE EXPERIMENT	TWO EXPERIMENTS	FOUR EXPERIMENTS
LOCAL COST a/	$ 56,000	$112,000	$224,000
ANALYSIS GROUP b/	300,000	400,000	600,000
TOTAL COST FOR LIFE OF THE EXPERIMENT	$356,000	$512,000	$824,000

a/ excluding overhead

b/ including overhead

NOTES AND REFERENCES

1. Various time-series designs are presented by Campbell and Stanley in Experiments and Quasi-Experimental Designs for Research (Chicago, Rand McNally, 1963).

2. Institute for Human Resources Research, "Phase I National Evaluation of Selected Patrol Strategies: Specialized Patrol Under the National Evaluation Program, Product 3: Project Families, Synthesis Framework and Measurement." Bethesda, Maryland, 1975.

3. However, it may be possible to obtain victimization data only for the two most recent six-month periods prior to the experiment due to the limitation in the ability of citizens to recall certain types of crime occurring more than one year in the past.

END