NATIONAL EVALUATION PROGRAM

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Number 5

Traditional Preventive Patrol

National Institute of Law Enforcement and Criminal Justice
Law Enforcement Assistance Administration
United States Department of Justice

Phase 1 Report

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NATIONAL EVALUATION PROGRAM
PHASE I SUMMARY REPORT

TRADITIONAL PREVENTIVE PATROL

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National Institute of Law Enforcement and Criminal Justice
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FOREWORD

Although patrol is the heart of police work, demanding the bulk of a department's resources, it has not been the subject of major research until recently.

The Police Foundation's 1973 study of routine patrol in Kansas City was a pathbreaker; it demonstrated that it is possible to conduct controlled experiments in police departments. Several research efforts sponsored by the National Institute are now under way that should help to accelerate the rethinking of patrol that began with the Police Foundation research.

This assessment of traditional preventive patrol is the first of those projects to be completed. It gives us a more accurate description of what patrol is and what it does. The message that emerges is clear: the patrol officer's time can be much better utilized. This conclusion bears out the major finding of the Police Foundation experiment, which found that routine preventive patrol could be altered substantially without noticeably affecting crime patterns. It also dovetails with preliminary data available from the Institute's study of response time, which suggests that shaving seconds or even minutes from the average police response may make no difference in apprehension rates. The victim's delay in reporting the crime is often so long that police response, no matter how prompt, occurs long after the felon has fled.

If traditional patrol has little effect on crime patterns and if patrol officers are deployed for a quick response that may be irrelevant, then how can the time devoted to patrol be used more productively?

One approach suggested by this report is the use of planned or directed patrol strategy, rather than one left to the discretion of the individual officer. An Institute-sponsored project in Wilmington, Delaware, is studying the directed approach as part of an evaluation of split-force patrol, and the results should help to illuminate this and other possibilities for improving the use of patrol time.

Better deployment practices can also enhance efficiency and economy. The rudimentary step of varying the level of manpower assigned to different shifts can avoid the costly waste of equal manpower on all shifts. Information on the use of civilians on patrol suggests that this approach can release police officers for more effective, directed patrol activities. While these innovations have been talked about for some time, they have yet to gain wide acceptance.

On the larger issues, the study notes that, although deterrence and apprehensions are the primary goals of patrol, no accurate measures currently exist for evaluating the effect of patrol on either of these results. Indicators now in use -- reported crime rates, arrest rates, response time -- are not reliable or valid measures of deterrence or apprehension.

This report is a call for more dramatic experimentation in police operations to improve our understanding in these and other complex areas. Today the process of change in the police world appears to be approaching a new threshold, as police departments demonstrate an unprecedented receptivity to research. The burden now is on the researcher to construct experiments that are relevant to the needs of policy-makers.

Gerald M. Caplan

Gerald M. Caplan
Director,
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PREFACE

This report presents a summary of the findings of a comprehensive review of the state of the art in traditional preventive patrol. It has been prepared by the University City Science Center for the National Evaluation Program of the National Institute of Law Enforcement and Criminal Justice, Law Enforcement Assistance Administration. It is a summary and, as such, has presented us with the inherently difficult choices involved in reducing extensive and quite detailed findings into a brief but broadly comprehensive survey of work in the area of preventive patrol. Patrol is a complex, multifaceted undertaking which is difficult to summarize succinctly. In this volume, important issues are, of necessity, treated in such brevity that the reader may quite rightly feel the need for further information and analysis. More detailed discussions are contained in the following volumes on which this summary is based:

Issues in Traditional Preventive Patrol: A Review and Assessment of the Literature;
Traditional Preventive Patrol: An Analytical Framework and Judgemental Assessment; and
Traditional Preventive Patrol: A Design for Phase II Research.

In addition, the material in these volumes provided the basis for the development of a framework designed to assist departments in evaluating their patrol operations. This framework is presented in Traditional Preventive Patrol: A Site-Specific Evaluation Design.

In deciding what should most appropriately be included in this summary report, we have reflected upon the quality and scope of reported findings and upon our perceptions of the salient operational concerns of law enforcement agencies. The text is supplemented with numerous exhibits which display a more total sense of the detail and complexity of the subject at hand.

The information and conclusions presented in this report were developed from an extensive review of available literature on patrol practices and from project reports setting forth the findings of research and program activities supported primarily by the Law Enforcement Assistance Administration and, to a lesser degree, by the Police Foundation. Information was also developed through direct contact with all LEAA regional offices, discussions with State Planning Agency representatives, and a survey of some 300 police and sheriffs' departments throughout the country. Finally, site visits were made to 26 police and sheriffs' departments for the purpose of reviewing on-going programs which had come to the attention of the project staff and were believed either to be particularly representative of traditional patrol practices or to constitute significant or provocative innovations in patrol. Extensive telephone conversations were also held with representatives of many departments.

All of the departments contacted were extremely cooperative and helpful. A special thanks is offered to the following departments, each of

which was visited by members of the project staff:

Alexandria Police Department, Alexandria, Virginia;
Arlington County Police Department, Arlington County, Virginia;
Boston Police Department, Boston, Massachusetts;
Cleveland Police Department, Cleveland, Ohio;
Cleveland Heights Police Department, Cleveland Heights, Ohio;
Denver Police Department, Denver, Colorado;
Fremont Police Department, Fremont, California;
Fort Worth Police Department, Fort Worth, Texas;
Harrisburg Police Department, Harrisburg, Pennsylvania;
Kansas City Police Department, Kansas City, Missouri;
Lakewood Department of Public Safety, Lakewood, California;
Los Angeles County Sheriff's Department, Los Angeles County, California;
Los Angeles Police Department, Los Angeles, California;
Menlo Park Police Department, Menlo Park, California;
Miami Beach Police Department, Miami Beach, Florida;
Multnomah County Department of Public Safety, Multnomah County, Oregon;
Oakland Police Department, Oakland, California;
Omaha Police Division, Omaha, Nebraska;
Orlando Police Department, Orlando, Florida;
Portland Police Bureau, Portland, Oregon;
Quincy Police Department, Quincy, Massachusetts;
Rochester Police Department, Rochester, New York;
San Diego Police Department, San Diego, California;
St. Louis Police Department, St. Louis, Missouri;
University City Police Department, University City, Missouri;
Worcester Police Department, Worcester, Massachusetts.

To all those who cooperated with us in the execution of our work for the National Institute, we would like to express our genuine appreciation. We are particularly grateful to the members of our advisory board, who, while having to respond to the needs of four interrelated projects in the area of patrol practices, have provided us with valuable assistance and guidance. They are: Sheriff Michael Canlis, Mr. Joseph Lewis, Dr. Elinor Ostrom, Chief James Parsons, Chief Rocky Pomerance, Mr. John Stead, Dr. Victor Strecher, and Mr. Eugene Zoglio. In addition, we would like to sincerely thank Mr. David Farmer, Dr. Richard Barnes, and Mr. William Saulsbury of the National Institute of Law Enforcement and Criminal Justice, and Mr. Joseph Nay of the Urban Institute, whose interest and concern for the project has greatly facilitated our work. Needless to say, the analysis and conclusions contained within this report are those of the project staff alone.

INTRODUCTION

Traditional preventive patrol is important. Approximately 60% of the sworn law enforcement officers in local and municipal police and sheriff's departments in the United States are assigned to general patrol duties,[1] and support of this function accounts for much of the approximately 5 billion dollars projected as the total 1975 municipal expenditure for police protection throughout the United States.

In the past, preventive patrol was typically conducted in a fairly straightforward manner, based on experience and the "collective wisdom" which police officials had developed over the years. In the last ten years, however, it has begun to change rapidly. Experimental and evaluative projects (sponsored mainly by the Law Enforcement Assistance Administration and the Police Foundation), the increasingly heavy demands being placed on the police, and the growing number of innovative police administrators have led to a questioning and re-examination of preventive patrol practices. As a result, much of what was once accepted as the standard operating procedure and underlying rationale for many patrol practices has now come under scrutiny. Questions have been raised concerning: the importance of response time;[2] the extent to which civilians can perform duties typically reserved for sworn officers;[3] the efficacy of aggressive patrol tactics;[4] the use of women on patrol;[5] and a host of other significant issues. One experiment has even directly questioned the need for routine patrol at all, suggesting implicitly that while the size of the force should not be reduced, the energies of the officers might be rechanneled into more productive activities.[6]

In the present atmosphere of change, re-evaluation, and debate, the Science Center has undertaken this review and assessment of available knowledge regarding traditional preventive patrol. In so doing, we have been asked to take a limited view of the subject. This inquiry is confined to the operational activities of uniformed officers assigned to general patrol duties. It specifically excludes the activities of patrol officers when they arrive at the location of a service call or when they go out of service to handle self-initiated tasks. In addition, this report is limited to the traditional model of patrol: locally autonomous, organizationally distinct teams of officers who provide the full range of police services on a neighborhood-specific basis are excluded from discussion, as are patrol activities performed by non-uniformed officers and operations with a specific crime or suspect orientation. Examination of these activities may be found in National Evaluation Program Phase I reports prepared by the National Sheriffs' Association and the Institute for Human Resources Research. Additionally, no discussion is presented of the contribution of crime analysis *per se* to the planning and operation of patrol activities. This topic is examined in an NEP report prepared by the Foundation for Research and Development in Law Enforcement and Criminal Justice.

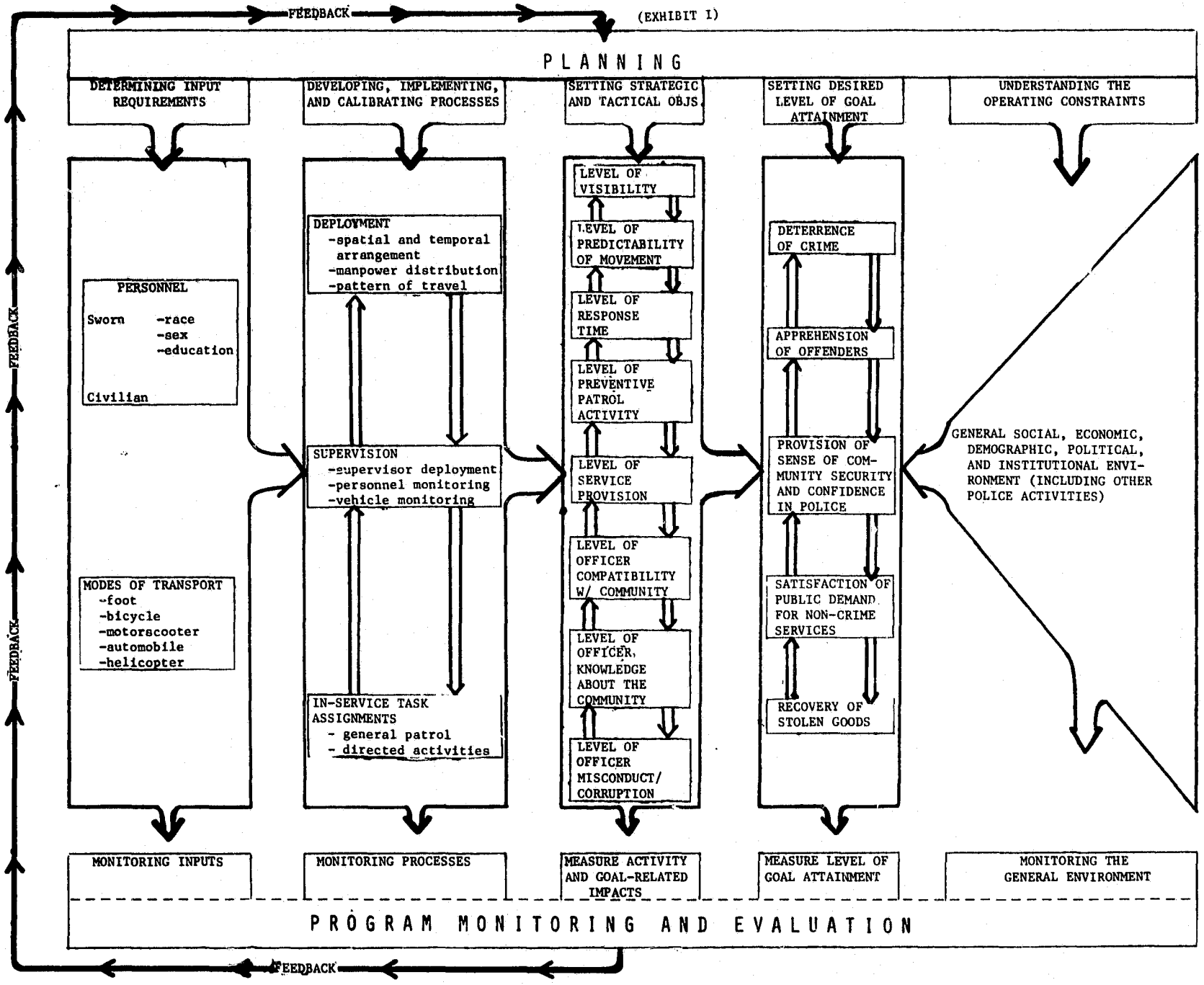
In examining the current "state of the art" in traditional preventive patrol, we have attempted to separate opinion from fact. Our central objective

has been to identify and evaluate empirically based findings regarding the relationship between patrol effectiveness and the variety of factors over which police officials have control. While the level of crime in the United States is a function of the performance of the entire criminal justice system and of prevailing social and economic conditions, police administrators are able to respond only with the limited resources of their respective departments. This report is explicitly directed toward assessing and presenting knowledge which will assist police departments in improving their patrol operations. Accordingly, only those variables over which police administrators can exercise at least partial direct control have been included.[7]

In this report, we have adopted a goal-oriented approach in considering what is known about traditional preventive patrol. The five principal and most commonly accepted goals of patrol have been identified: deterrence, apprehension, provision of non-crime related services, provision of a sense of community security and satisfaction with the police, and recovery of stolen goods. Each goal is examined in terms of the hypotheses and assumptions which link specific patrol activities, tactics, and strategies to goal attainment. Attention is devoted to determining the validity of these hypotheses and assumptions and to the type and quality of the measures of effectiveness which are used to gauge the contribution of various patrol practices to the over-all aims of patrol. The quality of these measures determines, to a large degree, the reliability and validity of available knowledge about preventive patrol.

Following the examination of goals, the report turns to consideration of the inputs and processes which comprise preventive patrol: characteristics of patrol personnel, modes of transportation, deployment practices, supervision, and in-service task assignments. It is through the manipulation of these factors that a department seeks to realize the desired levels of: patrol visibility, predictability of officer movement, response time, preventive patrol activity, service provision, officer/community compatibility, officer knowledge about the community, and officer misconduct and corruption. These intermediate strategic and tactical objectives of preventive patrol serve as the arbiters of patrol effectiveness. They provide the linkage between the inputs and processes of patrol and the attainment of the goals of patrol. Thus, patrol administrators, on the basis of explicit and implicit assumptions, manipulate the resources (inputs) at their disposal through the processes of deployment, supervision, and task assignment in order to reach the desired levels of attainments for the eight intermediate goals. It is through the achievement of these objectives that the patrol division seeks to realize the five basic goals of patrol. Exhibit I presents a flow diagram of this model of the patrol system.

No attempt has been made to include all facets of patrol in this report. Rather, the particular issues and questions selected for discussion are those which are featured prominently in the literature and/or appear to be of particular concern to law enforcement agencies. Issues are considered in terms of the content and quality of present knowledge about their relationship to the attainment of patrol objectives. As in the discussion of goals, measures of effectiveness again occupy a critical interpretive position between activity and knowledge. Throughout this paper, research findings and project results will be considered useful only insofar as they define relationships between, or present conclusions about, patrol operations and the effectiveness of patrol.


FEEDBACK
(EXHIBIT I)
PLANNING
DETERMINING INPUT REQUIREMENTS
DEVELOPING, IMPLEMENTING, AND CALIBRATING PROCESSES
SETTING STRATEGIC AND TACTICAL OBJS
SETTING DESIRED LEVEL OF GOAL ATTAINMENT
UNDERSTANDING THE OPERATING CONSTRAINTS
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Sworn -race -sex -education
Civilian
MODES OF TRANSPORT
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-bicycle
-motorscooter
-automobile
-helicopter
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-pattern of travel
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IN-SERVICE TASK ASSIGNMENTS
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LEVEL OF VISIBILITY
LEVEL OF PREDICTABILITY OF MOVEMENT
LEVEL OF RESPONSE TIME
LEVEL OF PREVENTIVE PATROL ACTIVITY
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MONITORING PROCESSES
MEASURE ACTIVITY AND GOAL-RELATED IMPACTS
MEASURE LEVEL OF GOAL ATTAINMENT
MONITORING THE GENERAL ENVIRONMENT
PROGRAM MONITORING AND EVALUATION
FEEDBACK
FEEDBACK
FEEDBACK

This report focuses on the goals, objectives and activities of patrol on a disaggregated basis. The division of content into discrete areas facilitates analysis and presentation and reflects the fact that patrol represents an amalgam of many quite disparate activities. It should not, however, be allowed to obscure the complex interrelationships between these activities, each one of which may be analyzed separately but truly understood only in its relationship to the entire patrol system. It may be useful for the reader to refer to the flow diagram in Exhibit I as a reminder that the totality of a patrol operation constitutes something more than the sum of its parts, and that patrol work is closely constrained by the environment in which it is conducted. The diagram also highlights the operational importance of planning and evaluation to the conduct of patrol. Substantial attention is devoted to the techniques and procedures of program monitoring and evaluation, but the actual organization and operation of patrol planning, research, and evaluation falls outside the scope of this report.

The report concludes with some prescriptive statements which are based on this assessment of the current state of knowledge about patrol. The final chapter discusses aspects of patrol which are most in need of further study and offers some suggestions and lessons concerning the execution of research on patrol. It points out important areas of ignorance in the present "state of the art," in which careful examination would have a significant impact on the practice of patrol while providing a firm grounding for the development of further knowledge about patrol. These "gaps in knowledge" are discussed more extensively in our design of projects for additional research.[8]

Finally, the report contains a number of exhibits. Some of them (Exhibits II-VI) present an assessment of techniques used for measuring goal attainment. Others (Exhibits VII-XIII) display assumptions regarding the relationship between the goals of patrol and the contribution of various aspects of patrol to the achievement of its goals. The exhibits displaying assumptions are analytical constructs which present points of view rather than facts or knowledge. They are heuristic devices which are intended to facilitate systematic and critical thinking about patrol. As such, they seek to highlight significant and often controversial questions rather than resolve issues. Knowledge about the merits and implications of these assumptions is summarized in the text of this report and presented in greater detail in accompanying volumes.

In reviewing the research and projects in the area of traditional preventive patrol, we found only a small body of empirically grounded research amenable to a rigorous evaluation. While all this research was examined from a methodological point of view, the few major experiments which have been conducted were given the most careful scrutiny because of the significance of their reported findings. In addition, a wide body of "experiential findings" was confronted which were extremely pertinent to the study and could neither be ignored nor dismissed as merely unsubstantiated opinion without doing an extreme disservice to practitioners who are sensitive to the problems of patrol and are working effectively to resolve them. In general, when experiential conclusions were (or could be) drawn which were consistent with well-documented research findings and the perceived experiences of several departments, or based upon a logic and set of considerations which seemed compelling, such conclusions were considered to constitute "knowledge." As a result, this report constitutes a "judgemental" assessment of current knowledge about the conduct of traditional preventive patrol.

As the following pages make clear, knowledge about patrol is incomplete in many respects and frequently of dubious quality. In a sense, this report may appear to offer little more than a recital of all that is not known about patrol. Knowledge, however, is a relative commodity. What constitutes a sufficient degree of certainty for some purposes may represent only the bare beginnings of understanding for others. At present, there are some strong indications about the ways in which different facets of patrol are related to the attainment of patrol objectives, and some broad outlines of the characteristics of effective patrol operations. This information may not appear to be fully adequate when judged by the strict standards of scientific research, but it does provide far better direction to patrol administrators than the all-too-often unexamined tenets of the "conventional wisdom." Moreover, in recent years there have been a number of strong efforts to address fundamental questions about patrol.[9] While flawed in many respects, they constitute an important first step. They demonstrate that it is possible to do relevant and penetrating research on patrol and that the results will stimulate interest, change, and further study which hopefully will lead to the growth of an empirically-based cumulative body of knowledge about patrol. In brief, the situation is not nearly as bleak as it might at first glance appear, and prospects for the future are optimistic.

CHAPTER ONE

THE GOALS OF TRADITIONAL PREVENTIVE PATROL AND THE MEASUREMENT OF PATROL EFFECTIVENESS*

Traditional preventive patrol is defined as the routine movement of uniformed officers by vehicle or on foot through delineated geographic areas. Patrol generally has five basic goals: (1) deterrence of crime; (2) apprehension of criminal offenders; (3) satisfaction of public demands for non-crime related services; (4) maintenance of a sense of community security and confidence in the police; and (5) recovery of stolen goods.[10] There is, essentially, a one-to-one correspondence between the goals of patrol and the over-all goals of police departments. The relative priorities of departmental goals and patrol-specific goals are also related. For both the department and its patrol division, deterrence and apprehension are of primary importance. Satisfaction of demands for non-crime services is usually considered to be of somewhat lower priority (except in the case of emergencies). The provision of a sense of community security and confidence is believed, in large part, to result from satisfactory attainment of the first three goals. Finally, the recovery of stolen goods, with the possible exception of stolen automobiles, appears to be of least importance.

The following discussion deals with each goal separately. Included is an examination of: the current state of knowledge regarding the contribution of various aspects of patrol to the attainment of goals; the measures commonly used to gauge goal achievement; and the difficulties encountered in determining patrol effectiveness and performance. The benefits and drawbacks of the various means of measuring patrol effectiveness are presented in schematic summaries which accompany the discussion of each goal. While each of the goals is considered individually, they are, in actuality, heavily interdependent: apprehension has a substantial impact on deterrence, community sense of security depends on the level of achievement of the other patrol goals, and so on. They are discussed separately here to simplify presentation, and because departments regularly emphasize some goals over others even though the interrelationships among them are recognized as important. The interdependency of goals is displayed in Exhibit VII which immediately follows this chapter.

I. Deterrence

Deterrence and prevention are frequently, and incorrectly, linked as goals of patrol. Deterrence involves activities which are intended to influence the perceptions of potential criminals as to the likelihood of apprehension. Prevention is aimed at making criminal activity more difficult regardless of the perceived odds of apprehension. Preventive measures do have a deterrent effect by making crime more difficult: the time and effort necessary to commit a criminal act increases, thus heightening the offender's sense of vulnerability. And patrol activities, such as providing advice on security measures and personal safety or making arrests which lead to actual incarceration, do contribute to prevention. It should be emphasized, however, that the two goals are analytically distinct. As a patrol goal, deterrence is much more important than prevention. Deterrence is thought to be most effectively achieved by patrol activities designed to increase the probability of apprehension, thereby intensifying the perceived risks of crime and reducing its incidence.[11]

* For a more detailed discussion of the material summarized in this chapter, see: Traditional Preventive Patrol: An Analytical Framework and Judgemental Assessment, prepared by the University City Science Center, January, 1976, p. 1-35.

Deterrence as a goal has provided the major impetus for the extensive deployment of a highly visible patrol force. It has generally been assumed that the conspicuous use of patrol units projects an image of police preparedness, efficiency and omnipresence that discourages would-be criminals.[12] It has been assumed that higher levels of patrol visibility bring about higher levels of deterrence.[13]

The assumptions which have traditionally related the deployment of a highly visible patrol force to deterrence have recently been called into question. For example, the reports on the Preventive Patrol Experiment conducted in Kansas City suggest that changes in the levels of visible routine preventive patrol may have little impact on deterrence or on other patrol goals.[14] It has also been argued that only certain types of crime can be deterred by patrol activities. Crimes such as homicide, assault, larceny, burglary, and rape are little affected by the deterrent aspects of patrol since they are often committed in private places or in secret.[15] In fact, one study suggests that only about 40% of all known crimes occur in locations where they can be observed by non-participants and thus potentially deterred by the police.[16] In short, it is suggested that if the crime is not observable, it cannot be deterred by patrol. This argument can be extended to imply that the deterrent effect of patrol diminishes as the amount of time declines that the perpetrator can be perceived to be in the act of committing a crime.

In the interest of deterrence, police departments have engaged in operational activities aimed at heightening the visibility of patrol and improving the effectiveness and deployment of individual officers. Tactics have included: (1) the use of one-officer cars, motor scooters, increased foot patrol, take-home cars, and saturation and split patrol; (2) attempts to match officer characteristics such as race, language, special skills, etc., with identifiable characteristics of their beats; and (3) the use of allocation and deployment models to direct patrol to high crime locales, randomize patrol presence, and/or minimize response time throughout the city. However, the fact that various allocation models are often based on opposing assumptions is indicative of the conflicting opinions regarding the relative merits of alternative approaches to deterrence. There is also very little evidence concerning how and to what degree officer characteristics and modes of patrol influence deterrence capabilities.

In addition to tactical procedures designed to enhance deterrence, departments have experimented with various supervisory procedures intended to increase the efficiency and insure the integrity of patrol personnel.[17] These efforts have been based on the assumption that the deterrent effect of patrol depends on the quality of individual officer performance and the maintenance of high standards of officer integrity. They have included the street deployment of supervisory personnel, frequent reassignment of patrol officers to other beats, and the utilization of a vehicle monitoring system.

Considerable effort has been expended to increase officer effectiveness and the deterrent level of patrol activity through stringent supervisory practices, but the experience of the Patrol Emphasis Program in Cleveland Heights, Ohio, suggests that supervisory concerns may to a certain degree resolve themselves if the number of officers deployed reflects the actual or potential level of service demands. By keeping the officers busy while on duty, the demand for services is believed to enhance motivation and, thus, may overcome some supervisory concerns.

Even though deterrence is considered by many to be the primary goal of police patrol and substantial resources have been devoted to improving the deterrent effect of patrol, there is no direct measure of deterrence available to administrators and researchers. There is no way to measure the number of crimes which are not committed due to the operations of routine preventive patrol. This inability to measure deterrence with a reasonable degree of certainty may partially explain why to date no significant relationship has yet been shown to exist between patrol activities and the deterrence of crime.[18] Without direct measurement, the relationship between the two must remain an inferred one, based largely on assumptions. The measures used by law enforcement agencies are indirect, and therefore extremely problematic.

The techniques currently used by departments to measure the deterrent effect of patrol fall into two categories: (1) measures of crime and victimization rates; and (2) measures of patrol activity thought to be related to levels of deterrence. Commonly used measures of deterrence include: (1) changes in the rate of reported crime; (2) changes in the rate of victimization by type of crime; (3) increases in the level of criminal arrests; (4) reduced patrol officer response time; (5) increases in aggressive actions by police; (6) increased visibility of the police; and (7) equalized probability that a patrol unit will appear anywhere in the city at any given time.

The first two measures are believed to be related to changes in the actual level of crime, while the last five are related to police activities which are assumed to have a deterrent effect. An assessment of the utility of these measures is presented in Exhibit II. In general, all of them have notable inadequacies. Only one, the use of victimization rates under carefully controlled experimental conditions, could provide a reasonably accurate reflection of the deterrent effect of specific patrol activities; however, it would be quite costly.

In sum, the goal of deterrence is of primary importance to patrol activities, but little is known about the relationship between patrol strategies and deterrence as at present there are no satisfactory cost-effective measures for evaluating the effects of patrol on deterrence. Departments throughout the country are expressing increasing concern about this problem. Unfortunately, however, further analysis will continue to be based on second order, surrogate indicators since non-events cannot be directly measured.

II. Apprehension

The second goal of patrol, apprehension of criminal offenders, is second only in importance to deterrence and closely related to it. When deterrence fails to prevent crime, the patrol force is responsible for apprehending the offender, and swift, efficient performance of this task is generally assumed to contribute to improved levels of deterrence.

In the context of this report, the definition of apprehension is restricted to arrests resulting from: (1) self-initiated actions by uniformed patrol officers following detection of a crime in progress or recognition of alleged offenders; (2) activities initiated by direct, non-dispatched citizen requests to officers for service or assistance; and (3) officer response to calls for service which result in arrests due to "tactical surprise."[19]

(EXHIBIT II)

MEASURES OF EFFECTIVENESS: DETERRENCE

EFFECTIVENESS MEASURES	SUPPORTING ASSUMPTIONS	OPPOSING ASSUMPTIONS	RELIABILITY AND VALIDITY
Changes in the level and rate of reported crime	The rate and level of reported crime is directly related to the actual level of crime and as deterrence is a primary objective of preventive patrol, a change in the reported level of crime can be attributed to changes in the deterrent effect of patrol.	Preventive patrol is only one factor affecting the rate of crime, the level of crime deterrence, and in general, the degree to which crime can be effectively prevented. As the myriad of social, economic, demographic, and institutional factors come into play and affect the level of reported crime, the link between preventive patrol and the level of reported crime is at best a tenuous one. There is no evidence to relate directly the level of reported crime to the level of actual crime. The measurement of the deterrent effect of patrol necessitates a measurement of the amount of crime which <u>did not</u> occur. Changes in the rate of reported crimes can not be construed as a measure of the degree to which events did not happen. It only indicates the degree to which events which did happen came to the attention of the police.	There is no demonstrated validity or reliability associated with the statistics on reported crime as a measure of the deterrent effect of preventive patrol.
Changes in the level and rate of victimization by type of crime	The level and rate of actual victimization (as determined through victimization surveys) is directly related to the deterrent effect of preventive patrol.	The actual level and rate of victimization is a function of many social, economic, demographic and institutional factors of which preventive patrol is only one. As a consequence, it is not possible to differentiate and determine the degree to which preventive patrol *per se* effected changes in the rate and level of victimization. Measurement of the deterrent effect of patrol necessitates a measurement of events which <u>did not</u> occur. It is not possible to measure non-events.	As a measure of the deterrent effect of patrol, victimization studies may have considerable reliability and validity if it is possible to control for the other intervening variables. As a consequence, victimization studies may be of considerable value in the context of carefully controlled experiments designed to determine the differential impact of alternative patrol procedures. It is to be noted also that victimization studies are extremely expensive if properly executed and are therefore impractical as on-going measures of patrol effectiveness in the context of most departments.

(EXHIBIT II continued)

MEASURES OF EFFECTIVENESS: DETERRENCE
continued

EFFECTIVENESS MEASURES	SUPPORTING ASSUMPTIONS	OPPOSING ASSUMPTIONS	RELIABILITY AND VALIDITY
Changes in the level and rate of criminal arrests.	It is assumed that an increase in arrest rates communicates to the would-be offender a heightened patrol effectiveness and a greater likelihood of capture. As a consequence it is assumed to deter crime. Arrest rates are therefore indirect measures of the deterrent effect of patrol.	The use of arrest rates assumes that the would-be criminal approaches the commission of a criminal act in a rational manner, taking into account good information on arrest rates of appropriate departments. There is very little basis for this assumption of rationality. Arrest rates are a function not just of preventive patrol, but also minimally of investigative activity. As such, they are not indicative of the deterrent effect of patrol as it is not possible to assign differential levels of importance to each contributing factor. The link between arrest rates and deterrence level is an untested assumption, and is self-serving to the department. Arrest rates do not provide a measurement of events that did not occur.	There is no demonstrated validity or reliability associated with changes in the level and rate of arrests as a measure of the deterrent effect of preventive patrol.
Patrol officer response time.	The rapidity of response time is assumed to communicate to the offender a likelihood of arrest. As a consequence, it is assumed that the lower the response time, the greater the level of deterrence resulting from patrol.	The use of response time assumes that the would-be criminal approaches the commission of a criminal act in a rational manner, taking into account good information on the response capability of the police. There is little basis for this assumption of rationality. With regard to most types of crime, it is the probability of detection during the criminal act and not the rate of response which is likely to affect the criminal's determination of his vulnerability to arrest. Response time as a measure of deterrence is an untested, self-serving measure which assumes a relationship which has not been demonstrated.	There is no demonstrated validity or reliability associated with changes in the rate of response time and the deterrent effect of preventive patrol.

(EXHIBIT 11 continued)

MEASURES OF EFFECTIVENESS: DETERRENCE
Continued

EFFECTIVENESS MEASURES	SUPPORTING ASSUMPTIONS	OPPOSING ASSUMPTIONS	RELIABILITY AND VALIDITY
The level of patrol visibility and the level of aggressive patrol tactics (emphasis on such activities as stop-and-frisk and vehicle checks).	A highly visible patrol force and/or the careful checking of "suspicious" individuals communicate an increased level of police presence and activity suggestive of a heightened likelihood of capture. As a consequence, it increases the level of deterrence.	The evidence linking the level of patrol visibility to the level of deterrence is fragmentary and contradictory. Patrol visibility and the projected sense of officer presence is relevant only to the deterrence of detectable crimes, if relevant at all. The level of patrol and of aggressive activity as a measure of deterence is a self-serving justification of a status quo orientation to patrol.	The evidence linking the level of patrol visibility to the deterrent effect of patrol is spotty, and as such there is little demonstrated validity and reliability associated with its use as a measure of effectiveness. With regard to aggressive patrol activity, however, limited evidence suggests that aggressive patrol tactics (e.g., use of field interrogation) may have an effect on the level of suppressible crime. As a measure of effectiveness, the use of statistics on aggressive activities requires first that substantial efforts be made to calibrate its relationship with changes in crime rates.

It is commonly assumed that increasing the number of officers on patrol will lead to an increase in the number of crimes in progress detected and the number of suspects apprehended on the streets. Additionally, deployment and allocation procedures are believed to have an important influence on officer-initiated apprehension capabilities. Policy decisions of this type have included: (1) the deployment of either one- or two-officer cars based on assessments of the differences in their observational capabilities and abilities in making arrests;[20] (2) the utilization of allocation formulas either to increase patrol presence in high crime areas or to randomize the distribution of patrol units in the hope of catching offenders off guard; (3) the use of a variety of modes of transportation (e.g., foot, bicycle, helicopter, scooter, motorcycle, marked and unmarked cars) based on assumptions regarding their effectiveness in dealing with different forms of crime in varying types of locales; and (4) differential assignment of men and women to beats based on assumptions regarding the differences in the aggressiveness of male and female officers in relation to the demands and characteristics of specific patrol areas.

In an effort to increase apprehensions which result from direct citizen-initiated contact with officers, departments have attempted to foster the ready accessibility of officers to the public by adopting modes of transportation believed to be suitable to particular types of patrol areas and by equipping officers with hand-held radios. Foot and scooter patrol are frequently used in business districts and other congested areas, and personal radios give officers freedom of movement in making contact with citizens. Departments have also been concerned with appropriately matching the characteristics of officers (such as race and language skills) to patrol districts in an effort to increase rapport, respect and cooperation between officers and members of the community they serve.

Emphasis on apprehension by tactical surprise has led to the use of allocation models designed to reduce response time and the use of priority screening of calls for those thought to offer the highest probability of offender apprehension.[21]

The effectiveness of patrol in terms of apprehension can be judged by two measures -- one direct and the other indirect. These are: (1) changes in the number of arrests (by type of situation and crime) made by uniformed officers as a function of the quality of arrest and the clearance rate; and (2) changes in response time of patrol units. The first measure, change in the number of arrests, should not be treated as an absolute number, although it commonly is. It requires qualification to determine the quality of the arrest so that only procedurally correct arrests of offenders are counted. The most prominently proposed qualification is the number of arrests under consideration. The use of the "first screening" distinction is suggested as it minimizes the impact of prosecutorial and court discretion on the final disposition of cases. This method constitutes an attempt to determine whether or not the officer acted reasonably in making the arrest. Qualifying the number of arrests on the basis of case outcomes further along in the judiciary process may significantly underestimate the apprehension effectiveness of patrol operations; however, it may also be argued that not to qualify the statistics on the basis of final outcome may render the apprehension statistics a self-serving measure which can possibly present an inflated appearance of patrol effectiveness.

It is also necessary to qualify arrest data with regard to levels of crime. Crime clearance rates, for example, are the percentage of reported crimes

(EXHIBIT III)

MEASURES OF EFFECTIVENESS: APPREHENSION

EFFECTIVENESS MEASURES	SUPPORTING ASSUMPTIONS	OPPOSING ASSUMPTIONS	RELIABILITY AND VALIDITY
Changes in the number of arrests by uniformed officers by type of crime.	Aggregate annual comparisons of arrest rates indicate changes in the effectiveness of the patrol function	Arrest rates alone, when there is no attempt to control for changes in the level of victimization or quality of the arrest are not indicative of effectiveness. Increases in the number of arrests as a measure of effectiveness may mask either a commensurate increase in crime or a decline in arrest quality. In addition, it provides motivation for making arrests with minimal grounds for so doing.	When reported in absolute terms, changes in arrest rates lack reliability and validity as measures of apprehension effectiveness.
The number of arrests by uniformed officers by type of crime divided by the number of reported crimes.	This ratio of arrests: level of crime activity controls for changes in the crime rate and yields a measure of performance which is related to the level of crime.	The number of reported crimes is an insufficient control as the relationship between the level of reported crime and the level of actual victimization is not known. As a result, it is not possible to interpret the statistic as it relates to the effectiveness of patrol. In addition, without controlling for arrest quality, a motivation is provided to the department for making arrests with minimal grounds.	The ratio $\frac{\text{arrests}}{\text{reported crimes}}$ lacks reliability and validity as a measure of apprehension effectivensss due to the fact that the number of reported crimes may not reflect the number of actual crimes.
The clearance rate: the percentage of the reported crimes accounted for by the number of arrests made by type of crime.	This measure reflects the fact that the same individual may be responsible for the commission of more than one crime. By computing the clearance rate achieved by the department, the arrests are reviewed with regard to the number of reported crimes and the result is a more accurate reflection of the apprehension effectiveness of the department.	The computation of clearance rates on the basis of reported crime neglects the fact that the level of reported crime is not reflective of the level of actual crime which only victimization surveys can yield. The use of clearance rates, without controlling for the quality of the arrest and of the subsequent charges brought, can be self serving to the department, motivating the department to attribute unsolved crimes to "available" suspects.	Due to the problems inherent in the utilization of reported crime rates and the failure to control for the quality of the arrest, this measure has no demonstrated reliability or validity as a measure of the apprehension effectiveness of the department.

(EXHIBIT III continued)

MEASURES OF EFFECTIVENESS: APPREHENSION
continued

EFFECTIVENESS MEASURES	SUPPORTING ASSUMPTIONS	OPPOSING ASSUMPTIONS	RELIABILITY AND VALIDITY
A modified clearance rate; the percentage of actual victimizations accounted for by the number of arrests made by type of crime; i.e., $\frac{\text{Arrests}}{\text{Percent Victimization}}$	This ratio provides an accurate measure of apprehension effectiveness as it reflects the percentage of active crimes accounted for by the arrests.	This ratio neglects the need to control for the quality of the arrests and may create motivation to either arrest with minimal grounds or to attribute otherwise unsolved crimes to those arrested.	While taking into account the actual number of victimizations, this measure does not take into account the quality of arrests and therefore lacks reliability and validity as a measure of effectiveness.
The percentage of victimizations accounted for by the arrests which survive the "first screening."	This ratio controls both for the quality of the arrest and for the level of victimization. The use of "first screening" as the control for arrest quality is the best possible as it minimizes: 1) The degree to which unfounded arrests will affect the statistics, and 2) The degree to which non-crime related concerns of the prosecutorial and court processes themselves affect the statistics.		This ratio at present seems to be the best available measure of apprehension effectiveness. It is to be noted, however, that victimization studies are extremely expensive and may therefore be impractical for most departments.

accounted for by the number of arrests made by patrol officers. The total number of apprehensions is related to the level of crime in order to make a judgement regarding patrol effectiveness. Unless the rate of crime is known to be increasing or decreasing, it is impossible to interpret changes in the rate of apprehension. For example, if the level of apprehension rises, is it because there is a significantly higher level of crime, or is it because the patrol force is more effective in solving a constant or smaller number of victimizations? The difficulty in monitoring victimization rates closely and the problems involved in interpreting rates of reported crimes (as discussed above) also limit interpretation of data on the number of apprehensions achieved by departments.

The use of response time as an indirect measure of apprehension is based on a limited body of empirical evidence of somewhat questionable validity which indicates that reductions in response time can have a considerable impact on apprehension rates.[22] It has been reported, in one example, that a reduction in response time from 14 minutes to one minute can lead to a 62% increase in the rate of apprehension resulting from calls for service.[23] Based on findings of this nature, the use of response time, in and of itself, is becoming increasingly common as a measure of the apprehension effectiveness of patrol. However, while a relationship between response time and apprehension rates may exist, its use as a measure of goal attainment can be self-serving and deceptive. It shares this problem with most indirect measures of effectiveness.

In the near future more information should be available on the relationship of response time to patrol objectives. The Kansas City Police Department is currently conducting a large-scale study of the question. While it is unwise to speculate prematurely about the results of research, preliminary and very tentative findings in the Kansas City study suggest that departments would do well to hold in abeyance judgements of effectiveness which are based on response time as a principal measure.[24]

In sum, while apprehension of criminal offenders is a primary goal of patrol operations, little is known about the relationship between patrol strategies and apprehension, and no entirely satisfactory measures exist for evaluating the effect of patrol tactics on the rate of apprehension. Exhibit III summarizes the merits and drawbacks of common measures of apprehension.

III. Provision of Non-Crime Related Services

The third goal of traditional preventive patrol, provision of non-crime related services, involves activities such as: emergency ambulance and rescue service, intervention and assistance in minor domestic matters, license inspections, reporting needed repair of public property and utilities, and providing services such as taking reports for insurance purposes. The range of non-crime services "routinely" performed by uniformed patrol officers is indicated by a recent inventory which included over 3,000 different activities.[25]

Performance of non-crime related services has fallen to the police due to the general abstention of other government agencies, the tendency of citizens to call the police when unable to think of where else to turn, and the fact that the police are often the only available source of help. In the main, the police have accepted these non-crime tasks because their provision does not seem to undermine the effectiveness of patrol and can even be viewed as contributing to

it, and because they perceived themselves to have little or no choice in the matter. Performance of these services is commonly felt to enhance community satisfaction with police work, improve rapport between citizens and officers, and build a "constituency" for the police among the public at large. In addition, it is argued that the police should continue to provide these services since their basic capabilities and infrastructure allow them to do so more economically and efficiently than other governmental agencies.[26]

In the past, non-crime related services have been provided by the police without much hesitation, but continuation of these services has recently come into question. As crime and fear of crime increase, provision of non-crime services has come to be seen as detracting significantly from the availability of patrol units for preventive patrol and response to calls for crime-related services.[27] The problem is of substantial magnitude: it has been estimated that the provision of non-crime related services combined with the performance of traffic duties and the policing of minor misdemeanors consumes from approximately two-thirds to three-fourths of the uniformed patrol officer's time.[28] It has been argued that this time could be more effectively spent on activities related to crime deterrence and criminal apprehension.[29]

In essence, the argument against police provision of these services maintains that they interfere with the effective achievement of more important goals of traditional preventive patrol and, as a result, may indirectly lower the level of community satisfaction with police performance.[30] It has been suggested that the performance of some of these services, such as traffic control and reporting of public utility outages, does not require the expertise of patrol officers and could be handled as well by non-sworn personnel, and that other non-crime activities, such as license inspections and resolution of minor domestic problems, could be provided more effectively and appropriately by other government agencies.

Proponents of curtailing police provision of non-crime related services, traffic functions, and the handling of minor misdemeanors do not disavow the importance of these functions *per se,* but rather offer alternative means of handling the work. Proposed changes include: (1) referral of certain types of calls for service to other agencies;[31] (2) creation of new agencies[32] or divisions[33] to handle some tasks currently performed by patrol officers; (3) increased use of citizen auxiliaries[34] and non-sworn personnel;[35] and (4) establishment of systems to dispatch officers on a priority basis to calls for service.

While non-crime related calls for service have a substantial impact on the allocation of patrol resources, departments do not seem to adapt the strategies and tactics of patrol operations to them.[36] Rather, they work the provision of these services around the performance of other tasks, increasing the manpower allocated to districts in which the non-crime service load is particularly heavy. Consideration of non-crime services is important in the context of this report because of their potential impact upon the availability of manpower and equipment for routine preventive patrol. However, since there is no empirically grounded research which quantifies the relationship between the number of officers deployed on patrol and levels of goal attainment, the extent and nature of loss due to non-crime services is unknown. In the jargon of economics, we do not know the marginal utility of the extra patrol officer.

The measures of effectiveness used to evaluate the contribution of patrol to the satisfaction of this goal are: (1) activity counts: showing

the number of non-crime related services provided, often as a percentage of the number of requests received for assistance; (2) changes in the number and content of citizen complaints: concerning the failure to provide such services satisfactorily, if at all; and (3) information from survey data: concerning the general quality of service provision and the satisfaction of the recipient with the performance of the police officer. Exhibit V presents a summary of the merits of these measures.

IV. Provision of a Sense of Community Security and Satisfaction with the Police

The fourth goal of traditional preventive patrol, the provision of a sense of security to the community and the generation of community satisfaction with the police, is usually considered to be dependent upon the achievement of the preceding goals. It is normally assumed that effective attainment of deterrence, apprehension, and non-crime service provision will result in high levels of perceived community security and satisfaction with police activities. However, some operational tactics are thought to contribute more to the attainment of this goal than others. Community satisfaction is, for example, commonly believed to be influenced by the level of police corruption, demeanor of patrol officers, and officer characteristics such as race, language skills, and sex.

While the impact which varying levels of visibility, aggressive patrol, and the utilization of women have on community attitudes has been studied to a limited extent, the other assumed relationships remain untested.[37] Surveys of citizen attitudes toward the police have been conducted, but only a few studies have attempted to relate survey results on a before and after basis to specific changes in patrol operations.

The measures which have been used to determine the impact of patrol upon the level of community security and satisfaction have, to a degree, already been suggested. They include: (1) attitudinal data collected from general population surveys and surveys of citizens who have had encounters with the police; and (2) attitudinal data inferred from citizen complaints about the police, structured observations of police-citizen encounters, and officer response times.

Survey research provides a direct measure of citizen attitudes toward the police; however, surveys generally offer little information regarding the intensity of those attitudes. While in principle it is possible to use surveys to determine the impact of changes in patrol techniques upon the attitudes and feelings of the public, these measures have seldom been employed properly for this purpose. Accurate information on this relationship requires testing of attitudes prior to any change in techniques and subsequent retesting at an appropriate time after the change. The Kansas City Preventive Patrol Experiment, the Women in Policing Study, and the San Diego Field Interrogation Experiment employed these steps correctly, but questions can be raised concerning the quality of the first two of these surveys *per se*.[38] As a result of the limited number of before and after surveys, rather little is known about the relationship between patrol tactics and citizen attitudes.

The second type of attitudinal data, those inferred from complaints, structured observation and response time, are generated on the basis of assumed relationships. The number and tone of complaints received against patrol officers

(EXHIBIT IV)

MEASURES OF EFFECTIVENESS: PROVISION OF NON-CRIME RELATED SERVICES

EFFECTIVENESS MEASURES	SUPPORTING ASSUMPTIONS	OPPOSING ASSUMPTIONS	RELIABILITY AND VALIDITY
Activity counts (typically as a percentage of the number of calls for service received).	The degree to which all calls for such services are responded to indicates the effectiveness of the police in providing such services.	This does not reflect the quality of response, only the fact of response. This measure does not control for the possibility that calls for service are not being made because of citizen perceptions that the response will be inadequate.	A measure which has high reliability and validity if and only if it can be supplemented with community attitude surveys measuring citizen satisfaction with services provided.
Attitudinal survey data of the general population and of individuals who have had non-crime related service encounters with the police.	Survey research utilizing appropriate scaling techniques provides a direct measure of citizen satisfaction with police services.	While yielding a measure of the number of people satisfied with the provision of services, and a measure of their reliance upon the police for same, it is extremely difficult to measure intensity of feeling.	A reliable and valid measure of the effectiveness of performance of non-crime related services, particularly when reflected upon in the light of data on the percent of calls for service responded to.
Police statistics reporting such things as the number and content of complimentary or critical correspondence received from the public.	Correspondence received by the department is indicative of the general effectiveness with which such services are performed.	Citizens that communicate directly with the police are not necessarily representative of the general population. In addition, there is no way of guaranteeing the integrity of the data base.	There is no demonstrated reliability or validity justifying the use of correspondence as a measure of effective service provision.

are often used as indicators of attitudinal dispositions. The problem in using this measure is that the number of complaints received can be influenced by both departmental procedures and by factors outside the control of the police, particularly media coverage. In addition, there is no basis for assuming that the complaints received have come from a representative sample of the population. Similar problems are faced in the use of structured observations of police-community encounters. It is at best immensely difficult to insure that observed encounters constitute a representative sample of all police-citizen contacts. Also, one can never be certain how the presence of an observer might affect the number, type and quality of observed interactions, and characterization of attitudes on the basis of observation is not a completely satisfactory procedure. While complaints and observation may point to specific concerns which should be addressed in attitudinal surveys, neither can be properly used as grounds for making general statements about public attitudes as a whole.

The use of response times as an indicator of attitudes assumes that a community's sense of security is dependent on perceptions of the ability of the police to respond quickly to calls for service. While there is some evidence that response time is an important determinant of satisfaction with police services,[39] the relationship is not sufficiently well-established to allow attitudes to be inferred from response time. Indeed, given the many dimensions contributing to the public's sense of security and feelings toward the police, it is doubtful whether indirect measures of attitudes, either individually or in combination, can ever be adequate.

In short, while measures of community attitudes exist, they have not been adequately used to test the impact of tactical changes on levels of citizen satisfaction and felt security. As a result, most of the reported relationships are based on uncertain assumptions. Exhibit V summarizes findings regarding the merits of common measures of citizen security and satisfaction.

V. Recovery of Stolen Goods

The fifth goal of patrol is the recovery of stolen goods. Except for the recovery of stolen cars, satisfaction of the goal appears to be most often achieved only incidentally to the realization of other goals. The location and recovery of stolen goods is primarily the concern of investigative personnel rather than patrol officers. The search for stolen automobiles, however, is a normal and frequently emphasized part of a patrol officer's routine. Tactical considerations in the performance of this function include an emphasis on traffic stops and spot checks, the use of special look-out sheets, and the deployment of two-officer cars for reasons of safety. The recovery of stolen goods as a goal loses much of its significance unless goods can be returned promptly to their rightful owners. Legal evidence requirements appear to have hindered police efforts to meet this objective.

Measurement of effectiveness in achieving this goal is based on: (1) the value of goods recovered; (2) the aggregate amount of goods recovered as a percentage of the aggregate amount reported stolen; and (3) the speed with which recovered goods are returned to their owners. The first two indicators are both direct measures. However, since neither is related to the total amount of stolen goods, but at best only to the reported amount, an increase in the

(EXHIBIT V)

MEASURES OF EFFECTIVENESS: PROVISION OF COMMUNITY SECURITY AND SATISFACTION WITH THE POLICE

EFFECTIVENESS MEASURES	SUPPORTING ASSUMPTIONS	OPPOSING ASSUMPTIONS	RELIABILITY AND VALIDITY
Attitudinal survey data of the general population and of citizens who have had encounters with the police	Survey research, utilizing appropriate scaling techniques, provides a direct measure of the number of people in the community who feel secure and/or are satisfied with the services provided by the police.	While yielding a measure of the number of individuals who feel secure and/or are satisfied with police services, it is extremely difficult to measure intensity of feelings.	A reliable and valid measure of the number of people who are satisfied with police services and/or who feel secure within the community.
Attitudinal data developed through structured observation.	Structured observations conducted by trained observers carefully recording data can yield reliable and valid information concerning the attitudes of citizens.	On the basis of a chance encounter it is not possible to infer the basic attitudes of the citizenry, even the ones of the moment. There is no way of controlling for the effect which the observer has upon the individuals party to the actual encounter. There is no way of guaranteeing the randomness of the encounters. If it is possible to generalize at all, it is only to the population having encounters with the police, and not to the general population.	There is no demonstrated reliability or validity justifying the use of structured observation to measure the attitudes of the citizenry with regard to police performance or sense of community security.
Officer response time.	The attitude of the citizenry towards the police and the sense of felt security is affected greatly by the rapidity with which officers respond to calls for service.	Officer response time is a self serving measure. The evidence supporting the link between response time and attitude is conflicting, and of questionable validity and reliability.	An indirect, inferential measure which has no demonstrated reliability or validity.

(EXHIBIT V continued)

MEASURES OF EFFECTIVENESS: PROVISION OF COMMUNITY SECURITY AND SATISFACTION WITH THE POLICE
continued

EFFECTIVENESS MEASURES	SUPPORTING ASSUMPTIONS	OPPOSING ASSUMPTIONS	RELIABILITY AND VALIDITY
Police statistics reporting such things as the number of letters received either complimentary to or critical of the police.	The correspondence received by the police department is indicative of the general tone and feeling of the community.	Citizens that communicate directly with the police are not necessarily representative of the general population. In addition, there is no way of guaranteeing the integrity of the data base.	There is no demonstrated reliability or validity justifying the use of correspondence received as a measure of community attitudes.

value or quantity of recovered goods may indicate either increased patrol effectiveness or possibly decreased effectiveness if the value or quantity of property stolen has also increased. The prompt return of recovered property is an important goal, but is not ordinarily the responsibility of patrol officers.

Exhibit VI summarizes the utility of common measures of stolen goods recovery.

* * * * *

In conclusion, traditional preventive patrol has five primary goals. As indicated above, these goals are intricately related to one another. The tactics and strategies directed at the realization of any one goal may either reinforce or interfere with efforts to attain others. The nature and direction of the interrelationships among goals are displayed in summary form in Exhibit VII. The relationships are expressed in terms of assumptions which are widely held by researchers and professionals. The lower left of the cross-support matrix displays aspects of goal interference; the upper right represents goal reinforcement.

Preventive patrol is only one of many factors which can affect the realization of these goals. This makes it difficult to relate the contribution of specific patrol activities and practices directly to the attainment of goals. Consequently, patrol administration typically concentrates on achieving the desired levels of the eight previously mentioned strategic and tactical objectives of patrol: (1) patrol visibility; (2) predictability of patrol unit movement; (3) response time; (4) level of preventive patrol activity; (5) level of service provision; (6) officer compatibility with their assigned beats; (7) officer knowledge of the community; and (8) officer misconduct and corruption. Unlike the goals of patrol, it is believed that these intermediate objectives can be directly realized through the manipulation of departmental resources. Each objective is linked by a set of explicit and/or implicit assumptions to the attainment of one or more of the five basic goals. They serve as mediators between patrol activities and goal attainment. As such, a consideration of these intermediate objectives has, in part, already been subsumed in this discussion of goals and is continued from a different perspective in the following chapter on the inputs and processes which comprise preventive patrol. Exhibit VIII presents the prevailing assumptions which link each objective to the primary goals of patrol. The intermediate objectives are also discussed in much greater detail in the volumes upon which this summary is based.[41]

(EXHIBIT VI)

MEASURES OF EFFECTIVENESS: RECOVERY OF STOLEN GOODS

EFFECTIVENESS MEASURES	SUPPORTING ASSUMPTIONS	OPPOSING ASSUMPTIONS	RELIABILITY AND VALIDITY
Value of goods recovered.	Directly measures the amount of goods recovered.	While typically reported, it is seldom if ever related to the value of goods stolen and as such does not provide a measure of effectiveness. The value of goods recovered is not necessarily related to the number of items stolen. As such, a high value recovery may mask the fact that most goods stolen are not recovered. The obverse also applies. The goal is not merely to recover stolen property, but rather to in turn have it restored promptly to its rightful owner.	No demonstrated reliability or validity as there is no attempt to relate this to the value lost. In addition the measure does not address the purpose of recovery.
Value of goods recovered as a percent of the value of goods stolen.	In relating value stolen to value recovered, this is a true reflection of the recovery-effectiveness of the police.	The value of goods recovered is not necessarily a reflection of the number of items stolen. The value of goods stolen as known to the police only reflects loss in reported crimes which can not be assumed reflective of total loss. The measure does not indicate the degree to which goods are promptly restored to their rightful owners.	There is no demonstrated validity or reliability justifying the use of this measure. In addition, it does not measure the return of goods to owners which is a major purpose of recovery.
Number of items recovered and returned promptly to their rightful owners as a percent of the number of items stolen.	A true reflection of the effectiveness of recovery and return.	This measure does not reflect a concern for the value of the items stolen. It may be beneficial to prioritize recovery on the basis of value.	

EXHIBIT VII

AN ILLUSTRATION OF ASSUMED INTERRELATIONSHIPS
AMONG PATROL GOALS

NOTE: This exhibit provides an illustration of the interrelationship among patrol goals indicating how actions designed to enhance attainment of one goal may have both positive and negative effects upon the attainment of others. As explained on page 4, these assumptions are presented here in schematic form to facilitate the systematic analysis of patrol activities. The level and quality of knowledge underlying these assumptions are summarized in this report and discussed in greater detail in accompanying volumes.[40]

(EXHIBIT VII) AN ILLUSTRATION OF ASSUMED

GOALS / GOALS	DETERRENCE	APPREHENSION
DETERRENCE	GOAL REINFORCEMENT / GOAL INTERFERENCE	The higher the level of apprehension, the greater the deterrent effect of patrol.
APPREHENSION	1. While high visibility may enhance the deterrent effect of patrol, it may also detract from the apprehension effect by diminishing the probability of intercepting a crime in progress. 2. The greater the commitment of patrol resources to investigative activities, the lower the commitment to general patrol, and the lower the level of deterrent effect. The obverse also applies.	GOAL REINFORCEMENT / GOAL INTERFERENCE
PROVISION OF NON-CRIME RELATED SERVICES	The greater the level of service provision, all else equal, the lower the level of resources available for patrol and the lower the level of deterrence. The obverse also applies.	The greater the level of service provision, the less time available for patrol activities and the lower the apprehension level. The obverse also applies.
COMMUNITY SECURITY AND SATISFACTION	1. The higher the level of aggressive patrol activity, the higher the level of deterrence, but the lower the level of citizen satisfaction. 2. As the level of satisfaction and security may derive more from the provision of non-crime services than from the deterrent effect of patrol, the greater the resource commitment to deterrence, the lower the level of citizen satisfaction.	1. The higher the level of aggressive patrol activity, the higher the level of apprehension, but the lower the level of citizen satisfaction. 2. As the level of satisfaction and security may derive more from the provision of non-crime services then from the apprehension effect of patrol, the greater the resource commitment to apprehension the lower the level of citizen satisfaction.
STOLEN GOODS RECOVERY	1. Time spent on deterrent activities may decrease the ability of the force to recover stolen goods, and vice versa. 2. Time spent on aggressive patrol activities may alienate the community and interfere with the flows of information which may enhance the capability to recover stolen goods.	All else equal, attainment of goals of goods recovery and apprehension do not interfere with one another.

INTERRELATIONSHIPS AMONG PATROL GOALS

(EXHIBIT VII)

PROVISION OF NON-CRIME RELATED SERVICES	COMMUNITY SECURITY AND SATISFACTION	STOLEN GOODS RECOVERY
Service provision affords a heightened opportunity to develop citizen support and cooperation thereby enhancing the deterrent capability of the patrol force.	The higher the level of deterrence, the greater the feeling of security and the greater the level of citizen satisfaction with the police.	1. The higher the level of deterrence, the less the need to recover goods. 2. The more aggressive the patrol activities, the more likely the recovery of stolen goods (but not necessarily prompt return to rightful owner).
Service provision affords a heightened opportunity to develop citizen support and cooperation thereby enhancing the apprehension capability of the patrol force.	The higher the level of apprehension effected by patrol, the greater the level of felt security and satisfaction.	The higher the level of apprehension, the higher the level of goods recovery (but not necessarily prompt return to righful owner).
GOAL REINFORCEMENT / GOAL INTERFERENCE	The higher the level of non-crime related service provision, the higher the level of felt security and satisfaction.	Service provision affords a heightened opportunity to develop citizen support and cooperation, thereby enhancing the recovery capability of the patrol force.
As the levels of apprehension and deterrence may have more of an impact on citizen satisfaction and felt security than does the level of service provision, the greater the commitment of resources to service provision, the lower the level of felt security and satisfaction.	GOAL REINFORCEMENT / GOAL INTERFERENCE	The higher the level of goods recovery, the higher the level of felt security and satisfaction if and only if the goods are promptly returned to the rightful owner.
The more resources committed to the recovery of stolen goods, the less resources available for the provision of services. The obverse also applies.	As the recovery and return of stolen goods may have less an impact on felt security and satisfaction than the deterrence, apprehension and service provision activities, all else equal the more resources expended on goods recovery, the lower the level of felt security and satisfaction.	GOAL REINFORCEMENT / GOAL INTERFERENCE

EXHIBIT VIII

PREVAILING TACTICAL AND STRATEGIC ASSUMPTIONS

NOTE: This exhibit displays a universe of assumptions relating patrol strategies and tactics to the goals of patrol; subsets of this universe govern the operation of patrol divisions throughout the country. As explained on page 4, these assumptions are presented here in schematic form to facilitate systematic analysis of patrol activities. The level and quality of knowledge underlying these assumptions are summarized in this report and presented in greater detail in the volumes on which this summary is based.[42]

(EXHIBIT VIII)

PREVAILING TACTICAL AND STRATEGIC ASSUMPTIONS

OBJECTIVES \ GOALS	DETERRENCE	APPREHENSION	PROVISION OF NON-CRIME RELATED SERVICES	COMMUNITY SECURITY AND SATISFACTION	STOLEN GOODS RECOVERY
LEVEL OF VISIBILITY	The higher the level of visibility, the greater the deterrent effect of the patrol force.	The higher the level of visibility, the less likely the patrol officer is to intercept a criminal in the act of a crime.	Visibility has little effect on service provision, all else being equal. The effect which does exist derives from the enhanced ability of the citizen to hail an officer on patrol.	The higher the level of visibility, the greater the sense of felt security and satisfaction with the police.	Through its impact on apprehension, the level of visibility affects goods recovery (but not necessarily the prompt return to the rightful owner).
LEVEL OF PREDICTABILITY OF MOVEMENT	The less able the would-be criminal is to predict the presence of the patrol unit, the higher the deterrent effect of the patrol activity.	The less predictable the movement of the patrol unit, the more likely that the unit will intercept a crime in progress and apprehend the perpetrator.	The level of predictability of movement has no effect on service provision, all else equal.	The level of predictability of movement has an indirect effect upon felt community security and satisfaction through its direct impact upon deterrence and apprehension.	Through its impact on apprehension, the level of predictability affects the level of goods recovery (but not necessarily the prompt return to the rightful owner).
LEVEL OF RESPONSE TIME	The lower the response time, the greater the deterrent effect of the patrol operation as the would-be perpetrator perceives a heightened probability of apprehension.	Particularly with regard to responding to criminal acts in progress, the lower the response time, the higher the probability of apprehension.	The lower the response time, the more rapidly the service can be performed. With regard to emergency medical situations and to other circumstances that could escalate into criminal acts, response time is critical to effective service provision.	The lower the response time to any and all calls for service, the greater the level of felt security and community satisfaction. (We note however that a step function exists with regard to perceptions of elapsed time. Therefore, small reductions in time are likely not perceived.)	Through its impact on apprehension, the level of response time affects the level of goods recovery (but not necessarily the prompt return to the rightful owner).

(EXHIBIT VIII continued)

PREVAILING TACTICAL AND STRATEGIC ASSUMPTIONS
continued II

OBJECTIVES \ GOALS	DETERRENCE	APPREHENSION	PROVISION OF NON-CRIME RELATED SERVICES	COMMUNITY SECURITY AND SATISFACTION	STOLEN GOODS RECOVERY
LEVEL OF SERVICE PROVISION	All else equal, the higher the level of non-crime related service provision, the lesser the availability of units for preventive patrol, and the lower the deterrent effect of the force.	All else equal, the higher the level of non-crime related service provision the higher the response time to crime related calls for service and therefore the lower the probability of apprehension. In addition, non-crime related services detract from the time available to enforce local ordinances.		The higher the level and quality of service provision, the greater the level of felt security and satisfaction with the police.	Through its impact on apprehension, the level of service provision affects the level of goods recovery. In addition, the amount of time the unit spends out of service affects the time available to check for stolen cars.
LEVEL OF OFFICER COMPATIBILITY WITH THE COMMUNITY (SIMILARITY OF RACE AND LANGUAGE SKILL)	Countervailing Assumptions Held Equally: 1. Compatibility has no effect upon deterrence. 2. Compatibility enhances respect for the officer and thereby respect for the law, increasing the deterrent effect of patrol. 3. The higher the level of compatibility, the greater the likelihood of officer corruption and, therefore, the lower the deterrent effect.	Countervailing Assumptions Held Equally: 1. Compatibility has no effect upon apprehension. 2. Compatibility improves apprehension level as it engenders increased community cooperation with the police. 3. Compatibility increases the likelihood of corruption and thereby has a negative effect upon apprehension of those so protected.	The greater the level of officer compatibility, the more efficiently and adequately the officer is able to provide non-crime related services.	The greater the level of officer compatibility, the greater the level of felt security and citizen satisfaction.	Through its impact on apprehension, the level of compatibility affects the level of goods recovery.

(EXHIBIT VIII continued)

PREVAILING TACTICAL AND STRATEGIC ASSUMPTIONS
continued

OBJECTIVES \ GOALS	DETERRENCE	APPREHENSION	PROVISION OF NON-CRIME RELATED SERVICES	COMMUNITY SECURITY AND SATISFACTION	STOLEN GOODS RECOVERY
LEVEL OF PREVENTIVE PATROL	The higher the level of preventive patrol, the greater the deterrent effect of the patrol force. The more aggressive the activity of the patrol, the higher the deterrent effect due to the "communication" of increased presence and attentiveness to duty.	The higher the level of aggressive activity, the greater the level of apprehensions.	All else equal, the greater the level of aggressive activity, the less time available for the provision of non-crime related services.	Countervailing Assumptions Held Equally: 1. The greater the level of aggressive activity, the greater the level of security and satisfaction due to the increased level of attainment of the goals of deterrence, apprehension, and goods recovery. 2. The greater the level of aggressive activity, the more dissatisfied the general public as they come to view the police as a hostile force.	The more aggressive the patrol force, the greater the level of goods recovery (but not necessarily the prompt return to the rightful owner).
LEVEL OF OFFICER KNOWLEDGE ABOUT THE COMMUNITY	Countervailing Assumptions Held Equally: 1. The level of officer knowledge does not affect the level of deterrence (assuming a random patrol model). 2. The higher the level of officer knowledge, the more thorough the patrol of areas at times of high crime opportunity and, therefore, the greater the deterrent effect.	Countervailing Assumptions Held Equally: 1. The level of officer knowledge has no effect on the level of apprehension. 2. The greater the knowledge, the more likely the officer will intercept crimes in progress, and the more likely to be able to find a fleeing or hiding suspect and search an area.	The greater the level of knowledge, the more able the officer to provide effective and efficient services.	The greater the level of knowledge, the better able to tailor the patrol activity to the perceived needs of the residents, thereby enhancing their level of felt security and satisfaction.	Through its impact on apprehension, the level of community knowledge will affect the level of goods recovery, and thus the assumptions are contradictory. Note in addition, the level of knowledge enhances the ability to conduct a search for stolen cars in particular.

(EXHIBIT VIII continued)

PREVAILING TACTICAL AND STRATEGIC ASSUMPTIONS

continued IV

GOALS / OBJECTIVES	DETERRENCE	APPREHENSION	PROVISION OF NON-CRIME RELATED SERVICES	COMMUNITY SECURITY AND SATISFACTION	STOLEN GOODS RECOVERY
LEVEL OF OFFICER CORRUPTION	The lower the level of corruption, the greater the deterrent effect of the patrol force.	The lower the level of corruption, the greater the apprehension level of the patrol force.	The lower the level of corruption. the greater the equity of service provision.	The lower the level of corruption, the greater the level of felt security and satisfaction due to the increased level of attainment of all other goals.	The lower the level of corruption, the greater the level of goods recovery (but not necessarily the prompt return to the rightful owner).

CHAPTER TWO

ISSUES IN PATROL OPERATIONS*

The preceding chapter focused on goal attainment -- the output side of patrol. Here attention is turned to the inputs and processes which comprise patrol operations. The discussion centers on three (3) processes: deployment of officers and units; supervision of officers; and in-service task assignments; and two (2) inputs: the characteristics of patrol personnel and modes of transportation. Taken together, these five factors represent major determinants of patrol effectiveness which are under at least the partial control of patrol administrators. Each one has a direct impact upon the strategic and tactical objectives of patrol and, through them, an indirect influence upon the attainment of the basic goals of patrol. This chapter presents a summary of the related sets of patrol activities and procedures which comprise each input and process and a brief assessment of the content and certainty of current knowledge about their contribution to patrol effectiveness.

I. Deployment of Patrol Units

The process of deployment is one of the major determinants of patrol effectiveness. Its primary purpose is to achieve and maintain a level of patrol activity which guarantees a rapid and appropriate response to calls for service, while providing a level of general patrol activity sufficient to affect deterrence and apprehension. Additional concerns include: (1) the equalization of workloads among patrol units; (2) optimal and equitable service provision throughout the jurisdiction; (3) homogeneity of patrol beat populations; and (4) heightened officer motivation and attentiveness to duty. Deployment practices determine the location and travel patterns of patrol officers, thus setting the context in which they carry out task assignments, interact with the public, and are monitored by supervisory personnel. As a result, deployment procedures may have a greater impact upon the effectiveness of patrol operations than any other aspect of patrol.

In general, the deployment practices of departments can be viewed as a function of four factors: dispatch procedures, beat boundary determination, designation of patrol travel routes, and the number of assigned units (including the level of assigned personnel). Each is discussed below in a general way, and a display of the assumptions linking these aspects of deployment to patrol effectiveness is presented in Exhibit IX.

Before proceeding to a discussion of these factors, it is important to note that deployment becomes merely an abstraction if patrol officers do not

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* For a more detailed discussion of the material summarized in this chapter, see: Traditional Preventive Patrol: An Analytical Framework and Judgemental Assessment, prepared by the University City Science Center, January 1976, pp. 71-141.

adhere closely to their beat assignments, and routing and dispatch directives. For example, it was discovered recently in San Diego that patrol officers frequently did not know the boundaries of the beats to which they were assigned.[43] This is not a unique circumstance. Neither is the fact that as cars respond to calls for service outside their beats, the boundaries themselves become blurred and the configuration of units patrolling streets is altered. The effectiveness and integrity of deployment within any given jurisdiction depends both upon the ability to motivate officers to adhere to the stated deployment configuation and the ability of supervisory practices to assure conformance. It is noted that regardless of the implications of an Automatic Vehicle Monitoring System for the important deployment considerations of response time and officer safety,[44] it provides an excellent means of auditing the conformance of officers to beat boundaries, travel routes, and dispatch directives.

A. Dispatch of Patrol Units

Dispatch is concerned with designating the most appropriate type, level and rate of response by police officers in order to provide the most effective level of service. Traditionally, patrol units were dispatched to calls for service on an as-received basis with informal screening when serious overloads developed. This practice is satisfactory as long as a sufficient number of units is available to respond to all requests promptly, but it poses serious problems if queuing results. In recent years, the dramatic increase in the level of service demanded by the public has made it clear that dispatch on an as-received basis can result in unattended emergencies and failures in apprehension.

Priority screening is employed to facilitate response to crimes in progress, potentially violent or hazardous situations, and medical emergencies. By discriminating among calls on the basis of a predetermined order of importance, immediate dispatch can be made to high priority situations. Studies conducted in a number of cities, including Boston[45] and St. Louis,[46] have indicated that in overload situations, priority screening significantly reduces response time to calls of immediate importance.

The practice of referring calls for service to other government or social service agencies or to non-sworn personnel in lieu of a response by sworn officers has an effect similar to that of priority screening. In theory, referral reduces the service load of patrol officers and results in a more rapid response to all calls for service. It is also believed that referral improves the level of patrol, as more time is available to officers for this activity, and enhances the quality of response, as the referral agency is often best equipped to handle the problem. While many departments indicate that they routinely refer calls to other agencies, it is not clear how universal the practice is or what effect it actually has on the quality of patrol.

In order to further improve response time, many departments are considering the introduction of Automatic Vehicle Monitoring (AVM) systems. Experience in St. Louis, Missouri,[47] and Stamford, Connecticut,[48] (as determined through the real-time monitoring of the movement and status of patrol vehicles) indicates that the AVM facilitates the identification and immediate dispatch of the patrol unit closest to the response destination. It results in the reduction of the average response time to all calls for service, including non-priority calls, while maintaining the patrol commitment of other vehicles. However, it is not clear that response time to high priority calls has been reduced since, typically, all units

in the vicinity of an emergency respond immediately.

In addition, there is substantial interest in the use of computer-aided dispatch systems from which data describing the criminal history, demographic and physical characteristics of a response location are retrieved and made automatically available to the dispatcher and responding officer(s), providing them with guidance in handling each call. While systems of this type are being considered by many departments, their value awaits empirical testing and evaluation. This is of great importance in light of their expense.

B. Establishment of Beat Boundaries

A patrol beat is a defined geographic area within a jurisdiction to which a patrol unit(s) is assigned in order to facilitate patrol coverage and response to calls for service. In setting the boundaries of patrol beats, the major concerns are: (1) the provision of an equitable level of patrol throughout a jurisdiction; (2) the minimization of response time to calls for service; and (3) the equalization of workload among units throughout the jurisdiction. Boundaries are set with particular consideration being given to projected workloads by location, number, type and time of incidents; variations in population density (as density is thought to be related to service needs); differential travel times throughout the jurisdiction; neighborhood lines; and the desired level of routine patrol activity.

The many considerations involved in the setting of beat boundaries are commonly addressed through either explicit or implicit workload and hazard formulas which "compute" the amount of time required for patrol as a function of street miles, expected level of service demands, number of buildings to check, number of community meetings to attend, number of citizen contacts to make, the density of traffic flows, etc. By estimating the total patrol time requirements for a jurisdiction, boundaries can then be set to equalize the demands on officer time and, as a result, officer workloads. In this way, it is assumed that individual patrol unit efficiency is maximized, response time is minimized, and equitable service is provided in the sense that the ability of the police to respond to demands is equalized throughout the jurisdiction.[49]

While theoretically workload and hazard formulas are satisfactory constructs, in practice they result only in baseline estimates of workload requirements. The reasons for this include: all patrol activities are not accounted for in the original calculations, the computations are not made often enough to reflect physical and demographic changes in the jurisdiction, and the time required to complete patrol activities is often incorrectly estimated. This last point is particularly important with regard to concerns that a given amount of time be available for general patrol. To provide the desired amount of patrol time, the total time requirement (response time requirements plus preventive patrol requirements) is computed by adding the amount of time desired for patrol to the workload computation. As a result, if the amount of time required to respond to service calls is underestimated, the amount of time available for patrol is diminished. However, as there are no ready means to calculate the amount of time expended on service calls, it is extremely difficult to determine the level of routine patrol. In essence, the amount of patrol becomes an indeterminate residual.

While most departments use some form of hazard or workload formulas, the derived boundaries may be modified on the basis of a consideration of neighborhood

lines. This is thought to provide for a homogeneity within beats, facilitating officer knowledge of the needs of the public being served. However, no research has been found to document the merits of this consideration.

C. Pattern of Travel

The next consideration in deployment is the pattern of patrol travel. The major issues addressed in determining the appropriate route of travel are response time to calls for service, the predictability of officer movement, and the projection of a sense of patrol presence. There are three principal types of travel patterns: (1) travel at the discretion of the patrol officer; (2) repetitive travel along a defined route; and (3) random travel.

The first method of determining the route of travel, officer discretion, is the dominant one. Under this procedure, patrol officers, with the support of their supervisors, choose their own routes on the assumption that officers know where the problems are within their beats. This procedure is assumed by many to increase officer visibility in those areas where it is most important, and to reduce response time due to the officers' tendency to travel in areas where there is the greatest probability that services will be demanded. These assumptions, however, appear to be largely unsubstantiated. There are no findings which relate travel routes determined on the basis of officer discretion to incident location or to changes in response time. In addition, there is considerable anecdotal evidence suggesting that officers tend to travel in comfortable, as opposed to high demand, areas.

The second routing pattern, the repetitive route, is usually used in areas with high crime potential, the assumption being that this will increase visibility where it is needed and reduce response time. An example of this is patrol of a "strip" which contains taverns and burlesque theaters and is frequented by prostitutes. Similar to the patrol of a "strip" is patrol of shopping centers on weekends, retirement communities, and commercial areas.

Repetitive patrol is assumed by some to increase the level of patrol visibility although there is no evidence supporting this. It does, however, reduce time and increase patrol activity in the area patrolled.

The third routing system, random patrol, is thought to equalize visibility throughout the beat and to render officer movement unpredictable to the would-be criminal, thereby effecting the highest degree of deterrence and the highest probability that the officer will intercept crimes in progress. However, no evidence has been found to empirically validate these assumptions.

In general, there is little empirical evidence to indicate that any one method of determining patrol routes is more effective than others. Some information does suggest that repetitive routes in areas of high crime potential may deter crime in that area. Also, to the extent that response times are reduced, there may be increased apprehension for certain types of crime. Differences of opinion concerning patrol routes, however, do exist. Giving the patrol officer complete discretion in determining his routes is thought by some to be the best way to have patrol meet neighborhood needs, while others believe that patrol officers will use this discretion to avoid work.

D. Number of Patrol Units

The basic decisions concerning the number of patrol units are usually derived from the process of determining patrol beat boundaries (on the assumption that a single unit is assigned to each defined beat). As noted, workload formulas usually provide the first estimates of the required number of patrol units. If the estimates prove to be too low in the sense that criminal activity and/or service demands increase beyond "acceptable" limits in a beat, then additional units may be assigned to it. Such increases have been shown to increase patrol visibility, reduce response time and increase apprehension levels. Furthermore, some suggest that the additional patrol units temporarily increase the attentiveness to duty of all officers, particularly if the extra officers are inexperienced or unfamiliar with the beat.[50]

In conclusion, it seems clear that from a "technological" point of view, sufficient knowledge and equipment exist to permit the fine manipulation of deployment so as to reflect to a very high degree the assumptions, desires and concerns of the patrol command. The state of the art is highly advanced, and the actual deployment of officers can be made to reflect the desired configuration through both motivation and supervision. There remains, however, one significant and, at the moment, unresolved problem: there has been very little research on the impact of alternative deployment patterns upon changes in the overall effectiveness of the patrol division. As a result, while we know a great deal about the techniques of deployment, we know very little about its ultimate effect upon anything other than the ability to respond to calls for service.

II. Supervision of Uniformed Patrol Officers

Supervision has a major impact upon all aspects of patrol. The purpose of patrol supervision is to insure that deployment patterns are maintained, assigned tasks are performed properly, and particular vehicles are used effectively -- in short, that officers are doing their jobs. The substantial power delegated to patrol officers by society and the individual nature of much of their work make such assurances particularly important and difficult to provide. This section summarizes current knowledge about the first-line supervision of officers and the control of patrol officer corruption.

A. First-Line Supervision of Officers

Patrol administrators have traditionally relied upon a "para-military" model of supervision which attempts to provide close control and observation over street personnel.[52] Recently, however, a few administrators have been moving toward a "participatory management" approach, emphasizing officer initiative in patrol activities and officer involvement in the decision-making process.[53] As a department approaches the strict para-military model, supervisory/patrol officer ratios tend to be small, close observation of field activities and stringent review of written reports are stressed, officers are required to maintain on-going communication with the dispatcher or station house, and they are frequently rotated among beats and sometimes partners. As a department approaches the participatory management model, there tends to be less emphasis on close supervision and detailed review of reports and more emphasis on individual assessment of beat conditions and participation in staff conferences. Most departments continue to rely on a para-military model of supervision; however, significant variations on this theme

EXHIBIT IX

A UNIVERSE OF ASSUMPTIONS GOVERNING DEPLOYMENT

NOTE: This exhibit displays a universe of assumptions concerning the efficacy of alternative approaches to deployment; subsets of this universe govern the operation of patrol divisions throughout the country. As explained on page 4, these assumptions are presented here in schematic form to facilitate systematic analysis of patrol activities. The level and quality of knowledge underlying these assumptions are summarized in this report and discussed in greater detail in accompanying volumes.[51]

(EXHIBIT IX)

A UNIVERSE OF ASSUMPTIONS

FACTORS / STRATEGIES	DISPATCH PROCEDURES (including such procedures as: dispatch to calls for service on an as-received basis; priority screening and referral; vehicle location and status screening; and computer aided dispatch.)	SETTING OF BOUNDARIES (including such considerations as: workload analysis; the definition of neighborhood boundaries; travel time; and population density.)
LEVEL OF VISIBILITY	1. AVM and status screening systems by controlling level of response facilitate maintenance of desired level of visibility across the jurisdiction. 2. Referral of non-crime related calls to other agencies or non-sworn personnel increases visibility of patrol units.	1. Boundaries determined on the basis of workload considerations maximize deterrent effect as they yield level of patrol visibility based on historical projections of total service demands. Visibility level becomes a function of incident density and yields increased visibility in areas of high demand. 2. Boundaries determined on the basis of population density equalize visibility without consideration of incident levels. . . . . . . Travel time considerations affect the level of visibility regardless of population or workload considerations, as visibility of vehicle is a function also of speed and distance traveled.
LEVEL OF PREDICTABILITY OF MOVEMENT	When level of predictability of movement is a function of assigned patterns of travel, AVM and status screening systems facilitate maintenance of assigned route.	
LEVEL OF RESPONSE TIME	1. If availability of units is insufficient to allow immediate dispatch in response to all calls for service, dispatch on an as-received-basis may slow response to emergency situations and crimes in progress. 2. Priority screening facilitates immediate dispatch and thereby minimal response time to emergency situations and crimes in progress. 3. AVM systems and status screening permit determination of closest units for dispatch, minimizing response time. 4. Referral of non-crime related calls to other agencies or non-sworn personnel results in improved response time, since more units are available for dispatch.	1. Workload considerations, by placing units in proximity of anticipated incidents, minimize response time by minimizing distance. 2. Travel time considerations in setting boundaries minimize response time by increasing density of units in congested areas.
LEVEL OF PREVENTIVE PATROL ACTIVITY	1. AVM systems assist in controlling level of response to calls and monitoring officer activity thereby assuring maximum time availability for patrol activity. 2. Referral of non-crime services results in increased levels of patrol activity, since more time is available for patrol.	Boundaries based on workload considerations modified on the basis of a "desired level of patrol" facilitate availability of units for aggressive activity.

GOVERNING DEPLOYMENT

(EXHIBIT IX)

ESTABLISHING PATTERN OF TRAVEL	ASSIGNMENT OF EXTRA UNITS
(including such alternatives as: officer discretion; repetitive routing; and random travel.)	(including such considerations as: changes in anticipated workload and population density; and the utilization of civilian personnel.)
1. Officer discretion improves deterrence as the officer, knowledgeable of potential targets within the beat, projects a level of visibility where it has the greatest effect. 2. Repetitive routes equalize visibility across the routes traveled which themselves are determined on the basis of hazard formulas. Deterrence is maximized as visibility is maximized where it has the greatest effect. 3. Random travel equalizes visibility throughout the beat, combining equal visibility with high level of unpredictability, thereby maximizing deterrence and apprehension.	1. Varying number of units assigned to a given beat on the basis of workload matches the level of visibility to the density of incidents and thereby maximizes levels of deterrence and community satisfaction and security. Note: this is a function of community perception over time. 2. An *ad hoc* approach to varying the number of units is realized by the magnetic draw of units into areas experiencing high demand, thereby increasing visibility as a function of demand and enhancing deterrence.
Random travel maximizes the uncertainty associated with the units arrival at a given location thereby maximizing the deterrent effect as the likelihood of intercepting crimes in progress is increased.	
1. Officer discretion, by yielding patrol travel in areas of potential targets, minimizes response time. 2. Repetitive travel on routes of high target density minimizes response time. 3. Random travel, by equalizing the probability of movement across all points on the beat, minimizes reponse time given equal likelihood of incidents occuring at all points throughout the beat.	Varying the number of patrol units within beats on the basis of workload projections minimizes response time by guaranteeing maximum availability of units for response, and by clustering units in vicinity of anticipated demands. Typical calculations establish the number of units necessary to respond to a level of calls for service within the desired response time.
Patterns of travel based on repetitive routes yield aggressive activities in areas of high crime probability thereby maximizing effectiveness. Patterns of travel based on officer discretion yield aggressive activities in areas of high crime probability.	Varying civilian and sworn officer levels on the basis of workload considerations and then taking into account the desired level of preventive patrol activity, provides for the availability of units for patrol. The number of units assigned is typically derived on the basis of calculations which determine the number of units necessary to respond to calls within a given amount of time. Availability for patrol is typically treated as a residual.

(EXHIBIT IX continued)

A UNIVERSE OF ASSUMPTIONS
continued

FACTORS / STRATEGIES	DISPATCH PROCEDURES (including such procedures as: dispatch to calls for service on an as-received basis; priority screening and referral; vehicle location and status screening; and computer aided dispatch.)	SETTING OF BOUNDARIES (including such considerations as: workload analysis; the definition of neighborhood boundaries; travel time; and population density.)
LEVEL OF SERVICE PROVISION	1. If availability of units is insufficient to allow immediate dispatch to all calls for service, dispatch on an as received basis may jeopardize the quality of service to the degree to which rapidity of response is important. 2. Priority screening facilitates immediate dispatch in response to emergency situations. 3. Computer aided dispatch facilitates determination of appropriate response. 4. AVM and status screening systems facilitate fastest response to emergency situations. 5. Referral of non-crime related services to other agencies or police divisions increases the amount of time available for crime-related services.	1. By setting boundaries to reflect the relative concentration of incidents across a jurisdiction, the proportional availability of officers to provide services of all types enhances the quality of service provision. 2. To the degree to which boundary considerations affect a minimization of response time, the provision of emergency services is facilitated. 3. By setting boundaries commensurate with neighborhood lines, officers become more cognizant of beat needs and the quality of services is thereby enhanced.
LEVEL OF OFFICER COMPATIBILITY WITH THE COMMUNITY	Computer aided dispatch facilitates assignment of appropriate officers if available and within reasonable distance to respond with the level of needed speed.	By setting boundaries commensurate with neighborhood lines, the ability to match officer characteristics to those of the community is facilitated due to homogeneity of beat population.
LEVEL OF OFFICER KNOWLEDGE ABOUT THE COMMUNITY	AVM and status screening systems facilitate the assignment of the beat units to calls within the beat and further enable the maintenance of beat integrity which serves to enhance the level of knowledge.	By setting boundaries commensurate with neighborhood lines, the ability of the officer to learn the needs, problems, and characteristics of the beat is facilitated due to beat homogeneity.
LEVEL OF OFFICER MISCONDUCT OR CORRUPTION	AVM and status screening systems allow dispatchers to monitor the activities of officers, thereby minimizing the opportunity for misconduct or corruption.	By setting boundaries commensurate with neighborhood lines and then matching officer characteristics to those of a homogeneous beat, the opportunity for corruption increases.

GOVERNING DEPLOYMENT
continued

(EXHIBIT IX continued)

ESTABLISHING PATTERN OF TRAVEL	ASSIGNMENT OF EXTRA UNITS
(including such alternatives as: officer discretion; repetitive routing; and random travel.)	(including such considerations as: changes in anticipated workload and population density; and the utilization of civilian personnel.)
1. To the degree to which travel patterns effect a minimization of response time, the provision of emergency services is facilitated.	By varying the level of officers on the basis of workload projections, availability of officers for service provision is affected.
Patterns set on the basis of officer discretion allows an officer to apply his knowledge of the beat in patrol, yielding higher effectiveness. The lower the level of officer knowledge concerning the beat, the more efficacious the random pattern.	
Officer discretion in travel pattern creates a heightened opportunity to neglect patrol duty. Travel over assigned general routes can be more easily monitored.	By varying the number of units on the basis of workload considerations, officers perceive a heightened need for their presence, "best" use is made of their time, and a greater attention is paid to duty minimizing misconduct.

are becoming increasingly common.[54]

Low supervisor/patrol officer ratios are assumed to increase the direct accountability of officers, thereby assuring conformity with regulations and heightened attention to duty.[55] Although there is much common sense argument about supervisory practices, there are no studies which show empirically valid relationships between low ratios and improved officer performance or patrol effectiveness. In fact, low supervisor/officer ratios have been criticized as an inefficient use of manpower which reduces the potential level of patrol activity.[56]

The street deployment of supervisory personnel and a high frequency of patrol officer call-ins are both assumed to increase the ability of supervisors to observe and maintain awareness of the actual characteristics of individual officer performance. On the one hand, it is argued that this maximizes officer attention to duty and increases the ability of the department to detect misconduct.[57] On the other hand, some believe that such close observation stifles officer initiative and has a negative impact upon morale.[58]

The practice of frequent rotation of patrol officers among beats and partners is based on the assumption that, through such rotation, opportunities for misconduct will be reduced.[59] While there is no empirical evidence which relates levels or even the advent of misconduct to the frequency of beat rotation, there is some evidence which indicates that frequent rotation undermines the effectiveness of the officer on the beat. His morale declines, and he does not develop an in-depth knowledge of the area which he is assigned to patrol.[60]

With respect to procedures used to evaluate patrol officer performance, it seems that an effective evaluation instrument which relates officer performance to patrol effectiveness has yet to be developed. This represents a substantial supervisory problem. Patrol officers' perceptions of the standards on which they are evaluated appear to constitute an extremely important determinant of their behavior. For instance, if officers believe that generation of "numbers" (arrests, traffic citations, field interrogation reports, etc.) are of prime importance, they will tend to concentrate on producing them, regardless of supervisory efforts to get them to focus on other concerns.[61]

In general, there is little empirical evidence which relates the different models of supervision to differences in officer performance or patrol effectiveness. While it is not possible to determine the relationship between the particular disaggregate characteristics of patrol and the level of individual officer performance, relationships have been found betwee the two models of supervision and the frequency of officer infractions. It has been observed that the closer a department approaches the para-military model, the fewer the infractions and the better the performance of individual officers; however, no connection has been made to the overall effectiveness of the patrol division.

It is commonly recognized that supervision of a patrol force is an inherently difficult task. Patrol divisions differ from most other formal organizations in that there is a great deal of individual discretion at the lowest levels of the organizational hierarchy. This presents a fairly unique supervisory situation which, while widely recognized, has been the subject of very little careful research. As a result, present knowledge about the relationship of supervisory practices to patrol effectiveness is extremely incomplete.

B. Control of Patrol Officer Corruption

There are three common approaches to the control of corruption. The first assumes that through more careful screening of recruits and better training in the legal and ethical aspects of patrol, officer susceptibility to corruption will be reduced. The second assumes that through close surveillance of patrol officers and frequent rotation of beat and partner assignments, the opportunity for corruption will be minimized, corruption itself will be deterred, and if deterrence fails, apprehension will be facilitated. The third assumes that through enhancing the career opportunities offered to patrol officers, including salary levels, the motivation for corruption will be reduced.[62]

The efficacy of all approaches remains in doubt due to the inherent difficulties in measuring levels of corruption. It is thought, however, that some of the approaches to the elimination of corruption may have important effects on patrol officer performance. Enhancing career opportunities and salary levels are assumed to have a positive effect on officer motivation, while the active functioning of an internal security unit is thought to have a negative effect on officer morale. However, no empirical evidence in support of either of these contentions has been found. The frequent reassignment of officers to beats and partners is thought to be generally counterproductive to overall effectiveness, as it reduces the officer's sensitivity to and knowledge of his territory. Limited empirical evidence has been found in support of this last contention.

In sum, the present state of knowledge about patrol officer corruption is not sufficiently detailed and reliable to permit any very definite conclusions concerning the relative merits of various approaches to dealing with the problem.[63] The John Jay School of Criminal Justice is currently conducting a NILECJ/LEAA-funded study of police corruption which promises to fill some of the gaps in current knowledge. Certainly, little can be accomplished in the absence of better and more detailed knowledge.

III. In-Service Task Assignments

Traditional preventive patrol is frequently viewed as an essentially undifferentiated activity involving the routine movement of patrol units through their assigned areas when not handling calls for service. Deployment decisions are normally made on the basis of call for service workloads with little attention devoted to the use of officers' non-committed time. In actuality, however, there is a myriad of specific activities which officers can perform while on patrol. Although the range of these activities is almost endless, some of the most important and common include: aggressive patrol, crime- and suspect-oriented patrol, community relations work, counseling citizens on crime prevention techniques, and assisting specific segments of the population such as juveniles and the elderly. This section discusses the availability of officers' time for the performance of non-call for service activities, methods for selecting appropriate tasks, and current knowledge about the effectiveness of particular activities.

While questions concerning the most effective use of non-committed patrol time have been with us for years, the results of the recently completed Kansas City Preventive Patrol Experiment have given these questions a new sense of urgency.[65] The experiment sought to test the effectiveness of routine patrol *per se*. Three different types of beats were defined: reactive beats in which preventive patrol was eliminated and officers were to respond only to service calls; control beats in

EXHIBIT X

A UNIVERSE OF ASSUMPTIONS GOVERNING
PATROL SUPERVISION

NOTE: This exhibit displays a universe of assumptions concerning the efficacy of alternative approaches to patrol supervision. Subsets of this universe govern the operation of patrol divisions throughout the country. As explained on page 4, these assumptions are presented here in schematic form to facilitate the systematic analysis of patrol activities. The level and quality of knowledge underlying these assumptions are summarized in this report and discussed in greater detail in accompanying volumes.[64]

A UNIVERSE OF ASSUMPTIONS GOVERNING PATROL SUPERVISION (EXHIBIT X)

Objectives	(including a consideration of alternative approaches to officer call-in; street deployment of supervisory personnel; officer/ supervisor ratios; and frequency of beat and partner rotation.)
LEVEL OF VISIBILITY	It is generally assumed that the greater the level of officer-supervisor contact and the greater the deployment of supervisory personnel, the more attention paid by officers to all aspects of duty and the more closely officer activity conforms to the desired quality and level. The primary, generally applicable, countervailing assumption is that by adjusting the level of officers deployed on the basis of projected need, the heightened level of activity and sense of importance increases patrol officer motivation and attention to duty. This in turn may substitute, to a degree, for intense supervision. Additional countervailing assumptions noted where appropriate.
LEVEL OF PREDICTABILITY OF MOVEMENT	
LEVEL OF RESPONSE TIME	
LEVEL OF PATROL ACTIVITY	
LEVEL OF SERVICE PROVISION	Frequent beat reassignment detracts from the officers level of knowledge about the beat and diminishes the quality of service provision.
LEVEL OF OFFICER COMPATABILITY WITH COMMUNITY	Ability to match officer and beat characteristics is undermined by the frequent reassignment of beats.
LEVEL OF OFFICER KNOWLEDGE ABOUT COMMUNITY	Level of officer knowledge about beat is limited in situations where frequent reassignment of beats is practiced.
LEVEL OF OFFICER MISCONDUCT AND CORRUPTION	Increased motivation and activity, resulting from varying the number of officers deployed in direct relation to the projected level of service demands, may substitute for a certain degree of supervision.

which patrol was maintained at normal levels; and proactive beats in which preventive patrol was increased to two or three times its normal level. The study attempted to determine the effect of these different levels of preventive patrol on the incidence of crime and the public's fear of crime. It concluded, in Chief McNamara's words, that "routine patrol in marked police cars has little value in preventing crime or making citizens feel safe."[66] It can be inferred from this conclusion that time devoted to preventive patrol might be spent more productively on other assignments.

Questions concerning the validity of the study's findings have generated a considerable amount of controversy.[67] Among the most important of these questions are the following:

(1) Ambiguity as to where the units withdrawn from the reactive beats were patrolling when not responding to calls for service (whether on the perimeter of the reactive beats or elsewhere) raises serious doubt concerning the maintenance of the experiment's integrity. This issue is of substantial importance since there was a reported tendency for units to over-respond to calls for service in reactive beats. The study does not report differences in the total amount of time spent by visible patrol units in the three types of beats; thus there is no direct check on the experiment's validity.

(2) Because the small proactive, reactive and control beats within the limited geographic area of the experimental grid were contiguous to one another, it is uncertain whether sufficient differentiation existed to affect citizen and "would-be" criminal perceptions of the relative intensity of patrol within and between the beats.

(3) Because of the extremely small sample sizes used in the surveys, especially the business survey, it is questionable whether there is a firm basis for generalizing to the community as a whole.

In sum, the experiment suffered from inadequate conceptualization and specification of the hypotheses to be tested, and included no direct measures of experimental integrity. As a result, there is substantial merit to many of the criticisms which have been leveled against the study, and its conclusions cannot be accepted as valid and reliable. It would, however, be a mistake to completely dismiss its importance on the basis of these criticisms. While flawed, the study contains some extremely important insights into the feasibility of innovations in patrol and the directions which such innovations might profitably take in the future. It demonstrates that it was possible, at least in one department, to make some apparently substantial, although uncertain, changes in the level and types of patrol activity without seriously jeopardizing community security or satisfaction with police services. It does not point out the acceptable limits or the appropriate direction of change, but it does indicate that departments can safely take a flexible approach to patrol and that it may be both worthwhile and possible to consider variations on the traditional model of patrol.

At present, a number of interesting attempts to develop task-oriented innovations in patrol practices are being tried by departments across the country.

For example, an experiment funded by NILECJ/LEAA in Wilmington, Delaware, is examining the efficacy of split patrol as a means of improving the response to calls for service while at the same time facilitating uninterrupted concentration on patrol activities.[68] This is being attempted by dividing the patrol force into two sets of units, one of which responds to all service calls, thus leaving the other free to concentrate on non-dispatched patrol duties. Split patrol seems to be a promising technique for restructuring patrol activities, but in its present form it has not addressed the specific types of activities which could provide the most effective use of units which are not dispatched to service calls.

This question is being examined in Kansas City, Missouri, where task forces made up of patrol officers and supervisors are developing patrol strategies and tactics directed at the solution of specific crime and non-crime related problems. Their work on directed patrol (e.g., patrol aimed at achieving certain pre-determined objectives) and interactive patrol (e.g., directed patrol with a particular emphasis on increasing the level of police/community interaction) represents an attempt to provide a focus for patrol officers' activities during their non-committed time.

Directed patrol involves patrol officers in designing and implementing patrol activities which are based on a careful and continuous analysis of the police-related problems in the communities they serve. Emphasis is placed on specific patrol strategies and tactics developed through a decentralized decision-making process which is supported by a sophisticated crime analysis system. As such, it constitutes more of an orientation toward patrol planning than a set of predefined patrol activities. The program is currently moving into an operational phase with attention initially focused on efforts to reduce residential buglaries and armed and strongarm robberies.

Interactive patrol is similar in many respects to directed patrol, but it has a more specific emphasis on improving police/community relations. It has included the use of community security surveys, citizen ride-alongs, patrol officers as instructors in local schools, and community input into the planning process. Both programs are explicitly intended to foster a more critical and reflective orientation toward the use of non-committed patrol time. And, as might be expected, the major difficulty which has been encountered in implementing them is the fragmentation of this time by service calls which makes it difficult to plan specific activities and concentrate on their effective performance.[69]

Another approach to the identification of specific tasks for performance during patrol officers' non-committed time is being implemented in San Diego.[70] The entire patrol force is currently being trained in the process of Community Oriented Policing which places primary responsibility for the development of patrol strategies and tactics on individual beat officers. The officers prepare detailed, written analyses of the police-related problems on their beats and develop techniques for coping with them. The analyses and proposed activities are reviewed by their supervisors, but the patrol officers bear primary responsibility for the identification and control of problems on their beats. In essence, Community Oriented Policing represents an attempt to make creative use of individual beat officers' discretion and initiative by increasing their sense of beat accountability, level of knowledge of beat conditions and involvement in beat activities. The program has been evaluated in an experiment funded by the Police Foundation. The results should be available shortly.

The programs described above represent attempts to restructure patrol officers' time and make decisions concerning the most effective use of non-committed

time. They are not based on a rejection of the utility of routine preventive patrol, but rather on the recognition that it represents only one of many possible uses of time spent on patrol. Unfortunately, there is currently very little definite knowledge about the effectiveness of alternatives to routine patrol or the various approaches which can be taken to the performance of patrol duties. One exception to this situation is in regard to the utility of aggressive patrol tactics which have been evaluated in a Police Foundation-funded experiment in San Diego.[71] The experiment found that the suspension of field interrogations was associated with an increase in suppressible crimes and that the frequency of field interrogations appeared to have no identifiable effect on community attitudes. While there are some apparent problems with the integrity of the experiment's design, its results are extremely interesting. They run counter to much of the "conventional wisdom" concerning the effectiveness of aggressive patrol tactics,[72] and, as the study's authors emphasize, the experiment deserves replication in another setting, on a larger scale.

In sum, the effectiveness of various in-service task assignments for patrol officers is an issue of growing concern. Present knowledge about the relative merits of different in-service task activities is slight, and this would seem to be an extremely important topic for further investigation. Future research possibilities in this area are discussed in the final chapter of this report.

IV. Characteristics of Patrol Officers

Personal characteristics are among the most important determinants of individual capability for service as a patrol officer. They frequently play a prominent role in selecting individual officers for particular beat and task assignments. This section summarizes present knowledge about the effects of officers' race, sex and educational background on the performance of patrol duties. It also includes discussion of use of non-sworn personnel to perform certain patrol functions. There are, it is recognized, several other characteristics which might have appropriately been included in this discussion. Perhaps most prominent among these are language skills, skills developed through special training, and psychological characteristics. The influence of language skills on patrol effectiveness is not considered because there is very little information pertaining to it. While some departments, such as the Los Angeles Police Department, offer additional pay to bilingual officers, and others, such as the Albuquerque Police Department, provide language training, the actual effect of language skills on the performance of patrol has received very little attention -- perhaps because the ability of officers to communicate with the citizens they serve would seem to be a fairly obvious advantage. Skills developed through special training, such as surveillance techniques and procedures for handling domestic disturbances, are excluded because training falls outside the domain of this report. Finally, psychological characteristics are not discussed because from an operation point of view their importance appears to be felt primarily in the recruitment and selection process. With the exception of severe personality disorders, their influence on day-to-day beat and task assignments seems to be mainly informal.

A. Racial Considerations in Patrol Assignments

Government commission reports and independent studies have stressed the importance of recruiting and deploying non-white patrol officers as a means of improving police/community relations and patrol effectiveness.[74] Minorities are currently under-represented, in terms of their proportion to a jurisdiction's total population, in virtually every department in the country. The relative

EXHIBIT XI

A UNIVERSE OF ASSUMPTIONS GOVERNING IN-SERVICE TASK ASSIGNMENTS

NOTE: This exhibit displays a universe of assumptions concerning the efficacy of alternative approaches to in-service task assignments. Subsets of this universe govern the operation of patrol divisions throughout the country. As explained on page 4, these assumptions are presented here in schematic form to facilitate the systematic analysis of patrol activities. The level and quality of knowledge underlying these assumptions are summarized in this report and discussed in greater detail in accompanying volumes.[73]

OBJECTIVES	A UNIVERSE OF ASSUMPTIONS GOVERNING IN-SERVICE TASK ASSIGNMENTS (EXHIBIT XI) (including a consideration of dispatched crime and non-crime related responses, officer initiated activities, and routine preventive patrol responsibilites.)
LEVEL OF VISIBILITY	1. A clear differentiation between response and patrol responsibilities maintains the integrity of the preventive patrol function and as such the level of desired patrol visibility. 2. Individual initiatives, e.g., aggressive patrol, reinforce the perception of visibility. 3. Task specific patrol activities, as opposed to routine patrol, convey a level of visibility commensurate in impact to that of general patrol while making optimal use of officer time and placing officers in areas of highest need. 4. Routine preventive patrol communicates the highest level of visibility.
LEVEL OF PREDICTABILITY OF MOVEMENT	A clear differentiation between response and patrol responsibilities facilitates maintenance of desired level of predictability of movement throughout beats, because the activities of a predetermined number of units are not disrupted by calls for service.
LEVEL OF RESPONSE TIME	1. A clear differentiation between response and patrol responsibilities facilitates fastest response to calls for service. 2. Task specific patrol activities, selectively placing officers in areas being victimized by particular types of crimes, minimizes response time to calls for service from those areas. 3. Traditional undifferentiated patrol force facilitates fastest response.
LEVEL OF PATROL ACTIVITY	1. A clear differentiation between response and patrol responsibilities facilitates attention of the non-response units to preventive patrol and to aggressive patrol activity and guarantees maintenance of the desired level of patrol. 2. General patrol force can effectively engage in desired levels of preventive patrol activity as long as a sufficient number of units are in service.
LEVEL OF SERVICE PROVISION	1. A clear differentiation between response and patrol responsibilities facilitates specialization of response units and enhances the quality of all service responses while enabling a careful monitoring of service level. In addition, the non-response units engaged in patrol can act on the basis of individual initiatives to further enhance service provision. 2. Routine patrol force can effectively provide desired level of services both through response and through individual initiatives. 3. Task specific patrol activities planned on the basis of comprehensive knowledge of the community facilitates provision of the most appropriate quality and level of services.
LEVEL OF OFFICER COMPATABILITY WITH COMMUNITY	1. Task specific patrol orientation permits greatest compatibility of officer activity with community. 2. Task assignments can be effectively accomplished irrespective of officer compatibility
LEVEL OF OFFICER KNOWLEDGE ABOUT COMMUNITY	Individual initiatives which include officer attention to learning about the beat, enhance officer knowledge of the beat.
LEVEL OF OFFICER MISCONDUCT AND CORRUPTION	General patrol activity with no direction or emphasis on individual initiatives or aggressive activity provides greatest opportunity for misconduct and corruption. This may be mitigated if the number of officers deployed is determined on the basis of need by time of day.

absence of minorities from police work has been viewed as a major factor contributing to the oft-repeated portrayal of the police as an alien, occupying force in areas of minority concentration. It has been suggested that increased use of minority officers will lead to more sensitive, effective and acceptable patrol of non-white areas, and that their presence in significant numbers will help to alter the prejudicial attitudes of their white colleagues.

Evidence bearing on these issues is sketchy and often of dubious quality. Studies with a direct focus on minorities on patrol are few in number and present confusing and often contradictory findings. For example, two survey studies have found that black patrol officers are more sympathetic than their white colleagues to the needs and problems of non-white citizens and that they perceive less hostility in black communities and are better able to interpret the meaning and significance of street activity in these areas.[75] However, other work has reported substantial levels of hostility directed toward black officers patrolling in black neighborhoods[76] and indicates that all officers, regardless of their race, attribute hostility to similar sources. Finally, examinations of departmental data on officer performance have revealed very few significant differences between whites and non-whites.[77]

There is very little information about the effects of minority officers on the attitudinal climate of patrol divisions. Some observers maintain that the presence of minority officers exerts a positive influence on the racial attitudes of white officers, while others have emphasized the social tensions within racially mixed forces.[78] In the absence of careful study, perhaps the most that can be said is that integration of patrol operations represents part of an on-going process in American society; as such, resulting problems and concerns can be treated, but not completely avoided, by administrative and supervisory practices.

In sum, there has not been a systematic study of the relative performance of white and non-white patrol officers. However, fragmentary evidence does exist which suggests that, on the whole, officers patrolling in minority areas perform similar tasks in a similar manner regardless of race.

At least part of the reason for the absence of detailed analysis of the effectiveness of non-white officers may stem from ambivalence regarding the assignment of non-white officers in disproportionate numbers to non-white districts. Most recommendations for the increased use of minority officers emphasize the assumed ability of minority officers to police non-white areas more effectively. However, at the same time there is great reluctance to staff minority districts primarily with minority officers: such a pattern would conflict with the goal of providing full occupational equality within departments, might contribute to the perpetuation of racial barriers, and would tend to reserve many of the most difficult patrol assignments for minority officers. The goal of full occupational equality is important, but it must be recognized that in most major cities, assignment procedures which do not account for race would greatly restrict the direct impact of minority officers on minority areas.

There appears to be no very satisfactory resolution to the dilemma between occupational equality and full efficiency in assignments. If minority officers are believed to be of primarily symbolic value, then the problem disappears; however, if they are seen as a means of coping with the problems of patrolling the inner city, then administrators face a very delicate situation. One seemingly useful response to the problem has been the deployment of racially mixed two-officer units in high crime areas.

In short, on the basis of current evidence, it is unclear to what degree departments with large numbers of minority officers on patrol in minority areas have experienced less community tension than departments with fewer minority officers. Nor is it clear whether increased deployment of minority officers has contributed to lower crime rates or to a decline in allegations of police harrassment and abuse of minority citizens. This lack of evidence does not constitute an argument against employing more minority officers and placing them on patrol in minority communities.[79] Instead it appears to be a consequence of the fact that, at bottom, increased use of minority officers has been stressed less for reasons of their supposed effectiveness than for reasons of equity and equality. While this sense of priorities cannot be argued with, it should not be allowed to impede examination of the effect of minority officers on patrol operations. The question is not whether minorities should be recruited and placed on patrol in greater numbers, but how they can best be utilized.

B. Women on Patrol

The assignment of women to patrol is one of the most controversial issues in policing. Since the late 1960's, police departments, under pressure from civil rights legislation, federal regulations, and feminist groups, have placed an increasing number of women on general patrol. It is estimated that in 1974 there were approximately 1,000 female patrol officers distributed among some 40 to 50 departments.[80] It is now legally incumbent of departments to hire and use women and men on an equal basis unless the existence of *bona fide* reasons for sex discrimination can be demonstrated. Yet, in spite of the legal requirements, the issue of women on patrol continues to be hotly debated.

From an operational point of view, the most important concerns regarding women on patrol appear to be: (1) the ability of women to perform adequately on patrol; (2) the advantages and disadvantages of using women on patrol; and (3) the possible effects of large numbers of female officers on the nature of police operations.[81] To date, program evaluations of women on patrol have been conducted in three departments: New York City; St. Louis County, Missouri; and Washington, D.C. The sample sizes in New York and St. Louis (14 and 16 respectively)are too small for their findings to be regarded as anything more than suggestive. However, the Washington, D.C. study represents an ambitious, elaborate, and influential effort to evaluate experimentally the use of women on patrol.[82]

The Washington study addressed the three central questions mentioned above by means of a year-and-a-half-long experiment. Eighty-six female officers were matched with an equal number of males and their performance was compared and evaluated in terms of a wide variety of criteria ranging from citizen reactions to supervisory ratings. The study concluded that:

(1) It is appropriate to assign women to patrol on the same basis as men. Both sexes were found to perform similar kinds of work in similar settings with roughly equal measures of success. In short, "sex is not a *bona fide* occupational qualification for doing police work."[83]

(2) Employing women on patrol has numerous advantages. Women are less likely than men to exhibit conduct unbecoming to an officer; they may be more effective in defusing potentially violent situations; they can provide a patrol force with a more representative proportion of its jurisdiction's population; and, finally, their presence protects a department from discrimination lawsuits. On the other hand, male officers tend to react negatively to women on patrol, and this can have a serious, although possibly temporary, effect on departmental morale.

(3) The use of a substantial number of women on patrol may reduce the likelihood of violent encounters between the police and the public and foster a less aggressive style of patrol. It may also stimulate a constructive review of patrol techniques and the measures used to evaluate patrol effectiveness.

These, put briefly, are the major findings of the Washington study. This project represents one of the most extensive experiments ever conducted in the field of preventive patrol. It has been well received, and its impact has been considerable.[84] It is necessary, however, to note that there are serious flaws in its design and execution which undermine the validity of its findings. The volumes summarized in this report include a complete analysis of the project,[85] but it may be useful to consider briefly a few of the problems as examples of the extreme care which must be taken in evaluating and employing the results of experimental research:

(1) Lack of integrity in the sample size: the study purports to present a comparative analysis of the performance of an equal number of male and female police recruits newly assigned to patrol. However, the number of officers in the sample, especially female officers, declined strikingly during the course of the experiment. As a result, there are serious questions as to whether the sample size remained sufficiently large and comparable between the two sexes to permit any generalizations to be drawn from the study's findings. Furthermore, for unexplained reasons, the sample size varies continually and widely in the presentation of data on different measures of performance. This makes interpretation of data extremely problematic and often misleading. The study also frequently and incorrectly reports general conclusions which are based on non-representative samples. Finally, toward the end of the experiment only 45% of the women, compared with 71% of the men, remained on patrol. In drawing its conclusions, the study frequently combines data on female officers on patrol with data on those with inside assignments. This procedure raises serious doubts about the extent to which the analysis and conclusions presented in the study actually pertain to patrol. Certainly, in reporting on the number of injuries sustained while on duty, the number of driving accidents, and changes in supervisory performance ratings on factors related to patrol, it is misleading to state as a conclusion that there were no significant differences between male and female officers when, in fact, more than 50% of the women included in the analysis were not assigned to patrol for the duration of the experiment.

(2) Administrative impact on the experiment: the influence of changes in departmental policy on the experiment's integrity is not adequately recognized and explored. For example, eight months into the study, the Chief rescinded his prior order that male and female officers be treated equally in every respect and declared the experiment to be a success. In all likelihood, this did serious damage to the study's experimental integrity and calls into question its status as an experiment.

(3) Citizen survey sample size: citizen attitudes toward male and female officers were examined in 129 telephone interviews with residents of the four police districts included in the experiment. On the basis of these interviews the study concluded, "Citizens

> of the District of Columbia generally approved of having policewomen on patrol." How such a general statement can be justified on the basis of interviews with only 129 respondents drawn from areas of the District which cannot be assumed to be representative of the city as a whole is never explained.

The above observations are intended to be indicative of some of the flaws contained in this study. They are presented here because the study represents the only meaningful attempt to date to examine the use of women on patrol, and because it is important to note that even the results of elaborate experimental research projects cannot be uncritically accepted as valid. However, it is not enough simply to criticize the study's methodology and dismiss its findings on that basis. Even if it has not provided the firm findings one commonly expects from experimental research, it still might offer less definite, but nonetheless useful, information about the performance of women on patrol. Of particular concern is the study's relevance to legal proceedings on equal employment opportunity.[86]

The study has played a role in legal proceedings in several jurisdictions[87] and, despite the flaws in its methodology, it may prove to be quite helpful in this respect. Its findings indicate that there was a considerable degree of overlap in the performance of male and female officers; i.e., some female officers performed as well as or better than some of their male counterparts on a wide variety of performance measures. Since the study does not report the extent of overlap in the overall performance of individual officers, it is uncertain whether some officers ranked consistently higher than others or whether rankings on different measures varied more or less independently of one another. However, performance assessment at this level of specificity may not be necessary for legal purposes.

The law, as it now stands, clearly places the burden of proof on those departments which wish to maintain sex as a *bona fide* occupational qualification for general police work. The findings of this study would appear to make their task more difficult. It is, however, beyond the scope of this report and the competence of its authors to enter into a detailed consideration of the legal ramifications of the study. Questions concerning the importance of sex as a qualification for police work and the types and quality of knowledge necessary to make this determination are still before the courts. Suffice it to note that to the extent that the study facilitates the resolution of this issue, it has made an important and worthwhile contribution.

Finally, it is important to note that the comments in this section refer to questions of social science research, not social policy. Criticism of this study is in no way meant to be an argument against using women on patrol. It merely indicates that we may know less about the issue than we perhaps thought we did. Hopefully, this situation will be remedied by an on-going NILECJ/LEAA-funded study of women on patrol in New York City.

C. Higher Education and Patrol Officer Performance

In recent years there has been growing interest in improving the quality and status of patrol by upgrading the educational background of patrol officers. Impressive claims have been made for the beneficial effects of higher education. For example, the President's Commission on Law Enforcement and Administration of

Justice stated that, "The quality of police service will not significantly improve until higher educational requirements are established for its personnel."[88] Comments to this effect have become increasingly common in law enforcement circles. However, while there is a certain logic to the contention that higher education will improve officer performance, there is still rather little hard evidence bearing on the issue.

Smith and Ostrom, in one of the most careful and useful examinations of the subject, discovered only a very weak relationship between college education and the positive attitudes and behavior it is assumed to foster. Their study concludes with the observation, "While considerably more analysis is obviously required, the results from our study thus far provide slight confirmation for hypotheses derived from police reform literature calling for higher levels of training and education."[89] Cohen and Chaiken, in a study of the background characteristics of officers in New York City, found that officers with at least one year of college were more likely to be promoted and less likely to receive civilian complaints than those with lower levels of education.[90] However, another author who studied and worked in the same department noted that differences in education can often lead to cleavages within a department between college-educated officers and their colleagues with only high school diplomas or equivalency certificates.[91] It has also been observed that education in police science frequently fails to lead to a career in law enforcement and that educated officers commonly leave the field in favor of other pursuits.[92]

The scarcity of research findings on the effects of higher education on officer performance is accompanied by uncertainty in the field as to its utility. Even departments which have long required that all recruits have at least some college background seem to have little precise evidence concerning the influence of the requirement on the actual effectiveness of officers.[93] On the basis of past experience, it appears that advanced education of officers may help to enhance a department's "professional" image. Education as a requirement has yet to lead to any major difficulties, but there is some concern that it may possibly make recruitment, especially of minorities, more difficult and result in increased levels of personnel turnover.

In sum, the available information on the effects of education on the conduct of police patrol is incomplete. It is difficult to generalize about the influence of education because educated officers may differ from their peers in many ways which are potentially related to performance, and different types of education may have differential impacts on patrol abilities. At present, there is little available evidence to support the assumptions which relate higher levels of education among officers to improved individual performance and patrol effectiveness.

D. Non-Sworn Personnel on Patrol

There is a growing interest in the use of non-sworn personnel in various patrol and patrol-related capacities. A number of departments across the country have instituted programs which integrate civilians into patrol operations. Examples of these programs include: (1) Community Service Office Units, in which uniformed civilians conduct general patrol and respond to non-crime related calls for service; (2) Police Cadet Programs, which provide an opportunity for on-the-job training and evaluation of the cadets' potential for police work; and (3) Citizen Auxiliary Programs, in which citizens, frequently on a part-time volunteer basis, are used to augment patrol.

The use of non-sworn personnel on patrol is generally expected to: increase the size of a patrol force in an economical way and release sworn officers' time for concentration on crime-related tasks; facilitate the recruitment and prior evaluation of new officers, especially minorities; and improve the quality of police services and police/community relations by lending a somewhat less authoritarian cast to many police/citizen interactions.

To date, there have been no in-depth evaluations of programs in this area.[94] However, field experience with the deployment of non-sworn personnel has been generally positive. For example, in Worcester, Massachusetts, nearly 40% of all calls for service are being effectively handled by non-sworn personnel, thereby releasing the time of sworn officers for participation in specialized units.[95] In Cleveland, Ohio, volunteer citizen auxiliaries patrol their neighborhoods over 3,000 hours per month, thus allowing sworn officers to concentrate on crime-related tasks.[96] In both these departments, the use of civilians has provided an inexpensive means of increasing the level and diversity of patrol activity.

Deployment of civilians has frequently encountered initial resistance from rank and file officers who fear that the civilians may represent more of a burden than a help and may be a threat to the status of police work. Negative reaction has usually subsided as officers discovered that civilians, if well used, could relieve the officers of many of the most unchallenging and routine aspects of patrol. In Worcester, sworn officers have even requested that the experimental police service aide program be extended.

In the absence of survey data, it is difficult to gauge the extent to which civilians on patrol have improved the delivery of police services and positively affected the image of the police. It should be noted, however, that only a few instances have been encountered in which civilians have been the targets of community criticism. Departments seem generally satisfied with their contributions to community relations. Non-sworn personnel also appear to make useful contributions to sworn officers' knowledge of the community.

The principal problem which has been encountered in using civilians involves the definition of their relationship to the department's career structure. All too often they have been hired without careful consideration of their career opportunities in a department or even of what would happen to them when project funding was exhausted. In at least one instance, this problem led to legal confrontation between a department and its community service officers.[97]

In sum, experience with non-sworn personnel on patrol has generally been positive, but there is very little definite information about their effectiveness or the ways in which they can most profitably be used. This issue is being addressed in an LEAA-funded study in Fremont, California, which will hopefully make a major contribution to the meager state of current knowledge.

V. Modes of Patrol

Since 1912, when August Vollmer introduced motor vehicles into patrol operations, police administrators have been concerned with determining the most appropriate forms of transportation for effectively fulfilling departmental responsibilities. To complement the traditional mode of foot patrol, modern

EXHIBIT XII

A UNIVERSE OF ASSUMPTIONS RELATING
OFFICER CHARACTERISTICS TO PATROL PERFORMANCE

NOTE: These exhibits display a universe of assumptions concerning the relationship between officer characteristics (race, sex, educational level, and civilian status) to patrol effectiveness. Subsets of this universe govern the officer utilization practices of patrol divisions throughout the country. As explained on page 4, these assumptions are presented here in schematic form to facilitate the systematic analysis of patrol activities. The level and quality of knowledge underlying these assumptions are summarized in this report and discussed in greater detail in accompanying volumes.[98]

(EXHIBIT XII)

A UNIVERSE OF ASSUMPTIONS RELATING OFFICER CHARACTERISTICS TO PATROL PERFORMANCE: RACE

SUPPORTING ASSUMPTIONS	OPPOSING ASSUMPTIONS
Matching an officer's race to that of the community to be patrolled improves police/community relations, facilitates the development of a working rapport with the community stimulating cooperation, enhancing officer knowledge and thereby increasing the effectiveness of all aspects of patrol.	Racial characteristics have little impact upon the ability of officers to perform effectively in any neighborhood. As minority neighborhoods are ofttimes felt to be the "toughest" assignments, considerations of race adversely effect morale of minority officers. Consideration of race limits deployment flexibility, thereby detracting from overall effectiveness.
In some instances, a failure to match racial characteristics communicates to the community a sense of an occupying force and adversely impacts on effectiveness.	It is the activity and not the race of the officer that communicates a negative image to the community.
Increased assignment of minorities to patrol, regardless of the degree of community match achieved, improves the overall image of the department and thereby enhances the performance of all functions.	Increased recruitment, assignment and promotion of minorities without regard to performance or tenure adversely effect department morale.

(EXHIBIT XII continued)

A UNIVERSE OF ASSUMPTIONS RELATING OFFICER CHARACTERISTICS TO PATROL PERFORMANCE: SEX

SUPPORTING ASSUMPTIONS	OPPOSING ASSUMPTIONS
Women are capable of performing the entire range of patrol duties equally as well as men.	Women do not have sufficient physical strength or stamina to carry out many of the duties of a patrol officer. Women are not sufficiently respected by the community in the role of patrol officer to gain citizen compliance and cooperation. Women by temperament and disposition are not sufficiently aggressive to perform effectively as patrol officers.
The emotional and temperamental makeup of women serves to diffuse potentially dangerous situations.	The characteristics of women's emotional makeup, the lack of community respect for them as patrol officers, and their physical limitations create a high probability that otherwise benign events will escalate into serious confrontations.
Considerations of equal employment opportunity suggest that if any women are capable of performance equal to that of minimally satisfactory males, all women should have the opportunity to be considered for patrol assignments.	Officer selection criteria are not adequate to differentiate sufficiently between women and therefore the selection of any women would lead to an intolerably high probability of poor performance.
Women are capable of handling certain types of patrol activities better than men, e.g., domestic disputes and juvenile problems.	Domestic disputes and juvenile problems are a small subset of patrol activity. For these purposes, women should be assigned to special divisions and not to general patrol.

(EXHIBIT XII continued)

A UNIVERSE OF ASSUMPTIONS RELATING OFFICER CHARACTERISTICS TO PATROL PERFORMANCE: HIGHER EDUCATION

SUPPORTING ASSUMPTIONS	OPPOSING ASSUMPTIONS
Higher education for patrol officers (beyond high school) improves every aspect of patrol performance which requires discretionary consideration of the officer.	Higher education has no impact on the ability of the officer to perform effectively on any aspect of patrol. Rewarding officers for higher education detracts from officer morale as officers believe that equal jobs and equal performance merit equal pay. Higher education serves to bias officer selection against inclusion of minorities in the force.

(EXHIBIT XII continued)

A UNIVERSE OF ASSUMPTIONS RELATING OFFICER CHARACTERISTICS TO PATROL PERFORMANCE: CIVILIANS

SUPPORTING ASSUMPTIONS	OPPOSING ASSUMPTIONS
Civilian personnel on patrol: Can effectively respond to non-crime related calls for service and can perform non-crime related support functions. Dispatchers are able to determine with a high degree of accuracy when a call can be safely and effectively responded to by a civilian officer.	Civilian personnel on patrol: Are in ever-present danger when responding to calls for service due to the possibility that any call has an associated probability of confrontation and conflict, and there is no assurance that dispatchers can differentiate between calls with a sufficient degree of accuracy to assure officer safety. (The inability of the dispatcher to so differentiate derives in part from the frequency with which needs are inaccurately described by callers.)
Are able to generate a positive rapport with the citizenry and gain increased knowledge regarding all aspects of the community due to the positive, non-adversary nature of all of their interactions with the public.	Generate no better rapport with the public than does a good patrol officer and detract from the public's confidence with the police due to the public's perception of an un-equipped cadre of police officers.
Enhance the morale and effectiveness of sworn officers who no longer are called upon to respond to "junk" calls or to perform "non-police" services. They are thus better able to concentrate on crime-related activity.	Detract from officer morale by placing upon them the added burden and responsibility of "keeping and getting the civilians" out of trouble.
Enhance the quality of non-crime related service provision due to a positive orientation towards the performance of such services by civilian personnel.	Detract from the overall quality of services due to the inability of the civilian to undertake and provide the full range of police responsibilities.
Facilitate the provision of non-crime related services to the public at a reduced cost to the department.	Result in only marginal cost reductions which are by no means sufficient to justify the loss of police capability which could have been attained had the number of sworn officers been increased in lieu of utilizing non-sworn personnel.
Increase the overall level of public satisfaction with the police due to the improved quality of non-crime related service provision, the more positive rapport developed with the civilian cadre, and the more positive attitude toward service provision demonstrated by the civilian officers.	Detract from the level of public satisfaction with the police due to the public's perception of an un-equipped, unqualified and un-sworn officer cadre.

technology has presented departments with an extensive array of transportation forms (including bicycle, motor bike, motor scooter, motorcycle, automobile, and helicopter). However, there is little well-documented guidance to assist departments in selecting the most appropriate configuration of vehicles given their perceived needs. As a result, departments have often tended to adopt new and different modes of transport in the absence of careful evaluation regarding their relative economy, safety, and effectiveness. Widely publicized endorsements often serve as the primary justification for the utilization of particular vehicles.

In assessing the relative merits of alternative modes of transportation, patrol administrators are concerned with the impact of the vehicle upon the ability of the department to realize the goals and objectives of patrol, and the operating characteristics of the vehicle in terms of officer safety, officer morale, vehicle availability, and economy of operation. With respect to these factors, particular modes can be viewed as being arranged along continuums of various dimensions. For example, foot patrol, at the end of one scale, provides intensive, localized police protection that facilitates officer interaction with the citizenry while, at the other end of the scale, the helicopter provides wide-ranging but totally non-personal coverage. Another example suggests that foot patrol restricts the range of officer activity due to limitations of movement and available equipment, while the patrol car enhances flexibility with respect to speed and maneuverability as well as carriage of a wide variety of equipment and large numbers of passengers.

Departments have attempted to achieve a middle ground by providing comprehensive coverage at a level which fosters interaction with the public, provides rapid and effective response to calls for service, and maintains high visibility within the community. In the pursuit of these goals, departments have mixed various modes of transportation and attempted to coordinate their activities for maximum effectiveness. Departments generally emphasize the use of the marked patrol car, which is supplemented when resources permit or according to public demand. Foot patrol is being used in dense urban and commercial areas on the assumption that it affords high visibility, generates a sense of community security and satisfaction, and facilitates the maintenance of order and the detection of targets of potential criminal opportunity. Additionally, foot patrol is thought to maximize officers' knowledge about their beats, thus increasing sensitivity to local needs and heightening the quality of service provision. Bicycles are being used in similar types of situations in the belief that they afford many of the advantages of foot patrol while increasing mobility without sacrificing the level of interaction with the public. Bicycles are also thought to facilitate apprehension due to a combination of speed, maneuverability, and silence of operation. Motor scooters are noisier than bicycles and, as a result, less satisfactory for apprehension. Their use in urban areas is based on the belief that they foster community interaction without sacrificing speed, mobility, or visibility. Finally, helicopters are seen as particularly effective for wide-ranging ground and rooftop surveillance and high-speed pursuit.

Each form of transportation is assumed to possess inherent advantages and disadvantages. Motorized transport is felt to contribute to officer detachment from the community; problems of officer fatigue and morale are linked to foot patrol; problems of officer safety and morale are attributed to bicycle and motor scooter patrol; and community dissatisfaction has been associated with the high noise levels and surveillance lights used in helicopter operations.

Only a limited amount of research regarding vehicle characteristics has been conducted to date. There have been some studies of the efficacy of foot patrol,[99] bicycles,[100] and helicopters.[101] With respect to foot patrol, the community seems to respond quite favorably, although the operational impact of foot patrol on the realization of the goals of deterrence and apprehension remains in doubt. Bicycles have been found to be of certain utility in patrol directed against burglaries. Helicopters have been judged effective in ground and roof-top surveillance, although their high operating costs may prove to be unjustifiable for all but the larger departments. Motor scooters have been found to facilitate patrol in urban areas, but the associated problems of officer safety and vehicle reliability are of considerable concern.[102]

The marked patrol car, both by default and due to its versatility and speed, remains the vehicle of choice for routine patrol. The use of the patrol car is, however, marked by one major point of controversy: should one or two officers be assigned to each unit? This has become a volatile issue in some departments with arguments concerning officer safety, observation capability, attentiveness to duty, and economy providing the central points of the debate. While there is little empirically valid and reliable evidence concerning merits of one- vs. two-officer cars, there is a body of experiential evidence which, when synthesized, indicates preference for the one-officer car. This evidence suggests that use of one-officer cars may increase patrol productivity, as measured by arrests, citations, field interrogations, provision of non-crime services, and increased visibility. In addition, given the wide use of one-officer cars in different parts of the country, it seems clear that except in particularly hazardous neighborhoods where officers patrolling alone are hesitant to take individual initiative and in isolated beats where back-up capabilities are limited, one-officer deployment does not apparently detract from patrol effectiveness or jeopardize officer safety. Dispatchers are able to discriminate among calls for service, assigning back-up units as necessary, and officers are sufficiently perceptive to know when to request assistance. Finally, there are economic reasons for the adoption of one-officer cars for general use given the continuing financial pressure on departments throughout the country.

VI. Conclusion

These issue discussions summarize current knowledge about traditional preventive patrol, identifying those areas in which research has produced useful results and those in which further inquiry is needed. There is a tremendous amount of information about patrol, ranging from opinions to the results of sophisticated research. Unfortunately, the uneven quality of much of the research greatly restricts the utility of its findings. This problem, it should be emphasized, is primarily due to the many difficulties inherent in studying patrol, not to a lack of commitment to research and experimentation. Systematic research on patrol is a new endeavor which only began in earnest with the creation of LEAA in 1968. It would be unrealistic to expect the resolution of many of the complex issues of patrol in such a short period of time. At present, a viable beginning has been made which, if continued, should lead to substantial improvements in the conduct of patrol. The following chapter outlines those areas which seem to represent the most promising targets for further research.

EXHIBIT XIII

A UNIVERSE OF ASSUMPTIONS GOVERNING MODES OF PATROL

NOTE: These exhibits display a universe of assumptions concerning the efficacy of alternative modes of patrol transportation; subsets of this universe govern the selection of modes by departments throughout the country. As explained on page 4, these assumptions are presented here in schematic form to facilitate systematic analysis of patrol activities. The level and quality of knowledge underlying these assumptions are summarized in this report and discussed in greater detail in accompanying volumes.[103]

(EXHIBIT XIII)

A UNIVERSE OF ASSUMPTIONS GOVERNING PATROL MODES: MARKED PATROL CAR

SUPPORTING ASSUMPTIONS	OPPOSING ASSUMPTIONS
The marked patrol car maximizes police visibility in the community, thereby enhancing the deterrent effect of patrol function.	The marked patrol vehicle places a barrier between the police officer and the citizen and has an adverse effect upon the level of police/citizen interaction, the level of officer rapport with the citizenry, the level of officer information about his beat, and the level of citizen satisfaction with the police. Other modes of patrol, particularly in high density commercial and residential areas, are significantly more productive. The level of patrol visibility has little impact upon the ability of the police to deter crime. High patrol visibility detracts from the potential for tactical surprise, thereby lessening the probability of intercepting crimes in progress. In high density commercial and residential areas, foot patrol or a scooter/bicycle variation provides greater visibility than does the marked patrol car. High patrol visibility in minority areas creates an image of a "hostile" or "occupying" force.
The marked patrol car provides the greatest amount of patrol officer mobility.	Motor scooters, motorbikes and bicycles provide greater maneuverability in congested areas.
The marked patrol car maximizes the amount of territory which an officer can effectively patrol.	Vehicular patrol over an extensive area reduces the level of an officer's familiarity with his beat. The larger the area patrolled in an automobile, the lower the intensity of coverage in an area. It is necessary to weigh the amount of territory covered against the quality of patrol. Particularly in high density residential and commercial areas, the automobile places a barrier between the police officer and the citizen, thereby inhibiting police/citizen interaction.
The marked patrol car maximizes the safety of the officer while on patrol.	The level of danger associated with officer patrol by foot, motor scooter and bicycle is grossly exaggerated particularly when officers are equipped with hand-held radios.

(EXHIBIT XIII continued)

A UNIVERSE OF ASSUMPTIONS GOVERNING PATROL MODES: MARKED PATROL CAR

SUPPORTING ASSUMPTIONS	OPPOSING ASSUMPTIONS
The marked patrol car maximizes the officer's personal comfort and morale.	The personal comfort of the officer which is maximized by the patrol car is not a sufficient reason for sacrificing the effectiveness of patrol. By isolating the officer from the community, the automobile deprives the officer of a major source of job satisfaction.
The marked patrol car facilitates the carriage of equipment and passengers, allowing for great flexibility in officer response.	Particularly when backup capability is readily available due to the utilization of hand-held radios, the need for the routine carriage of heavy or extensive equipment is considerably exaggerated.
The station wagon is a variant of the patrol car which further facilitates multipurpose utilization of the vehicle without detracting from the above listed advantages. Additional capabilities would include: ambulance use, equipment transport, canine transport...	This is a consideration only for those jurisdictions with a limited number of vehicles and little vehicle specialization. Otherwise, there is no justification for the increased cost.

CONTINUED

1 OF 2

(EXHIBIT XIII continued)

A UNIVERSE OF ASSUMPTIONS GOVERNING PATROL MODES: FOOT PATROL

SUPPORTING ASSUMPTIONS	OPPOSING ASSUMPTIONS
In high density commercial and residential areas, foot patrol: Provides maximum officer visibility, thereby increasing the deterrent effect of patrol, the level of citizen-felt security, and the level of citizen satisfaction with the police.	Officer visibility has limited if any effect upon the level of effective deterrence. Foot patrol provides less visibility and less sense of presence than vehicular patrol on a given beat, and the diversion of officers from vehicles detracts from the overall level of presence and visiblity throughout a jurisdiction. This diminishes the overall level of citizen-felt security and satisfaction with the police.
Maximizes officer/citizen contact and the level of police knowledge about the particular beat.	Increased officer/citizen contact on a foot beat increases the opportunity for officer corruption and thereby detracts from the overall effectiveness of the department. Officer/citizen contact is not important to the effective provision of police services.
Maximizes the order maintenance function of the police by facilitating reductions in loitering, disturbances, etc...	Has no greater impact on order maintenance than does vehicular patrol, but rather confines the cabability to the limited area of a foot beat and to the predictable presence of the officer.
Increases the level of citizen-felt security and satisfaction with the police.	Provides less visiblity and, therefore, less sense of presence than vehicular patrol on a given beat, and diminishes the overall level of felt citizen security and satisfaction throughout the jurisdiction.
When coordinated with vehicular patrol on a given beat, provides for the most comprehensive and effective coverage.	Detracts from the overall coverage which could be achieved by a total commitment to vehicles and increases the cost of patrol without improving its overall effectiveness.
Results in heightened officer morale and level of job satisfaction due to officers' continued contact with the citizenry and his increased sense of responsibility.	Detracts from officers' morale because they feel it is ineffective and outside the mainstream of police work. Officers prefer automobile patrol because it enhances their ability to respond to "hot" calls and is substantially more comfortable and less tiring.

(EXHIBIT XIII continued)

A UNIVERSE OF ASSUMPTIONS GOVERNING PATROL MODES: BICYCLE PATROL

SUPPORTING ASSUMPTIONS	OPPOSING ASSUMPTIONS
In high density commercial and residential areas, bicycle patrol provides the level of visibility, presence and citizen-police interaction which are the advantages of foot patrol (see "A Universe of Assumptions Governing Patrol Modes: Foot Patrol") while compensating for the disadvantages of foot patrol upon officer mobility, response time, the amount of territory which can be patrolled, and officer fatigue. Bicycle patrol further facilitates the ability of the patrol officer to apprehend some fleeing suspects due to its increased speed (over foot) and the silence of its operation.	While compensating for some of the disadvantages of foot patrol, the realized improvement is only minimal, and the bicycle has the following additional disadvantages: Detracts from citizen satisfaction with the police and citizen sense of security due to the negative image which the public has of bicycles as an appropriate vehicle for patrol. Has an adverse impact on officer morale as officers do not regard the bicycle as an appropriate patrol vehicle.
In parks and on bicycle trails, provides the most effective means of transportation for the patrol officer.	In parks and on bicycle trails, a motor scooter would prove a more effective vehicle due to increased speed and a minimization of officer fatigue.

(EXHIBIT XIII continued)

A UNIVERSE OF ASSUMPTIONS GOVERNING PATROL MODES: MOTOR SCOOTER

SUPPORTING ASSUMPTIONS	OPPOSING ASSUMPTIONS
In high density commercial and residential areas, motor scooters: Provide levels of visibility, presence, and citizen-police interaction similar to foot patrol (see "A Universe of Assumptions Governing Patrol Modes: Foot Patrol") without sacrificing officer mobility or response time, detracting from the amount of territory which can be covered by the patrol officer, and causing officer fatigue. In sum, the motor scooter combines all of the advantages of foot patrol without its disadvantages, and is the optimal vehicle for patrol in this type of area.	Motor scooters provide less officer/citizen contact than foot patrol; provide less visibility and less presence than do automobiles; are unsafe in traffic, at high speeds and in the rain or snow; have an adverse effect upon officer morale as the officers do not consider them to be appropriate vehicles for patrol.

(EXHIBIT XIII continued)

A UNIVERSE OF ASSUMPTIONS GOVERNING PATROL MODES: HELICOPTER

SUPPORTING ASSUMPTIONS	OPPOSING ASSUMPTIONS
For use in urban and suburban areas, the helicopter is an effective vehicle for general patrol activities as it: Permits wide ranging and accurate surveillance of an urban area and is particularly valuable in detecting certains types of offenses. Facilitates rapid response to calls for service, and enables surveillance of suspects until such time as apprehension can be effected by ground units. It is also safer than automobiles as a vehicle for high speed chases. In general, the surveillance and detection capabilities of the helicopter is considered equivalent to that of two to six ground officers.	The helicopter should be used as a response vehicle and as a crime-specific vehicle, as its general patrol utility appears somewhat limited and its operation is extremely expensive. The helicopter's effectiveness may depend upon the ability to coordinate its activities with those of ground units, and this may be difficult to accomplish. The response time of the helicopter is extremely low only if it is already airborne. If it must respond from the ground, it is very slow. While perhaps effective in detecting types of misdemeanors, particularly vandalism, prosecution is jeopardized due to the arresting officer not being the same as the officer observing the violation. The noise level effected is extremely high, as is the intensity of surveillance lights. This leads to community dissatisfaction.

(EXHIBIT XIII continued)

A UNIVERSE OF ASSUMPTIONS GOVERNING PATROL MODES: ONE-OFFICER CARS

SUPPORTING ASSUMPTIONS	OPPOSING ASSUMPTIONS
In all but the most dangerous and hostile neighborhoods, one-officer units are able to conduct patrol as effectively as two-officer units provided that sufficient and rapid back-up is available when needed.	In all neighborhoods the officer patrolling alone is hesitant to take individual initiative, fearing an inability to control situations without the support of a partner. As a result, the quality of patrol and the level of aggressive activity is less for the one-officer cars.
Dispatchers are able to discriminate among calls for service sufficiently well to provide a high degree of certainty so that, when necessary, more than one unit will be dispatched in response to calls to provide sufficient back-up.	Many situations have a certain associated probability of escalating into confrontations demanding the attention of more than one officer. Any risk that adequate support would not be available is intolerable.
Officers assigned to one-officer units are more attentive to duty, not being distracted by conversation.	Officers in two-officer units are more attentive to duty, as they monitor each other's performance.
One-officer units can observe activity and "crime opportunities" as well as two-officer units. In addition, two one-officer units will outperform one two-officer unit with only a marginal increase in costs.	The driver of a one-officer unit must pay close attention to driving and can not adequately observe the area of patrol.
One-officer cars are a more economical and efficient use of manpower. The increased cost necessitated by the purchase and maintenance of additional cars is inconsequential in light of the derived labor savings.	One-officer cars result in a decrease in officer productivity and safety.

CHAPTER THREE

CONCLUSION: NEW DIRECTIONS FOR RESEARCH*

The preceding sections of this summary have reviewed and assessed the quality and extent of available knowledge about traditional preventive patrol. From a rigorous methodological point of view, this assessment depicts a very disappointing state of affairs. Most of what is commonly called "knowledge" about traditional preventive patrol is, in fact, opinion based primarily on experiential evidence. The gaps in knowledge are pervasive and, as a result, few definitive statements can be made about the impact of alternative approaches to patrol upon the ability of departments to realize the goals of patrol.

Such an indiscriminate indictment of the research and findings in the field is, however, extremely unproductive: it neither focuses the attention of practitioners upon the most salient aspects of patrol, nor does it provide sufficient guidance to government agencies, private institutions and individual researchers seeking to make useful contributions to police science. Consequently, the identification of gaps in knowledge itself requires a judgemental assessment. It necessitates evaluation of both the relative importance of various patrol-related issues and the degree of certainty required by administrators before implementing any prescribed operational changes.

The importance of a given issue is a matter of judgement which can vary from department to department. To a large degree it depends upon the proportion of departmental resources and activities potentially affected and the contribution which resolution of the issue might make to the ability of departments to realize the goals of patrol and/or increase the productivity of patrol operations. The degree of certainty required about a proposed policy is also a judgemental issue. The greater the degree of surety required, the more extensive and rigorous must be the research upon which prescriptions are based. The need for certainty depends to a large degree upon the risks which the policymaker perceives to be entailed in the implementation of a particular program or policy. It generally increases with the cost of proposed changes and the scope and seriousness of their potential impact.

The attempt, in this chapter, to point out appropriate directions for future research is guided by the related considerations of importance and certainty. The recommended directions are discussed in relation to relevant, on-going research programs and innovative patrol projects in an effort to build upon an accumulating body of knowledge. Each suggested project is discussed in greater detail in the accompanying volume entitled Traditional Preventive Patrol: A Design for Phase II Research. This chapter concludes with some brief reflections upon the process of research on patrol.

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* For a more detailed discussion of the material summarized in this chapter, see: Traditional Preventive Patrol: An Analytical Framework and Judgemental Assessment, pp. 142-150; and, especially, Traditional Preventive Patrol: A Design for Phase II Research, both prepared by the University City Science Center, January, 1976.

I. Subjects for Future Research

As the preceding sections of this report indicate, recent years have been marked by a growing number of research projects on patrol conducted with the cooperation of departments throughout the country. Many of these projects have generated nationwide interest, but any mention of research on patrol almost inevitably seems to elicit comments on Kansas City. On-going and completed NILECJ/LEAA- and Police Foundation-supported projects in Kansas City, Missouri, reflect the types of research on traditional preventive patrol which promise to provide important insights into its conduct and effectiveness.

The most controversial of these projects is, without doubt, the Kansas City Preventive Patrol Experiment. The limitations of the experiment's validity and reliability have been briefly discussed earlier, and are dealt with at greater length in our comprehensive report.[104] We return here to a consideration of the experiment's significant and positive message.

Beyond the insights which the experiment provides into the process of applied research in police operations, it also clearly demonstrates that it is possible to vary the conduct of patrol without any apparent risk to community security. In Kansas City, the systematic and long-term interference with normal, routine patrol did not result in an identifiable increase in crime or a discernible deterioration of community attitudes toward the police. The study did not attempt to define the acceptable limits of change; it appears, however, that when coupled with the recent experiences with innovative approaches to patrol in other cities, the results indicate that departments can be extremely flexible in varying patrol operations in an effort to discover new means of improving the efficiency, economy and effectiveness of patrol operations.

The Preventive Patrol Experiment suggests the possibility of change in patrol practices and manipulation of patrol resources and, by inference, directs attention to the question of how patrol time can be most effectively spent. In light of the steadily increasing demands being placed on the police, overtaxed municipal budgets, and rising operating costs, tremendous pressure has been mounting for improvement of the effectiveness and productivity of existing departmental resources in lieu of expansion. Given the pressing nature of these concerns, it is clearly important to determine whether patrol officers' time is being fully and efficiently utilized. Information currently available, although incomplete, suggests that this is not the case -- general patrol activities may not necessarily be the most productive use of an officer's time. Consequently, even at present levels of staffing, there may be a very substantial number of patrol hours available for experimenting with a wide range of potentially useful strategies and tactics such as directed patrol and increased involvement in the community. It may also be possible to staff special units from within department personnel without the addition of new staff. Two other research projects in Kansas City have direct bearing on this issue.

Research on directed patrol has confirmed the limited findings presented in the Preventive Patrol Experiment which indicate that in Kansas City approximately 60% of an officer's time is spent on undirected, routine patrol. This in no way suggests that the size of a patrol force can be reduced; rather, it raises the positive question of how this time, which is typically fragmented by calls for service, could be restructured into periods of sufficient length to allow patrol officers to engage in activities which might be more goal-oriented and

productive than conducting routine patrol on a residual basis during the time which falls between the performance of ostensibly more important tasks. Time devoted to patrol may be time poorly spent, and the non-committed time of patrol officers may constitute an important and largely untapped resource. Research efforts can be profitably directed toward examining ways of reordering this time so that it can be turned to potentially more involving and constructive uses.

It is in this context that the Kansas City Response Time Study, sponsored by NILECJ/LEAA, becomes especially interesting. This study promises to be perhaps the most important single piece of research on patrol yet conducted. The study is gathering and analyzing comprehensive data on the elements which contribute to measures of response time. This will form the basis for an assessment of both the determinants of response time and the impact of response time on the effective delivery of police services. It can be anticipated that this study will provide some very definite answers (albeit specific only to Kansas City) regarding the significance of response time differentials to the outcome of calls for service. The issue of response time is an emotionally charged one -- assumptions regarding its importance provide the very basis for many aspects of traditional preventive patrol. It is, therefore, of great importance that plans be formulated immediately to duplicate and verify this study. Failure to do so may lead to its significant findings going unheard and unheeded.

It is possible that the Response Time Study will confirm traditional assumptions, but it appears equally possible that it may lead to a serious re-thinking of patrol operations. To indulge in conjecture: if the study indicates that except for responses to crimes in progress and personal injuries, response time is irrelevant to the outcome of calls for service, then there would be a serious need to re-think one of the major assumptions underlying the deployment and activities of patrol personnel. A potential re-orientation on the question of the importance of response time would facilitate the aggregation of patrol time, thus enabling officers assigned to traditional patrol to engage in directed activities designed to meet the specific and defined needs of the communities they serve. Such a decision, however, would depend heavily on the public's willingness to accept deferred responses to those types of service calls for which response time is determined to be a less than critical factor. This could be examined by way of expanded studies on the nature of and reasons for citizens' attitudes toward response time, and experiments on the effectiveness and acceptability of response by appointment to certain types of calls.

It is important to repeat that these comments on response time are based on conjecture about the results of an on-going study. Any attempts to alter patrol operations based on a reconsideration of response time should await the study's actual conclusions. In addition, plans to purchase expensive equipment systems designed to reduce response time, such as automatic vehicle monitors, might also be held in temporary abeyance.

There are a number of other interesting possibilities for increasing the effective utilization of patrol officers' time. For example, synthesis of evidence drawn from a variety of studies leads to the tentative conclusion that, except in extremely hazardous areas, the assignment of two officers to a patrol car is an inefficient use of personnel. As a result, departments which make extensive use of two-officer units could effectively increase the amount and variety of their patrol activities by shifting to the deployment of one-officer units. The relative merits of one- vs. two-officer units is a topic much in need of definitive study.

In Cleveland Heights, Ohio, another approach to tapping underutilized manpower is being tried. The Patrol Emphasis Program (funded by LEAA) has achieved what appear to be positive and significant results by instituting variations in the number of units assigned to patrol (from as many as 21 on the evening shift to as few as four in the early morning hours) on the basis of projections of service workloads by time of day and day of week. The adjustment of levels of patrol on the basis of expected needs has apparently led to a substantial decline in the rate of reported crime and a considerable increase in the number and quality of arrests made by patrol officers. A careful evaluation of the PEP program seems very much in order.

Split patrol offers a third approach to consolidating and restructuring patrol officers' time. It divides a patrol force into response and patrol units. The response units handle all calls for service, leaving the patrol units free to engage in routine patrol, directed and specialized activities, or some combination of the two. The concept of split patrol is being explored to a limited degree in a recently initiated experiment in Wilmington, Delaware, funded by NILECJ/LEAA. Additional research aimed at determining the appropriate combination of response, directed, and routine patrol activities would seem to be warranted.

Two other approaches for the better utilization of patrol officers' time have been suggested. In the very early stages of exploration is the possibility that by assigning investigative responsibilities to patrol officers, the size of the detective bureau can be drastically reduced, releasing officers assigned to that division for patrol activities. Recent experiences in Rochester, New York (in a Police Foundation-funded effort), seem to indicate that the traditional organizational split between the detective and patrol divisions may result in the underutilization of personnel. The work in Rochester seems to suggest that patrol officers may quite effectively become more involved in investigative activities, and that detectives may appropriately be assigned to street duty. In Cleveland Heights, Ohio, the actions of the department were far less tentative. The size of the detective bureau was drastically reduced, and the size of the patrol force increased along with reassignment of many traditional detective functions to the patrol officers who had received the requisite training. Both programs seem to present promising ways of increasing the effective utilization of manpower and, as such, they are appropriate topics for detailed evaluation.

Should the opportunity arise to increase departmental staffing, there seems to be considerable merit in the use of non-sworn personnel to respond to non-crime related calls for service. Such calls may account for as many as 40% of all calls received. In Worcester, Massachusetts, non-sworn personnel have been assigned to respond to these types of calls, thus releasing the time of sworn officers for work on robbery and burglary squads and increasing the morale of officers who continue in patrol operations. While the evaluation of this program has not yet been completed, the department believes that it has been well received by the public and that the operational framework itself is functioning effectively. It also may lead to substantial cost savings. The experience of the Fremont, California, Police Department seems to reflect the positive reaction expressed by the Worcester police. As it appears that the present evaluation of the Worcester program is concentrating primarily on the effectiveness of special units, it may be appropriate to look more closely at the effectiveness of the use of civilian personnel. In addition, we note the potential for using citizen auxiliary

personnel to augment patrol. The subject of citizen auxiliaries is being explored in greater detail in another NEP study.

Having identified some of the opportunities for freeing available officer time for directed patrol activity, the next requirement is to determine the most appropriate scope, range and mix of officer activities. First, it is necessary to understand the complexities of the concept of police presence. The projects mentioned throughout this report have, for the most part, focused on the manipulation of activity and deployment variables. Some attempt has been made to determine their impact on strategic and tactical objectives and on the attainment of the general goals of patrol, but little attention has been devoted to determining how these manipulations have affected the perceived level of police presence within the community. The Preventive Patrol Experiment touched on the issue by manipulating the levels of routine preventive patrol, but this is only one of the variables thought to influence the level of perceived presence. Presence is a complex phenomenon which entails much more than the mere physical visibility of the police. It is determined by the amount and types of police activity in a community, by the activities of people within the community, and by the reactions of citizens to police activity. At present, we know that patrol is conducted differently in different types of communities, but we have only a very rudimentary understanding of the ways in which police activities and community characteristics interact and how they can be appropriately matched. A thorough investigation of the nature of police presence would help to establish the direction and scope of future innovations in patrol and would assist departments in rationally determining patrol strategies and tactics.

Secondly, it is important to examine the various directed activities that might be engaged in by a department in order to determine the degree to which these activities should be undertaken by individuals permanently assigned to special squads or by officers assigned on an *ad hoc* or intermittent basis. In general, there is little knowledge about the possible flexibility of officer assignment to a range of activities or about the compatibility of the various specialized activities and operations carried out by the department. In addition, it is important to determine the degree to which special services can be provided to particular segments of the population without jeopardizing the equity of service provided to the community as a whole.

As a third consideration, it is necessary to assess the alternative approaches to patrol planning. In general, what is the most effective way to determine the needs of a given community, to assess its problems, and to structure the approach to policing? Clearly, the planning of patrol should go well beyond the considerations of crime analysis to encompass an understanding of the full array of activities engaged in by patrol officers who often spend less than 30% of their time on crime-related concerns. The Community Profiling Program undertaken in San Diego and the Interactive and Directed Models used in Kansas City are but a few examples of the alternative approaches to planning directed activities which should be evaluated.

A fourth area of concern is that of patrol officer supervision. As has been indicated earlier, little is known about the impact of various aspects of supervision (e.g., centralized versus decentralized authority, street deployment of supervisory personnel, scheduled officer call-in, and supervisor/officer ratios) upon the degree of officer attentiveness to duty, levels of misconduct and corruption, and general patrol effectiveness. Additionally, investigation of the following hypothesis is warranted: directed patrol activities, the diversion of non-crime related calls for service to non-sworn personnel, and the deployment of officers in direct proportion to the level of demands for service

will have a positive impact on the level of officer morale and job satisfaction by stimulating increased attention to duty and by diminishing the need for close supervisory attention. For departments with Automatic Vehicle Monitoring Systems, it would seem appropriate to consider the possibility that many aspects of supervision could be transferred to the dispatch center where the movement, location and status of vehicles and officers is closely monitored on a real-time basis.

Fifth, there continues to be a considerable degree of uncertainty concerning the importance of officer characteristics, particularly race, sex and education, on individual officer performance and the overall effectiveness of the patrol operations in different types of communities. In the context of present public debate in which questions of equal opportunity and equal work for equal pay are significant issues, it is particularly essential that well-designed research programs be developed to address these matters. There is no doubt that unless an efficacious approach to officer selection and assignment can be developed, the best formulated approaches to patrol activity will still meet with only limited success.

Finally, the information generated by research programs must be made readily available to departments in a way which will facilitate beneficial program changes. In order to facilitate the transfer of information and programs out of the experimental context and into the mainstream of policing, it is necessary to analyze the process of innovation within departments to determine the most effective way to communicate findings to departments and to provide for the ongoing review and analysis of research and program findings in order to promote a continuing, cumulative approach to research on patrol.

In conclusion, it should be noted with regard to all of the research areas discussed above that careful consideration must be given to developing and improving the available measures of effectiveness for evaluating alternative approaches to patrol. Without proper means of measurement, the entire process of research and analysis will continue to be compromised. LEAA, through the National Institute of Law Enforcement and Criminal Justice, is currently sponsoring an in-depth program to develop and evaluate alternative measures of effectiveness. This project, being conducted by the American Justice Institute, is of critical importance to the future of research in policing.

II. The Conduct of Future Research

As noted throughout this report, there have been many problems in the design, execution and reporting of research on traditional preventive patrol. It thus seems useful to conclude with a brief examination of some important lessons about the process of research which can be drawn from experience to date.

To be of value, research on patrol must be relevant to the needs of policy makers. This does not mean that applied research should be conducted to the exclusion of basic research questions. The police community generally recognizes that to produce meaningful and programmatically useful results, applied research must be based on a sound foundation. But it does mean that all research should be ultimately justifiable in terms of its relevance to departmental concerns.

Research projects should be designed to reflect the operating realities and constraints of police work. Departments are more receptive to the adaptation of policies and procedures for research purposes than has been commonly believed.

However, it is still incumbent on researchers to carefully assess and report the impact of these often unforeseen constraints on the reliability and validity of their findings.

It is of utmost importance that research and evaluation components be built into programs from the outset and that sufficient lead time be provided for the accumulation of the baseline data required for the conduct of a valid and reliable study. All too often, research designs have been developed on an *ad hoc*, after-the-fact basis. This deficiency has been responsible for many of the problems in much of the research carried out to date. The timely development of adequate evaluation designs may necessitate increased availability of funds for planning grants.

The prospects for the successful completion of a research project are greatly enhanced when all the departmental personnel who will be involved are carefully briefed and provided with an opportunity to express their concerns and offer their advice. It is also useful to maintain a detailed chronicle of all project activities. This not only facilitates the reconstruction of the project for analytical purposes, but it also contributes to the transferability of successful programs and useful findings to other departments. Finally, care should be taken to report results promptly and accurately. Modest and accurate presentation with a minimum of fanfare enhances the acceptance of research conclusions. The premature release of incomplete finds can touch off unproductive debates which may diminish the acceptability and utility of the final results.

* * * * *

Research on patrol is a relatively new endeavor which is now straining to reach maturity. Significant strides are being made toward answering some of the most important questions about patrol, and unprecedented opportunities to further knowledge and improve operations lie immediately ahead. Departments of all sizes throughout the country are keenly interested and willing to participate actively in efforts to examine salient aspects of patrol. While this review of traditional preventive patrol has identified many areas in which knowledge is lacking or incomplete, the situation can be expected to improve substantially in years to come.

FOOTNOTES

1. A 60% figure has been reported by the majority of respondents to the National Patrol Survey. This number is not unlike that reported in: G. Douglas Gourley, Patrol Administration, 2nd ed. (Springfield, Illinois: Charles C. Thomas, 1974), p. viii. We expect that a very firm estimate will be forthcoming based on the ongoing work of Elinor Ostrom.

2. Kansas City, Missouri, Police Department, Response Time Analysis Study (Kansas City, Missouri: forthcoming).

3. Jeraldine Braff, *et al.*, The Community Service Officers Project, City of Rochester Police Department (Rochester, New York: The Center for Governmental Research, Inc., 1973); and interviews with representatives of the Fremont, California, Police Department; the Rochester, New York, Police Department; and the Worcester, Massachusetts, Police Department.

4. John E. Boydstun, San Diego Field Interrogation: Final Report (Washington, D.C.: Police Foundation, 1975).

5. Peter B. Bloch and Deborah Anderson, Policewomen on Patrol: Final Report (Washington, D.C.: Police Foundation, 1974).

6. George L. Kelling, *et al.*, The Kansas City Preventive Patrol Experiment: A Summary Report and A Technical Report (Washington, D.C.: Police Foundation, 1974).

7. This distinction between two types of independent variables -- those potentially within the control of the administrator and those beyond his control -- is drawn from: James S. Coleman, Policy Research in the Social Sciences (Morristown, New Jersey: General Learning Press, 1972).

8. See: Traditional Preventive Patrol: A Design for Phase II Research, (prepared by the University City Science Center, January 1976.)

9. For example, see: Bloch, *op. cit.* ; Boydstun, *op. cit.*; Kansas City, Missouri, Police Department, *op. cit.*; Kelling, *op. cit.*; San Diego Police Department, Community Profiling and Police Patrol: Final Staff Report of the Community Profile Development Project (San Diego, California: San Diego Police Department, 1974); St. Louis Police Department, Automated Resource Allocation Control (St. Louis, Missouri: St. Louis Police Department, 1975); and St. Louis Police Department, Operation of Overtime Foot Patrol (St. Louis, Missouri: St. Louis Police Department, January 1974).

10. Many lists of departmental and patrol objectives have been found in the literature. There is, however, very little difference between them. Because of the extensive documentation provided, we have adopted those set forth in: The National Commission on Productivity, Opportunities for Improving Productivity in Police Services (Washington, D.C.: U.S. Government Printing Office, 1973). See particularly pp. 13-26. The more traditional definitions are found in: Clarence H. Patrick, "The Police in Modern Society," The Police, Crime, and Society, Clarence H. Patrick, ed. (Springfield, Illinois: Charles C. Thomas, 1972); and

Gourley, *op. cit.*, p. 157.

11. For a more extensive discussion of the distinction between deterrence and prevention, see: Isaac Ehrlich, "The Deterrent Effect of Criminal Law Enforcement," The Journal of Legal Studies, June 1972, pp. 259-276.

12. See, for example: Samuel G. Chapman, "Security Checks," Police Patrol Readings, Samuel G. Chapman, ed. (Springfield, Illinois: Charles C. Thomas, 1970), pp. 655-656.

13. Most discussions of patrol treat the concept of visibility in a deceptively simple manner. In fact, the concept has many complex and, to date, unexplored ramifications. For a discussion of the complexities of visiblity, see the concluding chapter of this report and Traditional Preventive Patrol: A Design for Phase II Research, *op. cit.*

14. Kelling, *op. cit.*

15. Clarence H. Patrick, "The Police in Modern Socity," *op. cit.*

16. J. F. Elliott and Thomas J. Sardino, Crime Control Team: An Experiment in Municipal Police Department Management and Operations (Springfield, Illinois: Charles C. Thomas, 1971), p. 11.

17. See, for example: Albert J. Reiss, Jr., The Police and the Public, (New Haven, Connecticut: Yale University Press, 1971), pp. 164-168.

18. Franklin E. Zimring, Perspectives on Deterrence (Washington, D.C.: U.S. Government Printing Office, 1971).

19. We note here that the available documentation suggests that only from 13-20% of the actions taken by uniformed patrol officers are officer-initiated. See: Reiss, *op. cit.*, p. 11, and John A. Webster, The Realities of Police Work (Dubuque, Iowa: Kendall/Hunt Publishing Company, 1973), p. 57.

20. J. F. Elliott, *et al.*, "The Detection and Interception Capability of One- and Two-Man Patrol Units," Police, November-December, 1969, pp. 24-26.

21. The crimes usually considered to have the highest associated probabilities of apprehension are robbery and burglary. See, for example: The President's Commission on Law Enforcement and Administration of Justice, Task Force Report: Science and Technology (Washington, D.C.: U.S. Government Printing Office, 1967), p. 10.

22. A typical example of the utilization of response time as a measure of effectiveness is found in: Spencer B. Smith, "Operations Research for More Effective Police Patrol," Technology and Human Affairs, Summer, 1972, Vol. 4, No. 2.

23. The President's Commission on Law Enforcement and Administration of Justice, Task Force Report: Science and Technology, *op. cit.*, pp. 9-10. A critical discussion of research on response time is presented in Chapter Three of Traditional Preventive Patrol: An Analytical Framework and Judgemental Assessment, prepared by the University City Science Center, January 1976. This discussion is summarized in Chapter Two of this report.

24. Kansas City Police Department, *op. cit.*

25. Paul M. Whisenand and James L. Cline, Patrol Operations (Englewood Cliffs, New Jersey: Prentice-Hall, 1971), p. 4.

26. Marvin Cummins, "Police and Service Work," Police in Urban Society, Harlan Hahn, ed. (Beverly Hills, California: Sage Publications, 1971), p. 287.

27. Herman Goldstein, "Police Functions Peripheral to the Task of Preventing and Controlling Crime," Police Patrol Readings, Samuel G. Chapman, ed., *op. cit.*, pp. 41-42.

28. James Q. Wilson, Varieties of Police Behavior: The Managment of Law and Order in Eight Communities (New York: Athenum, 1972), p. 19; and Whisenand and Cline, *op. cit.*, p. 5.

29. See, for example: Webster, *op. cit.*, pp. 98-100; Reiss, *op. cit.*, pp. 94-96; comments received in response to the Science Center's National Patrol Survey also indicate that this is a widespread belief among patrol administrators.

30. Richard A. Myren, "The Role of the Police," Police Patrol Readings, Samule G. Chapman, ed., *op. cit.*, pp. 25-33.

31. Goldstein, *op. cit.*, pp. 33-41.

33. It is frequently argued that police departments should be divided into two divisions: one which is assigned to handle law enforcement, and the other non-crime related services. For example, see: The President's Commission on Law Enforcement and Administration of Justice, Task Force Report: The Police (Washington, D.C.: U.S. Government Printing Office, 1967), pp. 122-124; and Jesse Rubin, "Police Identity and the Police Role," The Police and the Community, Robert F. Steadman, ed. (Baltimore, Maryland: The Johns Hopkins University Press, 1972), pp. 41-44.

34. Citizen auxiliaries are proposed as being capable of performing such services as neighborhood security checks and house watches, roving observations for wanted persons and vehicles, social service counseling, etc. See: The President's Commission on Law Enforcement and Administration of Justice, Task Force Report: The Police, *op. cit.*, pp. 223-224; James S. Campbell, *et al.*, Law and Order Reconsidered (New York: Bantam Books, 1970), pp. 441-445; George E. Berkely, The Democratic Policeman (Boston, Massachusetts: Beacon Press, 1969), pp. 177-178; National Advisory Commission on Criminal Justice Standards and Goals, Police (Washington, D.C.: U.S. Government Printing Office, 1973), pp. 264-269; and Gourley, *op. cit.*, pp. 86-93.

35. Citizens may be hired by police departments as non-sworn personnel to handle specialized functions which would otherwise be assigned to uniformed patrol officers. These might include traffic duties, community services, and the like. See: The President's Commission on Law Enforcement and Administration of Justice, Task Force Report: The Police, *op. cit.*, p. 125; and National Advisory Commission on Criminal Justice Standards and Goals, *op. cit.*, pp. 258-261.

36. In some cases certain equipment is utilized on routine patrol or assigned to patrol officers so that such non-crime related services can be provided, when necessary; e.g., the use of station wagons on patrol so that patrol cars can serve as ambulances.

37. See: Kelling, *op. cit.* ; Boydstun, *op. cit.* ; Bloch, *op. cit.*

38. *Ibid.* The Urban Institute's evaluation of Cincinnati's Team Policing Program also included before and after surveys. See: Alfred I. Schwartz, *et al.*, Evaluation of Cincinnati's Community Sector Team Policing Program, A Progress Report: After One Year, Summary of Major Findings (Washington, D.C.: The Urban Institute, 1975). For a review and assessment of this evaluation, see: The National Sheriffs' Association's National Evaluation Program report on Neighborhood Team Policing, January 1976.

39. The National Commission on Productivity, *op. cit.*, p. 19.

40. In particular, see: Traditional Preventive Patrol: An Analytical Framework and Judgemental Assessment, *op. cit.*, pp. 4-36.

41. *Ibid.*, pp. 22-31.

42. *Ibid.*, pp. 22-31. Discussion of assumptions regarding the intermediate objectives is interspersed throughout this volume.

43. Interviews with representatives of the San Diego Police Department, May 1975.

44. St. Louis Police Department, Automated Resource Allocation Control, *op. cit.*

45. Richard C. Larson, Models for the Allocation of Urban Police Patrol Functions (Cambridge, Massachusetts: MIT Operations Research Center Technical Report No. 44, 1969).

46. St. Louis Police Department, Allocation of Patrol Manpower Resources in the St. Louis Police Department: Supplementary Report (St. Louis, Missouri: St. Louis Police Department, 1969).

47. St. Louis Police Department, Automated Resource Allocation Control, *op. cit.*

48. Richard C. Larson, Description of a Proximity AVM System in Stamford, Connecticut (Cambridge, Massachusetts: Public Systems Evaluation, Inc., unpublished).

49. James D. Caldwell and James N. Nehe, "Patrol Distribution in Arlington County," Police, September 1974, pp. 47-50.

50. Interviews with representatives of the Harrisburg, Pennsylvania, Police Department, July 1975.

51. In particular, see: Traditional Preventive Patrol: An Analytical Framework and Judgemental Assessment, *op. cit.*, pp. 71-89.

52. Jerome H. Skolnick, Justice Without Trial: Law Enforcement in Democratic Society (New York: John Wiley and Sons, Inc., 1966), p. 11.

53. Ronald S. Weiner, Stress Factors and Police Response (Washington, D.C.: American University Mimeo, 1974), p. 25.

54. Notable examples of these variations are found in departments which have adopted team policing, and in the Kansas City Police Department's use of task forces and San Diego's Community Oriented Policing project. See: The National Sheriffs' Association's National Evaluation Program, Phase I Study of Neighborhood Team Policing, 1975; and San Diego Police Department, *op. cit.*

55. O. W. Wilson and Roy C. McLaren, Police Administration, 3rd Edition (New York: McGraw-Hill Book Company, 1972), p. 330.

56. John E. Angell, *et al.*, Police Consolidation Project: Staff Report (Portland, Oregon: Portland-Multnomah County Bureau of Central Services, 1975), p. 82.

57. Reiss, *op. cit.*, p. 167.

58. Angell, *et al.*, *op. cit.*, p. 81.

59. Bruce Smith, Police Systems in the United States (New York: Harper and Row, 1960), p. 256.

60. Leonhard F. Fuld, Police Administration: A Critical Study of Police Organization in the U.S. and Abroad (Montclair, New Jersey: Patterson Smith, 1971), p. 114; and San Diego interviews, *op. cit.*

61. San Diego interviews, *op. cit.*

62. The New York City Police Department has recently tried a number of these and other approaches in seeking to control its well-publicized corruption problem.

63. For a recent and excellent discussion of these and other approaches, see: Herman Goldstein, Police Corruption: A Perspective on Its Nature and Control (Washington, D.C.: Police Foundation, 1975).

64. In particular, see: Traditional Preventive Patrol: An Analytical Framework and Judgemental Assessment, *op. cit.*, pp. 90-104.

65. Kelling, *et al.*, *op. cit.*

66. Kelling, *et al.*, A Summary Report, *op. cit.*, p. vi.

67. For example, see: Edward M. Davis and Lyle Knowles, "A Critique of the Report: An Evaluation of the Kansas City Preventive Patrol Experiment," The Police Chief, June 1975, pp. 22, 24-27; Joseph D. McNamara, "The Kansas City Preventive Patrol Experiment," The Police Chief, June 1975, p. 30; Patrick V. Murphy, "The Davis-Knowles Observations on the Kansas City Preventive Patrol Experiment: A Summary Report," The Police Chief, June 1975, p. 30; George L. Kelling and Tony Pate, "The Davis-Knowles Critique of the Kansas City Preventive Patrol Experiment," The Police Chief, June 1975, pp. 32-34, 36 and 38; Charles E. Brown, "Evaluation Research in Policing: The Kansas City Experience," The Police Chief, June 1975, pp. 40 and 42-45; and Harold Tynell, "Citizens, Patrol Commanders and the Kansas City Preventive Patrol Experiment," The Police Chief, November 1975, pp. 42-43. The controversy surrounding the experiment also came up constantly in interviews with representatives of numerous departments throughout the country. Questions concerning the validity of the experiment's findings are considered in

greater detail in Traditional Preventive Patrol: An Analytical Framework and Judgemental Assessment, *op. cit.*, pp. 105-109.

68. Interviews with representatives of the Wilmington Police Department, July 1975.

69. Interviews with representatives of the Kansas City Police Department, May 1975.

70. San Diego Police Department, *op. cit.*, and San Diego interviews., *op. cit.*

71. Boydstun, *op. cit.*

72. See: David J. Bordau and Larry L. Tifft, "Citizen Interviews, Organizational Feedback and Police-Community Relations," Law and Society Review, November 1971, pp. 155-182; Wayland D. Pilcher, "The Law and Practice of Field Interrogation," Journal of Criminal Law, Criminology, and Police Science, December 1967, pp. 465-492; and Charles A. Reich, "Police Questioning of Law-Abiding Citizens," in The Ambiguous Force: Perspectives on the Police, Arthur Niederhoffer and Abraham S. Blumberg, eds. (Waltham, Massachusetts: Ginn and Company, 1970), pp. 244-251; and Reiss, *op. cit.*, pp. 92-94, for examples of negative assessments of the utility of aggressive patrol tactics.

73. In particular, see: Traditional Preventive Patrol: An Analytical Framework and Judgemental Assessment, *op. cit.*, pp. 105-114.

74. For instance, see: John Angell, *et al.*, Police Consolidation Project: Staff Report (Portland, Oregon: Portland-Multnomah County Bureau of Central Services, 1975), p. 109; George E. Berkeley, The Democratic Policeman (Boston, Massachusetts: Beacon Press, 1969), p. 63; and The President's Commission on Law Enforcement and Administration of Justice, Task Force Report: The Police (Washington, D.C.: U.S. Government Printing Office, 1967), pp. 167-168.

75. W. Eugene Groves and Peter H. Rossi, "Police Perceptions of a Hostile Ghetto: Realism or Projection," in Harlan Hahn, ed., Police in Urban Society (Beverly Hills, California: Sage Publications, 1970), p. 181.

76. Elliot M. Rudwick, "The Unequal Badge," in Samuel G. Chapman, ed., Police Patrol Readings, *op. cit.*, pp. 80-98.

77. Bernard Cohen and Jan Chaiken, Police Background Characteristics and Performance (Lexington, Massachusetts: Lexington Books, 1973), pp. 48-50.

78. Samuel G. Chapman, "The National's Most Wanted Man," in Chapman, *op. cit.*, pp. 98-105; John Darnton, "Color Line: A Key Police Problem," in Chapman, *op. cit.*, pp. 72-76; and David M. Rafky, "Police Race Attitudes and Labelling," Journal of Police Science and Administration, Vol. I, No. 1, March 1973.

79. James Q. Wilson, "Dilemmas of Police Administration," Public Administration Review, September-October 1968, p. 409.

80. Constance M. Breece and Gerald R. Garrett, "Women in Policing: Changing Perspectives on the Role," an unpublished paper prepared for the Governor's Commission on Law Enforcement and the Administration of Justice, Commonwealth of Massachusetts, n.d., p. 6.

81. Peter B. Bloch and Deborah Anderson, *op. cit.*, pp. 1-4.

82. *Ibid.*

83. *Ibid.*, p. 3.

84. For example, see: Breece and Garrett, *op. cit.*, p. 8; and Catherine Higgs Milton, *et al.*, Women in Policing: A Manual (Washington, D.C.: Police Foundation, 1974), p. 46. The only published criticism of the study that we have found is Jude T. Walsh, "Some Questions in Re: 'Policewomen on Patrol'," Police Chief, July 1975, pp. 20-22.

85. See: Traditional Preventive Patrol: An Analytical Framework and Judgemental Assessment, *op. cit.*, pp. 118-127.

86. The legal issue has been raised in Peter B. Bloch, "Reply to Questions Raised in Re: 'Policewomen on Patrol'," Police Chief, July 1975, pp. 22-23; and in discussions with Peter Bloch and Deborah Anderson. It is also briefly discussed at several points in Bloch and Anderson, Volume I, *op. cit.*

87. The study's findings have been used in legal proceedings in Baltimore, Philadelphia and San Francisco.

88. President's Commission on Law Enforcement and Administration of Justice, Task Force Report: The Police, *op. cit.*, p. 126.

89. Dennis C. Smith and Elinor Ostrom, "The Effects of Training and Education on Police Attitudes and Performance: A Preliminary Analysis," (Bloomington, Indiana: Workshop in Political Theory and Policy Analysis, n.d.), p. 39.

90. Bernard Cohen and Jan M. Chaiken, *op. cit.*, pp. 37-65.

91. Arthur Niederhoffer, Behind the Shield (Garden City, New York: Anchor Books, 1969), p. 32.

92. Charles W. Tenney, Jr., Higher Education Programs in Law Enforcement and Criminal Justice (Washington, D.C.: LEAA, June 1971), p. 61.

93. Interviews with representatives of the Multnomah County, Oregon, Department of Public Safety, May 1975.

94. The only possible exception to this statement is the evaluation conducted of the community service officer project in Rochester, New York. While useful, it is based on very limited data. See: Jeraldine Braff, *op. cit.*

95. Interviews with representatives of the Worcester Police Department, May 1975.

96. Interviews with representative of the Cleveland Police Department, May 1975.

97. Interviews with representatives of the Rochester, New York, Police Department, May 1975.

98. In particular, see: Traditional Preventive Patrol: An Analytical Framework and Judgemental Assessment, *op. cit.*, pp. 84-86 and pp. 115-130.

99. St. Louis Police Department, Overtime Foot Patrol (St. Louis, Missouri: St. Louis Police Department, 1973).

100. Edward L. Lee, "Back to Bikes for Baltimore," The Police Chief, May 1972, p. 22.

101. Peter J. Pitchess and C. Robert Guthrie, Project Sky Knight: A Demonstration in Aerial Surveillance and Crime Control (Washington, D.C.: U.S. Government Printing Office, 1968).

102. Jerry V. Wilson, Evaluation of Motor Scooters in Law Enforcement (Washington, D.C.: Metropolitan Police Department, n.d.).

103. In particular, see: Traditional Preventive Patrol: An Analytical Framework and Judgemental Assessment, *op. cit.*, pp. 131-141.

104. See: Traditional Preventive Patrol: An Analytical Framework and Judgemental Assessment, *op. cit.*, pp. 105-109.

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