ABSTRACT

ASSESSMENT OF PRODUCTIVITY AND COST OF MUNICIPAL POLICE PATROL SERVICES

By

Stanley Vanagunas

This study proposes techniques for assessing the productivity of municipal police patrol services. The work is concerned with a systematic classification of patrol "output," services, patrol "input," costs, and particularly with the measurement of their interaction so as to approximate economic optimality conditions in patrol operations.

The methodological approach of the study consists of analyzing one year's (1973) patrol experience of a medium sized police agency located in the Midwest. The department, having a complement of approximately 250 sworn and civilian personnel, serves as a model for the definition of patrol output and input and for the subsequent generalization of pertinent indicators estimating patrol productivity.

In 1973 the department deployed 89,350 uniformed patrol unit hours. The cost per hour deployed ranged

from $18.86 to $38.34, depending upon assumptions as to what departmental costs are properly accruable to the patrol division. The lower figure was calculated by accruing only those costs which are strictly identified with patrol operations as an accounting entity. The higher cost estimate was computed by considering the patrol as the key police function and the specialized divisions as aids. In the latter case, all departmental costs were allocated to the patrol.

It was found that the following output to input relationship prevailed for the subject department during the year under study:

34% Reactive + 40% Proactive + 26% Administrative
= 100% Deployed Patrol Unit Hours

About three quarters of time spent on administrative tasks was consumed by "catch-up" investigatory report preparation. The balance consisted of officially sanctioned personal breaks, time spent on exchanging defective equipment or waiting for it to be repaired and on-duty time in court.

Time consumed by the reactive (response) function consisted of 41.2% on crime related calls, 20.2% on conflict resolution responses, 26% on traffic complaints and 12.2% on sundry demands for patrol services. The most time consuming, consequently most costly, dispatches to calls for patrol service are those which a) involve a

threat to the safety of a person, such as robbery, rape or attempted suicide; b) pose a potential threat to the safety of officers responding to the call, such as disorderly cases, armed robbery or assault; c) require an extensive information gathering process for investigatory reports, such as traffic accidents; and d) interrupt the orderly flow of people or vehicles in the vicinity of the scene, such as street crimes, traffic accidents or fire calls.

Proactive (preventative) patrol time was derived as a residual given time consumed for responses to citizens' calls for service and officers' administrative tasks. Classyfing proactive patrol output or estimating its productivity is extremely difficult. Officers' non-committed time activities depend much upon their discretion. Furthermore, attempts to measure time consumed for events initiated by the patrolman, observation arrests for example, are not inherently meaningful as the premise behind proactive patrolling is deterrence rather than detection. Proactive patrolling is perhaps best described as a working poise for service. This conclusion is strongly supported by the practice of the subject agency and many metropolitan departments to deploy their manpower on the basis of elapsed time per service call experience rather than probabilities of criminal events.

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In terms of estimating patrol productivity, the stress must be placed on the reactive function. Not only it is the apparently key patrol function but it also lends itself to some meaningful quantification. Officers' reactive time can be more precisely accounted for. Emphasis of productivity analysis on the reactive function serves to accentuate the patrol objective of satisfying the demands of those actually calling upon the police for assistance rather than the more abstract demands of the public at large. Given the primacy of this objective, servicing of calls not related to criminal events assumes greater importance in the overall patrol task.

Among the most significant indices of patrol productivity is the ratio of reactive patrol time to total patrol time deployed. The study concludes that a patrol operation should aspire to devote as much time to responses to citizen assistance requests as a pre-determined queue delay permits. A productive patrol division is also the one which has a high rate of adjudicatory arrests resulting from responses to crime related calls, one which minimizes patrol time elapsed per dispatch event, and one which maximizes the degree of satisfaction with police service expressed by those using it. Specific productivity indices are identified in the body of the text.

A salient conclusion of the study is that much of what police do results in an indivisible social benefit;

e.g. crime deterrence, community security or maintenance of peace. Productivity analysis, aside from the methodological posture that it provides the student, is not very potent in making statements about the cost or value of such services. However, because productivity analysis is concerned with measurement, it is at its most powerful when applied to police activities which can be reduced to "divisible" services for specific households. Such are represented by patrol responses to citizen calls for police aid. The direct user of patrol services is not an abstract constituancy but a concrete person; a victim, a complainant. Satisfaction of his expectations from the patrol, be it succoring his distress or retrieving his stolen property, may concurrently advance indivisible benefits from police service such as crime prevention, a feeling of community security and a sense of democratic law enforcement.

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INTRODUCTION

The substance of this work is to propose a methodology for the assessment of productivity of municipal police patrol services. The concept of productivity, at its simplest, deals with realizing the maximum output per unit of input. Policing "inputs" are labor, capital, land and energy or, in the common alternative, costs. "Output" is, of course, the range of services provided by the police to the public. The interaction between the two is the essence of productivity analysis. Its goal is economic optimality, the administrative strategy which yields the "best" service, qualitatively and quantitatively, at least cost. Means for defining economic optimality of patrol operations are the focal concerns of this study.

Big money is spent on the police function in America. The monthly payroll approximates four hundred million dollars and is a source of livelihood for about five hundred fifty thousand persons.[1] In fiscal 1970 alone, direct expenditures by all levels of government for policing this nation amounted to over five billion dollars.[2] The public well deserves to ask on what

precisely is their trust being applied. However, it is difficult in the public forum to avoid the utopian superlatives and ideological partialities that issues of justice administration evoke. For some, the ultimate justification for the police is its role in safeguarding Constitutional freedoms. To others, the maintenance of order is paramount. To most, protection of life and property is the service that the tax funds are presumed to purchase.

There is a need for greater introspection in viewing the police service particularly by the executives and legislators of the villages, cities and counties under whose jurisdiction are found the approximate forty thousand police agencies of this country.[3] Introspection which, while conscious of the subtle and the complex in the police task, focuses on the measurable, the efficient, and the least costly. A convenient vehicle to arrive at such a view of policing is an economic analysis based on productivity and cost of services.

"The story of productivity," says an anonymous insight, "the ratio of output to input, is at heart the record of man's efforts to raise himself from poverty."[4] While this aphorism finds most direct pertinence to the industrial sphere, productivity analysis is not without applicability to the study of public services such as the police. Undoubtedly the police role is complex and much

of it is beyond the distillation to hard economic concepts. Part of criminal procedure is a ritual entailing practices which can clearly be "streamlined" but at the cost of liberty. Similarly, the prerogatives of home rule render moot a substantial part of discussion of economies of scale in police operations. Moreover, much of what police do results in a highly intangible product. Maintenance of order, establishment of a sense of community security or deterrence of criminal activity are commonly acknowledged police "outputs" yet, they hardly lend themselves to concrete measurement.

Nevertheless the fact remains that a police agency is required, to a varying extent, to "trade-off" between the different services it performs; be it criminal apprehensions, conflict resolution, preventative patrol, traffic or simply administrative tasks. Time spent on one function implies less time for others. It is advantageous from the public policy perspective to know the costs associated with these various activities. Cost and its minimization principles are not the sole but a pertinent criteria for decisions as to which aspect of police service to slight or to favor. Such decisions are particularly helped if cost is related to at least the easily visible measures of achievement, productivity indicators.

It is the uniformed patrol which is commonly accepted as the mainline responsibility of a municipal level police agency. As O. W. Wilson puts it: "Policing should be considered a patrol service with specialized activities as aids."[5] The concern of this study is, therefore, the fruitfulness of police labor in various patrol services whether they be ubiquity for crime deterrence, reaction to citizen calls for assistance, or the handling of ancillary administrative duties by patrol officers.

The empirical base for this analysis will be primarily drawn from the 1973 patrol work experience of Racine Police Department, a medium sized midwestern law enforcement agency located in Wisconsin. Racine, a city of approximately one hundred thousand residents, is an "autonomous" municipality with its own employment base. It is an industrial community sharing on a smaller scale the many problems of its larger urban sisters. Racine is not without exposure to the stress of racial tension, urban decay or unemployment. The city's police department, constituting about 250 sworn and civilian personnel, shares nearly all the unenviable duties of large metropolitan police agencies.

Besides its academic purpose, this study has the objective to provide local government and police administrators with concrete tools for the assessment of police

work in relation to its cost. The significance of the work, therefore, bears heavily upon the practitioner. This orientation is timely for today local government is confronted, on one hand, with shrinking tax revenues, and on the other hand, with unparalleled aggressiveness by public employees seeking higher wages. Unionization and collective bargaining in the public sector are now well recognized. As of December, 1973, thirty-five states had statutes which explicitly or implicitly recognize the rights of policemen to organize. Twenty-five of these states also set down statutory guidelines recognizing the right of police organizations to engage in collective bargaining.[6]

Moreover, bargaining and unions in the public sector are using the private sector as an analogy. Industry has sought to limit agreements for higher wages to growth in productivity. While at times self-interest permeates this argument, it is, nevertheless, a poignant one. Public administrators must also be aware of the essential principle that if workers' salaries exceed their productive output, "red margins," figuratively for government, inevitably follow. Of course, the greater the labor intensivity or an organization, such as the police agency, the more labor productivity is related to its economic health.

The practitioners who will find this study particularly significant are the general government and police administrators of municipalities and counties where police manpower is concentrated. Eighty-two percent of police personnel and seventy-five percent of police expenditures are found on the local government level.[7] Municipal and county executives and their legislative bodies need tools to intelligently assess the merits of demands for increased police manpower and for higher police wages. Police administrators need guidelines for not only achieving their maximum objective, but for the achievement that is reflective of least-cost principles. This study expects to contribute such knowledge.

Economic productivity is not a new concept in police administration. It is a "notion" that has always informally pervaded the occupation. Recently there have also appeared several formal presentations of police productivity issues, principally by the National Commission on Productivity. The latter, good works that they are, differ significantly from the perspective of this treatise. The ensuing does not attribute exclusivity to the crime control functions of the police. This work's originality lies in its reliance on the empirically defined police tasks within which the non-crime related functions of patrol assume deserved importance.

As indicated in the beginning of this chapter, the interest of a productivity analysis is optimality; i.e. the least input/maximum output alternative. In so far as police patrol is concerned, its "output" consists of the various services it performs per unit of time. Patrol "inputs" are, of course, costs of manpower, capital, equipment, and energy extended per unit of time. Since the substance of this work is to propose meaningful assessment techniques for patrol productivity, its cost and for their optimal relationships, this study must first define patrol outputs and inputs. Moreover, and as previously discussed, because of the premium that productivity analysis placed on quantification, the definitions of patrol services and costs must focus on those that are reasonable measurable. The above premises dictate the logic of the following format for this treatise:

Chapter I reviews literature pertaining to police productivity and points out the demarcation point of this study. Chapter II is devoted to highlighting the limitations of productivity and cost analysis to the police role. Methodological difficulties particular to this research are also covered.

Chapter III commences the discussion of patrol output beginning with the general configurations of police patrol as revealed in literature and in the Racine

experience. The nature of output encompassed by the preventative patrol (proactive) function and ancillary administrative tasks is pointed out. The difficulties of measuring the latter categories of patrol work are discussed.

Chapter IV presents an analysis of patrol output as reflected in the response (reactive) function. Since this category of patrol work best lends itself to measurement, a detailed classification of activities constituting the response function is made.

Chapter V is used to further define patrol output. It specifically addresses itself to the preventative patrol (proactive) function and on-duty administrative tasks.

Attention turns to the "input" side of the patrol productivity issue in Chapter VI. A procedure for estimating and allocating the costs of the various patrol activities is developed.

Chapters VII and VIII propose a methodology for estimating the productivity of municipal patrol. The focus is on a systematic technique and measurement. Main principles are presented in Chapter VII. The subsequent chapter proposes quantifiable indices for patrol productivity assessment.

A summary of the study and its salient conclusions are presented in the culminating Chapter IX. A compendium of data about the City of Racine and its police department is found in the Appendix. The appendix also incorporates a summary of recommendations for researchers and practitioners who may seek to adopt for their own use the productivity and cost analysis methodology developed in this treatise. Availability of requisite patrol work data is discussed.

INTRODUCTION NOTES

[1]U.S. Department of Justice, Sourcebook of Criminal Justice Statistics, 1973 (Washington, D.C., Government Printing Office, 1973), pp. 24-25.

[2]Ibid.

[3]Ibid., p. 82.

[4]Cited in John W. Kendrick, Postwar Productivity Trends in the United States, 1948-1969 (New York: Columbia University Press, 1973), p. 1.

[5]Orlando W. Wilson, Police Administration (McGraw Hill Book Co., 1963), p. 231.

[6]Mollie H. Bowers, Labor Relations in the Public Safety Services (Chicago: International Personnel Management Association, 1974), p. 33.

[7]U.S. Department of Justice, Sourcebook of Criminal Justice Statistics, 1973, op. cit., pp. 24-25.

CHAPTER I

POLICE PRODUCTIVITY IN LITERATURE

The Meaning of Productivity

At its most succinct, productivity means the amount of goods or services produced by a factor of production per given unit of time. Productive factors, or inputs, such as labor, capital, land or energy by themselves or in combination yield goods and services; i.e., output. The use of inputs is determined by the nature of the desired output, one can hardly expect an appreciative smile from a vending machine, but primarily by the relative scarcity of people, machines or energy. If man knows which combination of inputs and techniques yield the most goods or services, he can make better decisions on the utilization of resources. This is why the measurement of productivity is so important. If the productiveness of the various resources could be quantified, the choice of alternative combinations of inputs and methods could be more rational.

Productivity can be measured in two basic ways. One means relates the product of a firm, an industry or an economic sector to a single factor such as labor or

capital. The other way, and by far the more complex one, seeks to associate output to the relative importance of the various inputs that go into the productive process. The latter techniques of measurement, called the total factor measures, have not yet reached the level of common acceptance. The most widely used measure of productivity using a single input relates the output of goods and services to the input of labor time. It is usually expressed as output per man hour or, in the reciprocal, as the unit of labor required for a given quantity of the product. The wide use of the labor productivity measure is due to the relative ease with which it can be quantified and, more importantly, because labor is proportionately the single most significant factor in the economy.[1]

It follows that a preoccupation of productivity students is with its growth, particularly increases in labor productivity. From the point of view of general welfare, the alternatives that greater labor productivity offers are most pleasing. Increase in output per man-hour means either more goods and services per unit of labor input, or that a given amount of output can be produced with less work. This is no Scylla or Charibdis, certainly not to politicians. Many economists, if pinned to point out a concrete reason for the magnificent performance of the American enterprise, would most likely single out the growth of labor productivity. Consider

the profound implications of this approximation: "The average worker in the United States today produces more than six times as much in an hour of work as did his grandfather or great-grandfather in 1889."[2]

Improvements in labor productivity can result from many reasons. Better quality of labor through training, education, health, etc., is the most obvious in the causal chain. However, and with poignancy to many occupations, a degreed electrical engineer would not be better at replacing light bulbs than a janitor and would not be worth more for doing that kind of work. Investment in the education of the workforce raises its productivity. It does not necessarily mean though, that the more education the more productivity. Alternative sources for productivity imporvement, such as investment in tangible capital, may yield higher output per unit of labor. To be relegated to a ditch digger with a Bucyrus-Erie dragline is no derogation.

The largest growth in productivity of labor and of capital in America is attributable to the more efficient use of both. While the primary meaning of productivity focuses on the ratio of labor input to output; i.e., the fruitfulness of human labor in varying situations, productivity also encompasses the notion of the most efficient use of not only labor but capital and other factors. To put it another way, the maximum output per specific unit

of input may not be the optimum product when the combination of inputs is considered. Greater efficiency is related to technological change, innovation, economies of scale, political stability and to many other cultural and socioeconomic characteristics. Of the estimated 2.5% annual growth in labor productivity since 1889 in the private sector of the U.S. economy, one student attributes 1.5% to efficiency with imporvement in the quality of labor and increases in tangible capital sharing equally the 1% balance.[3]

When the governmental sector is taken into account, the estimated growth in labor productivity since 1889 declines to about 2.0% per annum.[4] The relative unproductiveness of governmental workers can be theoretically attributable to many causes. Inherent conservatism of governmental institutions, vagaries of political climate, monopolistic inefficiencies, the necessity to meet ideals as well as economic needs, are but a part of the many influences that substantially differentiate the governmental from the private sector. Most significant, however, is the fact that government distributes complex, "undivisible" products (justice, social security, protection, etc.), which, in the first instance, are exceedingly hard to measure and secondly, consist of highly labor intensive services. The latter do not easily lend themselves to the use of, for example, significant amounts of

tangible capital, thus precluding this source for productivity growth and minimizing the opportunity of alternative factor mixtures for greater efficiency. Of course, there are conspicuous exceptions. The present day military is highly capital intensive. Or the TVA, for example, sells measurable kilowatts of electricity and competes with private power sources.

Productivity and the Police

The subject of the treatise, the police, is quite illustrative of the difficulties of applying productivity analysis to most governmental services. Police services are "undivisible," i.e., everybody pays via the tax route for the sense of greater community security the police are presumed to provide. Of course, some may argue that divisibility is not beyond feasibility. Private security agencies sell their services on a "parcel" basis to individual consumers. However, if one accepts the commonly desired police outputs, it is clear that "undivisibility" of police services is a permanent fixture on the economic landscape.

Within its list of major current responsibilities of a typical police department, the American Bar Association includes: protection of constitutional guarantees, identification of community problems, maintenance of a feeling of security, and promotion and preservation of

civil order.[5] Clearly such police "output" is beyond quantifiable productivity measures.

The police function is also illustrative of the labor intensivity of governmental services. In a survey of police department budgets of over 1,000 cities, the International City Management Association found that the mean per capita 1970 police expenditure was $21.87, of which $19.95 (87%) consisted of labor cost; $0.92 (4%) were capital outlays; and $2.00 (9%) represented other expenses.[6] Similarly, a 1969 tally of the police expenditures of twenty-three Illinois municipalities indicated that 82% were for personal services, 3% for capital, and the remaining 15% for miscellaneous other outlays.[7] It can be readily concluded, given the traditional role of the police, that improvements in police productivity are most contigent on the efficient use and the quality of labor. It is these aspects that the recent formal police productivity studies have emphasized.

There are three main sources of studies on police productivity: The National Commission on Productivity, the International City Management Association and The Urban Institute. The works of these agencies on police productivity are highly inter-related. The main statement of the ICMA on productivity of police is found in its 1973 yearbook.[8] It is based on a 1972 research report by the Urban Institute, The Challenge of Productivity

Diversity Improving Local Government Productivity Measurement and Evaluation Part III -- Measuring Police-Crime Control Productivity.[9] Furthermore, the Urban Institute and the IMCA prepared a joint report in 1972 for the National Commission on Productivity which covered essentially the same substance on police productivity as in the previously mentioned publications.[10] As a consequence, the to-date magnum opus, Opportunities for Improving Productivity in Police Services (1973), prepared by the Advisory Group on Productivity in Law Enforcement, National Commission on Productivity,[11] contains some replication of the concepts and recommendations discussed by ICMA and The Urban Institute. Review of periodical literature indicates that an extensive and recent article on police productivity by Hirsch and Riccio (1974),[12] is based on the research done by the National Commission on Productivity and it encompasses a part of the same material as found in the Commission's report. Messrs. Hirsch and Riccio served as staff to the Commission's Advisory Group on Productivity in Law Enforcement. Because of the inter-relatedness of police productivity literature, its review will be grouped first by a summation of the Urban Institute/ICMA research, then the capsulation of the Commission's study and the Hirsch/Riccio findings and, lastly, other pertinent literature will be noted.

The Urban Institute/ICMA research sought to develop inter-city police productivity measurement techniques.[13] Their approach placed emphasis on the crime control function of the police. Traffic enforcement and regulation or miscellaneous non-criminal services of the police were excluded. The crime control function was assumed to consist of prevention (deterrence) and of apprehension. Productivity was interpreted within this context.

Analysis of data indicated that the variation in the socioeconomic characteristics among municipalities severely limited the development of productivity measures having inter-city validity. The study suggests the need for grouping of cities by similarity of characteristics for making of productivity comparisons. While cautioning on the use of their measures for comparisons among different jurisdictions, the Urban Institute/ICMA study recommends two sets of indices for estimating the productiveness of police output. The first category consists of measurements for which data is normally presently available. These are: crime rates and changes in crime rates for reported crimes; clearance rates of reported crimes; population served per police employee and per dollar; arrests per police department employee and per dollar; and clearances per police department employee and per dollar.[14]

Measurements which are recommended but which require significant additional data gathering are: crime rates, including estimates of unreported crimes from victimization studies; clearance rates based on victimization studies; percent of arrests that lead to conviction; percent of arrests that "survive" preliminary hearings in courts of limited jurisdiction; average response times for calls for service; percent of crimes cleared in less than "X" days; percent of population indicating a lack of feeling of security; and percent of population expressing dissatisfaction with police services.[15]

By far the most comprehensive exposition on police productivity is the previously mentioned report by the National Commission on Productivity[16] and its partial replication by Hirsch and Riccio in a 1974 issue of The Journal of Police Science and Administration.[17] The sources for the many ramifications of increasing police output that this report explores are the collective wisdom of the Commission's Law Enforcement Advisory Group; the results of survey administered to 40 police agencies throughout the nation; and a gleaning of contemporary police literature on issues bearing upon productivity. In essence, it is a study conducted by law enforcement professionals for their managerial peers. It is a useful and a precocious document which seeks to formalize and

to structure the concept of productivity in police work. However, while its sources provide the richness to its conclusions, they also represent the report's weakness. Not unlike the approaches taken by ICMA/Urban Institute studies, exclusivity is placed on the police crime control function at the expense of the non-criminal and regulatory duties of the police.

The Commission brings to bear four perspectives on police productivity improvement: (a) increasing performance without corresponding increase in cost; (b) concentrating on police activities which yield the highest output per expenditure; (c) increasing the probability that given police objectives will be met; and (d) maximum utilization of police talents.[18] Three basic strategies are recommended to achieve higher productivity. The most general, and perhaps least original, are various suggestions on the improvement of skills.[19] Within the latter are found the familiar concepts of lateral entry, specialist and generalist career path choices, manpower planning and improved training. The analysis of the various alternative for improving police skills serves as a useful reiteration of techniques presented by the 1967 President's Commission on Law Enforcement and Administration of Justice and the 1973 report by the National Commission on Criminal Justice Standards and Goals.

The second main strategy for improving output is crime-specific programming. The Commission's recommendations are based on the apparent success of six California departments to reduce residential burglary through crime specific deployment of police personnel.[20]

The third strategy and the one that seems to receive the preponderance of attention is more effective use of uniformed patrol.[21] The work objectives of the patrol force are conceived to be deterrence of crime, apprehension of criminal offenders and satisfaction of public demands for non-crime services. The latter, however, in relation to crime, receives but a minimal examination. The overall means by which the Commission envisions the achievement of greater patrol output are: "civilianization" or releasing sworn personnel for street duty; increasing the real patrol time of assigned officers by eliminating all unnecessary administrative duties; and the strengtheing of the patrol's impact through reduction in dispatch, queue and travel delays.

The recommended indices for measuring the productivity of patrol operations are presented in the form of ratios. To illustrate: The productivity index for overall patrol availability would be the ratio of patrolmen assigned to street patrol work to the total patrolmen on the force. A measure of real patrol time committment would be the ratio of patrol man-hours contributing to

patrol objectives to total patrol man-hours. Similarly, the suggested productivity indices for apprehension are, for example, the ratio of arrests surviving first judicial screening to total patrol man-years or to crime related calls for service for a given time period.

The New York City Police Department sought to put into practice several of these programs to raise patrol productivity. This experience no doubt served to influence some of the recommendations made by the Commission. During 1972-73 period, an attempt was made to release more sworn personnel for patrol duty through "civilianization" and to increase the effective patrol time of those assigned by reducing time in station through a "central booking" procedure.

In the "civilianization" program, the 563 new civilians hired for headquarters duty released only 256 officers for street patrol. The experience on the precinct level was somewhat better. The 412 civilians hired released 367 patrolmen for street work.[22] The program for increasing the effective patrol time of those already assigned through central booking has yielded some beneficial results. Central booking was established in Queens, the Bronx and Staten Island precincts. Evaluation of the 1972-73 results, indicates a reducation of overtime, a better quality booking practice, but no, as yet, noticeable change in police patrol time.[23]

An article in a 1973 issue of The Journal of Police Science and Administration by Holzer, serves as a convenient synopsis of the applicability and limitations of productivity analysis in police service.[24] Unique to other literature on police productivity, Holzer distinguishes between "internal" and "external" output. Internal output is considered to include police agency activities such as vehicle maintenance, training or certain clerical functions. External output he categorizes as police services rendered for use outside the organization itself; e.g., apprehension of offenders. He suggests measurements for each type of output. While some utility can perhaps be drawn from such a conceptual framework, it is clear that the distinction between what is external or internal output of a police organization is, at best, a nebulous continuum. In terms of accountability to the public trust, all police output is "external."

The approaches on police productivity summarized above are useful and will perhaps serve to advance a greater level of consciousness in the need to consider the cost of the benefit gained from alternative police operations. However, there are inadequacies in the to-date treatment of police productivity issues.

The contemporary productivity improvement formulations tend to draw their conclusions from an a priori conceptualization of what the police do rather than from

empirical studies of police output. For example, the Commission's report rightly assumes that patrol objectives are deterrence of crime, apprehension of offenders and satisfaction of public demands for non-crime services. However, there is no data base provided as to what proportion of patrol time is, on the average, actually spent on these activities. The output measurements thus proposed have an undefined relationship to operational concreteness.

The second factor rendering the to-date police productivity approaches problematic is the theoretical posture taken. Invariably, the studies cited draw their prognosis in terms of "ought" rather than "is." Crime deterrence and apprehension of criminal offenders is their preoccupation. This is a fallible emphasis for measuring the quantity and quality of police output. On the average, one out of five Americans have occasion to call upon the police for assistance.[25] But, and this shall be substantiated later, only approximately twenty percent of such calls deal directly with crime. Moreover, indications are that only a portion of police patrol time is committed to responses to requests for service. The preponderance is used for preventative patrol purposes; an activity under question as to its actual and potential fruitfulness in terms of crime deterrence.

Consequently, this research aspires to embark on a study of police productivity with perspectives that are substantially different from those previously taken. The theroretical posture of this treatise views the police patrol function as a public service organization strategically suitable to respond to citizen requests for assistance some of which are criminal, or otherwise of conflict generating nature, requiring the potential exercise of lawful coercive force. This stance serves to shift the methodology by which police productivity is defined and its measurement indices developed. By necessity, and contrary to the studies of productivity reviewed earlier, this study must rest on the empirical record of consumed time for the variety of services performed by police patrol including, with conspicuousness, services that are not related to crime.

CHAPTER I: NOTES

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[3]Ibid., Chapter VI.

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[11]National Commission on Productivity, Opportunities for Improving Productivity in Police Services (Washington, D.C.: National Commission on Productivity, 1973).

[12]Gary B. Hirsch and Lucius J. Riccio, "Measuring and Improving the Productivity of Police Patrol," Journal of Police Science and Administration, Vol. 2, No. 2 (June, 1974), pp. 169-184.

[13]The Urban Institute and The International City Management Association, op. cit.

[14]Ibid.

[15]Ibid.

[16]National Commission on Productivity, op. cit.

[17]Hirsch and Riccio, "Measuring and Improving the Productivity of Police Patrol," op. cit.

[18]National Commission on Productivity, op. cit., pp. 1-3.

[19]Ibid., Chapter 5.

[20]Ibid., pp. 39-40.

[21]Ibid., Chapter 3.

[22]Citizen's Budget Commission, Inc., New York City's Productivity Program: The Police Department, Mimeo (New York: Citizen's Budget Commission, Inc., November, 1973), pp. 10-11.

[23]Ibid., pp. 17-19.

[24]Marc Holzer, "Police Productivity: A Conceptual Framework for Measurement and Improvement," Journal of Police Science and Administration, Vol. 1, No 4 (December, 1973), pp. 459-467.

[25]American Institute of Public Opinion, Study No. 757, cited in U.S. Department of Justice, Sourcebook of Criminal Justice Statistics -- 1973, op. cit., p. 138.

CHAPTER II

THE POLICE TASK: LIMITATIONS AND OPPORTUNITIES OF AN ECONOMIC ANALYSIS

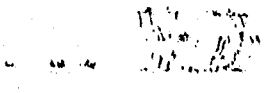
The interest of an economist in the police task, as in public policy in general, gravitates around the concept of "optimality"; i.e. in essence, which decision will yield the highest return for least expenditure from an array of possibilities. To put it in another way, the production of goods and services, public or private, entails inputs and outputs. Inputs are land, labor, capital and energy, each of which by itself or more usually in combination, yield a desired product or service. One concern of optimality analysis is therefore maximum productivity of inputs in terms of output yield. However, the economists do not stop there. The "best" decision is not necessarily the one producing the maximum but rather, the one which yields the optimum; i.e. the greatest output per least input (cost). It can be consequently seen that the notions of "productivity" and of "cost" are the building blocks of optimality analysis.

Limits of Productivity and Cost Analysis to the Police Role

How applicable are these concepts to police service? In the last analysis, they are useful and meaningful but only on the lower levels of police policy formulation. The reasons for such a conclusion are reasonable apparent. Main police decisions are made on other than economic grounds. The enforcement of the law and the maintenance of public peace are functions rationalized by the entirety of the sociopolitical ethic in a community and not by economic considerations alone. Furthermore, economic analysis is limited to lower levels of police policy formulation because the method itself places a premium on quantification. It so happens that measurability in policing is difficult; much of what police do is a highly intangible product.

Before the usefulness of an economic study of policing can be appreciated, a more thorough listing on inherent limitations is in order. The ensuing commentary will therefore cover "limitations" as they apply to the overall police function and subsequently, as they pertain to this study of police patrol in particular.

The American Bar Association, for one, identifies eleven major current responsibilities of a typical police agency:



1. "To identify criminal offenders and criminal activity and, where appropriate, to apprehend offenders and participate in subsequent court proceedings;

2. To reduce the opportunities for the commission of some crimes through preventative patrol and other measures;

3. To aid individuals who are in danger of physical harm;

4. To protect constitutional guarantees;

5. To facilitate the movement of people and vehicles;

6. To assist those who cannot care for themselves;

7. To resolve conflict;

8. To identify problems that are potentially serious law enforcement or governmental problems;

9. To create and maintain a feeling of security in the community;

10. To promote and preserve civil order; and

11. To provide other services on an emergency basis."[1]

Mere scrutiny of the above listed police responsibilities is sufficient to indicate that much of what the police do is beyond reasonable measures of productivity and consequently, beyond a clear relationship to cost of service.

The first problem evident in seeking to relate productivity and cost of police services can be expressed by the rhetorical querry, "What price ritual?" Protection of constitutional guarantees is a long acknowledged police service objective in a democratic state.[2] Moreover, there

is an implied mandate upon the police to perform their functions in a manner which in itself maintains the values of a democratic legal order.[3] To the extent then, that the police undertake operations which support the underpinnings of a people's political ideology, the productivity of such services is diffuse, intangible and beyond comparison to cost.

The police as part of the criminal justice system are integral to the notion of crime deterrence. Here is meant not their capability, or lack of it, to prevent specific crimes, but police as the living embodiment of the law; the symbol of unremitting justice on the perservering prowl. The the extent that the police, through its "institutional presence," deters criminal behavior, an unproven yet an intuitively persuasive argument, the productiveness of such services is beyond measurement.

The loss of life and property resulting from, for example, the Boston police strike of 1919 and from the more recent walk-out by Montreal officers in 1969, indicates the paramount role of the order maintenance function of the police. It can be proposed, therefore, that the police through their order maintenance activities aid in creating and maintaining an environment conducive and necessary to economic prosperity and consequently, contribute some share to the annual gross community product. While the productivity of order maintenance services is

therefore more tangibly grasped than, for example, the productivity of police as a crime deterrent, such productivity is nevertheless an unmeasurable quantity.

The related responsibility of the police to enhance the sense of community security, perhaps one of the most prominent of police service goals accepted by the public and by the occupation itself, is again a nebulous concept in terms of productivity and cost. Clearly the feeling of community security is influenced by more than the quantity and quality of police endeavors. Tolerance for social stress differs among groups; women seem to be more fearful of some crimes than men, the propertied ostensibly have more to lose from larceny than those without. Communities also adjust to different levels of social disorganization. A burglary in "Elm Grove" may prompt a stream of angry calls to the chief to get his department in order. The same offense in Chicago may be accepted as inevitable as a rainy day. Moreover, as the 1967 Presidential Commission implied, the feeling of community security may be more a function of what enters the media rather than what enters the local police budget.

The relationship between productivity and cost of some police services on the micro plane is equally confounding. "A horse, a horse, a kingdom for a horse!" cried Richard III, succinctly expressing the dilemma at

issue. To the extent that a police officer disarms a murderous robber or saves a drowning child, admittely infrequent but reoccuring police acts, such services are beyond measurement in the economic realm.

The fact remains, however, that some police functions, such as criminal apprehensions, preventative patrol, assistance to citizens, traffic control or conflict resolution can be, at least roughtly, approximated as to some measures of achievement and its cost. Relative time consumed, for example, for the above activities of the police can be reasonably estimated. Given the time estimates, the relative cost of these various tasks can be calculated and certain productivity indices defined; e.g. the frequency of specific tasks associated with above functions per unit of time. Not all is totally ambiguous in applying economic optimality analysis to police service.

Methodological Difficulties Particular to this Study

This study seeks to define the work output of a uniformed police patrol operation, to develop measurable productivity indicators based on output definitions, relate performance to cost of services, and lastly, to propose maximum productivity at least cost patrol deployment alternatives. The emphasis is not on redefining police objectives on an *a priori* basis and then proposing

productivity and least cost principles for their achievement. The focus is on the police patrol objectives implicit in a "typical," contemporary operational milieu. To put it another way, this treatise does not seek to arrive at new operational programs for the achievement of patrol objectives such as, for example, team policing, but rather to develop tools for estimating the productivity and cost of general, present day patrol strategies.

By necessity, therefore, the study must rest on an empirical assessment of patrol output. The data utilized are the calendar 1973 operations of the Racine Police Department (Particulars about the City of Racine and its police department are found in the Appendix). Since the proposed productivity and cost assessment techniques are primarily derived from the Racine patrol experience, the methodology in gathering the pertinent data shall be described here. Subsequently, the limitations of the data as to the purpose to which it is applied will be pointed out.

Methodology of the study

Police patrol, unique to other public agencies, operates on a 'round-the-clock' basis. In the course of the twenty-four hour day, each of the three patrol shifts engages in three general categories of activity: responses to requests for patrol service by citizens, preventative

patrol while not on call, and ancillary administrative tasks. The analysis of the 1973 Racine police patrol work records sought to measure time spent on the three broad categories of patrol activity and the various work sub-categories therein, to develop quantifiable indices for such activities, and to allocate costs for the identified operations. Subsequently, the analysis pertaining to the Racine police patrol output serves as a foundation to generalize productivity and cost assessment principles for police patrol as a whole.

The main empirical interest in the Racine Police Department was to define what in fact does the patrol force do and how much time does it spend doing it. The approach taken was first to calculate the total patrol unit hours deployed in calendar 1973. A patrol unit was defined as a single officer car or cycle assigned to a regular beat specifically for the purposes of overall patrolling; there were no walking beats in 1973 in Racine nor, under normal circumstances, two-men cars. Total available patrol unit hours were then derived by multiplying the number of basic beats by twenty-four hours by 365 days of the calendar year. (Specific methological steps are covered in the sections of this treatise dealing with the response, preventative and administrative functions respectively.)

Given total available patrol unit hours for 1973, it was then estimated how much time was consumed by responses to citizen requests for assistance; by preventative patrol activities; and by ancillary administrative duties which lend themselves to isolation from the first two patrol work categories. Definitions of specific subcategories of work output (e.g. crime related, public service, traffic, etc.) were arrived at simultaneously. All productivity and cost issues are discussed in terms of such output categorizations.

The crux of the data gathered is consumed time for the response function. The preventative patrol time consumed category was arrived at as a residual; i.e. if the patrol force is not reacting to dispatches or engaging in requisite administrative tasks, the assumption is made that it is "patrolling" for crime prevention purposes.

Total elapsed patrol time for the response function was derived as follows. (Specific exceptions to this procedure are covered in Chapter IV.) In 1973 the Racind uniformed patrol were dispatched to respond to 33,600 "complaints." Upon a reciept of a complaint, the dispatcher records the time and nature of the call, the unit assigned to respond, as well as the name and address of the complainant. When the officer assigned completes his mission, he notifies the dispatcher who then records "time completed" on the incident form and enters any

clarifications as to the nature of the incident handled. The complaint forms so accumulated in the course of the patrol day are forwarded to data processing where they are coded for entry on IBM cards. Codes by nature of incident handled, by patrol shift, by census tract, by beat area, and by time elapsed per incident are assigned. Such data is subsequently key punched on IBM cards. For the purposes of the study, the information on the 33,000 IBM cards for incidents handled in 1973 were transcribed to a magnetic tape. A program was written to extract patrol unit time elapsed by incident category, by shift, and by census tract.

The overall analysis of the Racine patrol experience included the use of other relevant operational records of the department, observation by the student of departmental practices bearing upon the data utilized for the study, and interviews of select members of the Racine police agency.

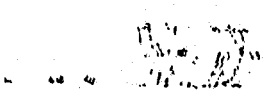
Methodological Difficulties

Since the resulting detailed tabulations of Racine patrol response experience are the primary empirical base to this study, the inherent limitations of such data need to be pointed out. Such limitations fall into several groups of observations: (a) technical difficulties in the use of operational police data for research purposes;

(b) work overlap of specialized police department units with those of uniformed patrol; and (c) the inherent arbitrariness in the classification of events handled by the police. Because this study itself is concerned with measurement of productivity and cost of police services, the ensuing qualifications as to the problems associated with the empirical quantification and definition of police output are particularly germane to the analysis throughout the body of this treatise.

Technical Problems: The recording of elapsed patrol time by the various categories of complaints, while seemingly a clear cut exercise, is nevertheless beset with serious technical problems. An incident may result in a dispatch of one or several patrol units. The time recorded for the complaint is the time from dispatch of the first unit to the departure from the scene of the last unit. Aggregation of consumed time for the response function therefore necessitates an estimation procedure to account for total unit time consumed per incident rather than net patrol time per event. Similarly, patrol units in the proximity of the incident often voluntarily move to the scene as backup to the dispatched squad. Such response activity fails to enter the records.

A record of elapsed time per incident can be distorted as a matter of varying procedure dictated by



circumstances or officer initiative. For example, a police report on the incident may be prepared immediately after the event whereby the officer does not notify the dispatcher as to his re-availability for service until the report is completed. However, some reports are prepared subsequent to the event, in the course of further on-shift duty, thus reducing the amount of elapsed time officially recorded for the particular incident handled. There also exists the ambiguity of determining whether the incident properly falls in the response function output category or should be classified as officer-initiated activity arising during "on-view" preventative patrol duties. A squad car flagged by a passerby which results in an investigation, is illustrative of such ambiguity. Moreover, some dispatches of patrol units originate from command directives rather than citizen calls for service; i.e. an information gathering run pertaining to an investigation. It can be argued that both the exclusion or the inclusion of such elapsed patrol time in the response function distorts it.

Overlap of Responsibilities: The Racine Police Department, as other larger police agencies, includes in its organizational structure units which specialize in certain police tasks: Criminal Investigators; Juvenile Investigators; Traffic Investigators; and an Animal

Control Officer. These specialized units normally work at least the first and the second shift and often have men in the field available for dispatch. Some calls for service may be routed directly to these units. Usually, however, it is the uniformed patrol officer who arrives on the scene first and is subsequently joined by the specialists. In either case, the response activity of the specialized units does not get into the official record as consumed time for the response function understating the significance of police in answering citizen requests for service.

Arbitariness Inherent in Classification of Events Handled by the Police: A serious problem from the point of view of data generated by the Racine Police Department and from research methodology in general, is the inherent ambiguity in police work which makes the classification of events very difficult. For example, inter-personal conflict situations, a frequent event to which police patrol are asked to respond, may show on the records as a mere disturbance, as a disorderly conduct case, or in the extreme, as a felonious assault. Similarly, a complaint dealing with "kid trouble" may be a mere inconvenience to the complainant due to a noisy ball game, a street fight, or an out-and-out case of vandalism. How the event enters the records depends upon

subtlety of the circumstance surrounding the incident and much upon the discretion of the individaul patrol officer responding to the incident.

The study design which can address the issue of patrol output with greater authority is one where an "impartial" observer accompanies a "representative" sample of patrolmen on a "representative" number of hours in the course of their duty. However, aside from cost considerations of such a research undertaking, gaining the cooperation of the police agency and its people, non-interference into the duties of the department, elimination of the "Hawthorne effect" -- the problem still remains as to what constitutes a "representative" sample of patrol work. Officers differ among themselves, as do their supervisors. Shifts and beats are not homogenous. Seasonal variations in terms of climatic differences have a considerable effect on patrol operations; e.g. influx of tourists or the exodus of the jurisdiction's citizenry to vacationland. Even heat waves or cold spells affect police events profoundly. And of course, how can a sample of patrol output include the contingent or the unique--a civil disorder for instance?

This analysis of the 1973 Racine patrol experience relies heavily on the operational data generated by the department. Empirical knowledge so gained is valuable but

it nevertheless, lacks the degree of impartiality, of randomness which only a controlled study design can produce. The data used in this treatise could not be presumed to substantiate or to negate a rigorous scientific hypothesis relating to, for example, the effectiveness of various patrol services in meeting their desired objectives. The data from the Racine Police Department is however, sufficient to serve as an empirical profile of patrol activities upon which judgments as to the proper means for the assessment of their productivity and cost can be made.

CHAPTER III

PATROL OUTPUT: MAIN CONFIGURATIONS

Introduction

"Policing," states O. W. Wilson, "should be considered a patrol service with specialized activities developed as aids."[1] Few will argue with this concise statement on the essence of policing. Contrary to popular belief and perhaps professional mystique, the detective, long a symbol of unremitting justice, is a relatively insignificant figure in the crime picture. Detectives view their role not so much as "sleuths," but more as developers and coordinators of criminal information whereby felons at large can be identified and hopefully apprehended.[2] The police are well aware of the fact that a criminal, if not apprehended soon after his crime, especially if he has no previous record, is pretty much a "gone bird." A study of burglary in six California cities indicates that the vast preponderance of burglary arrests are made by uniformed patrol officers within a 24 to 48 hour period after the crime. Thereafter, clearances are few.[3]

As there is little disagreement that the uniformed patrol for all practical purposes is the police, there is also seemingly no disagreement as to its ultimate role. Again, according to O. W. Wilson: "The elimination of the actual opportunity, or the belief in the opportunity for successful misconduct is the basic purpose of patrol."[4] The International Association of Chiefs of Police is just as unequivocal: "Law enforcement agencies have a specific task to perform for the communities they serve. First and foremost, crime must be controlled and prevented. When police fail in this primary duty, they then must perform a variety of duties designed to apprehend the offender and to recover stolen property."[5] The recent National Commission on Criminal Justice Standards and Goals is no less emphatic: "Every police chief executive should emphasize the need for preventative patrol to reduce the opportunity for criminal activity . . ."[6] Even the police line seems to agree on this with their hierarchy. A survey of 178 patrolmen as to their views on the most important function of the police department found that only fifteen officers did not agree that the preventative patrol function is it.[7] The public, when given the choice of indicating its view whether the police should be catching crooks or preventing crime opted two-to-one for the latter.[8] However, in another survey, and foreshadowing

the ideal versus the real in police crime prevention capabilities, the public went two-to-one for the affirmation that it is society in general, rather than the individual, that is responsible for crime and lawlessness.[9]

In the ideal crime prevention is considered the primary function of the patrol. However, police recognizes that it has the responsibility to respond to calls for service dealing with criminal and non-criminal incidents. The deployment patterns that the patrol characteristically follows are closely related to the history of overall called-for-service occurring in a particular city area.[10]

At its broadest, patrol time can, therefore, be broken down into two categories: patrol designed to inhibit criminal conduct, preventative patrol and patrol time utilized to respond to the miscellany of citizen assistance requests. Preventative patrol is theoretically intended to be a highly aggressive activity. The officer checks doors, searches alleys, questions suspicious persons and in general keeps a sharp eye out for the unusual on his beat. At its most passive, patrol consists of a marked car cruising on-view. In effect, when a patrol officer is not responding to a call, an activity that consumes time for arrival, investigation and follow-up such as booking in the case of an arrest, he is on preventative patrol. Of course, some of the latter time may

be spent on personal tasks, on administrative duties, or outright loafing.

What is the distribution between committed (responsive) and uncommitted (preventative) patrol time? A pre-World War II study in Wichita showed that the average patrolman spent less than 10% of his time on called-for services. The balance was devoted to preventative patrol and, by implication, to administrative tasks.[11] A 1952 study of the London Metropolitan Police indicates that its constables, on the average for all shifts, spent 54% of their time in preventative patrol.[12] Kakalik and Wildhorn (1971), find that a patrolman in Los Angeles spends 31% of his time on preventative patrol. The remaining 69% is applied on responses to calls, observation arrests, break time, court appearances and the like.[13] The corresponding ratio for Phoenix policemen was 23% to 77%.[14]

In a 1969 study of the South Bronx precinct, New York Police Department, Skelly found that on the average 53% of a foot-patrolman's and 36% of a motorized patrolman's time was spent on preventative activity. The remainder was devoted to responses, administration and personal breaks.[15] A recent study of Kansas City Police Department, a study marked by experimental controls, showed that for a ten week period, 60% of the mobile

patrol officers' time was not committed to responses or observational arrests.[16]

To summarize, anywhere between 30% to 60% of patrol time is typically devoted to preventative, non-committed time activities, the fruitfulness of which depends much upon the nature of the beat and the initiative of the officer. The reciprocal, from 70% to 40% of time, is spent on answering citizen requests for assistance.

Main Configurations: Racine Patrol Division

Table I summarized the 1973 organizational structure of Racine uniformed patrol. The structure represented is the "mean" about which some fluctuations occurred in the course of the year. For example, the third shift reduced its squad areas to seven in the summer months because of constraints on available manpower resulting from vacation bound officers. The emphasis throughout this study falls on the mainline of the patrol division--the units regularly assigned to patrol their respective squad areas. The cycle officers on the first and second shifts are also included in the ensuing data. These officers, because of their mobility in traffic and in hard to reach places generally cover the downtown section and parks of the city. Command personnel, officers

TABLE 1.--Racine Uniformed Patrol Structure, 1973.*

CHIEF OF POLICE

Assistant Chief of Police

First Shift--8 Squad Areas	Second Shift--11 Squad Areas	Third Shift--9 Squad Areas
(1) Watch commander-Captain	(1) Watch commander-Captain	(1) Watch commander-Captain
(1) Dispatch sergeant	(1) Dispatch sergeant	(1) Dispatch sergeant
(1) Roll-call sergeant	(1) Roll-call sergeant	(1) Roll-call sergeant
(1) Garage sergeant	(1) Garage sergeant	(1) Garage sergeant
(3) Patrol sergeant	(2) Patrol sergeant	(2) Patrol sergeant
(3) Cycle patrolman	(3) Cycle patrolman	
(8) Squad patrolman	(11) Squad patrolman	(9) Squad patrolman
Wagon	Wagon	Wagon
Radar Unit(s)	Radar Unit(s)	

*Represents the basic structure which may fluctuate due to manning problems and unusual demands for service.

assigned specifically to radar units for traffic enforcement and patrolmen manning the paddy wagon are considered as patrol support. These do not usually take calls of primary dispatch but at times provide back-up cover to squad patrolmen.

In addition to the patrol division, the department, as other larger police agencies, maintains specialized field units: detectives, juvenile investigators, traffic investigators, undercover investigators, and an animal control officer. Of course, the Racine Police Department also maintains divisions required for administrative support; i.e. records, jail, administration, and community relations. (Please see the Appendix for particulars.) A uniqueness of the Racine patrol as a larger police agency is that its squad units are manned by single officers. However, manpower savings realized from this practice are nullified as standard operating procedures call for the dispatch of back-up units in the vast majority of incidents handled by the patrol.

The Racine uniformed patrol force has the responsibility to respond to citizen requests for service and to undertake preventative patrol duties while not on call. There are, however, officers in the department holding the rank and title of patrolman but whose duties are specialized, such as communications, records, or "paper"

servers. Such personnel are excluded from the definition of a "patrol officer." The patrol division is, in the preponderance of circumstances, the first police unit to arrive on the scene of the event for which police services are requested. If the incident is such where it requires the participation of a specialized Racine police division, the patrolman has the responsibility of protecting the scene of the incident until specialists arrive. A traffic accident resulting in personal injury, for example, requires the presence of a traffic investigator. Similarly, criminal incidents, especially more serious offenses, are usually investigated by detectives. In both of the above illustrations, the patrolman would be present only for the preliminaries surrounding the event. However, some calls are routed directly to specialized units. Since the 1973 elapsed time per incident data was kept only for uniformed patrol dispatches, it is not known how much of the patrol response function has been absorbed by the specialized units of the Racine Police Department. Research indicates that such "absorption" occurred primarily in the areas of criminal incidents, animal control, traffic and events pertaining to juveniles.

Racine uniformed patrol is deployed throughout its jursidiction on the basis of demand for services experience with emphasis on criminal incidents. Squad areas

are generally stable but are periodically readjusted to take into account pronounced workload changes or manning problems.

An important concept throughout this study is the patrol unit hour. The latter is defined as an hour of deployed uniformed patrol time per standard unit of patrol. In the case of the Racine patrol division, a unit of patrol is considered a car manned by a single officer or a cycle. There were no walking beats deployed by the department in 1973. Patrol cars, with occasional exceptions, were manned by one officer. In other police jurisdictions a unit of patrol could be considered a two-man squad, a scooter officer, a walking beat-man, etc. The "patrol unit hour" is an essential element in the development of patrol productivity and cost assessment techniques later in this treatise.

In 1973 the Racine police department deployed a total of 89,350 patrol unit hours. The figure was arrived at by multiplying the number of basic patrol units, squads plus cycles, on each shift by eight hours by 365 days of the year and summing all shifts. The gross patrol unit hours deployed were subsequently reduced by 10% to account for day-to-day deployment reductions necessitated by officer absences due to sickness or other leave. The 10% reduction factor was based on an estimate derived from manning records of the average strength per

TABLE 2.--Distribution of Estimated Consumed Patrol Unit Hours for the Response Function, Preventative Function, and Ancillary Administrative Tasks; Racine Police Department, 1973.

	Number	%	Total
Patrol Unit Hours Deployed in 1973:			89,350
Hours Consumed on the Response Function: (Activity: Dispatches on crime related calls; conflict resolution calls; traffic related calls and sundry non-criminal calls.)	30,111	34%	
Hours Consumed on the Preventative Function: (Activity: Arrests and informal resolution of officer observed events; enforcement of traffic ordinances and criminal laws; patrolling to deter and eliminate criminal opportunities.)	36,112	40%	
Hours Consumed on Ancillary Administrative Tasks: (Activity: On-duty court appearances, preparation of reports; official breaks; and on-duty time for repairs of defective equipment.)	23,127	26%	
Total Patrol Unit Hours Deployed and Consumed:	89,350	100%	89,350

shift during the 1973 period. Supervisory personnel's time as well as patrol support (paddy wagon, radar units) time are not counted in the total patrol unit hours deployed. The focus is on the beat patrolman, the sum and substance of municipal policing. However, it should be understood that command and support personnel respond to some calls and may also undertake "on-view" patrolling activity. Their treatment here, as is intended in principle, is to consider supervisory and supportive staff as patrol "overhead" whose costs are allocable to the line activity.

What was done during these 89,350 patrol unit hours that the citizens of Racine "purchased" from their police department? What main classes of services constitute uniformed patrol "output"?

Table 2 presents a profile of Racine patrol activities on the basis of patrol unit hours consumed for the response function, the preventative function and ancillary administrative tasks. It can be seen that of the total deployed patrol unit hours, 89,350, the patrol division devoted 30,111 (34%) hours to called-for services. Administrative tasks consumed an additional 23,127 (26%) hours. The largest share, 36,112 (40%) of time was spent on preventative patrolling including such activities as checking doors of business establishments, making

observation arrests of criminal law and ordinance violators, and otherwise investigating suspicious persons or circumstances as perceived by the patrol officer.* The hours consumed by the preventative function were arrived at as a residual given the quantification of time consumed for the response function and administrative tasks. The preventative patrolling activities do not lend themselves to reasonable measurement. It is a function representing a "gray" area of police business in terms of productivity assessment. This aspect will be explored later in more detail.

Throughout the balance of this study the analysis of the Racine patrol experience and the development of productivity and cost measurement techniques are executed on the total patrol operations level. The discussion does not go to the detail of distinguishing between shifts and beats, for example, because the productivity and cost assessment methods developed have pertinence to the entire patrol organizational scale; from the total patrol division to a single patrol unit. However, while analytical principles remain the same, homogenuity in output is not presumed. Patrol work among shifts and beats can be, and usually is quantitatively and qualitatively different.

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*For specific analysis and derivation of data in Table 2 please see: Chapters IV and V. For overall methodological problems in the gathering and interpretation of such data please refer to Chapters II, IV, and V.

Table 3 summarizes Racine dispatch activity by patrol shift for 1973. It can be seen that both the first shift and the third shift devote less time to the response function and more time to preventative patrol. In terms of calls for police service, the second shift (3:00 p.m. to 11:00 p.m.) is the "action" shift in police business.

TABLE 3.--Distribution of Patrol Dispatches by Shift, Racine Police Department, 1973.

	Dispatches*	Percent	Dispatches Per Squad
First Shift (7:00 a.m. to 3:00 p.m.)	9,382	28%	1,172
Second Shift (3:00 p.m. to 11:00 p.m.)	14,592	43%	1,326
Third Shift (11:00 p.m. to 7:00 a.m.)	9,655	29%	1,073

*The data reflects the actual number of incidents in which uniformed patrol officers were dispatched by their respective shifts to investigate. The data does not reflect activity by other divisional units of the department.

"Qualitative" differences in the patrol work load between shifts are illustrated in Table 4. The second shift, for example, investigates the preponderance of reports of robbery, theft, traffic accidents and disturbances. Moreover, it handles the majority of service

TABLE 4.--Elapsed Uniformed Patrol Time for Select Incidents by Patrol Shift, In Minutes and Percent of Total; City of Racine, Censum Tract 4, 1973*

Incident Category	First Shift	Second Shift	Third Shift	Total
Robbery	257 (16%)	775 (47%)	604 (37%)	1,636
Burglary	3,297 (37%)	2,755 (31%)	2,977 (32%)	8,929
Theft	2,126 (35%)	3,035 (50%)	869 (15%)	6,030
Vandalism	1,084 (42%)	1,027 (40%)	449 (18%)	2,560
Traffic Accidents	3,223 (26%)	5,814 (48%)	3,122 (26%)	12,159
Disturbances	1,919 (15%)	5,944 (46%)	5,057 (39%)	12,920
Traffic Enforcement	1,656 (31%)	2,528 (48%)	1,103 (21%)	5,287
Services Requested: (Rescue, House Entry, Escorts, etc.)	1,195 (21%)	2,388 (42%)	2,108 (37%)	5,691
Open Windows and Doors**	0	104 (25%)	314 (75%)	418
Drunk Driving Stops**	0	72 (18%)	334 (82%)	406

*Total minutes elapsed consists of the sum of net patrol time per complaint handled. The time elapsed shown is not adjusted for cases where multiple patrol units were dispatched.

**Officer initiated activity recorded with dispatch control.

requests such as police escort duty or assistance to enter homes. The first shift handles more reports of burglary and vandalism; no doubt reflecting the "morning after" discoveries of mischief by distraught citizens. The third shift is last in terms of traffic related incidents handled and in the second place as far as investigation of criminal events are concerned. It also leads in time shown for officer initiated activities such as discoveries of open doors and stops for drunk driving. The data in Table 4 is based on a Racine census tract area characterizable as an inner city neighborhood.

It should be noted that the data in Tables 4 and 5 are in terms of "elapsed" patrol time. This represents the sum of patrol minutes expended for all incidents in a given category for the calendar year 1973. The data is not equivalent to patrol time consumed, as per Table 2, for example. Patrol time "consumed" takes into account the time all dispatched units spend per event. The conversion from "elapsed" time per incident to "consumed" time is explained in the following chapter.

Quantitative and qualitative difference in patrol work are also found among different squad areas of the city. Table 5 presents elapsed patrol time data for select incidents by select census tract for the city of Racine. While squad areas do not share boundaries with census tracts, the socioeconomic differentials in the

TABLE 5.--Elapsed Uniformed Patrol Time for Select Incidents by Select City of Racine Census Tract, 1973*

	Total Elapsed Time in Minutes			Elapsed Time per 100 Population		
	Tract 3	Tract 10	Tract 14	Tract 3	Tract 10	Tract 14
Robbery	1,892	382	314	38	4	4
Assault	941	400	392	19	4	4
Burglary	4,846	3,102	4,090	97	32	46
Theft	5,650	9,235	4,523	11	94	51
Vandalism	2,369	2,745	2,431	47	28	27
Animal Cases	1,965	2,926	2,296	39	30	26
Disturbances	10,716	4,407	3,433	214	45	38
Rescue Runs	1,955	1,659	711	39	17	8
Assistance to Citizens**	2,033	1,309	773	41	13	9
"Suspicious" Reports	2,176	2,238	1,231	44	23	14

*Elapsed patrol time shown consists of net patrol time per incident summed for all such incidents handled in 1973. The elapsed time shown is not adjusted for cases where multiple patrol units were dispatched.

**Transportation, entry into homes for "lockouts," etc.

latter are representative of the varying workload impact that neighborhoods make on patrol beats. Census tract 3 is characterizable as an inner-city area. Census tract 10 is a "lower-middle to a working class" neighborhood. Census tract 14 encompasses what can be described as the "affluent" north shore seciton of the city.

The following two chapters will be used to reduce the overall profile of patrol output to its progressively more specific components.

CHAPTER III. NOTES

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[2]Bernard Greenberg, Oliver S. Yu and Karen I. Lang, Enhancement of the Investigative Function (Menlo Park, California: Stanford Research Institute, June, 1972), p. 1 p. 14.

[3]Ibid., p. 29.

[4]Orlando W. Wilson, op. cit., p. 228.

[5]George W. O'Connor and Charles G. Vanderborsch, The Patrol Operation (Washington, D.C.: International Association of Chiefs of Police, 1967), p. 29.

[6]National Advisory Commission on Criminal Justice Standards and Goals, Police (Washington, D.C.: Government Printing Office, 1973), p. 191.

[7]Mark W. Haist, Robert Daniel and Charles E. Brown, "Patrolmen's Attitudes Toward Preventative Patrol" (Washington, D.C.: The Police Foundation, 1974), p. 5. (Mimeographed.)

[8]U.S. Department of Justice, Sourcebook of Criminal Justice Statistics -- 1973, op. cit., p. 137.

[9]American Institute of Public Opinion, Study No. 815, cited Ibid., p. 145.

[10]James S. Kaklik and Sorrel Wildhorn, Aids to Decisionmaking in Police Patrol (Santa Monica, California: Rand Corporation, 1971); and Allen P. Bristow, Effective Police Manpower Utilization (Springfield, Illinois: Charles C. Thomas, 1969), Chapter IV.

[11]Orlando W. Wilson, Police Planning (Springfield, Illinois: Charles C. Thomas, 1968), p. 94.

[12]Report on the Employment and Distribution of Strength in the Metropolitan Police, Part III (London, 1953), cited in Ibid.

[13]Kakalik and Wildhorn, op. cit., p. 46.

[14]Ibid.

[15]John F. Skelly, "Portrait of a Precinct" (Unpublished Masters Thesis, John Jay College, New York, January, 1969), cited in the Police Training and Performance Study (Washington D.C.: Law Enforcement Assistance Administration, 1970), p. 38.

[16]Haist, R. Daniel and C. E. Brown, "Analysis of Patrol Officers; Expenditure of Non-committed, In-service Time" (Washington, D.C.: The Police Foundation, 1974), p. 5. (Mimeographed)

CHAPTER IV

PATROL OUTPUT: THE RESPONSE FUNCTION

Introduction

This chapter presents an analysis of the 1973 experience of the Racine patrol division in answering the various calls for service from the citizenry. The emphasis is on the relative amount of patrol time that various incident categories consume.

The response function, be it answering calls related to crime, inter-personal conflict or miscellaneous assistance to the public, is quite different from preventative patrol activities. The latter is a proactive function which leaves much to the initiative of the department and to the individual patrol officer on the street. Response activity, however, is a reactive, committed endeavor and as a matter of common police practice, generally preempts other patrol tasks. It is a rare department which would not answer as promptly as other priorities permit even an apparently insubstantial call from a citizen. Not to respond would be "bad form" in terms of public service ideals and for police-community relations.

A singular distinction of the reactive role is that it reflects the police as a public service agency responding to specific "household" demands. Answering of citizen calls requires a different "client orientation" than that by preventative patrol responsibilities. The beneficiary of the preventative function can be envisioned as an abstract constituency, the community encompassed by the patrol's jurisdiction. Even the greater society, in the image of police perceived ideals, can be considered as the client of patrol initiated activities to inhibit criminal conduct. Response situations, the preponderance of which deal with events after the fact, demand a different client orientation. The user of patrol services is not an abstract constituency but a concrete person; a victim, a complainant. His property loss, grief or distress should be as relevant to the patrolman investigating as the act itself which necessitated the call to the police. The response function demands of the patrol that it be less impersonal, less aloof from the pain that crime and conflict inevitably sow.

What type of activities consume reactive time? A 1968 study by the Rand Corporation of New York City Police Department estimated that 30% of patrol time devoted to calls for service related to crime while 70% was of non-criminal nature.[1] Webster found that of time

consumed for various calls for assistance, only 17% dealt with criminal incidents. This study covered a west coast city with a population of about one-half million.[2] Moreover, Webster's analysis showed that within such calls, few were "crimes in progress." Yet, as pointed out earlier in this study, caution must be exercised in accepting the various interpretations of classified events to which the police are asked to respond. For example, this analysis chooses to consider time spent on answering calls dealing with burglar alarms and "suspicious" reports as crime related events despite the fact that many of such calls do not culminate in criminal incidents. This classification choice is not, however, arbitrary. The posture that the Racine patrol division takes in responding to such incidents, in terms of dispatching back-up units for example, is to assume the potentiality of crime.

The specific incidents that police are asked to respond to are literally beyond tally. "The Russians are coming!" Invariably it would be the bewildered patrol officer who would be the first public official to greet them. Consider the following excerpt from the Racine dispatch log: "20:32, March 9--Complainant reports seeing a lion crossing the street at Spring and Ohio. The lion did enter the city . . . Officers verify the animal is

loose and in the city of Racine . . ." This particular incident was resolved by the eventual "apprehension of the offender." Not, however, before he injured two children.

Patrol time consumed on responses varies. For example, a study in the 20th Precinct of the New York City Police Department sought to tabulate average consumed time for forty-five "typical" incidents requiring a police response. Answering a homicide call consumed an average of 290 minutes; burglary -- 42 minutes; an ill person -- 44 minutes; a narcotics complaint -- 230 minutes; serious auto accident -- 199 minutes; utility trouble -- 38 minutes; disorderly groups -- 22 minutes; and a traffic violation -- 27 minutes.[3] Similarly, a time study of Berkley Police Department found, for example, that a response to a serious traffic accident needed 170 minutes; an insanity case -- 128 minutes; a prowler call -- 65 minutes; and a traffic violation -- 30 minutes.[4] Again, great care must be taken in making inter-study or inter-city comparisons of consumed time. Does the data reflect single men cars or two men cars? Is the time spent by patrol command personnel on the scene counted or not? Are back-up units being considered? The exemplified complications make meaningful comparison of time consumed per classified patrol events by various departments a very difficult task.

The Racine Patrol Experience

In the previous chapter it was shown that of the total patrol unit hours deployed by the Racine Police Department in 1973, 30,111 hours (34%) were estimated to have been consumed by the response function. The ensuing sections distribute and analyze the totality of response function hours by various sub-categories of activity.

The basic methodology and its inherent problems involved in the accumulation of data pertaining to time spent on called-for services was outlined in Chapter II. It remains to specify some particular steps taken in the adjustment of raw, elapsed patrol time per incident data to yield estimates of time consumed, as opposed to time elapsed, per event handled. Throughout this analysis "time consumed" is defined as the sum of time attributable to a particular call and consisting of travel by all patrol offiers to the scene, investigation, including any report preparation activity while "on-scene" and in the case of an arrest, booking time. The response function definition excludes "committed" time accruing to events initiated by patrol officers; e.g., observation arrests. The latter category of incidents is defined within the preventative function group of activities.

It should be recalled that the Racine communications division records time of dispatch and time "completed" for every complaint necessitating a uniformed

patrol response. Such complaint forms are subsequently forwarded to the records division where each complaint is coded for the nature of the incident, shift, location of the incident by census tract and city grid, and for patrol minutes elapsed for the incident. This information is transcribed on IBM cards and stored. For the purposes of this study the data was placed on tape and a run for the entire calendar year was made by incident code group, per shift, per Racine census tract. A total of 27,230 incidents on which elapsed patrol time was recorded were counted by the computer.

Two problems had to be overcome before the resultant data could be translated to a meaningful approximation of patrol time consumed for the response function.

In the first instance, the count of 27,230 incidents did not agree with the operational log of patrol dispatches for 1973. This log is kept on a continuous basis by the records division and is used for management information purposes. The log showed the total number of uniformed patrol dispatches for the year was 33,630. Part of the discrepancy between the computer count and the dispatch log was found to pertain to those incidents where specialized units of the department (criminal, traffic and juvenile investigators) were dispatched to "take over" from the patrol. Since the Racine data system is specifically geared to pick up only uniformed

patrol time elapsed from the initiation to the completion of an investigation of an incident, some events left "hanging" by the patrol in the hands of the special units are not recorded as to patrol time elapsed. Part of the discrepancy can be attributable simply to failure to record time elapsed for some patrol dispatches.

The discrepancy between incidents tallied in the dispatch log and by the computer run was adjusted as follows: The average elapsed time per type of incident was derived from the 27,230 events for which elapsed time was recorded. Frequency of incidents shown by the computer run was compared to the frequency shown in the operational records. The number of incidents constituting the discrepancy were multiplied by the "average elapsed time" per appropriate incident and summed with the total elapsed time tallied by the computer run. Table 6 illustrates this adjustment of data.

TABLE 6.--Adjusted Elapsed Patrol Time on Robbery Incidents.

a. Robbery investigations by patrol (per data run):	205
b. Total patrol time elapsed, in minutes, for robbery investigations (per data run):	9,206
c. Average time elapsed per robbery incident (b÷a):	45
d. Robbery investigations by patrol (per operational records):	277
e. Number of incidents in the discrepancy (d-a):	72
f. Estimated patrol time elapsed for discrepancy (e x c):	3,240
g. Total estimated patrol time elapsed for all robbery incidents, in minutes (f+b):	12,446

The resultant estimated elapsed time for total incidents investigated was not as yet equal to patrol unit time consumed. As previously indicated, the Racine communications division is geared to record patrol time elapsed per incident handled rather than the time consumed per incident per patrol unit dispatched. Where an event is investigated by a single patrol unit, both time figures are equivalent. However, such is not the case in multiple unit dispatch situations which occur as a normal operating procedure dealing with calls for police service of more serious nature; e.g., assaults, distrubances, robberies, family arguments, etc. This is particularly ture of the Racine patrol practice. Since Racine basic patrol squads are manned by single officers, back-up units are sent to respond to most calls for services.

The conversion from total elapsed patrol time for incidents investigated to total patrol time consumed for responses was made as follows: A sample was taken of complaints to which uniformed patrol was dispatched to investigate. The number of units sent was noted by incident type by frequency. A correction factor for multiple unit dispatch was computed which also took into account the shorter presence "on scene" of back-up units. It was estimated that a back-up unit, depending upon the nature of the event, spent 50% to 25% less time on an

investigation than the unit of primary responsibility for the event. Table 7 illustrates this adjustment.

TABLE 7.--Conversion of Elapsed Patrol Time to Consumed Time.

a. Total 1973 patrol time elapsed for robbery robbery incidents in minutes:	12,446
b. Estimated number of units dispatched per robbery incident as adjusted by the "shorter presence" factor for back-up units:	4.0
c. Estimated total patrol unit hours consumed for all 1973 robbery incidents $(\frac{axb}{60})$:	831 hrs.

It should be noted that the consumed time adjustment for multiple unit dispatch situations deals only with patrol squads formally dispatched by communications command. No attempt was made to estimate time spent on responses by units which voluntarily move to back-up their fellow officers. This occurs with regularity, particularly on "dull nights." Similarly, the measurement of patrol unit hours spent on the response function does not encompass time spent by supervisory personnel who at times respond to calls, nor to responses by, for example, undercover men, detectives or traffic officers deployed in the field. The concern of this analysis is

with time spent on calls for service by uniformed, regularly assigned squad area patrol officers.

The definition of what the officer actually does when handling a dispatch varies with the nature of the incident. Time consumed, of course, always involves travel to the scene. Subsequently, the event itself determines much of what is done and the length of time it takes to do it. A major crime or an accident may require the uniformed patrol unit to merely protect the scene until criminal or traffic investigators arrive to take over. A family quarrel may be resolved swiftly, the presence of the "law" being sufficient to re-establish at least an appearance of harmony, or it may even lead to the arrest of one of the parties. Some incidents require but a brief informal patrol report which is immediately called in, while others may need a lengthy information gathering process and a detailed, formal report. For example, crimes against the person or property, traffic accidents and animal bite cases require the Racine patrol officers to fill out extensive, preprinted reporting forms. Such reports may be "pencilled-in" while on the scene. On other occasions, the patrol officer may be required by the press of other dispatches to complete the report later in the course of duty. As it will be pointed out more explicitly in the discussion

of patrol administrative tasks in Chapter V, it is difficult, particularly for some events after the fact such as traffic accidents, to distinguish where "police work" ends and clerical, record keeping duties begin.

Table 8 presents a summary distribution of the 30,111 estimated patrol unit hours which the Racine patrol division expended for the response function. The four main categories of events constituting the total response activity encompass crime related calls, conflict resolution calls, traffic related incidents and responses to miscellaneous non-criminal requests for police service. The definitions of these categories are reflected by the events identified in the table. More specific definitions will be found in Tables 9 through 12 as the above four classifications are reduced to greater detail. The classification of events handled by the Racine patrol are based on the system used by the department's records division for managerial and Uniform Crime Reports purposes.

It is appropriate at this time to reiterate the point raised in Chapter II--that the classification of incidents encountered by the police involves much inherent arbitrariness. Consider, for example, an incident such as a tavern "brawl." Depending upon the circumstances encountered and the discretion of the officer in the

TABLE 8.--Distribution of Estimated Patrol Unit Hours Consumed on Dispatches to Crime Related, Conflict Resolution, Traffic and Miscellaneous Non-Criminal Calls; Racine Police Department, 1973.

	Number of Incidents	Percent of Incidents	Hours Consumed	Percent of Hours Consumed
Crime Related Calls:				
Crimes Against Person	1,013	3.0%	2,785	9.2%
Crimes Against Property	5,788	17.2%	5,076	16.9%
Other Crimes	2,631	7.8%	2,222	7.4%
Alarms and "Suspicious" Calls	4,293	12.7%	2,815	7.7%
	13,725	40.7%	12,398	41.2%
Conflict Resolution Calls:				
Family Problems	1,349	4.0%	1,124	3.7%
Neighbor Conflict, Fights (Civil Trouble)	2,728	8.1%	2,985	9.9%
Problems With Children	992	2.9%	572	1.9%
Noisy Persons	819	2.4%	410	1.4%
Undesirable Person on Premises	957	2.8%	743	2.5%
Other Conflicts	94	0.5%	251	0.8%
	6,939	20.7%	6,085	20.2%
Traffic Related Calls:				
Traffic Accidents	3,946	11.7%	5,787	19.2%
Parking Complaints	1,400	4.2%	632	2.1%
Fire Calls	877	2.6%	1,052	3.5%
Other Traffic Calls	348	1.0%	493	1.6%
	6,571	19.5%	7,964	26.4%
Miscellaneous Non-Criminal Calls:	6,395	19.1%	3,664	12.2%
Total All Dispatches:	33,630	100.0%	30,111	100.0%

disposition of the event, the "brawl" may appear on the records as "civil trouble," a disorderly case, a simple assault, or, in the extreme, as a felonious assault. Such examples of classification problems are applicable throughout the range of events to which the patrol is asked to respond. This awareness must continuously accompany the reading of this study and others like it. Yet it should also be kept in mind that while some degree of arbitrariness in the categorization of incidents is unavoidable, it is minimized when incident definitions are consistently applied, particularly by informed personnel.

In terms of incident frequency the data in Table 8 indicates that the preponderance of all dispatches, 40.7%, dealt with calls related to crime. The balance was almost equally distributed among events related to conflict resolution, traffic and sundry non-criminal patrol services. In terms of patrol hours consumed, crime related calls accounted for 41.2% of total expended response function hours; conflict resolution -- 20.2%; traffic matters -- 26.4%; and miscellaneous calls -- 12.2%. Percentage of hours consumed paralleled the ratio of incidents for the crime related and conflict resolution events. Traffic dispatches, however, absorbed more patrol time per incident than the other three categories.

Sundry incidents required the least amount of patrol time per number of cases handled.

Crime Related Responses

Table 9 contains a summary of the frequency and consumed patrol time for crime related dispatches. As a category, crimes against property are the most voluminous in terms of the number of incidents (42.2%) and hours consumed (40.9%). Crimes against the person, while constituting but 6.4% of all crime related incidents, because of their considered seriousness, absorb 22.5% of patrol unit hours spent on crime related events. The violent crime class also consumes the greatest amount of patrol time when measured on per incident basis. A homicide case is estimated to use up 592 minutes of patrol time and a rape case 252 minutes. Robbery and assault calls consume 180 and 154 minutes respectively. The data for homicide and rape should be accepted with reservation as the sample was small in both instances, N = 3 and N = 26.

Part II offenses constitute 19.2% of incidents and consume 17.9% of time spent on all crime related calls. The count of these incidents, as shown in Table 9, understates the actual number of such calls handled by the department in 1973. The discrepancy occurs because the response to many of these offenses is the

TABLE 9.--Estimated Patrol Unit Hours Consumed on Dispatches to Crime Related Calls, Racine Police Department, 1973.

	Total in Hours	Percent of Total Hours	Number of Incidents	Percent of Incidents	Consumed Time Per Incident (In Minutes)	Elapsed Time Per Incident (In Minutes)
A. Crimes Against Person (Part I Offenses):						
Homicide	30	0.3	3	0.02	592	148
Rape	109	0.9	26	0.18	252	84
Robbery	831	6.7	277	2.0	180	45
Assault	1,815	14.6	707	5.2	154	44
Sub-Total of "A"	2,785	22.5	1,013	7.4	165	46
B. Crimes Against Property (Part I Offenses):						
Burglary	1,702	13.7	1,621	11.8	63	42
Larceny	3,077	24.8	3,846	28.0	48	32
Auto Theft	297	2.4	321	2.4	56	37
Sub-Total of "B"	5,076	40.9	5,788	42.2	53	35
C. Other Crimes (Part II Offenses):						
Vandalism	898	7.2	1,497	10.9	36	20
Sex Offenses	271	2.2	285	2.1	57	19
Drunkenness	246	2.0	261	1.9	56	28
Other (Arson, Forgery, Fraud, Weapons, Narcotics, Gambling, Liquor Laws, Curfew, Runaways, Bomb Threats, etc.)	807	6.5	588	4.3	82	40
Sub-Total of "C"	2,222	17.9	2,631	19.2	51	25
D. Responses to Residential and Commercial Alarm Systems:	1,182	9.5	2,027	14.8	35	14
E. Responses to Reports of "Suspicious" Persons or Circumstances:	1,133	9.2	2,266	16.4	30	15
Total Crime Related Calls:	12,398	100.0	13,725	100.0	54	28

"specialty" of criminal and undercover investigators rather than of the patrol division; e.g. narcotics, fraud, gambling or prostitution. Least time consuming per incident handled are the responses to alarms and investigations of "suspicious" persons or circumstances. This happens because these events, as recorded, already reflect the absence of patrol encountered circumstances which would serve to reclassify the incident as a crime call. Alarm and "suspicious" calls are considered here as crime related incidents since the Racine patrol division, not unlike other police agencies, treats such calls as potentially criminal events.

Not reflected in Table 9 but of relevancy in the definition of patrol "output" within the crime related response function is the specific nature of some events handled. Of the 277 calls dealing with robbery, for example, 53% involved the use of firearms while the remainder involved knives and other weapons. Of the 707 incidents of assault, 7% involved a gun, 12% a knife, 13% other weapons and the preponderance, 68%, depended upon "hands and feet." Forty-eight percent of the assaults occurred on the street, 26% in homes, while the balance happened in business and public establishments.

Within the count of 1,621 burglary calls, 63% involved forcible entry, 27% consisted of unlawful entry without force and the remainder were attempted, forcible

burglary incidents. The 3,846 larceny incidents can be distributed as follows: 15% shoplifting; 16% thefts from automobiles; 17% thefts of automobile parts; 19% stolen bicycles; 19% thefts from buildings; and 14% consisted of other "varieties" of theft. About 50% of calls dealing with vandalism pertained to vandalized dwellings or business establishments and 37% involved destruction of motor vehicles. Of the 285 calls pertaining to sex offenses, seventy percent involved "peepers and prowlers." The remainder were distributed among exhibitionists, molesters, and obscene verbalists.

Conflict Resolution Responses

Table 10 presents the distribution of incidents and patrol time consumed on the handling of dispatches related to inter-personal conflict situations. Because of the highly charged, emotional circumstances which frequently surround such events, often requiring physical restraint, the Racine practice normally calls for the dispatch of several back-up units for the handling of the majority of such incidents. As a result, patrol time expended per conflict resolution dispatch is substantially higher than the net patrol time elapsed. Many of the events are such that the presence of the police on the scene is brief but highly "visible."

TABLE 10.--Estimated Patrol Unit Hours Consumed on Dispatches to Conflict Resolution Calls, Racine Police Department, 1973.

	Total in Hours	Percent of Total Hours	Number of Incidents	Percent of Incidents	Consumed Time Per Incident (in Minutes)	Elapsed Time Per Incident in Minutes
Family Problems	1,124	18.5	1,349	19.4	50	20
Problems with Children	572	9.4	992	14.3	34	17
Noisy Parties	410	6.7	819	11.8	30	12
Undesirable Person on Premises	316	5.2	379	5.5	50	20
Trouble with Tavern Patrol	163	2.7	245	3.5	40	16
Trouble with Patrol (Other Establishments)	264	4.3	333	4.8	48	19
Fights, Neighbor Conflict and other Civil Trouble	2,985	49.1	2,728	39.3	66	19
Other (Suicide Attempts, Mental Cases, etc.)	251	4.1	94	1.4	160	56
	6,085	100.0	6,939	100.0	53	19

Within the events classified, street fights, landlord-tenant arguments, neighbor conflict and similar "civil trouble" predominate in terms of incident frequency and time consumed; representing 39% and 49% respectively of total conflict resolution responses. Family problems are second in call volume. The least time consuming are officer stops to "keep the noise down." Not reflected separately in Table 10 are 75 dispatches classified as attempted suicides. These calls consumed an estimated 191 minutes of patrol time per each dispatch.

Traffic Related Responses

Table 11 summarizes the Racine patrol experience in responding to reports of traffic accidents, responses to fire calls, and dispatches to handle traffic related complaints. The investigation of traffic accidents predominates in the number of events (60.1%) and in time consumed (72.7%). Patrol time spent per accident is also high, 88 minutes, reflecting the need for patrol manpower not only to investigate the accident but to untangle ancillary traffic problems. The consumed time shown for accidents is lower than perhaps could be anticipated because accidents involving death or injury are processed by traffic investigators, a specialized unit of Racine police.

TABLE 11.--Estimated Patrol Unit Hours Consumed on Dispatches Related to Traffic Calls, Racine Police Department, 1973.

	Total in Hours	Percent of Total Hours	Number of Incidents	Percent of Incidents	Consumed Time Per Incident (Minutes)
Traffic Accidents:	5,787	72.7	3,946	60.1	44
Fire Calls:	1,052	13.2	877	13.3	24
Parking Complaints:	632	7.9	1,400	21.3	18
Enforcement (on Complaint):	493	6.2	348	5.3	43
	7,964	100.0	6,571	100.0	36

Police fire calls are included under the traffic related classification because such events require the patrol to reroute vehicle traffic around fire zones and control pedestrian movement within the vicinity of the conflagration. Both the parking and traffic enforcement incident categories reflect response to demand for patrol service upon complaint rather than officer initiated activities. In the case of parking, complaints of blocked driveways are illustrative of the nature of events included in Table 11. The enforcement upon complaint category is exemplified by a dispatch such as "speeders on the block." Officer initiated traffic enforcement activities are included under the preventative function classification. For example and as a contrast to enforcement upon complaint, in 1973 Racine officers made 8,655 "observation" arrests (citations) of moving traffic violators and apprehended 274 drunk drivers.

Miscellaneous Non-Criminal Responses

This category of police patrol services includes dispatches which can not be comfortably fitted in the previous three classes of events; crime related, conflict resolution and traffic matters (Table 12). Emergency services, i.e., "rescue runs," predominate in terms of incidents handled (20.9%). Animal cases, consisting of

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TABLE 12.--Estimated Patrol Unit Hours Consumed on Dispatches to Miscellaneous Non-Criminal Calls, Racine Police Department, 1973.

	Total in Hours	Percent of Total Hours	Number of Incidents	Percent of Incidents	Consumed Time Per Incident (Minutes)	Elapsed Time Per Incident (Minutes)
Barking Dog:	87	2.5	313	4.9	17	17
Dog Bite Cases:	308	8.4	379	5.9	48	33
Animal Cases--Other:	361	9.8	398	6.2	54	27
Defective Public Facilities:	146	4.0	205	3.2	43	29
Lost and Found Reports:	136	3.7	236	3.7	34	34
Rescue Runs:	637	17.4	1,341	20.9	28	19
Assistance to Citizens:	623	17.0	1,084	16.9	35	23
Escorts:	75	2.0	145	2.3	31	31
Notification of Persons:	63	1.7	136	2.1	28	28
Ordinances other than Traffic:	156	4.3	248	3.9	38	19
Information Requests:	282	7.7	643	10.0	26	26
Unfounded Calls:	310	8.5	517	8.1	36	18
Miscellaneous--Other:	*480	13.0	750	11.9	38	28
TOTAL:	3,664	100.0	6,395	100.0	34	24

*Abandoned property, non-traffic accidents, missing persons, extra attention, storm related incidents, etc.

the "barking dog," "dog bites" and "other animal cases" categories, account for 17% of total miscellaneous calls. It should be noted that the calls relating to animals as shown reflect only those dispatches which have been routed to uniformed patrol officers. Racine Police Department employs a civilian animal control officer who handled an additional 1,850 complaints in 1973. The provision of sundry assistance classification ranks third in the volume of calls, 16.9%. The latter events are exemplified by services such as providing "lifts" to citizens in need or help to locked out persons to re-enter their homes.

In terms of patrol time consumed, animal cases account for the highest proportion (20.7%) of total time consumed for miscellaneous calls, followed by rescue runs (17.4%), and assistance to citizens (17.0%). Most time consuming on per incident basis are animal cases excluding "barking dogs.' Reflected in Table 12 but under the aggregate classification of "Other" are, for example; 54 dispatches to investigate reported street hazards; 61 attempts to locate persons; 29 investigations of reported storm damage; 22 complaints of unshoveled snow; 69 calls on fireworks; and 33 reports of abandoned property.

Variability of the Response Function

Table 13 ranks, by average time consumed, thirty select incidents to which the Racin patrol division was requested to respond in 1973. The incidents selected are generally those where the sample was large, exceeding 100 cases as counted by the computer run of elapsed patrol time. The ranking of these events indicates a pattern which can be used to generalize the relationship between patrol time consumed and the nature of the dispatch. The incidents that consume most of patrol time are those that involve threat to the safety of a person (e.g. robbery and assault); threat to the safety of the police officer (e.g. disorderly, robbery); require extensive preparation of investigatory reports (e.g. property and person cromes, accidents) and interrupt orderly movement of persons or vehicles in the vicinity of the scene (e.g. street crime, traffic accidents, fire calls).

The listing of patrol handled events in Table 13 also conveniently summarizes this chapter in that the events ranked illustrate the complexity of the response task. There is a wide disparity in personal aptitudes and attributes demanded on an investigator of a rape case and of a barking dog complaint. Yet, the patrol officer is called to do both. It is not surprise that study conducted in the thirties found that a competent

TABLE 13.--Estimated Patrol Time Elapsed and Consumed by Type of Dispatch for Select Incidents; Racine Police Department, 1973*.

	Consumed Time Per Incident (Minutes)	Elapsed Time Per Incident (Minutes)
1. Rape	252	84
2. Robbery	180	45
3. Disorderly	171	47
4. Assault	154	44
5. Attempted Suicide	153	51
6. Bomb Threat	141	47
7. Sudden Death	122	61
8. Curfew & Loitering	112	56
9. Narcotics	108	54
10. Mental	98	49
11. Traffic Accident	88	44
12. Fire Call	72	24
13. Civil Trouble	66	19
14. Burglary	63	42
15. Sex Offense	57	19
16. Auto Theft	56	37
17. Drunkenness	56	28
18. Family Trouble	50	20
19. Unwanted Party	50	20
20. Larceny	48	32
21. Dog Bite	48	33
22. Non-Traffic Accident	42	21
23. Abandoned Property	38	38
24. Vandalism	36	20
25. Alarm	35	14
26. Children Trouble	34	17
27. Suspicious	30	15
28. Notification	28	28
29. Parking Complaint	27	18
30. Barking Dog	17	17

*Time "elapsed" per incident represents net patrol time spent on the handling of the event. Time "consumed" adjusts elapsed time for formal dispatch of back-up units to the same incident.

CHAPTER IV: NOTES

[1]Sorrel Wildhorn, Research on New York City's Police Problems (New York: Rand Corporation, November 1, 1968), p. 7.

[2]John A. Webster, The Realities of Police Work (Dubuque, Iowa: Kendall/Hunt Publishing Company, 1973), p. 13.

[3]Law Enforcement Assistance Administration, Police Training and Performance Study (Washington, D.C.: U.S. Government Printing Office, 1970), p. 33.

[4]Charles S. Benson and Peter B. Lund, Neighborhood Distribution of Local Public Services (Berkley California: University of California, 1969), p. 83.

[5]Cited in: Charles B. Sounders, Jr., Upgrading the American Police (Washington, D.C.: The Brookings Institution, 1970), p. 17.

[6]Melany E. Baehr, John E. Furcon, and Ernest C. Froemel, Psychological Assessment of Patrolman Qualifications in Relation to Field Performance (Washington, D.C.: U.S. Government Printing Office, 1970), p. 9.

CHAPTER V

PATROL OUTPUT: THE PREVENTATIVE FUNCTION AND ADMINISTRATIVE TASKS

The Preventative Patrol Function

Forty percent of patrol unit hours deployed by the Racine Police Department were consumed by the preventative patrol function (Table 2). However, and contrary to the response function, it is extremely difficult to account for the expenditure of preventative patrol time in concrete terms. Incidents of more serious nature and all incidents leading to "observational" arrests enter the departmental records by means of formal reports. For example, in 1973, Racine patrolmen reported 379 cases of discovered open doors or windows in the course of patrolling. Similarly, 274 observational arrests were made of drunk drivers and a total of 8,655 moving traffic violation apprehensions (citations) were recorded. Patrol officers also reported defects in city facilities, such as inoperative street or traffic lights, made arrests of observed curfew and loitering violators and in general, encountered a variety of

criminal and non-criminal situations of which they disposed formally or informally; all of which consumed a substantial proportion of their uncommitted, preventative patrol hours.

An estimate of time consumed for events encountered and reported to headquarters in the course of patrolling perhaps could be made. The exercise, however, would not be very significant. Firstly, only a portion of incidents handled by patrol officers are reported. Much of patrolmen's initiated activity is disposed of informally and at their own discretion. Secondly, and more significantly, the premise behind the preventative patrol concept is deterrence of incidents rather than their discovery. To illustrate, the time spent on checking for open doors or windows of business establishments is of greater importance than the discovery of such. Likewise, time devoted to watching for reckless drivers is perhaps more meaningful than their arrests. Of course, the fact that some open doors are found and some drunk drivers are arrested may be indicative of the "quality" of preventative patrolling activities.

Ultimately there is no systematic way to determine on a practical, continuous basis and with reasonable accuracy as to where and how a patrol officer spends his uncommitted time. Informal procedures exist. These

consist of the "feel" by a patrol supervisor as to the degree to which his men are "hustling." For example, some experienced police administrators occasionally make the observation that they can "tell if a beat man is working ismply by listening to the radio traffic." This is a credible statement. But practice cuts both ways. An experienced patrolman, for his part, can no doubt generate a great deal of "strategically" calculated messages.

It should, therefore, be reiterated that the total hours shown as consumed for the preventative function by the Racine patrol operation were derived as a residual given the consumed time data for administrative tasks and for the response function. The assumption is made that when a patrol officer's time is not committed to the latter two responsibilities, it is utilized for preventative patrol. This assumption needs a strong qualification. Effectiveness of preventative patrol is much dependent upon the initiative of the officer himself. It can be a vigorous activity where the officer persistently checks for the physical security of residences and commercial establishments, pokes about crime inviting nooks and crannies of his beat, or with perserverence "stakes-out" areas where his experience indicates a potentiality of trouble. Yet, "preventative patrolling"

may consist of passively cruising or, a not unheard of extreme, of sleeping in a well-warmed squad car parked in the obscure, dimly-lit confines of the local freight yard.

While there is no practical, continuous means of accurately determining the time consumed by the various activities inherent in the preventative patrol function, there are periodic, albeit expensive, research techniques which can estimate such time distributions. In the case of the Racine operation, for example, the placement of observers with a representative sample of patrol officers for a representative period of patrol hours could result in good time consumed data for the miscellany of tasks performed in the course of patrol. Such data gathering was beyond the means of this study. To the extent that Racine patrol field operations were observed, such was done for overall background purposes. The observation was not of sufficient representativeness or duration to permit an estimate of time consumed for various preventative patrol tasks.

Guidance is, therefore, sought in an empirical study of preventative patrolling in another city; the Police Foundation's research in the patrol practices of the Kansas City Police Department.[1] Of course, the specific implications of this study can not pertain to

the Racine experience. The broad implications, i.e. types of activities consuming preventative patrol hours, are, however, pertinent to the development of patrol productivity and cost assessment tools.

The Police Foundation's research team sought to find out the work output of "non-committed" patrol time. In this instance "non-committed" time was defined as patrol hours not devoted to responses to dispatch or to observational arrests. It was determined that 60.31% of the Kansas City patrol time sampled fell into the "non-committed" category. Its distribution is presented in Table 14.

TABLE 14.--Patrol Officers' Expenditure of Non-committed Time, Kansas City South Patrol Experiment, 1973.

	Percent Non-committed	Percent of Total Time
(Vehicle in Motion)		
Police related activity	23.54%	14.20%
Non-police related activity	25.47%	15.36%
(Vehicle Stationary)		
Police related activity	26.01%	15.69%
Non-police related and residual	24.98%	15.06%
	100.00%	60.31%

Source: M. Haist, R. Daniel and C. E. Brown, "Analysis of Patrol Officers' Expenditure of Non-committed, In-service Time" (Washington, D.C.: Police Foundation, 1974), p. 20. (Mimeographed)

The analysis appearing in Table 14 was drawn from 1,230 hours of observation by five observers conducting 198 observational tours averaging 6.2 hours in duration. Examples of non-committed time activities by patrolmen are as follows:

> Stationary Police Related--report writing, waiting for tows, filling out encounter surveys, surveillances, traffic ordinance enforcement;
>
> Stationary Non-Police Related--eating, resting, reading non-police material, talkint to observers, girl watching, phone calls, visiting with friends, sleeping, watching movies or sports events;
>
> Mobile Police Related--looking for suspicious cars, people, stolen autos and traffic violations, watching residences and buildings, training new patrolmen;
>
> Mobile Non-Police Related--driving nonchalantly to relieve boredom, girl watching, going to eat, to the bank, to the cleaners, other personal errands, pleasure riding;
>
> Contacting Personnel in the Field, Police Related--talking about crime suspects, calls, policies, procedures, getting or giving information on policies or procedures, exchanging mug shots, getting reports approved, discussing ongoing innovations, evidence, courts, complaints, etc.;
>
> Contacting Personnel in the Field, Non-Police Related--general talk, hunting, cars, sports, sex, vacations, joke-telling, family life, etc.;
>
> Residual--traveling to and from the station to the district, time in and traveling from court, garage, headquarters, radio repair, etc., to his district.[2]

From the foregoing discussion of the preventative patrol function it can be concluded that its "output" can be identified but it is extremely difficult to measure in terms of patrol time consumed. The conspicuous examples

of such output are: informal dispositions of observed incidents, preventative activities such as watching for the security of buildings and enforcement of criminal laws and ordinances through observational arrests.

Does preventative patrol, the central occupational ideal of police service, prevent a significant amount of crime? No wholly satisfactory answer is possible. On one hand, there is the strong sway of the common-sense proposition that posting a policeman on every stoop will surely deter much of criminal behavior. On the other hand, given a police agency size within the circumstance of practical economic constraints, there is some doubt that its preventative patrol carries much deterrence weight. Aggregate data, with its admittedly many limitations, indicates that there is no clear-cut relationship between the "crime rate" and numbers of police. The average number of uniformed policemen per 1,000 inhabitants in cities exceeding 500,000 in population of 2.3. The corresponding figure for cities in the 10,000 to 25,000 people bracket is 1.5.[3] However, the small cities, with some exceptions, experience a substantially lower rate of reported offenses than the more policed metropolises. One is compelled to address the issue of police crime prevention capability. Programs to improve police productivity will not get very far as long as the police administrator can counter

budgetary probes by the heretofore unassailable and esoteric comment that when his patrolmen are not responding to citizen service requests,they are preventing crime.

The limited number of studies dealing with the crime preventing capabilities of the patrol present mixed conclusions. Rand Corporation sought to assess the crime consequences in the 20th Precinct of the New York City Police Department after its manpower was increased by forty percent.[4] This study examined crime data for the subsequent five year period, 1963-1967. Rand cautiously concluded that there was no impact on "inside" crimes, offenses not normally visible from the street. There were, however, significant decreases in "outside" crimes, particularly auto theft, larceny and robbery which could be seen from the street. Interestingly, the researchers found that some crime was "displaced" to the neighboring Central Park as a result of the greater police density in the 20th Precinct.

In August, 1969, the Indianapolis Police Department purchased 320 additional marked cars for a total fleet of 455 squadrolls.[5] All patrolmen were issued a car which they were authorized to use for personal as well as official business. It was anticipated that the increased visibility of the police would serve to significantly inhibit criminal activity. An evaluation

of the program after eight months of operation indicated that while total reported crime increased in the city, "outdoor" crime decreased: auto theft by 15% and purse snatching by 8%. There was also a significant decrease in traffic accidents. Police clearance rates of reported offenses went unchanged.

A similar project was also tried by Cahokia, Illinois.[6] This village of about 20,000 residents usually deployed three squad cars. Nine more were purchased and given to each member of the patrol for use on- and off-duty. An evaluation of one year effects on crime (April, 1971, to April, 1972) showed no impact on crime and no increase in police initiated interrogations. Budnick (1972), sought to determine the impact of increased manpower in a Washington, D.C. police district. He found that initially there was a significant decrease in the crime rate but eventually the trend reversed itself and climbed toward the pre-experimental levels. The investigator was led to speculate that offenders somehow are able to adapt to the "changed environment."[7]

The Police Foundation's controlled Preventative Patrol Experiment in Kansas City is the most elaborate and rigorous study to-date of the crime deterrence capabilities of the police.[8] While the Foundation cautions as to the need for further research and the

direct applicability of its conclusions to the uniqueness of Kansas City, its study, nevertheless, points to the limited capacity of general patrol strategies to prevent crime.

The Police Foundation research design established three patrol groups: proactive, reactive and control. The proactive category emphasized officer initiated activities and had more visible units. The reactive group concentrated solely on responses to citizen requests for service and avoided self-initiated entry into its assigned area. The control group assumed a stance of a normal mix between responses and initiated activities. The experiment was begun October 1, 1972, and was terminated on September 30, 1973. Significant to the issue in question was the conclusion of the study that "as revealed in the victimization surveys, the experimental conditions (three contrasting levels of patrol visibility: increased, normal and greatly decreased) had no significant effect on residence burglaries, larcenies, auto thefts, larcenies involving auto accessories, robberies or vandalism, crimes traditionally considered to be deterrable through preventative patrol."[9]

Ancillary Administrative Tasks

Report preparation, court appearances, personal breaks and similar administrative tasks are patrolmen's

activities which, of course, do not have an end in themselves. Most administrative duties are closely related to the number and kind of activities undertaken in the course of preventative patrolling or responding to public demand for services. The number of court appearances are dependent upon arrests made and/or traffic citations contested. The number of incident reports filed are a function of incidents handled. Consequently, while administrative duties do not constitute "output" in themselves, they are part and parcel of the overall police product and do consume a very substantial amount of patrol officers' on-duty time. An increase in the productivity of administrative task performance can make more time available for substantive patrol duties or, in the alternative, reduce the need for patrol manpower.

Table 15 presents a summary of estimated patrol unit hours spent in 1973 by Racine patrol officers on administrative tasks, consisting of personal breaks, report preparation, court appearances and time spent on repairs and exchanges of defective equipment. These four categories do not exhaust the range of activities that patrolmen are asked to do and which can be classified as on-duty administrative tasks. Patrol officers "break-in" new men, for example, and run with regularity

to perform miscellaneous errands for headquarters. The four classes of tasks reflected in Table 15, however, are more easily identifiable routine duties which also consume the most of administrative time.

TABLE 15.--Estimated Patrol Unit Hours Consumed by On-Duty Ancillary Administrative Tasks, Racine Patrol Division, 1973.

Activity	Hours Consumed
Official Personal Breaks	5,584
Investigatory Report Preparation	16,194
Repairs and Exchanges of Equipment	1,229
On-Duty Court Appearances	120
Total	23,127

Personal Breaks

In the course of an eight hour patrol shift a Racine patrol officer is formally allowed 20 minutes for "lunch" and 10 minutes for a "coffee break." In other words, 6.25% of the shift is consumed by personal break time or, in the alternative, 6.25% of each patrol unit hour is allocable to personal time-off. The 5,584 hours consumed for breaks in the course of 1973 (Table 15) were arrived at by applying the 6.25% break time ratio to the total patrol unit hours (Table 2) deployed by the department in that year (89,350 x 6.25%).

Report Preparation

Patrolmen's reporting responsibilities fall into several categories: a) reports, written and oral, of informally disposed incidents; b) reports and processing (booking) of events formally disposed (arrests); and c) pro-forma reports pertaining to incidents after the fact involving crimes against person or property, traffic accidents and animal bites.

Incidents of minor nature which are informally disposed are usually called in on the radio whereby the officer indicates action taken and perhaps notes the names of the principals involved, addresses, etc. More serious incidents, such as a family problem, which are nevertheless informally disposed, may require a written narrative for file and future reference.

Arrests require an extensive booking and reporting procedure. In this study, the time consumed for booking is allocable either to the response function or to hours consumed on preventative patrol. Crimes after the fact, e.g. rapes, robberies, all forms of theft, nevertheless, require the patrolman to fill out a variety of background data surrounding the event. The same is also true of accidents and animal cases leading to personal injury. In addition, many of such reports need written narrative supplements. It can perhaps be said that in events

after the fact of serious criminal nature, or accidents involving death or injury, the patrolman's job is essentially to protect the scene until the arrival of investigators and to succor the distress of the victim. In situations after the fact pertaining to lesser crimes and minor accidents, the full reporting workload falls on the patrolman. As a matter of fact, the entire incident can perhaps be viewed as, more or less, a clerical exercise because the patrol officer spends most of his time gathering information necessary to fill out his forms.

This presents a problem in defining where "police work" ends and administrative tasks begin. Some officers complete their reports while on the scene and return to available for dispatch status only upon completion. Others make notes of the necessary data pertaining to the event and prepare the requisite reports later in the course of duty as time becomes available between dispatches. Since the Racine patrol elapsed time data per dispatch for the 1973 incorporates reporting tasks performed on the scene, it remained to approximate the amount of on-duty time that is spent on reporting, i.e. how much of uncommitted patrol time is used for writing and/or calling in of investigatory reports.

Thirty-five Racine patrol officers were asked to make an estimate of such time per "normal" eight hour patrol hour. The mean for the sample (N = 35) was 1.45 hours (M = 1.45; s = 0.47; Range 2.0 - 0.5). This estimate was used to calculate the 16,194 hours consumed in 1973 on investigatory report preparation and processing. (1.45 ÷ 18.125% x 89,350 deployed patrol unit hours = 16,194 hours consumed on reporting.) In other words, out of every hour of patrol duty approximately 11 minutes are utilized on "catch-up" reporting.

Repairs and Exchanges of Equipment

Patrol officers are highly dependent upon vehicles and their radios. The sample of thirty-five officers were asked to estimate the number of hours of on-duty time during an "average month" that they spend on exchanging malfunctioning equipment or waiting for it to be repaired. The mean for the sample (N = 35) was 2.2 hours (M = 2.2; s = 1.62; Range 8.0 - 0.5). This mean was used to estimate the 1,229 hours consumed for repairs and exchanges of equipment as shown in Table 15. (2.2 ÷ 160-hour patrol "month" = 1.375% x 89,350 total deployed patrol hours in 1973 = 1,229 patrol hours used on equipment problems.)

contested traffic case is docketed for a hearing on a particular morning, the officer is compelled to arrive in the hearing room by 9:00 a.m. and wait until the case in question comes up before the judge.

Court appearances by patrolmen are important as an overall issue of cost to the department. But because of the focus of this study on the productive use of on-duty patrol manpower, time lost to court proceedings is not a very significant item in the general profile of patrol output, at least not in the case of the Racine Police Department.

CHAPTER VI

PATROL INPUT: COST OF RESOURCES

Introduction

The central idea behind productivity is to get the maximum output per unit of input. Police patrol output consists of the various services it performs. Inputs are predominently manpower plus equipment, facilities and energy; i.e. costs in common parlance. In the previous several chapters it was, in effect, asked what do patrolmen do and how much time it takes to do it? This chapter seeks to translate the time spent on various patrol activities to a denominator common to the production of all goods and services, cost of resources used.

To do so in the case of police services in the aggregate is not a difficult exercise. That is because the police is a highly labor intensive enterprise. A 1970 survey of 1,187 city police budgets by the International City Management Association found that the mean distribution of expenditures was as follows: 87% police salaries and wages; 5% capital outlays; and 8%

for other operating expenses.[1] The model for this study, Racine Police Department, is no exception. Eighty-seven percent of its 1973 expenditures were for salaries and fringes, 5% capital costs, and the balance was spent for other expenses.

Consequently, given the time consumed for the various patrol activities in the earlier sections of this study, it is really sufficient to have a substantive understanding of what is costly or cheap in patrol services. Handling a "barking dog" complaint is obviously cheaper than a "dog bite" case as the former consumes an estimated 17 minutes of patrol time whereas the latter needs 48 minutes. To put it another way, allocating dollar costs to patrol services while already having knowledge of the amount of time spent on such services is somewhat of a redundant exercise. Yet it is not without usefulness. Dollar costs are the language of municipal budgets tying all public services to a common framework. Besides, police time when translated to its dollar "value" seems to have more of an impact on productivity consciousness. Knowing that every time a citizen complains to the police about a barking dog next door it costs the taxpayer $5, as opposed to 17 minutes of patrol time, is perhaps more striking and meaningful to city management and its constituents.

The cost data on the 1973 Racine patrol experience presented in this chapter is not easily comparable to cost studies of other police agencies. There are several explanations for this. The most obvious one is that local government police agencies differ among themselves in organizational structure and modes of operation. The second, and perhaps the more important reason is that the police operation, because of its complexity, lends itself to a variety of initial assumptions which, in turn, lead to a variety of views for allocating costs to police services.

For example, Rand's model PPBS police budget, as based on the 1968-69 executive budget of New York City, chooses to allocate 82% of cost to "crime prevention and control" and to "investigation and apprehension," 9% to "traffic control," 2% to "emergency services," and 7% to "support."[2] Rand's program cost categories are not suitable to this study. The analysis of Racine patrol output indicates that the significance of non-crime related activities can not be underestimated. Other cost studies also tend to treat policing with exclusivity on its crime control responsibilities.[3]

Difficulties of Allocating Departmental Costs to the Patrol Function

Contemporary municipal police agencies of larger size are no longer, and have not been for years, engaged

solely in the patrol function. Many specialized units have evolved; e.g. detectives, traffic, juvenile, undercover, records, etc. This presents a problem for proper allocation of departmental expenses to the patrol operation.

O. W. Wilson observes that "Policing should be considered a patrol service with specialized activities as aids."[4] Strictly applying such a conceptualization of policing to the cost allocation problem, it can be proposed that expenditures associated with other departmental divisions are fully allocable to the patrol function. On the opposite extreme, patrol can be defined as an "autonomous" police division sharing only such supportive services as are common to all divisions; e.g. building, communications, administration, etc. Between these opposites there is a range of alternative. It can be argued that the cost of records and identification, for example, is most appropriately allocable to the patrol as it is the latter which makes the most use of the records bureau. The same could be said, to a varying degree of applicability, of community relations, communications, or traffic. Inter-study comparisons of patrol costs are, therefore, highly complicated by diverse definitions of those departmental costs which are accruable to the uniformed patrol function.

the student by the administrative services section of the department.

TABLE 16.--Expenditures for 1973, Racine Police Department.

	(a) Total Department	(b) Patrol Division
Base Salaries	$2,401,090	$1,181,336
Fringe Benefits	600,273	295,334
Overtime	28,211	13,879
Equipment: Maintenance & Fuel	75,190	36,993
Equipment: Uncapitalized Purchases	85,493	42,062
Safety Building: Heat, Maintenance & Bond Issue Interest	160,583	79,007
Other Expenses	74,604	36,705
Total 1973 Expenditures:	$3,425,442	$1,685,316

Cost Per Patrol Unit Hour

In Chapter II it was shown that in the course of 1973, the Racine patrol division deployed a total of 89,350 patrol unit hours. These were calculated on the basis of the number of squad areas regularly manned by each shift for the entire year. For example, assuming one squad area calling for the assignment of a single-officer car, the total patrol unit hours deployed for

the year would be 8,760 (24 hours times 365 days). The number of patrolmen needed to provide coverage for one squad area is 4.9 in the case of Racine (8,760 ÷ 1,787*). The latter figure does not, of course, include manpower for superivsion and support.

Patrol output has been defined in terms of hours consumed for the various classifications of services performed. Of interest in this chapter is to determine the total and per event cost of such activities. To derive such data it is necessary first to calculate the cost of a patrol unit hour deployed by the two alternative expenditure allocation methods chosen: total departmental cost basis and patrol division cost basis:

$$\text{Cost Per Patrol Unit Hour (Patrol Division Cost Basis)} = \frac{\text{1973 Expenditures (Patrol Division Cost-Table 16)}}{\text{1973 Patrol Unit Hours Deployed (Table 2)}}$$

$$= \frac{\$1,685,316}{89,350}$$

$$= \$18.86$$

$$\text{Cost Per Patrol Unit Hour (Total Department Cost Basis)} = \frac{\text{1973 Expenditures (Total Department Cost-Table 16)}}{\text{1973 Patrol Unit Hours Deployed (Table 2)}}$$

$$= \frac{\$3,425,443}{89,350}$$

$$= \$38.34$$

*Net hours worked by Racine patrolmen in 1973 after adjustment for paid leave; vacations, holidays, sick days, and compensatory days off.

Relative Cost of the Response Function, the Preventative Function and Ancillary Administrative Tasks

Table 17 costs-out the hours consumed on the three main categories of patrol services; called-for services, preventative patrol, and administrative duties. Reflecting the ratio of hours consumed in relation to total hours deployed, the costliest function is that of preventative patrolling. It absorbed an estimated 40% of cost. The response function accounted for an additional 34% of 1973 expenditures. The cost per patrol hour is in the range of $18.86 to $38.34, depending upon the cost allocation alternative utilized.

TABLE 17.--Distribution of Estimated Patrol Costs for the Response Function, Preventative Function, and Ancillary Administrative Tasks, Racine Police Department, 1973.

	Hours Consumed	*Patrol Division Cost Basis	**Total Department Cost Basis	Percent
Response Function	30,111	$567,893	$1,154,456	34%
Preventative Function	36,112	681,248	1,384,298	40%
Administrative Tasks	23,127	346,175	886,689	26%
Total	89,350	$1,685,316	$3,425,443	100%

*$18.86 per each patrol unit hour.
**$38.34 per each patrol unit hour.

Table 18 presents a similar cost distribution for the components of the administrative task classification. Again reflecting the ratio of patrol hours consumed on the various on-duty administrative activities, the costliest task is that of investigatory report preparation. It accounts for 70% of total administrative task cost.

TABLE 18.--Distribution of Estimated Patrol Costs Among On-Duty Ancillary Administrative Tasks, Racine Police Department, 1973.

	Hours Consumed	*Patrol Division Cost Basis	**Total Department Cost Basis	Percent
Personal Breaks	5,584	$105,314	$214,090	24%
Report Preparation	16,194	305,419	620,888	70%
Equipment Defects	1,229	23,179	47,120	5%
Court Time	120	2,263	4,591	1%
Total	23,127	$436,175	$886,689	100%

*$18.86 per each patrol unit hour.
**$38.34 per each patrol unit hour.

Analysis of Cost by Called-for Service Categories

The following two tables (19 and 20) present cost estimations for the various types of calls that the patrol is required to respond. Crime related calls absorbed 41% of cost, traffic matters 26%, conflict resolution 20% and miscellaneous non-criminal dispatches 12%. Within the

crime related category, the costliest incidents in terms of total expenditure were crimes against property. Traffic accident handling was by far the most expensive activity for the overall category of traffic related calls. Within the classification of conflict resolution, fights, neighbor conflict, landlord-tenant arguments and the like, consumed about fifty percent of the total cost allocable to the conflict resolution classification. Of the miscellaneous non-criminal events, animal cases predominated in terms of total expenditures.

Analysis of costs per incident type indicates that the costliest events are those which: a) involve a threat to the safety of a person (e.g. robbery, rape, attempted suicide); b) pose a threat to the safety of patrol officers responding to the call (e.g. disorderly cases, robbery, assault); c) require extensive report preparation (e.g. property and person crimes, traffic accidents); and d) interrupt the orderly flow of people or vehicles in the vicinity of the scene (e.g. street crimes, traffic accidents, fire calls).

TABLE 19.--Distribution of Estimated Patrol Costs on Called-For-Service Categories; Racine Police Department, 1973

	Number of Incidents	Total Hours Consumed	Patrol Div. Basis* Total Cost	Patrol Div. Basis* Cost Per Incident	Total Dept. Basis** Total Cost	Total Dept. Basis** Cost Per Incident
Crimes Against Person	1,013	2,785	$ 52,525	$52	$106,777	$105
Crimes Against Property	5,788	5,076	95,733	16	194,615	34
Other Crimes	2,631	2,222	41,907	16	85,191	32
Alarms and Suspicious Calls	4,293	2,315	43,661	$10	88,756	21
Total Crime Related	13,725	12,398	$233,826	$17	$475,339	$ 36
Family Problems	1,349	1,124	$ 21,199	$16	$ 43,094	$ 32
Neighbor Conflict, Fights (Civil Trouble)	2,728	2,985	56,297	21	114,445	42
Problems with Children	992	572	10,788	11	21,930	22
Noisy Persons	819	410	7,733	8	15,719	19
Undesirable Person on Premises	957	743	14,013	15	28,486	30
Other Conflicts (Att. Suicide, Mental, etc.)	94	251	4,633	50	9,625	102
Total Conflict Resolution:	6,939	6,085	$114,763	$17	$233,299	$ 34
Traffic Accidents	3,946	5,787	$109,143	$28	$221,874	$ 56
Parking Complaints	1,400	632	11,920	9	24,423	17
Fire Calls	877	1,052	19,841	23	40,334	46
Other Traffic Calls	348	493	9,297	27	18,901	54
Total Traffic Related:	6,571	7,964	$150,201	$23	$305,340	$ 46
Animal Cases	1,090	756	$ 14,258	$13	$ 28,895	$ 27
Rescue Runs	1,341	637	12,014	9	24,423	18
Assistance to Citizens	1,084	623	11,750	11	23,886	22
Information Requests	643	282	5,318	8	10,812	17
Lost & Found Reports	236	136	2,565	11	5,214	22
Other Non-Criminal Calls	2,001	1,230	23,198	12	47,158	24
Total Misc, Non-Criminal Services:	6,395	3,664	$ 69,103	$11	$140,478	$ 22
Total Called-For Services:	33,630	30,111	$567,893	$17	$1,154,456	$ 34

*$18.86 per each patrol unit hour. **$38.34 per each patrol unit hour.

TABLE 20.--Estimated Patrol Cost Per Select Dispatch Event, Racine Police Department, 1973.

	Estimated Consumed Time Per Incidents (Minutes)	*Cost Per Event; Patrol Division Basis	**Cost Per Event; Total Department Basis
1. Rape	252	$79	$161
2. Robbery	180	57	115
3. Disorderly	171	54	109
4. Assault	154	48	98
5. Attempted Suicide	153	48	98
6. Bomb Threat	141	44	90
7. Sudden Death	122	38	78
8. Curfew ¢ Loitering	112	35	72
9. Narcotics	108	34	69
10. Metnal	98	31	63
11. Traffic Accident	88	28	56
12. Fire Call	72	23	46
13. Civil Trouble	66	21	42
14. Burglary	63	20	40
15. Sex Offense	57	18	36
16. Auto Theft	56	18	36
17. Drunkenness	56	18	36
18. Family Trouble	50	16	32
19. Unwanted Party	50	16	32
20. Larceny	48	15	31
21. Dog Bite	48	15	31
22. Non-Traffic Accident	42	13	27
23. Abandoned Property	38	12	24
24. Vandalism	36	11	23
25. Alarm	35	11	22
26. Children Trouble	34	11	22
27. Suspicious	30	9	19
28. Notification	28	9	18
29. Parking Complaint	27	8	17
30. Barking Dog	17	5	11

*$18.86 per patrol unit hour.
**$38.34 per patrol unit hour.

CHAPTER VI: NOTES

[1]B. D. Harman, "Expenditures for Police and Fire Departments," Urban Data Service, Vol. 2, No. 9 (September, 1970).

[2]A. J. Tenzer, J. B. Benton and C. Teng, Applying the Concepts of Program Budgeting to the New York City Police Department (New York: Rand Corporation, June, 1969).

[3]For example: J. Fred Giertz, "An Economic Approach to the Allocation of Police Resources" (Unpublished Doctoral Dissertation, Northwestern University, 1970); Norman C. Walzer, "Economics of Scale and Municipal Police Services" (Unpublished Doctoral Dissertation, University of Illinois, 1970); and Eugene R. Swimmer, "Measurement of the Effectiveness of Urban Law Enforcement--A Simultaneous Equations Approach" (Unpublished Doctoral Dissertation, Cornell University, 1972).

CHAPTER VII

ESTIMATING PRODUCTIVITY OF PATROL SERVICES: MAIN PRINCIPLES

Given the definitions of patrol output and its cost in the previous sections of the study, how does one assess the productiveness of the various services performed by the patrol? The answer to this rhetorical question is the substance of the next two chapters. Their focal concerns are a systematic methodology for the estimation of patrol productivity and quantifiable indices for its measurement. The discussion commences by outlining main principles of patrol productivity analysis. It is followed by the recommendation of a series of quantifiable indices for productivity assessment.

Developing an Accounting Perspective of the Patrol Service

Because of the labor intensivity of police patrol, it follows that its productivity analysis must be overwhelmingly concerned with the use of patrol officers' time. The knowledge of what categories of activities consume what proportions of patrol hours does not, of

course, say too much about the inherent productiveness of time spent. But such knowledge is an essential building block to productivity and cost analysis.

Assuming a constrained police budget, the police department of any municipality can deploy only a given amount of patrol unit hours for service. It should be recalled that a patrol unit hour is defined as one hour of uniformed patrol on-duty time per basic unit of patrol (squad car, cycle, beat-man, etc.). Total deployed patrol unit hours ("inputs") are then the sum of the patrol time of all individual units deployed for the period (week, month, year, etc.) and for the patrol personnel component (beat, shift, division, etc.) desired. On the basis of the Racine model, the department deployed a total of 89,350 patrol unit hours for the calendar year 1973 for the entire patrol division. Total patrol unit hours made available or deployed represent, under normal circumstances, the time limits on the capability of a police agency to provide patrol services; i.e. maximum "input."

Patrol output consists of services. Performance of such however, consumes time. Consequently, just as "input" can be envisioned as patrol unit hours deployed, "output" can also be looked upon as patrol unit hours consumed. It was shown in Chapter III that patrol unit

hours deployed are consumed, on the general plane, by three broad categories of on-duty patrol activity: responses to calls for service by the public, preventative patrol, and on-duty administrative tasks. The relationship between time deployed (input) and patrol time consumed (output) can be expressed by an equation:

$$R + P + A = T$$

Where:

R = patrol unit hours consumed by the response function;

P = patrol unit hours consumed by the preventative function;

A = patrol unit hours consumed by administrative tasks; and

T = total deployed and available patrol unit hours. All elements are for the same time period.

Illustrating with the Racine patrol experience for 1973 (Table 2):

$$30,111 + 36,112 + 23,127 = 89,350$$

The same idea can be simplified further to equal a unity:

$$\frac{R}{T} + \frac{P}{T} + \frac{A}{T} = 1$$

As in the case of Racine:

$$\frac{30,111}{89,350} + \frac{36,112}{89,350} + \frac{23,127}{89,350} = 1$$

There is no great merit in expressing the relation ship between deployed patrol time and its utilization in mathematical terms, however such a manner concisely highlights the significance of increased productivity in police patrol operations and underlines the need to develop an accounting perspective in productivity analysis.

Assume a rise in productivity of administrative tasks, say through the use of voice taped reports instead of handwritten ones. There is a decrease in "A" permitting a corresponding increase in "R" or "P" or both. Or, in the alternative, and if the equation is rewritten as:

$$\frac{R}{T} + \frac{P}{T} = 1 - \frac{A}{T}$$

it is clear that increased productivity in administrative tasks, thus requiring less patrol unit hours to perform the requisite duties, can be used to reduce overall patrol manpower needs without decreasing the level of time devoted to the response and preventative functions.

The relationship between patrol time consumed and patrol time available as stated above is a simplification as it assumes independence between "R", "P" and "A" which does not exist in actuality. Administrative tasks of patrol officers, such as on-duty report preparation or time in court, are dependent upon the volume of police events handled through the response function and/or

be, in turn, broken down further to its individual components. For example, it may be advantageous for a particular analysis to reduce the definition of patrol unit hours devoted to crime related calls to the sum of hours spent on calls relating to crimes against the person, crimes against property, and other crime related calls.

Similarly, time spent on administrative tasks can also be reduced to its components, albeit with less precision than the time devoted to calls for service. Preventative patrol time, however, as was indicated in Chapter V, does not lend itself to meaningful quantification, at least not by practical means.

Relating time consumed to patrol time deployed does not say much about the productiveness of service performed during such time; i.e. which functions to slight or to favor. The significance of time data so accumulated and so arranged is to provide a base for productivity analysis. It should be kept in mind that output is always defined per unit of time. Without the time element, little of substance can be said about the productiveness of various patrol activities.

The gathering of time consumed data is within the capability of police agencies which have access to data processing facilities. The initial source of response function statistics is the dispatcher. Contemporary police practice, as a matter of standard operating procedure,

requires a log of complaints handled by patrol units. Time consumed on a particular call by each unit dispatched, as opposed to net patrol time per incident for all dispatched units, is a reasonable procedural adjustment to the workload of the communications section. The costlier burden lies in the transcribing of the dispatch records to an automated data system; i.e. coding, key-punch, and processing. On-duty administrative tasks (court time, report preparation, on-duty training, etc.) can be approximated on a periodic sampling basis. Given the empirically determined consumed time on the response function and the administrative tasks, time spent on preventative patrol can be arrived at as a residual. Of course, gathering of patrol time consumed data is not without complexities, as the qualifications to this study indicated. However, much useful information can be collected and used to reduce patrol decision making uncertainties.

The Significance of the Response Function

The following chapter presents a series of indices which are intended to estimate the productivity of the three main categories, and their sub-classifications, of patrol services; responses to calls, preventative patrol, and on-duty administrative activities. These indices in the aggregate are the approximate measure of the productivity of the patrol function as a whole.

While there is no single index which by itself would serve to reasonably estimate the productiveness of a patrol operation of a given police agency, there is one consumed time measure which has a special significance beyond merely indicating where patrol time is spent. The latter can be expressed by the following ratio:

$$\frac{\text{Patrol Unit Hours Consumed by the Response Function}}{\text{Total Patrol Unit Hours Deployed}}$$

Illustrating with the Racine Model (Table 2):

$$\frac{30,111}{89,350} = 34\%$$

This ratio expresses the proportion of time that the patrol devotes to called-for services. It is important as an overall measure of patrol productivity for several reasons.

Despite the widely articulated ideal that the purpose of uniformed patrol is to prevent crime*, the police, in practice relegate preventative patrolling activities to a residual, "catch-as-catch-can" function. Perhaps the police practitioners have long sensed what, for example, the Police Foundation's study of Kansas City patrol experience explicitly concluded--that the ability of general patrol strategies to prevent a significant

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*Please see the introductory section of Chapter III.

amount of crime is limited. Contemporary police practices emphasize reaction to called-for services. This is indicated by the fact that response function experience rather than probabilities of criminal offenses, in increasingly becoming the base for anticipating and distributing patrol workloads.

The Oakland Police Department's beat distribution is grounded on the consumed time principle. The department's procedure considers the amount of time patrol officers spend on various calls as the main criteria for deployment rather than the type of seriousness of the incident.[1] St. Louis patrol units are deployed on the basis of demand for called services. Such are predicted by the hour and geographic area using projections based on historical demand for service data with adjustments for weekly and seasonal variations.[2] Los Angeles uses a similar procedure which, however, can be adjusted to give priority to certain types of anticipated calls.[3] The Phoenix Police Department utilizes the "hazard" concept to allocate the workload for its patrol division. A "hazard" is defined as the sum of time for dispatch delay, travel to the scene, and elapsed time for services multiplied for all calls during given locale. Phoenix patrol cars are deployed by district, shift and day of the week in relation to the fraction of the city-wide hazard projected to occur during the particular period

and in the particular geographic area.[4] The Chicago Police Department's system for patrol deployment also considers calls-for-service as the main criteria,[5] as does the Racine police, the model for this treatise.

On the day-to-day operational level the response function is, in effect, the main patrol function. Consequently, the central concern of patrol productivity is with the quantity and quality of services rendered to citizens requesting them. If a police department so manages its patrol resources where it primarily seeks the satisfaction of its direct clients, it is likely that in the long run, the department will concurrently enhance its aggregate, "ultimate" outputs; the feeling of community security, deterrence of crime and a sense of democratic law enforcement.

Another reason for the importance of the ratio of hours spent on called-for services to total patrol hours deployed, is esoteric to the nature of productivity analysis. The latter, as previously indicated, places a premium on that which is reasonable measureable. In this context, ancillary administrative tasks of patrol officers and the response function in particular, lend themselves to some quantification of performance: e.g. number and types of calls handled per unit of time. Reactive patrol duty can be more precisely accounted for. This is not true of pro-active preventative patrolling.

The premise behind productivity is economic optimality which in turn assumes rational decisions on the basis of best information so as to reduce uncertainty. The techniques of productivity assessment are biased to that which is more objectively ascertainable. In this context, the more productictive department is the one which can measure to some degree the frequency and type of services performed. In this context, the ratio of time spent on the response function may in itself be an indicator of the productive use of uniformed patrol manpower.

Defining Patrol Objectives

Just as a definition of patrol time consumed is a dimension entering productivity analysis, so are the definitions of patrol objectives. To put it another way, the quantity of services performed per unit of patrol time tells one something about the productivity of time used. But the question remains, are such services achieving the desired goals? A statement of objectives is therefore also needed in patrol productivity analysis.

However, it should be quickly added, the productivity idea incorporates goal achievement with a reservation. A distinction between "effectiveness" and "productivity" needs to be emphasized. Effectiveness deals with

the degree to which an objective is successfully acomplished without, generally speaking, a concern for resources expended. Productivity, on the other hand, is a concept that concerns itself not only with "workability" but also its costs. The optimal alternative is the preoccupation in productivity analysis whereas the maximal alternative, the "strategy of affluence," is the salient theme behind the effectiveness notion.

Patrol objectives are well exemplified in the eleven major responsibilities enumerated at the beginning of Chapter II and as identified by the American Bar Association. But, as it was pointed out in the same chapter and reiterated above, productivity analysis, as an applied methodology, places a premium on measurability. Consequently, productivity assessment techniques can not meaningfully utilize police objectives of an "upper" hierarchical order. Such goals as general crime deterrence, increasing the sense of community security, maintenance of order, or the safeguarding of constitutional freedoms are beyond concrete relationship to patrol productivity indicators.

The emphasis of patrol productivity analysis must fall on the "lower," more measurable hierarchy of objectives. The definition of such objectives is found in the operational milieu of patrol rather than in its generalized ideal. The description of the various patrol

activities by the Racine patrol division indicated which outputs lend themselves best to measurement, i.e. called-for services. It was also pointed out that the response function has a special significance. Police organizations in practice, as opposed to ideal, consider the reactive role as the primary duty of patrol. Given these two premises; i.e. the measurability and the primacy of the response function, the following patrol objectives are suggested for the purposes of productivity assessment:

a) Satisfaction of citizen demands for the resolution of criminal incidents: The focus of this objective is on the satisfaction of demands upon the patrol by the victims of crime, those directly using patrol services, rather than the general public;

b) Satisfaction of citizen demands for the resolution of inter-personal conflict: Again, the objective is directed at meeting the demands of those requesting police services rather than the overall constituency;

c) Satisfaction of citizens' demands for the provision of miscellaneous assistance: This objective encompasses the provision of services such as escorts, emergency aid, notification of persons, animal control, weather warnings, etc. These are services which the patrol as a public agency is uniquely suited to provide because of its 24-hour availability, mobility, communications capability, and authority to use lawful force.

d) Regulation of traffic and enforcement of traffic ordinances; and

e) Enforcement of criminal laws by the apprehension of violators.

The above stated objectives are not mutually exclusive nor are they without a relationship to other goals of the patrol service. The underlying assumption is that the concentration on the productivity in the achievement of these more measurable objectives will concurrently enhance the achievement of the "superordinate" police goals. To illustrate: A greater number of criminal arrests by the patrol, other variables being constant, is indicative of increased productivity in the law enforcement function and presumably results in the greater overall productivity of patrol to deter crime. Similarly, increase in the number of callers satisfied with the way the patrol officers handle their complaints may also concurrently increase the feeling of security in the community.

Defining Quantitative and Qualitative Productivity Indicators

On a purely theoretical level, productivity deals with the "quantity" of output per unit of input. Homogeneity in output is presumed. But even peas in a pod differ. Consequently, on the applied level the concept of productivity encompasses both qualitative and quantitative measures of output. It can be readily appreciated that an increase in output per unit of input, when accompanied by a concurrent decrease in the product's quality, is an illusory gain in productivity.

The central patrol productivity measure in the quantitative sense is the number of services provided per unit of time or, conversely, the length of time it takes to perform the desired service. Obviously, the aspiration of every police agency is, or at least should be, to reduce the minutes consumed per every patrol event handled or activity undertaken. This is the clearest road to productivity improvement, assuming no impairment to the quality of the services provided.

Qualitative indices of patrol productivity are therefore very important, yet the most difficult to define in measurable terms. However, given patrol objectives which are oriented to the servicing of direct clients rather than the more abstract constituency, it is clear that what is needed is some technique for the reasonably objective assessment of the degree of satisfaction with patrol services as expressed by those using them.

Surveys of community views on their police department are, of course, nothing new.[6] Such devices are meaningful tools to introspective police and general government administrators. However, their usefulness for productivity assessment is limited. They are periodic information devices not suited to provide police management with continuous, operationally sensitive data. They are also expensive to undertake. Lastly, and perhaps most

importantly, the community surveys reach a cross section of the general population including those persons who may not have had direct contacts with the police. Their views may be based on hearsay or simply on intuition. It is difficult for police administrators to operationally react to such diffuse impressions.

A device of greater pertinence to productivity analysis is a victimization survey. While this device is intended to primarily determine the "true" incidence of crime, it usually also incorporates victims' attitudes toward police services. The use of victimization studies have been recommended by the police productivity improvement suggestions of the National Commission on Productivity[7] and the International City Management Association.[8] Such surveys, while having more specific applicability to patrol productivity, nevertheless share with the community attitude studies the problems of expense and of an infrequent data base.

What is needed is a survey device which: a) can be administered on a continuous basis so that it can be related to operational changes; b) involves minimal expense; c) reaches not only users of patrol for crime related problems but all categories of "clients"; d) will be designed in a manner which allows for some degree of quantification of views expressed by respondents; and which e) has reasonable statistical controls.

A survey format which is believed to meet such criteria is illustrated in Figure 1. The logistical assumptions are as follows: At the end of every month (or other select period), the department would mail out the survey form to a representative sample of citizens who had occasion to ask for patrol services in the course of previous thirty days. The sample would encompass a cross section of events handled; i.e. criminal incidents by type, conflict resolution incidents by type, traffic events by type and select miscellaneous non-criminal responses. The tabulated responses would serve to indicate, particularly after a "history" of several such surveys, graduated changes in the quality of patrol services and provide management with a concrete tool for performance improvement decision-making. (The specific techniques for the use of this survey device to increase productivity are covered in the latter half of the next chapter.)

The implementation of such a surveying program is not without problems. One can anticipate objections by police officers. They would, after all, be judged on their deportment and identified in specific circumstances by managerial personnel. There may be reluctance of some users of police services to respond critically for fear of affronting the police. Lastly, since the preponderant users of patrol services are from the lower

socioeconomic groups, there may be problems of comprehension of this survey or any written instrument.

Despite imperfections, an attitudianl device to measure the degree of satisfaction with police services on part of their direct users is the only "objective" means available to approximate on a continuous basis the quality of the services provided. Police is a legal monopoly. Those unsatisfied with it do not have the luxury of "buying" services from competing agencies thus indicating their displeasure.

Dear (name):

On (date) you called your police department because (brief description of the incident). We are interested in knowing how you would rate the police services provided. Please take a minute to answer the following few questions and mail them back to us in the pre-posted envelope. There is no need to sign your name.

Each question asks you to rate the officers who answered your call. If you are very unsatisfied, circle 1. If you are very satisfied, circle 10. If your feelings are someplace in between, circle the number which most closely fits the way you feel about the question.

1. How satisfied are you about the length of time it took for the police to come to your place?

10	9	8	7	6	5	4	3	2	1
Very Satisfied									Very Unsatisfied

2. How satisfied are you about the officers' manners toward you?

10 9 8 7 6 5 4 3 2 1

3. How satisfied are you about the amount of consideration that the officers gave to your problem?

10 9 8 7 6 5 4 3 2 1

4. How satisfied are you about the way the entire matter was handled by the police?

10 9 8 7 6 5 4 3 2 1

Do you have any other comments? _____

_____

CODE: (by individual, date of event, shift, locale, squad unit, etc.)

Figure 1.--Model Questionnaire: Victim/Caller Satisfaction With Patrol Services.

[1]Allen P. Bristow, Effective Police Manpower Utilization (Springfield, Illinois: Charles C. Thomas, 1969), p. 88.

[2]James S. Kaklik and Sorrel Wildhorn, Aids to Decision-Making in Police Patrol (Santa Monica: Rand Corporation, 1971), p. 57.

[3]Ibid., p. 58.

[4]Ibid., p. 56.

[5]National Institute of Law Enforcement and Criminal Justice, Allocation of Resources in the Chicago Police Department (Washington: Government Printing Office, 1972), p. 165.

[6]National Commission on Productivity, Opportunities for Improving Productivity in Police Services (Washington, D.C.: National Commission on Productivity, 1973).

[7]George P. Barbour, Jr., "Measuring Local Government Productivity," The Municipal Year Book--1973 (Washington, D.C.: International City Management Association, 1973), pp. 38-46.

CHAPTER VIII

ESTIMATING PRODUCTIVITY OF PATROL SERVICES: KEY INDICATORS

Indicators For The Response Function

The patrol response function entails the meeting of public demands for the various called-for services. Increased productivity in the handling of calls means essentially that the amount of time spent per call is reduced without a corresponding decrease in the quality of services or, conversely, increase in the caliber of services without a corresponding increase in the amount of time devoted to their fulfillment.

There are some productivity indices common to all called-for-service responses and some that are particular to the crime related class of calls. In terms of presentational format, the ensuing discussion will cover first the productivity indicators common to all types of calls for service. Indicators specific to crime related call categories will be suggested subsequently.

Quantitative Indicators

One goal of productivity improvement, as previously indicated, is to reduce the amount of patrol

time spent per each dispatch event regardless of type. The basic indicator for the number of patrol services provided per unit of time is encompassed by the following ratio:

$$\frac{\text{Patrol Unit Hours Consumed on Calls-for-Services (By Type)}}{\text{Number of Calls-for-Service Handled (By Type)}}$$

Illustrating with the Racine model for the response function as a whole (Table 8):

$$\frac{30,111}{33,630} = .895 = 54 \text{ minutes}$$

Reducing the scale of the response function to its main subclasses, the pertinent ratios are as follows:

$$\frac{\text{Patrol Unit Hours Consumed on Crime Related Calls (By Type)}}{\text{Number of Crime Related Calls Handled (By Type)}}$$

E.g. Racine (Table 8): $\frac{12,398}{13,725} = .90 = 54$ minutes

$$\frac{\text{Patrol Unit Hours Consumed on Conflict Resolution Calls (By Type)}}{\text{Number of Conflict Resolution Calls (Ty Type)}}$$

E.g. Racine (Table 8): $\frac{6,085}{6,939} = .88 = 52$ minutes

$$\frac{\text{Patrol Unit Hours Consumed on Traffic Related Calls (By Type)}}{\text{Number of Traffic Related Calls (By Type)}}$$

E.g. Racine (Table 8): $\frac{7,964}{6,571} = 1.21 = 73$ minutes

$$\frac{\text{Patrol Unit Hours Consumed on Miscellaneous Calls (By Type)}}{\text{Number of Miscellaneous Calls (By Type)}}$$

E.g. Racine (Table 8): $\frac{3,664}{6,395} = .57 = 34$ minutes

It should be quite evident that this quantitative productivity assessment ratio can be applied to the scale needed by a particular analysis or to the degree that consumed time data is available. For example, should one seek to determine the effect of a given patrol strategy on consumed time for crimes against the person, the appropriate index would be:

$$\frac{\text{Patrol Unit Hous Consumed on Crimes Against Person Calls}}{\text{Number of Calls Related to Crimes Against Persons}}$$

E.g. Racine (Table 9): $\frac{2,785}{1,013} = 2.75 = 165$ minutes

$$\frac{\text{Patrol Unit Hours Consumed on Robbery Calls}}{\text{Number of Calls Related to Robbery}}$$

E.g. Racine (Table 9): $\frac{831}{277} = 3.0 = 180$ minutes

Assuming the quality variable to be constant, each of the above exemplified ratios can be improved (time reduced) by means of two general patrol manpower utilization strategies. The most obvious one is to dispatch only that number of patrol units which are minimally necessary to handle the event for which service was requested. Minimality is dependent upon such considerations

as the safety of persons calling and officers dispatched, probabilities of apprehending a serious offender, need to regulate traffic or pedestrian movement in the vicinity of the scene and the like. In this context, a useful supplementary productivity indicator is:

$$\frac{\text{Number of Patrol Units Dispatched on Calls-for-Service (By Type)}}{\text{Number of Calls-for-Service Handled (By Type)}}$$

The second method for reducing consumed patrol time per call is to improve the expeditiousness with which events are handled by patrolmen. Here, however, one is concerned with the complex totality which incorporates individual officer aptitudes and attributes, deployment strategies, administrative tasks, etc., all within the context of incidents, many of which have unique properties. "Expeditiousness" is concerned more with the quality of output rather than its quantity per unit of time.

Qualitative Indicators

It was indicated in the previous chapter that the only practical means to monitor the quality of patrol responses to citizen calls was to institute a "complainant satisfaction" surveying technique. It was suggested that the method should involve continuous sampling by mail of the users of police patrol. It was further stipulated

that the survey should not be exclusively concerned with victims of crime, but also encompass a representative sample of those individuals who call upon the police for miscellaneous assistance, for conflict resolution or for traffic related problems. It was also pointed out that public attitude surveys and victimization studies are not novel in the police performance evaluation sphere. The procedure suggested here is dictated by the logic that if one wants to find out how effectively a service is being performed, why not ask the direct recipient of such service.

It should be recalled that the survey form sought the sample of patrol service users to express their degree of satisfaction by ranking response time, courtesy, "professional" deportment of officers responding, on a scale from "very unsatisfied" to "very satisfied." The fourth question on the survey sought to ascertain the user's overall impression of the performance of the police on the particular complaint (Figure 1). (It should be stressed, of course, that the survey instrument proposed is merely illustrative of the general idea that such techniques or one similar to it should be within the evaluative tool resume of police administrators or of municipal management if productivity analysis of police service is to have some applied bite.) The

results of the survey could be tabulated by incident type to yield a "satisfaction--dissatisfaction" ratio for those responding by a particular aspect of officers' performance during the event (response-time, courtesy or "professional" deportment) or for handling of the incident in its entirety.

Assuming the use of a surveying device to sample the reaction of complainants to patrol handling of their complaints, the following ratios are meaningful qualitative indicators of patrol productivity for the response function:

$$\frac{\text{Percent of Complainants Expressing Satisfaction (By Type)}}{\text{Total Number of Complainants Responding (By Type)}}$$

The ratio can be, of course, adapted to the degree of specificity needed by the productivity analysis problem or to the degree that the survey sample includes specific types of called-for-services. For example:

$$\frac{\text{Percent of Crime Related Call Complainants Expressing Satisfaction}}{\text{Total Number of Crime Related Call Complainants Responding}}$$

$$\frac{\text{Percent of Conflict Resolution Call Complainants Expressing Satisfaction}}{\text{Total Number of Conflict Resolution Call Complainants Responding}}$$

$$\frac{\text{Percent of Burglary Victims Expressing Satisfaction}}{\text{Total Number of Burglary Victims Responding}}$$

Etc.

In the absence of a formalized, "institutionalized" procedure to continuously monitor the reaction of complainants to patrol services received, there are some alternative indicators which can be used to gauge the quality of overall patrol services provided. These are, however, poor substitutes to a systematic survey since they lack statistical controls. For example:

$$\frac{\text{Number of Persons Voluntarily Expressing Dissatisfaction About Police Handling of Their Complaint (By Type)}}{\text{Number of Calls-for-Service Handled (By Type)}}$$

A rapid response to a citizen's call has been traditionally considered by the police as an important measure of their effectiveness. Response time is defined as the elapsed time between the receipt of a call for service and the arrival of the patrol unit at the scene. It is the sum of time attributable to dispatch delay, queue delay and travel delay. Elaborate systems simulation models have been designed to reduce response time.[1] Although logic argues for it, there is no firm evidence that the rapidity with which police answer a call has a deterrent effect on crime.

There has been a study made, however, which found that a rapid patrol response is likely to have a beneficial

impact on saving the life an an injured person.[2] Also, a 1967 study by the President's Commission on Law Enforcement and the Administration of Justice of Los Angeles patrol practices indicates that a faster response would result in more arrests of suspects and interrupt more crimes-in-progress.[3] Yet, the main justification for emphasizing rapid handling of citizen complaints seems to be the intuitive expectation by law enforcement that promptness connotes efficiency increasing public confidence in the police and, consequently, promotes a greater sense of community security.

Other police productivity studies have recommended the measurement of response time as a qualitative indicator of patrol productivity.[4] The following ratio for the measurement of response time is also suggested by the National Commission on Productivity:[5]

$$\frac{\text{Number of Calls (By Type) Responded to in Under "X" Minutes}}{\text{Total Calls (By Type)}}$$

The "X" represents a time factor determined after taking into consideration the priority nature of the dispatch; crime in progress, accident with an injury, etc. However, since reduced response time can be conceived of as an objective for all calls regardless of type, the main utility of the above index would be for inter-period comparisons of response performance and for its continuous monitoring.

Crime Related Responses--
Qualitative Indicators

The quantitative productivity measure for crime related responses is common to all calls. It consists of the amount of patrol time spent per event. The goal is a reduction of consumed time without a corresponding decrease in the "quality" of service. There are, however, qualitative productivity indicators specific to crime related dispatches.

The main distinction of crime related calls from other complaints, i.e. conflict resolution, traffic and miscellaneous non-criminal incidents, is that the former are assumed to pose a particular threat to person and property and also involve violators of criminal law whom the police are responsible for apprehending. As a consequence, the patrol generally gives priority to crime related events in terms of the rapidity of response and the amount of resources devoted to such events. For example, 41% of the 1973 Racine patrol cost for the entire response function is attributable to crime related events (Table 19). Also, as a single category, calls related to crimes against the person consume the most patrol time per dispatch and, of course, are the most costly (Table 20).

Increasing the probability of offender apprehension is but one reason for devoting more patrol resources

on calls related to criminal events. Safety of the officer, demands for more detailed investigative procedures because of the considered seriousness of the event or the need to protect the scene from the curious also dictate to a varying degree the number of patrol units dispatched. However, the motive for increased offender apprehension and the interruption of crimes-in-progress is usually the pre-eminent rationale for greater patrol time consumption for criminal events. In this context, there are two useful measures to aid the patrol resource allocation decision. The first is:

$$\frac{\text{Total Crimes-In-Progress Interrupted as a Result of Public Calls (By Type)}}{\text{Total Crime Related Calls (By Type)}}$$

The significance of the above index is two-fold. The ratio of crime-in-progress to total criminal calls can provide patrol administrators with an objective probability statement as to the nature of patrol work surrounding crime related dispatches. If the ratio of crimes-in-progress to total crime related calls is small, it indicates that the officers dispatched essentially spent their time handling an event after the fact; i.e. succoring the victim, protecting the scene or preparing investigative reports. Such type of patrol activities demand less patrol resources and patrol deployment should

should be adjusted accordingly. The above ratio can also be used as a cross-check on the effectiveness of the response time.

The second ratio which also aids decision-making in allocating resources to crime related calls and, concurrently, provides an estimate of the enforcement productivity of crime related dispatches is:

$$\frac{\text{Adjudicatory Arrests Made By Patrol Units Dispatched to Respond to Crime Related Calls (By Type)}}{\text{Crime Related Calls (By Type)}}$$

If the above ratio is low, it is indicative that few arrests are made on the scene. Such knowledge should influence patrol operating procedures as to the number of patrol units which should be dispatched on particular crime related calls. If the probabilities for on-scene apprehensions are low, the committment of a large amount of patrol resources to a given criminal event cannot be rationalized primarily by the apprehension motive. The reference to "adjudicatory arrests" in the above ratio is intended to mean those apprehensions which pass initial judicial screening as to the validity of the charges brought.

Other Patrol Productivity Indicators

As it was pointed out earlier, because of the greater problems of measuring preventative patrol activities

and because of its consideration by police practice as a residual service, productivity analysis in this study emphasizes the response function. Nevertheless, there are some rough indicators of the degree tow hich preventative patrol is a productive endeavor.

These indices serve as measures of the extent to which patrol officers exercise their initiative during their non-committed time. The following are useful:

$$\frac{\text{Adjudicatory Arrests Made By Patrol Units During Non-Committed Time (By Type)}}{\text{Patrol Unit Hours Consumed on Preventative Patrol}}$$

$$\frac{\text{Discoveries of Open Doors and Windows of Residences and Business Establishments}}{\text{Patrol Unit Hours Consumed on Preventative Patrol}}$$

It should be reiterated that the above ratios should be interpreted with great caution. The premise behind preventative patrol is deterrence. The time that a patrol officer spends looking for criminal opportunities is, under the preventative patrol concept, more important than the fact that he discovers one. To put it in another way: Assume a beat patrolman of aggressiveness and competence. It may be that he is able to "secure" his beat over time to the degree that criminal opportunities are practically eliminated. As a consequence, his work record may show few observational arrests, yet he is a highly productive officer. The above hypothetical

situation is, of course, an extreme one but, nevertheless, poignant to illustrate the difficulty of measuring preventative patrol productivity.

Ancillary administrative tasks of patrol officers, as indicated in Chapter V, consume a great deal of on-duty time. The index to measure productivity is reflected in the following ratio:

$$\frac{\text{Patrol Unit Hours Consumed On Administrative Tasks (By Type)}}{\text{Total Patrol Unit Hours Deployed}}$$

Since administrative duties do not have a "goal" in themselves but are related to other patrol activities, it is to the interests of patrol productivity to keep the above ratio as low as circumstances permit so as to release patrolmen for substantive duties.

CHAPTER VIII: NOTES

[1]For example: Richard C. Larson, Urban Police Patrol Analysis (Cambridge, Mass.: The MIT Press, 1972); and Law Enforcement Assistance Administration, Allocation of Resources in the Chicago Police Department (Washington, D.C.: Government Printing Office, 1972).

[2]R. B. Andrews, "Criteria Selection in Emergency Medical Systems Analysis," (University of California, Los Angeles: Report EMS-61-1-W, 1969) cited in Larson, op. cit., p. 32.

[3]Herbert H. Isaacs, "A Study of Communications, Crimes, and Arrests in a Metropolitan Police Department," Task Force Report: Science and Technology, President's Commission on Law Enforcement and Administration of Justice (Washington, D.C.: Government Printing Office, 1967).

[4]Gary B. Hirsch and Lucius J. Riccio, "Measuring and Improving the Productivity of Police Patrol," Journal of Police Science and Administration, Vol. 2, No. 2 (June, 1974), p. 18; and National Commission on Productivity, Opportunities for Improving Productivity in Police Science (Washington, D.C.: National Commission on Productivity, 1973), pp. 19-22.

[5]Ibid., p. 20.

CHAPTER IX

SUMMARY AND CONCLUSIONS

This study sought to develop a methodology for assessing the productivity of municipal patrol services. The concept of productivity, at its simplest, is concerned with realizing the maximum output per unit of input. Inputs are labor, capital, land, energy or, in the common alternative, costs. Outputs are goods and services. The interaction between the two is the essence of productivity analysis. Its goal is economic optimality, the strategy which yields maximum product at least cost.

Policework is not making widgets. It is complex, subtle in its ultimate impace on society and very hard to measure. The fact that productivity analysis places a premium on measurability greatly limits its applicability to policing. A productivity study of the patrol operation, because of the need to define output and input in measurable terms, can deal only with the lower hierarchy of police objectives. It is the latter order of goals that lend themselves somewhat to quantifiable statements. Police objectives of the "super-ordinate" level, such as deterrence of crime, providing a sense of security to the

community, maintaining order or safeguarding constitutional freedoms, are beyond concrete relationships to cost or to value. Not all is futile. To the extent that "hard" statements can be made about patrol productivity they are useful; they reduce uncertainty and improve rational decision making.

Because of the labor intensivity of patrol services, about 85% of input being labor costs, it follows that productivity analysis of patrol must be preoccupied with the use of police officers' time. The way that patrol uses time, the services it performs, constitutes patrol output.

The vehicle chosen to define output is one year's patrol experience of a medium sized police agency located in the Midwest. This department, having a complement of 242 sworn and civilian personnel, recorded 33,630 dispatches of its uniformed patrol officers in the course of 1973. Data was kept for the patrol time elapsed for each dispatch by type of call. The elapsed time data was converted by means of an estimation procedure to consumed patrol time per event handled to yield the total estimated consumed time on called-for-services for the period of one year. This data, tabulated by classes of incidents handled, serves as the main empirical base to this study.

Just as the services that the patrol performs for the public constitutes its output, the patrol unit hours

that a department deploys, assuming limited resources for a budget period, can be viewed as maximum input. The hours deployed are consumed by services. In this sense, an accounting equality between input and output can be expressed. Patrol unit hours deployed are equal to patrol unit hours consumed. On the general plane, patrol hours are consumed by three categories of activities; responses to citizens' calls for service, preventative patrolling and administrative tasks. Having determined consumed time on called-for services and administrative tasks, preventative patrol time can, therefore, be derived as a residual.

As a matter of fact, there is no practical alternative to arrive at a reasonable measure of preventative (non-committed) patrol time except by the residual process. Officers' non-committed time activities depend much upon their discretion. Furthermore, attempts to measure time consumed by events initiated by the patrolman, observation arrests for example, are not inherently meaningful as the premise behind preventative patrolling is deterrence rather than detection. The fact that an officer finds one open door is not as significant as, for example, the fact that he spent substantially more time on checking fifty secure doors. In terms of estimating productivity, the preventative patrol function remains a "gray" area. The bias of patrol productivity analysis falls on the more

measurable. Time spent on administrative tasks can be approximated from information available in patrol records as supplemented by sampling techniques. Time consumed on calls for service particularly lends itself to good time approximations if an agency logs its dispatches.

In the case of the subject department, it was found that the following output to input relationship prevailed for the year under study:

34% Reactive + 40% Proactive + 26% Administrative
= 100% Deployed Patrol Hours

About three quarters of time spent on administrative tasks was consumed by "catch-up" investigatory report preparation. The balance consisted of officially sanctioned personal breaks, time spent on exchanging defective equipment or waiting for it to be repaired and on-duty time in court.

Time consumed by the response function consisted of 41.2% on crime related calls, 20.2% on conflict resolution responses, 26.4% on traffic complaints and 12.2% on sundry demands for patrol services. As far as specific types of dispatches are concerned, the most time consuming events are those which (a) involve a threat to the safety of a person, such as robbery, rape or attempted suicide; (b) pose a potential threat to the safety of officers responding to the call, such as disorderly cases, armed robbery or assault; (c) require an extensive

information gathering process for investigatory reports, such as traffic accidents, property and person crimes or animal bites; and (d) interrupt the orderly flow of people or vehicles in the vicinity of the scene, such as street crimes, traffic accidents or fire calls.

Cost distribution were also made. Basing expenditures on the department's 1973 budget, it was estimated that the cost per patrol unit hour deployed ranged from $18.86 to $38.34. The lower figure was calculated by accruing only those costs which are strictly identified with the "patrol division" as an accounting entity. The higher cost estimate was computed by considering the patrol as the key police function and the specialized divisions as aids. In the latter case, all departmental costs were allocated to patrol. Because of the labor intensivity of patrol services, cost distributions for the various activities parallel consumed time data. As a single class, patrol handling of calls related to crimes against the person were found to be most expensive, while sundry assistance calls were least expensive. For example, the cost of responding to a robbery call ranges from $79 to $115. The cost of answering a complaint of a barking dog lies between $5 and $11.

Given the definitions of patrol output (types of services) and patrol input (cost of services), how does one measure the interaction among the two: i.e.,

productivity of patrol? The emphasis of the analysis must fall on the services associated with responses to public demands for service. The reasons for this are several.

While prevention of criminal opportunities is articulated as the ideal of patrol, in practice it is treated as a residual function. Preventative patrolling seems to be something to do between dispatches on calls. It is perhaps best described as a working poise for service. This conclusion is strongly supported by the practice of many metropolitan departments to deploy their manpower on the basis of elapsed time per service call experience rather than probabilities of criminal events. Moreover, the response function assumes a special significance for productivity analysis because, as previously said, decisions on economic optimality place a premium on measurement. Patrol time spent on calls can be more precisely accounted.

Due to the stress on measurability and the actuality of police practice to give priority to calls for service, patrol objectives for the purpose of this study were formulated as follows:

1. Satisfaction of public demands for services related to criminal and non-criminal complaints. (Note: The objective addresses itself not to the general public, but to those actually calling upon the police for help.)

2. Enforcement of criminal laws and ordinances by the apprehension of violators.

The above two objectives are not mutually exclusive. Presumably a victim of crime would be more satisfied if the perpetrator was apprehended. Nor are the above objectives unrelated to the upper, less measurable hierarchy of patrol goals. To illustrate: A greater number of criminal arrests by the patrol, other variables being constant, is indicative of increased productivity in achieving the law enforcement objective and presumably results in greater overall productivity to deter crime. Similarly, increase in the number of callers satisfied with the way that patrol officers handle their complaints may also concurrently increase the feeling of security in the community.

Having defined goals, output and input of patrol services, one can, therefore, make a general judgement as to what constitutes a productive patrol operation. It is the agency which has a high ratio indicated by the following index:

$$\frac{\text{Patrol Unit Hours Consumed on Calls-for-Service}}{\text{Total Patrol Unit Hours Deplored}}$$

In other words, a patrol division should aspire to spend most of its time on calls to the extent that a pre-determined queue delay permits. Given the law enforcement objective, a productive patrol operation is also the one which has a high ratio on the next indicator:

$$\frac{\text{Adjudicatory Arrests Resulting from Responses to Crime Related Calls for Service}}{\text{Crime Related Calls for Service}}$$

Since the focal concern of the patrol objectives is to directly satisfy complainants and the general public only indirectly, the apprehensions of prime significance are those resulting from responses to calls rather than officer initiated activities.

Productivity encompasses both quantitative and qualitative indicators. It can be readily appreciated that an increase in output when accompanied by a decrease in its quality is but an illusory gain in productivity. The central quantitative indicator of patrol productivity is the number of services per unit of time or, in the converse, the length of time per service performed. Consequently, it can be said that a productive patrol operation is the one which shows the next ratio as low:

$$\frac{\text{Patrol Unit Hours Consumed on Calls-for-Service (By Type)}}{\text{Number of Calls-for-Service Handled (By Type)}}$$

Of course, indicators of decreasing amount of time spent per event are not signs of productivity if quality of services extended are going down. Quantitative measures must be viewed in combination with qualitative indicators. Given the objective of satisfying the demands of complainants (victims, callers) for patrol service, the only reasonable means to determine how

satisfied they are is to ask them. Community views on police surveys are nothing new in the law enforcement field, neither are victimization questionnaires. This study recommends a continuing mail sampling procedure to determine the expressed degree of satisfaction with patrol services by those who had occasion to use them. Assuming the operational utilization of a survey device, the following ratio can be very useful to introspective police and general government administrators:

$$\frac{\text{Percent of Complainants Expressing Satisfaction With Patrol Handling of Their Complaint (By Type)}}{\text{Number of Complainants Responding (By Type)}}$$

Other, more detailed indicators of the quality of patrol service will be found in the body of the text. The four preceeding indices were restated here because they succinctly encompass the main implications of productivity analysis of municipal patrol services.

Much of what police do results in an indivisible social benefit; e.g., crime deterrence, community security or maintenance of peace for orderly transactions among people. Productivity analysis, aside from the methodological posture that it provides a student, is not very potent in making concrete statements about the value of such services. However, because productivity analysis is concerned with measurement, it is at its most powerful when applied to police activities which can be reduced to

"divisible" services for specific households. Such are represented by patrol responses to citizen calls for police assistance. The direct user or patrol services is not an abstract constituency but a concrete person; a victim, a complainant. Satisfaction of his expectations from the patrol, be it succoring his distress or retrieving his stolen property, may concurrently advance indivisible benefits from police service such as crime deterrence, a feeling of community security and a sense of democratic law enforcement.

APPENDIX

Income Characteristics of the Population of the City of Racine: 1970*

Median Family Income:	$10,526
Mean Family Income:	11,405
Mean Public Welfare Income:	1,478
Percent of Families Below Poverty Line:	6.6%

Population Characteristics of the City of Racine: 1970*

Total Population - 1960:	89,144	
Total Population - 1970:	95,162	6.7%
White Population - 1960:	84,332	
White Population - 1970:	84,667	0.4%
Non-White Population - 1960:	4,812	
Non-White Population - 1970:	10,495	118.1%

Other Characteristics of the City of Racine: 1970*

Percent of Population Industrially Employed:	55%
Percent of City Area in Residential Use:	47%
Percent of Housing Renter Occupied:	36%
Percent of Dwellings in Unsound Condition:	11%

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*Sources: U.S. Census - 1970 and Racine Planning Department.

Personnel Deployment by Function, Racine Police Department, 1973*

Division I:	Community Relations	5
Division II:	Records and Identifications	16
Division III:	Administration	33
Division IV:	Planning-Research-Training	8
Division V:	Detective	26
Division VI:	Juvenile	14
Division VII:	Traffic	13
Division VIII:	Intelligence	8
Division IX:	Patrol	119
	Total Sworn and Civilian Personnel:	242
	Total Authorized:	253

Sworn Personnel Authorized by Rank, Racine Police Department, 1973*

1	Chief of Police
1	Assistant Chief of Police
1	Inspector
7	Captains
12	Lieutenants
9	Juvenile Investigators
22	Sergeants
5	Intelligence Investigators
19	Detective Investigators
7	Traffic Investigators
107	Patrolmen
191	Sworn Positions

*Source: 1973 Annual Report, Racine Police Department.

PRODUCTIVITY AND COST OF PATROL SERVICES

Note on Replication

Police agencies of different municipalities and counties have some operational properties unique to themselves. The author believes, however, that operational "styles" among the various departments are not of sufficient diversity to preclude the adoption of this study's methodology for the assessment of patrol productivity. To the extent that limits on replication exist, they gravitate about the degree to which data on patrol work may be available for a particular police department. This appendix is intended to point out the minimal data requirements to replicate for a given patrol operation the productivity and cost analysis of Racine Police Department, the model for this study.

In seeking to utilize the recommended methodology, the prospective administrator or student should be particularly cognizant of the limitations of productivity analysis to the police role. These are extensively discussed in Chapter II and should be reviewed. It should also be noted that throughout the statistical and analytic presentations of this work, the author deliberately speaks

in terms of "estimates" rather than absolute derivatives. Statements about patrol productivity, or its cost allocations, can only be approximations which are, nevertheless, useful in reducing uncertainty in police policy decision-making.

Data Required for Classifying Patrol Services (Output)

It should be recalled that patrol output can be broken down to three broad categories of activities: the response function, preventative patrol and ancillary administrative tasks. Administrative duties are defined as investigatory report preparation, on-duty appearances in court, officially sanctioned personal breaks and other activities which do not have an end in themselves but are supportive of the other two functions and which can, as a matter of reasonable measurement procedures, be distinguished from them. Patrol time consumed on administrative tasks can be derived from operational records, such as payroll data for on-duty court appearances by patrol officers or by means of periodic survey questionnaires. Chapter V contains illustrative procedures whereby Racine patrolmen's administrative duty time was estimated.

The response function consists of the totality of tasks the patrol performs which can be related, again as a matter of reasonable measurement, to dispatches based on calls for service. Patrol time consumed on the response

function by incident class is the elemental data requirement in order to utilize the productivity and cost analysis techniques brought out in this study. Response time consumed is defined as the sum of time attributable to a particular dispatch and consists of travel of patrol officers to the scene, investigation, including any report preparation while "on-scene," and in the case of arrest, booking. The definition excludes time acruing to events initiated by patrolmen, such as observation arrests, and time spent on administrative tasks related to a particular dispatch but which are performed subsequently; e.g., court appearances or "catch-up" report preparation. It should be noted that "time consumed" by incident type should account for all patrol units formally sent to investigate. Time expended by back-up officers must be counted although they may spend substantially less time on the event than the units of primary dispatch.

Under ideal circumstances, reactive patrol time data will be found in a records system which is geared to log time expended per patrol unit dispatched per complaint handled. To illustrate: The receipt of a complaint by communications results in the immediate entry of a complaint number including the description of the call. As each patrol unit is dispatched to respond to the event, time "sent" and time "completed" is recorded for each patrol unit and entered on the given complaint form.

Such forms are subsequently sent to data processing for coding and keypunch as to the nature of the incident, patrol time consumed and other information (shift, beat, location of the incident, etc.) required by the records system. It can be readily appreciated that such a process permits facile automated accumulation of patrol time consumed on the response function for the period desired. Specificity of classification is dependent, of course, on the degree of detail to which incident classifications are reduced.

Regressing one step below the ideal data system for the gathering of time consumed on calls for service, one finds the more common practice whereby records are kept for patrol time elapsed per event as opposed to patrol time consumed. The focus of such a record system is on the net patrol time an incident consumes as opposed to the time that each patrol unit dispatched expends on the event. The count commences with the dispatch of the first unit to the departure from the scene of the last unit. Where only one unit is sent, time consumed is equivalent to time elapsed. This is not the case, however, in the vast majority of events to which patrol is asked to respond, particularly in those departments where single officer cars are deployed. The procedure for converting elapsed patrol time to consumed time is explained in detail in Chapter IV. The conversion is dependent

upon the availability of accurate historical data as to the average number of back-up units dispatched on particular classes of calls. Given such data, statistical sampling techniques can be easily adopted to estimate the amount of time that back-up officers spend on various incidents to which they were dispatched.

In the absence of a continuous operational log of consumed or elapsed patrol time per responded event, or if a police agency lacks data processing facilities, the means for estimating time consumed on the response function must rely on a sampling procedure. Time expended by patrol units on various types of calls for service will need to be recorded and tabulated manually for a select sample period. In most instances a sample of one week of patrol dispatch activity should be sufficient to draw substantive conclusions as to the department's time distributions on the response function activity, providing that the week selected excludes highly unusual patrol workloads prompted, for example, by natural disasters, civil disturbances of similar contingencies.

Preventative patrol responsibility is the aggregate of activities initiated by patrol officers themselves excluding patrolmen initiated administrative tasks which can be isolated as a matter of reasonable measurement technique. As stressed throughout the body of this study, "preventative patrol" is a loose definition to the

extent that it incorporates police activity which may range from aggressive crime prevention activity to outright loafing. The assumption is made that if a police officer is not reacting to dispatches or is not engaged in requisite administrative tasks, his time is essentially dependent upon his initiative and discretion. Preventative function time is, therefore, derived as a residual of total patrol unit hours deployed for the period in question, given hours consumed by responses to calls and administrative duties.

Data Required for Classifying Patrol Costs (Input)

In productivity analysis, inputs are labor, capital, land, energy or, in the common perspective, costs. Total dollar outlays for a patrol budget result in the department's capability to deploy a given amount of patrol unit hours. The latter can be envisioned, as an "analytic fiction," as the net input which results in an output of patrol services through the response function, the preventative function or through the related administrative tasks. It can be seen that under such a conceptualization there is an accounting equality between input and output; i.e., costs are equal to services; patrol hours deployed are equal to patrol hours consumed.

The allocation of costs to the various patrol services is accomplished by determining the cost per

patrol unit hour deployed and subsequently distributing such unit cost to the classes of patrol activity in ratio to hours consumed by such activity. This is precisely what was done to the Racine model in Chapter VI of this study.

The "patrol unit hour" is defined as an hour of deployed uniformed patrol time per standard unit of patrol. In the case of the Racine patrol division, a unit of patrol was considered a car or cycle manned by a single officer. In other police jurisdictions a unit of patrol could be considered a two-man squad car, a scooter officer, a walking beat-man, etc. Total deployed patrol unit hours are calculated by multiplying the number of basic patrol units on each shift by eight hours by 365 days of the year (or by the number of days in a selected period) and summing all shifts. The gross patrol unit hours so derived must be reduced by an appropriate factor to account for day-to-day beat deployment variations necessitated by officer absences due to sickness or other leave.

The calculation of the cost per patrol unit hour is a straightforward exercise once the share of the departmental budget has been properly allocated to the uniformed patrol function. On the input side of productivity analysis, choosing the appropriate patrol cost allocation basis is the complicating dilemma. Availability of good

financial records is naturally also very important. It should be noted, however, that given accurate financial data for the cost of base salaries and fringes of a police agency, one has a record encompassing approximately 90% of the total departmental costs. Consequently, even if other expenses such as capital amortization, supplies, utilities, etc., are merely approximated, the distortion to the overall cost calculations will be minimal if personnel compensation expenses are carefully recorded.

To reiterate, computation of the cost per patrol unit hour deployed is dependent upon what departmental functions are properly allocable to the patrol operation. This study chose to present cost data in terms of two diverse alternatives. One alternative treated the patrol as an independent accounting entity where only such costs were allocated to it which were identified with the line patrol division. Under this alternative cost of patrol manpower constituted about 90% of the total cost while the balance represented capital outlays plus other operating expenses distributed to patrol in ratio to its manpower in the department. This allocation method can perhaps be viewed as presenting the "bare bones" cost of patrol operations.

The second alternative considers patrol operations as the key police function and other divisions as aids. The determination of cost per deployed patrol unit hour

is uncomplicated. Total departmental budget for the period is simply divided by the computed patrol unit hours for the period. However, as pointed out in the body of the text, the "true" cost of patrol operations is perhaps someplace between the above two alternatives. The following comment seeks to point out cost allocation possibilities more representative of patrol expenditure burden.

The demarcation point for allocating costs to the patrol function is found in the distribution of personnel compensation expenses, base pay and fringes, strictly on the basis of manpower employed by the various divisions of the department. Expenses other than personnel, supplies, vehicles, amortization, etc., should be subsequently distributed in ratio to manpower employed by the various divisions. Greater accuracy is possible, such as the distribution of vehicle costs on the basis of vehicles "owned" by various divisions, but it is perhaps unnecessary because of the previously mentioned overwhelming predominence of manpower cost in the total budget.

The next stage in the cost allocation process is to divide departmental divisions into two groups: administrative support and specialized field units. Administrative support is represented by communications, records and identification, office of the chief, garage, etc. Specialized units are represented by the patrol

division, detectives, the juvenile bureau, tactical squads, undercover investigation, traffic investigation, etc. Total manhours worked for a given period should be computed for the specialized divisions (year, month, etc.). The cost of administrative support should be subsequently distributed to the specialized divisions in ratio to manhours worked.

The latter cost allocation method represents a third alternative in presenting the costs of patrol operations. Nevertheless, it should be pointed out that a good argument can be made to allocate the cost of some specialized units to patrol. Much depends upon the assumptions made by the student as to the relationship of other police operations to that of uniformed patrol.

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