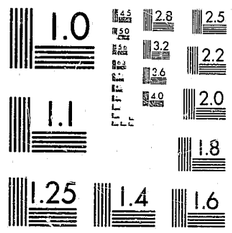

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Synopsis

RESPONSE TIME ANALYSIS

a publication of the **National Institute of Justice**

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Harry M. Bratt
Acting Director

RESPONSE TIME ANALYSIS

Synopsis

Kansas City, Missouri, Police Department
Norman A. Caron
Chief of Police

November 1980

U. S. Department of Justice
National Institute of Justice

National Institute of Justice
Harry M. Bratt
Acting Director

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ABSTRACT

This research was initiated to evaluate assumptions regarding rapid police response as an effective operational strategy and to identify problems and patterns which account for citizen delays in requesting police service. The calls for service that make up the data base came primarily from a target area selected for its high rate of robberies and aggravated assaults. Collected data covered the entire spectrum of police service, including both Part I and Part II crime calls, and noncrime calls. This report summarizes findings presented in previous volumes.

The design of the study and data collection spanned three years. Data for analysis were collected by civilian observers, communication tape analysts, and telephone and personal interviewers. Observers accompanied police officers in the field to collect data on travel times and on-scene activities, while tape analysts collected dispatch time data by measuring length of telephone and radio exchanges recorded on Communications Unit tapes. The interviewers questioned victims of crimes and citizens who reported crime and noncrime incidents or requested police service.

Response time was conceptualized as consisting of three major intervals: citizen reporting time, communications dispatching time, and police travel time. Analysis of the impact of response time on the probability of making an arrest or of contacting a witness on scene was limited to crime cases. Variations in the three response time intervals were analyzed to see how they affected recovery time from injuries and how they affected citizen satisfaction with police service for crime and noncrime incidents alike.

Additionally, the problems citizens encounter when reporting incidents, and the patterns or actions citizens follow prior to reporting, were identified and analyzed for their effects on reporting delays. Relationships between citizens' social characteristics and both reporting time and problems and patterns were analyzed for crime and noncrime incidents.

Results indicated reporting time was longer than either the time taken to dispatch a call or the time taken to travel to an incident and, on the average, was longer than dispatch time and travel time combined. For both Part I and Part II crimes, in which citizens were involved during the commission of the offense, the length of reporting time was the strongest predictor of on-scene arrests and of the availability of witnesses on scene. Response time was found to be unrelated to the probability of making an arrest or locating a witness for the large proportion of Part I crimes that were discovered after occurrence, although the length of reporting time had some impact on the probability of a witness being contacted for Part II "discovered" incidents.

Apathy was by far the strongest determinant of the length of reporting time for crime incidents, whereas in noncrime incidents reporting times tended to be longer when citizens felt unsure whether police could or would help in a particular situation. Although incidents with an injury, on the average, had shorter reporting, dispatch, and travel times, the length of the three intervals had no apparent effect on the length of a victim's stay in a hospital. Citizen satisfaction with police response time was more closely associated with citizens' expectations and perceptions about response time than actual response time. Citizens were also more likely to

be dissatisfied if they thought faster response could have made a difference in the outcome of an incident.

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PREFACE

Rapid police response has long been an accepted procedure in law enforcement. The need to reduce response time has served as justification for bolstering officer strength and for large expenditures on equipment. While it is not unreasonable to assume that rapid police response will produce more arrests, more witnesses, fewer serious citizen injuries, and more satisfied citizens, little empirical data exists that can support these assumptions.

The Response Time Analysis study was designed to provide a comprehensive assessment of issues and assumptions regarding the value of police response to a variety of crime and noncrime, emergency and nonemergency incidents. Specifically, two objectives were established for study:

1. Analysis of the relationship of response time to the outcomes of on-scene criminal apprehension, witness availability, citizen satisfaction, and the frequency of citizen injuries in connection with crime and noncrime incidents.
2. Identification of problems and patterns in reporting crime or requesting police assistance.

This is the final report in a series which examines the relationships between the time taken by citizens to report crime or request police service, the time required for the police to process, dispatch, and respond to calls, and various outcomes related to police response. This report presents a summary of results presented in previous reports. It follows four volumes and an executive summary which detail the methodological design of the study, analysis and findings for Part I and Part II crimes

and for noncrime incidents.

Although technical treatment of data is necessary to perform statistical analysis of relationships studied, emphasis was placed upon preparing a report conducive to functional interpretation by police administrators. Administrative interpretation of findings regarding crime and noncrime incidents must include realization that only citizen generated calls processed through the department's Communications Unit were eligible for inclusion in sample data analyzed. Calls resulting from officer self-initiated activities, citizen flagdowns, and either walk-in or phone-in self reporting of crimes were excluded from data analysis.

It is hoped that while taking admitted limitations of the study into account, the questions stimulated by this research and the implications cited within might provoke serious discussion that will help improve police policies and thus enhance police practitioners to more effectively serve the public. Appreciation is extended to project consultants Dr. Albert J. Reiss, Jr., Yale University, New Haven, Conn.; Dr. Lee Sechrest, Florida State University, Tallahassee, Fla.; and Dr. Cris R. Kukuk, Social Impact Research, Inc., for their technical assistance in evaluation of analysis procedures and statistical interpretation of results.

Lt. Col. Lester N. Harris
Project Director

INTRODUCTION

Rapid police response has long been an accepted procedure in law enforcement. The need to reduce response time is cited by police administrators as justification for increased expenditures to bolster officer strength, purchase faster cars, and acquire sophisticated communications equipment. Although it is not unreasonable to assume that rapid police response will produce more arrests, more witnesses, fewer serious citizen injuries, and more satisfied citizens, empirical research has yet to establish a definite relationship between response time and incident outcomes.

The joint interests of the National Institute of Law Enforcement and Criminal Justice and the Kansas City, Missouri, Police Department merged in 1973 to establish a forum in which the subject of response time was proposed for research. Both organizations were keenly aware of the high value placed on rapid police response by the vast majority of police practitioners. While the strategy of rapid response was, in many respects, intuitively appealing, both organizations had begun to question the previously unexamined assumptions that supported conventional wisdom in this area of police operations.

In framing its research program for fiscal 1973, NILECJ staff singled out response time as one of five major areas in policing for intensive study. Despite the widespread opinion regarding the importance of response time, institute staff determined that no adequate empirical data existed to substantiate its value. In a brief review, they were able to identify only one preliminary study which addressed that topic (Isaacs, 1967). Its

author concluded that his analysis suggested a relationship existed between police response time and incident outcomes, but he stressed the limitations of the data and the need for additional research before any causal relationships could be inferred. To address this critical void in police knowledge, institute staff recommended funding for response time investigation to be included in the fiscal 1973-1974 NILECJ research plan.

In Kansas City, Mo., interest in researching the issue of response time emerged in late 1971 concurrent with the Kansas City Preventive Patrol Experiment, a study which questioned traditional preventive patrol. Like many professional police agencies, the Kansas City, Missouri, Police Department stressed a generalized rapid response to all citizen calls for service. Delaying the dispatch of calls was kept to an absolute minimum. One of the three primary thrusts of the original design of the Preventive Patrol Experiment was to measure the effects of differential lengths of police response time on the variables of arrest and citizen satisfaction with police service. However, this early design failed to consider adequately the complexity or the costs of operationalizing response time research, and evaluators were only able to superficially address the dimension of citizen satisfaction with police response.

In April 1973, NILECJ staff met with planning and program development personnel of the Kansas City, Missouri, Police Department to consider Kansas City as the host jurisdiction for a major response time study. As a result, a basic framework for the exploratory research addressed by this study was formulated and submitted to the institute, and funding was awarded for the first phase of this research in June 1973.

Of the few studies previously conducted that focused on the subject of response time, most share several major limitations. The most significant limitation was the failure to measure the time between the commission or discovery of a crime and the initial reporting of that crime to a police dispatcher, and then to relate that measurement to response time outcomes. Previous research has failed to consider that citizens who are victims of crimes, witnesses to crimes, or who discover crimes often fail to report crimes promptly, although experienced police officers can relate stories of problems citizens encounter or the activities they pursued after a crime occurred but before they reported it to police. A few studies have acknowledged citizen reporting delays, and some have attempted to identify problems and patterns in reporting which contribute to delays. Not one study reviewed, however, had taken a comprehensive look at this interval and its effects on response time and the desired outcomes of increased on-scene arrests, witness availability, etc., in relationship to crime calls.

Previous research and literature have concentrated on the interval between a citizen's request for service and the arrival of a field unit at the scene. The definition of response time has commonly been based on those two points in time (Isaacs, 1967; Larson, 1972; Raab, 1976). However, Mayo (1969:33-34) claimed, "True response time must be measured in the real world context from the instant a requirement occurs (i.e., a crime is committed) until the response unit arrives at the requirement scene." The importance of his statement becomes evident as data on crime reporting are analyzed.

Out of necessity, the time interval from crime occurrence to

telephoning the police must be obtained from a victim or witness, and measurement of this interval is reliant on the citizen's perception of time. This may, in part, account for the few attempts at measurement. Leonard (1938) and Isaacs (1967) recognized the importance of immediate reporting by citizens as a crucial element of police response time, but it was Elliott (1973) who first investigated the area of patterns in reporting which was omitted from previous studies. Data were provided by Syracuse, N.Y., police officers who estimated how much time had lapsed between crime occurrence and reporting of the crime by a citizen to the police. Although 25 percent of the crimes were estimated to have been reported within the first 2 minutes after occurrence, 70 percent were not reported for over 10 minutes after occurrence.

The one response time component, for which no empirical data are available, begins with the time of officer arrival in the general vicinity of a call, defined in this study as departure from the vehicle, and ends when the officer makes direct contact with participants related to the incident. This component between vehicle arrival and citizen contact is needed to obtain a meaningful total response time, because it could involve a relatively large proportion of the total response time continuum. In areas where high-rise business and residential structures are prevalent, significant movement or searching by an officer may be required to locate the appropriate citizen. The measurement of this component has been omitted in previous research studies.

Another limitation in response time research has been in the methods of data collection. Often studies have relied upon police employees timing

themselves during the various phases of response rather than having them timed by trained, impartial researchers. Furthermore, self-reporting sometimes relied on individual estimates of times, which can be confused by memory and recall or factors of stress. In some cases, researchers used dispatch tapes to measure the times between dispatch and arrival at the incident scene, but tapes precluded the measurement of the two important time components mentioned above: 1) the time between the occurrence of a crime and when a dispatcher has been contacted about the incident; 2) and the time between when an officer exits from his car at an incident scene and when he is able to make contact with someone with information about the incident so an investigation can begin.

Although these studies collectively identified a number of individual time components that comprised the total response time continuum, specific intervals were sometimes vaguely defined, inviting inconsistencies in the measurement of the various components. These limitations cast suspicion upon the validity or potential implications of findings presented.

A number of conditions appear to be necessary if police response time is to have an impact on the outcome of a call. One of the most intuitively obvious of these conditions is whether or not a crime is discovered after it has occurred and the suspect has left the scene. For some types of crime, e.g., robberies, a victim is always present during the commission of the crime and aware of its occurrence, whereas in some instances of other types of crime, a victim may not become aware that a crime has been perpetrated until long after its occurrence. A victim of a commercial burglary, for example, may not know of the crime until several days after

its occurrence. The importance of rapid police response time for the purpose of on-scene arrest is obviously nil in such a case. Another critical factor influencing the impact of rapid police response is the length of time that elapses after the incident occurs until a citizen reports it to a police dispatcher. For example, the chances of making an on-scene arrest for a robbery reported in progress can be expected to be better than for one which occurred 10, 20, or 30 minutes before. The number of cases reported rapidly by citizens may in large part determine the number for which rapid police response times can increase the chance of suspect apprehension and of police contact with witnesses essential to successful prosecution.

The importance of rapid response time for on-scene arrests is questionable when any one of several factors apply. If a suspect's name or address is known by a victim or witness contacted at the scene, the role of response time in effecting an arrest is minimized. Apprehension of suspects being held at the scene prior to police arrival, injured and unable to leave the scene, or arrested on a previous warrant cannot be attributed to rapid response. Response time obviously cannot be considered a factor in those cases in which a suspect turns himself over to the police.

Police administrators have traditionally assumed that rapid response to calls is necessary to maintain citizen satisfaction with police. This assumption is predicated on the belief that citizens think rapid response is important for all incidents and that they always expect a quick response. It is possible that citizens recognize the futility of rapid

response to some calls, e.g., a burglary discovered days after its occurrence. Citizens who take longer to report an incident may be satisfied with a wider range of police response times. Satisfaction may be dependent on how long citizens expect police response time to be. Actual lengths of police response time can affect citizen satisfaction only insofar as they affect the citizens' perceptions of the length of response time.

Objectives

The Response Time Analysis study was designed to provide a comprehensive assessment of the issues and assumptions regarding the value of rapid police response to a variety of crime and noncrime, emergency and nonemergency incidents. Specifically, two objectives were established for study:

1. Analysis of the relationship of response time to the outcomes of on-scene criminal apprehension, witness availability, citizen satisfaction, and the frequency of citizen injuries in connection with crime and noncrime incidents.
2. Identification of problems and patterns in reporting crime or requesting police assistance.

Previous volumes have detailed the methodology, design, analysis, and findings pertaining to Part I and II crimes, and noncrime incidents. This report presents a summary of the results and an overall assessment of operational implications regarding the value of police response strategies.

METHODOLOGY

Between March 1975 and January 1976, field operations research was conducted in a target area of Kansas City, Missouri to help assess one of the

most basic assumptions of policing - that rapid response is a critical factor in obtaining on-scene arrests, locating witnesses, minimizing citizen injury, and maximizing citizen satisfaction. Collected data covered the entire spectrum of police service, including Part I and II crime calls, and noncrime calls.

To avoid limitations of previous studies, response time was defined in its broadest context to include the times taken by citizens to report incidents, by dispatchers to relay incident information, and by field officers to arrive at dispatched locations to begin investigations. The reporting, dispatching, and travel intervals correspond to the role of the public, police communications, and police field operations, respectively.

The data collection process was divided into three basic components corresponding to the three response time intervals. Observers riding with police officers assigned to "beats" collected travel time data, analysts collected dispatch time data from tape recordings made in the department's Communications Unit, and interviewers collected reporting time data from citizens who had reported incidents to police. With information obtained by the field observers, tape analysts located the calls on tapes which corresponded to the observed incidents, and interviewers contacted the appropriate citizens. Response time was then calculated for particular calls from the time they originated until an officer had initiated his investigation.

Once response time had been calculated, its impact on on-scene witness availability, citizen injury, and citizen satisfaction was evaluated.

Field observers collected information on arrests, witness availability and citizen injury. Interviewers contacted hospitals for additional information on hospital treatment. Interviewers were also responsible for gathering information on citizen satisfaction, reporting delays, and reasons for delay. Patterns, voluntary citizen actions which delayed reporting, and problems citizens encountered in reporting crimes or requesting police assistance were identified and assessed. Offense reports provided supplemental information on arrests, witness availability, and problems and patterns which the citizen mentioned to the officer but not to the interviewer. Citizen injury, citizen satisfaction, and problems and patterns in reporting were evaluated for crimes and noncrimes alike. Analysis of the impact of response time on arrest and witness availability, however, was limited to crime cases.

For a case to be included in the data base, police response had to be initiated by a citizen's telephone call. Field observers accompanied officers on a total of 7,101 citizen-initiated calls: 949 Part I crimes, 359 Part II crimes, and 5,793 noncrimes, or incidents for which no offense report was taken. All Part I and Part II offenses as defined by the FBI Uniform Crime Report were eligible for complete data collection, but the preponderance of noncrimes precluded thorough analysis of each case. Nearly one-half of all noncrime calls were not analyzed because they failed to meet criteria of eligibility for complete data collection and because systematic random elimination was used to reduce interviewer workload. Completed noncrime cases accounted for less than 20 percent of the total noncrime sample.

Eligible Part I and Part II offenses were classified according to FBI

Uniform Crime Report definitions, but noncrimes lacked a standardized classification system. This study categorized them according to the four basic functions police perform: crime control, traffic regulation, social service, and peace maintenance. Once the cases had been grouped by type of call, they were then classified as "involvement" or "discovery," two categories which were created especially for this study. Cases in which a citizen saw, heard, or was otherwise involved in the event and initiated reporting were involvement cases. Incidents which were detected after they occurred were discovery cases. The effect of the reponse time intervals on the outcomes measured was analyzed separately for involvement and discovery cases.

FINDINGS

This study was designed to thoroughly analyze reporting, dispatching, and travel times. Efforts were made to take a comprehensive look at the reporting interval not only because most previous studies have neglected it, but also because throughout the study the reporting interval comprised almost one-half the total response time continuum. Dispatch and travel time combined represented approximately the other 50 percent of total response time. (Table 1)

The distinction between involvement and discovery crimes is especially useful in evaluating reporting time. Most Part I offenses (62.3 percent) were discovery crimes, whereas most Part II (81.3 percent) and most noncrime incidents (83.0 percent) were involvement cases. Predictably enough, discovery cases had longer average reporting time than involvement

TABLE-1

Response Time Intervals

Interval	Median Time	Percent of Total Response Time
Reporting		
Part I	6:17	48.1
Part II	7:03	51.7
Noncrimes	5:46	49.3
Dispatch		
Part 1	2:50	20.1
Part II	2:13	19.0
Noncrimes	2:19	19.7
Travel		
Part I	5:34	30.9
Part II	4:20	29.4
Noncrimes	4:45	31.1

incidents, although there were individual exceptions. A few discovery incidents were reported as quickly as one minute after their detection, and one involvement Part II offense was reported after a 107-minute delay. (Table 2)

TABLE-2

Median Reporting Times for Involvement and Discovery Incidents

Type of Incident	Discovery	Involvement
Part I	9:44	4:37
Part II	20:16	5:39
Noncrimes	9:41	5:20

Once the three response time intervals had been identified, analyzed, and compared, their impact on incident outcomes could be evaluated. Of special interest, was the relationship between response time and the probability of making an arrest and locating witnesses to a crime. The

influence of response time on citizen injuries and citizen satisfaction was investigated for crimes and noncrimes alike. Problems and patterns which contributed to reporting delays were also evaluated for both crimes and noncrimes.

Arrests

One of the most fundamental and widely held assumptions concerning police response is that reducing police dispatch and travel time increases the probability of apprehending a suspect. Such an assumption, however, is largely untested. Furthermore, the potential effect of the time taken by the citizen to report the incident has not been systematically examined.

Arrest was defined as the transporting of a suspect for the purpose of booking, questioning, or identification. Analysis was limited to on-scene arrests, those arrests made before the conclusion of the initial investigation by the dispatched officer. Since it seemed unlikely that response time was the primary determinant of all on-scene arrest, a response-related arrest subsample was identified. Arrests were excluded from this subsample if the suspect had been apprehended by a private citizen or security guard prior to police arrival or had been rendered immobile by injuries. In addition, arrests were excluded if a victim or witness had provided the reporting officer with the suspect's name or address, or if the suspect had voluntarily turned himself over to police officials.

Out of the total 1,308 cases for which a Part I or Part II offense report was taken, 174 (13.3 percent) resulted in on-scene apprehensions of one or more suspects. Only 46 of these cases (3.5 percent), however, had a response-related arrest, and all but 8 of these were for involvement

crimes. No response-related arrests were made in connection with discovered Part II crimes, and all but one of the discovered Part I crimes with response-related arrests were detected by alarms. Alarm cases, which were considered to be discovered in progress instead of after the crime occurrence as in crimes discovered by individuals, had a high response-related arrest rate of 46.7 percent. However, the Part I crime sample included only 15 alarm calls; officers responded to an additional 636 alarm calls for which no criminal activity was established and no offense report was taken.

Two categories of crime accounted for more than half of the response-related arrests (52.2 percent): involvement burglary (12 arrests) and involvement forgery, fraud and embezzlement cases (12 arrests). Both types of crime were detected during the commission of the crime. Both could be reported to the police while the incident was still in progress without the suspect being aware that the crime had been detected and that the police had been called. However, these two categories comprised only 56 of the 1,308 crime calls and had an overall response-related arrest rate of 1.8 percent.

The length of reporting time was the strongest predictor of on-scene apprehensions especially for Part I offenses. Dispatching time was never found to significantly influence the probability of an arrest or of a response-related arrest. In some cases travel time had an impact on the probability of arrest; the length of travel time was a powerful predictor of response-related arrests in involvement burglary cases and involvement forgery, fraud, and embezzlement cases, with an unusually high probability

of arrest for short travel times. Cases of involvement forgery, fraud, and embezzlement had nearly a 90 percent arrest rate when travel time was 1 minute or less.

The relationship of travel time to response-related arrests varied with the time taken to report a crime. Short travel times for Part I crimes reported with more than 5 minutes delay had virtually no impact on the probability of arrest. Rapid reporting was not in itself sufficient to increase the probability of an arrest in Part II involvement cases, but it did enhance the likelihood of suspect apprehension at all lengths of the travel interval while longer reporting delays reduced the probability of a response-related arrest even with prompt officer arrival.

Overall, 438 incidents resulted in either the on-scene or subsequent arrest of one or more suspects in the 1,308 Part I and II crimes sampled (33.4 percent). A total of 601 persons were arrested in connection with these 438 incidents; 159 juveniles and 442 adults.

There were 212 adult convictions and juvenile petitions sustained for the 601 persons arrested (35.2 percent). The conviction rate for adults was approximately 38 percent, and the petitions sustained (conviction) rate for juveniles was approximately 27 percent, although significant differences in conviction were found between adults and juveniles for Part I and II crimes. Juveniles were much more likely to have petitions sustained (convicted) for Part I crimes than were adults. The converse was found for Part II crimes.

Significant differences were also found between conviction frequencies for on-scene vis-a-vis subsequent arrests. Suspects arrested on-scene were

more likely to be convicted than suspects arrested following subsequent investigation of crime incidents. No difference, however, was found in conviction of suspects between on-scene response-related and on-scene nonresponse-related arrests.

Field research did not substantiate the assumption that reducing response time significantly increased the probability of making on-scene arrests. Although response time is substantially related to the probability of making on-scene arrests for a few types of crime, most notably, involvement burglary and involvement forgery, fraud, and embezzlement cases, the reporting interval is much more significant than the traditional focus of police strategy and expenditure, i.e., dispatch and travel time.

Witness Availability

Another outcome assumed to vary according to the length of police response time has been witness availability, defined in this study as contact, during the on-scene investigation, between the field officer and at least one witness other than the victim or suspect. Approximately 21 percent of all Part I and Part II crimes had at least one witness contacted at the scene. This respresented 48 percent of the Part I involvement incidents and 23 percent of the Part II involvement cases. The relationship between response time and the probability of witness availability was expected to vary between involvement and discovery cases since witnesses to the latter had often left the scene and had to return in order to make contact with the reporting officer. This variation did in fact occur for both Part I and Part II crimes. However, witness availability in Part I discovery

cases was not related to any of the response time intervals. Reporting time was the most important predictor of witness availability. For the Part I and Part II involvement incidents, as reporting time increased the probability of a witness being contacted decreased. The biggest fluctuation occurred in Part I involvement incidents, where the probability of a witness being contacted decreased from a high of 65.7 percent of the shortest reporting interval of 1 minute, 4 seconds, to a low of 34.8 percent for a reporting time of 30 minutes. For Part II involvement offenses, witnesses were contacted in 30 percent of the cases with a reporting interval of 1 minute. This probability dropped to less than 25 percent at 10 minutes with very little further change.

For Part II discovery crimes, however, the probability of having a witness present at the scene increased as the time taken to report the crime increased. Virtually no witnesses were contacted in Part II discovery cases reported in less than 5 minutes. With further delay the probability of witness contact increased to about 7 percent at 20 minutes' reporting time. The explanation for this phenomenon lies in the fact that a disproportionate number of the discovery cases with witnesses available (57.1 percent) were discovery forgery, fraud and embezzlement cases and these cases had a minimum reporting time of over 5 minutes.

The time taken to dispatch an incident did not influence the probability of contacting a witness on scene for either Part I or Part II crimes. For Part I involvement crimes, travel time was a weak predictor of witness availability.

The importance of witness availability rests on the assumption that if witnesses are not contacted on scene, there is less chance they will

subsequently be found and pertinent information may be lost. This assumption is not universally accepted, and the impact of rapid response on the availability of witnesses may vary according to departmental policies.

Citizen Injuries

A pioneer effort was made to systematically evaluate the effect of response time on the frequency and the seriousness of injuries sustained by citizens in both crime and noncrime incidents. The primary question to be assessed was that, given two injuries of equal seriousness, the one receiving the shorter reporting, dispatch, and travel times would result in more rapid recovery, fewer chronic impairments, less specialized treatment, etc. This basic premise was not substantiated: no difference in the length of hospital stay was noted for equally serious injuries with varying response times.

The lack of a statistically significant effect of response time on hospital treatment cannot be construed to mean that response time has no effect on injury. The lack of empirical support may be due more to the limited sample size and the lack of variation in the length of hospital stay than any true independence of response time and injury effects. As Table 3 indicates, incidents involving injuries did not account for a high percentage of the total sample. Many of those injuries required no hospital care at all, and most of those that did require hospital attention were limited to emergency room treatment. Also, the measure of injury outcome chosen for this study - type and length of hospital stay - may be too insensitive to reflect differences in outcome due to the speed of response.

Rapid response may serve to limit the frequency of injuries by neutralizing volatile situations before they erupt, an issue not addressed by this study. Although the tested assumptions regarding response time and injuries are challenged by the findings, additional and more refined research is needed before a definitive conclusion about this relationship can be made.

TABLE-3

Length of Hospital Treatment

	Cases with Injuries	Percent of Total Sample	Cases with Injuries Requiring Hospital Treatment	Cases with Injuries Requiring Only Emergency Room Treatment
Part I	105	11.1	51	25
Part II	77	21.4	17	16
Noncrimes	379	6.5	*218	*151
Total	561	7.9	286	192

* Information was not available for cases randomly sampled for no follow-up data collection nor for cases which failed to meet the criteria of eligibility for follow-up data collection.

Citizen Satisfaction

Rapid response has long been considered essential to maintaining citizen satisfaction with police performance. Public opinion is an important gauge of effective police service especially in the area of noncrimes, where there are few objective measurements. Throughout the study citizens expressed a high level of satisfaction with the response times of the Kansas City, Missouri, Police Department. When citizens were asked how satisfied they were with the length of police response time, respondents indicated a degree of satisfaction ranging from "very dissatisfied" to "very satisfied." Approximately 70 percent of citizens interviewed were very satisfied with police response time.

Evaluating citizen satisfaction necessitated more than a simple mathematical assessment of actual response time. Although there was an indirect chain of relationships between response time and citizen satisfaction, the total impact of response time was discovered to be no stronger than chance. Much more significant was the discrepancy between what citizens expected response time to be and what they perceived it had been. Citizens were generally satisfied when they thought the officer had arrived as soon or sooner than expected. When respondents perceived that the officer had arrived later than expected, satisfaction with response time began to wane. Dissatisfaction varied with the magnitude of the discrepancy between expectations and perceived delays. If a citizen expected response time to be lengthy and the officer arrived a little late, the citizen was not too annoyed, but if the citizen expected a quick response, slight delays seemed more serious.

Satisfaction with response time was also directly influenced by how relevant citizens thought response time was to the outcome of the incident. When citizens were asked whether or not a faster response could have made a difference, most of them replied "no". Citizens desired faster response in fairly small percentage of incidents. Approximately 86 percent of the Part I respondents, 81 percent of the Part I respondents, and 76 percent of the noncrime respondents thought the incident outcome would not have been altered by a quicker response.

In general, citizens expected quicker response to involvement than to discovery incidents. Perhaps they had these higher expectations because they also thought response time influenced the outcomes of involvement cases. If citizens thought faster police response could have made a difference to the outcome of the incident, they also thought the police took longer than expected.

Findings indicated that citizen satisfaction was not strongly dependent on actual police response time. Neither dispatch or travel time was a strong determinant of citizen satisfaction. Rather, citizens were most satisfied when they thought response time was appropriate to the situation. When they thought police arrived as soon or sooner than expected, citizens were most satisfied. When they did not think response time was important to the outcome, they expected police to take longer and were just as satisfied with slower response. Citizens thought response time was less important to the outcome of discovery cases than of involvement cases, and their perceptions and expectations varied accordingly.

Problems and Patterns in Reporting

Delays by citizens reporting incidents were found to be substantial. On the average, it took about as much time to report an incident as it did for police to both dispatch the information and travel to the call. The act of telephoning police and relaying information could not account for the length of the reporting interval, since this time component was found to be insignificant compared to the time which elapsed before a citizen was able or had decided to call the police. One of the primary objectives of this study was to identify the important determinants of reporting delay.

A number of factors were associated with citizen delays in reporting crime and noncrime calls, and these factors were divided into two categories. They were problems--uncontrollable hindrances that an individual encountered in reporting an incident--and patterns--voluntary actions or attitudes which affected the decision to call police.

Voluntary action taken by citizens before they called the police were grouped in six categories: talking to another person, pursuing the suspect, investigating the scene, telephoning another person, waiting or observing the situation, and contacting security. Two attitudes expressed by citizens interviewed--apathy and uncertainty of the appropriateness of police assistance--were additional patterns. Public and police communications trouble, injuries, fear or emotional trauma, and misinformation about whether the police had already been contacted were problems encountered during the reporting interval.

The most frequently cited pattern of reporting delay for both crimes and noncrimes was delay due to talking to another person. The most common

reason for this pattern of delay was to obtain advice, assistance or additional information from the person. The most frequently cited problem was trouble with public communication, primarily the unavailability of a telephone.

The problems and patterns were more strongly affected by situational factors, i.e. the type of incident, than by the type of individual reporting the incident. For example, citizens reporting discovery burglaries, said they investigated the incident scene before calling the police more often than citizens reporting most other types of calls. On the other hand, variations in social characteristics such as the education, income, and sex of the victim or caller, seemed to make little difference in the problems or patterns cited.

For both Part I and Part II crimes apathy proved to be by far the strongest predictor of the length of reporting time. Reporting times were also disproportionately long when citizens mistakenly thought a Part I or Part II crime had already been reported, and telephoning another person contributed to reporting delay for Part I crimes.

In noncrime incidents reporting times tended to be considerably longer when citizens felt unsure of whether police could or would help, a pattern which exerted only a slight influence on the reporting times of crime cases, probably because crime incidents more clearly fall within the police domain. Telephoning or talking to another person and investigating the incident scene also contributed significantly to reporting delays in noncrime cases. Regardless of the type of incident, the problems and pattern variables identified in this study were substantially related to delays in requesting police service.

CONCLUSIONS AND IMPLICATIONS

Conclusions

Rapid response to citizen requests for police service has traditionally been viewed as important in order to produce more arrests, more witnesses, fewer citizen injuries and more satisfied citizens. When police arrive at the scene of a crime it has been assumed that arrests are more likely because suspects have less time to escape and contact with witnesses is more feasible because they are more likely to still be at the scene. It is not unreasonable to assume that injuries are less serious if police arrive quickly and prevent further violence, and that recovery is quicker because victims obtain treatment sooner. When response is quick citizens may be more satisfied because they believe police did all they could; if police arrival is delayed, it is feared citizens blame police for undesireable outcomes.

There are a number of reasons why the assumed importance of rapid response is tenuous. First, the relationship between rapid police response and outcomes of police service have been based on an idealization of police work as primarily crime focused activity. Findings of this study do not bear out this idealization. Study data collected in beats with the highest crime rate indicated that approximately one-half of all citizen-initiated calls for service were related to crime control. Many of these calls were limited to obtaining additional information about previously reported offenses, recovering stolen property or investigating suspicious activities which were determined legitimate. The probability of an arrest or of locating a witness is not an important outcome for many crime control calls nor for calls not related to criminal activity.

Second, most crime calls are not emergency situations. Sixty-two percent of the Part I crimes and 51 percent of all crimes are not discovered until after the perpetrators have left the scene. Rapid response in order to make arrests or locate witnesses to these offenses is largely irrelevant.

Third, even among those cases in which victims or witnesses are involved while the incident is occurring, the impact of police response is often nullified by delays in citizen reporting. In approximately 50 percent of the involvement cases, citizens delay more than 5 minutes before calling the police. Reporting delays of this length or longer cause police dispatch and travel times to be irrelevant to arrest or witness availability. The number of involvement crimes reported quickly enough for rapid police response to potentially be effective is approximately 18 percent of the total crime calls.

Fourth, the percentage of arrests which could be attributed to rapid response is small. Many on-scene arrests could have been made on scene regardless of police response, because of information provided by the victim or other person on scene, apprehension of the suspect by a private citizen or security guard, immobility due to suspect injury, or because the suspect voluntarily submitted to arrest. Response-related arrests occurred in only 3.7 percent of the Part I crime and 5.6 percent of the Part II crime. Witnesses were available in approximately 20 percent of all crime calls.

Implications

Because of the small frequency of calls to which rapid response is effective, increased expenditures to reduce police response time would probably have negligible impact on crime outcomes. Current technology and traditional response strategies permit police to affect response time somewhat; dispatching the closest in-service car can affect the length of response time. In addition, use of crime analysis to deploy emergency response cars in areas of high crime beats could perhaps efficiently sustain rapid response capabilities to those few calls to which rapid response is necessary.

Emphasis of police department communications units should be an accurate determination of the nature of the incident reported, and the quickness of response that is appropriate. It may be argued that although emergencies are rare, police must be capable of responding when they do occur. However, indiscriminate use of rapid response is not required, and give continued austerity budgets, many departments may soon be unable to afford the luxury.

Alternative response strategies must be developed for those calls which do not require the police to make rapid response. Studies such as those currently being conducted in Birmingham, Ala., San Jose, Calif., Hartford, Conn., and Peoria, Ill., are examples of the type of research which may produce more efficient strategies for police operations. Dimensions which should be examined include: the length of delay which can be tolerated, the personnel and combination of skills required to deal with the situation, alternative agencies which might more effectively deal with the

problem reported, and alternative uses of officer time for more proactive crime-focused activities.

Citizens should be encouraged to report crime activities as rapidly as possible, and the ramifications of their delays should be impressed upon them. Findings from the replication of this study which is currently being conducted by PERF should provide further insights into how to deal with citizens' delays. However, police administrators should be aware that there may not be any effective way to substantially alter citizen behavior vis-a-vis reporting delay. The problems identified by this study are, by definition, involuntary hindrances in reporting. Patterns of behavior, while not inherent in the crime situations, may be appropriate from the citizen's viewpoint. For example, it is natural for people to seek reinforcement from friends or relatives before reporting to the police an incident which may result in criminal prosecution. In addition, negative effects, such as increased fear of crime may occur if large scale efforts to increase citizen awareness of the need for rapid reporting are made.

GLOSSARY

ARREST--The transporting of a suspect to any specific location for the purpose of booking, questioning or identification.

CALLER--Any citizen whose call to the police initiated a response to an incident.

DISCOVERY INCIDENT--Any incident which occurred unobserved, or if witnessed, the witness did not report the incident.

DISPATCH TIME--The time from when a dispatcher understands the nature and location of a call until an officer acknowledges the end of the dispatch assigning him to the call or has begun response to the call, whichever comes first.

FIELD INJURY--An injury to a citizen who was not transported to the hospital before arrival of police.

INVOLVEMENT INCIDENT--Any incident in which a citizen saw, heard, or became involved between the time the incident began and the citizen was free from involvement in the incident.

NONCRIME INCIDENT--As categorized in this study, any situation to which a police officer is dispatched but for which no offense report is taken.

OBSERVER--Any of nine civilians employed by the Kansas City, Missouri, Police Department to accompany officers in specially designated beat-watches and collect data pertinent to the study.

ON-SCENE ARREST--The apprehension of a suspect in flight from, adjacent to, or at the scene of an incident before the conclusion of the initial investigation of the call. The arrest must have been directly related to the crime for which an officer wrote the offense report.

PART I CRIME--As defined in the FBI Uniform Crime Report, the crimes of homicide, rape, robbery, aggravated assault, burglary, larceny, and auto theft.

PART II CRIME--As categorized in this study, included the crimes of nonaggravated assault; vandalism; weapon possession; drunkenness; disturbing the peace; disorderly conduct; and forgery, fraud, and embezzlement.

PATTERNS IN REPORTING--Those voluntary actions taken prior to or in the process of reporting and the attitudes which affected them.

PROBLEMS IN REPORTING--Uncontrollable hindrances encountered prior to or in the process of telephoning police.

REPORTING TIME--The time from the end of a citizen's involvement in or discovery of an incident until a dispatcher had been contacted about the incident and understood the nature of the incident and location to which an officer should be dispatched.

RESPONSE TIME CONTINUUM--The total length of time elapsed from the end of citizen involvement in or discovery of an incident until a police officer begins his initial investigation of the incident. The time period includes the time necessary for a citizen to report an incident, for a dispatcher to assign an officer to the call, and for the officer to travel to the scene of the incident.

RESPONSE TIME INTERVAL--One of three lengths of time which correspond to the three processes followed in reporting, dispatching, and traveling to a call for police service. The three intervals making up the entire

response time continuum are the reporting, dispatch, and travel intervals and are synonymous with reporting time, dispatch time, and travel time.

RESPONSE-RELATED ARREST--The arrests which resulted from rapid response. This excludes arrests made after a citizen apprehended a suspect, when the suspect's name or address was provided by the victim or a witness, when the suspect was unable to leave the scene because of an injury, or when the suspect turned himself over to police.

TRAVEL TIME--The time from when an officer acknowledged the end of a dispatch assigning him to a call, or when the officer began response to a call, whichever came first, until the officer began his initial investigation of the call.

VICTIM--The citizen against whom a crime was committed. Unlike most statutory definitions, the victim of a commercial robbery, by study criteria, would be the clerk held up at the business and not the individual or corporate owner of the business.

WITNESS--Any citizen, other than a victim or suspect, who saw, heard, or became involved in a crime or noncrime incident at any point during its occurrence.

WITNESS AVAILABILITY--Contact between a field officer and at least one witness to a crime other than the victim, before the conclusion of the initial investigation of a call.

REFERENCES

Elliott, James F.

1973 Interception patrol. Springfield, Illinois: Charles C. Thomas.

Issacs, Herbert H.

1967 "A study of communications, crimes and arrests in a metropolitan police department." Pp. 88-106 in Task Force Report: Science and Technology: The Institute for Defense Analyses. Washington, D.C.: U.S. Government Printing Office.

Larson, Richard C.

1971 Measuring the response patterns of New York City police patrol cars. New York: Rand Institute.

1972 Urban police patrol analysis: Boston: Massachusetts Institute of Technology.

Leonard, V. A.

1938 Police communication systems. Berkley: University of California.

Mayo, Louis A., Jr.

1969 "Law enforcement communications, surveillance and alarm systems." Pp. 33-35 in S. I. Cohn (ed)., Law Enforcement Science and Techonology II. Chicago: Illinois Institute of Technology.

Rabb, Selwyn

1976 "Police rate radio car response times." New York Times 125, January 4, 1976:1;43.

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