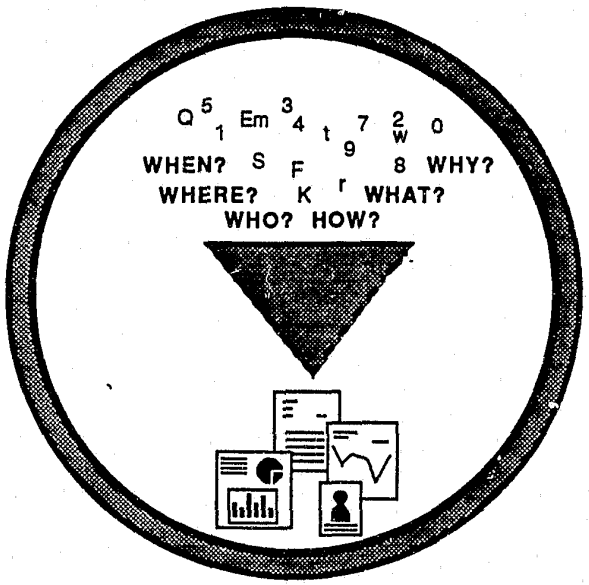
Crime Analysis: From Concept to Reality



By

Steven Gottlieb and Shel Arenberg

Edited By
Stephen Busack, Ph.D.

Office of Criminal Justice Planning Edition

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OFFICE OF CRIMINAL JUSTICE PLANNING

Providing Support to Criminal Justice Agencies, Victim Service Organizations, and Crime Prevention Programs

THE PREPARATION OF THIS PUBLICATION WAS FINANCIALLY ASSISTED THROUGH GRANT AWARD NUMBER CA86016350-00 FROM THE CALIFORNIA OFFICE OF CRIMINAL JUSTICE PLANNING (OCJP). THE OPINIONS, FINDINGS, AND CONCLUSIONS IN THIS PUBLICATION ARE THOSE OF THE AUTHORS AND NOT NECESSARILY THOSE OF OCJP. OCJP RESERVES A ROYALTY-FREE, NONEXCLUSIVE, AND IRREVOCABLE LICENSE TO REPRODUCE, PUBLISH, AND USE THESE MATERIALS, AND TO AUTHORIZE OTHERS TO DO SO. A COPY OF THESE MATERIALS MAY BE OBTAINED FROM OCJP UPON PAYMENT OF THE COST OF REPRODUCING THE MATERIALS.

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PREFACE

PREFACE

Change is an inevitable consequence of societal progression and neither people nor institutions are immune from its influence. In today's world, the question is not whether change should be avoided or even resisted, for these adaptive strategies will eventually be overpowered by the relentlessness of change. Rather, the question which must be asked and answered is how to most effectively prepare for and manage change to ensure that it promotes positive outcomes. The methods by which people and organizations choose to cope with change will ultimately determine their survival or demise.

Increased populations, technological advancements and heightened competition for economic resources have created new social problems which beg for resolution. Further, many of these changes in the human condition have brought new challenges to the doorstep of the law enforcement profession.

The protection of life and property has always been the primary goal of law enforcement. Philosophies regarding how this goal could best be achieved however, have changed throughout the years. Until the 1970s, many police administrators felt that the adequate suppression of crime and the apprehension of criminals could be accomplished only by the increased acquisition of personnel and equipment. The visible presence of the police, it was believed, was the key to reducing criminal activity.

Since the 1970s, however, many studies conducted throughout the country have demonstrated that mere numbers of police officers are not enough to suppress crime in our communities. Rather, it is their planned deployment that makes crime suppression an obtainable goal.

Crime analysis programs make it possible for police administrators to objectively determine the nature of criminal activity in their jurisdictions and to develop directed patrol and tactical action plans to effectively combat it. At the same time, crime analysis units can

provide the information needed to ensure that we are using limited resources to their best advantage.

Crime analysis is still an emerging field within the law enforcement community. As a result, there is little information available to acquaint law enforcement personnel with the operation of a crime analysis unit. Most crime analysts and supervisors of crime analysis units have had to learn the job without the help of formal training.

This book has been written as a guide to establishing a crime analysis program and was designed to be of assistance to new crime analysts and their supervisors. It presents not only the concepts involved in crime analysis, but a "hands-on" approach to determining crime patterns, forecasting crime occurrences and developing the processes necessary to provide a wealth of support services to patrol and investigative personnel.

The authors are well qualified to write this book. Steve Gottlieb has spent over twenty years in the law enforcement profession and, as Special Services Manager of the Chino Police Department, has been responsible for the operation of our crime analysis program since 1982. Shel Arenberg is a private consultant to law enforcement and is a nationally recognized expert in the fields of crime analysis and intelligence analysis. Both of these gentlemen have taught crime analysis classes within California and throughout the nation.

We are extremely pleased with the benefits we have derived from the implementation of a crime analysis program within the Chino Police Department. Our adoption of the program has helped us meet the challenges presented us by the changing world in which we live. We hope that you, the readers of this book, will be similarly succesful in your efforts.

James E. Anthony
Chief of Police
Chino Police Department

ACKNOWLEDGMENTS

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We, the authors of this manual, have taught introductory crime analysis classes for a number of years. The time usually made available for us to present our courses was often less than the time required to master basics of the subject. Because most course attendees were new to crime analysis and to quantitative analysis, many requested that we present our lectures in a "how to do it" reference guide. This book is our way of saying thanks for the encouragement.

Preparation of this book evolved from an earlier work of the authors entitled *A Cookbook of Procedures for Crime Analysts.* Financially supported by a grant from the Office of Criminal Justice Planning (OCJP), that volume primarily dealt with the statistical aspects of the crime analysis process. The current work, *Crime Analysis: From Concept to Reality*, presents a significant amount of program information as well as statistical material that we hope will assist readers in developing, implementing and operating their crime analysis programs. We thank OCJP for their original fiscal support, for giving us the freedom to write as we saw fit and for allowing us to express our opinions as our experience dictated. With such freedom comes responsibility. We are totally responsible for the contents of this book including all technical, stenographic or judgmental errors. We thank OCJP for its support and confidence in us.

We also wish to thank Louisa Chabot, Roz Hodge, Lori Douglas, Patrick Northam, Jim Coyne and Dick Dauphin, crime analysts from the Los Angeles County, California, Sheriff's Department, for consenting to review our initial work. Their comments led to the inclusion of much of the new material which is presented in this book.

This book is but another step on the authors' learning curve regarding crime analysis. Other agencies supported us while we took our first faltering steps and they deserve mention for being there when we most needed help and encouragement. Without such support, this manual would not have been written.

The California Crime Technological Research Foundation presented the first nationwide training program in crime analysis in 1974, thanks to a grant from the U.S. Department of Justice. Some of the material in this book came from that program, which was presented by a number

of trainers including one of the authors. Since the conclusion of the national effort, the California Department of Justice, supported by the California Commission on Peace Officer Standards and Training has provided similar training for crime analysts throughout the Golden State. Both of the authors are still very much involved with this effort.

We tried to keep this manual "practical" and attempted to avoid as much theory as possible. One problem instructors have is their need to justify their choice of technique. We were fortunate to have three pragmatic overseers to keep us on the "straight and narrow path" of practicality. Dr. Raphael Dubrovner of the System Development Corporation taught us the gentle art of teaching mathematics to non-mathematicians. Dr. William Herrmann of the RAND Corporation, and a retired member of the Los Angeles Police Department, patiently helped us build the bridge from arcane formulas to "on-the-street" utility to the patrol and investigative officers of today's law enforcement community.

Chief James Anthony of the Chino, California, Police Department deserves special mention. He kept reminding us, by his editing and over-coffee conversations, that police personnel—from top to bottom—want crime analysts to give them useful insights. Providing the technical rationale behind an answer is nice, but the "bottom line" is crime suppression and criminal apprehension. With today's workload of cases and calls-for-service, there isn't much time for anything else. The authors thank Chief Anthony for his valuable input and insistence on practicality. We hope our readers benefit from his patience. We know we did.

Thanks also go to Captain Jerry Stephens of the Chino, California, Police Department. Captain Stephens allowed us to invade his domain and was kind enough to keep our interruptions to a minimum. We are grateful for his interest in us and this project and for giving us the time and materials needed to accomplish our objectives.

We are also indebted to Fred Cotton of SEARCH Group, Inc. for his insight and generous donation of material regarding automation processes. Fred provided us with the information presented in Chapter 9 of this book and we sincerely acknowledge his contribution.

Appreciation is similarly extended to Crime Analyst Dale Brearcliffe of the Livermore, California, Police Department. Dale provided us with

his monograph entitled *Time Series Analysis Methods* (September 1987) which was originally presented to the Bay Area Crime Analysts Association. Dale's research methods were used in the preparation of Chapter 13 of this book and we thank him for sharing them with us.

We also wish to thank the people who graciously provided their time and expertise in the preparation of this material. Alan Bediamol, Crime Analyst for the Chino, California, Police Department took our hand-drawn sketches and transformed them into the readable graphs that have been used throughout the book. Alan also provided us with some of the crime analysis products that appear in the Appendix of the book. We appreciated his generous assistance to this effort.

Other graphs, forms and products were given to us by Dwight Tompkins, Senior Crime Analyst of the Long Beach, California, Police Department; Sgt. Ed Ridenour of the Stanislaus County, California, Sheriff's Department; Lt. Doug Clements of the San Diego County, California, Sheriff's Department; Kurt Johnson, Serious Habitual Offender Crime Analyst of the Chino, California, Police Department; and Miles Wagner, Crime Analyst and Lt. Patrick Crowe of the Colton, California, Police Department. We express our sincere appreciation to each of you for your contribution to this work.

We also extend our appreciation to Jessie Pryce, Special Services Aide for the Chino, California, Police Department for the clerical assistance provided the authors. Jessie had the unrewarding task of threading her way through numerous revisions of this book and we are grateful her diligence.

Finally, we entend our deepest gratitude to our editor, Dr. Stephen Busack, of the El Cerrito, California, Police Department. Dr. Busack burned much midnight oil on our behalf and went through many red pens in the process of editing our material. We are indebted to him for the expertise he brought to this project and for his unwavering support of our efforts.

Steven Gottlieb

Shel Arenberg

INTRODUCTION

INTRODUCTION

Although the term "crime analysis" has been known to law enforcement since 1963, the incorporation of crime analysis units into the mainstream of police operations is still a relatively new phenomenon. As such, compared with the functions of patrol or investigations, little has been written to acquaint crime analysts with the tasks they need to perform when assigned to these units. Even less has been written about *how* these tasks should be performed.

The purpose of this book is to provide this information to crime analysts and supervisors of crime analysis units. Hopefully it will serve as a reference guide for those individuals who have been given the responsibility of analyzing crime and for passing on the results of their analyses to patrol, investigations and management staff.

The information we wish to share is that which has been presented to students in our crime analysis classes around the country. And in writing this book, we envisioned a training session in which the reader was present with the authors in a discussion of crime analysis concepts and techniques. In keeping with this "vision"—and to make things as simple as possible—we chose to use a writing style that is rather colloquial. Sentences like, "The authors recommend that the reader determine what data he or she will need to collect," have been omitted in favor of the more conversational "We recommend that you determine...."

The first chapters of the book discuss the history of crime analysis and its place in the modern police organization, the functions of a crime analysis unit, the role of the crime analyst, and how to perform the tasks necessary to be successful on the job. Data collection, collation, analysis, distribution, feedback and evaluation processes are covered in detail as are the issues involved in the development and implementation of a crime analysis program, Management of Patrol Operations Program and Management of Criminal Investigations Program.

Latter chapters deal with a description of the statistical techniques which must be used by the analyst to properly interpret data. The use of statistical methods—beyond the computation of simple percentages—will enable you to *logically* derive your conclusions and thereby greatly enhance your ability to provide solid information to your customers.

Finally, the book has been designed to give you a *basic* overview of the crime analysis process. It will not tell you *everything* you need to know about this field. But it will get you up and running and give you the information you need to provide a high level of quality service to your user groups.

Best wishes for much success!!

Part One:

DEVELOPMENT AND IMPLEMENTATION OF CRIME ANALYSIS PROGRAMS

CHAPTER 1

CRIME ANALYSIS: AN HISTORICAL PERSPECTIVE

CRIME ANALYSIS: AN HISTORICAL PERSPECTIVE

The formalized processes of analyzing crime and establishing specialized units to perform these tasks are relatively new to law enforcement. If you are just beginning to develop a crime analysis program, you may be asked to acquaint your agency's personnel with the history of this most interesting field. The following material is provided to assist you with such a presentation.

Analyzing crime to identify suspects and/or crime patterns can be traced to the feudal period of England. Populations of geographic areas were small, people knew each other well, and villagers often spent an entire lifetime in the same village or town. The local constable knew who the troublemakers were, where they lived, and had a good working knowledge of how they committed their crimes.

By the late 1800s, crime in Europe had risen to the point that it seemed only Sherlock Holmes, the fictional detective created by Sir Arthur Conan Doyle, was capable of ferreting out the criminals. Holmes' ability to scientifically analyze bits and pieces of information made him a legendary hero; the real police officer was viewed as a buffoon. The reason, of course, was that use of scientific methods to study and analyze crime was not as advanced in reality as it was in the imaginative mind of Mr. Holmes' creator.

As the years rolled on, new scientific discoveries were made and many came to be of significant benefit to law enforcement. Physical examination of a wide variety of materials enabled police officials to place suspects at scenes of crimes. At the same time, the developing field of psychology began to explain the nature of human personality and the establishment of habit patterns. These and other outgrowths of scientific inquiry allowed law enforcement to accurately determine the nature of criminal activity, predict its future occurrence, and identify its perpetrators.

August Vollmer, Chief of the Berkeley, California, Police Department in the early 1900s, introduced the English technique of systematic classification of known offender modus operandi (MO) to the United States. Vollmer developed the technique of examining recorded calls for service to perform beat analyses and was instrumental in promoting the use of "pin" or "spot" maps for visually identifying areas where crime and calls were concentrated. In his essay entitled "The

Police Beat," Vollmer offered the following statement regarding the use of crime analysis to support police operations:

> "On the assumption of regularity of crime and similar occurrences, it is possible to tabulate these occurrences within a city and thus determine the points which have the greatest danger of such crimes and what points have the least danger."

Another forerunner in crime analysis was O. W. Wilson. Wilson expanded Vollmer's beat analysis technique to include hazard formulas, or the assignment of weighting factors to various categories of crimes and service calls, in an effort to provide a systematic approach to the allocation of patrol resources. It was, however, not until the second edition of Wilson's *Police Administration* (1963) that first mention was made of the term "crime analysis."

Wilson (1963) identified crime analysis as an essential police function and recommended that a crime analysis section be created within planning and research divisions of large police departments.[1] The crime analysis section was clearly envisioned as being responsible for the systematic examination of "daily reports of serious crimes in order to determine the location, time, special characteristics, similarities to other criminal events and various significant facts that may help to identify either a criminal or the existence of a pattern of criminal activity."

By the late 1960s, crime analysis units began to be established in the nation's larger police organizations. These units were primarily responsible for the detection of criminal modus operandi, the discovery of crime patterns within geographical areas, and the determination of relationships between known offenders and crimes. [2]

The expansion of crime analysis was further influenced through development of the Integrated Criminal Apprehension Program (ICAP)

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[1] Experience gained over the years suggests that crime analysis units *should not* be assigned to planning, research or other administrative divisions. Instead, it is highly recommended that they be assigned to patrol or investigative divisions and that they provide strategic and tactical action support—as opposed to administrative support—to their agencies.

[2] Richard G. Grassie, et al., Crime Analysis Executive Manual (U.S. Department of Justice, Law Enforcement Assistance Administration, April 1977), pp. 1-8 through 1-11.

by the Law Enforcement Assistance Administration in the 1970s. Pioneered by President Richard M. Nixon, this federal organization was created by the Omnibus Crime Control and Safe Streets Act and the program was founded on the belief that many crime problems can be attributed to persons who are habitual, and thus career criminals or, at the very least, repeat offenders.

Founders of the ICAP Program recognized that people who had devoted themselves to a life of crime (career criminals) would frequently come into contact with law enforcement officials. Sometimes they would be arrested and an arrest report would be completed. On other occasions they might be the subject of a field interview (FI) or receive a traffic citation. In each case, officers would include in their paperwork a physical description of the person, his or her address, a description of a vehicle (if appropriate), and a notation as to how the crime was committed (MO). Until the age of computerization, however, this information was of little value since everything pertaining to the individual was generally filed according to the subject's last name.

Officers could respond to crime scenes and be given suspect descriptions but, since they had no name, officers had no way of accessing departmental records for possible matches. They could detect definite MO patterns but, without a suspect's name, could not search the files for previously arrested persons who had used those same MO patterns.

ICAP sought to redesign recordskeeping systems of police agencies and better use the vast amounts of data collected by records bureaus. As a result of these changes, police personnel today can record physical descriptions of suspects and have names of suspects returned to them by computer. Likewise, MO patterns can be entered and matched against those used by suspects who have previously been arrested.

ICAP also recognized that repeat offenders are often creatures of habit. They frequently commit crimes during the same times, days of the week, or by the same method. ICAP therefore recommended that crime analysis units be established to monitor trends and patterns, and to report same to patrol and investigative personnel. It was further recommended that the patrol force develop directed patrol or tactical action plans to deal with problems brought to their attention by the crime analysis unit.

These concepts, along with others derived from the famed Kansas City Police Department study of the 1970s, dealt the death blow to the time-honored tradition of fielding police units under the "random patrol" theory. For years it was believed that the visible presence of police officers was a significant deterrent to crime and the best way to cure crime problems was to hire more police officers. This was an expensive belief to maintain; more importantly, it proved to be false.

The Kansas City study told us that it was not how many officers an agency had, but what they did with those officers, that was of greatest importance. If an agency had its officers deployed on the east side of town while all its crooks were on the west side, little in the way of crime reduction would be accomplished. The study, therefore, concluded that best use of the patrol force was achieved when officers were placed in the right areas at the right times. The crime analysis unit subsequently came to be viewed as that component of a department that could be of significant assistance to patrol supervisors.

As an increasing number of agencies began to accept this concept, additional evidence accumulated to suggest that random patrol equaled random results. Instead of focusing on the *acquisition* of resources, concentration was redirected to *proper allocation* of resources. No longer would officers hop into a patrol car, drive around for thirty years, and then retire. From this point on, supervisors would *direct* their activities from information provided to them by the crime analysis unit.

Under the ICAP Program, this concept fell under the heading of the "Management of Patrol Operations." Additionally, the Program supported other changes which also led to better utilization of patrol resources. Call prioritization systems, mail-in report systems, and the use of non-sworn community services officers to perform non-hazardous duties were employed to allow officers to concentrate on preventing crime and apprehending criminals.

Also under ICAP, "Management of Criminal Investigations (MCI)" sought to improve the quality of case preparation, further develop police and prosecutor relations, identify career criminals, and increase the number and proportion of career criminals arrested. At the same time, MCI was designed to provide investigations the same type of efficiency given to patrol managers. ICAP recommended enhanced case screening procedures and the incorporation of solvability factors into

preliminary crime reports. Patrol officers were encouraged to fully participate in initial investigations by obtaining most information which could have been obtained during the officers' first victim and/or witness contacts. Finally, the ICAP Program recommended that crime analysis units provide investigators with suspect leads, MO pattern analyses and other such aids to assist the agency with identifying criminals and possible future locations of criminal activity.

The Law Enforcement Assistance Administration was discontinued during the Carter years and federal funding for law enforcement programs ceased. Many states, impressed with the results of the ICAP Program, made state funds available to local agencies that wished to implement ICAP's strategies. California for example, adopted the Program in 1978 and renamed it the "Career Criminal Apprehension Program" (C-CAP). C-CAP is presently administrated by the Office of Criminal Justice Planning and provides grant funding to law enforcement agencies that wish to improve operations through use of the concepts explained above.

State funds are not, however, necessary for beginning crime analysis programs. Many agencies have developed them without external fiscal assistance. No matter how they are funded, and no matter what name they are given, these programs all share the same basic objectives—to provide a sophisticated means for identifying and apprehending criminals and for improving utilization of the Department's resources.

CHAPTER 2

DEFINITION, TYPES, FUNCTIONS AND APPLICATIONS OF CRIME ANALYSIS PROGRAMS

DEFINITION, TYPES, FUNCTIONS AND APPLICATIONS OF CRIME ANALYSIS

DEFINITION:

The Law Enforcement Assistance Administration's Integrated Criminal Apprehension Program (ICAP) defined the crime analysis function as:

> "... a set of systematic, analytical processes directed at providing timely and pertinent information relative to crime patterns and trend correlations to assist operational and administrative personnel in planning the deployment of resources for the prevention and suppression of criminal activities, aiding the investigative process, and increasing apprehensions and the clearance of cases. Within this context, crime analysis supports a number of department functions, including patrol deployment, special operations and tactical units, investigations, planning and research, crime prevention and administrative services (budgeting and program planning).[3]"

TYPES:

"Crime analysis" often refers to three different types of processes:

- Tactical Crime Analysis
- Strategic Crime Analysis
- Administrative Crime Analysis

Tactical Crime Analysis:

The tactical crime analyst provides information to assist operations personnel in the identification of *specific* crime problems and in the arrest of criminal offenders. Crime analysis data is used to promote a quick response to field situations.

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[3] Ibid., p. 1-14.

Strategic Crime Analysis:

Strategic crime analysis furnishes information concerning long-range problems. Strategic crime analysts provide data relative to long-term increases or decreases in crime (*crime trend* data). They also prepare crime statistical summaries—often referred to as *exception reports* since they reflect deviations from the norm—and provide resource acquisition and allocation information.

Administrative Crime Analysis:

Administrative crime analysis focuses on the provision of economic, geographic or social information to administrators. Examples of administrative crime analysis tasks include grant writing, feasibility studies, and the preparation of special research projects.

Only in the larger police agencies of the country will crime analysts become involved in but one of the above areas. Most frequently they will be expected to perform some of the tasks associated with each process from time to time. This expectation is not unreasonable as long as the emphasis remains on the analysts' performance of tactical crime analysis tasks.

FUNCTIONS:

Crime analysis information can be used to not only enhance an agency's ability to catch crooks, but to do it more efficiently. The unit can assist the department through its performance of the following functions:

- Identification of evolving or existent crime patterns and series
- Forecasting future crime occurrences
- Initiation of target profile analyses
- Provision of investigative leads
- Provision of support data to crime prevention programs
- Assisting in case clearance processes

- Provision of trend and other data to support resource allocation and departmental planning

- Analysis of operational data for deployment planning and budgeting

While records bureaus serve as *repositories* of information, crime analysis units are *processors* of information. The success of a crime analysis unit lies in the ability of its personnel to take bits and pieces of information and connect them to determine the nature of criminal activity within the community. Once that has been accomplished, the crime analysis unit can provide patrol and investigative personnel with the information needed to suppress criminal activity. Depending upon its staffing level, the unit can also provide administrators with information necessary for properly budgeting resources for adequately staffing departments, equiping and deploying personnel.

APPLICATIONS:

Assume that burglaries of construction sites have been occurring in the southeastern portion of your jurisdiction for a two-month period. Over the same time frame, armed robberies of liquor stores have been occurring in the northwestern section of your city.

Identification of Evolving or Existent Crime Patterns

In the daily process of reviewing crime reports, the analyst looks for similarities in dates, times and methods by which crimes are committed. He or she also notes any similarity in suspect descriptions. This procedure identifies a *particular* suspect who may be responsible for the commission of several offenses. After report examination, the analyst collates and analyzes the data in an attempt to define recurring patterns of criminal activity. If a pattern is noted, relevant information is disseminated to patrol or special tactical action units. The analyst then continues to monitor the pattern until the pattern ceases, usually because the suspect leaves the area or is arrested.

In this example, the analyst notes that, of the construction site burglaries committed, there is nothing to suggest they are being committed by the same person(s). In some instances only lumber was taken; in others, appliances were stolen and lumber was left behind. Some burglaries occurred on weekends; others occurred at night

during the week. Witnesses also described a variety of suspects. Some were male white juveniles while others were black adults.

At this point, the analyst would say that a *crime pattern existed.* A **crime pattern** is the occurrence of similar offenses in a defined geographic area, either a single reporting district, a beat, or an entire city. In this case, the analyst has a number of construction site burglaries committed in the same part of town but there is nothing to suggest that the same person or persons are responsible.

The armed robberies, however, are another matter. In one of the robberies, a teenage white suspect used a knife. In two others, the suspects simulated a weapon. One of the suspects was a black male and the other a Hispanic adult. The robberies occurred on different days of the week.

In four other robberies, however, an adult white male used a chrome plated revolver. This suspect made his victims kneel on the floor, opened the register himself, removed cash and then told his victims to "wait five minutes before calling the cops." He committed all robberies on Wednesdays between nine and eleven o'clock in the evening.

Since a number of robberies (same type of crime) were occurring in the northwestern part of town (same geographical area), it would be appropriate to state that a crime pattern was in evidence. However, in the case of the four robberies wherein the chrome plated handgun was used, the analyst would state that he or she was observing a *crime series.* A **crime series** is a crime pattern wherein there is reason to believe that the same person or persons are responsible.

In the four robberies committed on Wednesdays, the MO in each case was the same and all victims gave similar suspect descriptions. The same person is probably responsible for committing these crimes.

Forecasting Future Occurrence:

By examining the crime pattern, the analyst can come to some conclusions regarding date, time and location of future criminal events. Assuming that the robber in the previous example adheres to past habit, he will likely hit another liquor store in the northwestern section of town next Wednesday night between nine and eleven o'clock. He will probably be armed with the chrome plated handgun. Having reached this conclusion, the analyst would prepare a bulletin

describing the nature of the series and disseminate that bulletin to patrol and special units for tactical action planning.

Successful forecasting of a criminal event can be an exhilarating experience. Often, however, forecasting is frustrating for the following reasons.

Some people feel that the analyst has a crystal ball or, that the analyst's computer magically foretells the next criminal incident. Crystal balls are nonexistent, and the best any computer can do is provide the analyst with information he or she can use for examination purposes. There is no magic button that tells the analyst the location, date and time of the next crime, or the name of its perpetrator.

More frustrating, however, is the frequent failure of the criminal to do what he or she is *supposed* to do according to an analyst's prediction. Criminals just don't cooperate! To illustrate this point, the authors recall a story told to them by Lt. Lee Blevins of the El Cerrito, California, Police Department. A suspect's actions had been monitored over a period of time and the police felt quite certain he would strike on a particular evening. Officers placed themselves at the targeted location and waited for the suspect to make his grand entrance. He never made an appearance. Later, when subsequently apprehended and interrogated, the suspect was asked why he had failed to commit the crime anticipated. His reply was enlightening. He told investigators that they had accurately identified his pattern and that he had planned to hit the location they were watching. However, on that particular night, he was home in bed with a terrible case of flu!

The analyst monitors the actions of people, not machines; while criminals often adhere to habit, there is always the possibility they will deviate. In fact, a "good" criminal will deviate from habit frequently and intentionally. The analyst must remember that some things—like a bad case of flu—cannot be factored into an equation.

There are many other reasons why predictions may not come true:

- the information used to formulate the prediction was inaccurate
- the analyst's determination of the pattern/series was incorrect

- targeted locations and/or date/time calculations were incorrect
- suspect left the area or was arrested by another jurisdiction
- suspect no longer has a need to commit crime (got a job, received an inheritance, is being supported by a friend or relative, has "seen the light," etc.)
- suspect is deceased

Target Profile Analyses:

Successful target profiling identifies what type of person, structure, vehicle or establishment is likely to become a target (victim) of crime. In our example, the analyst concluded that other liquor stores in the northwestern part of town were vulnerable. Operations units may wish to monitor these establishments in an attempt to apprehend the suspect.

Target profile analyses benefit both police and the public at large. Police officials use the information to develop tactical action and directed patrol plans. *Tactical action plans* guide the activities of operations personnel in the suppression of *specific and well-defined* crime problems (e.g., the four liquor store robberies in our example). *Directed patrol plans* are less specific and are designed to place officers in areas having more *generalized* crime problems (e.g., neighborhoods where burglaries have increased to the extent that a crime pattern can be identified). Target profile information can be used to warn the public of existing or impending criminal activity. A newspaper story citing robberies at automated teller machines can help reduce the number of these occurrences. Radio or television announcements describing certain crimes in certain areas and emphasizing the need for caution can also be effective.

Investigative Leads For Investigators:

Robbery detectives will join with patrol in an attempt to identify and locate the suspect responsible for the four robberies in our example. The crime analyst searches manual or automated data files for previously arrested persons (known offenders) matching the suspect description. If the suspect's vehicle was seen, the analyst would search vehicle files to see if it had ever been listed on a crime report, field interview (FI) card or traffic citation. Any information obtained

would be passed to investigators and leads would be used by detectives to identify and locate the suspect.

Support Data For Crime Prevention Programs:

Crime prevention personnel would use the information regarding the robbery series to inform other liquor store employees of these crimes. As noted earlier, this information can be very useful to *potential* victims of crime. A liquor store owner might decide to increase the number of employees assigned to work on Wednesday evenings or move the cash register closer to the front of the store where it can be better observed by officers cruising by. The owner might also wish to discuss with employees precautions to take should a robbery occur.

Crime prevention officers might wish to take the analyst's information in the burglary example and solicit cooperation from the owners of construction companies to better secure their worksites. They could also share this information with neighborhood watch groups. By being properly informed, a witness may call the police if he or she observes another burglary attempt.

Analysts can also provide crime prevention officers with information to "tailor make" their presentations. Assume that a particular neighborhood has been the victim of an auto thief. An officer speaking to this group should be able to address the auto thefts that have occurred. If the officer is talking to a group of residential burglary victims, he will want to talk about the burglary problem. Many agencies *require* their crime prevention officers to obtain neighborhood "work-ups" before making their presentations.

Assisting in Case Clearance Processes:

When suspects are taken into custody, the analyst can determine if they may be responsible for offenses *other* than those for which they have been arrested. When our mythical robber is captured and interrogated, he may tell investigators that the robbery for which he was arrested was the *only* robbery he ever committed. Fat chance! How is the investigator to know what other crimes he may have committed? The investigator can use crime analysis information to link the suspect with other crimes he may have committed. Once these have been identified and substantiated, they can be cleared.

Data to Support Resource Allocation and Departmental Planning Activities:

Analysts can provide their agencies with a wealth of material for overall planning purposes. For example, crime analysis can provide answers to the following questions:

- is crime increasing or decreasing?
- how many crimes are likely to occur next year?
- how many calls for service are we likely to receive next year?
- what will be the impact on resources if we annex an area?
- how many officers will we need over the next two years?
- is there a significant relationship between crime rate and implementation of our new crime suppression program—is it worth the cost?

Answers to these inquiries will provide the basis for planning for future departmental growth.

Operational Data for Deployment Planning and Budgeting Activities:

Every jurisdiction needs a number of patrol officers on duty at any given time of the day or night. Exactly *how* patrol officers should be deployed throughout a twenty-four hour period is not easily determined without research. This research is done by the crime analyst and is another function of the crime analysis unit.

In the past, agencies approached the question of how to deploy their people in a rather straightforward way. If they had 30 officers, they would assign 10 to day shift, 10 to swing shift and 10 to graveyard. Beats were often defined by geographical boundaries, not by crime rates. This method does not always work.

While the 10 officers on day shift were falling all over themselves trying to find something to do, the folks on evening and graveyard shifts were buried in work. Workloads weren't evenly distributed. Because beats were drawn along geographical boundaries (e.g., "let's divide the city into a four-beat quadrant at Elm and Maple Streets since they're the two biggest streets in town and everybody knows

where they are"), it was not unusual to find some officers in a state of near retirement while others were working themselves to death!

By knowing the agency's needs, the community's needs, the number of calls for service, the crime rate, etc., the crime analyst can do a workload and manpower distribution study to determine how many officers the agency needs, how these officers should be deployed, and what the proper beat boundaries should be. This provides for a more efficient patrol force.

By providing an analysis of operational data, the crime analyst also assists administrators with budgetary concerns. Once the number of people the agency needs has been ascertained, it then becomes necessary for the department's budget analyst—*not the crime analyst*—to determine how much it will cost to equip them. How many more police cars are needed? How many more guns? How much more for overtime, Xerox paper and coffee for the lunchroom? All of these questions have to be answered annually by every police agency in the nation. By providing the budget analyst with information relative to staffing needs, the crime analyst performs a service benefiting all members of the organization.

CHAPTER 3

PROGRAM DEVELOPMENT ISSUES

PROGRAM DEVELOPMENT ISSUES

Most crime analysis programs have been created by the development and implementation of the following three modules:

- a Crime Analysis Unit
- a Management of Patrol Operations (MPO) Program
- a Management of Criminal Investigations (MCI) Program

Timing of Implementation:

Agencies differ in the amount of time it takes to implement a crime analysis program. Some departments elect to develop the components in consecutive order using a twelve month period to accomplish each phase. Others decide to develop the crime analysis unit within twenty-four months and then concurrently develop their MPO and MCI programs over the next eighteen months. Any method can be satisfactory as long as prior planning is done to ensure the success of the project.

Program Planning:

Whether a department uses outside funds or not, proper planning is essential to successful development of a crime analysis program.

Agencies in California must submit a written plan to the Office of Criminal Justice Planning before receiving permission to use state grant funds to start their programs. This plan describes the objectives, the training of personnel, the necessary equipment, and provides a time line depicting dates that program milestones will be achieved. A line item budget detailing all program costs is also required. Agencies requesting to use these monies to purchase computer equipment must also submit a needs assessment to justify its acquisition.

The development of a written plan which takes the above factors into consideration is highly recommended regardless of funding source. Without such a plan, the program may develop haphazardly and fail to achieve its objectives.

Executive Commitment:

Implementation of a crime analysis program creates long-term change in an organization. Many people are resistant to change—especially when it involves abandoning time-honored practices and procedures. Left unchecked, these individuals can prevent a crime analysis unit from becoming an effective part of the organization.

All persons in the organization must know that the program has the *total support* of the chief executive. Command staff must be told that the unit has been established to benefit the entire department and that the cooperation of their personnel is not only necessary, but required.

Crime analysts are dependent upon receiving information from many people in the organization. For them to be truly effective, others must act on the information they provide. If this exchange does not occur, the crime analysis program will fail to meet its objectives.

Executive Task Force:

An executive task force should be created in the early stages of program development. All members of the task force should be acquainted with crime analysis concepts and the functions of the crime analysis unit. The purpose of the task force is to guide the direction of the crime analysis program, provide for its integration into the department and to ensure that it meets the needs of its user groups.

At minimum, the task force should be composed of the following:[4]

- Project director (law enforcement executive)
- Project manager (supervisor of the program)
- Crime analysis supervisor (if not the project manager)
- A patrol commander (if not the project manager)

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[4] Office of Criminal Justice Planning, Career Criminal Apprehension Guidelines, January 1988, p. 7.

- An investigations commander (if not the project manager)
- A representative from the prosecutor's office [5]
- Any additional staff member(s) whose involvement in this task force would promote successful program implementation.

Because the crime analysis program fosters many changes, the person who serves as the project director for the program must have access to the chief executive. Where the chief or sheriff is the project director, this access must be given to the project manager. The chief executive must be kept informed of contemplated changes and the program's continuing state of development.

Intradepartmental User Committee

Line level individuals who will have direct contact with the crime analysis unit must cooperate in the program. To secure this cooperation, these individuals must be included in the user group committee.

The committee should meet regularly, and operational needs of both the analyst and the users should be openly discussed. Moreover, all members of the group should be given the opportunity to discuss the types of products and services they wish to receive from the crime analysis unit. The committee may also address forms design, the establishment of information exchange procedures, and the use of crime analysis data for directed patrol and/or tactical action planning. Finally, committe members should be encouraged to give crime analysis unit personnel continuing feedback and evaluation relative to their provision of product and services.

The user group should be comprised of members from the following divisions, units or bureaus:

- Crime Analysis Unit

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5 In those states which have them, this individual should be the project director for the district attorney's Career Criminal or other such prosecution program. Where no such program exists, the district attorney should assign a deputy district attorney to coordinate with the local agency regarding the handling of career criminal cases.

- Patrol
- Investigations
- Records
- Special Units/Details
- Crime Prevention
- Administration
- Computer Services (if not assigned elsewhere)
- Communications/Dispatch
- Planning and Training
- Traffic
- Any additional division, unit or bureau whose representation would promote successful implementation of the program.

Representatives of the above divisions, units and bureaus need not be supervisors; indeed, sometimes it is better if they are not. However, regardless of rank, they should be people whose opinions are respected by others in the organization.

Interdepartmental User Committee:

It is also beneficial to establish a user group composed of representatives from agencies outside the organization who will have contact with the crime analysis unit. Meetings with these people facilitate exchange of information and keep the analyst apprised of community concerns. Among others, committee members may include representatives from the following organizations:

- District Attorney's Office (for information on progress of pending cases, changes in policies and/or procedures, etc.)
- Probation/Parole (for information regarding persons who have either been taken off probation/parole or are about to be released into the community)

- Neighboring Police/Sheriff's jurisdictions (for information regarding shared criminals, crime patterns, crime series and/or other crime problems)

- Schools (for information regarding the activities of juvenile offenders and the nature of gang, drug and other crime problems on or near school grounds)

- Adult/Juvenile State Prisons if located in or near the jurisdiction (for information regarding incarcerations, releases, escapes, etc.)

- Any appropriate community organizations (e.g., gang or drug rehabilitation centers; housing authority; other such agencies which can provide insight into crime or crime causation factors in the community)

- Any other organization whose representation would be of assistance to the program.

CHAPTER 4

DEVELOPMENT OF A CRIME ANALYSIS UNIT

DEVELOPMENT OF A CRIME ANALYSIS UNIT

Placement Within the Organization:

Crime analysis units are most effective when assigned to patrol or investigative divisions. Large agencies may wish to assign crime analysts to specialized units (e.g., narcotics, forgery/fraud, homicide, intelligence, etc.) as well. Under no circumstances, however, should crime analysis units be assigned to planning, research, budget or similar administrative divisions. The *primary* objective of a crime analysis unit is to detect crime patterns and to provide information to patrol and investigative officers to assist in the identification of criminal offenders. These people should be the *first* beneficiaries of the analysts' efforts and it is important that analysts become acquainted, regularly communicate, interact with, and be continually available—on a daily basis—to provide these officers the information they want and need.

When assigned to administration or the chief executive's office, crime analysis will be seen by the troops as a unit developed to provide assistance to administrators; they will not consider it a component developed to be of assistance to them. When this occurs, interaction between crime analyst and field and investigative personnel becomes diminished. Crime analysts are often assigned to administrative divisions because they have skills of benefit to administrators. They are usually good writers and proficient mathematicians and are often called upon to provide administrative staff with a wide variety of reports. *Crime analysts* should not be required to spend the bulk of their time working on these activities; administrative duties should be given to *others* in the organization who have been specifically hired for this purpose. The crime analyst should be free of administrative work so that he or she can provide service to patrol and investigative personnel.

Physical Placement of the Unit:

The crime analysis unit should be physically located where it is easily accessible to patrol and investigative officers. Though an office near the patrol briefing or report writing room is ideal, any area of the building will suffice as long as officers have access to it. Many officers will not frequent a crime analysis unit if it is inconvenient for them to do so; further, they often will not visit if they have to go through "mahogany row" to get there.

Supervision of Crime Analysis Personnel:

The unit should be supervised by an individual who is well-respected within the department and familiar with crime analysis concepts. This person should know what crime analysis is and how it should be done.

Supervisors should introduce new analysts to members of the department, explain the role and functions of analysts, and assist analysts gain acceptance by agency personnel. Supervisors should also provide new analysts with familiarization training in the following areas:

- General police operations of the agency
- Job functions of departmental personnel
- Crime analysis concepts
- Job expectations of the analyst
- Sources of internal and external information
- Use of departmental reports
- Use of departmental computer systems
- Functions of other components of the criminal justice system
- MOs used by criminals to commit various crimes
- History and general nature of crime in the community

Training of Crime Analysis Personnel:

Because this is a new field, it is not uncommon for the following scenario to occur. On his or her first workday, the analyst walks in and meets the supervisor of the crime analysis unit. During the conversation, the analyst may say something like, "This sounds like very interesting work. I know a little bit about it from reading the job flyer and from what was said during my oral interview, but I'd like to know more about it. Exactly what *is* crime analysis and what am I supposed to do?" In response, the supervisor leans close to the

analyst and in hushed tones whispers, "You know, I wouldn't want this to get around; but frankly, I haven't got the *foggiest* idea!"

This happens more frequently than one might imagine. And the reason it occurs is because little in the way of formal crime analysis training is currently available. To prevent reinactments of the scenario just described, we recommend that supervisors receive crime analysis training *prior* to the arrival of analysts and the development of the unit. If this is not possible, analysts and supervisors may attend training sessions together.

Crime analysis training may be obtained in California from the Commission on Peace Officers Standards and Training. The Office of Criminal Justice Planning also sponsors crime analysis conferences at various times during the year. Other organizations throughout the nation that similarly provide crime analysis training include: the International Association of Chiefs of Police (Gaithersburg, Maryland), Public Administration Service (McLean, Virginia), and the Institute of Police Technology and Management (University of North Florida, Jacksonville, Florida).

Staffing:

Numbers of people assigned to the crime analysis unit are dependent upon the size of the agency and the crime rate. ICAP recommended that one to two analysts plus clerical support be employed by agencies having 100 to 300 personnel, three to four analysts plus clerical support be employed by agencies having 300 to 800 personnel, and five to seven analysts plus clerical support be employed by agencies having 800 to 1200 personnel. Agencies having in excess of 1200 personnel will obviously exceed these staffing recommendations.

Departments operating out of one building need only one crime analysis unit. Agencies having outlying stations or precincts need to decide if they wish to centralize or decentralize crime analysis operations.

The Dallas, Texas, Police Department has a headquarters crime analysis unit and assigns additional analysts to its stations. Station analysts perform routine analyses while the centralized staff concentrates on complex crime problems. The centralized staff uses information provided by peripheral analysts to track crime throughout the whole of the jurisdiction.

Placing analysts outside of headquarters promotes personal interchange between analyst and station officers. Dallas officials found that communications efforts were hampered when they had only a centralized unit; this realization served to promote assignment of analysts to outlying areas.

Another factor influencing staffing decisions is the number of crimes analysts are expected to analyze. Budgetary constraints, coupled with the volume of cases, may preclude hiring the number of analysts needed to track and monitor *all* criminal incidents. Administrators in this position should consider having their analysts focus on crimes of *greatest concern* to the agency. In this situation, the analyst should be encouraged to provide comprehensive analyses of one or two crime types rather than superficial analyses of many criminal events.

Agencies with fully automated information systems will need fewer analysts than those using manual procedures. Administrators should remember, however, that computer systems cannot make decisions for an analyst; they will, however, significantly reduce the time used to acquire the information needed to make them.

Sworn vs. Non-Sworn Personnel as Analysts:

The primary advantage of using sworn personnel as crime analysts is the experience and knowledge of police operations that they bring to the job. Since sworn officers know the jurisdiction, its crime problems, and "the way cops think," they will have little trouble securing and dispensing the information needed to integrate crime analysis into the mainstream of the department. Additionally, sworn officers may have immediate credibility with the troops.

The primary disadvantage of using sworn officers as crime analysts is that it fails to accomplish one very important objective that is central to the whole purpose of creating a crime analysis program in the first place—it fails to free officers to do the things that only they can do in protecting life and property. It reduces the strength of the patrol force, and reduces the uncommitted patrol time available to those officers who *are* working the streets. Officers who are assigned as analysts are subject to transfer or promotion out of the unit and this can impede or halt the unit's progress. Similarly detrimental is the tendency to use officers for non-crime analysis functions (e.g., to fill patrol spots during vacation periods, assisting short-staffed detectives

on a "door kick", etc.). The use of light-duty officers is also of minimum benefit for they return to regular duty after recovering from an injury or illness; projects started by such officers may not be completed. An additional disadvantage is that it costs more to hire sworn staff than it does to hire civilians.

Those who hire civilian analysts look for people who enjoy analysis work and who will likely be around to do it for many years. When hiring an analyst, look for someone with demonstrated research, writing, analytical and mathematical skills. Applicants who have congenial personalities, are adaptable to new situations, and who can work well with others are desirable.

The disadvantage of hiring non-sworn analysts lies not so much in their having any particular fault, but because some members of the agency may refuse to accept them under any circumstances merely because they are civilians. Where such sworn versus non-sworn issues exist, little in the way of communication is established between the two groups. This situation will render a crime analysis unit ineffective, for officers will neither share information with the analyst nor use the data he or she provides. [6]

We feel the advantage of using civilians outweighs any disadvantages. Many non-sworn analysts throughout the country are exceedingly effective in their jobs, and have experienced few problems securing the acceptance and cooperation of sworn staff. Non-sworn analysts are quite capable of providing products and services of benefit to all members of their organizations. Administrators who use civilian analysts are able to relieve sworn personnel of administrative tasks and improve the efficiency of their operations forces.

Hours of Operation:

Most crime analysis units maintain a Monday through Friday, 8:00 AM to 5:00 PM, workweek. This schedule is satisfactory for most agencies, especially in the beginning stages of program development. The crime analyst will have to be available to answer questions, draft new procedures and perform other tasks associated with development of

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[6] If you are an analyst who has tried everything and found yourself *hopelessly* caught in this situation, we have a word of advice for you. "Quit!" Then find another organization who will be more appreciative of your efforts.

the program. This can best be accomplished during the standard workweek.

Analysts should be given some freedom to vary work hours to meet evening and graveyard shifts. These shifts also need to know about crime analysis and should become acquainted with the analyst at the earliest opportunity. Analysts allowed to vary their work schedules can more easily establish good communication with *all* members of the organization early in the development process. This is extremely important and often contributes to the success or failure of the crime analysis program. Anything that enhances communication between analyst and agency members should be strongly encouraged.

Open Door Policy:

The crime analysis unit should have an "open door" policy; all persons regardless of rank or position within the organization should have ready access to it. Supervisory approval to contact analysts regarding legitimate requests for information should *not* be required. Open door policies encourage communication and the free exchange of information; establishing "procedures" for visiting the crime analysis unit erects barriers that inhibit this process.

Equipment and Supplies:

The crime analysis unit should be equipped much like any other non-tactical office of the department. Basic items include the following:

- Desks or workstations for staff
- Typewriters
- Office supplies
- Telephones
- File Cabinets
- Bookcases
- Statistical calculator
- Standard copy machine (or convenient access to same)
- Standard fan-fold and wall maps of the jurisdiction

- Multi-color 1/8" adhesive dots (for color coded depiction of crime locations on maps)
- Plastic map overlays
- Flip chart and accessories
- "Kroy" or similar lettering machine (to create headlines, banners, etc.—a great alternative to "rub on" lettering sheets)
- Graphics supplies (to do "paste ups" of bulletins and to prepare camera-ready materials)
- Standard reference guides (codebooks, street directory, dictionary, thesaurus, etc.)

Depending upon the budget of the agency, acquisition of the additional below listed items will be helpful:

- Computer terminal and/or full computer system and the following peripheral items: [7]
    - ° Software

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[7] Agencies need not have a computer system to have effective crime analysis units. Indeed, many operated successfully in a manual mode before the advent of automation. However, for those departments which *are or will be* automated, it is *essential* that crime analysis units be provided their own computer terminals. These terminals should be on-line to a department's primary computer system so that an analyst can easily download data from or upload data to it.

If the primary system has only the singular function of capturing crime and other incident data, it is recommended that the agency acquire a stand-alone personal computer system for the crime analysis unit. Depending upon the software purchased for it, the system will allow the analyst to create graphics, spreadsheets and databases. It will also perform word processing and desktop publishing tasks and facilitate computation of the statistics necessary to the data analysis process. Further, the system can be used to monitor crime patterns and series and to track case assignments and clearances. Project management, flowcharting, simple budget accounting for the unit and other such routine activities can also be assisted through use of the personal computer. Finally, when networked together on a department-wide basis, these computers can be used to promote the rapid exchange of information throughout the entire organization. For more information regarding automated systems, please see Chapter 9 of this book.

- ° Dot matrix or laser printer (a color printer will add flair to documents)
- ° Graphics Plotter (to create color graphs and charts)
- ° Scanner (to allow photos, drawings and maps to be easily entered into the computer's graphics system)
- ° Network hardware and software (to connect computer systems and peripherals)
- ° Modems (to allow computer access to systems outside the department)

- Color copier (also adds flair to documents)
- Overhead projector
- Drafting table and supplies
- Facsimile machine
- Additional reference materials (National Institute of Justice bulletins, Law Enforcement News, Criminal Justice Newsletter, etc.).

CHAPTER 5

THE CRIME ANALYSIS PROCESS

THE CRIME ANALYSIS PROCESS

The five processes inherent in crime analysis are:

- data collection
- data collation
- data analysis
- data dissemination
- feedback and evaluation

DATA COLLECTION:

Data collection may be defined as the gathering of specified raw data taken from crime reports and other law enforcement documents. [8]

Collection and analysis of data enable the crime analyst to determine *what* criminal activity is occurring, *when*, *where* and *how* it is being committed, and *who* the perpetrators might be. Data may thus be considered the lifeblood of the crime analysis operation. Without data, the crime analysis operation will cease to exist.

Source Documents:

Although many documents in an agency may be considered "source documents," the ones of primary concern to the analyst are the offense (crime) report, the suspect/arrest report and the field interview (FI) report. These documents contain the data that are used most frequently to establish the existence or emergence of crime patterns, build MO and suspect files and determine the identity of criminal offenders.

Source Document Modifications:

Modifications to source documents usually emanate out of an analyst's need to gather data which is standardized, usable, of good quality and in a format that facilitates the collection process. If current report forms and source documents do not meet these criteria, new ones should be developed. Newly created documents should contain data specific enough to allow formulation of conclusions as to the existence or emergence of criminal activity and to the identification of possible suspects, while allowing pertinent data to be easily extracted.

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[8] California State Department of Justice, Introduction to Crime Analysis, (Department of Justice Training Center), p. 1-3.

Data Element Requirements:

At minimum, the following source documents should include the data listed below:

- Crime Reports
  - geographic factors
  - time factors
  - victim/target descriptors
  - property loss descriptors
  - physical evidence descriptors
  - solvability factors
  - specific MO factors
  - preliminary investigation information
- Suspect/Arrest Reports
  - geographic factors
  - time factors
  - victim/target descriptors
  - recovered property descriptors
  - physical evidence descriptors
  - specific MO factors
  - suspect descriptors
  - suspect vehicle descriptors
- Field Interview (FI) Reports
  - geographic descriptors
  - time factors
  - subject descriptors
  - subject vehicle descriptors
  - names of associates with subject
  - reasons for the interview.

Report Formats:

The two types of formats most widely used in the design of source documents are the:

- narrative format

- forced choice format.

Documents designed in a narrative format are usually inappropriate for crime analysis work because they leave too much to the discretion of the officer completing the report. Important information may be overlooked and subjective opinions may be presented as facts. Additionally, collecting data from narrative reports is cumbersome. The analyst spends so much time trying to locate data within the body of these reports that analysis often comes too late to be of any real value to patrol and investigative officers.

Forced-choice reports aid the data collection process by:

- eliminating the need for officers to remember to include various data elements in their reports
- standardizing the capture and improving the accuracy of data
- presenting data in a format that eases collection and facilitates analysis.

The two basic types of forced-choice reports are the "check-box" report and the Scantron® report. "Check-box" reports—so named because of their check-box design—list pre-defined data elements used to describe people and criminal events. Officers simply "check off" elements as they apply to any particular investigation (Figures 1, 1A, 2, and 2A).

Scantron® reports are completed by blackening data element boxes with a pencil. Developed by the Scantron Corporation and the Chino, California, Police Department to capture crime, suspect and field interview data, these reports utilize a forced-choice format that is specifically designed for use by agencies with automated information systems (Figures 3, 4 and 5). Reports are fed through an optical scanning device and their information is automatically sent to and stored by the agency's computer system.

Scantron® reports offer two primary benefits not shared by other reporting systems. First, they minimize data entry time. Data can be entered into an automated system in a matter of seconds instead of minutes. Second, Scantron® reports enhance the accuracy of the data entry process. Using traditional methods, data entry operators may accidentally enter incorrect information and their errors may never be discovered. By contrast, since the optical scanning device only "reads"

Figure 1

OFF. NAME _____ STANISLAUS COUNTY SHERIFF'S OFFICE

1. PAGE _____ OF _____ **SUSPECT/ARRESTEE/MISSING PERSON REPORT** 2. INCIDENT NO. _____

☐ FOLLOW-UP CJIS

3.SEQ#	4.NAME-LAST (OR PARTY ID#)	FIRST	MIDDLE	5.AKA-LAST	FIRST	MIDDLE		
	6.AGE	7.DOB	8.HT	9.WT	10.OCCUPATION	11.PHONE		
	13.AD TYPE	ADDRESS	CITY	ST	ZIP			
19.DESC. BY SEQ#	14. STATUS	15.DATE ARR.	16.TIME ARR.	17.LOCATION OF ARREST-ADDRESS	CITY	ST	ZIP	
	18.CHARGES							
3.SEQ#	4 NAME-LAST (OR PARTY ID#)	FIRST	MIDDLE	5.AKA-LAST	FIRST	MIDDLE		
	6 AGE	7 DOB	8 HT	9 WT	10.OCCUPATION	11.PHONE		
	13 AD TYPE	ADDRESS	CITY	ST	ZIP			
19.DESC. BY SEQ#	14 STATUS	15.DATE ARR.	16.TIME ARR.	17.LOCATION OF ARREST-ADDRESS	CITY	ST	ZIP	
	18 CHARGES							
3 SEQ#	4 NAME-LAST (OR PARTY ID#)	FIRST	MIDDLE	5.AKA-LAST	FIRST	MIDDLE		
	6.AGE	7.DOB	8.HT	9.WT	10.OCCUPATION	11.PHONE		
	13.AD TYPE	ADDRESS	CITY	ST	ZIP			
19.DESC. BY SEQ#	14 STATUS	15 DATE ARR	16.TIME ARR.	17 LOCATION OF ARREST-ADDRESS	CITY	ST	ZIP	
	18.CHARGES							

20. ADDITIONAL SUSPECT/ARRESTEE/MISSING PERSON DESCRIPTION

ARTY TYPE (2)
- RE-SPONSIBLE
- SU-SPECT
- CI-TATION
- AR-RESTEE
- MI-SSNG PERSN
- FI-ELD INTRVW

RACE (1)
- W-HITE
- B-LACK
- H-ISPANIC/MEX
- C-HINESE
- F-ILIPINO
- I-AMER INDIAN
- J-APANESE
- M-ID EASTERN/ NORTH AFRICAN
- P-ACIFIC ISL/ ASIAN
- O-ALL OTHERS
- U-KNOWN

SEX (1)
- M-ALE
- F-EMALE
- U-KNOWN

EYE COLOR (2)
- BLK-BLACK
- BLU-E
- BRO-WN
- GRY-GRAY
- GRN-GREEN
- HAZ-EL
- UNK-NOWN

GLASSES (2)
- PRE-SCRIPTN
- PLA-STC FRAME
- WIR-E FRAMES
- SNO-GLASSES
- SUN-GLASSES
- UNK-NOWN
- NON-E

HAIR COLOR (2)
- AUB-URN
- BLN-BLOND
- RED
- WHI-TE
- OTH-ER

HAIR LENGTH (1)
- SHT-SHORT
- SHO-ULDR LGTH
- LONG

HAIR STYLE (4)
- AFR-O
- BUS-HY
- CRE-W CUT
- GRE-ASY
- MIL-ITARY
- PRO-CESSED
- SID-E PART

HAIR TYPE (2)
- BAL-D
- REC-EDING
- THK-THICK
- MED-IUM

FACIAL HAIR TYPE (2)
- CLE-AN SHAVN
- UNS-HAVEN
- FUL-L BEARD
- MUT-TN CHOPS
- FUM-MANCHU

FACIAL HAIR COLOR (2)
- AUB-URN
- BLK-BLACK
- BRO-BROWN
- SDY-SANDY
- WHI-WHITE

MAJOR HAND (1)
- B-OTH
- R-IGHT

TEETH (2)
- BRAC-ES
- GOOD
- CHIP-PED
- IRRE-GULAR
- DECA-YED
- MISS-ING
- GOLD

BUILD (2)
- LAR-GE
- MED-IUM
- SMA-LL
- THN-THIN
- UNK-NOWN

APPEARANCE (2)
- CAS-UAL
- FLA-SHY
- CON-SRV
- DIS-TY
- DIS-GUIS
- PRO-PER
- WEL-L G
- DEMEANOR (2)
- VIOL-ENT
- CALM
- NERV-OU
- POLI-TE
- ANGR-Y
- STUP-ER
- UNKN-OW

SPEECH (2)
- ACCE-NT
- SLUR-RE
- USP
- TALK-ATI
- STUT-TE
- SLOW

21. MISSING PERSON/RUNAWAY

- FIN-ANCIAL WORRY
- POO-R HEALTH

REASON FOR LEAVING (2)
- UNDER AGE MARRIAGE
- FAM-ILY TROUBLE

- DRU-GS/ALCOHOL
- UNK-NOWN

CLET'S NOTIFIED JUV UNDER
- YES
- NO

I HEREBY ARREST THE ABOVE DEFENDANT(S) ON THE CHARGE(S) INDICATED AND REQUEST A PEACE OFFICER TO TAKE HIM INTO CUSTODY. I WILL APPEAR AS DIRECTED AND SIGN A COMPLAINT AGAINST THE PERSON(S) I HAVE ARRESTED.

40

22. CITIZEN'S SIGNATURE _____ CITIZEN'S SEQ# _____ ARR. SEQ# ___ ___ ___

STATUS CODES

BKD-BOOKED
CIT-E & RLS

COM-PLAINT
COM-MS & RLS

DIV-CITE TO DIVERT

INF-ORMATION & BELIEF

FIR-FIELD INTERVIEW REQUESTED

STANISLAUS COUNTY SHERIFF'S OFFICE

CRIME/INCIDENT REPORT

Figure 1A

CJIS

1. PAGE _____ OF _____

2. INCIDENT NO. _____

☐ FOLLOW-UP

3. REPORT TYPE ☐ CR-IME ☐ IN-CIDENT ☐ TH-EFT ☐ AD-DITIONAL PATROL ☐ SU-SPICIOUS CIRCUMSTANC
☐ AL-ARM ☐ WA-RRANT SERVICE ☐ OT-HER (LIST)

4. SPECIAL CATEGORY ☐ DO-MESTIC VIOLENCE ☐ RE-STRAINING ORDER ☐ LA-NDLORD/TENANT ☐ CH-ILD CUSTODY

5. REPORT DATE	6. REPORT TIME	7. OFFENSE

8. LOCATION OF OCCURRENCE - ADDRESS CITY ST ZIP

9. DATE OCCR	TIME OCCR	10. END DATE OCCUR	END TIME OCCUR	11. NO. OF SUSPECTS	12. ID NOTIFIED ☐ YES ☐ NO	13. RECOMMEND INVESTIGATION ☐ YES ☐ NO	14. ☐ CO-MPLAINT/REFERRAL ☐ VI-CTIM OF VIOLENT C.. ☐ DO-MESTIC VIOLENCE C.

15. NARRATIVE DICTATED ☐ YES (WRITE SYNOPSIS BELOW) ☐ NO (WRITE NARRATIVE BELOW) CROSS REF #

16. SEQ#	17. NAME-LAST	FIRST	MIDDLE	18. AKA-LAST	FIRST	MIDDLE

19 OCCUPATION	20. SEX	21. AGE	22. DOB	23. RELATES TO SEQ#/RELATIONSHIP CODE

24 AD TYPE	ADDRESS	CITY	ST	ZIP	25. TELEPHONE
AD TYPE	ADDRESS	CITY	ST	ZIP	TELEPHONE

16 SEQ#	17. NAME-LAST	FIRST	MIDDLE	18. AKA-LAST	FIRST	MIDDLE

19 OCCUPATION	20. SEX	21. AGE	22. DOB	23. RELATES TO SEQ#/RELATIONSHIP CODE

24 AD TYPE	ADDRESS	CITY	ST	ZIP	25. TELEPHONE
AD TYPE	ADDRESS	CITY	ST	ZIP	TELEPHONE

16 SEQ#	17. NAME-LAST	FIRST	MIDDLE	18. AKA-LAST	FIRST	MIDDLE

19 OCCUPATION	20. SEX	21. AGE	22. DOB	23. RELATES TO SEQ#/RELATIONSHIP CODE

24 AD TYPE	ADDRESS	CITY	ST	ZIP	25. TELEPHONE
AD TYPE	ADDRESS	CITY	ST	ZIP	TELEPHONE

26. [redacted]

1 2 3 PARTY TYPE (3)

- ☐ ☐ ☐ VI-CTIM
- ☐ ☐ ☐ [redacted]
- ☐ ☐ ☐ PA-RENT
- ☐ ☐ ☐ [redacted]
- ☐ ☐ ☐ ST-EP PARENT
- ☐ ☐ ☐ [redacted]
- ☐ ☐ ☐ MD-MEDICAL
- ☐ ☐ ☐ [redacted]
- ☐ ☐ ☐ ME-NTIONED

1 2 3

- ☐ ☐ ☐ RP-REPORTING PARTY
- [redacted]
- ☐ ☐ ☐ AC-ARRESTING CITIZEN
- [redacted]
- ☐ ☐ ☐ RO-REGISTERED OWNER
- [redacted]
- ☐ ☐ ☐ GA-RAGE
- [redacted]

1 2 3 RACE (1)

- ☐ ☐ ☐ W-HITE
- [redacted]
- ☐ ☐ ☐ H-ISPANIC/MEX
- [redacted]
- ☐ ☐ ☐ F-ILIPINO
- [redacted]
- ☐ ☐ ☐ J-APANESE
- [redacted]
- ☐ ☐ ☐ P-ACIFIC ISL/ASIAN
- [redacted]
- ☐ ☐ ☐ U-KNOWN

1 2 3 VICTIM'S INJURIES (1)

- ☐ ☐ ☐ MI-NOR
- [redacted]
- ☐ ☐ ☐ MA-JOR
- [redacted]
- ☐ ☐ ☐ UN-KNOWN

RELATIONSHIP

BU-SINESS CONTACT
[redacted]
EX-SPOUSE
[redacted]
CO-HABITANT
[redacted]
GI-RLFRIEND
[redacted]
RO-OMMATE
[redacted]
CL-COMMON LAW

27. L E OFFICER

L E TYPE OFFICER ID	OFFICER NAME
REP	

ROUTE CC TO:

☐ PATROL _____ ☐ DETECTIVES _____ ☐ OTHE _____
☐ CR ANALYSIS _____ ☐ ADMIN _____

CODES

ADDRESS TYPE

OTH-ER ADDRESS
SCH-HOME RESIDENCE WHILE ATTENDING SCHOOL
VEH-ICLE LOCATION
RES-IDENCE ADDRESS
VAC-ATION RESIDENCE ADDRESS
WOR-K/BUSINESS ADDRESS

2020

Figure 2

STANISLAUS COUNTY SHERIFF'S OFFICE

MODUS OPERANDI DETAIL

1. INCIDENT INVOLVES (1)

B C S

- ☐ H-OMICIDE
- ☐ [redacted]
- ☐ S-ATTEMPT RAPE
- ☐ [redacted]
- ☐ A-SSAULT
- ☐ [redacted]
- ☐ P-ARSON
- ☐ [redacted]
- ☐ M-OTOR VEH THEFT
- ☐ [redacted]

— CRIME TYPE MODIFIER —

HOMICIDE (1)
- ☐ MU-RDER
- [redacted]

BURGLARY TYPE (1)
- ☐ FO-RCED
- [redacted]
- ☐ AT-TEMPT FORCE

THEFT TYPE (1)
- ☐ PP-PICK POCKET
- ☐ [redacted]
- ☐ SH-OPLIFT
- ☐ [redacted]
- ☐ MP-PARTS FROM A MOTOR VEHICLE
- ☐ [redacted]
- ☐ BI—CYCLE
- ☐ [redacted]
- ☐ AO-ALL OTHERS

PHYS FORCE USED AGAINST ANOTHER (1)
- ☐ FI-REARM
- ☐ [redacted]
- ☐ OW-OTHER DANG WEAPON
- ☐ [redacted]
- ☐ SI-MPLE ASSAULT

GENERAL TIME (1)
- ☐ [redacted]
- [redacted]
- ☐ U-NKNOWN

OCCUPANCY (1)
- ☐ OC-CUPIED
- [redacted]
- ☐ VA-CANT
- [redacted]

NUMBER OF [illegible] OF PRIMARY [illegible]

UNDER 18 YEARS ___

OVER 18 YEARS ___

2. LOCATION TYPE (5*)

• SINGLE FAMILY
- ☐ [redacted]
- ☐ DUPL-EX
- ☐ [redacted]
- ☐ MOBI-LE
- ☐ [redacted]

• MULTIPLE FAMILY
- ☐ APAR-TMENT
- ☐ HOTEL/MOTEL
- ☐ DORM-ITORY
- ☐ [redacted]

• STORAGE
- ☐ WARE-HOUSE
- ☐ [redacted]
- ☐ BARN-

• COMMERCIAL
- ☐ CONV-ENIENCE STORE
- ☐ [redacted]
- ☐ BAR-/LIQUOR STORE
- ☐ [redacted]
- ☐ AUTO-/GAS SERVICE
- ☐ [redacted]
- ☐ FINA-NCIAL INSTIT.
- ☐ [redacted]
- ☐ CHAI-N STORE
- ☐ [redacted]
- ☐ DRUG-/MEDICAL
- ☐ [redacted]

• COMMUNITY/PUBLIC
- ☐ CHUR-CH
- ☐ [redacted]
- ☐ RECR-EATIONAL
- ☐ [redacted]
- ☐ SCHO-OL
- ☐ CUST-ODIAL FACILITIES
- ☐ GOVE-RNMENT BUILDING

• MOTOR VEHICLE
- ☐ CARS-AUTO
- ☐ TRUC-K
- ☐ BUS-
- ☐ [redacted]
- ☐ MOTO-RCYCLE

• MOBILE PROPERTY
- ☐ TRAI-LER
- ☐ [redacted]
- ☐ AIRP-LANE
- ☐ BOAT-
- ☐ CAMP-ER

• OPEN AREA
- ☐ CROP-S
- ☐ [redacted]
- ☐ HIGH-WAY
- ☐ [redacted]
- ☐ ALLE-Y
- ☐ [redacted]
- ☐ CYAR-COMMERCIAL YARD
- ☐ [redacted]

• OTHER STRUCTURES
- ☐ OUTB-UILDINGS
- ☐ [redacted]
- ☐ SIGN-S
- ☐ [redacted]

SURROUNDING AREA (1)
- ☐ RESID-ENTIAL
- ☐ [redacted]
- ☐ RURAN-RURL RNCH/FARM
- ☐ [redacted]
- ☐ BUSIN-ESS/COMMERCIAL
- ☐ [redacted]
- ☐ RECRE-ATIONAL
- ☐ [redacted]

ECONOMIC AREA (1)
- ☐ U-PPER CLASS
- ☐ [redacted]
- ☐ L-OWER CLASS

3. ENTRY AND PROWL

BUILDING MATERIAL (2)
- ☐ WO-OD
- ☐ [redacted]
- ☐ ST-ONE
- ☐ [redacted]
- ☐ SU-STUCCO
- ☐ [redacted]
- ☐ OT-HER

STORIES/LEVELS (1)
- ☐ SI-NGLE STORY
- ☐ [redacted]

LIGHTING CONDITIONS (1)
- ☐ DAY-LIGHT
- ☐ WEL-L LIT
- ☐ POO-RLY LIT
- ☐ NOT-LIT
- ☐ MOO-NLIGHT
- ☐ [redacted]

SECURITY USED (3)
- ☐ AL-ARM
- ☐ [redacted]
- ☐ DO-G
- ☐ [redacted]
- ☐ IN-TERIOR LIGHT
- ☐ [redacted]
- ☐ LO-CKS
- ☐ [redacted]
- ☐ PH-OTO CAMERA
- ☐ [redacted]
- ☐ NO-NE

POINT OF:

ENTRY (1/1)		EXIT
☐	FR-ONT	☐
☐	[redacted]	☐
☐	SI-DE	☐
☐	[redacted]	☐

LEVEL OF:

ENTRY (1/1)		EXIT
☐	[redacted]	☐
☐	UP-PER LEVEL	☐
☐	[redacted]	☐
☐	BA-SEMENT	☐
☐	[redacted]	☐
☐	UN-KNOWN	☐

LOCATION OF:

ENTRY (1/1)		EXIT
☐	[redacted]	☐
☐	WI-NDOW	☐
☐	[redacted]	☐
☐	DU-CT/VENT	☐
☐	[redacted]	☐
☐	WA-LL	☐
☐	[redacted]	☐
☐	NO-OD	☐
☐	[redacted]	☐
☐	UN-KNOWN	☐

DEVICE USED FOR ENTRY (3)
- ☐ KEY-
- ☐ [redacted]
- ☐ SAW-
- ☐ [redacted]
- ☐ BUR-N
- ☐ [redacted]
- ☐ TOR-QUE INSTRUMENT
- ☐ [redacted]
- ☐ BOL-T CUTTER
- ☐ [redacted]
- ☐ SMA-SHING INSTRUMENT
- ☐ [redacted]
- ☐ WIR-E
- ☐ [redacted]
- ☐ OPE-N
- ☐ [redacted]
- ☐ SLI-P LOCK
- ☐ [redacted]

TYPE OF LOCK DEFEATED (1)
- ☐ CH-AIN
- ☐ [redacted]
- ☐ DE-ADBOLT
- ☐ [redacted]
- ☐ SP-RINGLATCH
- ☐ [redacted]

RESIDENCE PROWL (2)
- [redacted]
- ☐ BAS-EMENT
- ☐ [redacted]
- ☐ BED-ROOM
- ☐ [redacted]
- ☐ KIT-CHEN
- ☐ [redacted]
- ☐ GAR-AGE/CARPORT
- ☐ [redacted]
- ☐ STO-RAGE
- ☐ [redacted]
- ☐ OCC-UPANTS

COMMERCIAL PROWL (2)
- ☐ [redacted]
- ☐ SAF-E BOX
- ☐ [redacted]
- ☐ DIS-PLAY ITEMS
- ☐ [redacted]
- ☐ OWN-ER
- ☐ [redacted]
- ☐ MAN-AGER
- ☐ [redacted]
- ☐ WOR-K AREA
- ☐ [redacted]
- ☐ OTH-ER

4. MOTIVE (2)
- ☐ EUP-HORIA
- ☐ [redacted]
- ☐ PER-SONAL GAIN
- ☐ [redacted]
- ☐ SEL-F SATISFACTION
- ☐ [redacted]
- ☐ RIT-UALISTIC
- ☐ [redacted]
- ☐ CON-CEAL OTHER CRIME
- ☐ [redacted]
- ☐ ANG-ER
- ☐ [redacted]

5. LOCATION/ACTIONS

VICTIM'S LOCATION (1)
- ☐ [redacted]
- [redacted]
- ☐ VAC-ATION
- ☐ [redacted]
- ☐ [redacted]
- ☐ [redacted]

VICTIM'S ACTIONS BEFORE OFFENSE (1)
- ☐ EAT-ING
- ☐ [redacted]
- ☐ SLE-EPING
- ☐ [redacted]
- ☐ CLO-SING/OPENING
- ☐ [redacted]
- ☐ HIT-CHHIKING
- ☐ [redacted]
- ☐ WAI-TING ON CUSTOMER
- ☐ [redacted]
- ☐ OTH-ER
- ☐ [redacted]

6. SUSPECT ACTIONS

PRIOR TO COMMITTING OFFENSE (4)
- ☐ [redacted]
- ☐ AFRO-APPROACHED FROM FRONT
- ☐ [redacted]
- ☐ AVEH-APPROACHED W/VEHICLE
- ☐ [redacted]
- ☐ FVEH-FOLLOWED VICTIM IN VEH
- ☐ [redacted]
- ☐ PRET-ENDED CAR TROUBLE
- ☐ [redacted]
- ☐ SPRU-NG FROM CONCEALMENT
- ☐ [redacted]
- ☐ ANSW-ERED AD
- ☐ [redacted]
- ☐ MVIC-MET VICTIM AT BAR/PARTY
- ☐ [redacted]
- ☐ SLE-IGHT OF HAND
- ☐ [redacted]
- ☐ USED-DRUG/ALCOHOL
- ☐ [redacted]
- ☐ ODRU-OFFERED DRUGS
- ☐ [redacted]
- ☐ ORID-OFFERED RIDE
- ☐ [redacted]
- ☐ OTHE-R SIGNIFICANT ACT

IMPERSONATED (3)
- ☐ CU-STOMER
- [redacted]
- ☐ SE-RVICEMAN
- [redacted]
- ☐ PO-LICE
- [redacted]
- ☐ UT—ILITY REP
- [redacted]
- ☐ SU-RVEY TAKER
- [redacted]
- ☐ FR-IEND
- [redacted]
- ☐ RE-NTER
- [redacted]
- ☐ GO-VERNMENT REP

ON PREMISES (4)
- ☐ VAN-DALIZED
- [redacted]
- ☐ [redacted]
- [redacted]
- ☐ ATE-
- [redacted]
- ☐ BAL-DRANK ALCOHOL
- ☐ [redacted]
- ☐ MAS-TURBATED
- ☐ [redacted]
- ☐ [redacted]
- ☐ [redacted]
- ☐ [redacted]
- [redacted]
- ☐ PRE-PARED PROPERTY
- [redacted]
- ☐ ULO-USED LOOKOUT
- ☐ UVT-USED V'S TOOLS
- [redacted]
- ☐ [redacted]
- [redacted]
- ☐ ALA-DISABLED ALARM
- ☐ [redacted]
- ☐ COV-ERED HANDS
- ☐ [redacted]
- ☐ SET-FIRE
- ☐ [redacted]
- ☐ LMA-LEFT MATCHES
- ☐ [redacted]
- ☐ UAC—USED ACCELERANT
- ☐ [redacted]
- ☐ UND-ER FENCE
- [redacted]

WITH VICTIM (4)
- ☐ SUR-PRISED VICTIM
- [redacted]
- ☐ CHO-KED VICTIM
- ☐ [redacted]
- ☐ CUT-VICTIM
- ☐ [redacted]
- ☐ SHO-T VICTIM
- ☐ [redacted]
- ☐ [redacted]
- ☐ [redacted]
- ☐ COV-ERED V'S FACE
- ☐ [redacted]
- ☐ TOO-K HOSTAGE
- ☐ [redacted]
- ☐ [redacted]
- ☐ [redacted]
- ☐ USN-USED SOME NAME
- [redacted]
- ☐ [redacted]
- ☐ [redacted]
- ☐ [redacted]
- [redacted]
- ☐ [redacted]
- [redacted]
- ☐ [redacted]
- [redacted]
- ☐ [redacted]
- [redacted]
- ☐ WWB-WEAPON CONCEAL WAISTBAND
- [redacted]
- ☐ WB-WEAP. CARRIED IN BAG
- [redacted]
- ☐ WPC-WEAPON CARRIED IN POCKET
- [redacted]

WITH SEXUAL ASSAULT VICTIM (7)
- ☐ [redacted]
- ☐ DISR-SUSPECT DISROBED
- [redacted]
- ☐ [redacted]
- [redacted]
- ☐ [redacted]
- [redacted]
- ☐ LICK-SUSPECT LICKED VICTIM
- [redacted]
- ☐ MAST-V. FORCED TO MASTURBATE SUSP
- [redacted]
- ☐ [redacted]
- [redacted]
- ☐ LUBR-SUSPECT USED LUBRICANT
- [redacted]
- ☐ URIN-SUSPECT URINATED ON VICTIM
- ☐ LATE-SUSPECT ORALLY COPULATED VICTIM
- [redacted]
- ☐ [redacted]
- [redacted]
- ☐ [redacted]
- [redacted]
- ☐ FAEJ-SUSP FORCED VICTIM TO WASH
- ☐ [redacted]
- ☐ OAVI-SUSP EJACULATED ON VICTIM
- [redacted]
- ☐ HOMO-SUSP PERFORMED HOMOSEXUAL ACT

STANISLAUS COUNTY SHERIFF'S OFFICE
WEAPON AND VEHICLE DETAIL

Figure 2A

WEAPON INFORMATION

CALIBER 1 2 3 4 5 ____ ____ ____ ____ ____

FIREARM TYPE (1) 1 2 3 4 5
- RIF-LE
- PIS-TOL
- SHO-TGUN

ACTION TYPE (1)
- AUT-OMATIC
- BLA-CK POWDER
- BOL-T
- LEV-ER
- PUM-P
- REV-OLVER
- SEM-I AUTO
- SIN-GLE SHOT
- UNK-NOWN

BARREL TYPE (1) 1 2 3 4 5
- DOU-BLE
- MUL-TIPLE
- OVE-R UNDER
- SID-E BY SIDE
- SIN-GLE
- UNK-NOWN

BARREL LENGTH (1)
- 2 IN-CH
- 3 IN-CH
- 4 IN-CH
- 5 IN-CH
- 6 IN-CH
- LON-G
- MED-IUM
- SAW-ED OFF
- SHO-RT
- UNK-NOWN

OTHER WEAPON TYPE (2) 1 2 3 4 5
- BLU-NT INSTRUMENT
- CLU-B
- CLE-AVER
- CUT-TING INSTRUMENT
- DIR-K/DAGGER
- FOL-DING KNIFE
- HUN-TING KNIFE
- KIT-CHEN KNIFE
- MIL-ITARY KNIFE
- MAC-HETE
- SWI-TCH BLADE
- HAT-CHET/AXE
- EXP-LOSIVE
- LIQ-UID/GAS
- MAR-TIAL ART WPNS
- THR-OWN OBJECT
- OTH-ER
- UNK-NOWN

WEAPON FINISH (2) 1 2 3 4 5
- BAR-E METAL
- BLU-E
- CHR-OME
- PLA-STIC
- RUS-TED
- STA-INLESS
- WOO-D
- OTH-ER
- UNK-NOWN

GRIP FINISH (2)
- BON-E
- IVO-RY
- MET-AL
- PLA-STIC
- TAP-E
- WOO-D
- OTH-ER
- UNK-NOWN

VEHICLE INFORMATION

P COLOR ☐ 1 ____ ☐ 2 ____ ☐ 3 ____ ☐ 4 ____ ☐ 5 ____
S COLOR ☐ ____ ☐ ____ ☐ ____ ☐ ____ ☐ ____

I COLOR — ☐ 1 ____ ☐ 2 ____ ☐ 3 ____ ☐ 4 ____ ☐ 5
INDICATE SHADE IN BOX (SEE CODES BELOW)

BODY STYLE (2)
- TWO-DOOR SEDAN
- FOU-R DOOR SEDAN
- CON-VERTIBLE
- STA-TION WAGON
- SPO-RTS CAR
- PIC-K UP
- TRU-CK
- SEM-I
- VAN-
- MOT-ORHOME
- ALL-TERRAIN VEHICL
- DIR-T MOTORCYCLE
- STR-EET MOTORCYCLE
- CUS-TOM MOTORCYCLE
- MOP-ED
- SCO-OTER
- UNK-NOWN

WHEELS (3)
- MAG-
- SPO-KE
- WIR-E
- DIS-H
- CHR-OME
- NO H-UB CAPS
- UNK-NOWN

WINDOWS (3)
- CUS-TOM
- TIN-TED
- LOU-VERED
- CUR-TAINS
- SUN-ROOF
- BRO-KEN
- UNK-NOWN

ENGINE (2)
- MOD-IFIED
- STO-CK
- LOU-D PIPES
- WOR-N EXHAUST
- UNK-NOWN

DECALS (3)
- WIN-DOWS
- BUM-PER
- BOD-Y
- REA-R WINDOW
- UNK-NOWN

LEVEL ALTERED (1)
- FRO-NT
- REA-R
- SID-E
- WHO-LE
- UNK-NOWN

ACCESSORIES (5)
- SPO-TLIGHTS
- WID-E MIRRORS
- ANT-ENNAS
- HOO-D SCOOP
- REA-R AIR SPOIL.
- FRO-NT AIR DAM
- FLA-RES
- FOU-R WHEEL LOCK
- UNK-NOWN

PAINT (3)
- DES-IGN
- STR-IPES
- PIC-TURE
- PRI-MER
- UNK-NOWN

I HEREBY CERTIFY THAT TO THE BEST OF MY KNOWLEDGE THE INFORMATION GIVEN IN THIS REPORT IS TRUE AND ACCURATE.

DOORS LOCKED ☐ YES ☐ NO
AUTO PAYMENTS CURRENT ☐ YES ☐
INSURED ☐ YES ☐ NO

VICTIM SEQ# SIGNATURE

4. IMPOUNDED/STORED/RECOVERED VEHICLE INFORMATION

VIN CHECK ☐ YES ☐ NO
VIN ALTERED ☐ YES ☐ NO

GENERAL VEHICLE CONDITION 1 2 3 4 5
- DRI-VE
- WRE-C.
- STR-
- BU-

SPEEDOMETER 1 ____ 2 ____ 3 ____ 4 ____ 5 ____

DETAIL VEHICLE CONDITION (INDICATE CONDITION OF PART, SEE CONDITION CODES BELOW)

	1 2 3 4 5		1 2 3 4 5		1 2 3 4 5		1 2 3 4 5
BODY		LR TIRE		TRANS		STERO/TAPE	
F BUMPER		RR TIRE		BATTERY		SPEAKERS	
R BUMPER		SPOTLIGHTS		F SEAT		CLOCK	
GRILL		FOGLIGHTS		R SEAT		CIG LIGHTR	
WHEEL/HUB		MIRRORS		AIR COND		KEYS	
LF TIRE		WIPERS		HEATER		REGISTRATN	
RF TIRE		MOTOR		RADIO			

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GARAGE AGENT X ____ GARAGE AGENT'S SEQ# ____ VEH LOC ____

CODES

COLOR
BGE-BEIGE BUR-GUNDY BLU-E GRY-GRAY ORG-ORANGE PIN-K WHI-TE BLP-BLCK PRIMR RDP-RED PRIMR
BLK-BLACK BRO-WN GOL-D GRN-GREEN PUR-PLE RED- YEL-LOW GRP-GRAY PRIMR UNK-NOWN

SHADE
D-ARK F-ADED L-IGHT

CONDITION
G-OOD P-OOR F-AIR M-ISSING

SCANTRON FORM – CHINO POLICE DEPARTMENT

M.O. IDENTIFIERS NAME/OFFICER I.D. _____ CRIME _____ CASE NO. _____ Pg. _____ of _____

PLACE ATTK
0 _____
8 Ft/Bk Yard
1 Park
2 Parking Lot
3 School
4 Shopping Cntr
5 St Alley
6 Struc
7 Vac lot

SURR AREA
0 _____
1 Business
2 Farm
3 Industrial
4 Open Area
7 Park
8 Prison
5 Residential
6 School

STRUCTURE Commercial
0 _____
1 Apince/Frn
2 Auto Parts
3 Bank
4 Bar
5 Bike
6 Book Str
7 Car Sales
8 Camera Str
9 Cleaners
10 Clothg Str
11 Coin Lndry
12 Const
13 Conv Str
14 Computr Str
15 Dept Str
16 Drv-in Str
17 Drug Str
18 Elctrnc Str
19 Fast Foods
20 Fnce Cr Un
21 Florist
22 Gas/Garage
23 Gun/Sp Gds
24 Hardware
25 Hotel/Motel
26 Jewelry Str
27 Liquor Str
28 Med Clinic
29 Mfg Firm
30 Mom & Pop
31 Office Bldg
32 Pawn Shop
33 Phone Booth
34 Photo
35 Restaurant
36 Shoe Str
37 Storage
38 Supermarket
39 Thtr Entmnt
40 Travel
41 TV/Radio
42 Video Str
43 Warehouse

Residence
51 _____
52 Apt
53 Condo
54 Duplex
55 Garage
56 House
57 Mobile Home

Public
61 _____
62 Church
63 Hospital
64 Park
65 Parking Lot
66 Public Bldg

Vehicle
81 _____
82 Aircrft
83 Boat
84 Camper
85 Mtr Home
86 Passenger
87 Pick-Up
88 RR/Car
89 Trailer
90 Truck
91 Van

TARGETS
0 _____
1 Attic
2 Backroom
3 Basement
4 Bathroom
5 Bedroom
6 Cash Reg
7 Countr Area
8 Den/Fmly Room
9 Dining Room
10 Display
11 Fenced Area
12 Garage
13 Kitchen
14 Living Room
15 Person
16 Saf/Strg Bx
17 Str Shed
18 Storage Room

Vehicle
31 _____
32 Console
33 Eng Cmptmt
34 Glove Bx
35 Trunk
36 Truck Bed

Property
40 _____
41 Auto Parts
42 Bike
43 Cash/Notes
44 Clths/Fur
45 Coins
46 Coll/Stmps
47 Coll/(Oth)
48 Consum Gds
49 Const Mat
50 Firearms
51 Hshld Gds
52 Jwlry/Mtls
53 Livestock
54 Ofc Equip
56 Purse
55 TV/Rdo/Cam
57 Tool

Victim
61 0-13 yr
62 14-17 yr
63 18-24 yr
64 25-54 yr
65 55+ yr

ENTRY/EXIT
0 0 _____
1 1 Unknown
2 2 Adj Bldg
3 3 Basement
4 4 Door
5 5 Duct/Vent
6 6 Floor
7 7 Front
8 8 Garage
9 9 Ground Lvl
10 10 Rear
11 11 Roof
12 12 Side
13 13 Sldng Dr/Wndw
14 14 Uppr Lvl
15 15 Wall
16 16 Window

Vehicle
30 30 _____
31 31 Drvr Dr
32 32 Drvr Wndw
33 33 L/R Dr
34 34 L R Wndw
35 35 L Wng Wndw
36 36 Pass Dr
37 37 Pass Wndw
38 38 R R Dr
39 39 R/R Wndw
40 40 R/Wng Wndw
41 41 Rear Door
42 42 Rear Wndw
43 43 Sun Roof
44 44 Trunk
45 45 Windshield

MOE
0 _____
1 Unknown
2 Attempt
3 Body Force
4 Bolt Cut
5 Brick/Rock
6 Chnnl Lock
7 Ct Hngr Wre
8 Explosives
9 Hid in Bldg
10 Ky/Slip/Shm
11 No Force
12 Punch
13 Remove Lvrs
14 Sw/Drll/Brn
20 Scrw Drvr
15 Tire Iron
16 Tnnl Thru
17 Pry Bar
18 Vice Grip
19 Wndw Smash

Vehicle
31 _____
32 Unknown
33 Dr/Lock Forcd
34 Pass Door
35 Slip Lock
36 Trnk Forced
37 Unlocked
38 Wndw Broken
39 Wndw Forced
40 Wndw Open

0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9

SECURITY SYSTEM
0 _____
1 Audible Alarm
2 Auxiliary Locks
3 Dog
4 Gar Dr Locked
5 Inside Light On
6 Obscured Int View
7 Outside Light On
8 Private Sec Ptrl
9 Security Signs
10 Silent Alarm
11 Standard Locks
12 Wndw Bars/Grills

SUSP/ACTION
0 _____
1 Alarm Dsabld
2 Arson
3 Ate/Drnk on Prem
4 Bound Gag/V
18 Been Drinkng
5 Cased Loc
6 Cat Burglar
62 Conducting Srvy
63 Cust/Client
7 Covered V Face
9 Defec/Urinated
10 Demanded Money
64 Delivery Person
66 Drunk
8 Dsabld Phone
65 Dsabld Motorist
11 Disrobed V Fully
12 Disrobed V Partly
67 Employee Employer
13 Exposed Self
14 Fired Weapon
16 Frcd V Fondle S
17 Frcd V Move
15 Frcd V in Veh
68 Friend/Relative
20 Inflict Injury
21 Insert Fngr/Vagina
69 Ill/Injured
22 Knew Loc/Cash
23 Made Threats
19 Multi Susps
24 Made V Vulgar La
25 Masturbated Self
70 Needed Phone
26 Photographed/V
27 Put Prop/Pcket/B
28 Put Prop/Pillowc
71 Police/Fireman
29 Prepared Exit
30 Ransack
31 Rape by Instrume
72 Renter
73 Repairman
32 Rip/Cut Clothes
74 Sale/Illct Gds
75 Salesperson
33 Searched/V
77 Seek Assist
78 Seek Person
34 Selective Loot
35 Shut Pwr Off
36 Smoked/Premis
37 Sodomy
79 Solict Funds
38 Struck Vic
39 Sggst Lewd Act
40 S/Armed
41 S/Climaxed
42 S/Fondled/V
43 S/Erecti
44 S/Leave
45 S/Orl Copulat/
46 Took Concealb
47 Took V/Veh
48 Tortured/V
49 Und Influ/Drgs
50 Unk If Climaxed
51 Unusual Odors
52 Used Demnd N
53 Used Driver
54 Used Lookout
55 Used Match/Cr
56 Used V/Name
57 Used V Suitcas
58 Used V Tools
59 Vandalized
60 Veh Remove P
61 V Orl Copulat

PRELIMINARY INVESTIGATION
AREA CHECKED : STATEMENT TAKEN : DUSTED FOR PRINTS
DIAGRAM OF SCENE : VICTIM(S) CONTACTED : TIRE/SHOE TRACKS
NEIGHBORS CONTACTED : WITNESSES CONTACTED _____

REQUESTED RESPONDED
HELICOPTER
CANINE
SPECIAL UNIT
OTHER _____

SOLVABILITY FACTORS
Y N 1 WAS THERE A WITNESS TO THE CRIME?
Y N 2 WAS A SUSPECT ARRESTED?
Y N 3 IS A SUSPECT NAMED?
Y N 4 CAN A SUSPECT BE LOCATED?
Y N 5 CAN A SUSPECT BE DESCRIBED?
Y N 6 CAN A SUSPECT BE IDENTIFIED?
Y N 7 CAN A SUSPECT VEHICLE BE IDENTIFIED?
Y N 8 IS THE STOLEN PROPERTY IDENTIFIABLE?
Y N 9 IS THERE A SIGNIFICANT M.O.?
Y N 10 IS SIGNIFICANT PHYSICAL EVIDENCE PRESENT?
Y N 11 IS THERE A MAJOR INJURY SEX CRIME INVOLVED?
Y N 12 IS THERE A GOOD POSSIBILITY OF SOLUTION?
Y N 13 IS FURTHER INVESTIGATION NEEDED?
Y N 14 IS CASE GANG RELATED?

NEIGHBORHOOD WATCH
Y N 1 IS MEMBER OF BUSINESS NEIGHBORHOOD WATCH
Y N 2 IS MEMBER OF OPER IDENT
Y N 3 INTERESTED IN NW BW OID
Y N 4 SECURITY CHECKS DESIRED
Y N 5 HAD HOME BUSINESS INSPECT
WHEN INSPECTED? _____

EVIDENCE
19 _____
1 Blood
2 Bul Casing
3 Bul Prjtl
4 Clothing
5 Cntrfd Subs
6 Feces
7 Fngr Prnts
8 Firearms
9 Glass
10 Hair
0 None
11 Paint
12 Paraphnlia
13 Photogr
14 Rape K
15 Semen
16 Tl Markings
17 Tools
18 Urine

VICTIM PROFILE
Relation To Suspect
0 UNKNOWN
1 ACQUAINTANCE
2 BOYFRIEND
3 BROTHER
4 BUSINESS ASSOC.
5 DAUGHTER
6 FATHER
7 FRIEND
8 GIRLFRIEND
9 HUSBAND
10 MOTHER
11 NEIGHBOR
12 OTHER FAMILY
13 SISTER
14 SON
15 STRANGER
16 WIFE
17 OTHER _____

Physical Condition
0 NO IMPAIRMENT
1 BLIND
2 DEAF
3 ELDERLY
4 EMOTIONALLY UPSET
5 HANDICAPPED
6 MENTALLY DIST. RET.
7 MUTE
8 SICK INJURED
9 UNDER INFL DRUGS ALCOHOL

Marital Status
0 UNKNOWN
1 ANNULLED
2 COHABITING
3 COMMON-LAW
4 DIVORCED
7 MARRIED
8 WIDOW(ER)
5 SEPARATED
6 SINGLE

Annual Income
1 0-5K
2 5-10K
3 10-15K
4 15-25K
5 25-35K
6 OVER 35K

Homeowner
Y N

Education
1 BELOW 8 YRS
2 BELOW 12 YRS
3 HIGH SCHOOL
4 2-YRS. COLLEGE
5 4-YRS COLLEGE
6 MORE THAN 4 YRS

SCANTRON FORM NO 30462-CDC

Chino Police Department – Figure 3

SCANTRON FORM – CHINO POLICE DEPARTMENT

Susp Name _____ — SUSPECT/ARREST IDENTIFIERS — Case No. _____

Susp Name _____ Pg. ____ of ____

HAIR LENGTH:
1 2 99) _____
1 2 (3) Collar Length
1 2 (5) Long
1 2 (6) Punk Style
1 2 (7) Shaved
1 2 (2) Short
1 2 (4) Shldr Lngth
1 2 (1) Unknown

TYPE:
1 2 (99) _____
1 2 (7) Bald
1 2 (4) Fine
1 2 (6) Receding
1 2 (2) Thick
1 2 (5) Thinning
1 2 (1) Wig
1 2 (8) Wiry
1 2 (3) Unknown

STYLE:
1 2 (99) _____
1 2 (1) Afro Natural
1 2 (5) Bangs
1 2 (2) Braided
1 2 (3) Bushy
1 2 (4) Butch
1 2 (16) Center Part
1 2 (17) Combed Back
1 2 (18) Curlers
1 2 (5) Curly
1 2 (19) Dirty
1 2 (6) Flat Top
1 2 (7) Greasy
1 2 (21) Layered
1 2 (8) Military
1 2 (9) Mohawk
1 2 (10) Ponytail
1 2 (11) Processed
1 2 (12) Punk
1 2 (20) Side Part
1 2 (13) Straight

STYLE (cont)
1 2 (14) Wavy
1 2 (22) Widows Peak
1 2 (0) Unknown

COMPLEXION:
1 2 (99) _____
1 2 (1) Acne-Pocked
1 2 (2) Albino
1 2 (3) Clear
1 2 (4) Dark
1 2 (5) Freckled
1 2 (6) Light/Fair
1 2 (7) Medium
1 2 (8) Olive
1 2 (9) Pale/Sallow
1 2 (10) Ruddy
1 2 (11) Tanned
1 2 (12) Weathered
1 2 (13) Wrinkled
1 2 (0) Unknown

FACIAL HAIR:
1 2 (99) _____
1 2 (34) Abe Lincoln
1 2 (43) Anchor Beard
1 2 1) Beard
1 2 (35) Beard w/exposed chn
1 2 (20) Bushy Moustache
1 2 2) Clean Shaven
1 2 (18) Confucious
1 2 (28) Desg Beard w/Moust
1 2 (38) Fork Beard
1 2 3) Fu Manchu
1 2 (39) Full Beard
1 2 (44) Full Goatee
1 2 (4) Fuzz
1 2 (5) Goatee
1 2 (25) Handle Bar
1 2 (15) Lge Cheek Sideburns
1 2 (14) Lge Flare Sideburns
1 2 30) Lge Full Beard
1 2 (16) Lge Reverse Flr SB
1 2 31) Lge Ring Beard

FACIAL HAIR (cont)
1 2 (12) Lobe Lgth Sideburns
1 2 (13) Lobe Lgth SB w/Flre
1 2 (21) Long Pointed Moust
1 2 (26) Low Extension
1 2 (7) Moustache
1 2 (36) Mutton Chops
1 2 (33) Old Dutch Beard
1 2 (41) Pointed Goatee
1 2 (23) Pointed w/Part
1 2 (32) Scraggly Beard
1 2 (37) Short Beard
1 2 (22) Short Moustache
1 2 (8) Sideburns
1 2 (29) Small Ring Beard
1 2 (40) Southern Colonel
1 2 (17) Square Moustache
1 2 (27) Thick Moustache
1 2 (24) Thin Moustache
1 2 (42) Three-Point Goatee
1 2 (19) Turkish Moustache
1 2 (9) Unshaven
1 2 (10) Van Dyke
1 2 (0) Unknown

FACE SHAPE:
1 2 (99) _____
1 2 (1) Broad
1 2 (2) High Cheekboned
1 2 (3) Long
1 2 (4) Oval
1 2 (5) Round
1 2 (6) Square
1 2 (7) Thin/Long
1 2 (0) Unknown

GEN APPRNCE:
1 2 (99) _____
1 2 (1) Casual
1 2 (2) Dirty/Unkempt
1 2 (3) Disguised
1 2 (4) Flashy
1 2 (5) Military
1 2 (6) Well-Groomed

BODY SHAPES:
1 2 (99) _____
1 2 (1) Thin
1 2 (2) Medium
1 2 (3) Heavy
1 2 (4) Fat
1 2 (5) Muscular

DISTINGUISHING MARKS:
1 2 (99) _____
1 2 (1) Missing Limb
1 2 (2) Artificial Limb
1 2 (3) Blind
1 2 (4) Cane/Crutch
1 2 (5) Crpld Bdy Prt
1 2 (6) Deaf
1 2 (7) Deformed Limbs
1 2 (8) Growths
1 2 (9) Hearing Aid
1 2 (10) Limp
1 2 (11) Mute
1 2 (12) Skn Discoloratn
1 2 (13) Spastic Mvmnts
1 2 (14) Wheelchair

TEETH:
1 2 (99) _____
1 2 (1) Braces
1 2 (2) Broken
1 2 (3) Chipped
1 2 (4) Crooked
1 2 (5) False
1 2 (6) Gaps Between
1 2 (7) Gold Capped
1 2 (8) Jewld/Studded
1 2 (9) Missing
1 2 (10) Retainer
1 2 (11) Silver Capped
1 2 (12) Stained Decyd
1 2 (0) Unknown

SPEECH:
1 2 99) _____
1 2 (2) Accent Fore
1 2 (1) Accent US
1 2 (9) Deep
1 2 (3) Disguise
1 2 (4) Lisp
1 2 (8) Mute
1 2 (5) Slurred
1 2 (6) Impediment
1 2 (7) Stuttering
1 2 (0) Unknown

WEAPON:
1 2 (99) _____
1 2 (11) Baseball Bat
1 2 (12) Blackjack
1 2 (13) Blowgun
1 2 (14) Bodily Force
1 2 (15) Bomb/Explos
1 2 (16) Bottle
1 2 (17) Brick/Rock
1 2 (18) Club/Bludgeon
1 2 (19) Flashlight
1 2 (2) Handgun
1 2 (8) Knife
1 2 (3) Machine Gun
1 2 (20) Metal Knuckle
1 2 (21) Nunchaku s
1 2 (10) Oth Stb/Cut I
1 2 (7) Oth Unk Gun
1 2 (4) Rifle
1 2 (22) Scissors
1 2 (23) Screwdriver
1 2 (5) Shotgun
1 2 (1) Simulated
1 2 (24) Tear Gas/Che
1 2 (6) Toy Gun
1 2 (9) Toy Knife
1 2 (25) Vehicle
1 2 (0) Unknown

S#	CODE	CLOTHING	TATTOOS/MARKS/SCARS DESC.	L	R	HANDED: L R U
Cap/Hat						
Coat/Jkt			Arm			
Pants			Back Torso			
Shirt			Face			
Shoes			Front Torso			
Mask			Hand			
Glove			Leg			
Jewelry			Neck			
Glasses			Shoulder			

S#	CODE	CLOTHING	TATTOOS/MARKS/SCARS DESC	L	R	HANDED: L R U
Cap/Hat						
Coat/Jkt			Arm			
Pants			Back Torso			
Shirt			Face			
Shoes			Front Torso			
Mask			Hand			
Glove			Leg			
Jewelry			Neck			
Glasses			Shoulder			

WEAPON

GANG NAME: _____ Known: Y N Suspected: Y N

WPN	TYPE		FEATURE		CALIBER		LENGTH
S#							
S#							

NAME (LAST, FIRST, MIDDLE)

AKA | PHONE

RES ADD

DL # | SEX [] M [] F | RACE [] WHI [] NEG [] ORIENT [] MEX [] A IND []

SOCIAL SEC # | DOB

HAIR COLOR [] BRN [] BLN [] GRAY [] WHI [] BLK [] RED [] S P [] ____ | EYE COLOR [] BRN [] BLUE [] HAZEL [] BLK [] GRN [] GRAY

HT | WT | BUILD [] THIN [] MED [] HEAVY [] MUSCULAR [] FAT | STATUS [] DRIVER [] PED [] PAS

CLOTHING

LOCATION OF FI

DATE/TIME | ID # | OFF NAME

NARRATIVE

FIELD INTERVIEW CARD
SCANTRON FORMAT
CHINO POLICE DEPARTMENT
FRONT OF CARD

ASSOCIATE #1 | SEX [] M [] F | RACE | DOB

ASSOCIATE #2 | [] M [] F

GANG AFFILIATION | [] 1 KNOWN [] 2 SUSPECTED

VEH YR | MAKE | MODEL | STYLE | COLOR/COLOR

LIC # | ST | ADD IDENT

RO (NAME & ADDRESS)

SCANTRON FORM NO 30463-COC

HAIR LENGTH
- 3 Collar
- 5 Long
- 6 Punk Style
- 7 Shaved
- 2 Short
- 4 Shldr Length
- 1 Unknown

HAIR TYPE
- 7 Bald
- 4 Fine
- 6 Receding
- 2 Thick
- 5 Thinning
- 1 Unknown
- 8 Wig
- 3 Wiry
- 9 Other

HAIR STYLE
- 1 Afro/Natural
- 2 Braided
- 3 Bushy
- 16 Center Part
- 17 Combed Back
- 5 Curly
- 19 Dirty
- 7 Greasy
- 8 Military
- 9 Mohawk
- 10 Ponytail
- 12 Punk
- 13 Straight
- 14 Wavy
- 20 Side Part
- 0 Unknown

FACIAL HAIR
- 1 Beard
- 2 Clean Shaven
- 3 Fu Manchu
- 4 Fuzz
- 5 Goatee
- 7 Moustache
- 8 Sideburns
- 9 Unshaven
- 0 Unknown

HANDED
- 1 Right
- 2 Left
- U Unknown

VOICE
- 2 Accent
- 4 ...
- 5 ...

COMPLEXION
- 1 Acne/Pocked
- 2 Albino
- 3 Clear
- 4 Dark
- 5 Freckled
- 6 Light/Fair
- 7 Medium
- 8 Olive
- 9 Pale/Sallow
- 10 Ruddy
- 11 Tanned
- 12 Weathered
- 13 Wrinkled
- 0 Unknown

GLASSES
- Corrective
- Sunglasses
- 0 Unknown

FIELD INTERVIEW CARD
SCANTRON FORMAT
CHINO POLICE DEPARTMENT
BACK OF CARD

TATTOO SIDE			PART
L	R	U	1 Arm
L	R	U	2 Back Torso
L	R	U	3 Face
L	R	U	4 Front Torso
L	R	U	5 Hand
L	R	U	6 Head
L	R	U	7 Leg
L	R	U	8 Neck
L	R	U	9 Shoulder

Field Interview Form (Scantron) - Figure 5

information contained on the reports, only that information will be entered into the system.

Forced-choice reports greatly simplify data collection and retrieval. They often contain more descriptive crime and suspect information than narrative reports and their use is highly recommended.

Intradepartmental Impact:

Changes in source documents or report forms invariably impact an agency. It will take time for officers to become familiar with new forms and they may find themselves doing more preliminary investigation work. These factors alone may lead to discontent. To ensure that changes are positively received, we offer the following suggestions:

- Discuss the need for changes with user group members *before* they are implemented. The group should be comprised of representatives from patrol, investigations, records and any other units, bureaus or divisions that will be directly affected by the introduction of new documents. Be sure to include people who are antagonistic to the forms revision process. They will keep you on the straight and narrow. Allow all group members to provide input into the change process.

- Explain the need for contemplated changes and the results expected to result from them. Positive outcomes may be:

    - enhancement of the preliminary investigation process
    - expedient identification of crime patterns
    - development of crime, suspect, vehicle, MO and similar files
    - ability to provide officers and investigators with suspect leads, case matching and case clearance information

- ° ability to provide operations managers with information which can be used to develop directed patrol and tactical action plans.

- Develop written training guides that explain how new documents should be completed.

- Attend briefing or roll call sessions to personally answer questions regarding the documents.

- Meet regularly with supervisors to discuss quality control concerns, additional training needs, acceptance issues, and so on.

Interdepartmental Impact:

Source document and report form revisions will not only impact members of a law enforcement organization, but those of other agencies as well. Advise judges, prosecutors, public defenders, probation officers and other members of the criminal justice community of any document changes which are being planned and give them the opportunity to provide input into the revision process. At the same time, ask members of the judicial system to review new documents to ensure that they meet legal requirements.

Data Quality Issues:

To be useful, information must be:

- timely
- reliable
- accurate
- valid.

Timeliness refers to the time it takes for documents to reach the crime analysis unit. Copies of all crime reports, suspect/arrest reports, FI cards and related documents should be received by the crime analysis unit within 24 hours of their submission by field and investigative personnel. Crime analysts can only produce useful material when provided with fresh information. Unit products describing last week's or last month's incidents are yesterday's news and of little value to patrol and investigative officers. Without the information needed to monitor ongoing criminal activity, the analyst is unable to provide material necessary for the development of directed patrol or tactical

action plans. If this occurs with regularity, operations personnel will eventually view the analyst as unresponsive to their needs and discontinue their patronage of the crime analysis unit.

The necessity for providing the crime analysis unit with timely information should be discussed with patrol, investigative and records bureau managers in the early stages of program development. If necessary, managers should draft new procedures allowing expedient review, approval and internal processing of documents so that they can be submitted to the crime analysis unit within 24 hours.

Reliable documents contain the information needed to establish that an incident did, in fact, occur; explain when, where, how and why it was committed, and describe the person(s) responsible.

Police documents were unstructured in the past, and narrative descriptions of incidents were left to the discretion of individual officers. It was difficult to quickly determine if necessary data elements had been omitted. Document reliability has improved significantly over the years, and highly structured forms incorporating "check-off" boxes to capture information are in wide use.

Accuracy refers to the preciseness of information, and to the extent all information adheres to a standard which is understood by all organization members. People describe events, concepts, and other people in a wide variety of ways. Based on our own experience, we also interpret things differently. Someone who sports a military haircut may consider a person with collar-length hair to have "long hair." To the person with collar-length hair, however, "long hair" may be hair that extends to the middle of the back or beyond. While we all know the age range referred to by the word "teenager," we may not be as certain of the ages of people described as "young," "a child", "a young person," "a youth," "middle age", "elderly" or "old." Someone who is thirty may be considered "old" to a fifteen year old; those of us who have seen 30 come and go may not share this perception. Collecting accurate, standardized, data is important. For the analyst preparing an analysis of residential burglary, knowing that a suspect is hitting "homes" will not be nearly as helpful as knowing that they are one or two story homes, condominiums, apartments, mobile homes, etc.

Many agencies have developed materials to overcome problems of interpretation. Such materials often include figures of the human

body and notations as to what will be considered short, medium-length, and long hair; what part of the body is the shoulder, the upper arm, etc.; how vehicles and articles of clothing are to be described, and so on. Development and use of these types of materials by law enforcement agencies is highly recommended.

Validity refers to the extent that the incident reported is actually the incident that occurred. We concern ourselves with validity because we wish to avoid misclassification of criminal events. In California, for example, someone breaking into a house and stealing a firearm is committing burglary. If that same individual steals a gun left lying on the bench at a public, outdoor shooting range, the crime is theft of a firearm. If tools are taken from an open, unlocked, garage, the crime is classified as a burglary. If the same tools were taken from the back of an open-bed pick-up truck, the crime would be classified as a theft.

It is easy to see how misclassification of crimes against property can occur. But errors can also occur with classifications of crimes against persons. For example, assume a woman is pushing a shopping cart in a market and someone snatches her purse *from the cart.* In California, the crime is grand or petty theft depending upon the value of the purse and its contents. If the woman has the purse *hanging from her shoulder* when it is snatched—and the woman does not try to resist in any way—the crime is grand theft person (felony) *regardless* of the value of the purse and its contents. If the woman offers *any* resistance to the thief, the crime becomes robbery. To complicate matters further, if it can be proven that the suspect entered the market with *intent* to steal a purse, a burglary charge could also be lodged against the suspect.

Validity of information is important for three reasons. First, it allows determination of what crimes are actually occurring. This is useful for planning and budgeting activities. Second, it provides for the appropriate examination of related incidents and provides the analyst with uncorrupted data useful for accurately determining patterns of criminal activity. Third, it can help to distinguish between actual crime and reported crime. For various reasons, many crimes are never reported to the police and police administrators never know *exactly* how much crime is occurring in their jurisdictions. If reported crime represents an accurate sample of actual crime, approximations of total criminal activity can be accurately calculated.

Internal Information Sources:

The following information sources can be found within the organization:

- Offense Reports - Also known as crime reports, these documents substantiate the occurrence of criminal events and provide the basic information necessary for analysis. They will tell you what occurred, when and where it occurred, and provide a general idea of how it occurred. Speculation as to why the crime was committed may also be contained in the offense report. Be cautious in your use of this latter information; reasons given for why a crime was committed are often subjective.

- Arrest Reports - These reports often provide extensive explanation of how crimes were committed, along with descriptions of apprehended suspects. This information is used to create known offender files.

- Field Interview Reports - Completed by field officers to document suspicious, though not necessarily criminal, activity, these reports state the nature of the activity and provide a description of people and vehicle(s) involved. This information can later be used to link people to people, people to vehicles and people to events. Field interview reports can assist in providing suspect leads to investigators. For example, an officer may see an adult loitering around a closed commercial establishment at four o'clock in the morning. Although this is not a criminal event, if the officer notes the occurrence in a field interview report and it is later discovered that the establishment was burglarized, the interview report may assist investigators in locating the possible suspect.

- Sex/Narcotic Registration Forms - People convicted of sex and narcotic violations must register with the police agency in the city in which they live. This information allows you to keep track of convicted sex and narcotic offenders and is also used to build known offender files.

- Traffic Citations - As with field interview reports, traffic citations can be used to link suspects to vehicles they own, register or drive. For various reasons, victims and witnesses are often unable to provide a physical description of a suspect (they did not get a good look at the suspect, the suspect wore a mask, etc.). However, if they are able to get a description of the suspect's vehicle, the analyst can run it through the traffic citation file and often determine the identity of the offender.

- Booking Reports - Completed when a person is booked into a custodial facility, most booking reports provide basic information such as date, time and location of arrest, the offense charged, a complete physical description of the arrestee, and indications as to whether he or she was on parole or probation at the time of arrest, has any medical problems, etc.

- Criminal History Information - Every agency has local criminal history records of its own arrestees. More complete information can be found in Record of Arrest and Prosecution (RAP) sheets usually maintained by state government agencies. These can be requested by mail or accessed by computer. **Note:** Because criminal history information is protected by law, its improper use can be a serious offense. Contact the records bureau supervisor of your agency for information regarding the training you will need to use it correctly.

- Calls for Service/Dispatch Records - Examination of these records allows determination of the nature of calls, response times and peak periods of officer activity. This is useful in preparing manpower and workload distribution studies. It may also provide information to assist you in linking suspects and vehicles to various criminal activities. Finally, you may be able to use calls for service/dispatch records to establish a relationship between tripped alarms, prowler or trespass calls and crime patterns which are currently under investigation.

- Investigations Reports - Investigative reports provide the analyst with more comprehensive knowledge of

criminal events. The follow-up information contained in these reports may extensively describe suspects and their actions and the analyst may be able to better establish their identities or determine their patterns of criminal activity.

- Evidence Reports - Physical evidence gathered at the scene of a crime may also help to identify suspects and/or indicate the methods by which crimes have been committed. Among others, the following are considered to be physical evidence:

    - blood
    - bullets and other projectiles and/or casings
    - clothing
    - controlled substances (narcotics and other drugs)
    - feces
    - fingerprints
    - firearms
    - footprints
    - glass
    - hair
    - paint
    - paraphernalia of various types
    - semen
    - tire markings
    - tools and tool markings (also known as pry marks)
    - urine

° anything else which may reveal the identity of a suspect and/or establish his or her presence at a crime scene.

- Property Reports - These can be used to determine if suspects have particular preferences for the types of items they steal (e.g., concealable items such as money and jewelry; coin or stamp collections; televisions and/or VCRs, etc.). This information can be useful in identifying crime patterns and series. Should a suspect be arrested and found in possession of stolen property, property records may be of help in linking the suspect to unsolved cases in which similar items were stolen. This will aid the case clearance process.

- Victim and Offender Interview Information - Information provided by these sources has the potential to be *extremely* valuable. However, it must be used with caution and *cannot* be considered accurate without supporting corroboration. Experienced police officers will confirm that eyewitnesses are often the worst witnesses; they often do not see or hear what they think they see or hear. Under the stress of a criminal event, witnesses may fail to pay attention to some things and misinterpret others. They often overestimate or underestimate the height and weight of suspects, or fail to notice what they wore. They may also be unable to state the race of the suspect or to describe scars, marks, tattoos or other characteristics unique to the suspect. Descriptions which *are* given may also be in error. Do not summarily discount what victims and witnesses have to say, but be mindful of possible inaccuracies. Make every effort to obtain independent verification of statements.

For obvious reasons, offender information is often unreliable. Statements made by suspects may be distorted in an attempt to mislead investigators, to prevent the discovery of other crimes they have committed, or to deny their participation in a criminal activity. False or misleading statements of offenders will taint and complicate an investigation; admissions, however, can be quite valuable. Admissions that can be substantiated

often result in additional case clearances. On the other hand, verified admissions that establish innocence will eliminate suspects and free officers to continue their search for the actual perpetrator(s).

Do not accept the admissions of suspects until they can be verified; there are many demented souls out there who confess to crimes they didn't commit. Be especially cautious in the evaluation of the information provided by these people.

External Sources of Information:

The following agencies are excellent sources of information:

- Other Law Enforcement Agencies - These agencies will provide want and warrant information, a variety of statistical data and information regarding shared criminals and patterns of criminal activity.

- Parole/Probation Departments - These departments will keep you informed of incarcerations, releases and the terms and conditions which have been imposed on parolees and probationers. Knowing that known offenders are to be released into the community is extremely useful. Their files can be reactivated, officers can be alerted to their pending arrival and the analyst can watch for anything that might indicate the resumption of criminal careers.

- Department of Motor Vehicles - This agency will provide comprehensive information relative to ownership and registration of vehicles and licensing of drivers. It will also provide accident, traffic violation, and court disposition data.

- Federal Bureau of Investigation (FBI) - The FBI maintains the National Crime Information Center (NCIC), a repository that contains information on everything from stolen securities, boats and airliners to fugitives reported by the Canadian government and Interpol. These data may be accessed by computer in most agencies.

- California Department of Justice - The Criminal Justice Information System (CJIS) is automated and contains data similar to those contained in the NCIC system.

- California Bureau of Criminal Statistics (BCS) - Upon request, BCS will provide information on adult and juvenile arrests, dispositions and other court information, and comparative crime statistics. Arrest information can be provided categorically, by sex, age and race of offenders.

- California State Department of Finance - Population and census data for your jurisdiction available from this agency can be useful for trend studies.

- National Institute of Justice (NIJ) - Located in Washington, D.C., NIJ can provide criminal justice research on almost any topic and many of their publications are available without charge. Perusal of NIJ documents will keep you informed of nationwide criminal justice concerns and of research being done to address these concerns.

- Other Federal Agencies - Agencies such as the U.S. Customs Service; Drug Enforcement Administration; U.S. Postal Inspection Service; Immigration and Naturalization Service; Internal Revenue Service; Bureau of Alcohol, Tobacco and Firearms; and the Secret Service can provide you with specialized information. If any of these agencies are located near you, make an appointment to call on their representatives. Explain the nature of your program and attempt to establish a relationship that will promote the exchange of information. If personal visits are not possible, call or write for information.

- Other Local, State and Federal Automated Data Systems Other systems throughout each county, state, and the Federal government provide a wide variety of information. Consult the information systems manager of your agency for a listing of the systems available to you.

DATA COLLATION:

Once data are collected, they must be collated. Defined as the indexing, sorting and storage of raw data, data collation is the next step in the crime analysis process. [9] Raw data, by itself, is seldom of much value. Not until like items can be considered together will the analyst be able to provide meaning to the data. Data collation and analysis accomplishes this objective.

Consider the following scenario. The analyst comes to work on Monday morning and finds an unordered pile of reports on the desk; robbery, burglary, rape and other reports are all mixed. Before the data can be analyzed, they must be collated. The analyst sorts the reports, puts all robbery reports in one pile, burglary reports in another, and so on. This accomplishes the first step in the data collation process. To complete the next step in the collation process, he or she will take all reports of similar incidents and extract data from them.

The File Development Process:

"Extracting data" is a process by which similar data are taken from each crime report and used to develop separate and distinct files (i.e. suspect files, vehicle files, etc.). After initial files have been created, the analyst will add data to them.

Law enforcement documents contain many types of data. Categories considered most useful for crime analysis are those relating to:

- geographic factors
- time factors
- victim descriptors
- property loss descriptors
- physical evidence descriptors
- specific MO factors
- suspect descriptors

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[9] Ibid

- suspect vehicle descriptors.

When stored *by category*, these data ultimately result in the following files:

- Master Case Files - which contain the times, dates, locations, types and case numbers of incidents. These are useful for determining geographic locations of criminal activity and aid in the identification of existing or emerging crime patterns and/or series.

- Master Name Files - which contain the names, nicknames, aliases of suspects, names of victims and witnesses; etc.

- Suspect (Known Offender) Files - which contain the names, addresses and physical descriptions of suspects and listings of the crimes they have committed (see Figure 6). They may also contain a description of the MOs used by suspects.

- Suspect Vehicle Files - which contain information regarding vehicles suspects may register, own or drive. Vehicle descriptors include such things as make, model and color of vehicles as well as any unusual identifying features (unique paint job, damage to the vehicle, special accessories, etc.).

- M.O. Files - which contain data describing how crimes were committed. Among others, M.O. files may include the actions and statements of suspects; type of weapons and/or tools used; the type of persons, structures, businesses or vehicles attacked; method and points of entry and exit; types of property stolen, and so on.

- Property Files - Contain data necessary to identify property reported lost, found or stolen. These files contain listings of types of property (e.g., photo equipment), makes and models (e.g., Canon AE-1), serial numbers, and any identifying markings (e.g., an engraving of a driver's license number on the bottom of a camera). Should a suspect have property in his possession, the property can be run through these files

KNOWN OFFENDERS

Figure 6

Name	DOB	Sex	Race	Hgt	Wgt	Hair	Eyes	Type	Address	RD	Crime	Vehicle	Tattoo	Gang	Monitor	Date
Andrade, John Bastist	53/09/16	M	Mex	600	185	Brn	Brn	11590	Lewis 12466	28	11550	1UI14403				89/04/17
Aberchase, Kevin	69/01/02	M	Blk	602	150	Blk	Brn	SHO Adult	Sepulveda 17604 San B.	NA	GTA		Scar Shoulder & Scalp	Crip (Assoc.)		89/04/17
Abbal, Frank	58/07/11	M	Mex	507	140	Blk	Brn	Parolee	4th St 13016	63	Sales	648JDS	Dove on Branch, Butterfly	Sinners	Bandit	89/05/12
Aceves, David	55/04/09	M	Mex	600	200	Blk	Brn	Parolee	Central 28364	60	459	1BDA890	Crying Clown	Chino Sur	Yogi	89/04/14
Alesquar, Adolfo	72/05/24	M	Mex	509	150	Blk	Brn	SHO	W Ralston 506 Ont.	NA	496	234ASL	Chino	Pomona South Side		89/02/05
Acevedo, Fernando	71/10/24	M	Mex	505	145	Blk	Brn	SHO	E 9th 631 Pom.	NA	459	3D13107	Sur L/Elbow	Pomona South Side	B: ne	89/05/11
Achella, David	71/10/10	M	Mex	510	165	Blk	Brn	SHO	13 St 211	65	211	N547345				89/06/19
Addelono, Rigoberto	73/06/19	M	Mex	507	137	Blk	Brn	SHO	W. Ralston 506 Ont.	NA	496		Lil David	Chino Sur	Lil Pige	89/06/01
Achoa, Antonio M	31/06/13	M	Mex	511	198	Blk	Brn	11590	Revere 5183 #5	30	11350					89/04/04
Aguilar, Benjamin	68/08/12	M	Mex	505	160	Brn	Brn	290	S Reservior 2187 Pom.	NA	261	635GTD	Benjie R/Arm, Aguilar L/Arm	Pomona Sur	Trigger	89/06/11
Argues, Daniel	73/11/10	M	Mex	411	110	Brn	Brn	SHO(P1)	5th 13380	66	459			Chino Sur	Danny Boy	89/04/14
Alecante, John	55/05/31	M	Mex	507	160	Blk	Brn	Parolee	5th St. 13240	66	Sales	735FDS		Sinners	Bashme	89/05/12
Anderson, John	55/05/31	M	Wht	507	170	Bln	Blu	290	1st 143245	57	261 2	2G34727				89/05/05
Aguilar, Steven John	55/06/22	M	Mex	507	190	Blk	Brn	11590	5th 12365	66	11550	2FPR963	Sur,13,Chino	Chino Sur	Paco	89/03/22
Antones, Roy	59/05/24	M	Wht	509	160	Brn	Brn	11590	5th St. 12432	66	11350			Sinners	Flaco	89/06/12
Antones, Steve	68/09/30	M	Wht	409	80	Brn	Brn	Parolee	17th 36273	72	459		Skull		Killer	89/06/12
Alcasta, George A.	45/04/23	M	Mex	510	190	Blk	Brn	11590	Ponderosa 986	106	11351	3MBA261	Reaper			89/04/12
Alcasta, George A.	45/04/23	M	Mex	510	230	Blk	Brn	Parolee	Anderson 5360	106	11350		Bull		El Toro	89/04/12
Alcasta, Joseph	70/08./31	M	Mex	507	160	Brn	Brn	SHO (Ad)	11th 13130	68	11550		I E., Chino, Alisa	Sinners (MM)	Shy boy	89/05/12
Alcarado, Jose A	64/08/13	M	Mex	508	135	Blk	Brn	11590	Fairway 4930	41	11550	HJW780				89/06/06
Alcarado, Richard	63/07/02	M	Mex	601	200	Blk	Brn	Parolee	N. Elderberry 519 Ont.	NA	211		Ricky, Alcaraz, Num. TT's	Ontario	Lil Ricky	89/05/11
Alcarado, Antonio	64/08/13	M	Mex	508	150	Blk	Brn	Parolee	Fairway 5679	41	GTA	HJW780	Woman, Chino, Butterfly	Sinners	Smile	89/05/12
Alcarado, Eustorgio	53/04/23	M	Mex	507	180	Blk	Brn	11590	E. Belmont 607	40	11550			Sinners	Nonie	89/06/12
Alfarez, Ralph	51/05/15	M	Mex	508	190	Blk	Brn	11590	Monte Vista 13171	66	11350	073YZN				89/04/14
Allergio, Armando	71/06/04	M	Mex	506	120	Blk	Brn	SHO (P1)	5th 13072	66	459	573ZCS	Sur, Mondo	Chino Sur (Susp.)	Mi Mi, Shorty	89/04/14
Alferez, Pablo	69/01/03	M	Mex	505	130	Brn	Brn	Parolee	Cynthia 48094	66				Chino Sur (Susp.)		89/04/14
Alferado, Richard	71/06/04	M	Mex	504	106	Blk	Brn	SHO	Camilo 13034	65	459		Sara	Chino Sur	Boxer	89/04/14
Alarez, Rosa	69/12/28	M	Mex	505	135	Blk	Brn	Parolee	5th 13072	66	211	1LFA811		Chino Sur (Susp)	Casper, Bete	89/04/14
Amanguez, Raymond	60/12/06	M	Mex	503	150	Blk	Brn	Parolee	19th 13198	70	459		Eagle&Spider,Chino Sur, Etc.	Sinners	Mayo	89/05/12
Alanslo, Roman	57/05/23	M	Mex	508	140	Blk	Brn	Parolee	4th 13263	60	459	1C52805	Chino Sinners R/Arm	Sinners		89/06/12
Almandaro, Roy	64/03/10	M	Mex	507	145	Brn	Brn	11590	Julia 485	29	11550		Skull, Chino, Jr.Sinner	Sinners (MM)		89/06/12
Almost, Ruben	61/11/07	M	Mex	507	135	Brn	Brn	Parolee	4th 13263	60	211		Sinner, D, Butterfly	Sinners	Squeeks	89/06/12
Almason, Joseph	71/08/29	M	Mex	507	140	Blk	Bro	SHO	2nd 13150	59	459	2WEV546		Chino Sur	Popeye, Hoser,	89/04/14
Almason, Michael	72/12/04	M	Mex	507	140	Blk	Brn	SHO(P1)	Riverside 7835	76	10851			Chino Sur	Goofy, Daffy	89/04/14
Amonderas, Fernando	45/11/02	M	Mex	506	200	Brn	Brn	Parolee	Alba 875	52	487	A294CVR	Sinners	Sinners (MM)	Bucky	89/06/12
Alfonzo, Rodney	49/07/28	M	Mex	506	225	Blk	Brn	11590	11th 13232	68	11352	124UYT	Man behind bars			89/04/17
Alcaron, Thomas	58/05/24	M	Mex	510	295	Brn	Brn	11590	17th 13154	70	11550	213897	Tears on face, Tommy	Chino Sur	Shorty	89/06/11
Amaro, Joseph	09/11/17	M	Mex	510	168	Blk	Brn	290	Chino 5848	70	647A					89/04/17
Amos, Hank	48/12/21	M	Wht	509	170	Brn	Brn	Parolee	Olive 3956	24	211					89/06/11
Ammes, Eric	70/08/24	M	Blk	504	160	Blk	Brn	SHO (Ad)	Benson 12951 #138	70	211	IND635, 998UEX	WSC	Crip West Side Mafia	E-Dog, House	89/04/17
Annes, Lionel	69/05/04	M	Blk	507	140	Blk	Brn	SHO(Ad)	Volmer 8546	19	211	1Z49604	F, BK	Crip (Assoc.)		89/04/17
Anson, Steve	69/12/12	M	Wht	600	175	Brn	Brn	290	11th 13109	68	261.1			Tagger	Boner	89/05/15
Anderson, Arnold M.	64/03/09	M	Mex	600	180	Brn	Brn	11590	9th 12950	68	11550					89/04/11
Anders, Tony	71/05/31	M	Wht	601	200	Brn	Blu	SHO	Fairview 666 Ont.	47	211	236KSD	BK	Crip (Assoc.)		89/04/17
Angelo, Antonie	72/04/05	M	Wht	508	110	Brn	Hzl	SHO(P2)	3rd 13624	60	459					89/04/14
Apadonia, Raymond	65/01/09	M	Mex	508	115	Brn	Brn	Parolee	10th 13247	68	211	1TEJ874		Cucamonga Kings (Assoc.)		89/06/11
Andrasco, Angel	72/02/11	M	Mex	505	130	Brn	Brn	SHO (P1)	East End 12011	65	148		Chino	Chino Sur	El Banded	89/04/14
Arosco, Jessie	70/03/20	M	Mex	508	140	Blk	Brn	SHO	Meras House/3rd & 4th	65	245		Sur, 13	Chino Sur	Whino	89/04/14
Archer, Ulric	65/09/03	M	Mex	507	150	Brn	Brn	11590	Horton 1284	70	11550	1W23456				
Archidas, Rick	65/06/20	M	Wht	508	140	Brn	Brn	11590	17th 13252	77	11352			Chino Mosh Crew		89/06/16
Arch, Richard	70/03/12	M	Blk	509	130	Blk	Brn	Parolee	Riverside 5235 #9	76	187		6" Scar R/Hand	Crip (Assoc.)		89/04/17

to determine if it has been previously reported stolen or lost.

- Field Interview (FI) Files - Contains data taken from documented police contacts though no arrest was made. FI reports contain name(s) of the person(s) contacted, physical and vehicle descriptions, and the reason for the contact. Should the analyst later receive a crime report in which an offender's physical or vehicle description is given, the analyst can search this file in an attempt to find a matching suspect.

Manual Versus Automated Data Collation Methods:

Actual capture and storage of data is accomplished in one of two ways. It is either handwritten onto matrices developed for this purpose, or entered into an automated system. Matrices, most often used by agencies operating in a manual mode, should be individually designed to capture data elements for only one crime. A robbery matrix should be designed to capture only robbery data, and a burglary matrix should be designed to capture only burglary data.

Matrices can be cumbersome and time consuming to use; information has to be written down and analysts must often flip through numerous pages to retrieve information necessary to produce reports.

These problems are reduced by automated systems for they speed data collation and retrieval processes. Assume that two analysts are just starting a crime analysis program. The one who is working in a manual mode might extract information from all robberies and enter it in a robbery matrix. This will enable the analyst to track their progress. Once apprehended, all information relative to suspects will subsequently be used to *create* a known robbery offender file.

The crime analyst who is working with an automated system need not create and keep a matrix to track criminal activity. Depending upon its programming, the system will generate this information automatically. This is done through its delivery of the preliminary case report data that has been entered into it. Additionally, automated systems simplify the process of creating files. For example, a suspect need only be entered as a known offender. He need *not* be entered specifically as a *robbery* offender since the system would automatically classify him as such. The system makes this

determination based upon the preliminary information it receives from the case report. Thus, once the computer knows that a robbery report is being entered, it automatically classifies the suspect as a robbery offender.

Conversely, the analyst who is working in a manual mode will have to develop a known offender file, MO file, vehicle file and other descriptive files *for each type of crime.* He or she will therefore have several known offender files, several MO files and so on. In contrast, the automated system may have but one large known offender file, one large vehicle file, etc. These files contain data which have been entered for all crimes and thus are *not* crime specific.

Automated systems greatly simplify and accelerate data collation and retrieval. Analysts who have to collate and retrieve data manually will not be able to do it as quickly as those who work with automated systems and may therefore be unable to focus attention on as many crimes.

Analysts often ask if they should capture the data elements necessary to analyze *all* crimes. The answer is no. "The crime analysis operation should direct its efforts towards those classes of criminal offenses that the police are most capable of preventing or suppressing. Failing this, the analytical function should consider those offenses in which the responsible persons can be apprehended." [10] A review of existing police crime analysis operations reveals the crimes most applicable to analysis are:

- burglary
- robbery
- auto theft
- larceny (petty and grand theft)
- fraud
- rape and other sex crimes
- aggravated assaults

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[10] Ibid., p. II-4.

- murder.

"Each individual community should analyze its own crime activity to determine whether crimes should be added, subtracted or eliminated from this list." [11]

Data Collation Planning Considerations:

Considerable planning is necessary to ensure that the data collation process does not become an end in itself. Some analysts are kept so busy entering data into computers or onto matrices that they never have much of an opportunity to analyze crime; this defeats the entire purpose of the crime analysis program. In determining what data should be collated, which files should be developed and how the files should be maintained, the following must be considered:

- how many and what type of crimes are targeted for analysis
- do the crimes selected occur frequently enough to produce recognizable patterns of criminal activity that can be diminished or eliminated through implementation of directed patrol or tactical action plans
- does the crime analysis unit have the personnel and time necessary to build and maintain all of the files desired
- is the data to be collated specific enough to be categorized (e.g., can suspects be described in terms of definite age ranges as opposed to vague generalities such as "young" or "old")
- has the collation and file development process been designed to facilitate later retrieval of information
- have files been developed such that relationships between people, vehicles, and events can be established

There is an old computer axiom, "garbage in, garbage out." This axiom holds true for the crime analysis function as well. Collection, collation and categorical storage of accurate, reliable and valid information in a

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[11] Ibid.

manner permitting expedient retrieval is essential. Under lesser conditions, the analysis of crime is not possible.

DATA ANALYSIS:

Types of Data Analysis:

Data analysis may be defined as examination and processing of information that results in the development of recognizable patterns of criminal activity and in the identification of offenders. It is of two types:

- Modus Operandi (MO) Pattern Detection and Correlation
- Statistical Analysis

"Modus Operandi (MO) Pattern Detection and Correlation refers generally to using mapping techniques or searching the various [manual or automated] files in order to determine if similar offenses or a crime series are occurring or to correlating cases once an arrest is made."[12] Statistical analysis is done to mathematically establish likely times, locations and probabilities of future criminal events. It may also be used to determine relationships between events. *Both* types of analysis must be used if the analyst is to provide officers and investigators with accurate information.

In this chapter we will focus on Modus Operandi (MO) Pattern Detection and Correlation analysis techniques. Part Two of this book presents a complete discussion of statistical analysis techniques. The use of both types of analysis techniques will not only enable you to comprehensively analyze your data, but will provide validity and integrity to your conclusions.

Types of Crime Patterns:

The task of analyzing data and drawing conclusions from them is much like putting a jig-saw puzzle together. The analyst is working with many data elements that have been gathered from a wide variety of sources. The goal is to combine the data so that a true "picture" of criminal activity can be determined. These pictures manifest themselves in the form of crime patterns. As described below, they are of two types:

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[12] Ibid., II-44

Geographic concentration patterns refer to patterns identified on the basis of:

- similarity of crime type (e.g., commercial burglary)
- multiple occurrences in well-defined geographic areas.

Identification of a geographic concentration pattern (known more simply as a "crime pattern") means only that certain types of similar crimes are frequently occurring in particular areas of the jurisdiction. Without any other similarities or relationships between these crimes, there is no reason to believe that the same person or persons are responsible for their commission.

Specific and recurring MO patterns refer to patterns identified on the basis of:

- similarity of suspect and/or suspect vehicle description(s)
- unique MO characteristics.

Once a specific and recurring MO pattern has been identified, it is called a crime series. A crime series is characterized by the presence of sufficient similarities to give the analyst reason to believe that the same person or persons are responsible for committing each crime in the series.

To demonstrate the difference between a crime pattern and a crime series, assume that murders have been occurring in a particular section of town. In one, a transient was stabbed to death in an alley. In another, a suspect entered a residence and shot a victim. In still another, a victim was strangled in a motel room. Some murders occurred during the day, others occurred at night; witnesses gave varying descriptions of suspects. This is an example of a crime pattern. The only similarities between the crimes is crime type (murder) and the geographical location in which they occurred.

Now let's assume there were various areas throughout a city frequented by prostitutes. Many of them had been slain at night. Their throats had been slashed and their bodies severely cut and mutilated. Several witnesses said they had seen "a well-dressed gentleman in evening clothes" leaving each area shortly before the bodies were found. In this fictional scenario of London near the end of the 19th century, the "gentleman" became known as Jack the Ripper.

Because of the uniqueness of his MO and the similarity by which he was described by witnesses, he had committed a crime series and thus, by definition, was a "serial killer."

Had crime analysts been around in Jack's day, they would have known that they were observing a crime series for several reasons. First, the murderer was attacking prostitutes, a very specific type of victim. Second, all of the murders occurred at night. Third, all of the victims were killed with the same type of weapon—a knife or similar cutting instrument. Fourth, in addition to cutting the throats of his victims, the murderer used the knife to further mutilate their bodies. Fifth, enough witnesses described the suspect as being a "well-dressed gentleman in evening clothes" to give reason to believe that this individual, whomever he was, was indeed the person responsible for committing the crimes.

Though Jack the Ripper, the Zodiac killer, the Night Stalker and other such persons generate headline news, crime analysts throughout the nation observe less noteworthy crime series on a daily basis. In every series, notorious or mundane, there will usually be something unique to the commission of each crime. The identification of that "something" will serve to indicate that the crimes are being committed by the same person(s).

Crime Pattern/Series Detection - Manual Techniques:

Geographic concentration patterns can be identified if the analyst places color coded dots on maps to indicate locations of criminal incident occurrences. Known as spot maps, these devices facilitate the visual identification of crime patterns (Figure 7).

For example, assume that blue dots represent commercial burglaries. Each time a commercial burglary occurs, the analyst places a blue dot on a map of the jurisdiction. The time and date of each occurrence is written on each dot. Over time, these dots may begin to cluster in a particular area. The appearance of those clusters will alert the analyst to the emergence of a crime pattern. Its continuance or cessation can be determined by the dates listed on the dots.

Spot maps can be of great assistance to the analyst. However, they will only depict crime patterns. The analyst will have to look for additional clues to determine if a crime pattern is also a crime series. In our current example, the map will only tell the analyst that he or

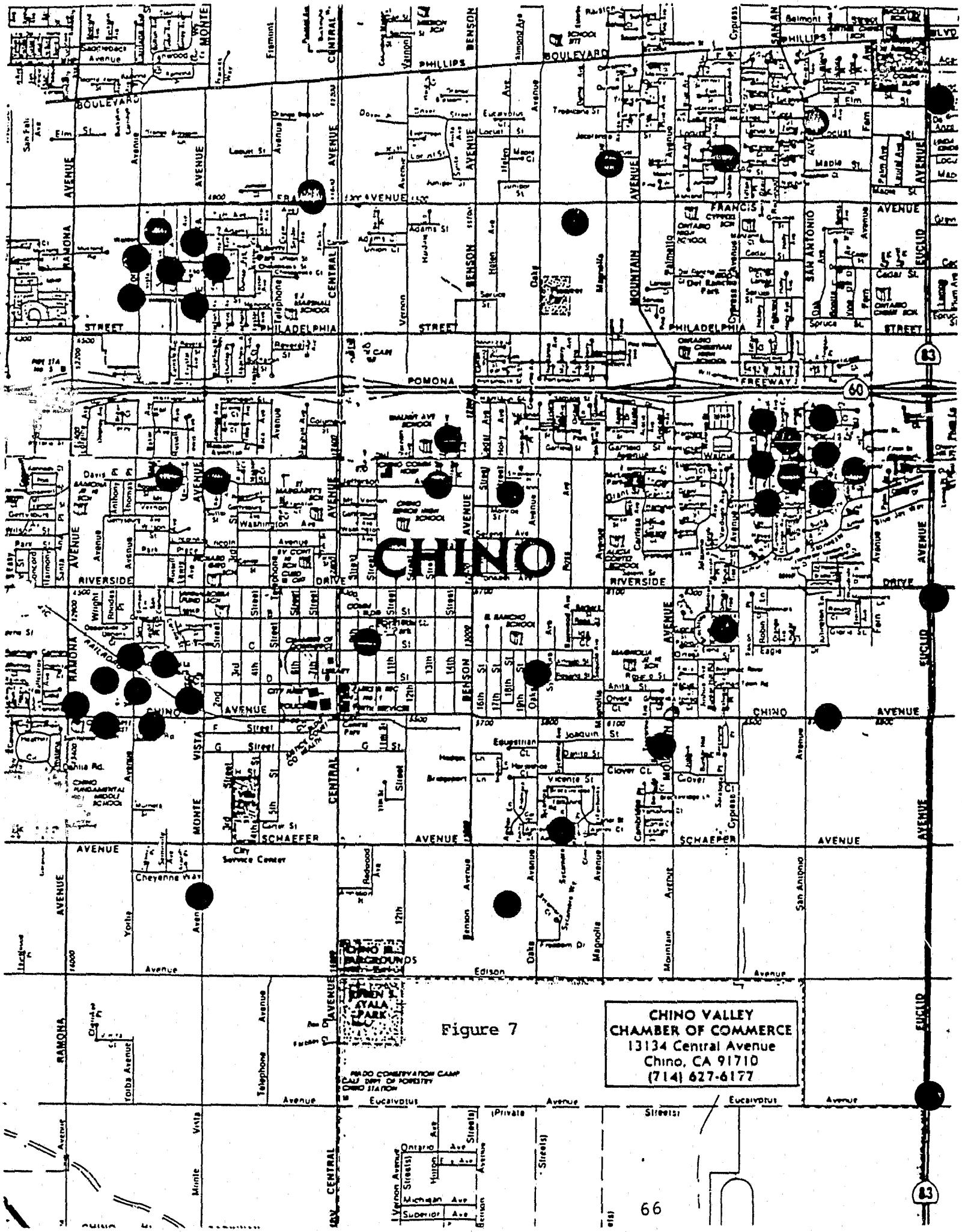
CHINO
CHINO VALLEY
CHAMBER OF COMMERCE
13134 Central Avenue
Chino, CA 91710
(714) 627-6177

Figure 7

she has a commercial burglary pattern. Whether or not it is also a crime series is yet to be determined.

For the analyst who is working in a manual mode, this determination will be made upon examination of the data contained in his or her commercial burglary matrix. This matrix would have been created as part of the data collation process described above.

Let's assume that, upon review of the matrix, the analyst notes that there have been ten commercial burglaries in the past month (see Figures 8 and 9). Five of them were burglaries of pharmacies and five were of various other establishments. Of the five pharmacy burglaries, three showed definite similarities. Each of the three was committed between Tuesday night and Wednesday morning, had evidence of rooftop entry, drugs were stolen, and storeroom safes were pried open. Having observed these similarities, the analyst would be able to confirm the existence of a crime series. He or she would then take the information from these three cases and use it to create a separate log to track the progress of the series (see Figure 10). All future occurrences would be placed in the log and the log would be maintained until the series stopped or the suspect(s) were apprehended.

Crime calendars can also manually track crime series. The analyst takes a calendar that has a one to two inch square box for each day of the week. Whenever a new crime in the series is committed, the analyst makes a note of it on the day of its occurrence (see Figure 11). By flipping through the calendar, the analyst can easily determine how many days elapse between "hits." Crime calendars, when used in conjunction with spot maps and matrices, provide the information necessary to determine possible dates, times and locations of future serial events.

Crime Pattern/Series Detection - Automated Techniques:

This entire task is made easier for the analyst working with an automated system. "Instead of devoting time to maintaining cumbersome and lengthy files, the information is entered into the computer and is available for instant recall whenever necessary. This approach saves not only data input time, but if the sort routines are effectively written, can save data extraction time by allowing the analyst to search and retrieve just the information wanted on an

Figure 8

LONG BEACH POLICE DEPARTMENT

BURGLARY MATRIX

COMMERCIAL

CAU #						
CR NUMBER	-01-020	9-01-0038	-01-0100	9-01-0125	89-01-015
DAY / DATE	M-T 1/2-3/89	SUN 1/8/89	M-T 1/9-10 89	T-W 1/10-11/89	T-W 1/10-1
TIME	100-1000		2100-0900	2000-0800	2100-[redacted]
TIME SPLIT/DAY					
LOCATION	5832 RIVERSIDE	1021 CENTRAL AV.	1231 BENSON ST.	961 BENSON ST.	785 PHILADELI
BEAT		1	4		
EFT DISTR	70	0	69		
ARREST MADE	NO	NO	NO	NO	NO

SUSPECT INFORMATION

DESCRIPTION

SEX
RACE
AGE
HEIGHT
WEIGHT
HAIR
EYES
COMPLEXION
FACIAL HAIR
B=BEARD M=MOUSTACHE
GLASSES

VEHICLE

YEAR
MAKE / MODEL
COLOR
LICENSE

ACTIONS

CAT BURGLAR
RANSACKED
MALICIOUS MISCHIEF

T OFF ALARM

TYPE OF PREMISE

CLOTHING STORE
DEPT. STORE — X
DRUG STORE — X
BANK/FINANCIAL INST
FOOD - TAKE OUT
GROCERY STORE
HARDWARE STORE
JEWELRY STORE
GAS STATION
LIQUOR STORE
MEDICAL BLDG/DR. OFF
SCHOOL
SPORTING GOODS STORE
TV/VCR STORE

POINT OF ENTRY

E-ENTRY X-EXIT

WINDOW — B-X — E-X
DOOR — E-X
ROOF — -X
WALL
FENCED AREA — -X
UNKNOWN

METHOD TO GAIN ENTRY

DOOR

PRIED OPEN
BROKEN OPEN
TWIST KNOB
PASS KEY
CUT/SAW PADLOCK — X
UNLOCKED
OPEN FOR BUSINESS

WINDOW

BROKE / REMOVED — BROKE
PRIED OPEN — X
UNLOCKED
SKYLIGHT

OTHER

WALL TUNNEL
OTHER — BROKEN VEN

OBJECT OF ATTACK

CAMERA - EQUIPMENT
JEWELRY — X
GUNS
TOOLS
MONEY — X
NARCOTICS — X
RADIO/SOUND EQUIPT
TV / VCR
SAFE — X — X
VEHICLE PARTS

Figure 9

LONG BEACH POLICE DEPARTMENT

BURGLARY MATRIX — COMMERCIAL

C A U #						
CR NUMBER	- 01- 17	- 01- 0180	- 01- 0225	- 01- 0271	9 - 01 - 027
DAY / DATE	T-W 1 17-18 89	SAT 1 21 89	T-W 1 24-25 89	TH-Fr 1 26-27	T-W 1 M-
TIME	2100 - 0900	0 - 0	2200 - 0700	2300 - 100	1800 - ●
TIME SPLIT/DAY					
LOCATION	16251 TELEPHONE	1725 WALNUT	1060 SCHARPS	1116 CENTRAL AV	5821 WALNU
BEAT	1	2		4	2
APT DIST#	18	49		68	48
ARREST MADE	NO	NO	NO	NO	NO
SUSPECT INFORMATION — DESCRIPTION					
SEX					
RACE					
AGE					
HEIGHT					
WEIGHT					
HAIR					
EYES					
COMPLEXION					
FACIAL HAIR B=BEARD M=MOUSTACHE					
GLASSES					
VEHICLE YEAR					
MAKE / MODEL					
COLOR					
LICENSE					
ACTIONS CAT BURGLAR					
RANSACKED					
MALICIOUS MISCHIEF					
		5 T OFF ALARM			
TYPE OF PREMISE CLOTHING STORE					
DEPT. STORE					
DRUG STORE					
BANK/FINANCIAL INST					
FOOD - TAKE OUT					
GROCERY STORE					
HARDWARE STORE					
JEWELRY STORE					
GAS STATION					
LIQUOR STORE					
MEDICAL BLDG/DR. OFF					
SCHOOL					
SPORTING GOODS STORE					
TV/VCR STORE					
POINT OF ENTRY WINDOW					
DOOR		-X	-X	-X	
ROOF	E -				-X
WALL					
FENCED AREA					
UNKNOWN					
METHOD TO GAIN ENTRY — DOOR PRIED OPEN					
BROKEN OPEN			X	X	
TWIST KNOB		X			
PASS KEY					
CUT/SAW PADLOCK					
UNLOCKED					
OPEN FOR BUSINESS					
WINDOW BROKE / REMOVED					
PRIED OPEN					
UNLOCKED					
OTHER SKYLIGHT					BROKEN
WALL TUNNEL					
OTHER	CUT HOLE				
OBJECT OF ATTACK CAMERA _ _UIPMENT					
JEWELRY					
GUNS					
TOOLS					
MONEY			X	X	X
NARCOTICS					X
RADIO/SOUND EQUIPT					
TV / VCR					
SAFE					X
VEHICLE PARTS					
OTHER		SYRINGES	VANDALISM	LIQUOR/CIGARETTES	

Figure 10

CRIME SERIES LOG

MONTH JANUARY /YEAR 1989

DR#	DATE	DAY	TIME	SPLIT TIME/ DAY	LOCATION	RD	BEAT	METHOD OF ENTRY	POINT OF ENTRY	PROPERTY REMOVED	SUSPECT DESCRIPTION	SUSPECT VEHICLE	TARGET	EVID/ PRINT
89-01	1/10	TUES	2100	-------	786 Philadelphia	32	2	BROKEN VENT	ROOF	MONEY NARCOTICS SAFE	none	none	DRUG STORE	--
0133	1/11	WED	0800											
89-01	1/17	TUES	2100	-------	16251 TELEPHONE	18	1	CUT HOLE	ROOF	MONEY NARCOTICS SAFE	NONE	NONE	DRUG STORE	--
0175	1/18	WED	0900											
89-01	1/31	TUES	1800	-------	5821 WALNUT	48	2	BROKEN SKYLIGHT	ROOF	MONEY NARCOTICS SAFE	none	none	DRUG STORE	--
0277	2/1	WED	0700											
	-----	-----	-----	-------										
	-----	-----	-----	-------										
	-----	-----	-----	-------										
	-----	-----	-----	-------										
	-----	-----	-----	-------										
	-----	-----	-----	-------										

Figure 11

JANUARY

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
1 NEW YEAR'S DAY	2	3	4	5	6	7 New Moon
8	9	10 DRUG STORE 785 Philadelphia 32/2 2100 HR — 0800 HR. ROOF / BROKEN VENT	11	12	13	14 First Quarter
15	16 MARTIN LUTHER KING, JR BIRTHDAY OBSERVED	17 DRUG STORE 16251 Telephone 18/1 2100 HR — 0900 HR ROOF / CUT HOLE	18	19 ROBERT E. LEE. 1807	20	21 Full Moon
22	23	24	25	26	27	28
29	30 Last Quarter	31 DRUG STORE 5821 WALNUT 48/2 1800 HR — 0700 HR. ROOF / BROKEN SKYLIGHT				

DECEMBER

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

FEBRUARY

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28				

appropriately formatted report."[13] Thus, in our current example, the analyst using an automated system would merely query the system and request a report of all commercial burglaries in which one or more data elements are common.

One caution is directed to analysts working in large agencies: try to narrow initial search requests. In the above example, it would be inefficient to ask the system for all commercial burglaries committed between Tuesday nights and Wednesday mornings. Hundreds of cases may have been returned! It would be better to ask the system to provide any cases containing two or more matching MO characteristics. By requesting information in this manner, the system would return only cases in which:

- rooftop entries had been made AND safes had been pried
- safes had been pried AND drugs had been stolen
- rooftop entries had been made AND drugs had been stolen
- other MO matches had been found.

If it is felt that the information returned is inadequate and the scope of the search was too narrow, the parameters can later be broadened.

Once you are satisfied with the data you have obtained, these data can be stored away in a separate computer file. This file is analogous to the log kept by the analyst working in a manual mode. And, just as that individual would add updated information relative to subsequent pharmacy burglaries to the written log, so would you add this type of data to your computer file.

Target Profile Analysis:

Target Profile Analysis, also known as victim profile analysis, is an attempt to identify the type of person, structure, vehicle or establishment most likely to be attacked by a suspect. Knowledge of a suspect's preferences for certain types of victims may enable the police to stake-out (or otherwise observe) possible locations of future

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13 Samson K. Chang, et al., Crime Analysis System Support: Descriptive Report of Manual and Automated Crime Analysis Functions, (International Association of Chiefs of Police), p. 3.

activity. This may subsequently lead to the arrest of the offender. At the same time, crime prevention officers can use this information to warn possible victims of their vulnerability to attack.

In our present scenario, a target profile analysis would reveal that the suspect(s) had a preference for pharmacies. This information would be given to patrol and investigative officers and used in the creation of directed patrol and/or tactical action plans. Crime prevention officers would use the information to inform other pharmacy owners of the crime series and admonish them to take whatever precautions necessary to prevent victimization (e.g., better secure roof vents, empty the safe at night, put the empty safe near a well-lit window, etc.).

Forecasting Future Criminal Occurrences:

Forecasting future criminal occurrences requires examination of all material the analyst has gathered to this point *and* its subjection to statistical analysis treatment as described in Part Two of this book. By considering what, when, where, and how past crimes were committed—in tandem with the preference of the suspect to attack a certain type of target—the analyst *may* be able to predict the time, date and location of future criminal activity.

This is the desired goal of the crime analyst, but it is very difficult to achieve. Suspects may change locations, may no longer have a need to commit their crimes and so on. When changes occur, the analyst is left with a prediction that fails to materialize, a frustrating experience for analysts and officers alike.

Use care in making predictions. Officers are counting on you to be right—wrong "guesses" resulting in wild goose chases will seriously reduce your credibility.

Suspect Identification:

The analyst attempts to identify suspects through a *crime/suspect correlation process.* This process involves searching files of previously arrested persons, examining the MOs they used to commit their crimes, and then determining if they might be responsible for crime(s) currently under analysis.

Continuing with our current example, let's assume that our drug store burglar has been arrested by the agency in the past for burglary. The offender's name, physical description, etc. would be contained in the analyst's MO file. A search of this file for previously arrested persons who had committed commercial rooftop burglaries would likely reveal the suspect's identity. The suspect might also be found in any file which contained the names of persons arrested in conjunction with safecracking incidents.

Similarly, depending upon how they are structured, known offender files may provide suspect identities. If offender files allow inquiry by crime type, as well as by name, suspect identification is relatively easy. The analyst merely looks at the commercial burglary category and notes the names of all persons arrested for rooftop burglaries of pharmacies. He or she will then look to see if any of these people also pried a safe during the commission of the offense.

Searches of suspect description files and suspect vehicle files will also facilitate the suspect identification process as long as there is something *unique* about the suspect or the vehicle being sought. Broad searches for white males between 35 and 40 or late-model red Chevrolets will prove unproductive. Conversely, searches for people and vehicles having unique identifying features can produce usable results.

Case Matching:

Case matching, also known as "case correlation," takes place after a suspect has been arrested. In this activity, the analyst considers the offense for which the arrest was made and then attempts to link the suspect to similar unsolved crimes. To conclude our example, assume that the drug store burglar is finally arrested. Once a check has been made of offense files, the analyst will discover the other three cases for which he may be responsible. This information can then be given to investigators for use in the case clearance process.

DATA DISSEMINATION:

Data dissemination may be defined as the distribution of crime analysis information which is used to develop directed patrol and tactical action plans, assist continuing investigations and crime prevention efforts, and facilitate the accomplishment of general administrative, operational, and organizational planning tasks.

Goals of Data Dissemination:

There are two goals associated with data dissemination. These are:

- To provide information that can be used or acted upon by others
- To enhance communication between people within and without the organization.

Product Development Planning Considerations:

Most frequently, data are disseminated through written products developed by the analyst. While some are published for the benefit of specific individuals or units within the department, others may be used by all members of the organization.

It is not uncommon for new crime analysts and their supervisors to rush the product development process. However, in their haste to "get something out," they often fail to provide information that truly meets the needs of intended customers. This can be avoided by obtaining answers to the following questions:

- Who are the intended users of information? Among others, they may include:
  - ° patrol officers and patrol supervisors
  - ° investigators and investigative supervisors
  - ° tactical action teams
  - ° training officers
  - ° communications/dispatch personnel
  - ° budget/other administrative analysts
  - ° executives and other command staff officers
  - ° prosecutors, probation and parole officers and other outside agency personnel.
- What are the informational needs? Among others, there may be a need for:

- ° general crime summary information
- ° crime pattern information
- ° crime series information
- ° crime trend information
- ° known offender/career criminal or habitual offender information
- ° suspects wanted information
- ° gang, narcotics or other special problem information
- ° stolen vehicle information
- ° warrant information
- ° parole/probation information
- ° pawn information
- ° daily, weekly, monthly or yearly crime statistics
- ° crime prevention presentation data
- ° calls for service statistics, manpower and workload statistics, officer arrest and citation statistics, etc

• What products will meet those needs? Among others, products to be considered may be:

- ° Daily Bulletins
- ° Crime Pattern/Crime Series Bulletins
- ° Known Offender Bulletins
- ° Parolee Bulletins
- ° Weekly Statistical Crime Summaries
- ° Monthly Statistical Crime Summaries
- ° Wanted Persons Bulletins

- ° Warrant Lists
- ° Arrest/FI Summaries
- ° Crime Prevention Statistical Bulletins
- ° Gang/Narcotic/Unique Offense Special Bulletins.

- How would personnel like information presented? Formats include:
  - ° narrative format
  - ° graphic format
  - ° narrative and graphic format
  - ° memorandum format
  - ° "newspaper" or other unique format.
- What data are required to produce products?
  - ° all crime, MO and suspect data or only that for certain designated crimes? If the latter, for which crimes?
  - ° response time and calls for service data?
  - ° officer arrest and citation statistics?
  - ° population, geographic and economic data?
  - ° intelligence data?
- Other considerations such as:
  - ° what type of graphs, charts, matrices, etc. will have to be developed to capture data needed to produce products?
  - ° should documents be printed on standard size paper or breast-pocket cards, 2 or 3 hole punched, printed on colored paper, etc.?
  - ° how often will various products be published?

- how much time will it take to create products?
- does the crime analysis unit have the necessary resources to publish the products requested?
- of what value is each product—very helpful, somewhat helpful, nice to have, will be used occasionally, not helpful?
- what is the likely return on investment from each product? Is it worth the time and effort to do it? Would the operation be hampered without it?

Instead of creating products on their own, analysts should initially meet with management and staff from throughout the organization to ensure that products ultimately developed will, in fact, meet user needs. For each user group, the analyst should document:

- which products are needed
- the purpose of each product
- the information needed for each product
- product dissemination requirements.

Types of Products:

The number and types of crime analysis products which could be created is limited only by the imagination of the analysts who create them. Refer to the appendix of this book for examples. The most universally used, however, are those described in the following paragraphs:

Daily Bulletins are used to provide general crime summary information. They contain information taken from recent crime and arrest reports and may include noteworthy FI data as well. They may also contain alert and comment messages, missing persons information, all points bulletin information, extra patrol requests and crime and/or suspect information which has been contributed from outside agencies. Daily bulletins may also be used to keep officers familiarized with happenings throughout the Department (e.g., notice of promotional examinations, upcoming unit vacancies, etc.) and to congratulate them for a good arrest, investigation and so on.

There are some precautions that should be taken when publishing a daily bulletin. First, be sure the information it contains is timely. Do not print old material if you know or suspect it may be stale. Officers will not only stop reading the bulletin if it frequently contains yesterday's news, but may also assume that you are either behind in your work or uninformed. Neither assumption will enhance your credibility. Second, some analysts use the Daily Bulletin as a catchall. There is nothing wrong with this so long as it does not become difficult to use, too lengthy to read, and continues to contain information of interest. Officers do not have time to search through the bulletin looking for crime, suspect and other pertinent information. Make sure they get the information they *need* to have, and present it in an easy to read format.

Crime Pattern and Crime Series Bulletins contain information relative to the continuing occurrence of particular criminal activities. They acquaint officers with the types of crimes being committed, list the days, times and locations of their occurrence and provide officers with any known suspect, suspect vehicle, MO and/or property loss information. Information concerning the preferred target of attack (victim and/or property) should also be included, as should results of past analyses or predictions as to when and where the suspect(s) may strike again. Bulletins should be updated until suspects are arrested or the pattern/series comes to an end.

Crime pattern and crime series bulletins will most often be used by patrol officers to create directed patrol or tactical action plans. Patrol officers must, therefore, be given as much information as possible to enable them to develop a strategy which effectively deals with the problem. This may be accomplished by providing officers with a narrative description of incidents, a map depicting past and possible future locations of occurrence, and any graphs which clarify the problem.

Known Offender Bulletins are circulated to keep officers informed of the whereabouts and activities of previously arrested persons. They are particularly helpful for tracking movements of gang members, sex and narcotic offenders, career criminals and other such habitual offenders. These bulletins include pictures and descriptions of offenders, list their vehicles, last known addresses, past offenses, "hang-outs" and known associates and outline their MOs. They may also provide terms and conditions of probation or parole as well as brief criminal histories.

Known offender bulletins must be distributed with caution. An officer's overzealous and indiscriminate use of them to merely "hassle" a known offender may bring charges of police harassment. Further, state and federal privacy statutes protect the use and dissemination of criminal history information. Should it be retrieved from a trash can by someone at the local car wash, for example, or otherwise fall into the wrong hands by some other means, a suit could be initiated against the department.

Parolee Bulletins may be used for much the same purpose as Known Offender Bulletins. Parolee information is obtained from the state's Parole Department and is used to inform officers of former prisoners being released into the community. Parolee bulletins may also be circulated whenever a parolee from another community moves into the jurisdiction. As with Known Offender Bulletins, Parolee Bulletins should contain a picture of the offender along with all applicable supplemental information. Special terms and conditions of parole should be mentioned as well. Caution is similarly advised in the publication and use of this document, for it, too, contains sensitive information which is protected by law.

Parolee information can be best obtained from parole officers. Get to know them well. Create a "drop-in for coffee" atmosphere that encourages these officers to provide you with updates on their clients.

Parolee bulletins should be updated whenever a parolee who has been named in a previous bulletin is released from parole, is arrested for another crime or has a change in his or her terms and conditions of parole.

Weekly Statistical Crime Summaries are prepared for management and executive staff and are used to show the number and percentage of crime increases or decreases on a weekly basis. Though they can be completed for every offense, these reports are most frequently prepared to monitor changes in the rates of certain targeted crimes. Crimes frequently selected for inclusion are homicide, rape, robbery, assaults, burglary, petty and grand theft, and auto theft.

Although this report can be prepared to reflect crime rate changes throughout the whole of the jurisdiction, it is helpful if it is prepared on a shift-by-shift basis. This allows patrol supervisors the

opportunity to more accurately assess the impact of their officers on crime problems and may point to a need to develop directed patrol plans to abate any escalating criminal activity occurring during their tours of duty.

In tandem with the statistical data, patrol supervisors should be provided with a supplemental crime summary sheet. This sheet should list the crimes which have occurred during the week, their dates, times and locations and any suspect or suspect vehicle information which can be provided.

Monthly Statistical Crime Summaries are prepared for management and executive staff and are used to show the number and percentage of target crime increases or decreases on a monthly basis. Current month statistics for each target crime are compared with those posted for the same month of the previous year. Year-to-Date figures are also included in the summary.

Assume that the summary was being completed for May 1989. At the far left of the summary would be a column that lists the types of crimes being reported upon. To the right of each crime would be the number of incidents posted during the current month. Next to that number would be the number of incidents posted during the same month of the previous year. This would be followed by the numerical change and percentage difference between them.

Under the Year-to-Date heading would be a column showing the total number of crimes which occurred for each separate crime type from January through May 1989. This would be followed by year-to-date information drawn from January through May 1988 (the same time period of the previous year). The numerical change and percentage difference between these figures would then be calculated and reflected on the report.

An accompanying supplemental report should also be prepared to provide management and executive staff with the location, date, time of day, and day of the week each crime occurred during the month under review. Graphic displays can similarly be used to depict monthly occurrences by time of day, day of week, and shift.

Wanted Persons Bulletins are prepared and circulated on an "as needed" basis. They state the crime for which an individual is wanted, list the date, time and location of occurrence, and give an explanation

of the MO used. These bulletins also contain physical descriptions of the wanted person and, depending upon availability, other identifying information (e.g., vehicle descriptions(s), locations frequented, associates, crime and weapons history, etc.). A photograph, sketch or "Identi-Kit" composite picture of the suspect may similarly be included. Once the suspect is apprehended, an update bulletin should be disseminated to cancel his or her wanted status.

Warrant Lists may be distributed on a weekly or monthly basis. Arrest warrants are provided by courts to jurisdictions they serve. However, they may also be received by mail or Teletype from other outside law enforcement agencies. Warrant lists contain the name of the person listed on the warrant, his or her physical description and last known address, the number of the warrant, the bail, the date of issue, the file number, and the offense charged. Should it be desired, the name of the court and authorizing magistrate may be listed as well. Once a warrant is cancelled, or the individual named on a warrant is taken into custody, a warrant cancellation notice should be published.

Arrest/FI Summaries are used to keep officers and investigators apprised of people who have been arrested or had some sort of documented contact with police over the period of a week or month. The arrest section of the summary will list the name of the arrestee, his or her physical description, the location, date, and time of arrest, the name of the arresting officer and a brief explanation of the offense charged. This may be presented in a one-line ledger format. The FI summary section will provide the same type of information with the exception of its explanation of a contact as opposed to an arrest. It should also provide information regarding any vehicle or associates that may have been with the person at the time of the encounter.

Most officers love to make arrests, but some do not want to take the time to complete FI reports. This is detrimental to the crime analysis operation, for the information provided by FIs can be extremely useful to the analyst. Arrest and FI summaries can be used to list arrest and FI occurrences, and to congratulate officers for their work and initiative. Everyone likes to see his or her name in print. This is your chance to give public recognition for effort—take advantage of it!

Crime Prevention Statistical Bulletins are prepared on an "as needed basis" and are provided to help crime prevention officers

customize presentations to neighborhood and business watch or block groups. These most often contain crime statistics which have been posted over a specific period of time for certain beats or reporting districts. Among others, these bulletins may provide area-specific information regarding numbers of domestic violence incidents, elderly persons victimization, and the nature of crimes occurring in any particular part of town.

Crime prevention officers can also use information provided by the crime analysis unit to ascertain the validity of citizen complaints. For example, someone may complain that crime is running rampant and that patrol cars are never seen in their area. By checking calls for service and offense files the analyst may be able to determine that perhaps only one or two crimes have been reported in the area over the past six months. Further, there may have been a reduction in the area's crime rate over last year. Thus, the statement that "crime is running rampant" may be more the perception of the complainant than a definite fact. On the other hand, people may feel that crime is plaguing the neighborhood because they "always see cop cars in the area." Once again, a report prepared by the crime analyst may show that patrol units have frequently been in the area, but for reasons unrelated to crime. It may be that an officer followed a traffic violator off of the freeway and finally got him stopped in the neighborhood in question. Perhaps officers towed abandoned vehicles from the area or were seen answering a barking dog call. Officers may have responded to the neighborhood to assist an invalid who had fallen out of bed, take a missing persons report, make a death notification, or to handle any number of other service calls. With this information, the crime prevention officer can explain the reasons for the presence of police in the area and assure the complainant that his or her neighborhood is not being victimized by crime.

Crime complaints which are justified can be brought to the attention of patrol supervisors for their development of whatever directed patrol and/or tactical actions plans may be necessary. At the same time, the crime prevention officer can work with citizens to form neighborhood watch groups, better secure residences, and give citizens the information they need to prevent future victimization.

Gang/Narcotic/Unique Offense Special Bulletins are often published for use by intelligence officers, although they may be disseminated to patrol and investigative officers as well. These may be used to provide information regarding the activities and arrests of

gang members, major narcotics violators or any other group of targeted offenders, or to familiarize personnel with the occurrence of a particularly unique criminal offense.

Because it is a "special" bulletin, the information presented should be "special." Circulated too frequently with information that could be more appropriately included in the publications listed above, special bulletins lose impact.

Product Development - Technical Considerations:

The following technical considerations should be given to product development:

- Each should accomplish a specific function. Do not try to make one product all things to all people
- Disseminate documents on a timely basis
- When preparing a document for an individual or a particular user group, try to think of others in the organization who might benefit from its use (e.g., crime prevention officers will appreciate receiving crime pattern/crime series bulletins, communications/dispatch personnel will find it helpful to have copies of wanted persons bulletins and warrant lists, etc.).
- Include admonishments on publications which direct officers to verify that suspects are still wanted and warrants are still valid before making arrests. This will prevent those little embarrassing moments!
- Do not become overly attached to your products. If they are not being read or accomplishing their function, either redesign or eliminate them from your literary repertoire.
- Be sure that information presented is complete, accurate and devoid of spelling and grammatical errors.
- Use an easy-to-read format. When in doubt about the size of print to use, set it bigger (people have a hard time reading small type). Clutter does not improve readability. Don't feel obligated to cover an entire page with words. And whenever possible, treat blank space as a friend.

- Select formats that are both neat and attractive. Also, design them so that they are easily recognizable as crime analysis products. Consider the use of a special logo for this purpose. You may also wish to use different colored paper for each each publication.

- Unless graphs are truly self-explanatory, do not use them without accompanying narrative. Similarly, it is rarely advisable to provide long lists of data without an explanation of their meaning. Officers don't have time to take raw data and draw conclusions from it. Therefore, provide them with data that has, in fact, been analyzed. Use your products to simply tell them what you want them to know. Don't make them figure it out for themselves.

Product Distribution Techniques:

Products may be distributed to personnel in a variety of ways. In many agencies, products are simply placed in patrol officers' mailboxes. Should this prove too time consuming, they can be placed in the briefing or roll call area. Products should also be placed on the briefing board so that they may be commented upon by briefing or roll call supervisors. If officers carry notebooks, be sure the products are designed to fit neatly within them.

Though you may distribute products to officers each day, be sure your contact with them is not limited to the printed page. Attend the briefing sessions of all shifts occasionally and verbally describe the nature of current criminal events.

Investigators and their supervisors may also receive products by mail. However, when possible, it is recommended that you deliver your products in person. This enables you to discuss the product and solicit suggestions for improvement. In the process, you will be demonstrating your desire to be of assistance while taking advantage of an opportunity to enhance your credibility.

While there is no argument that management and executive staff should receive crime analysis products, the question sometimes arises as to *when* they should receive them. It is almost universally accepted that they should be immediately informed of major criminal events. However, there is debate about less pressing issues. For

example, many patrol supervisors would prefer that management and executive staff receive crime pattern/crime series bulletins ten to fourteen days *after* they are initially published. This gives them the opportunity to resolve a problem before it comes to the attention of the chief or sheriff. Thus, when later asked about it, they are able to explain what action was taken and what results were realized from the efforts of their officers.

The issue, of course, is the avoidance of embarrassment. No supervisor wants to appear ignorant or uninformed in the presence of the chief executive. If the chief or sheriff is informed of a problem at the same time as it is made known to lower level staff, the way is paved for the following scenario:

"May I see you in my office, Lt. Tackleberry?"

"Yes Sir, may I help you?"

"I certainly hope so. I just received this Crime Series Bulletin from the crime analysis unit. It says that burglars are carrying off half the city during your shift. What do you know about this?"

"Uh, um, well, Sir, I, ah, just got my bulletin this morning, too. I, ah, well I really haven't had an opportunity to, ah, well really look into it fully, Sir."

"I'm surprised, Tackleberrry. I'd certainly think you would know what's happening on your shift! That's not an *unreasonable* expectation, is it? What do you plan to do about it?"

At this point, little beads of sweat are forming on Lt. Tackleberry's brow. He's feeling many things. Love for the crime analysis unit is not among them.

"Uh, well Sir, I'm not *exactly* sure what, ah, I mean I *am* going to do *something* about it, but, ah, well, if you could just give me a little time, Sir, then I feel pretty sure that, I mean I *know* that my officers and I can solve this little problem."

"I hope so, Tackleberry. I'll be checking the unit's update bulletins to see how you're coming along."

Undoubtedly, Lt. Tackleberry will handle the problem. However, his embarrassment could have been avoided if he had been given the information and had a chance to do something with it prior to its receipt by the chief. When questioned, he could have told the chief that he was indeed aware of the burglaries and had implemented various directed patrol and tactical action plans to deal with them. He could then cite the results he achieved.

It should not be inferred from this discussion that delaying the delivery of information to executives is synonymous with trying to keep or otherwise hide information from them. Rather, it is to give lower level staff the opportunity to quickly address (and hopefully resolve) problems before executive intervention becomes necessary.

Management and executive staff members will ultimately decide for themselves when they wish to receive crime analysis products. If it is to be at the same time as others in the organization, then the analyst must make lower level staff aware of that fact. This "advance warning" may cue them to familiarize themselves with these materials at their earliest opportunity.

Management and executive staff will usually receive routine products through inter-office mail. However, they may request that any products or information prepared for their specific use be personally delivered by the analyst. Whatever their preference, accommodate them.

Some analysts use video presentations to keep personnel informed of criminal activities. For example, crime reinactment programs can be used to visually describe the nature of existing or emerging crime patterns. Programs designed to familiarize officers with gang members, career criminals and other such known offenders can also be developed, as can presentations which describe current suspects wanted by the agency. Finally, video presentations can be used to recognize officers for good arrests, investigations and so on.

Video presentations work well if they are professionally done. But if they look like they were made by loving hands at home, they will usually elicit more laughter than interest. Additionally, they are extremely time consuming to prepare and generally cannot be created without the assistance of several people. Thus, unless you have the equipment, expertise, time and personnel resources necessary to

professionally accomplish this task, it is recommended that it be bypassed in favor of other activities which might be more productive.

Finally, products which are to be disseminated to agencies outside of the organization may either be mailed to them or given to their representatives at interdepartmental user groups meetings. Items containing information of an urgent or immediate nature may be "faxed" to them as well.

FEEDBACK:

Feedback may be defined as information resulting from the establishment of formal and informal communication processes implemented to determine the accuracy, reliability, validity, timeliness and overall usefulness of crime analysis products and services.

Need for Feedback:

A significant amount of resources are expended in the establishment and maintenance of a crime analysis program. As such, there comes a point when crime analysis, too, must be evaluated. The feedback process helps executives and unit members accomplish this task.

Formal Feedback Methods:

Formal methods involve development of Request for Information and Feedback forms. These should be completed any time information or service is requested from or provided by the crime analysis unit. Request forms list the nature of the information or service desired and the purpose for which it is to be used (Figure 12). Feedback forms reflect the type of information or service rendered by the unit and the results obtained from its use (Figures 13 and 14). Various "housekeeping" items such as the name of the requestor, the date of the request, the unit's turnaround time and so on should similarly be included on the forms. Additionally, logs should be developed to track the receipt of feedback information.

Experience has shown that officers may not request information if they have to fill out Request and Feedback forms. It is therefore recommended that they be allowed to verbally state their requests and feedback results while the analyst writes them down.

Figure 12

STANISLAUS COUNTY SHERIFF'S DEPARTMENT
CRIME ANALYSIS
REQUEST FOR INFORMATION

DATE: REQUEST NO:

REQUESTED BY:

TYPE OF REQUEST

OFFENDER INFORMATION

____ SUSPECT DEVELOPMENT (TO DEVELOP NAME LEADS) BY PHYSICAL DISCRIPTION

____ SUSPECT DEVELOPMENT (TO DEVELOP NAME LEADS) BY VEHICLE DESCRIPTION

____ CASE MATCHING THROUGH SUSPECT DESCRIPTION

CRIME INFORMATION

____ GENERAL ANALYSIS OF CRIMES WITHIN A SPECIFIC AREA DURING A SPECIFIC TIME

____ PATTERN ANALYSIS (DETERMINE CRIME TRENDS BY M.O. OR SUSPECT DISCRIPTION)

OTHER INFORMATION

____ MATCH PROPERTY RECOVERED AGAINST REPORTS OF STOLEN PROPERTY

____ STATISTICS ON CRIME TYPE(S) FOR COMMUNITY MEETINGS, MEDIA INFORMATION, BUDGET PURPOSES, ETC.

____ OPERATIONS ANALYSIS INFORMATION (FOR DEPLOYMENT AND ALLOCATION OF RESOURCES. MAY INCLUDE WORKLOAD DISTRIBUTION QUESTIONS, BEAT SURVEYS CASE MANAGEMENT QUESTIONS ETC.)

SPECIFIC INFORMATION REQUESTED AND PURPOSE:

IN THE SPACE BELOW, STATE YOUR REQUEST AND WHAT INFORMATION YOUR HAVE. EX: I AM LOOKING FOR SUSPECT DESCRIBED AS WMA, 20-25, 5-10 TO 6-0, 150-170, PLEASE SEARCH YOUR JANUARY FILES FOR ANY PARTICULAR CRIME PATTERNS, ETC

FOR CRIME ANALYSIS USE ONLY:

SAN DIEGO SHERIFF'S DEPARTMENT
CRIME ANALYSIS UNIT
REQUEST FOR FEEDBACK

FIGURE 13

Career
Criminal
Apprehension
Program

TO: _____

DATE: _____

REF. # _____

_____

Recently you received information from Crime Analysis. To monitor our effectiveness and improve our services to you, we need your feedback. Please answer the following questions and return this form by _____.

1. Was the information useful? ☐ YES ☐ NO

   If not, why? _____

2. Did this information assist in:

   ☐ REDUCTION OF CRIME ☐ SUSPECT ELIMINATION ☐ SUSPECT IDENTIFICATION

   ☐ DRUG SEIZURE $_____ ☐ PROPERTY RECOVERY $_____

   ☐ DEVELOPMENT OF LEADS ☐ INFORMATION VERIFICATION ☐ OTHER _____

3. Was the information used to establish special tactics? ☐ YES ☐ NO

   ☐ DIRECTED PATROL ☐ SATURATION PATROL ☐ STAKEOUT

   ☐ UNDERCOVER UNIT ☐ SURVEILLANCE ☐ CITIZEN ALERT

   ☐ INCREASED PUBLIC CONTACT ☐ OTHER: _____

4. Did the information result in an arrest ? ☐ YES ☐ NO

   If yes, please list name(s) and charge(s):

NAME	CHARGE	NAME	CHARGE
_____	_____	_____	_____

5. Did the information result in case clearance? ☐ YES ☐ NO

   If yes, please list case number(s) and crime type:

CASE #	CRIME	CASE #	CRIME
_____	_____	_____	_____

6. If the information was ADMINISTRATIVE in nature was it used for:

   ☐ PATROL MANAGEMENT ☐ TRAFFIC MANAGEMENT ☐ INVESTIGATIVE MANAGEMENT

   ☐ MEDIA RELATIONS ☐ CRIME PREVENTION ☐ OTHER _____

7. COMMENTS: _____

RETURN TO: S.D.S.O. CRIME ANALYSIS UNIT M.S. O-339 5555 Overland, Bldg 1, S.D. 92123

STANISLAUS COUNTY SHERIFF'S DEPARTMENT
CRIME ANALYSIS

FEEDBACK FORM

Figure 14

TO: CRIME ANALYSIS UNIT
FROM:

DATE:
RFI#:

RECENTLY YOU WERE PROVIDED DATA FROM THE CRIME ANALYSIS UNIT. TO INSURE WE ARE PROVIDING YOU THE DATA YOU NEED, YOUR FEEDBACK TO THE UNIT IS VITAL. PLEASE COMPLETE THIS FORM AND RETURN IT TO US WITHIN 15 DAYS OF RECEIPT.

PLEASE COMPLETE ALL SECTIONS

WAS THE INFORMATION PROVIDED USEFUL? YES_____ NO_____
IF NOT, WHY? _____

_____

_____

WHAT WAS THE INFORMATION USED FOR?

_____VERIFY CASE DATA _____DEVELOP NEW LEADS _____CLEAR CASES
_____IDENTIFY A SUSPECT NAME: _____
_____MAKE AN ARREST NAME: _____
_____OTHER EXPLAIN: _____

_____

_____

DID THE INFORMATION ESTABLISH TACTICAL ACTION? YES_____ NO_____
IF YES, WHICH?

_____HIGH VISIBILITY PATROL _____DIRECTED PATROL _____STAKEOUT
_____UNDERCOVER UNITS _____PHANTOM CAR _____DECOY
_____FIELD INTERROGATION _____WALKING TEAM _____BIKE TEAM
_____TARGET HARDENING _____HIDDEN CAMERA _____CITIZEN ALERT
_____OTHER (PLEASE EXPLAIN) _____

_____

WERE YOU PROVIDED WITH ALL DATA REQUIRED? _____YES _____NO
WAS THE SERVICE SATISFACTORY: _____YES _____NO
PLEASE GIVE ANY COMMENTS AND SUGGESTIONS. BE CANDID! EACH WILL BE REVIEWED AND POSSIBLY IMPLEMENTED BY THE UNIT. _____

_____

_____

_____

CRIME ANALYSIS USE ONLY

Survey research methods can also provide formal feedback to the unit. Creating and distributing a questionnaire asking various questions about crime analysis products and services can assess the frequency with which users request information or service, the efficiency of the unit in responding to requests, the value of the information provided and so on.

While questionnaires provide useful feedback, the actual value of the questionnaire is directly related to its ability to present questions and capture responses which accurately assess feelings and/or perceptions of people completing them. Questionnaires must be appropriately formatted, and their questions properly asked; failing this, spurious results may be obtained.

If you are unfamiliar with survey research techniques but wish to use a questionnaire as part of your feedback process, contact a local college or university (marketing research, psychology, or sociology departments) for assistance. Survey research projects are always needed by students, and many will do them without charge.

Structured interviews may also be used as part of the formal feedback process. As with questionnaires, caution must also be exercised when developing interview questions. To enhance the process, persons independent of the organization—or at least independent of the crime analysis unit—should be selected to interview respondents. This allows interviewees to be candid during interviews and ensures a higher degree of objectivity in feedback obtained.

Informal Feedback Methods:

Informal feedback methods also assess the effectiveness of the unit and the products it provides. One simple method is the "trash can survey." This merely involves looking in trash cans throughout the department to see how much of your material is thrown away. A variation on this theme is to note how many products remain in patrol and investigative briefing areas after officers and detectives have left for the field or returned to their desks. If much of the material is being discarded or left behind, it could be an indication that the information it contains is of little value to others.

Other informal feedback methods are described below:

- Examine crime analysis unit request logs. If the unit has received many requests for information and service, then it probably has made a positive contribution to the organization.

- Stop publishing and disseminating products and see what happens. If people notice and ask for them to be reinstated, accommodate their request. If the stoppage goes unnoticed, the products were not serving a useful purpose.

- Consider how often you are asked to provide follow-up information on people and events described in your products. Such requests indicate that products are being read.

- Read arrest reports and determine how many and for what types of offenses arrests are made as a result of crime analysis information.

- Talk with people individually and collectively under informal circumstances and solicit their opinions of the unit and its products. This may be done on ride-alongs, in the hallway, at briefings, in the gym, etc. Ask people if they are receiving the information and service they desire, have any suggestions for improvements and can recommend anything else that might be done to better serve their needs.

Feedback is necessary to ensure that crime analysis units are meeting user group needs. At the same time, feedback provides analysts and their supervisors with the information necessary to determine which products and services are of most—and least—benefit to their organizations. Armed with this knowledge, managers and analysts can make whatever operational revisions may be required to improve efficiency and service capabilities in their units.

EVALUATION:

Evaluation is a process which is implemented to assess a program's performance, ascertain its worth, and justify its continuance or elimination. A crime analysis program should be evaluated based

upon its achievement of goals and objectives set for it by administrators of the organization.

Evaluations of crime analysis units based on such factors as clearance rates, crime rates, arrest rates and so on should be avoided for two reasons. First, the capture of criminals, the cessation of crime patterns and so on cannot be *directly* linked to the use of crime analysis information. Other variables may be responsible for, or contribute to these outcomes. Second, though the unit provides information, the unit has little control over the use of this information. Utilization of the above factors as evaluative criteria may therefore be of little assistance in determining the overall worth of the unit.

"Perhaps the most meaningful evaluation of crime analysis operations is one based upon the ability of the unit to produce worthy and timely products. This type of evaluation measures the use and acceptance of crime analysis information by user groups. Another basis for evaluation is a determination of whether the crime analysis unit is making proper use of all available resources and is employing the appropriate analysis techniques to develop information.

Regardless of the evaluation tool used, a crime analysis unit should be encouraged to maintain a detailed record of all reports, bulletins, or informal communications provided to each user group. This record should be kept in the form of a log and should contain a detailed accounting of all products—both informal and formal—provided to various department users. Whenever possible, actions taken as a result of a product should also be noted." [14]

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[14] Grassie, op. cit., pp. 3-18 to 3-19.

CHAPTER 6

VOLUNTEERS IN CRIME ANALYSIS PROGRAMS

VOLUNTEERS IN CRIME ANALYSIS PROGRAMS

Civilian volunteers can be of great assistance to crime analysts of any agency; they are *indispensable* to anyone using manual methods.

Law enforcement officials, traditionally, have been hesitant to open their doors to volunteers. Of most concern were access to, or inappropriate use of, confidential information; ability to interact favorably with officers and competently perform tasks; and departmental liability should injury occur on the premises. Fortunately, none of these has proven to be a major problem over the years and volunteers are used by many police agencies throughout the country.

Job Duties:

Volunteers free analysts to perform analysis tasks. To give analysts this freedom, identify tasks that could be done by others, and assign these tasks to volunteers. These tasks may include:

- maintaining spot maps
- processing reports
- entering data onto matrices, logs, etc.
- filing reports
- preparing and disseminating routine products
- providing general clerical assistance to unit personnel.

Once volunteer tasks have been identified, they should be written in the form of job descriptions. A design for this form is shown in Figure 15.

Volunteer Recruitment:

As shown in Figure 16, volunteers may be recruited from colleges and universities, senior citizen centers, churches and synagogues, service clubs and various other civic organizations. Newspaper and radio ads, volunteer fairs and so on can also be used. (see Figures 17 and 17A).

Figure 15

VOLUNTEER JOB DESCRIPTION

Job Title	Department	Project

Job Description

(clearly defined purpose)

Responsibilities and Tasks

(specific – will serve as criteria in evaluation)

Authority

(plus any limitations to authority)

Qualifications

(spell out: education, experience, age limit, if any, willing to supply uniform, car, pay membership dues, etc.)

Requirements of the job

(one year appointment; location – facility, floor, etc.; time required – hours of the day, days of the week; confidentiality; training (specific course) required, if any.)

Comments

(other pertinent information such as need for volunteer to be emotionally able to work with multiple-handicapped clients.)

Supervision

(relationship with director of volunteers and relationship with job supervisor and his/her name.)

Agency's name, address, telephone

POSSIBLE SOURCES OF VOLUNTEERS

AMERICAN RED CROSS
ART ASSOCIATION
BOY/GIRL SCOUTS
BUSINESS ORGANIZATIONS
CHARITABLE ORGANIZATIONS
CHAMBER OF COMMERCE
CHURCHES
CIVIC ORGANIZATIONS
COLLEGES/UNIVERSITIES
COUNSELING CENTERS
FRATERNAL ORGANIZATIONS
HEALTH AGENCIES
HIGH SCHOOLS
HOSPITAL AUXILIARIES
SENIOR CITIZENS CLUBS
SOCIAL SERVICE AGENCIES
SOROPTOMISTS
TEACHERS
TRADE UNIONS
HOMEMAKERS
JUNIOR CHAMBER OF COMMERCE
KIWANIS
LEAGUE OF WOMEN VOTERS
LOCAL LIBRARY
LIONS CLUBS
MEDICAL PROFESSION
NEWS MEDIA
ORGANIZATIONS OF BUSINESS AND PROFESSIONAL PEOPLE
OTHER PROFESSIONAL ORGS.
PARENT/TEACHER ASSOCIATION
PRIVATE CLUBS
PUBLIC SAFETY AGENCIES
RECREATION CLUBS
ROTARY CLUBS
SALVATION ARMY
YM/YWCA
VOLUNTEER ORGANIZATIONS

Figure 16

Figure 17

RECRUITING POSSIBILITIES

DISPLAYS/EXHIBITS

Bank lobbies, supermarkets, schools, libraries, department store windows, malls, city/county complexes, etc. Any place where large numbers of people are likely to traffic. Consider having an agency person at the display/exhibit site to hand out brochures, applications and to answer questions about your program.

SPEAKERS BUREAU

Develop a list of speakers who are interested or involved in your program who will give talks about your program and its services to various local clubs/organizations.

PRESS RELEASE

Publish articles about existing program and/or place help wanted advertisements in your local newspaper, community magazine, shopper's guide, minority/ethnic group newspaper, school or other organization newsletter.

MEDIA

Most local radio, commercial or cable television stations will give public service announcements free of charge. Contact your local station on "how-to's".

STREET RECRUITMENT

Set up a "sidewalk" office in front of a frequently trafficked area (i.e. supermarket in a shopping center). All you need is a large sign listing your agency's volunteer needs, card table and chair, registration cards/forms (for future contact) and an enthusiastic, knowledgeable person to answer questions and conduct "on-the-spot" interviews.

MOBILE RECRUITMENT

Decorate a van or other large vehicle with posters signs advertising your program. This "roving" office can pick and choose locations people frequent.

VOLUNTEER FAIR

This is a great opportunity to bring family, neighbors, and friends together to educate them on the various opportunities available in your program. Combine with other organizations who utilize volunteer services.

MEET YOUR NEIGHBOR

Sponsor a home get-together with neighbors, friends, and/or family. Find a common interest/activity to combine with your recruiting efforts (i.e. cookie baking session, brunch, etc.).

OPEN HOUSE

Invite the public to tour your facility. Let them see your volunteer(s) at work and give them the opportunity to learn more about your organization.

WORD OF MOUTH

This is the **MOST** effective recruiting tool, yet it's not a planned action. If your volunteers are happy with your organization and the types of services they provide they will definitely "talk it up" with their friends and neighbors. A solid program sells itself - be sure yours is worth talking about.

Figure 17A

Prospective volunteers should be given an introductory letter (see Figure 18) and an application form (see Figures 19 and 19A). The application form will determine the skills of each applicant and allow subsequent assignment to suitable jobs.

Interviewing Candidates:

The successful use of volunteers requires people to be matched to jobs which best utilize their talents and skills. This can be facilitated by interviewing candidates and assessing their qualifications to perform various tasks. Use of a screening worksheet during the interview will assist the process (see Figure 20).

- Preparing for the Interview

  - ° Know the assignment you are trying to fill. Observe persons engaged in similar work. Evaluate both the positive and negative aspects of the tasks observed and discuss them with prospective volunteers.

  - ° Thoroughly review the application form prior to the interview. Determine what additional information you will need to obtain during the interview.

  - ° Plan the direction of the interview. Decide what information you wish to obtain. Develop questions to help you determine volunteer:

    Motivations

    Why are you interested in doing volunteer work?

    Attitudes

    What have you enjoyed most/least in previous volunteer assignments?

    Interpersonal Relations

    With what type of co-worker do you work best (i.e. goal oriented, mechanical, etc.)?

POLICE DEPARTMENT
JAMES E. ANTHONY
Public Safety Director
Chief of Police

CITY OF CHINO

Dear

Thank you for your inquiry about our Volunteer Program.

Our citizen assistants are efficient, highly motivated, and sincerely welcomed by staff members. A variety of assignments are performed within various offices of the Department. Volunteers may be asked to assist with clerical, research, or computer-related tasks. Although special skills are a plus, we provide on-the-job training and no previous experience is necessary!

Since assignments are limited, please complete and return the enclosed application form at your earliest convenience.

If you have any questions, you may contact me at (714) 627-7577.

Sincerely,

JAMES E. ANTHONY
Chief of Police

Jessie C. Pryce
Volunteer Coordinator
Special Services Bureau

Enclosure

Figure 18

13250 Central Avenue, Chino, California 91710
Mailing Address: P.O. Box 667, Chino, California 91708-0667
(714) 627-7577

Figure 19

CITY OF CHINO POLICE DEPARTMENT
VOLUNTEER APPLICATION

NAME _____ SEX ____/____
Last First MI M F

HOME ADDRESS _____
Street City Zip Code

HOME PHONE ( ) _____ MESSAGE ( ) _____

PERSON TO CONTACT
IN EMERGENCY _____ PHONE ( ) _____

CALIFORNIA DRIVER'S LICENSE NO. _____

KNOWLEDGE OF (Check as many as apply):

___Adding Machine/Calculator
___Typing (wpm_____)
___Shorthand (wpm_____)
___Filing
___Statistics Background
___Police Procedures
___Computer Hardware
___Computer Software
___Research Procedures
___Data Entry/Collection
___Art/Graphic Design
___Other_____

DAYS/TIMES AVAILABLE:

	(0800-1200)	(1300-1700)
Monday	_____	_____
Tuesday	_____	_____
Wednesday	_____	_____
Thursday	_____	_____
Friday	_____	_____

HAVE YOU EVER BEEN CONVICTED OF ANY CRIMES OTHER THAN MINOR TRAFFIC VIOLATIONS? Yes___ No___. If yes, please explain _____

_____

DO YOU HAVE ANY PHYSICAL LIMITATIONS? Yes___ No___

If yes, please explain _____

_____

Figure 19A

BRIEFLY STATE YOUR BACKGROUND EXPERIENCE (Use additional paper if necessary):

_____

_____

_____

_____

_____

BRIEFLY STATE WHY YOU ARE INTERESTED IN DOING VOLUNTEER WORK:

_____

_____

_____

_____

OTHER INTERESTS AND/OR HOBBIES:

_____

_____

_____

_____

_____ _____

Signature Date

Interviewer's Comments _____

_____

_____

__ID Badge/Card __Fingerprints __Background __Security Code

Figure 20

SCREENING WORKSHEET

Applicant's Name: _____ Date: _____

	Rating Range 1-10 Scale (10 = Superior)
1. Relationship between personal goals and the program.	
2. Appearance	
3. Attitude - (i.e., towards self, the program, and life in general)	
4. Openness - (Is applicant candid about feelings, doubts?)	
5. Objectivity - Ability to be non-judgmental)	
6. Does applicant have the insight into what the program involves?	
7. Does the applicant demonstrate understanding, compassion, empathy	
8. Willingness to perform additional duties beyond stated commitment.	
9. Leadership potential	
10. Your overall view of applicant's acceptability into program.	

Values

What do you like to do in your leisure time? What hobbies do you have?

Emotional Stability

How well do you work under stress or the pressure of rushed deadlines?

Decision Making

What are the most significant decisions you have made in your life?

Work Habits

How would you describe your work habits?

- Conducting the Interview

  - Provide a private, quiet setting where you can give the volunteer applicant your undivided attention.

  - Introduce yourself. Call the volunteer by name and show interest in him/her as an individual.

  - ***Listen***. Let the applicant tell his or her story and use your questions to bring out facts and clarify feelings, attitudes or concerns. ***Verify*** your understanding of what is really being said. Use non-directive questions to help you evaluate motivations, attitudes, etc. ***Be supportive.*** Interrupt only to keep the interview focused.

- Timing the Interview

  - An interview need only be long enough to elicit the information desired from the volunteer applicant and to answer his or her questions.

  - Keep the objective of the interview in mind. Use your questions to keep the interview within proper bounds. Be thorough, but keep the discussion focused on the job.

- ° Confine the interview to pertinent information. Concentrate on appraising the applicant's qualifications to work in the crime analysis unit. Attempt to match interest areas, talents and abilities to possible job assignments.

- Evaluating the Volunteer

  - ° Consider each fact in relation to all others. Avoid basing evaluations on first impressions, biases, etc. Be non-judgmental.

  - ° Consider the applicant's skills, knowledge, talents, abilities, interests, motivations, etc.

  - ° Note the applicant's body language, mannerisms, mental reaction time and organization of thoughts when answering questions.

  - ° Note applicant's evaluation of himself, what he thinks he can and cannot do and how well he feels he performs tasks.

  - ° Note the quality of self-prepared application forms, handwriting, ability to follow directions, clerical ability, etc.

- Closing the Interview

  - ° Thank the volunteer for his/her interest.

  - ° If not suited for your agency, redirect him to another agency or program.

  - ° If accepted, schedule orientation and training times.

  - ° If applicant rejects the assignment, be sure to note reasons. This will assist you in future interviews with other prospective volunteers.

Background Investigations:

Although each agency has its own policies regarding background investigations for volunteer workers, most will at least want to check state criminal history files for arrest records. If you are making

inquiries by mail, include applicant fingerprint cards. Driving records may be checked through Department of Motor Vehicle files.

Background investigations should not be done without the knowledge and consent of applicants. A written form for this purpose is shown in Figure 21.

Orientation Training:

Orientation training for volunteers should parallel that given any new employee. Volunteers should be introduced to members of the department, acquainted with organizational rules and regulations and familiarized with the operation of the crime analysis unit. Volunteers should also be given special identification cards to wear while on duty.

During orientation, volunteers should be informed of the tasks they are expected to accomplish and should also be familiarized with equipment they will use, told where supplies are kept and so on. Job descriptions should be reviewed and training schedules established.

Work hours should be discussed with volunteers during orientation. Most agencies allow volunteers to set their own work hours and this practice is not deleterious as long as volunteers adhere to the work schedules they have agreed upon. Allowing volunteers to come and go as they please is not advisable. It is difficult to plan work under such conditions and tasks planned for completion can be left unfinished or undone.

Supervision:

Volunteers assigned to crime analysis units are most often supervised by crime analysts. These people then become responsible for the work and actions of volunteer assistants.

Volunteers should be supervised in much the same manner as salaried personnel. Their work should be planned and evaluated and they should be given performance feedback.

Recognition:

Volunteers should be recognized for contributions to the agency they serve. They can be recognized formally at staff meetings, annual employee banquets or special luncheons or dinners held in their

honor. At the very least, they should be presented with certificates of appreciation, certificates of merit or similar written accolades. Volunteers may also be routinely recognized by supervisory comment, by notes congratulating them for jobs well done, by the sending of greeting cards on employment anniversary dates and so on. Feelings of appreciation will also be generated by using any products or ideas developed by volunteer assistants.

Other suggestions for volunteer recognition are shown in Figure 22.

POLICE DEPARTMENT
JAMES E. ANTHONY

CITY OF CHINO

FRED AGUIAR
Mayor
M. YANKEY
DIANE L. ERWIN
DICK SAWHILL
DENICE CILLOA

NAME _____ **DATE** _____

ADDRESS _____

POSITION APPLIED FOR: _____

I understand that this Background Investigation is done for Volunteer employment purposes only. It is to assess qualifications for this specific employment and is not to be construed as intended for any other purpose.

I understand that I will be given no feedback or results other than being notified of "passing" or "not passing". Also, I acknowledge that these records are confidential, and will remain the property of the Chino Police Department. They will not be made available to any other Police Agency or employer, for background purposes, without an Authorization to Release Information signed by me.

If I am not accepted for Volunteer service, I understand that this means only that I do not meet the standards established for the position for which I have applied.

Signed_____

Date_____

Witness_____

Date_____

Figure 21

honor. At the very least, they should be presented with certificates of appreciation, certificates of merit or similar written accolades. Volunteers may also be routinely recognized by supervisory comment, by notes congratulating them for jobs well done, by the sending of greeting cards on employment anniversary dates and so on. Feelings of appreciation will also be generated by using any products or ideas developed by volunteer assistants.

Other suggestions for volunteer recognition are shown in Figure 22.

VOLUNTEER RECOGNITION

RECOGNITION - Acknowledgement and Appreciation of Achievement.

Following are just a few ideas for recognition possibilities:

- Smile
- Say "Good Morning"
- Greet by Name
- Be Pleasant
- Be Patient
- Respect Sensitivities
- Recognize and Accommodate Personal Needs & Problems
- Take Time to Talk
- Say "Thank You"
- Send Cards for Special Occasions/Holidays
- Maintain Coffee Bar
- Provide Pleasant Working Conditions
- Accept Individuality
- Take Time to Explain Tasks
- Provide Opportunities for Job Growth
- Give Additional Responsibility
- Fully Orientate to Policies and Procedures
- Facilitate Personal Growth
- Keep Challenging Them
- Provide Substantial Training
- Introduce to Other Staff Members
- Plan Staff/Volunteer Meetings
- Hold Rap Sessions
- Celebrate Outstanding Projects and Achievements
- Plan Staff/Volunteer Social Events
- Invite to Volunteer Conferences or Workshops
- Plan Annual Ceremonial Events
- Afford Participation in Team Planning
- Offer Advocacy Roles
- Utilize as Consultant
- Enlist to Train Other Volunteers
- Award Special Citations for Achievement and Longevity
- Publish Volunteer Newsletter
- Send Newsworthy Information to Media

Figure 22

CHAPTER 7

DEVELOPMENT OF A MANAGEMENT OF PATROL OPERATIONS PROGRAM

DEVELOPMENT OF A MANAGEMENT OF PATROL OPERATIONS (MPO) PROGRAM

Prior to the 1900s, policemen patrolled beats on foot or horseback and police departments had to employ a large number of officers. This was particularly true for agencies serving large populations. Later use of the police car allowed fewer officers to patrol larger areas; response times were greatly improved.

Victims and witnesses could still only contact the police by waiting for the officer to come by or by calling the station and requesting that he be sent to their location. This was not always satisfactory and the introduction of radios in police cars of the Detroit Police Department during the 1920s significantly enhanced the ability of officers to respond to calls for service. The Wickersham Commission of 1931 concluded that "the radio in police work is assured a brilliant future."[15].

The radio-equipped police car remained the answer to police response problems through the first half of the twentieth century. Police administrators felt that criminals could be arrested and crime problems solved if only they had enough officers, cars and radios available. Much money was expended in pursuit of this objective. By the 1960s, however, this philosophy began to be questioned. With all the money spent on officer and equipment acquisition, crime still remained at unacceptable levels in many jurisdictions.

The Kansas City *Response Time Analysis* (1977) found that many serious crimes were not discovered until some time after they occurred and their solutions were unaffected by rapid police response. For remaining crimes—those in progress or just completed—*the time taken by a citizen to report a crime*, not the speed of the police response, was the major factor in determining whether or not an on-scene arrest would be made. Prompt reporting time—under 5 minutes—coupled with a speedy police response can have a significant impact on certain types of crime. But the study found that many

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15 David G. Monroe and Earle W. Garrett, under the direction of August Vollmer. Police Conditions in the United States, A Report to the National Commission on Law Observance and Enforcement, Patterson Smith Reprint series, 1968 as cited by William Spellman and Dale K. Brown in Calling the Police: Citizen Reporting of Serious Crime, (National Institute of Justice, October 1984), p. 17.

citizens delay before calling police and, with each additional minute, the chance of on-scene arrest drops. [16] Similar conclusions were reached elsewhere. The Police Executive Research Forum replicated the Kansas City study in Jacksonville, Florida; San Diego, California; Peoria, Illinois; and Rochester, New York. In their three year study of the problem, they found that:

- 86 percent of all calls were placed more than 5 minutes after the incident occurred—the time period critical for making an on-scene arrest
- on-scene arrests attributed to fast police response were made in only 2.9 percent of reported serious crimes
- fast response may be unnecessary in three out of four reported serious crimes.[17]

These findings were a jolt to police administrators throughout the nation. Over the years they had spent billions of dollars acquiring personnel and materiel necessary for quick response. Now they were being told that rapid response was seldom sufficient to effect the apprehension of criminal offenders.

Armed with this new information, police administrators began to question the wisdom of hiring increasing numbers of officers. This was an expensive practice to maintain and, in the high inflation of the 1970s, budgets were shrinking at an alarming rate. It became clear that the number of officers an agency had (so long as it had an adequate officer to population ratio) would not, by itself, create reductions in crime. Instead of recommending hiring of additional personnel to accomplish crime reduction, researchers encouraged administrators to employ techniques that made *more efficient use of existing departmental resources.*

The recommended techniques were revolutionary; they challenged widely held beliefs that:

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[16] Marc H. Caplan, Efficient Use of Police Resources, (National Institute of Justice, November 1983), pp. 2-3.
[17] Ibid.

- police calls should be answered on a "first come, first served" basis
- with few exceptions, only sworn police officers could be sent to calls
- police officers should be sent to the location of the caller.

Adherence to these beliefs was counterproductive to the police operation. Research demonstrated that police agencies could satisfactorily handle increased workloads without increasing their resources by:

- implementing call screening/call prioritization dispatch procedures
- utilizing non-sworn personnel to handle non-emergency, non-hazardous calls
- utilizing callback, telephone reporting, mail-in reporting and walk-in reporting techniques.[18]

Management of Patrol Operations Programs ensure that patrol resources (both personnel and materiel) are efficiently used to maximum effectiveness. This is best accomplished by designing procedures and establishing practices that:

- increase availability of field officers
- utilize alternative police response strategies to satisfy citizens' needs without sacrifice to the efficiency of the sworn patrol force
- properly deploy officers to enhance crime reduction and criminal apprehension efforts.

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[18] Since the 1970s, a number of patrol management studies have been conducted throughout the nation. Those reviewed for this text include the *Wilmington, Delaware Management of Demand Program* (sponsored by the National Institute of Justice); *Differential Police Response Field Test* (designed by the National Institute of Justice and conducted by the Garden Grove, California; Toledo, Ohio and Greensboro, North Carolina Police Departments); and the *Managing Patrol Operations Program Test Design* (sponsored by the National Institute of Justice and conducted by the Albuquerque, New Mexico; Charlotte, North Carolina; and Sacramento, California, Police Departments).

ALTERNATIVE APPROACHES TO POLICE RESPONSE

Implementation of Call Screening/Call Prioritization Dispatch Procedures:

Adoption of a call screening/call prioritization procedure allows the dispatcher to determine the nature of the call and the necessity of sending an officer. The *Police Referral in Metropolitan Areas* study conducted by the National Institute of Justice found that nearly 50 percent of all calls were handled by dispatchers without any further police involvement.

Calls which do require a police response are usually divided into two categories: critical and noncritical. Critical calls (those of an emergency nature) are answered first. Noncritical calls are put in a queue (referred to as "call stacking") and handled as time becomes available.

Use of call screening/call prioritization does away with the "first come, first served" police response and is extremely useful for maximizing patrol force efficiency. To work properly, however, the dispatcher must be trained to classify calls and to deploy agency personnel in accordance with departmental response guidelines. The caller must be advised if the call is to be held; citizens do not object to waiting for a response if they are told *in advance* that the response will be delayed and given a general idea of for how long.

Utilization of Non-Sworn Personnel:

Police perform many tasks that do not require a sworn police officer. Many departments have non-sworn personnel handle such requests; this allows officers to patrol their beats and quickly respond to emergencies. Trained civilians can take some types of reports, perform vacation house checks, home security inspections and similar crime prevention duties, handle parking and minor traffic problems, and provide a wide range of other services.

In a survey conducted by the Birmingham, Alabama, Police Department, people who had made noncritical calls and received a sworn officer response indicated that they would have been just as

satisfied with an alternative response that allowed better use of the officer's time. [19]

Utilization of Other Alternative Response Techniques:
It may not always be possible to send personnel to a caller and some agencies have developed alternatives to satisfy the caller without impeding efficiency of the force.

One alternative is the "callback". Dispatchers tell callers that someone will call back and provide the information requested. This technique works well as long as someone does, in fact, call back.

Three other techniques can be used for taking minor police reports. One instructs the caller to give the report over the telephone, a second sends a report form to the caller and lets him or her fill it out and mail it in. Both techniques work well as long as report forms are well designed, easily understood, and used only for minor incidents (e.g., petty theft where the stolen item cannot be identified, there is no suspect, or any information or evidence that might lead to the recovery of the item or discovery of the thief). A third technique requires the caller to come to the station to make the report.

Some agencies are able to send sworn officers to all calls, others are not. Those with limited resources may wish to adopt one or more alternative response strategies to increase patrol efficiency.

MANAGEMENT OF THE PATROL FORCE:

The patrol force is the largest and most costly resource of the police organization. But because of its size, it can be difficult to manage. We indicated earlier that random patrol produced random results and recommended that patrol supervisors "direct" the activities of their officers so as to make the most efficient use of them. Left to their own devices, patrol officers will generally approach the job in one of four ways. They will:

- be dependent upon the radio and *react* to situations rather than assuming a proactive role in discovering and handling problems

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[19] Ibid., p. 5.

- pursue activities that are personally appealing *regardless* of the needs of the individual beat

- pursue patrol activities based on *unconfirmed opinions* about area needs and departmental objectives

- take it upon themselves to obtain *current and accurate information* on their districts and then use it to guide them in the performance of their duties. [20]

These approaches leave policing the jurisdiction to the discretion of individual officers with the result that there is little, if any, effort directed toward the achievement of departmentally-identified objectives.

Needs Identification:

The first step in developing a Management of Patrol Operations Program is to identify the needs of the jurisdiction and the responsibility of the department to meet those needs. Often these encompass the following:

- protection of life and property

- protection of civil liberties

- provision of assistance to those who cannot care for themselves

- maintaining traffic flow

- provision of crime prevention services

- identification of community problems that may lead to criminal activity.

While these are all responsibilities of the department, they need not be the responsibility of the patrol force.

In order to maximize efficiency, the department must first establish which units will be given responsibility for each of the above. Priority for response must then be determined for responsibilities assigned to

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20 G. Hobart Reinier, et. al., Crime Analysis Operations Manual (U.S. Department of Justice, Law Enforcement Assistance Administration, June 1977), p. 2-3.

the patrol function. Calls involving immediate threat to life, felony crimes in progress, and the like should be answered first; other calls should be stacked or handled in accord with alternative response procedures.

Creation of a Manpower Distribution Study:

Creation of a manpower distribution study is the next step in the development of an MPO Program. The study determines how many officers the department needs in order to provide adequate service to the community. Throughout the country, the standard for large cities has been 1.5 to 2.0 officers per 1,000 population; local needs often alter this figure.

The study begins by examination of patrol activity logs, radio logs, dispatch run cards and/or information generated by computer aided dispatch (CAD) systems. Data obtained will indicate how much time is spent by officers in three general categories:

- responding to calls for service
- attending to administrative details
- preventive patrol activities.

An agency with only enough officers to keep up with calls and administrative tasks is understaffed. It must have the additional people necessary to give officers time (also known as uncommitted time) for proactive crime preventive activities. In general, uncommitted patrol time should range between 25 and 35 percent of the total time of the patrol force. The remaining 65 to 75 percent can be apportioned between responding to calls for service and performing administrative duties such as servicing the patrol unit, testifying in court, eating, transporting prisoners and so forth.

In determining how much time should be allocated to responding to calls for service, it is necessary to consider the time needed to respond to the initial call, plus any additional time required for follow-up investigation, report preparation, prisoner processing and related duties. Once the total required patrol time has been determined, it is necessary to convert this to patrol positions on the basis of the average number of days or hours a patrol officer can be expected to work in a given year. This is calculated by reviewing a sample of personnel time sheets for a one-year period. These sheets will

provide information regarding how many days each officer works along with the number of days lost due to vacations, holidays, illness or other absences. Once this has been determined, it can be divided into the total number of patrol hours required to provide the necessary staffing level. [21]

Once manpower needs have been determined, it then becomes necessary to equitably distribute officers among shifts. To provide a simple example of how this is accomplished, assume that a department has 100 officers and deploys them in three shifts. After examination of the data, it is found that 23 percent of all incidents occur on day watch, 46 percent occur on swing shift and 31 percent occur on graveyard. To determine the best distribution of officers for each of the three shifts, the total number of officers (100) should be multiplied by the percentage of incidents listed for each shift. Thus, day shift should have 23 officers (100 X .23 = 23), swing shift should have 46 officers (100 X .46 = 46), and graveyard should have 31 officers (100 X .31 = 31). In actuality, seldom will the numbers come out this evenly; but the method used to determine them will be the same. Moreover, they may be altered depending upon the nature of criminal activity in the jurisdiction. Two officers might be able to handle a typical disturbance call in some cities. In others, three or more officers may often be required.

Although the above method will help determine the number of officers needed by the department to adequately cover all shifts *throughout the year*, it must be remembered that the number of officers which need to be assigned on *any particular day* may vary. On Wednesday and Friday nights, for example, swing shift may account for 57 percent of all the day's incidents. In this case, were it to have but 46 officers assigned to it, the shift would be understaffed. A manpower distribution study must be expanded to determine the quantity of officers needed by the department annually, and on each shift during specific days of the week. Agencies will be unable to have the desired numbers of officers assigned to all shifts at all times. The goal, however, should be to approximate these numbers to the greatest possible degree.

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[21] Local Government Police Management, ed. by Bernard L. Garmire, p.128.

Creation of a Workload Analysis Study:

Once manpower needs have been determined, the next step is to evenly distribute officer workload by conducting a workload analysis study. This involves examining activities occurring in each beat (the geographical area patrolled by an officer), and then, if necessary, redrawing beats to evenly distribute the workload.

Our manpower distribution study indicated that since day shift had 23 percent of all incidents, it should have 23 officers assigned to it. What if 15 of those officers are busy all of the time and 8 are not? This indicates that beats are incorrectly drawn, and some officers are overworked while others are underworked. The solution to the problem is to redesign the beats by determining the percentage of total workload generated by each beat.. Assume that in a simple four beat system, day shift beat 1 has 42 percent of the workload, beat 2, 18 percent, beat 3, 31 percent, and beat 4, 9 percent. Officers working beats 1 and 3 are much busier than those working beats 2 and 4. Redraw the beats so that the workload is evenly distributed. In this example, beats 1 and 3 would probably be reduced and beats 2 and 4 would be increased.

Full explanations of how to conduct a manpower distribution or workload analysis study are available elsewhere and you are encouraged to refer to these references to assist you in in your work.[22]

Directed Patrol Planning:

Once the required number of officers has been determined, and workloads evenly distributed, the patrol supervisor can direct patrol toward the accomplishment of goals targeted by executives of the organization. Frequently, these goals relate to the suppression of specific criminal activities occurring throughout the jurisdiction.

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22 Patrol Deployment, by Margaret J. Levine and J. Thomas McEwen, September 1985; A Preliminary Guideline Manual for Patrol Operations Analysis, by Richard G. Grassie and John Hollister, June 30, 1977; Review of Patrol Operations Analysis: Selected Readings from TCAP Cities, by the Westinghouse National Issues Center, June 13, 1978; Managing Patrol Operations - Participant's Handbook, by Donald F. Cawley et al., 1977. All published by the U.S. Department of Justice, National Institute of Justice; Washington, D.C. 20531.

Random patrol is unplanned patrol, but "directed patrol" is planned and directs resources to have the greatest influence on identified crime problems. The crime analyst can be of great assistance to patrol supervisors in the identification process.

Implementation of a directed patrol problem begins with the analyst's collection and analysis of pertinent data. Information regarding existing or emerging crime problems is given to operations supervisors for their use in formulating "Directed Patrol Plans." These plans direct the use of uncommitted time to patrolling those specific areas having the greatest potential for criminal activity.

A "Directed Patrol Plan" should include the following:

- nature of the problem (burglary, robbery, gang, etc.)
- type of potential target (person, business, house, vehicle, etc.)
- time, location and days of week of occurrence
- suspect information (if any)
- patrol strategies available for problem resolution
- resources required for implementation of each strategy
- selection of the strategy to be employed

Once the plan has been implemented, it should be evaluated for effectiveness and the results made known to the crime analysis unit.

Role of the Crime Analyst in the MPO Process:

The crime analyst will provide the information necessary to create a system of policing that will foster the accomplishment of the following objectives:

- implementation of directed patrol efforts
- use of specialized tactical applications to abate specified crime problems**
- use of a more scientifically-based rationale for determining the strategic deployment of personnel

- an increased ability to achieve *predetermined* operational objectives.

These objectives are met by the analyst's examination and analysis of:

- crime rates by geographic area
- current deployment staffing patterns
- workload distribution patterns
- calls for service statistics
- current call prioritization/call management procedures
- alternative police response techniques.

Review of the above information will be of assistance to patrol operations managers and organizational executives. At the operations level, the data will guide more efficient utilization of organizational manpower. At the executive level, it will assist in accurately determining current and future resource needs. This facilitates the budgetary process and helps ensure that the department has the personnel and equipment necessary to adequately police the jurisdiction.

Officer Training:

Initial acceptance of a Management of Patrol Operations Program is likely to meet with resistance unless officers are properly trained and totally familiarized with it. People are resistant to change—and this program may change many aspects of the patrol operation. Beats may change. Hours of work and days off may change. Officers may have to become more accountable for their activities and the amount of time they spend on them. Civilians may be used to perform tasks previously done by sworn personnel. Officers accustomed to their freedom in the field may not appreciate a program which structures their activities.

Executive commitment to the program will help to overcome some resistance, but for MPO to be truly successful, training must be provided to patrol supervisors and officers Officers must realize that the MPO program is being implemented to maximize their crime suppression and apprehension efforts. Any transitional problems

which may occur should be viewed by officers as short-term inconveniences necessary to the developmental process.

Selling the Program:

Agencies which implement an MPO Program will be dependent upon the crime analyst to assist with the development of manpower distribution and workload analysis studies. He or she will also be required to provide information critical to creation of directed patrol plans. Beyond that, however, analysts will also have to help sell the program to the troops.

The Chino, California, Police Department developed its MPO Program in 1983. Though light-hearted in style, the memorandum which begins on the following page is serious in content. It was distributed to patrol supervisors to acquaint them with MPO goals and objectives and to remove any misconceptions they may have had about the Program. Should you so desire, you may use it to familiarize your staff with MPO concepts and promote the "sale" of the Program.

MEMORANDUM
CITY OF CHINO
POLICE DEPARTMENT

TO: **All Patrol Supervisors**
SUBJECT: **Management of Patrol Operations—What It Is and How It Came to Be**

Simply stated, the Management of Patrol Operations means managing patrol resources (primarily personnel) so that they are efficiently used to their maximum level of effectiveness. This is accomplished in two ways:

A. By establishment of Departmental policies which aid in the conservation of patrol resources. Such policies may include:

1. establishment of a call prioritization system
2. establishment of a civilian component to handle calls which do not require the expertise of a police officer
3. a mail-in or telephone method of reporting
4. a careful review of all jobs performed by officers and the elimination of those which can be done by others in the Department at less cost
5. establishment of a philosophy which strives to maximize the uncommitted time of officers such that they can *primarily* devote themselves to the identification of crime and the apprehension of criminals.

B. By the control exercised by the patrol supervisor over subordinates.

To be sure, the policies enacted by the executives of a police administration will determine the latitude given a supervisor to control his or her people. However, no matter what these policies may be, there are some things a supervisor can do which will usually, if not always, be in harmony with organizational objectives. These are summarized as follows:

1. If you still believe that more manpower is the answer to your problems, try to divest yourself of that notion. Hanging on to that concept will only prove counterproductive, and you will constantly be frustrated by the lack of bodies assigned to your shift.

   It is acknowledged that we *always* need a *minimum* number of personnel on each shift; the Department is aware of this and, as budgets allow, the City will try to hire additional people. But until you see new faces in briefing, try to mentally adopt the attitude that "what you see is what you get." Now, having adopted that attitude, what *can* you do with what you've got? Your answer might be, "I don't know what I can do because I don't know what I've got." And to a point, you are right!

   It has come to our attention that our monthly publishing of Part I crimes is of little value to patrol supervisors. How many burglaries occurred citiwide is not as helpful as knowing on what shift they occurred and in which beat. In recognition thereof, we are completely changing our reporting procedures and have instructed the crime analysis unit (CAU) to publish new documents that have been specifically designed to give you the information you need to answer the question, "What have I got."

2. Recognize that once you have answered this question, you must now address yourself to the question of "What do I do?" The search for the answer can be a very challenging and exciting experience.

   Lieutenants and sergeants in patrol have a responsibility to ensure that the citizens of this community are getting maximum effectiveness out of each officer we employ. And, since we only have a limited number of resources available to us, they must not be squandered. Just as you would not waste your family's assets, neither can you expend your shift's assets without due regard for your return on investment.

3. Realize that as patrol supervisors you have been thrust into the role of change agents. You hold your positions because of the faith and trust the Department has in you to keep watch over our most valuable resource—our people. You have the

power to lead them, guide them, and to help them grow personally and professionally. And, you most certainly have the responsibility, authority and the obligation to ensure that they are maximizing their potential and meeting the Department's crime suppression goals.

4. Come to the conclusion that if your officers are to meet the Department's crime suppression goals, then some of your supervisory styles may have to change. This should not taken negatively, but accepted positively.

   As a supervisor, you have officers available to you for eight hours of work each day. If this Department never exceeded shift minimums, this translates to at least 20,000 man-hours per year—20,000 man-hours that you, as supervisors, can control and put to use as *you* see fit.

5. Granted, there are some limitations placed on you which prevent you from controlling *all* of the time of your officers. But know that you can control some of it, perhaps a large majority of it.

6. Accept the fact that with a reduction in resources—and the mandate that both effectiveness and efficiency be maximized—will come *your* responsibility to manage the uncommitted time of your officers.

   In the months and weeks ahead, the CAU will be giving you information relative to what the crime problems are, where they are occurring and so on. The CAU never has and never will require that any action be taken. Its personnel may make recommendations in an effort to assist you with your strategic and tactical action planning efforts, but it will never impose itself on you. Thus, what you do with the information given you by the CAU will be up to you. However, recognize that inaction, in reality, is itself an action.

7. Reflect upon this as a new supervisory beginning. Soon you will have more crime information available to you and, as we continue to computerize our operation, you will have even more. Consider too that collectively you also have thousands of man-hours available to you—hours that you can use to attack specific crime problems.

The objective of the Management of Patrol Operations program is not to have officers driving aimlessly about their beats, but to have them concentrating on criminal activities in accord with the plans of action *you* set for them. Further, the Department is considering several alternatives to our current methods of policing. Primarily, we are attempting to identify those areas where the uncommitted time of each officer can be increased so that you will not only be facilitated in *your* efforts to develop Directed Patrol Plans, but will be able to develop them confident in the knowledge that you will have the creative ability to bring those plans to successful conclusions.

We conclude by once again repeating the question, "What can I do with what I've got?" The CAU will help you to answer the latter part of the question. Each supervisor must answer the first part of the question for himself. Obviously, you will be expected to do *something* with the information given you, but this should be no cause for concern. Each of you is already held accountable for what happens on your respective shifts.

No, this is a time for excitement and a time to be very creative. Let your imaginations go and think of new solutions to old problems. Can you take two people out of their beats and let them stake out an area? How about four hours in uniform and four hours in plain clothes? For burglary problems, could all of the units be concentrated in two or three areas and only broken away for emergency calls? Maybe yes, or maybe no. These may or may not be viable alternatives. The point is that you have the opportunity to be creative with the time of your people. They may resent the structuring of their time at first, but the positive results that will come out of this program should quickly counteract any negative feelings which initially appear.

I encourage you to review this information with your officers and to solicit their input. Consider the formulation of formalized Directed Patrol Plans and, as mentioned above, begin thinking creatively of some new ways to attack old problems. You have our help, your have your officers and you have their time. What can you do with what you've got? You can make a difference. The choice of determining *what* difference you want to make—and *how* you want to make it—we now leave up to you.

CHAPTER 8

DEVELOPMENT OF A MANAGEMENT OF CRIMINAL INVESTIGATIONS PROGRAM

DEVELOPMENT OF A MANAGEMENT OF CRIMINAL INVESTIGATIONS (MCI) PROGRAM

The purpose of developing a Management of Criminal Investigations (MCI) Program is to maximize the efficiency of the investigations component of the law enforcement agency. This is best accomplished through establishment of procedures that increase apprehension efforts and provide investigators with the time necessary to focus attention on those cases which have a high probability of solution.

It is impossible to eliminate all criminals from a jurisdiction. Lack of comprehensive information regarding all criminal events, coupled with limitations on police resources, make this an unattainable goal. A more realistic approach is to concentrate on individuals deemed to be, and often referred to as, career criminals, repeat offenders or habitual offenders. These individuals commit the majority of the crimes; their identification and apprehension should be the primary focus of law enforcement effort.

Accomplishment of this objective is made possible by developing each of the five following elements, which when integrated, provide the foundation for an MCI Program:

- expansion of the role of patrol in the preliminary (or initial) investigation process
- implementation of case screening procedures
- implementation of continuing investigations management procedures
- enhancement of police/prosecutor relationships
- monitoring of the investigations system.

Expansion of the Role of Patrol in the Preliminary Investigation Process:

Patrol officers historically played a small part in the preliminary investigation process. They were often viewed as report takers. Much of the initial investigative work they could have performed was deferred to detectives. This procedure failed to recognize that the patrol officer was in the best position to gather information and evidence which could later become lost or destroyed. Since patrol

officers were not allowed to investigate criminal incidents to any appreciable degree, agencies had to employ many detectives for this purpose, clearly an inefficient use of personnel.

Preliminary investigation is the most important part of the investigative process. It determines:

- whether a crime has actually occurred
- the type of crime
- the location, date and time of the crime
- the identity of the victim
- solvability factors (reasons to believe that a suspect can or cannot be identified and apprehended)
- what follow-up action needs to be taken.

Another objective in completing a thorough preliminary investigation is to eliminate the need for detectives to later duplicate the officers' efforts. Acting on information provided initially, detectives should be able to proceed with an inquiry without having to repeat earlier data collection procedures.

Some departments allow patrol personnel to pursue an investigation until all leads have been exhausted. In these agencies, an officer may spend one or more entire shifts on one case. He or she may contact additional victims or witnesses, attempt to find a suspect, search for more evidence, etc. This officer will continue with the case until such time as a suspect is apprehended or the case comes to a dead end. This practice is common in small agencies which have few, if any, investigators.

Most agencies have patrol personnel collect basic information and then return them to general patrol duties. Few departments can afford to have patrol officers tied up on one or two cases for an entire shift. If patrol officers become overly involved in investigations, an agency can easily lose its ability to quickly respond to emergency situations and routine calls for service. If a department does not have the resources to provide an intensive effort, preliminary investigations should usually be limited to the capture of data which can be obtained by

patrol officers at the crime scene. Once this information has been obtained, it can be turned over to detectives for further investigation.

Implementation of Case Screening Procedures:

In this process, cases which can be solved are separated from those having little chance of solution. Investigative managers assign only solvable cases to detectives; others are administratively deactivated or closed unless the discovery of new information warrants reactivation and review.

Use of a case screening process provides an objective basis for determining whether or not a case should be assigned for follow-up action. Often this decision will be based upon the number and nature of "solvability factors" identified during the preliminary investigation.

Solvability factors are those data or circumstances that indicate the *potential* for case solution. Where many—or particularly significant—solvability factors exist, the probability of solving a case is high. Where none or very few exist, the probability is low.

The existence of solvability factors is determined by patrol officers during the preliminary investigation process. On the basis of information and evidence obtained, they will answer the following or similar questions:

- Was there a witness to the crime?
- Was a suspect arrested?
- Is a suspect named?
- Can a suspect be located?
- Can a suspect be described?
- Can a suspect be identified?
- Can a suspect vehicle be identified?
- Is the stolen property identifiable?
- Is there a significant MO?
- Is significant physical evidence present?

- Is there a good possibility of solution?
- Is further investigation needed?

These questions are usually included in the body of the officers' reports and are subsequently reviewed by investigative managers. Responses to the questions will help managers determine if assignment of the case to an investigator is justified.

Consideration of solvability factors weighs heavily in case assignment determinations, but other factors also play a part. These include the quality of preliminary information presented by the investigating officer, the officer's belief that follow-up action is necessary, or the nature of the case itself. Homicides are always given the benefit of a comprehensive investigation regardless of how many solvability factors are initially identified. Many sex crimes, shootings, and other major crime incidents receive similar treatment.

Implementing case screening procedures focuses the efforts of investigators on those cases having high potential for solution. This makes for a more efficient use of manpower.

Implementation of Continuing Investigations Management Procedures:

The purpose of implementing these procedures is to increase the efficiency of the investigative process, not to create a productivity measurement tool to "keep track of people and tell them what to do." Any attempt to use the program to these ends should be strongly discouraged.

Some investigators resist attempts to manage the investigative process; they, too, have become accustomed to freedom and may resent intrusion into their activities. Further, with the implementation of investigative management procedures, investigators will be held increasingly accountable for their time and for the progress of their investigations. This may also cause resentment.

Resistance can be overcome if investigators are informed that investigative management procedures are being developed to enable them to more efficiently investigate their cases and to bring them to successful conclusions. They may be skeptical of this assertion initially, but as their ability to solve cases and apprehend criminals increases, their resistance will diminish.

Enhancement of Police/Prosecutor Relationships:

The goal of developing a well-coordinated crime analysis, MPO and MCI Program is to identify and apprehend career criminals *and* to successfully prosecute them. A strong link between the law enforcement agency and the prosecutor's office is required for this goal to be achieved.

The primary benefit derived from developing this link is improvement in communications. Feedback from the prosecutor's office keeps investigative managers apprised of inconsistencies between changing prosecutorial policies and police investigative priorities and provides police administrators with timely information relative to completeness and quality of their agency's investigations.

The formal relationship between police and prosecutor should recognize the value of working together for the accomplishment of mutually desired objectives. Prosecutors should be willing to train investigators in areas of concern to the court, and police administrators should demonstrate willingness to cooperate with prosecutors by adopting policies and procedures necessary for properly preparing and presenting cases.

Neither police nor prosecutor can convict an offender alone; a concerted, coordinated effort on the part of both is required. Successful convictions are only obtained when each knows the capabilities and limitations of the other, shares expertise, and cooperates to the highest degree possible to maximize probability that cases will be adjudicated to the ultimate satisfaction of both agencies.

Monitoring of the Investigations System:

Monitoring of the investigations system, a mechanism developed to provide feedback on the entire investigative process, is a continuing activity that assesses the strengths and weakness of an MCI Program. Properly done, monitoring allows management the opportunity to determine if investigative goals are being met. Issues to be examined during the monitoring process include:

- has the quality of preliminary investigations improved?
- has the time necessary to investigate solvable crimes increased?
- have more suspects been identified and apprehended?
- have more cases been referred to and accepted by the prosecutor's office for prosecutorial action?
- have conviction rates increased?
- have case clearance rates increased?
- have investigative caseloads been more equitably distributed?

Affirmative answers to these questions indicate that the MCI Program is successful; negative answers may mean that additional training or program restructuring is necessary.

Proper evaluation of an MCI Program requires that investigative managers collect and analyze data relative to case assignments, case progressions, clearance rates, conviction rates and so on.

Role of the Crime Analyst in the MCI Process:

Once an MCI Program is developed, the analyst will be responsible for providing investigators with suspect leads and may be asked to keep statistical data. The analyst should keep records relative to:

- the percentage of all reported crime that is initially deemed solvable
- the percentage of solvable crime that is solved
- optimum length of assigned cases
- average length of assigned cases
- determination of optimum investigative caseloads
- percentage of investigator time available for investigation

- percentage of investigator time spent on administrative duties
- number of cases closed by:
    - ° arrest
    - ° referral to other agencies (juvenile authorities, diversion programs, etc.).
    - ° exception (suspect commits suicide, is killed by police, victim refuses to prosecute suspect, etc.).
- number and types of cases referred to and accepted for prosecution by the prosecutor's office
- number of cases rejected by the prosecutor
- reasons for case rejections
- number of convictions obtained.

It is possible that the police agency developing this program has never kept these types of records before. A considerable amount of the analyst's time may be spent gathering the data needed to properly monitor the investigative process. Resist the urge to relegate this task to a position of minor importance! Examination of these data is necessary, for it will identify investigative training needs, assess any need for change in the investigative process, and ultimately contribute to the heightened efficiency of the entire law enforcement operation.

CHAPTER 9

AUTOMATION ISSUES

AUTOMATION ISSUES

Agencies need not have automated information systems to have effective crime analysis units. However, data collection, collation, retrieval and analysis are greatly facilitated by the use of a computer system.

Several companies throughout the United States sell information systems that have been specifically designed for the law enforcement community. These range in price from several thousand to a million dollars or more depending upon the overall sophistication of the system. Because of the cost involved, administrators considering the purchase of an automated system should be certain that any system proposed will adequately meet agency needs. It makes no sense to purchase a large system when a smaller, less expensive one will suffice. On the other hand, a small system that has limited capabilities to process data or is quickly outgrown will be of little benefit to the organization.

The best way to determine what type of system will be of greatest service to an agency is to conduct an automated needs assessment study. These can be conducted by private consultants or in-house personnel familiar with computer systems and should address the following issues:

- what are the outputs desired by the system?
- what data will need to be collected and disseminated?
- what software will be needed to accomplish automation goals?
- what hardware will be needed to accomplish automation goals?
- what resources will be required to develop an automated system?

Prepared by Fred Cotton of SEARCH Group, Incorporated, the material which follows lists the primary information system features and functions which were considered desirable by one police department. Needs of other agencies may be different. This list is not intended to replace a needs assessment study, but to acquaint you with some of

the automated outputs desired by various divisions, units and bureaus of a typical law enforcement organization.

RECORDS DIVISION

CRITICAL:

- Master name and index file
- Call up reports by case number, names, assigned officer, type of crime
- UCR, BCS and arrest register
- Warrants System
    - ° Track all warrants
    - ° Recall warrants by name, docket, case number
    - ° Track abstracts
- Ability to print complaint forms based on system data
- Single entry for information into the system
- Rapid movement from one screen to another without going through a hierarchy of menus
- Ability to generate form letters based on data in the system
- Maintain stolen/recovered/stored/impounded vehicle files
    - ° Abatement
    - ° Evidence
    - ° Impounds
    - ° Value information
- Word processing capability for case narrative linked to case information. The system should have the ability to download the narrative to hard copy and clear it from the

system under the control of the system administrator.

- Audit trail for copies of any case
- Password security system with different levels of security
- Uninterruptable power supply (UPS) back-up

SHOULD BE INCLUDED:

- Soundex search on master name index file
- Ability to link names and AKAs in the master name index
- Ad Hoc query capability on any field across all files
- Vehicle information file linked to master name index file
- Warrant due diligence record
- Warrants linked to master name index file
- Registered persons file
    - ° Narcotics
    - ° Sex
    - ° Arson
    - ° CCW Permits
- License files
    - ° Bicycle license
    - ° Card rooms
    - ° ABC violations
    - ° Pawn shops/second hand dealers
- Track traffic citations
- Track traffic accidents
- Maintain case file number log for audit trail purposes by
    - ° Victim name
    - ° Date

- ° Occurrence
- ° Location
- ° Officer

- Maintain business emergency information files
- Electronic spreadsheet capability for budget preparation
- Events calendar for all departmental activities
  - ° Tickler file when appointments or key upcoming dates

OPTIONAL:

- Prepare duty schedule for records personnel
- Probation, Parole search conditions and information
- Maintain inventory of Department property
  - ° Shotguns
  - ° Vehicle fleet
  - ° Equipment assigned to officers
  - ° Supplies
- Traffic accident/enforcement analysis module

PATROL OPERATIONS

CRITICAL:

- Officer, shift and division activity log information
  - ° Type of arrest (felony, misdemeanor, warrant, citizen)
  - ° Reports taken by type (felony, misdemeanor, traffic, etc.)
  - ° Citations issued (hazardous moving, other moving, parking)
  - ° Specialized miscellaneous activity tracking

. Bar checks

. Citizen assists

. Abandoned vehicles

. Other

- Activity broken down by
  - ° Type of call
  - ° Day of week
  - ° Month
  - ° Time of day
  - ° Reporting district or location for multiple beat systems
- Field contact report file with query capability on any field for combination of fields
- Ad Hoc Query capability for incidents and traffic by any field

SHOULD HAVE:

- Officer scheduling information for any given date range
  - ° Number of officers working
  - ° Number of officers off
  - ° Officer shift assignment history
    - . Vacation scheduling compared to work schedules
- Tracking officer schedules and work hours (overtime, comp. time, vacation, etc.)
- Crime/workload analysis function with pre-programmed reports
  - ° Analysis of individual officer activity with standard

deviation for reasonable expectation of productivity

OPTIONAL:

- On-line Departmental manual or emergency response procedures
- Emergency resources file
    - ° Skilled personnel
    - ° Special equipment
- Mutual and requests/responses

ADMINISTRATIVE SERVICES

CRITICAL:

- Ad Hoc query of data elements across all files
- Do analysis on Juvenile, Parolees and Probationers
- Ad Hoc report generator capability
- General word processing
- Specialized security for internal affairs documents
- Electronic spreadsheet with graphing capability
- Track Neighborhood Watch groups

SHOULD BE INCLUDED:

- Ability to generate mailings to Neighborhood Watch groups
- Ability to identify incident by Neighborhood Watch group
- Sign-out register for Crime Prevention equipment
- Maintain employee training files
- Maintain employee personnel files

- Have system key operators on required training due dates
- Mail merge capability for word processing
- Forms generation for word processing
- Spell checking and thesaurus capability
- Computer aided design/drawing function
- Presentation quality output device
- Desktop publishing capability for crime prevention
- Ability to create and maintain unique database files

OPTIONAL:

- The ability to move information from the database files directly into the electronic spreadsheet

INVESTIGATIONS

CRITICAL:

- Case tracking/Case management
- Track case status (open, pending, closed, court dispositio etc.)
- Case assignment
- Ad Hoc query across all files

SHOULD BE INCLUDED:

- Crime trends by
    - ° Reporting district
    - ° Time
    - ° Date

- ° Day of week
- ° Crime type
- ° M. O.

- Statistical workload of individual investigators
- Statistical workload of investigations division
- Track bad check files with the ability to
  - ° Search checks by name of subject
  - ° Identify amount owed/paid
  - ° Search by victim's name
- Query premises history files

OPTIONAL:

- Generate check notices based on information in the check files

TRAFFIC BUREAU

CRITICAL:

- Accidents/enforcement by
  - ° Primary violation
  - ° Location
  - ° Day of week
  - ° Time of day
  - ° Officer
- Accidents/enforcement by specialized category
  - ° DUI
  - ° Bicycle

- ° Pedestrian
- ° Hit and Run
- ° Hazardous materials

- Ad Hoc query capability into traffic files

SHOULD BE INCLUDED:

- Inquire as to returned reports
- Status of reports (pending, completed, follow-up required, etc.)
- Ability to log citizen complaints by violation or location
- Ability to track temporary statistical information on accidents and enforcement activity
  - ° DUI during specified periods
  - ° Seat belt violations vs accidents
  - ° Commercial vehicle enforcement activity
- Tracking parking functions
  - ° Parking meter reliability
  - ° Parking meter complaints
  - ° Complains forwarded to court
- Track drivers license suspension/revocation orders
- Computer aided design/drawing with template files of intersections and measurements
- Electronic spreadsheet for skidmark-speed analysis
- Tracking blood-alcohol levels by
  - ° Case
  - ° Officer
- IBM compatibility for data exchange with PWC

- Track traffic and engineering surveys for city locations
    - Feed accident data into survey data

OPTIONAL:

- Track habitual violators

PROPERTY SECTION

CRITICAL:

- Locate items by case file number or by name
- Track property by type
    - Evidence
    - Stolen/recovered
    - Found
    - Safe keeping
- Track property by classification
    - Narcotics
    - Vehicles
    - Firearms
    - Explosives
    - Hazardous materials
- Ad Hoc file query capability on property by any property field
- Maintain chain of custody information

SHOULD BE INCLUDED:

- Generate form letters
- Purge property list based on user defined criteria

- Find property by date of occurrence
- Track court disposition/destruction orders
- Find property by
    - ° Officer
    - ° Location
    - ° Storage location
    - ° Serial, model or ID numbers
    - ° NCIC/FCN file control numbers
    - ° Classification
- Check stolen files against recovered files
- Prepare auction list
- Track estimated value of property
- Track recovered and stolen bicycles
    - ° Compare against bicycle license files
- Generate a master inventory list

OPTIONAL:

- Bar code tracking

REQUEST FOR PROPOSALS:

Once informational needs of the agency have been assessed, it is necessary to obtain purchase bids from prospective system vendors. This is accomplished by writing a Request for Proposal (RFP) and distributing it to vendors who provide automated products and services. The RFP explains project objectives, system requirements, the scope of services to be provided and so on. The following material is presented as a guide to help you prepare an RFP:

I. PROBLEM STATEMENT:

- Indicate in general terms the problems encountered with the current system.
- Explain the steps which have been taken to correct those problems.
- Explain the success or failure of the actions already taken.
- List the alternatives to the current system and the reason for the agency's choice of the proposed plan of action over the other alternatives.

II. STATEMENT OF OVERALL PROJECT OBJECTIVES:

- List the objectives of the new system.
- Identify the general areas which the system would improve.

III. DETAILED SYSTEM REQUIREMENTS:

- Group the system requirements into functional areas

  Example: CAD requirements

  - Provide multi-user, multi-tasking operating environment with the ability to show split-screen tasks.
  - Provide for E-911 interface allowing location information to be downloaded into the system from telephone company records.
  - Provide a geo-base capability allowing cross reference of call location and premises history information.
  - Provide for a master system time source for logging call information and other time related references. This system must be able to function properly in the event of power failure.
  - Provide for entry and validation of data describing all types of emergency incidents.
  - Assist the communications operator in rapidly and accurately determining the location of each incident.

- Assist the operator in screening out redundant reports of previously reported incidents.
- Notify the communicator of potentially hazardous situations associated with the incident.
- Assist the communicator in selecting the optimum combination of field units for assignment to each incident.
- Assist the communicator in verifying that units have acknowledged and are responding.
- Support status entry from mobile terminals and continuously monitor and display the status of all emergency field units, assigned and unassigned.
- Alert the communicator when a unit has not checked in within a specific preset time. Allow a manual override of the alert message/tone.
- Provide for on-line emergency information on businesses and other facilities and services.
- Provide known associates information for all persons in the system.
- Provide hard copy information for use in reverting to manual mode operation in the event of system failure.
- Support switching of messages, in digital form, among all mobile and fixed terminals within the system.
- Provide on-line access to state and federal systems including CLETS and NCIC. Provide user ID and audit trail on all request for outside information.
- Provide on-line maintenance of all required databases.
- Provide a complete detailed log of all system transactions in machine-processable form, for on-line review and processing to provide management and administrative reports. (Describe all required reports.)

Example: Investigations

- ° Provide query capabilities across all files and fields or combination thereof.
- ° Provide for case tracking and assignment
- ° Provide for crime analysis inquiry by location, time, date, day of week, reporting district or beat, type of crime and modus operandi.
- ° Provide monthly management reports (describe reports).
- ° Provide tracking of evidence, stolen property, pawned property and recovered property along with cross reference or search capability.

- Number the system requirements and use a sub-numbering system to identify specific tasks under each group.
- This section explains the precise needs of each section to be automated. It describes the manner in which systems must interact and the data which must be available. It is, in fact, the detailed description of the systems' functions.

IV. SCOPE OF SERVICES TO BE PROVIDED BY THE CONTRACTOR:

- A general overview of the services to be provided.
- A description of the software/hardware requirements.

V. PROPOSAL AND CONTRACT REQUIREMENTS:

- Identify the vendor's responsibility in the following areas:
  - ° Installation of all hardware and software at the site.
  - ° Maintenance of hardware and software
  - ° Upgrades of hardware and software

- ° Maintenance of databases (back-ups, purges, etc.)
- ° Requirements for the system to interact with CLETS/NCIC system for data exchange.
- ° Training of system administrator
- ° Training of users
- ° Continued training of new staff
- ° Response time maximums for queries
- ° Response time maximums for maintenance
- ° Graduated acceptance/payment agreement
- ° Disclaimer on agency's right to select another vendor if a contract agreement cannot be reached.
- ° Vendor to keep all information on this project confidential and secure from unauthorized file access.
- ° The vendor will agree to place the source code and technical documentation in escrow against the possibility of the vendor going out of business.
- ° The agency will own the source code and technical documentation for the software in the event the vendor goes out of business.
- ° Time lines for each phase of the project and penalties for late responses to the time lines unless approved by both parties.

VI. EVALUATION CRITERIA AND SCHEDULE:

- Identification of an evaluation committee
- Identification of any other independent evaluation(s)
- Evaluation schedule with specific dates for evaluations of the system
- Deadline for RFP mailings

- Proposals due
- Evaluation and notification of vendor
- Completion of contract negotiations
- Approval by governing council or board
- Start date for the project
- Date of first evaluation report and related payments
- Date for subsequent evaluation reports and related payments
- Date for final acceptance or rejection of the system and related payments

VII. PROPOSAL FORMAT AND CONTENT:

- The submitted proposal should be organized in the following format:

  ° Title Page

  The title page will show the vendor's name, the system title and the date.

  ° Letter of Introduction

  The vendor must state exactly what they are bidding on. Within a one page limit, the following must be included: vendor's name, address and a statement as to whether the vendor is an individual, partnership or corporation. The letter will be signed by an individual, partner or officer of the corporation authorized to bind the corporation, depending on the legal nature of the vendor. It will also name the person or persons who will be authorized to make representations for the vendor, their addresses and telephone numbers. If this quotation is a joint venture or involves subcontracting, this must be stated in the letter of introduction.

° Table of Contents

There will be a comprehensive "Table of Contents" of material included in the proposal. This index must include a clear definition of the material identified by page number and by section reference.

° Description of the System Proposed

The vendor must describe in detail the proposed content of the work products identified in this project in the section entitled "Scope of Services to be Provided by the Contractor".

° Budget and Project Bid

The vendor must specify in this section a cost breakdown showing the total maximum cost to the requesting agency for this project. The budget should be submitted with the understanding that it will be final and will not be exceeded. The requesting agency reserves the right to open the project bidding to other potential vendors in the event the project budget cannot be mutually agreed upon.

Along with the cost data outlined above, the vendor should indicate the basis and method of billing the requesting agency. All services and other items to be billed should be specifically identified along with a full schedule of billing rates.

Time is of the essence on this project. The vendor should specify a project time schedule that recognizes the need for prompt completion of project goals. The vendor will submit a detailed time schedule for completion of work products specified in the "Scope of Services to be Provided by the Vendor" section of this document. This time schedule should indicate the monthly billing projected for work products identified in the budget, as well as the delivery date for each product.

° References and Company Information

The vendor will submit a list of current installations of the proposed product including the agency name, agency address, zip code, contact names, telephone numbers and system installation date.

The vendor will also include the following information about their corporation: Date incorporated or established, number of full time employees, total number of installations, average product cost.

° Resumes of Key Project Staff

The resumes of all key project staff will be included in this section. The requesting agency reserves the right to investigate all resumes.

° Affirmative Action Plans

Affirmative action plans of the vendor and sub-vendors (if any) shall include statistical documentation of affirmative action activities.

° Acceptance of Conditions

By submitting a proposal the vendor affirms that they accept the following conditions, any of which may be included in the contract to be entered into by the requesting agency and the vendor.

The requesting agency may require whatever evidence is deemed necessary relative to the vendor's financial ability to complete the contract.

The vendor shall, as a condition of the contract, post a performance bond and/or agree to the withholding of a specified percentage of the contract pending satisfactory completion of the contract.

The requesting agency reserves the right to ask for further information from the vendor either verbally or in writing.

Requests will be addressed to the person(s) authorized by the vendor to represent the vendor.

The requesting agency reserves the sole right to evaluate the vendor's representation.

The requesting agency may select a vendor from those submitting proposals. Said selection shall be made on the basis of the evaluation criteria set forth in this invitation. The requesting agency reserves the right to have an independent corporation or individual evaluate any submitted proposals. The names of selection committee members shall not be disclosed until the selection of the successful vendor is made.

When the vendor has been selected by the evaluation committee, the requesting agency and the vendor will negotiate a contract for submission to the City Council for consideration.

The requesting agency may cancel this project without any cost or obligation at any time up until the award of the contract. In the event agreement cannot be reached with the selected vendor, the requesting agency reserves the right to select an alternate vendor.

° The following conditions are to be accepted by the vendor if any work is subcontracted:

1. The vendor is the prime and responsible party for contracting and communicating the work to be performed and for channeling other information between the requesting agency and the sub-vendor(s).

2. The vendor assumes total responsibility for the quality and quantity of all work performed whether it is undertaken by the vendor or is subcontracted to another vendor.

3. If sub-vendor involvement is required in the use of a license, patent, or proprietary process, the vendor is responsible for obtaining written authorization for the sub-vendor to use the process or for providing another process, acceptable to the requesting agency, which is comparable to

that which is required. This will be done at no additional cost or liability to the requesting agency.

4. Any subcontracting must be specified in the vendor's proposal. Any subcontracting will need prior, expressed approval from the requesting agency.

° Financial Statements and Contract

The most current financial statements available, to include income statement and balance sheet, showing the vendor's current financial status will be presented in this section. In addition, a copy of the vendor's proposed contract should also be included.

° Other

Within their quotations, vendors should define any areas of this request for proposal to which they take exception. Identify the specific part and paragraph and the reason.

° Additional Information

Material and data not specifically requested for evaluation but which the vendor feels is essential must not appear in the proposal section but may appear only in this section. This has reference to the following types of data:

1. Standard sales brochures and promotional material with minimal technical content.

2. Pictorial material of the type used as space fillers.

3. Generalized narrative of non-specific nature.

4. If there is no other data the vendor wishes to present, this section shall contain the statement "There are no additional items we wish to present."

VIII. APPENDIX A DETAILED PROBLEM STATEMENT AND OPERATIONAL ANALYSIS

° This section should include a narrative description of all tasks currently being performed in the areas to be announced.

- Each functional area of the agency should have a separate section and each task should have a separate sub section.

- This section must give the vendor enough information about the operation of the agency to allow it to determine what software package will best meets its needs.

IX. APPENDIX B - BACKGROUND STATISTICS

- Include statistical data from the agency concerning volume of calls for service, information storage, numbers of arrests, reports, personnel, etc.

- The information in this section will be used by the vendor to determine the size and scope of the system.

X. APPENDIX C - FACILITY DESCRIPTION

- A detailed description of the facility, including where computer work stations will be placed, power sources, CLETS/NCIC lines, 911 phone system and any other information concerning the physical layout of the facility should be provided here. A blueprint type drawing of the office layout should also be included in this section.

XI. APPENDIX D - STAFFING

- This section should contain information on the organizational structure of the requesting agency. Organizational charts and manpower breakdowns assist the vendor in anticipating the number of work stations necessary.

- A functional relationship matrix may also be helpful in this area.

CHAPTER 10

OVERCOMING RESISTANCE TO THE CRIME ANALYSIS PROGRAM

OVERCOMING RESISTANCE TO THE CRIME ANALYSIS PROGRAM

If you are just beginning to develop a crime analysis program, the title of this chapter may be a little disconcerting for it presupposes that program development efforts will, in fact, be met with resistance. This is not true for all agencies; but it occurs in enough of them that its discussion is warranted. Don't panic! The encountering of at least *some* resistance to your program is normal and should be no cause for concern if you have prepared for and developed strategies to deal with it.

One would think any program that could provide law enforcement officers with suspect leads, accurate knowledge of when and where crimes are occurring, and a heightened ability to identify, apprehend, and successfully prosecute criminals would be warmly received. Why might people be resistant to it? Because of the misconceptions they may have about the program. These misconceptions, in tandem with strategies that can be employed to overcome the resistance they engender, are discussed below.

PROGRAM MISCONCEPTIONS:

The "Here We Go Again Syndrome":

"Innovative" law enforcement programs have been presented over the last 20 years, each with much fanfare, and touted as *the* program to cure all ills. Many never lived up to expectations and people became skeptical as a result.

The announcement that another "unique" program is about to be unveiled may therefore be met with cynicism. We too have been disappointed with past programs, but believe that this program works and can be of tremendous assistance to police departments. Convincing others of its merit, however, may not be an easy task.

Strategies For Overcoming Resistance:

1. Acknowledge that past programs have been ineffective, and often fostered feelings of unfulfilled expectations.

2. Recognize that experience with unsuccessful programs may have created a general feeling of skepticism; accept this as natural, and do not take it personally.

3. Request that the chief executive meet with staff and user group members to explain program benefits. If in-person meetings cannot be arranged, request that the chief executive circulate a department-wide memorandum to accomplish this objective.

4. Use the publications referenced in this book to cite the success of agencies which have adopted the program.

5. Invite representatives from successful crime analysis programs to share their experiences with staff and user groups.

6. Offer to take staff and user group members on visits to other crime analysis programs. Arrange to have them talk with crime analysis personnel, patrol and investigative officers, supervisors and executives.

Is This Productivity Measurement in Disguise?:

Because the crime analysis unit collects a wide variety of information regarding everything from the number of criminal incidents that occur to the number of hours spent on continuing investigations, some people consider the unit's repository of information a source which can be accessed by management to measure productivity. Those who fear this possibility have the gut-wrenching feeling that "the brass is going to find out about me and they're going to fire my rear end! I'm going to lose my job!" This is not likely to happen—at least not as a result of *this* program. And if it does? Well, the brass probably knew about these individuals' lack of effort long before you walked through the door.

Strategies to Overcome Resistance:

1. Be sure executives realize that the crime analysis program is not designed to monitor productivity and encourage them to resist using it for this purpose.

2. Focus *primary* effort on materials that personnel will consider beneficial rather than detrimental to them (crime information, suspect leads, etc.). [23]

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[23] It is unlikely that you will be able to avoid collecting this information forever. For that matter, it will be necessary when you develop your MPO and

3. Take advantage of or create opportunities to explain the true purpose of the program. Promote the understanding that, with implementation of the program, the agency will develop a heightened ability to identify and apprehend criminals.

Computers Will Replace Us All:

Most departments have reaped significant benefits from automating. Implementation of a crime analysis program often serves as the impetus to computerize a law enforcement agency; some people fear a loss of jobs as a consequence. We are unaware of any police agency which dismissed personnel solely because it acquired computers. As a general rule, the only thing that happened was that people were freed to perform other tasks. Automation serves to *create* jobs in many agencies.

We have been amazed at the paranoia exhibited by people throughout the country when it was announced that a computer was being purchased for their agencies. The concern is caricaturized as follows: "Have you heard that the department is going to buy one of those fancy new computers? I mean, you've never seen a computer this big. It's going to replace us all! Records bureau will be a thing of the past. Even typists and clerks will lose their jobs! None of this would have happened if we hadn't gotten involved with that new crime analysis program."

Strategies to Overcome Resistance:

1. Prepare a needs assessment to determine whether the acquisition of an automated data processing system is justified. If it is, refer to the next strategy.

2. Determine how many people are necessary for, and how much time is currently spent on, data processing. Identify the personnel and time savings anticipated because of automation. Outline other tasks personnel can perform if their available time

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MCI Programs. Hopefully, however, you will be allowed to use this information not for productivity measurement, but for program development purposes. Remember, if you are to obtain the acceptance of the troops, you must be considered one of the "good guys." Those who conduct productivity studies are often viewed as the enemy. Therefore, to the greatest extent possible, resist the efforts of those who ask you to conduct them.

is increased. Finally, determine who would like to perform those other tasks.

3. An automated system will assist people by providing them quicker access to information. Explain that people no longer needed for data processing will provide valuable service to the department by performing other duties.

4. Recognize and accept that some folks are intimidated by computers. Offer to show them how the computer works and what it can do for them. Set up dummy files and let people play with them. Tell them they can neither corrupt these files nor damage the computer in any way. [24] Let people know they are being given an opportunity to expand their knowledge and skills by working in a computer-aided environment.

5. Help personnel develop computer applications of specific assistance to them; show them how to use various software packages to create their own files and programs.

Civilians Are Going to Tell Me How to Do My Job:

This seems to be more of a concern among detectives than among patrol personnel. They have sometimes expressed the opinion that they do not need anyone—let alone a civilian—to tell them who they should be looking for and how much time they should spend on their investigations.

Detectives can be particularly difficult to handle, and will often refuse to provide assistance or receive help from an analyst. This inhibits the free exchange of information necessary for the program's success. Similarly, patrol officers may see analysts as well-intentioned people,

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[24] Be sure to tell people to take obvious precautions against coffee spills, keyboard abuse and other things that *will* damage computers or corrupt files. Also inform them of any peculiarities of the system. These may relate to the need to leave it on, indications that it is not working properly and so on.

To familiarize personnel with the operation and the "feel" of the equipment, some agencies have installed computer games on their automated systems. We have no particular objection to this practice as long as it serves its intended purpose. Problems sometimes arise, however, when game playing becomes an end in itself. When this occurs, the games should be removed. After all, occasional work breaks are not an unreasonable request of management!

but too unfamiliar with police operations and the "ways of the world" to be of any real assistance.

Strategies to Overcome Resistance:

1. The unit supervisor should have made it clear that the analyst would not be telling anyone how to do his or her job prior to the analyst's initial entry into the department. Analysts only provide information; how that information is ultimately used is up to management and staff. Stress this point.

2. Get to know people, attend officer briefings on all shifts, and ride with on-duty officers. If you are so inclined, work out in the gym with them or volunteer to be on their softball team. Offer to do some "grunt work" for detectives. In short, seek opportunities to talk with people and explain the program to them.

3. Do not feel intimidated as a newcomer to the law enforcement profession. Allow others to teach you the trade and ask personnel for suggestions relative to the type of products and services they would like to receive.

4. Request permission to go to burglary, robbery and other such meetings. These meetings will give you a feel for the type of crime occurring throughout your jurisdiction and provide you with the opportunity to get acquainted with investigative personnel.

5. Accept the fact that you may be tested. This is normal. Officers and investigators often want to determine if you are really a team player before trusting you with information. Expect to go through an initiation period and accept whatever teasing or ribbing accompanies it.

6. You will have many opportunities to interact with people in group settings. While these are valuable and encouraged, they may not be nearly so revealing as conversations you have with people individually. Let them tell you of their job needs and concerns. If you can resolve a problem for them, do so. Your actions will help you gain their support.

7. Respond quickly to requests for information and assistance. Delay is the deadliest form of rejection. People will continue to ask for help only to the extent that they know it will be provided.

8. Show products, bulletins and proposed analysis reports to line level as well as supervisory staff. Ask these people if the documents contain information useful to them. Solicit their opinions as to content, style and format. Use their suggestions to help design your materials.

9. Should you encounter a particularly stubborn individual who continually refuses to use your products and services, you may wish to explain that you can be of help and that the primary reason you are there is to provide assistance. Request that he or she give you that opportunity.

10. Recognize that some people will never allow you to truly interact with them no matter what you do. When this occurs, accept it and do not take it personally. Be content with the knowledge that others in the organization will receive great benefit from your work.

The Program Will Take Away Our Freedom:

One of the primary objectives for creating a crime analysis program is to increase the efficiency of patrol and investigative operations. Of necessity, this involves developing directed patrol programs and restructuring investigation activities. Officers who view these actions as attempts to take away their freedom fail to recognize the goals of the program.

While the freedom of patrol officers *will* become diminished to some degree, this is done to maximize the likelihood of their apprehending perpetrators. It's not that the department wants to keep them from fishing, it just wants to make sure they're fishing in the right places at the right times.

Detectives may view the program as an attempt to remove their "mystique." For years there has been a rather impenetrable cloud of mystery which has surrounded members of investigative units. No one was actually sure of what they did, but all assumed it was of utmost importance. "What are you working on, Joe?" "Can't tell

you...too secret!" With all due respect to the majority of hard-working investigators throughout the nation—and indeed their number is legion—this mystique provides excellent cover for those few detectives who are less than attentive to their duties. With the implementation of a crime analysis unit, however, comes the removal of the mystique and the scrutiny of their efforts. This may not be welcomed by certain individuals who have grown comfortable in positions where accountability was unquestioned.

Strategies to Overcome Resistance:

1. We have yet to meet the police officer or investigator who does not enjoy putting crooks in jail. Use of crime analysis information enhances their ability to accomplish this objective. Therefore, it should be emphasized that the crime analysis unit is being created to facilitate the achievement of crime suppression goals.

   Fear of a loss of freedom may best be mollified initially by the chief executive of the organization and mitigated routinely by the supervisor of the crime analysis unit. Emphasis should be focused on the desirability of having officers patrol locations which are in greatest need of police attention. It should also be noted that officers are likely to make more arrests in these areas as well. If that doesn't evoke great tears of joy, nothing will!

2. Investigators should be told that the program is designed to relieve them of many administrative tasks. It should also be explained that the crime analyst has been hired to free detectives of much of the tedious background work germane to the investigative process.

3. Fear of a loss of freedom will diminish once officers and investigators realize positive results from crime analysis information. In recognition thereof, analysts often hurry to put out information in their desire to get their first "hit." Resist the urge to proceed too quickly.

   Be exceedingly cautious in dispensing information early in the program; two or three crimes seldom constitute a crime wave. Be sure you have enough information to justify predictions *before* the troops cry "Tallyho" and sally forth into battle. Use

statistical techniques (explained in this book) to determine event probabilities and provide this information to your users.

Remember: there are no absolutes in this business. You don't have a crystal ball, and the best you can do is estimate the likely occurrence of criminal events. Don't overstate your capabilities and lead people to believe that you can do the impossible. Do not use phrases like "The suspect will rob Pop's Market next Tuesday at 9:03 P.M." When such language is used, a host of circumstances will wondrously conspire together to guarantee that the suspect will definitely *not* appear at the appointed hours. That leaves you, the analyst, with egg on your face. Instead, use phrases such as, "Based on his past pattern of criminal activity, we have determined that there is a *68 percent* chance that the suspect will rob a market in beat 3 next Tuesday between 8 and 10 P.M. Pop's Market *should* be considered a *possible* target." Presented this way, everybody knows that there is a good chance the suspect will commit a crime but that its commission is not guaranteed. Your reputation will not be severely damaged should the crime not occur.

Everything's Going to Change Around Here:

Agencies experience change as a result of the development of a crime analysis program. Forms change, policies and procedures change, patrol and investigative methods change, and shift hours and beat configurations change. Those who anticipate change possess an accurate assessment of the future; problems only arise when those anticipating change assume changes will be *negative* .

Most changes noted above will not be warmly received—at least not initially. Officers may resent the extra work created by the introduction of new forms, new shift schedules may prove inconvenient, and many complaints may be voiced during the early stages of program development.

Strategy to Overcome Resistance:

Focus on the need for change and the resulting benefits. Explain that changes will heighten efficiency and increase apprehension effort. Specific complaints may be addressed as follows:

• **New Forms** are needed to more accurately and comprehensively capture criminal incident and suspect data. Data collected from the forms will be analyzed to inform personnel of the nature of crime problems (probable locations, dates and times of future occurrences) and to build known offender, MO and similar files to aid the offender identification process.

• **Policy and procedural changes** ensure that efforts of all personnel are directed toward accomplishment of departmentally-defined goals and objectives. Through use of crime analysis information, supervisors will be able to make more informed—and more objective—deployment, workload, case assignment and other decisions regarding resource allocations.

Policies and procedures are to the law enforcement agency what a conductor is to an orchestra. All musicians know how to play their instruments, keep time and so on and could play a tune without a director. However, since the interpretation of each part would be left to the discretion of each musician, the final rendition might be quite displeasing to the audience. The conductor provides a unified *interpretation* of the music. Similarly, police officers know how to use their equipment, realize that criminals must be apprehended and are generally aware of the job to be done. Policies and procedures serve to develop a uniform approach to guide the delivery of law enforcement services.

• **Patrol and investigative methods** will change to maximize return on investment. Utilization of alternative police response and directed patrol techniques will increase the available time of officers and allow them to patrol those areas which have the greatest existing or potential crime problems. Investigators will be able to spend their time primarily working cases that can be solved. Use of new patrol and investigative methods will provide an opportunity to enhance the efficiency of both operations and achieve greater results without an increase in cost.

• **Shift hours and beat configurations** will change to properly deploy personnel and evenly distribute workloads. It should be explained that officers on some shifts are running from call to call because personnel are not adequately deployed

during peak time hours. Others may be overworked because beats were originally drawn without regard for the volume of work generated by each beat.

Should decisions be made to change shift hours and beat configurations to better meet the demands of the jurisdiction, explain that such decisions were not made capriciously. Rather, examination of calls for service records, officer-initiated incident and other data led to the determination of how many officers were needed for each twenty-four hour period. Assessment of the activity generated by each area of the jurisdiction necessitated beat configuration changes. Finally, assure personnel that changes should result in the following benefits:

- an increase in uncommitted patrol time
- greater availability of manpower during peak time hours
- greater availability and quicker response of back-up units
- more equitable distribution of workloads
- relief from the overworked/underworked syndrome
- less need to stay after work to complete reports which, due to time constraints, could not be completed during regular duty hours.

SUMMARY:

Few crime analysts are able to implement a crime analysis program without encountering some resistance. Few people really like change; police officers are no exception. We all tend to feel secure in our comfort zones and don't really appreciate being pulled out of them. Control-oriented individuals may have an especially hard time dealing with change, and this is not hard to understand.

Police officers tell people what to do all day long and usually get their way. If they determine someone is going to get a ticket or go to jail, that happens. It doesn't take long for officers to become so accustomed to controlling others that they become resistant to being controlled. They will accept control from departmental executives and supervisors (usually), but seldom from anyone else. That this creates

problems in their interpersonal relationships is understood by police psychologists throughout the nation.

Officers may see the analyst as yet another person trying to control their actions and shake them out of their comfort zones. You and your program may initially be perceived as tools the department will use to "fix what ain't broke." For the sake of your own self-esteem, realize that this interplay of personal dynamics creates resistance to programs. Expect it, prepare for it, and do not take it personally. Be yourself. Learn from the officers, provide them with what they want and need and you will eventually gain the acceptance you desire.

PART TWO:

STATISTICAL METHODS FOR CRIME ANALYSTS

CHAPTER 11

STATISTICS AND THE CRIME ANALYSIS PROCESS

STATISTICS AND THE CRIME ANALYSIS PROCESS

Much of police work is concerned with numbers. The number of burglaries in a month or year, the amount of time it takes to respond to calls-for-service, the street price of a narcotic, the number of patrol officers available for deployment, clock times that a series of crimes have occurred, comparisons of this year's "things" with the same "things" of last year, and the number of dollars which comprise a department's budget are but a few examples of the role played by numbers to facilitate the decision-making process.

Concern with numbers can be found at all levels of a police organization. A police chief or sheriff is expected to reduce (the number of) crimes, educate (numbers of) children to resist drug use, set up (numbers of) neighborhood watch programs, and answer (numbers of) calls of every kind in the shortest possible time (numbers of minutes). Further, these objectives, along with many others, must be accomplished with limited (a dollar number) funds. No agency has a bottomless pot of gold.

Of necessity, the concern with numbers by executives will be a shared concern of others throughout the police organization. Subordinates become concerned with patrol workloads, personnel and materiel available for deployment, deployment schedules and tactics, numbers of crimes by type, time, location, day of the week, and so on. Numbers of persons arrested and the numbers of cases cleared, closed or suspended also need to be counted and tracked. These numbers can be manipulated to generate other numbers that will facilitate development of directed patrol/tactical action plans, help us to effectively manage criminal investigations and ensure the proper allocation of police resources.

The "ABCs" are components of spoken and written language. Numbers are components of mathematical language. The letters "saynasli" mean nothing in and of themselves until reordered into the word "analysis." So also the numbers 64, 4, 16, 1, 8, 32, 2 appear to be without meaning until we reorder them as 1, 2, 4, 8, 16, 32, 64 and find that each number is twice its predecessor. By themselves, numbers are usually meaningless. Given order, however, we often find that numbers can communicate an idea just as ordering letters of the alphabet can lead to a work of poetry.

The role of the crime analyst is to give order to the myriad numbers generated in a police agency. Only in the ordering of numbers can we make rational decisions that are based on quantitative factors. The "ordering" of numbers is known collectively as mathematics. Mathematics, like language, have various forms. The world of spoken and written language is comprised of English, French, Spanish, and a planet full of other languages and dialects. The language of mathematics is comprised of algebra, geometry, calculus, and so on. In crime analysis, we communicate most effectively through use of the mathematical language known as "statistics."

EARLY STATISTICS:

Statistics is not a new mathematical language nor did it come from anything but humble roots. Centuries ago, statistics were primarily used to keep state records. The word "statistics" comes from the German "statis-tik," state-affairs. In China, under the Chou Dynasty of 2000 BC, census lists were maintained for determining available warriors and for estimating revenues and expenditures. Similar lists were kept in ancient India and Egypt. In pre-conquest Peru, in the absence of all writing, the Incas kept census records on colored and knotted strings. Indeed, the origin of writing itself may lie in the record keeping requirements of early civilizations. We know that the Phoenicians, who are credited with inventing the alphabet around 1600 BC, were the principal international traders of their day. As such, they had an urgent and practical need for an accurate and convenient system to store their data. Until the invention of the computer nearly four thousand years later, however, the best storage system was the Phoenician invention of symbols to represent the sounds of speech.

DESCRIPTIVE AND INFERENTIAL STATISTICS:

Descriptive statistics are summaries that describe the more prominent features of a mass of data. These summaries include descriptive measures such as means and percentiles, tables, charts and graphs, all of which are encountered by the crime analyst. Statistical inferences are the generalizations or conclusions we can draw from the data we study. Most crime analysis problems are inferential in nature, and it is with the inferential role that modern crime analysis is most frequently identified.

From the crime analyst's point of view, descriptive and inferential statistics are inextricably linked. The number of robberies committed over a period of time can be shown on a table or a graph (descriptive statistics). However, by observing a criminal's habit pattern or MO, the analyst is often able to *infer* or predict what the criminal will do next (inferential statistics). This information can be used to develop directed patrol or tactical action plans or to aid detectives with their investigations. Indeed, correlating behavior to individuals is often the most effective way we have of assisting the investigative process.

STATISTICAL ANALYSIS REQUIREMENTS:

A question which is often raised by new crime analysts is, "Does statistical analysis require the use of advanced mathematics?" No. Analysts need to know some elementary algebra and have a fair measure of common sense. This does not imply that a full treatment of the mathematical foundations of statistical inference can be developed with no more than elementary algebra. It does mean that a sound understanding of the basic mathematical concepts and their application to police problems can be achieved without additional mathematical training. We constantly use the creations of the human mind without fully understanding their logical foundation. We use language without mastering linguistics, we use money without having attended business schools and we even become parents without having a child development degree! So too was mankind using numbers for thousands of years before Bertrand Russell (1872-1970) devised the first acceptable definition of a natural number.

STATISTICS AND COMPUTERS:

The bulk of modern statistical theory was known by 1930, but it was insufficiently used. This was because the accumulation and analysis of statistical data, even with the aid of powerful theory, involved performing tedious and often overwhelming computations. Before the arrival of electronic data processing, it was not practical to carry out the lengthy calculations required by the theory. Today, this obstacle has been removed and we see a vast increase in the use of statistical analysis, particularly by those employed by law enforcement agencies. Anymore, the tedious mechanics of deriving answers to analytical problems has been left to the computer.

Does this mean that it is no longer necessary to study statistics? No. But it does mean that it is no longer necessary to study the

computational tricks and shortcuts required by manual computations. For our purposes, the present need is to master statistical concepts and to learn how to apply them to crime analysis work. That's what the rest of this book is all about.

OVERCOMING NUMEROPHOBIA:

Most people have fears of one sort or another. While some folks are afraid of heights or enclosed places, others are plagued by numerophobia, a fear of numbers. This often results from one's having had difficulty with them in school and his or her coming to the conclusion that "I'm just no good at math." For these people, balancing even a checkbook is a traumatic experience that is accompanied by hair pulling, chest beating and frequent expressions of pain and suffering.

If this describes you, here's the good news. The following chapters have been written just for you! They were written on the assumption that you have no prior experience doing statistical or analytical work. Further, the material is presented without the use of complicated formulas and the technical jargon which often accompanies statistical texts. If you can add, subtract, multiply and divide—or use a calculator that performs these functions—you should be able to follow the examples given. You may then apply the principles which are demonstrated to your work.

We have one last suggestion. *Give yourself a chance* to work through the material. Don't automatically assume that because you may not be fluent with numbers that the material will be difficult to understand. It isn't. Take your time and familiarize yourself with one concept before moving on to another. Before long, you'll be able to use these concepts to solve the "real-life" analytical problems that confront you on the job.

CHAPTER 12

GETTING STARTED

GETTING STARTED

Often the most effective way to describe, explore and summarize a set of numbers is to look at "pictures" of these numbers. Data graphics (pictorial representations of sets of numbers) visually display measured or computed quantities by means of a coordinate system, points, lines, numbers, symbols, shadings, and color. At their best, graphics are instruments for representing quantitative information and well-designed data graphics are usually both simple and very effective.

The Frequency Table:

Before graphing or analysis can begin, the analyst must organize the data. Picture a month of crime reports and field interviews as they were handed to you. The days of occurrence of all crimes are jumbled, as are the hours, the locations, and other elements that have been included. All of these "facts" are of little value if they are not organized in a meaningful manner. We organize data so that we may look for such things as the range in the values (smallest to largest), any apparent trends, values around which the data tend to group, values that appear most frequently, etc. The more patterns we can identify, the more likely we, as crime analysts, will understand what's going on "out there".

Data, before they are arranged and considered, are called "raw data". They are "raw" because they are not organized. Consider being requested to give an overview of response times for calls-for-service. Dispatch provides the following raw data (in minutes):

5	15	14	7	6	6	12	10	9	8
7	6	8	7	7	9	10	9	5	10

The data given to you in this form do not present anything meaningful.

The first thing to do to correct this situation is to array the data. The simple data array arranges data from lowest value to highest value in ascending order, or from highest to lowest value in descending order. For example, response times could be arrayed as follows:

5	5	6	6	6	7	7	7	7	8
8	9	9	9	10	10	10	12	14	15

From this simple array:

(1) The analyst can quickly see highest and lowest values within the data.

(2) The analyst can easily partition the data into meaningful sections.

(3) The analyst can see whether any value appears more than once.

(4) The analyst can see intervals between values.

In spite of these advantages, a data array may not be the most advantageous way to organize data. Because an array lists all data, it can be quite cumbersome when a large amount of data are involved. In these cases, we need to compress the data while retaining their utility. To accomplish this compression a chart, referred to as a frequency table of ungrouped data, would be constructed. Using data from the previous example, list the values of all unique response times in a column labelled "X". Next to each unit of time, in a column labelled "f" (for frequency), indicate how often each response time was recorded. Such a frequency table would look like:

X	f	
5	2	
6	3	
7	4	
8	2	
9	3	
10	3	
12	1	
14	1	
15	1	
	20	Column Total

Now let's assume that the person who requested this analysis can't get a feeling for the distribution of response times from reading numbers in the frequency column and would prefer to see percentages. To accomplish this modification, simply total the frequency column (sum = 20 in our case), divide each frequency by that total, multiply the

resulting decimal by 100% and enter the final result in a column labelled "%". Our revised frequency table would then be:

X	f	%	
5	2	10	(2/20) X 100 = 10
6	3	15	(3/20) X 100 = 15
7	4	20	etc.
8	2	10	
9	3	15	
10	3	15	
12	1	5	
14	1	5	
15	1	5	

By expanding our frequency table to include percentages, we have helped our analyst answer a variety of questions. In addition to advising that 10% of all calls were responded to in 8 minutes, the analyst may want to know the percentage of calls answered in less than 8 minutes. Note that the response time for some calls was 5 minutes, for some it was 6 minutes, and for some it was 7 minutes. By adding the percentages representative of these response times, the analyst sees that 45% of the calls took fewer than 8 minutes to respond to. Similarly, 15% took more than 10 minutes to get to. Adding percentages is a lot easier than recomputing each time a query is made.

Data can also be compressed into a frequency table of "grouped data". Grouped data are data organized into intervals. For example, using the previous example of response times, a frequency table of grouped data could look like:

Intervals of response times (minutes)	f	
4 - 5	2	
6 - 7	7	
8 - 9	5	
10 - 11	3	
12 - 13	1	
14 - 15	2	
	20	Column Total

We could also expand our grouped data frequency chart by adding associated percentages. Such an expansion would look like:

Intervals of response time (minutes)	f	%	
4 - 5	2	10	(2/20) X 100 = 10
6 - 7	7	35	(7/20) X 100 = 35
8 - 9	5	25	etc.
10 - 11	3	15	
12 - 13	1	5	
14 - 15	2	10	

Grouped data frequency charts are often used in crime analysis. Examples include the grouping of individuals by age, the grouping of dollar losses from burglaries, or the grouping of crimes by reporting districts. Because grouped data frequency tables will frequently be of use to you in your work, let's examine the procedures necessary for constructing one correctly.

(1) Decide upon the number of intervals. As a rule, analysts rarely use less than five, or more than ten, intervals.

(2) Decide upon the size of the interval. As a rule, use intervals of 2, 3, 5, 10, or 20. If you are working with age, and have decided to use an interval of 2, an interval might be 15-17 or 19-21 years of age. If you are working with the value of property taken in burglaries, an interval of 2 could well mean $2,000-$4,000 or $13,00-$15,000. The interval is the unit of measurement you choose.

(3) The lower limit of the first inclusive category should be evenly divisible by the interval you selected. If you choose an interval of 2, the first category should be evenly divisible by two. Two, 4, 6, etc. are evenly divisible by two, whereas categories of 3, 5, 7, etc., are not. This rule explains the selection of 4-5 as our first inclusive category in the response time example, even though the lowest actual value was 5.

Let's apply this reasoning to our exemplary grouped data of response times. We first determine the "range" of our distribution:

Range = (highest score - lowest score) + 1

In our example, the range for the distribution of our response times is:

Range = (longest response time - shortest response time) + 1

Range = (15 - 5) + 1

Range = 11*

* The range of a set of values is not the same as the difference. The difference is simply the lowest value of a set subtracted from the highest whereas the range includes both the highest and the lowest values. For example, the set of values 61, 62, 63, 64, and 65 has a difference of (65-61= 4) whereas the set "ranges" over 5 distinct values.

Next we compute the number of data groups and divide the range by the interval we would like to use. We chose an interval of 2. If the result of this division is a number between 5 and 10, we have met the first and second requirements for constructing a grouped data frequency table correctly (see 1 and 2 above). In our response time example, we get

Total number of intervals = 11 (range) / 2 (interval)
= 5.5 (rounded off, 6)

Finally, we must choose a lowest value for our table. Five minutes is the lowest response time in the distribution. Five, however, is not evenly divisible by the interval we chose (5/2=2.5). To meet the third requirement above, we select the first number below 5 which is evenly divisible by our chosen interval. In this example, that value is 4 (4/2=2). We now have the basic elements of our grouped frequency table:

Interval = 2

Number of groups - 6

Lowest value = 4

Applying these elements, we get the groups:

4 - 5
6 - 7
8 - 9
10 - 11
12 - 13
14 - 15

The analyst chooses which factors to count. The factors you select, "X", are known as independent variables. Once "X" is chosen, the number of elements of "X" is provided by the data that you have collected. Resulting frequencies of occurrence of each data element "X" are referred to as "f", and are known as dependent variables.

Assume your supervisor is interested in burglaries in your community. The first thing you would do is collect all crime reports dealing with burglary. Now, start by building a frequency table of the number of burglaries reported by day-of-the-week. Day-of-the-week is your independent variable, and based on that choice of independent variable, you will end up with a frequency table containing seven entries (one for each day of the week) in column "X" and a corresponding number in column "f" showing the number of burglaries reported each day. You could just as easily have chosen hour of the day and compiled a grouped data frequency table comprised of twenty-four entries. Or you could have chosen to count burglaries by beat number, reporting district, type of premise burglarized, etc.

You can also get more sophisticated and hold one independent variable constant while counting another. For example, you could hold a day of the week constant and count the number of burglaries by reporting district. Or, you could construct a table illustrating the pattern of burglary throughout your jurisdiction on a particular date.

You are not limited to one independent choice. Two, three, or more independent variables can be held constant while the distribution of other variables is counted. You can hold both day-of-the-week and reporting district constant and count the number of occurrences of a particular crime by hour of the day. Your choices are limited only by the data you have collected, your imagination, and experience.

The purpose of counting is to identify those factors on which operational decisions can be based. For example, if your counting indicates that the frequency of burglaries is particularly large in RD

123 on Wednesdays between 1500 and 1700, patrol resources could be assigned accordingly.

Which independent variables should be counted? It depends upon the crime and the experience of the analyst. There is no "cut and dried" answer. The analyst must work with the data to develop a "feeling" for the common (or most frequently counted) factors. Only by working with specific data can common factors be identified.

Crime patterns and crime series vary. Experienced analysts have found that the factors listed below often help determine a pattern, if a pattern exists. Numbers in parentheses suggest the order in which you may want to search your data.

If you are working with residential burglaries, try:

Geographic Factors (1)
Time Factors (2)
Property Loss Descriptors (2)
Target Descriptors (2)
Physical Evidence Descriptors (2)
Specific M.O. Factors (2)
Suspect Vehicle Descriptors (3)
Suspect Descriptors (3)

If your problem involves commercial/business burglaries, try:

Geographic Factors (1)
Target Descriptors (1)
Specific M.O. Factors (1)
Property Loss Descriptors (2)
Physical Evidence Descriptors (2)
Time Factors (3)
Suspect Vehicle Descriptors (3)
Suspect Descriptors (3)

If your problem involves thefts from vehicles try:

Geographic Factors (1)
Property Loss Descriptors (1)
Suspect Vehicle Descriptors (1)
Time Factors (2)
Target Descriptors (2)

Physical Evidence Descriptors (2)
Specific M.O. Factors (2)
Suspect Descriptors (3)

If your jurisdiction is concerned with strong-arm robberies or thefts from persons, try:

Geographic Factors (1)
Time Factors (1)
Victim Descriptors (1)
Property Loss Descriptors (2)
Physical Evidence Descriptors (2)
Specific M.O. Factors (2)
Suspect Descriptors (2)
Suspect Vehicle Descriptors (3)

For armed robberies, try:

Geographic Factors (1)
Time Factors (1)
Suspect Descriptors (1)
Target Descriptors (2)
Specific M.O. Factors (2)
Suspect Vehicle Descriptors (2)
Property Loss Descriptors (3)
Physical Evidence Descriptors (3)

The following may be important if sexual offenses are being analyzed:

Time Factors (1)
Victim Descriptors (1)
Suspect Descriptors (1)
Victim-Suspect Relationship (1)
Geographic Factors (2)
Physical Evidence Factors (2)
Specific M.O. Factors (2)
Suspect Vehicle Descriptors (3)

Remember, these variables are only suggestions. The best solution will be found by your persistence in identifying the most significant variables, if any.

An Exemplary Data Search:

To illustrate this point, Mr. Arenberg, one of the authors, cites the experience of the Dallas, Texas, Police Department. In conceptualizing the development of a fully automated pattern detection system, Dallas personnel first thought that every offense committed in the city every day should be compared to every other offense committed over a three to six month period and to all known offenders. It became readily apparent that the sheer size of the data processing implied in such comparing made such an effort impractical. Obviously, an effective limiting approach was needed that would both reduce insignificant comparisons and select the most probable offense similarities.

Pertaining to limitation, the first decision was to compare an offense only against its own crime category. Investigators felt it was more important to compare offenses in the same category for a longer period of time than to compare an offense against every crime category for a shorter time period. An important exception was rape. Rapes should be compared against residential burglary offenses but not vice versa. Index crimes should be compared within crime categories for 40 day periods relative to murder, rape, robbery and aggravated assault, and to 30 day periods relative to burglary, larceny, and auto theft. In Dallas, as in most jurisdictions, the former set of index crimes occurs less frequently than the latter. Thus, for these offenses, an extra ten days was given to the data collection and comparison process. To limit the similarities reported by the system to only those that would have significance to a criminal investigation, it was found necessary to consider not only the degree of similarity between two offenses, but the significance of the similarity as well. Moreover, the offenses considered for similarity had to contain significant or unique data.

For example, a match on suspect vehicle license numbers would be considered uniquely significant and conclusive for all offense comparisons. On the other hand, suppose a witness described a male suspect's height as 5'9". Most males in the U.S., including criminal suspects, range in height from 5'7" to 6'0". Consequently, since a height of 5'9" would be far from unique, it would be of little help in identifying a possible perpetrator or matching one crime with another. However, if a suspect's height was unusual, less than 5'2" for instance, the uniqueness would be significant.

Graphing:

A graph is a pictorial representation of data, constructed for the purpose of illustrating changes in one variable or for comparing several similar or related variables.

A graph may be the best way of presenting data to people. Readers of graphs can see the magnitude of the factors being presented and the relationship between these factors at the same time.

Constructing graphs is not difficult. A graph consists of a set of points, each of which defines value on two or three axes. Our discussion will limit itself to two dimensional graphs. The horizontal scale is usually called the X-axis (or abscissa) and the vertical scale, the Y-axis (or ordinate). Independent variables are plotted along the X-axis—the reason for our labelling the column for the independent variables in the frequency table "X". The Y-axis contains the corresponding frequencies for the various categories of the dependent variables as they appear in the data set. Figure 23 illustrates the basic characteristics of a graph.

The following points should be kept in mind when preparing a graph:

(1) Make sure your graph has a title explaining its nature.

(2) Calibrate your scales accurately.

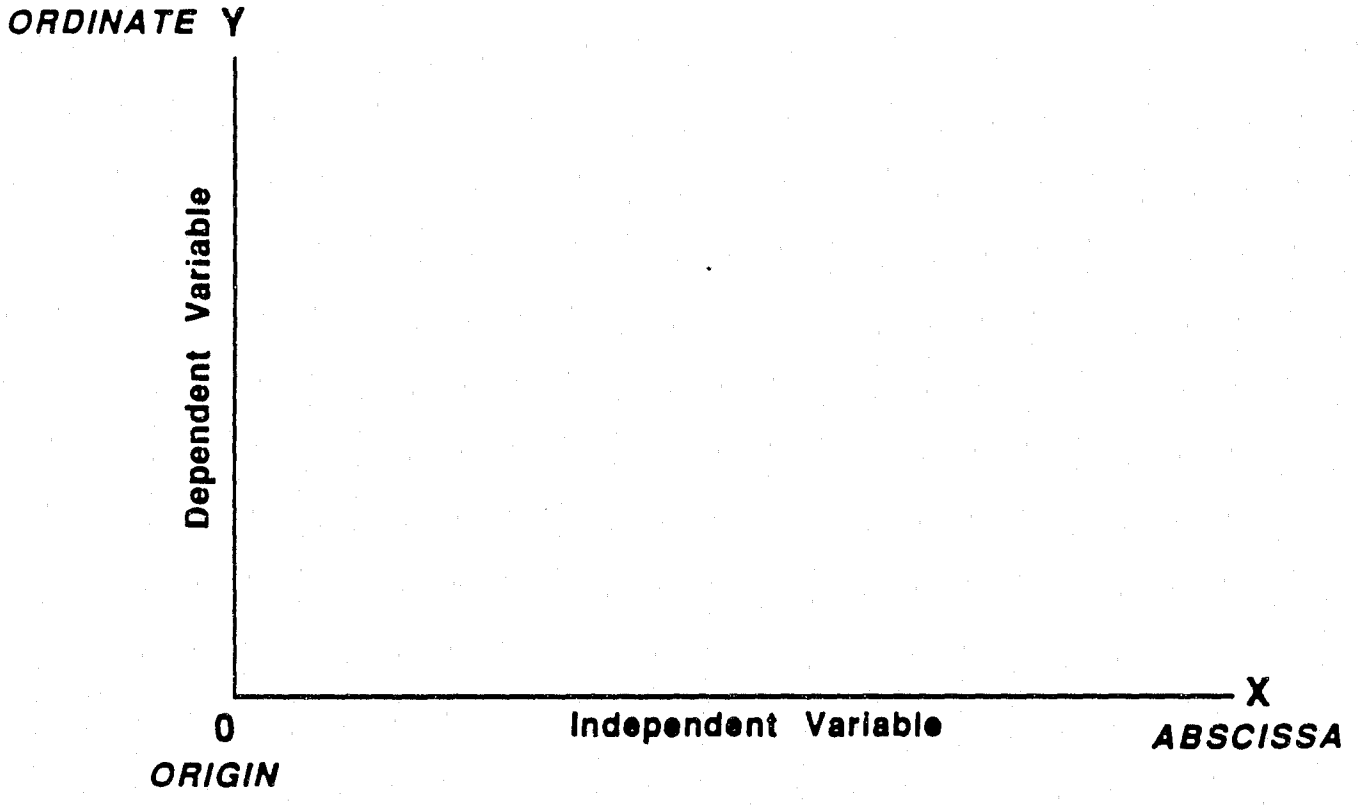
(3) Clearly identify units of measure along each axis.

(4) The X-axis should be 25% longer than the Y-axis. The vertical axis should be laid out so the height of the point representing the largest frequency is three-quarters the length of the horizontal axis.

(5) All scales begin with zero.

There are four basic graphs of use in crime analysis: the bar graph, the histogram, the frequency polygon, and the bivariate graph.

Assume that the following numbers are the ages of the last 100 men arrested for burglary in your city:



Basic Characteristics of a Graph

Figure 23

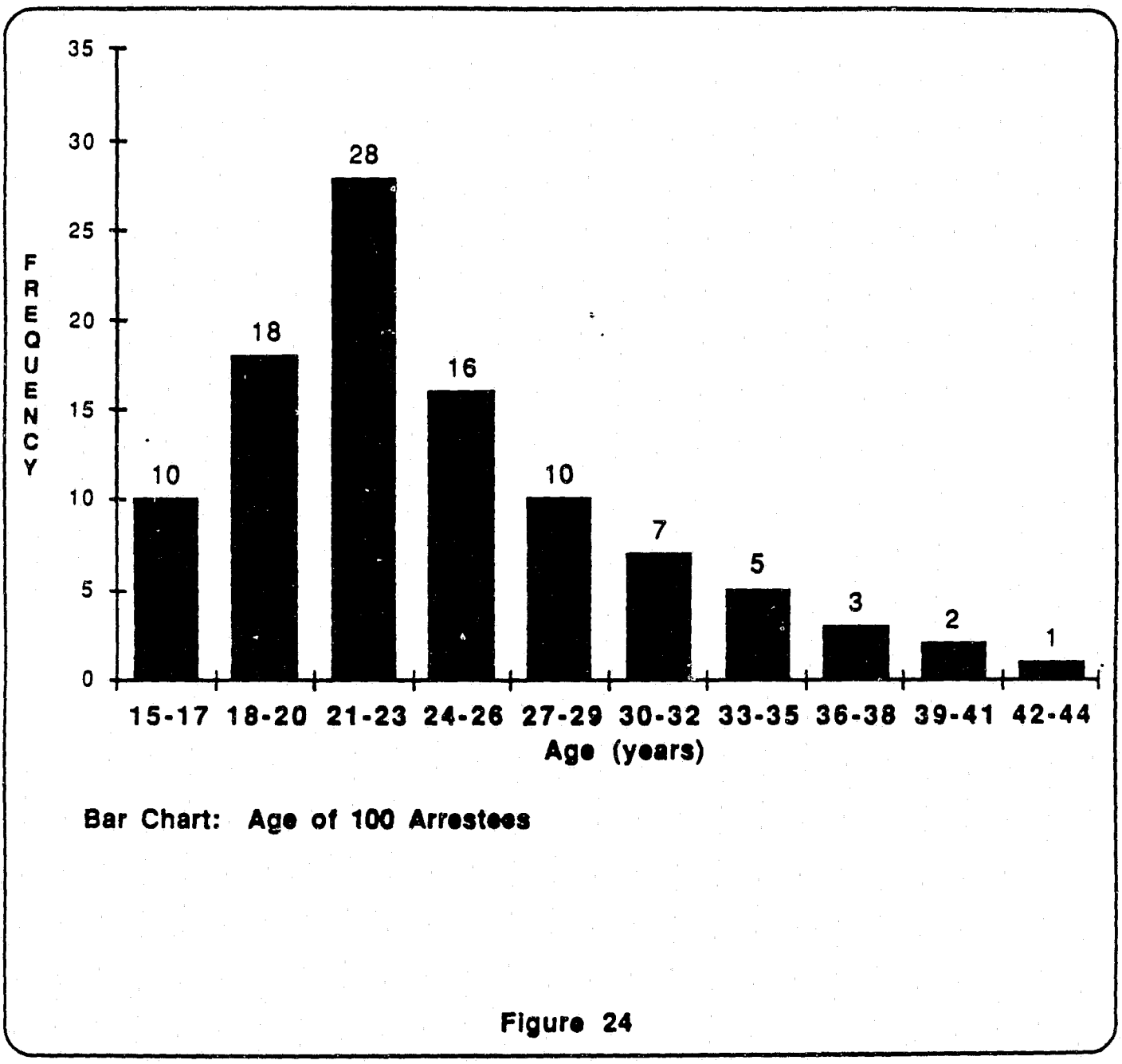
20	15	22	23	25	26	23	30	31	26
31	15	20	38	27	21	19	35	18	21
21	22	24	24	19	36	33	23	20	33
24	17	21	20	19	27	24	36	21	25
22	39	22	26	27	21	23	23	21	24
30	16	21	28	27	22	29	19	39	17
32	21	18	28	15	33	24	25	22	22
21	27	30	15	21	18	22	24	18	23
31	29	20	18	22	17	22	19	15	18
18	42	24	26	16	22	18	33	28	25

Arrange these data as a frequency table (using grouped data):

Age Group	Frequency	Percentage	
X	f	%	
15-17	10	10	(10/100) X 100 = 10
18-20	18	18	(18/100) X 100 = 18
21-23	28	28	etc.
24-26	16	16	
27-29	10	10	
30-32	7	7	
33-35	5	5	
36-38	3	3	
39-41	2	2	
42-44	1	1	
	100	Column Total	

The Bar Graph: The bar graph makes data comparisons by the use of parallel bars placed either vertically or horizontally on the graph. In the construction of a bar graph, the length of the bars is kept proportional to the dependent variable. The width of the bars and the space between them should be consistent. Figure 24 provides an example.

Bar graphs are most often used when the dependent variable is discrete. A discrete variable can only take on a finite number of values, usually whole numbers. For example, the roll of a pair of dice can only result in one of eleven discrete values: 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12. There are no other values that the pair of dice can have. Therefore, if we were to construct a bar graph depicting the number of ways that each value of a pair of dice could be made, a bar at each of



Bar Chart: Age of 100 Arrestees

Figure 24

the eleven discrete values would be drawn but no other data would appear on the graph. In crime analysis, such discrete variables may include numbers of a specific crime, year-to-year or month-to-month figures, numbers arrested, patrol units deployed, etc.

The Histogram: The histogram is a special case of the vertical bar graph and is used to represent the information contained in frequency distributions of grouped data. It consists of a series of contiguous (no space between) columns whose heights are proportional to group frequencies, and whose widths are proportional to the size of the interval of the variable. A histogram is not only a graphic record of absolute class frequencies, but a mirror of the size of each frequency relative to all others.

A histogram is used when the independent variable can have any value from the lowest to the highest value represented in the data. Suppose we wanted to graph calls-for-service over a 24-hour period, something all analysts do for patrol workload studies. We could divide our X-axis into 24 one-hour segments (the first running from 0000 to 0059, the second from 0100 to 0159, etc.) or 12 two-hour segments or 8 three-hour segments or whatever grouping we prefer. Once the size of the segment has been selected, we simply plot (in the form of a bar graph) the frequency of calls-for-service reported during each time segment. Time is perceived as a continuum and there are no breaks. Data that crime analysts might be requested to illustrate as a histogram could be the number of burglaries arranged by the reported dollar value of goods stolen, the number arrested arranged by age, or the number of vehicles traveling at various speeds on a particular thoroughfare.

An example of a frequency table plotted in the form of a histogram is shown in Figure 25.

Frequency Polygon: Often, we wish to illustrate the continuous nature of our data and would like to illustrate differences in frequencies from interval to interval as they occur. We could do this by placing a point at the center of the top of each bar in Figure 24 and connecting these points with straight lines. The resultant figure is a frequency polygon, and for our data looks like Figure 26.

In a frequency polygon, the points reflect interval frequencies, and are plotted at interval midpoints. In the table on page 185, the interval

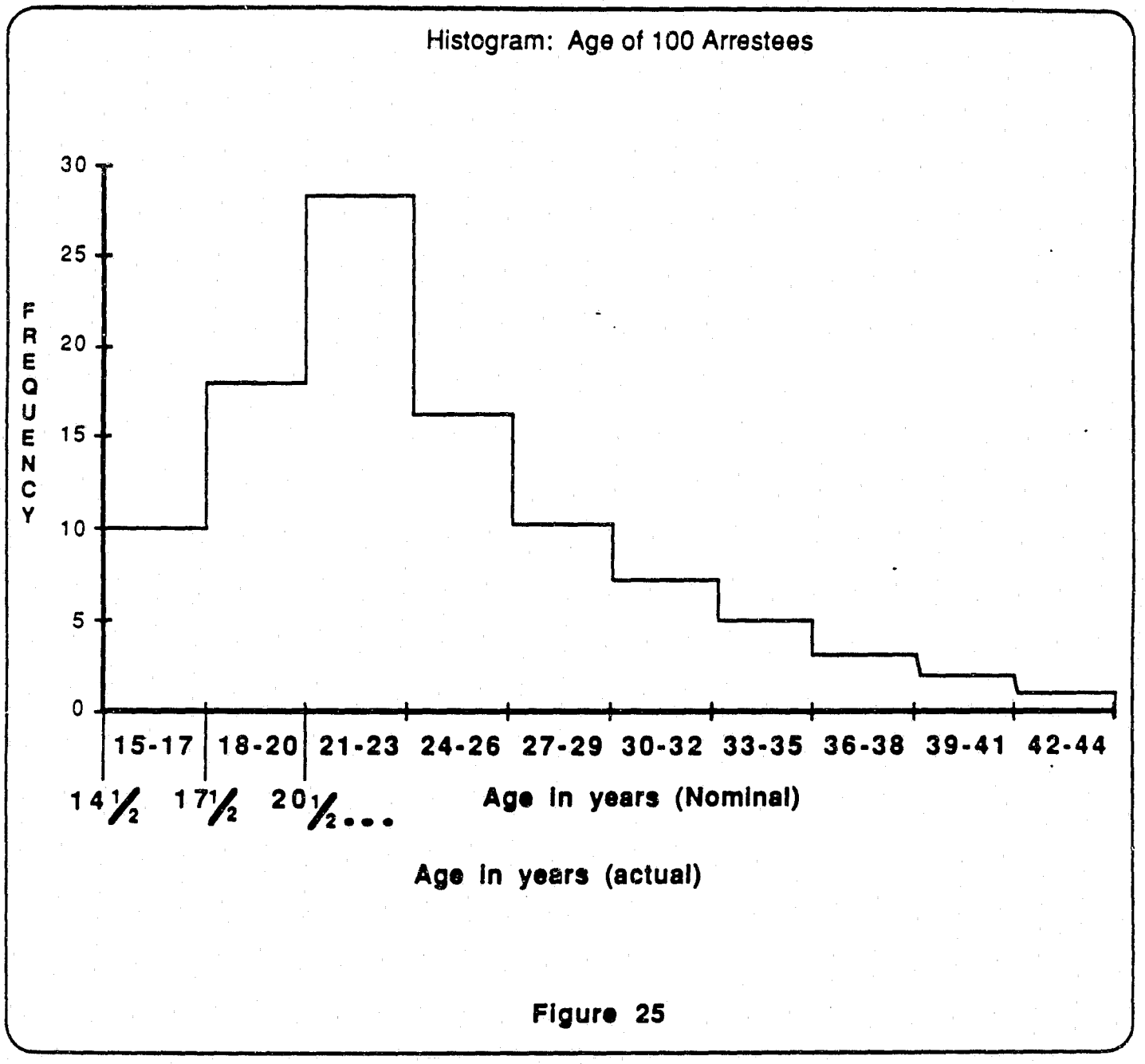
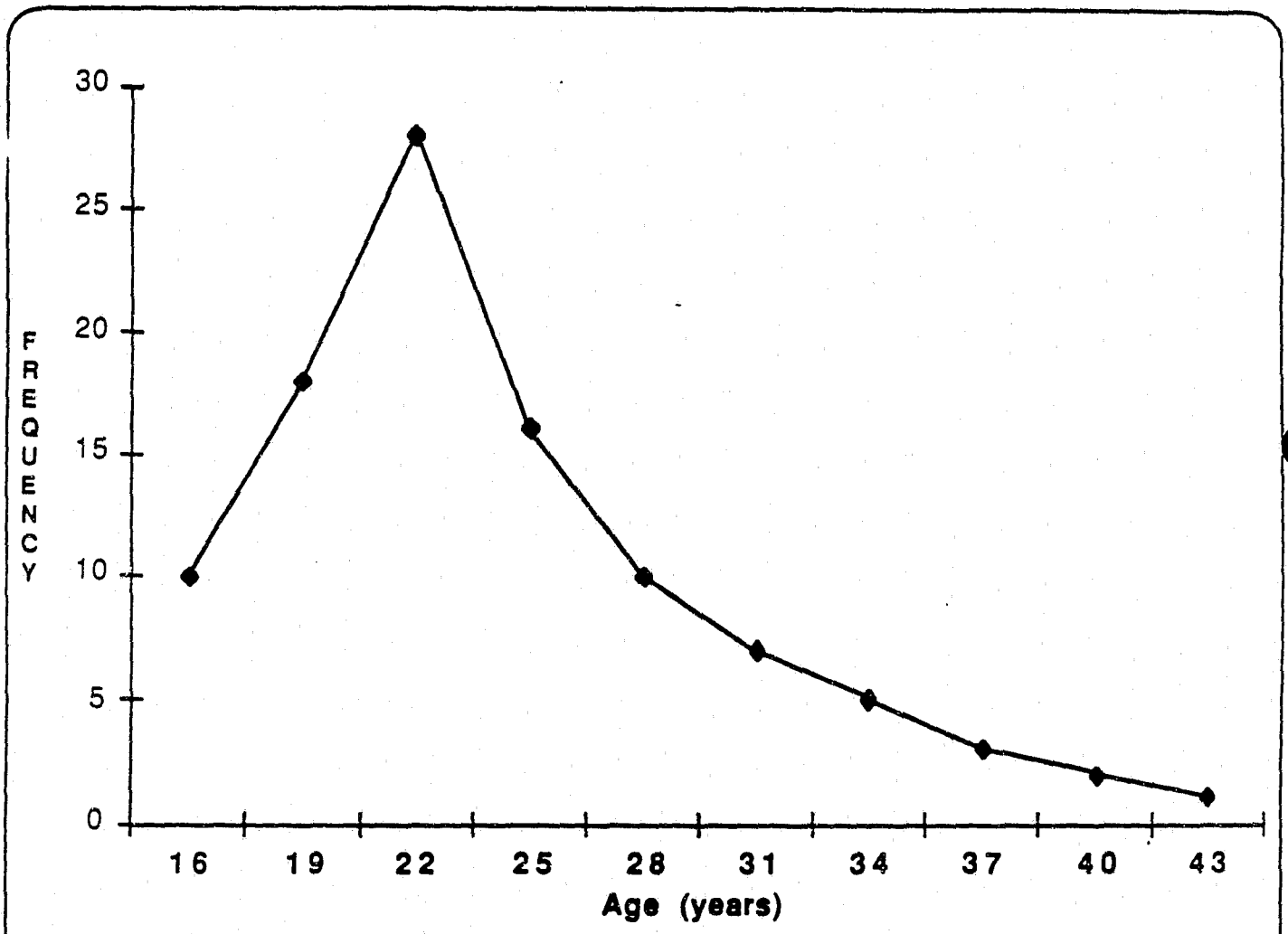

Histogram: Age of 100 Arrestees
FREQUENCY
30
25
20
15
10
5
0
15-17
18-20
21-23
24-26
27-29
30-32
33-35
36-38
39-41
42-44
14½
17½
20½...
Age in years (Nominal)
Age in years (actual)

Figure 25



Frequency Polygon: Age of 100 Arrestees

Figure 26

27-29 had 10 cases in it. The point would be placed opposite 10 on the vertical scale and at the midpoint of the interval 27-29.

We frequently graph data derived from a sample of people; the sample is supposedly typical of the population from which the sample was drawn. Assume that the population of all criminals is similar to the sample of criminals that we have apprehended. Based on this sample, conclusions regarding the criminal population as a whole (which, of course, includes those still at-large) may be drawn. If a school system wished to structure an in-jail remedial educational program for juvenile delinquents and, based on its sample of delinquents, extend the program to the overall educational system, basic data for the design of such a program would include the distribution of some type of reading scores. Assume, however, that we have scores on only 100 of these juveniles, those in the sheriff's custody. If we put these data into a frequency polygon (like Figure 26), we would probably see irregular peaks in the graph because our sample does not adequately represent the entire population. Such irregularity might diminish if we were to graph data representative of the entire population.

There is a very simple technique for smoothing frequency polygons; we do a kind of "averaging" among adjacent intervals. The smoothed frequency for a given interval is the average of the frequencies of that interval and the intervals on each side of the one being considered.

From the table on page 185, let us determine the smoothed frequency for the interval 27-29. We work with the frequency of that interval, 10, and the frequencies of the interval below it (24-26) and the one above it (30-32). These frequencies are 16 and 7, respectively. The sum of these three frequencies (10+16+7=33), divided by three intervals, results in a "smoothed" frequency of 11 (note: 33/3=11) for the interval 27-29. When this procedure is repeated for all intervals, the smoothed frequencies can be graphed.

Analysts new to this procedure may be uncertain about handling the first (15-17) and last (42-44) intervals in a distribution, because the first interval contains no frequency below it, and the last interval no frequency above it. The interval below the first one in which we actually have a frequency simply has no cases in it. Its frequency is zero, as is the frequency of the interval above our highest interval in which there are no cases. Therefore, in smoothing our first interval containing a frequency (15-17), we start with the frequency for that

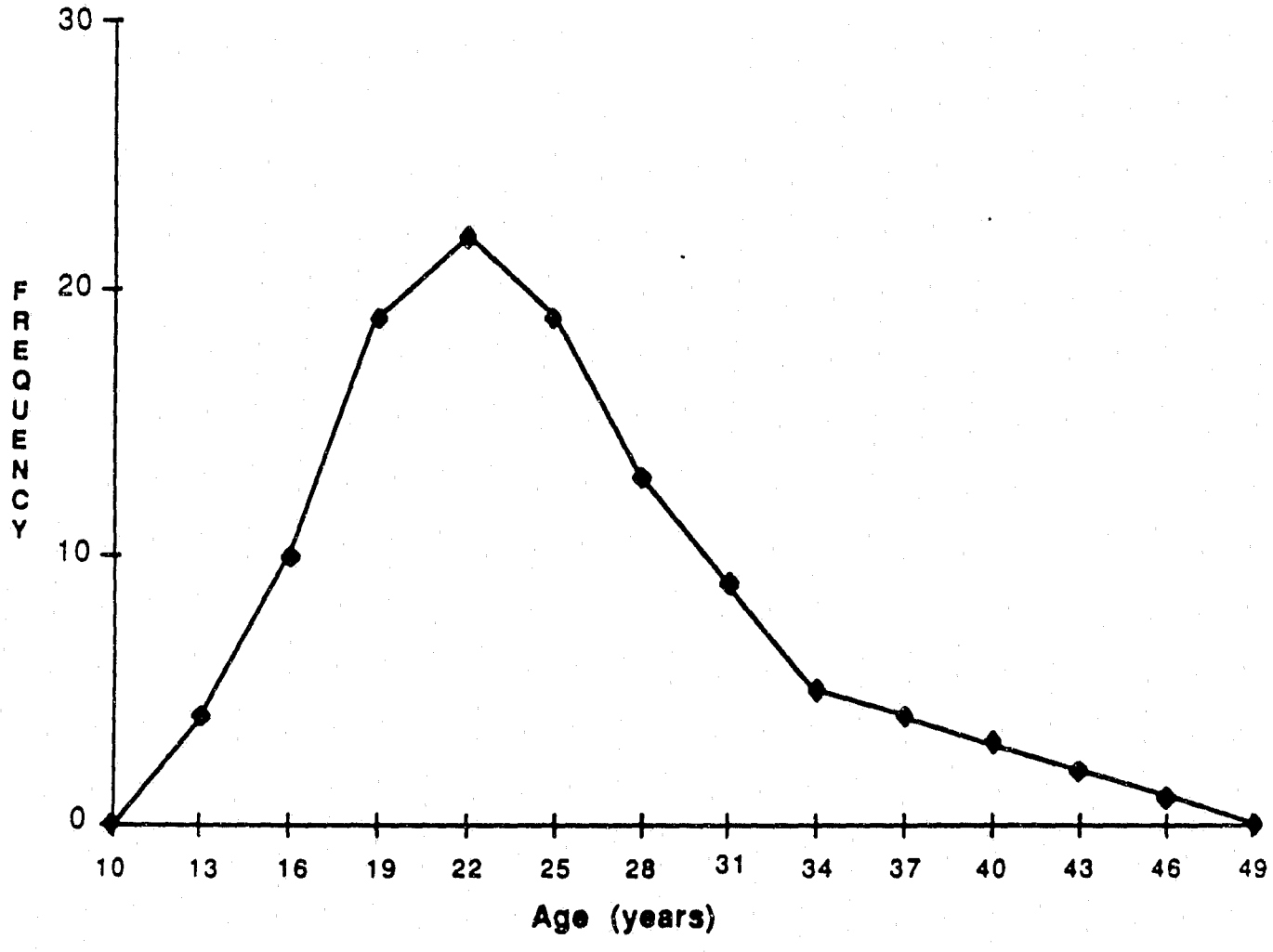
interval (10), add to it the frequencies in the intervals above and below, 0 and 18, respectively, and divide by three. The smoothed frequency for interval 15-17 is 9.33 (10+0+18=28/3=9.33).

Now, how do we handle interval 12-14, the one just below our first frequencies? Again, the intervals 12-14 and 9-11 are certainly real, even though they contain no frequencies. Interval 12-14 is zero, as is the interval below. The interval above (15-17), however, contains 10 cases. We add 0, 0, and 10, divide by three, and compute a smoothed frequency for interval 12-14 of 3.33. Similarly, the smoothed frequency for interval 9-11 is zero.

Smoothed frequency polygons must begin and end at zero. To get to zero, we had to go down to the 9-11 interval even though our collected data began with the 15-17 interval. Following the same process at the upper end, we had to continue past our collected data interval of 42-44 to the 48-50 interval before we arrived at zero. The smoothing process stopped when we reached consistent interval values (zero) at both ends of our frequency polygon as noted in column F (smoothed). Smoothed, as well as actual, frequencies are presented below. The smoothed frequency polygon is illustrated in Figure 27.

X	f (actual)	F (smoothed)
9-11	0	0.00
12-14	0	3.33
15-17	10	9.33
18-20	18	18.67
21-23	28	20.67
24-26	16	18.00
27-29	10	11.00
30-32	7	7.33
33-35	5	5.00
36-38	3	3.33
39-41	2	2.00
42-44	1	1.00
45-47	0	0.33
48-50	0	0.00

Bivariate Graph: Sometimes we wish to show the relationship between two conditions we have observed. For example, how does the number of community service officers affect available beat time?



Smoothed frequency polygon: Age of 100 Arrestees

Figure 27

What is the impact of changes in the enforcement of codes regarding narcotic usage on reported burglaries? When two variables are plotted together, the result is a bivariate graph. For this type of graph two measurements are required for each item observed. One variable is scaled along the horizontal axis, the other along the vertical axis. A point is placed on the graph where a given ordinate (vertical) value intersects its associated abscissa (horizontal) value, and this point is known as the coordinate. Later in this book we will discuss techniques for relating coordinates on bivariate graphs to establish patterns and predictions. Consider the following values for X and Y:

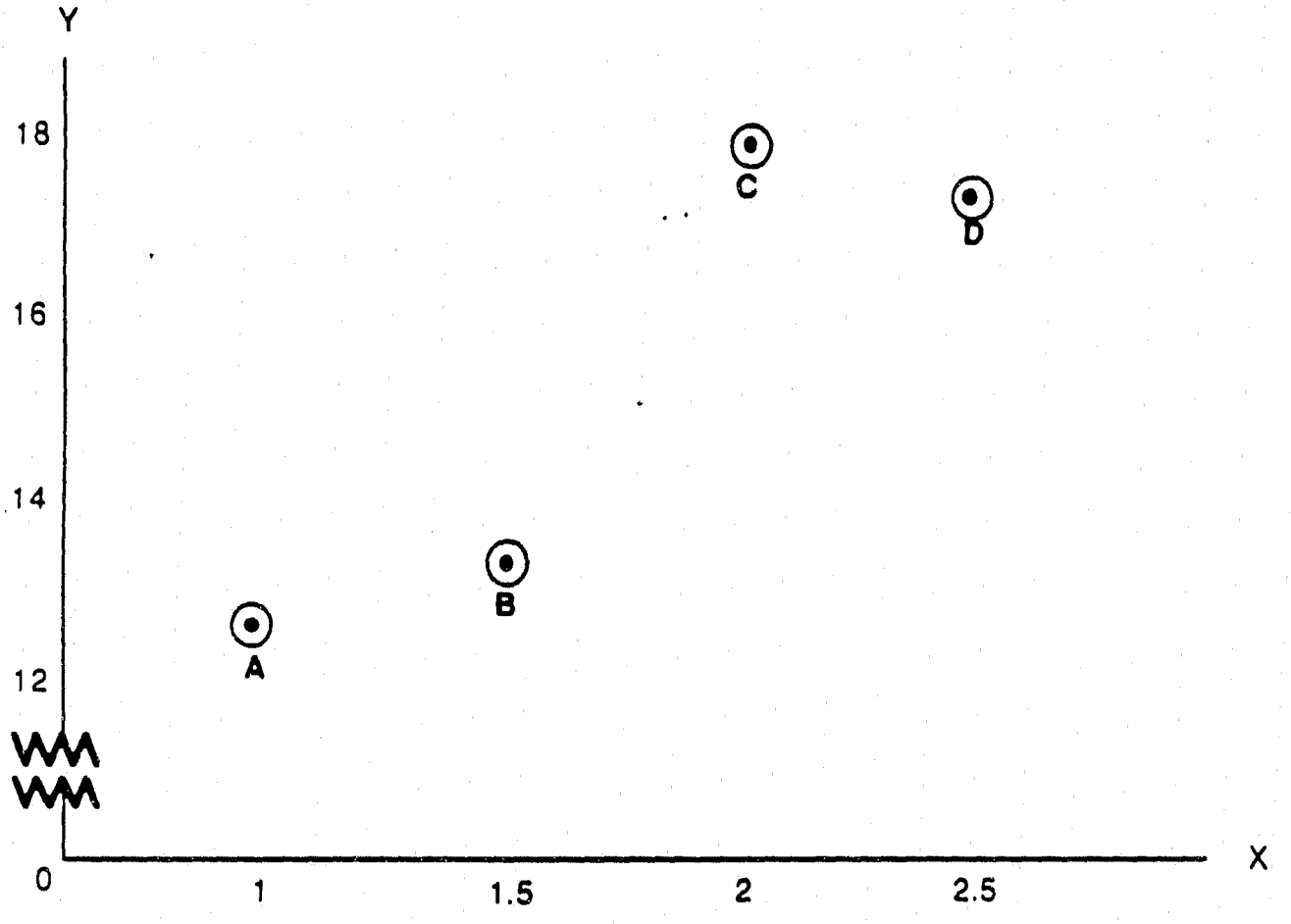
Coordinate	X	Y
A	1.0	12.5
B	1.5	13.0
C	2.0	17.5
D	2.5	17.0

A bivariate graph of these four coordinates is illustrated in Figure 28. A comment regarding Figure 28 is in order. Note that the vertical axis begins with a zero value, is broken, and then followed by 12.0. This is often done where the first value in a series is considerably distant from the origin (zero). This better illustrates the relationship between actual values and is a good graphing practice.

One variant of the bivariate graph is the "pin map", commonly used in law enforcement to illustrate types and times of crimes by location. Locations of crimes are plotted on a street map by placing a marker at the point on the map which represents the street address. Assume that a type of crime (e.g., burglary) occurred at the following addresses:

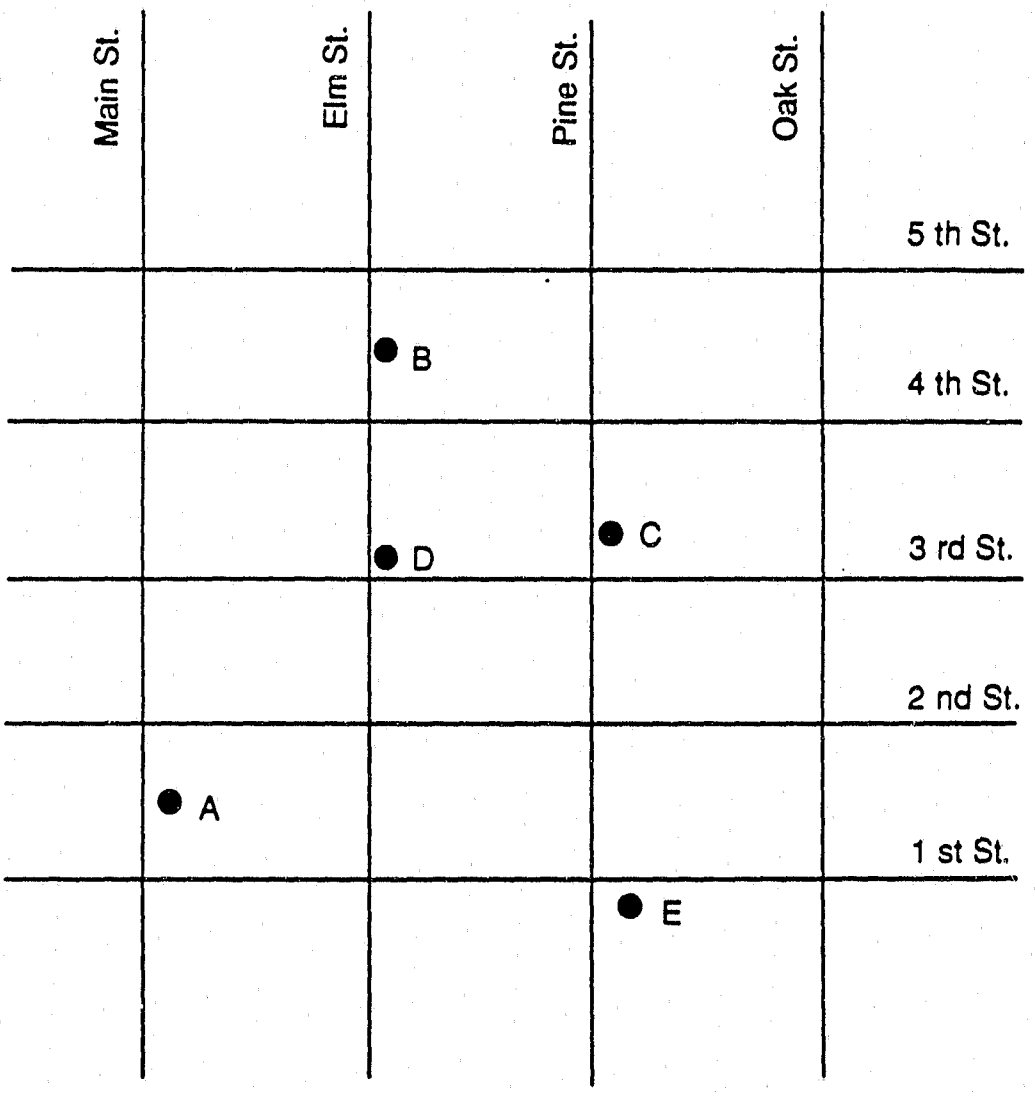
CRIME	ADDRESS
A	123 Main St.
B	457 Elm St.
C	319 Pine St.
D	301 Elm Ave.
E	1604 1st St.

Plotting these crimes on a pin map would give us a graph as shown in Figure 29.



Bivariate Graph

Figure 28



Pin Map

Figure 29

If we add a set of axes to our street map (as shown in Figure 30), our crimes have new "addresses" expressed in terms of bivariate coordinates:

CRIME	X	Y
A	11	1.82
B	21	4.95
C	32	3.81
D	21	3.55
E	32.5	1.41

By converting conventional addresses to bivariate addresses, we facilitate the use of basic statistics to identify patterns, "hot spots", and other useful relationships. These simple statistical procedures will be presented in the next chapter.

Data Presentation: Substantive content, extensiveness of labels, and volume and ordering of data all help determine the method of choice for the display of quantitative material. The basic tools for presenting data are the sentence, the table and the graphic. Whatever tool helps you best understand data is the one you should use. Experiment! One tool may work well for you in one case, and be an absolute dud in another. There is no method that always helps you see "what's happening", but there are some basic rules to follow when trying to explain your work to someone else.

The conventional sentence prevents comparisons within data and is a poor way to show more than two numbers. The linear flow of words, folded at arbitrary points (decided not by content but by happenstance of column width or paper size) offers less than one effective dimension for organizing data. Instead of:

Nearly 53 percent of Group A
did something or other
compared to 46 percent of Group B and
slightly more than 57 percent of Group C

arrange the type to facilitate comparisons, as in this text-table:

Percentage differences in how
three groups did something or other:

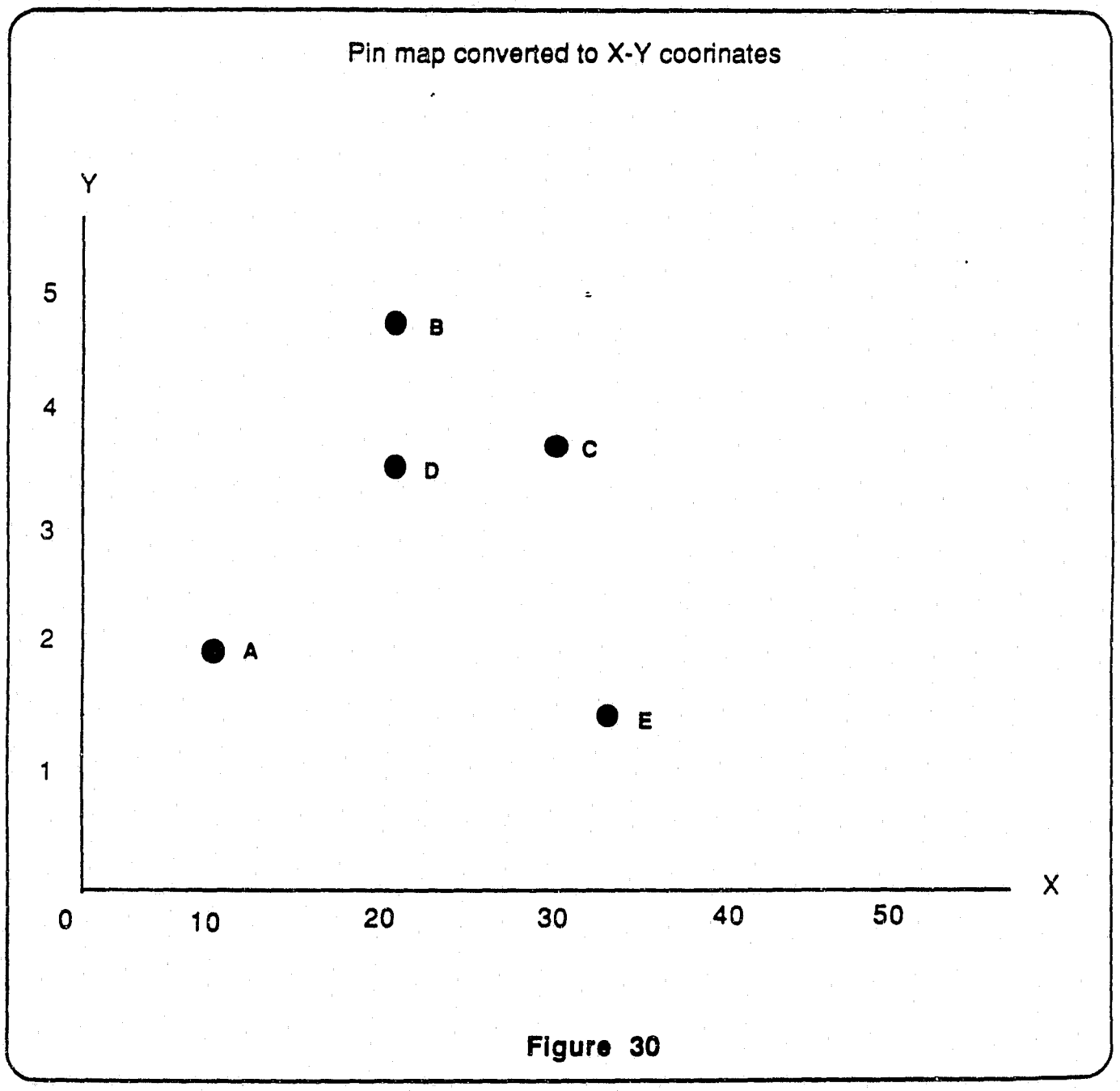

Pin map converted to X-Y coorinates
Y
5
4
3
2
1
B
C
D
A
E
X
0
10
20
30
40
50

Figure 30

Group A	53%
Group B	46%
Group C	57%

There may be sequences better than alphabetical for ordering information. If we order from low to high, for instance, we see differences and ranges at the same time:

Group B	46%
Group A	53%
Group C	57%

Tables are the best way to show exact numerical values and are preferred over graphics to describe small data sets. Further, a table is usually better than a pie chart; the only worse design than one pie chart is several pie charts. No viewer should be asked to compare quantities located in spatial disarray within and between pies! (Pie charts are not covered in this book. We recommend that you avoid using them).

When sets of data are large, use graphs. Use bar charts and histograms when illustrating tabular data, or when you want to compare elements within a single data set. Use frequency polygons, smoothed or unsmoothed, when you want to illustrate the distribution of your data. Use bivariate graphs when you need to illustrate trends or patterns.

CHAPTER 13

THE BASICS

THE BASICS

Crime analysts find it useful to summarize data that lead to numerical results called "descriptive measures". The two most basic types of descriptive measures—measures of central tendency (averages) and measures of variability (dispersion)—will be discussed in detail in this chapter of the book.

For the moment, think of a distribution simply as a set of numbers. For the ages of 100 individuals who have been arrested, we have 100 numbers to be summarized or described by a single number that will indicate the "center" of these numbers.

The most common "center" is the ordinary average. This center is the arithmetic mean or, simply, the mean. The arithmetic mean is called "a" measure, rather than "the" measure because there can be other points of view on what is the "true" center. For each point of view, there is a different way to compute the center. The three most commonly used "center" calculations are explained below. Guidelines as to which one to use under what conditions are discussed.

THE MEAN:

The mean is the best known and most commonly used measure of central tendency. The mean is computed by summing up all the values in the data set and dividing by the number of those values. The rule for computing the mean can also be stated as follows:

MEAN = sum of all the data items/number of data items

Suppose you had the following data items and wanted to compute the arithmetic mean: 87, 76, 94, 105 and 79. The sum of these numbers is 441. The number of data items is 5. Applying our procedure for computing the mean, we get:

MEAN = 441/5 = 88.2

THE MEDIAN:

Sometimes the mean yields a value which common sense tells us we cannot accept as meaningful. If 51 burglaries have occurred and the first 50 of them reported a loss of $100 but the remaining one claimed a loss of $100,000, the total loss is obviously $105,000, and the mean is $2,059.

This is the true arithmetic mean ("average"), yet most would not accept $2,059 as the meaningful center of the set of data. In this case, it is more meaningful to examine the middle value (or "median") of the data set.

The median is obtained by rearranging the data in order by size from low numbers to high numbers and selecting the term in the middle. In our example of burglary losses, the middle term is 26th in the list of 51 and its size is, of course, $100.

When you have an *odd* number of data items, the median is the middle value of a rearranged data set. For example, assume you have an odd number of data elements as follows:

88, 89, 97, 92, 86.

Rearrange the data into numerical order from low to high as shown below:

86, 88, 89, 92, 97.

The median is the *middle* data item, 89. Eighty-nine is the middle data item since there are the same number of data elements below it as above it (two on each side).

When you have an *even* number of data items, there is no middle item. Thus, the median must be determined by calculating the mean of the two items *nearest* the middle. For example, assume you have the following set of six values (six is an even number):

12, 8, 15, 10, 13, 9

Rearrange these data into numerical order as shown below:

8, 9, 10, 12, 13, 15

Determine the two items nearest the center (10 and 12). We know that 10 and 12 are nearest the center because there is an equal number of numbers below the lowest value (10) as above the highest value (12). Two numbers are below 10 and two numbers are above 12. Thus, 10 and 12 are indeed the two values nearest the middle. The median value for this set of data is calculated as follows:

$$(10 + 12)/2 = 11.$$

THE MODE:

The mode (mode = popular) in a data set is the most frequently occurring item. If there are three 68's, four 70's, six 75's and one each of other values in a listing of various values, 75 is the mode of that distribution. If there were four 68's, four 70's, and three 75's, then the distribution would have two modes—68 and 70—and would be called bimodal. A distribution may have one or more modes. A distribution could also be comprised of data elements in which no value appears more than once and, in that case, the distribution would have no mode (no mode, not a mode of 0). A mode of zero implies that the most frequent value in the distribution is zero.

Which Average To Use:

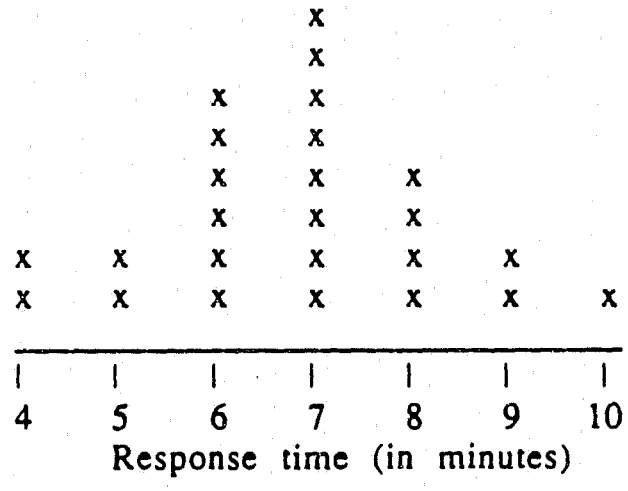
Because the location of the mean is dependent upon the position of each observation in the distribution, the "mean" average is the best of the three to use except when the data are obviously skewed.

If the following data represent the time (in minutes) of patrol's responses to a single type of call-for-service:

6	4	9	4	6
10	7	8	5	7
7	7	7	7	6
5	6	6	9	8
7	8	7	8	6

We could quickly rearrange these data as:

x = a single call-for-service



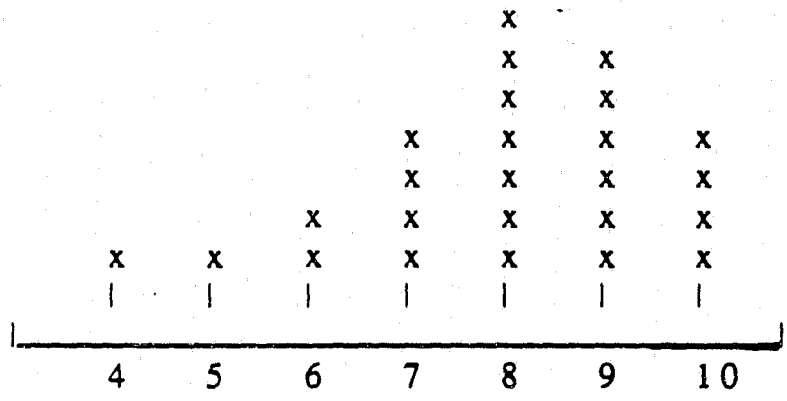
and readily see that the data are pretty well balanced, and their distribution is somewhat bell-shaped.

On the other hand, if we have the following response times:

8	5	10	8	9
6	8	9	9	10
8	7	4	7	8
10	8	9	6	7
7	9	8	10	9

which, rearranged, look like this:

x = a single call for service



Response times (in minutes)

our data are concentrated around the higher values. This data set is "skewed to the right".

We could also have data that are "skewed to the left" and data with two modes, etc. Nothing beats a picture for allowing you to see how to best describe your data.

Values deviating widely in one direction from the center of the distribution tend to "pull" the mean toward them. This is not true of the median, however (even in markedly skewed distributions), and the median may be more nearly central to the bulk of the data than is the mean. The following extreme situation has a mean of 7, entirely out of range of the majority of the data. The median 5, however, is centrally located:

2, 3, 3, 4, 5, 6, 6, 6, 28

Because the median is not influenced by widely deviating values, it is preferable for describing a typical data point when the distribution contains a few elements whose values deviate widely from the rest. The mode, like the median, is also insensitive to widely deviating values; its instability, however, makes it the last choice, even in markedly skewed data.

In summary: Use the "mean" average when the data are symmetrically distributed, and use the median when the data are skewed. Don't use the mode to summarize data distributions. . .

A Note About "Dropping" Highs And Lows:

High and low values are as real as other values. Dropping them cannot be justified unless a clear and logically precise explanation is offered. To simply ignore certain values leads to difficulties, both objective or subjective in nature:

(1) The resulting analysis may not be representative of the actual situation. The analyst could be accused of selecting data on the basis of a desirable result. In accounting terms, the analyst could be accused of "cooking the books".

(2) By eliminating "highs" and "lows", the analyst may eliminate his or her opportunity to identify possible causes for these values and unintentionally (or worse) inhibit "improving things".

MEASURES OF VARIABILITY:

The mean, median and mode tell us only part of what we need to know about the characteristics of data. To understand more, the analyst must also determine variability (the spread or dispersion of the data). Three measures have been found most useful: the range, the mean average deviation, and the standard deviation.

Range:

As indicated in Chapter 11, the simplest—and most readily calculated—way to establish the amount of dispersion in a data set is to determine the difference between the lowest and highest values in the data set and add 1

to the result. This measure is known as the "range". It is computed by subtracting the lowest value from the highest value. For the following data:

99, 80, 63, 87, 82, 66, 54, 32, 56, 75

the range is (99 - 32) + 1 or 68. Though simple to compute, the "range" of a data set gives little in the way of understanding to the data since only two data points are considered.

Mean Average Deviation:

Another measure of dispersion, which considers all the data, is the mean average deviation. To calculate mean deviation, we first calculate the mean average. Then we find the difference between each individual piece of data and the mean average of the data.

For the following data:

11, 8, 6, 7, 8

to compute the mean average, we sum these data (for a total of 40) and divide by the number of data elements (in this case, 5). The mean average for this simple data set is 8.

Now, in order to get the mean difference, we calculate the difference between each data element and the mean average of all the data. For this calculation, all differences are treated as positive numbers. The results of these subtractions are:

11 - 8 = 3
8 - 8 = 0
6 - 8 = 2
7 - 8 = 1
8 - 8 = 0

The mean deviation is the sum of all differences (3+0+2+1+0 = 6) divided by the number of calculated differences (5 in this case). The mean deviation is 6/5, or 1.2.

What do these calculations tell us? Two things: the data center around the value 8 and the average dispersion of the data is 1.2 units to the left, and 1.2 units to the right of that center value.

Standard Deviation:

Measures discussed so far are used because they are easy to calculate and understand. They are of little use, however, to the crime analyst asked to address problems impacting upon an agency's resources. The most important measure of dispersion, in these cases, is the "standard deviation". The standard deviation is the most informative of all calculations of dispersion.

To calculate the standard deviation in a set of data:

(1) Calculate the mean average.

(2) Calculate the difference of each data point from the mean average.

(3) Square each of the differences calculated in Step 2. (The square of a number is found by multiplying it by itself. The square of 4 is 4 x 4 = 16).

(4) Sum the squares calculated in Step 3.

(5) Divide the sum of the squares calculated in Step 4 by the number of data elements. The result from this division is the "variance".

(6) Find the square root of the variance to obtain the standard deviation. (The square root of a number is a number that, when multiplied by itself, results in that number. The square root of +36 is 6. When you multiply 6 by itself [6 x 6], the result is +36. Remember that -6 is also a valid square root of +36. When you multiply -6 by -6, the result is also +36 [multiplying two negative numbers results in a positive number]. Thus, all numbers actually have two square roots—a positive root and a negative root).

For example, *if* our data are

11, 8, 6, 7, 8

(1) The mean average is 8: (11+8+6+7+8 = 40, and 40/5 = 8).

(2) The differences between the mean average and each data element in this set (ignoring signs) are: 3, 0, 2, 1, 0.

(3) The squares of these differences are: 9, 0, 4, 1, 0.

(4) The sum of these squares, 9 + 0 + 4 + 1 + 0 = 14.

(5) Dividing the sum of these squares by the number of data elements, 14/5, gives us the variance, 2.8, in this example.

(6) The standard deviation of the example data set is the square root of 2.8, a plus or minus 1.67.

The standard deviation is a measure of the scattering of data from its mean average. To see how it functions in this respect, first note that if the standard deviation was zero, then all the deviations must be zero and thus, all the data are clustered at one point. If all the data are clustered close to the mean, then the sum described in Step (4) above is small, which results in a standard deviation near, but not equal to, zero. As the data becomes more spread out, the standard deviation will increase in size.

While there are formulas that use the standard deviation to make predictions, they must, by necessity, be quite conservative since they cover every conceivable type of data distribution. For distributions having a bell-shaped appearance, the following empirical results more nearly reflect what is encountered.

EMPIRICAL PREDICTIONS

The interval of +/- one standard deviation from the mean will contain about 68% of the data.

The interval of +/- two standard deviations from the mean will contain about 95% of the data.

The interval of +/- three standard deviations from the mean will contain about 99.7% of the data.

Alternatively, we can say that about 68% of the data are within one standard deviation of the mean, about 95% within two standard deviations of the mean, and virtually all are within three standard deviations of the mean. See Figure 31.

Of what use is the standard deviation to crime analysts? Primarily, it can be of great assistance when we want to predict the likely occurrence of events. Any data distribution which is symmetrical about its mean

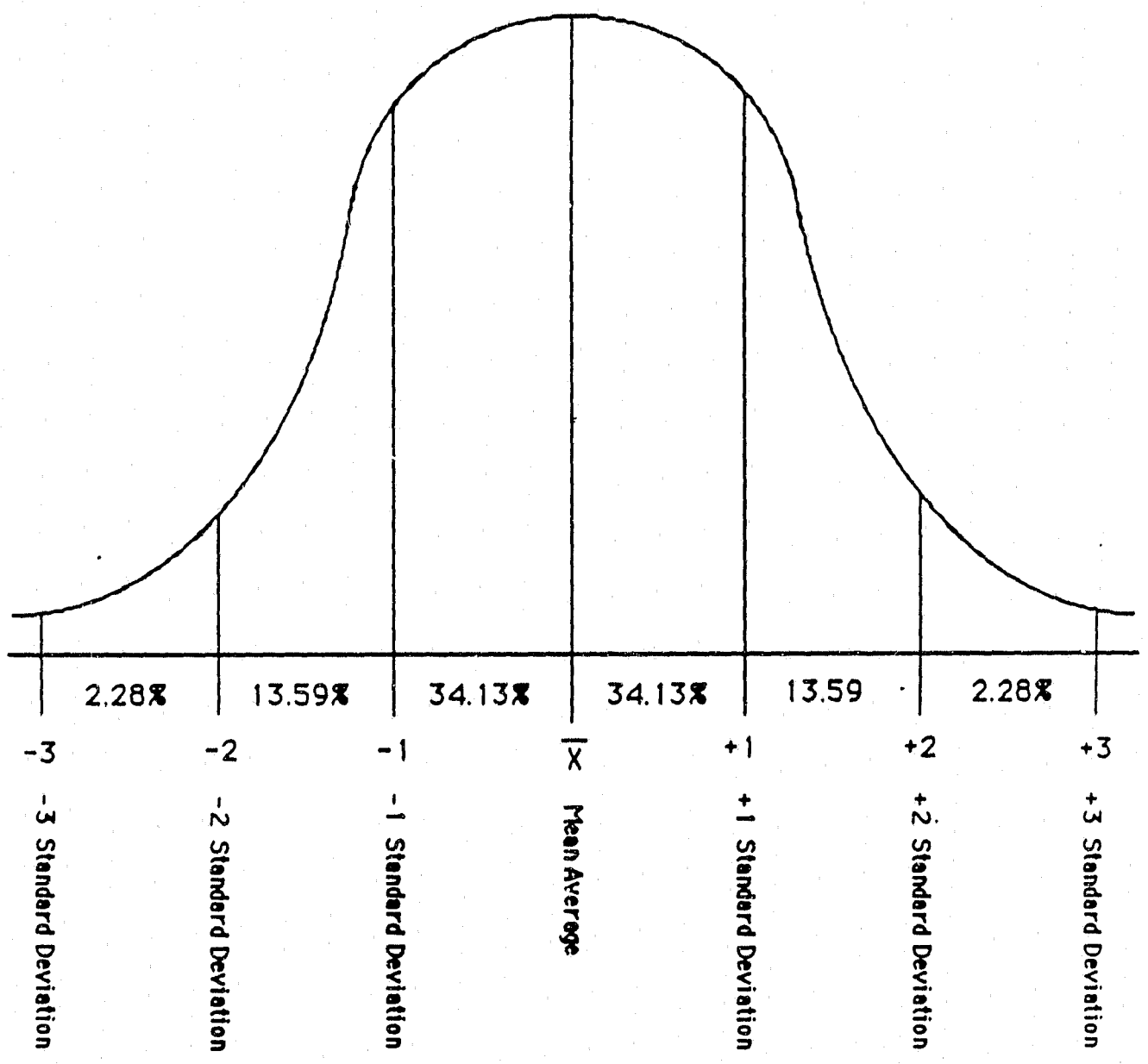


Figure 31
Bell Curve with Standard Deviation Illustrated

average (like a bell-shaped curve) is unimodal. That is, it has one hump in the center when the data are plotted as a histogram. These types of data have some unique characteristics that lend themselves to the forecasting function. For example, there is little error in assuming that two-thirds (actually 68 percent) of the data are distributed within one standard deviation of the mean. In addition, 95% of the data are distributed within two standard deviations of the mean, and almost all of the data (99.7%) lay within three standard deviations of the mean. This is a rough rule, of course, but it has been found to work very well.

The standard deviation is a powerful tool for crime analysts and can be used in a variety of ways. For example, assume a neighborhood is being victimized by a burglar-rapist. After interviewing victims, we find that the mean average time of the crime is 0300 and that the mean average time has a standard deviation of +/- 1 hour. Two standard deviations from the mean are +/- 2 hours. Three standard deviations from the mean are +/- 3 hours.

We would conclude that 68% of the crimes that have been committed and are yet to be attempted by this criminal—if his current pattern continues—will occur between 0200 and 0400 hours, one standard deviation from the mean. (Remember, the mean is 0300. Thus, calculating +/- 1 hour from the mean gives us the range of 0200 to 0400). Ninety-five percent of these crimes (two standard deviations from the mean or 2 hours) are distributed between 0100 and 0500 hours, and virtually all of these crimes are distributed between 2400 and 0600 hours (three standard deviations from the mean or 3 hours). Armed with this information, a department's patrol commander would be in a position to order a cost-effective deployment of agency resources in an effort to apprehend this perpetrator.

SEASONAL AVERAGING:

Many human activities vary with time of year. Traffic accidents near a beach are more frequent during the warm summer months than during cold winter months. In jurisdictions where snow marks the winter season, response times to calls-for-service tend to be longer than during non-winter months. Some crimes increase with the advent of the Thanksgiving-Christmas holidays, particularly shop lifting and theft from vehicles. Although these observations may seem obvious to law enforcement professionals, it may be important to demonstrate a surge in a particular crime during a season to a non-professional, or to demonstrate that a crime is occurring at a higher or lower rate than expected.

It is important for crime analysts to be able to compute seasonal averages so that management is able to plan for seasonal changes. It is also important for law enforcement professionals to be made aware of the season just past. Was a specific crime committed with a frequency that fell within the expected range of values (a threshold), or was its frequency unusually high or low?

Two methods for computing seasonal average are presented. The first is the easier of the two, but its results are not as accurate as other methods. The second method is presented in Chapter 15 of this book. Both methods are exemplified by three years of data—three years are necessary for seasonal averaging. If you have more data, fine. If you have fewer, advise those who will be utilizing your results to use them with caution.

Seasonal Averaging (Method 1):

The following table represents gallons of gasoline (in thousands) hijacked monthly over the past three years:

	YEAR 1	YEAR 2	YEAR 3
JAN	40	60	50
FEB	42	62	73
MAR	53	64	71
APR	82	60	78
MAY	74	71	81
JUN	82	84	100
JUL	100	103	120
AUG	122	125	141
SEP	115	124	118
OCT	92	110	103
NOV	76	94	90
DEC	126	123	137

Step 1: Determine the mean average for each month.
January mean = (40+60+50)/3 = 50
February mean = (42+62+73)/3 = 59, etc.

Step 2: Calculate a season adjustment factor (SAF) by dividing the most current information by the mean for that month over the past three years. If 58,000 gallons of gasoline

were hijacked during January of YEAR 4, the seasonal adjustment factor would be:

58 (the most current data)/50 (the 3 year mean for Jan.) = 1.16

The figure 1.16 means that, in the current year, the amount of gasoline stolen was 1.16 times that of previous years. Sixteen percent more gasoline was hijacked during January of YEAR 4 than was hijacked in the "average" January of the previous three years.

Step 3: If this trend were to continue throughout YEAR 4, the analyst could calculate the number of hijacked gallons expected for the remainder of YEAR 4:

For February: 59.0 x 1.16 = 68.4
For March: 62.7 x 1.16 = 72.7
For April: 73.3 x 1.16 = 85.0, etc.

Putting our work in tabular form,

	YEAR 1	YEAR 2	YEAR 3	MONTHLY MEAN	SAF	ESTIMATE
JAN	40	60	50	50.0	1.16	58 (*)
FEB	42	62	73	59.0		68.4
MAR	53	64	71	62.7		72.7
APR	82	69	78	73.3		85.0
MAY	74	71	81	75.3		87.3
JUN	82	84	100	88.7		102.9
JUL	100	103	120	107.7		124.9
AUG	122	125	141	129.3		150.0
SEP	115	124	118	119.0		138.0
OCT	92	110	103	101.7		118.0
NOV	76	94	90	86.7		100.6
DEC	126	123	137	126.7		147.0

(*) Actual

One reasonable question the analyst might pose is: What if the actual amount hijacked in February does not agree with the calculated estimate? (It probably won't).

The answer: Adjust the calculations using February's actual amount as the basis for computing a new Seasonal Adjustment Factor (SAF). Then, recompute the new estimates for March through January, with January's estimate being for YEAR 5.

MOVING AVERAGES:

Moving averages provide the most insightful way to determine whether crime is increasing or decreasing, or whether long-term programs or long-term operational changes are having the desired effect. Moving averages are designed to smooth variations over time intervals and to highlight trends. If one were to plot most crimes as a function of time on a frequency chart, most graphs would appear to be saw toothed—up one month, down the next. A police agency cannot respond to peaks and valleys; its deployment must be based on trends. When the trend is up (by beat, time interval, or specific day), resources should be assigned to "hot spots" to prevent crime from crossing a threshold. If the data indicate that the "hot spot" has cooled and will not cross the threshold for some time, resources can be moved to other areas, other shifts, or other assignments. Remember: the key to computing an effective moving average is the time interval. The longer the time interval, the less influence exerted by any particular time period within the interval. The best way to choose a prudent time interval is to examine your agency's recent data, and experiment with it.

There are three basic moving averages: simple, weighted, and exponential. All can be used for any time interval; the choice is up to the analyst. The authors, however, have found the most practical minimum time interval to be one year. Moving averages smooth variation within the time interval of the average, and emphasize variation for time intervals greater than the average. For example, a four quarter moving average would smooth seasonal variation and concentrate on year long (or longer) trends.

Simple Moving Average:

The simple moving average does not require intricate calculations and does not recognize that the most recent data may have more meaning than less recent data. Table I creates a five-week simple moving average for a hypothetical set of data. The first five weeks are required as an initialization period, and the moving average should be interpreted from the sixth week on. Calculation of the average for each week requires summing the five most recent weekly data points and dividing that sum by five. All the data are given equal weight and all the data determine

the level of the average. The data added and deleted each week affect the moving average, causing week-to-week variations.

Assume that the data given in the column titled "end of week data" is the number of robberies reported for the week listed in the column titled "week". If the data given in the first two columns were plotted, we would get a classic "saw tooth" and not see the long-term trend in robberies. The data in the column titled "moving average" gives us the average week over a five week span (starting in the sixth week). Note that beginning with week 6, the data from week 1 is dropped and the pattern of "dropping weeks" continues to the end of the data set (i.e., in week 7, the data from week 2 is dropped; in week 8, the data from week 3 is dropped, etc.). If we were to plot the moving average by week, our curve would be considerably smoothed and we would see that the trend in robberies is up.

Table I
Simple Five-Week Moving Average

Week	End of Week Data	Calculation	Moving Avg.
1	20	20/1	20.00
2	21	20+21/2	20.50
3	21	20+21+21/3	20.66
4	20	20+21+21+20/4	20.50
5	22	20+21+21+20+22/5	20.80
6	22	21+21+20+22+22/5	21.20
7	21	21+20+22+22+21/5	21.20
8	23	20+22+22+21+23/5	21.60
9	24	22+22+21+23+24/5	22.40
10	24	22+21+23+24+24/5	22.80
11	25	21+23+24+24+25/5	23.40
12	27	23+24+24+25+27/5	24.60
13	24	24+24+25+27+24/5	24.80
14	23	24+25+27+24+23/5	24.60
15	25	25+27+24+23+25/5	24.80

Weighted Moving Average:

The weighted moving average allows flexibility in determining what relative contribution each data point will make to the value of the average. Table II provides another example of a moving average calculation, using the same data as Table I. This example assigns heavier weights to the

most recent data; however, any weighting system is possible. When there are sharp movements in recent data, the weighted moving average may differ significantly from the simple moving average.

The concept behind the weighted moving average is that current data is more significant than past data. To reflect this significance, various multipliers are used. Let's look at week 2 in Table II below. The data at the end of the second week (21) are more important than the data at the end of the first week (20). To reflect this difference, we multiply the data at the end of the second week by two, thus making this datum twice as important than the first. Multiplying it by two, however, creates the effect of two second weeks. Since we are also averaging in one first week, we have the mathematical equivalent of three weeks, hence the division by three. The same concept is used for calculating the moving average at the end of the third week. In this case, the third week is the most current and, therefore, the most significant, followed by the second week and finally the first week. This significance is reflected in the multipliers (also known as weights) and the division by six is due to the sum of the mathematical equivalent of three third weeks, two second weeks and one first week.

This process continues until we reach the end of the sixth week. Since our example deals with a five week moving average, data from the end of the first week are dropped from further inclusion in our calculations (they are six weeks old). The same "drop" of second week data is implemented when we compute the moving average as of the end of the seventh week.

Table II
Weighted Five-Week Moving Average

Week	End of Week Data	Calculation	Moving Avg.
1	20	(20x1)/1	20.00
2	21	(20x1)+(21x2)/3	20.66
3	21	(20x1)+(21x2)+(21x3)/6	20.83
4	20	(20x1)+(21x2)+(21x3)+ (20x4)/10	20.50
5	22	(20x1)+(21x2)+(21x3)+ (20x4)+(22x5)/15	21.00
6	22	(21x1)+(21x2)+(20x3)+ (22x4)+(22x5)/15	21.40
7	21	(21x1)+(20x2)+(22x3)+	

		(22x4)+(21x5)/15	21.33
8	23	(20x1)+(22x2)+(22x3)+	
		(21x4)+(23x5)/15	21.93
9	24	(22x1)+(22x2)+(21x3)+	
		(23x4)+(24x5)/15	22.73
10	24	(22x1)+(21x2)+(23x3)+	
		(24x4)+(24x5)/15	23.26
11	25	(21x1)+(23x2)+(24x3)+	
		(24x4)+(25+5)/15	24.00
12	27	(23x1)+(24x2)+(24x3)+	
		(25x4)+(27x5)/15	25.20
13	24	(24x1)+(24x2)+(25x3)+	
		(27x4)+(24x5)/15	25.00
14	23	(24x1)+(25x2)+(27x3)+	
		(24x4)+(23x5)/15	24.40
15	25	(25x1)+(27x2)+(24x3)+	
		(23x4)+(25x5)/15	24.53

Exponential Moving Average:

The exponential moving average is the most sophisticated moving average, requires less historical data than the other two techniques, and is the easiest to calculate. This technique, recommended for most crime analysis problems, automatically corrects for differences between past moving averages and the actual data.

In the weighted moving average technique, we arbitrarily chose our multipliers (see Table II). The exponential moving average requires us to compute a very specific value, known as the "smoothing constant". The smoothing constant varies from zero to one and is computed with the following simple formula:

$$SC = 2 / (T + 1)$$

where T = time interval of the moving average
and SC = smoothing constant

For instance, for a five-week exponential moving average (T in our formula), the smoothing constant would be:

$$SC = 2 / (5 + 1) = 0.33$$

Table III presents an example of a five-week exponential moving average. In order to start the exponential average, the moving average in week one was assumed to be equal to the actual data at the end of week one. The calculation for any subsequent week is straightforward. It is the

smoothing constant (0.33 in our example) times the end of week data, plus one minus the smoothing constant (1 - 0.33 = 0.67), times the previous moving average.

Table III
Exponential Five-Week Moving Average

Week	End of Week Data	Calculation	Moving Avg.
1	20	----------	20.00
2	21	(0.33)(21)+(0.67)(20.00)	20.33
3	21	(0.33)(21)+(0.67)(20.33)	20.55
4	20	(0.33)(20)+(0.67)(20.55)	20.36
5	22	(0.33)(22)+(0.67)(20.36)	20.90
6	22	(0.33)(22)+(0.67)(20.90)	21.26
7	21	(0.33)(21)+(0.67)(21.26)	21.17
8	23	(0.33)(23)+(0.67)(21.17)	21.77
9	24	(0.33)(24)+(0.67)(21.77)	22.50
10	24	(0.33)(24)+(0.67)(22.50)	22.99
11	25	(0.33)(25)+(0.67)(22.99)	23.65
12	27	(0.33)(27)+(0.67)(23.65)	24.75
13	24	(0.33)(24)+(0.67)(24.75)	24.50
14	23	(0.33)(23)+(0.67)(24.50)	24.00
15	25	(0.33)(25)+(0.67)(24.00)	24.33

COMPARING DATA:

It is common for an agency to request a comparison of this year's total burglaries with those of last year, this year's first quarter total robberies with those of last year's, or this month's auto accidents at a particular intersection with those at another intersection for the same period. Two data elements are needed for such comparisons: the data that are to be compared, and the data with which they are to be compared. Let's label the former the "object" data and the latter the "reference" data. To make comparisons, we simply solve the following equation:

(OBJECT DATA - REFERENCE DATA) / (REFERENCE DATA) X 100%

In 1985, Plainville had 487 residential burglaries. The year before, 1984, they had 319. The Chief of Plainville's Police Department wants a comparison of 1985's residential burglaries with 1984's. The Department's crime analyst identified the object data to be 1985's total of 487 and the

reference data to be 1984's total of 319. (The analyst must listen closely to requests for comparison. If, for some obscure reason, it were requested that 1984 be compared to 1985, the result would be quite different). Having correctly identified the object data and the reference data, Plainville's crime analyst simply "plugged" the values into the above equation and got:

$$(487 - 319) / (319) \times 100\% = +53\%$$

The 53% shows the amount of change in the number of residential burglaries between the two years. The "+" sign indicates that the change was an increase from 1984 to 1985. (The inclusion of the "+" sign emphasizes the fact that a positive number indicates an increase; we tend to ignore the "+" sign when values are positive). If we reverse the number of total residential burglaries and give 1984's total as 487 and 1985's as 319, the answer to the chief's request is:

$$(319 - 487) / (487) \times 100\% = -34\%$$

These figures reflect a change of 34% from 1984 to 1985 and the "-" sign indicates a decrease in the object data when compared to the reference data. Remember that the key is accurate identification of the object data and the reference data. The computation is straightforward, giving both the magnitude and direction of change.

RATES:

Although comparisons are easily calculated, results from comparisons may not always be as informative as they might. Crimes must have targets: there must be residences to have residential burglaries, there must be fast food establishments to have "stop-and-rob" fast food robberies, there must be children to have child abuse. Straight comparisons overlook this apparent fact.

The utility of additional data is illustrated in the following example, in which the year, number of residential burglaries and number of residences are listed in tabular form:

YEAR	# OF RESIDENTIAL BURGLARIES	# OF RESIDENCES
1987	4,127	14,739
1986	3,902	11,149

Comparing the number of residential burglaries in 1987 with the number in 1986 gives us:

$$(4{,}127 - 3{,}902) / (3{,}902) \times 100\% = +6\%$$

And comparing the number of residences that could have been burglarized gives us:

$$(14{,}739 - 11{,}149) / (11{,}149) \times 100\% = +32\%$$

Suppose we compute the number of burglaries per residence so that we can compare our data on a common data base, burglary per residence. The number of crimes, divided by the number of available targets, is known as the crime rate. The residential burglary rate for 1986 in our example was:

3,902 burglaries/11,149 residences = 0.35 burglaries/res.

and in 1987 it was:

4,127 burglaries/14,739 residences = 0.28 burglaries/res.

If you compare the rate of residential burglaries in 1987 to that in 1986:

$$(0.28 - 0.35) / (0.35) \times 100\% = -20\%$$

And it would appear that we have contradictory results. On the one hand, the absolute number of residential burglaries increased 6% from 1986 to 1987. On the other hand, the rate of residential burglary (chance of any individual residence being burglarized) decreased 20%. Which result to give? Both! Your job as departmental crime analyst is to provide completed work. Both answers are correct, and completed work demands that you provide both numbers. Presentation and use of these values is not the analyst's job.

Rate calculations and comparisons are important for deployment, crime prevention programs, crime-specific undertakings, and community problem solving. Therefore, a crime analyst should have readily available a detailed description of the community's population (sex, age, race, residential density, census data distribution throughout the community, etc.), detailed maps of the community, and data describing all structures within the community. Without these data, the analyst is working with crime numbers alone and is not able to relate the crime to community characteristics.

INDEXES:

In our previous example, we computed a crime rate of 0.28 burglaries per residence for 1987. Most people think in terms of whole numbers when it comes to crime, and analysts generally convert crime rates to values comprised of whole numbers. This procedure is known as indexing.

If we have 0.28 burglaries per residence, we have twice as many burglaries for twice the number of residences (0.28 X 2 = 0.56 per two residences), three times as many burglaries for three times the number of residences (0.28 X 3 = 0.84 per three residences), etc. How many burglaries would we have for 100 residences?

0.28 X 100 = 28 burglaries per 100 residences

Note that we have not changed any relationship. All we have done is change a rate (which is a measure per unit—in this case, 0.28) to an index (which is a measure per chosen number of units—in this case, 100). You may choose any multiplier; the index, however, must stipulate the choice (as shown in our example).

Now suppose you want to compare your agency's index of some crime with that for the state. If your jurisdiction had 1.3 homicides per 1000 population and the state's index was 104.5 per 100,000 population, you would convert both indices to a common homicide rate.

The procedure for indexing involves finding the smallest number which, when used as a multiplier of both the numerator and the denominator, will produce a whole number in the numerator. Your community has a homicide rate of 1.3/1000 (0.0013 homicides per person) and the state reports a homicide rate of 104.5/100,000 (0.0010 homicides per person). From a rate point of view, your jurisdiction has a greater homicide problem than the state. Specifically, your community's rate compared to the state's rate is:

(0.0013/0.0010) x 100% = 130%.

This means that your rate is 30% greater than the state's.

Put in another form, the state has:

(0.0010/0.0013) x 100% = 77%

of the community's rate of homicide, a rate 23% less than your community's.

Most state and Federal crime statistics are based on 100,000. Using 100,000 for a community whose population is 15,000 does not help you communicate to your constituents, however. Remember, keep the index as small as possible in order to generate whole numbers in the numerator. It is all right to have a decimal in the numerator (e.g., 4.8, 6.2. etc.). Just keep in mind that an effective index contains whole numbers.

CHAPTER 14

ANALYZING PATTERNS OF TIME

ANALYZING PATTERNS OF TIME

If a time pattern can be discerned for past crimes (in a series), then criminals involved with that crime series may continue following the same time pattern. Time patterns fall into two general categories: exact time patterns, and time interval patterns. Exact time crimes are those in which law enforcement is advised as to the exact time that a crime occurred. Crimes such as rape or robbery are usually exact time crimes.

Burglary and auto theft are typical examples of time interval crimes. The victim is unaware of his loss until sometime after the crime occurred. A citizen parks his vehicle at 2300 hours and retires for the evening. At 0800 hours the next day, the citizen returns to his car and finds his stereo radio stolen. The crime occurred sometime (time interval) between 2300 and 0800 hours, but the exact time of the theft is unknown.

The following section is largely based on a memorandum prepared by Dale Brearcliffe, crime analyst for the Livermore (CA) Police Department. Mr. Brearcliffe presents a number of techniques in an understandable format and Messrs. Gottlieb and Arenberg, the authors of this book, prepared this section to reflect Mr. Brearcliffe's work.

EXACT TIME CRIMES - NOT AROUND MIDNIGHT:

The procedure for identifying the time pattern or exact time crimes that do not wrap around midnight consists of the following steps:

(1) Convert all times to their decimal equivalent.

(2) Calculate the arithmetic mean of these times.

(3) Calculate the standard deviation of these times.

(4) Subtract the standard deviation from the arithmetic mean, and convert that time to the format of a 24-hour clock. Add the standard deviation to the arithmetic mean, and convert that time to the format of a 24-hour clock. These two times form the boundaries of the time period in which 68% of the crimes have occurred and are likely to occur.

(5) Subtract two times the standard deviation from the arithmetic mean and convert the result to the format of a 24-hour clock. Add two times the standard deviation to the arithmetic mean

and convert the result to the clock. These two values form the boundaries of the time period in which 95% of the crimes have occurred and are likely to occur.

Let's illustrate this process with a simple example. A series of armed robberies has been committed by the same criminals at the following times:

1330, 1415, 1100, 1200, 1300, 1545, 1630, 1000

Following Step (1) results in the following decimal equivalent hours:

13.50, 14.25, 11.00, 12.00, 13.00, 15.75, 16.50, 10.00

(Note: To convert 1330 to its decimal equivalent, note that 1330 is halfway between 1300 and 1400—hence, 13.50. 1415 is a quarter of the way between 1400 and 1500—hence, 14.25. To compute the decimal equivalent of minutes after the hour, divide minutes by 60).

Following Step (2) requires calculation of the arithmetic mean which in this case is 13.50 + 14.25 + 11.00 + 12.00 + 13.00 + 15.75 + 16.50 + 10.00 / 8 =

13.25 (the mean), which translates to 1315 hours

(Note: to convert a decimal equivalent to minutes, multiply the *decimal part* of the time by 60. In our example, .25 X 60 is 15 minutes; hence, 13.25 hours converts to 1315 hours.)

Following Step (3) requires computing the standard deviation as explained in Chapter 12. The standard deviation in our illustration is:

+/- 2.24 hours (or +/- 2 hours, 14 minutes)

Step (4) combines the result from Step (2) with one standard deviation [calculated in Step (3)]. The result gives us the 68% probability period, which is:

13.25 +/- 2.24 hours

which, when converted to the 24-hour clock, gives us:

1315 +/- 2 hours, 14 minutes =

1101 to 1529 hours

Step (5) results in the 95% probability period (two standard deviations), which is:

13.25 +/- 4.48 hours (Note: 2.24 X 2 = 4.48)

which, when converted to the 24-hour clock, gives us:

13.15 +/- 4 hours, 29 minutes =

0846 to 1744 hours.

EXACT TIME CRIMES - AROUND MIDNIGHT:

We will define an around midnight series of crimes as a pattern of crimes which occurred before and after 2400. In order for the arithmetic mean and the standard deviation to make sense for such crimes, "conventionally" reported times for crimes occurring after 2400 must be adjusted. This is done by adding 2400 to the reported time of each "next day" crime. Rather than simply stating this rule, let's look at why:

Assume that we are analyzing a series of crimes that have occurred at the following times:

2300, 0100, 0200, 2200

When we convert these times to their decimal equivalents (as required in Step 1), we get:

23.00, 1.00, 2.00, 22.00

Step (2) calls for the arithmetic average which, in this case is:

(23+1+2+22)/4

which gives 12.00 or 1200 or HIGH NOON. An analyst would be hard pressed to defend the notion that the best time to look for a criminal who "capers" late at night or early in the morning is to search for him around noon. What's gone wrong? And how do we get around this minor problem?

Create a continuum of time so that we can use our statistical tools. 0100 is an hour after 2400 hours, so we convert 0100 to 2500 hours. If a crime in our series occurred at 0230, we would first convert the time to its decimal equivalent (2.50) and then convert it once more by adding 2400; the fully converted time is 26.50.

Remember our original times:

2300, 0100, 0200, 2200

Converting these times to their decimal equivalents:

23.00, 1.00, 2.00, 22.00

And, now, fully converting to our continuum, gives us:

23.00, 25.00, 26.00, 22.00

The arithmetic average of these converted times is 24.00, or 2400 hours, or midnight.

Suppose you had a series of crimes that occurred at the following times:

0300, 0130, 2340, 0500, 2115, 0445

Convert these times to their decimal equivalents:

3.00, 1.50, 23.66, 5.00, 21.25, 4.75

Now convert these times to create a continuum by adding 2400 hours to each time (e.g. 2400 + 3.00 = 2700; 2400 + 1.50 = 25.50; etc.). This gives us the following:

27.00, 25.50, 23.66, 29.00, 21.25, 28.75

The sum of the times represented in this final conversion is 155.16 which, when divided by 6 (the number of data points), gives us the arithmetic average of:

25.86

Once we have completed our calculations, we must convert to a more conventional representation of time. We know that the portion of the number given as 25 means one hour after 2400 hours, or 0100, or 1:00 a.m. The 0.86 part is the decimal equivalent of the number of minutes after 1:00 a.m., (0.86 x 60) or 52 minutes. The time to present to the user of your analysis is:

0152 hours or 1:52 A.M.

Finally, let's use our conversion together with the five basic steps for determining the time spread of a crime series. The following series of times represents the times of occurrence of seven crimes:

2330, 0117, 2400, 0230, 2345, 0100, 0130

When we convert these times to a continuum, we have:

2330, 2517, 2400, 2630, 2345, 2500, 2530

And, using these continuum-converted times, we proceed through the steps outlined earlier (in the Not Around Midnight section).

Step (1) : Convert all times to their decimal equivalent:

23.50, 25.28, 24.00, 26.50, 23.75, 25.00, 25.50

Step (2): Calculate the arithmetic mean:

24.79 (2447 hours, or 0047 hours)

Step (3): Calculate the standard deviation:

+/- 1.086 (or +/- 1 hour, 5 minutes)

Step (4): Calculate the 68% probability period:

23.70 to 25.88

which, when converted to conventional times, gives us:

2342 to 0153 hours

Step (5): Calculate the 95% probability period:

22.62 to 26.96

which, when converted to conventional times, gives us:

2237 to 0258 hours

TIME SPAN CRIMES:

Time span crimes are crimes in which the exact time of the crime is unknown, but the time span during which the event occurred is known. Examples of time span crimes are burglary and auto theft. In both types of crime, the victim left a premise or a vehicle at a known time, returned to it at a known time, and found that between leaving and returning (the time span), a crime had been committed.

Studying time span crimes draws the analyst into that fuzzy world where experience means as much as knowledge of analytical procedures. Three methods for handling time spans will be discussed; the strengths and weaknesses of each method will be presented. Before getting into methods of time span crime analysis, however, it is essential that the reader understand that each of the following techniques works when the time span is no greater than 24 hours. For time spans exceeding 24 hours, no method has yet been found that will provide a practical solution.

Time Span Crimes - Midpoint Analysis:

Midpoint analysis is based on the exact time analyses discussed earlier. The midpoint between the earliest and latest time of the time span in which the crime occurred is calculated. Midpoints are then treated as exact times and 68% and 95% probabilities are applied, as in the exact time procedures.

(1) Calculate the midpoint of each time span as follows:

   (a) Convert initial and ending times to decimal equivalents.

   (b) Subtract initial time from ending time, and divide by 2.

   (c) Add the result of (b) to the initial time.

(2) Treat resulting mid-points as though they were exact times and follow the procedure outlined in Exact Time Crimes.

Assume that a series of nine daytime residential burglaries occurred during the time spans shown in the following table:

Crime Report Number	Date Span	Time Span
1	4/22	0900-1400
2	5/05	0845-1600
3	5/06	0800-1715
4	5/06	0745-1720
5	5/15	1130-1200
6	5/17	1400-1600
7	5/16-5/18	1200-0800
8	5/18	1245-1345
9	5/19	1345-1630

Let's compute a couple of midpoints. Crime report #1 has a time span bounded by 0900 (initial time) and 1400 (end time). The decimal equivalents of these times are 9.00 and 14.00, respectively, and the difference between 9.00 and 14.00 is 5.00. 5.00 divided by 2 is 2.50. Adding 2.50 to the initial time (9.00) places the midpoint for the crime at 11.50 (or 1130 hours).

Crime report #2 shows an initial time of 0845 and an ending time of 1600. The respective decimal equivalents of these times are 8.75 and 16.00 and the difference between them is 7.25. When 7.25 is divided by 2, we get 3.625 which, when added to the initial time (8.75), places the mid-point at 12.375 (or 1223 hours).

Finally, let's look at crime report #7. Here we see that the time span is greater than 24 hours. We will ignore this crime report (as mentioned earlier) and consider that we are dealing with 8—instead of 9—crimes in the pattern.

When we have calculated all mid-points, our table looks like this:

CR#	DATE SPAN	TIME SPAN	MIDPOINT	DEC. EQUIV.
1	4/22	0900-1400	1130	11.500
2	5/05	0845-1600	1223	12.375
3	5/06	0800-1715	1238	12.625
4	5/06	0745-1720	1232	12.542
5	5/15	1130-1200	1175	11.750
6	5/17	1400-1600	1500	15.000

(DROPPED FROM CONSIDERATION BECAUSE TIME SPAN EXCEEDS 24 HOURS)

8	5/18	1245-1345	1325	13.250
9	5/19	1345-1630	1508	15.125

Using decimal equivalents as a basis for computation, we get:

Arithmetic mean:

13.02 (or 1301 hours)

Standard deviation:

+/- 1.369 (or 1 hour, 22 minutes)

68% period:

1139 to 1423 hours (13.02 +/- 1.369)

95% period:

1017 to 1546 hours (13.02 +/- 2.738)

The advantage of this method is that classical, standard statistical techniques are used. The main disadvantage is the size of the potential error: 50%. With a standard deviation of +/- 2 to 3 hours, such an error is acceptable; but when the standard deviation starts approaching +/- 8 to 10 hours, 50% error is not acceptable. **Guideline:** this method should *not* be used when standard deviations exceed +/- 4 hours.

Time Span Crimes - Equal Opportunity Method:

Each time span crime has a beginning and an ending time. The equal opportunity method assigns one point (a value of 1) for each hour (or part of an hour) defined by the time interval. The total number of points per hour per day are then calculated; the grand total of all points is also determined. Dividing the total of each hour by the grand total (and multiplying by 100%) will result in the percentage (or probability) of each hour that the series of crimes could have occurred.

The major advantage of this technique is that it works well for a wide range of time spans. Moreover, the technique produces an easily interpreted graph. A crime that could only have occurred within one hour is assigned 1 point to that hour while a crime that could have occurred anytime within a 24-hour period will also be assigned 1 point during the same hour.

Let's lay this process out in the following steps:

(1) For each crime, determine the hours in which the crime could have occurred. A partial hour counts as a full hour. To each of these hours, assign a point, a value of 1.

(2) Total the number of points that fall during each hour of the day.

(3) Total all of the points for the 24-hour period.

(4) Determine the percentage of points falling during each hour. Divide the total number in each hour by the total number for the 24-hour period, multiply the result by 100%, and round the final result to the nearest whole number.

(5) Plot the results of Step (4) as a bar graph. Plot these data with hour of the day on the horizontal axis and percentage on the vertical axis.

(6) Examine the bar graph. Identify the peak hour(s) and move away from this hour along the graph in both directions, totalling percentages as you go.

(7) The hours you select represent your time span. Related total percentages represent the cumulative probability that the criminal is "capering" within that time span.

To illustrate this process, let's use the same data we used previously:

Step (1): Assign points.

0900 to 1400 - Assign 1 point each to 0900 (for 0900-0959), 1000 to 1059, 1100 to 1159, 1200 to 1259, and 1300 to 1359. (Remember, this is 1300-1400; 1400 receives no points).

0845 to 1600 - Assign 1 point each to 0800 to 0859, 0900 to 0959, 1000 to 1059, 1100 to 1159, 1200 to 1259, 1300 to 1359, 1400 to 1459, and 1500 to 1559.

0800 to 1715 - Assign 1 point each to 0800 to 0859, 0900 to 0959, etc.

Step (2): Total the points for each hour represented in the total span of all reports:

0700-0759:	1
0800-0859:	3
0900-0959:	4

1000-1059:	4
1100-1159:	5
1200-1259:	5
1300-1359:	6
1400-1459:	5
1500-1559:	5
1600-1659:	3
1700-1759:	2

Step (3): Total points for the entire time period:

43 points

Step (4): Determine and round the percentage of the total represented by each hour. That is, divide each of the points in Step (2) by 43 and round the result as follows:

0700-0759:	2%	(1/43) = .02 = 2%
0800-0859:	7%	(3/43) = .07 = 7%
0900-0959:	9%	etc.
1000-1059:	9%	
1100-1159:	12%	
1200-1259:	12%	
1300-1359:	14%	
1400-1459:	12%	
1500-1559:	12%	
1600-1659:	7%	
1700-1759:	5%	

Step (5): Graph the results:

See Figure 32

Steps (6) and (7): Determine time spans and probability of occurrences. This is done by selecting any two intervals and adding the percentages between them. For example, there is a 62% probability that the crimes are occurring from 1100 to 1600 hours. (Note the percentages listed above for each hour between 1100 and 1600. When added together, we get 12% + 12% + 14% + 12% + 12% = 62%). Following the same process, we can determine that there is a 27% probability that the crimes are occurring between 0700 and 1100 hours.

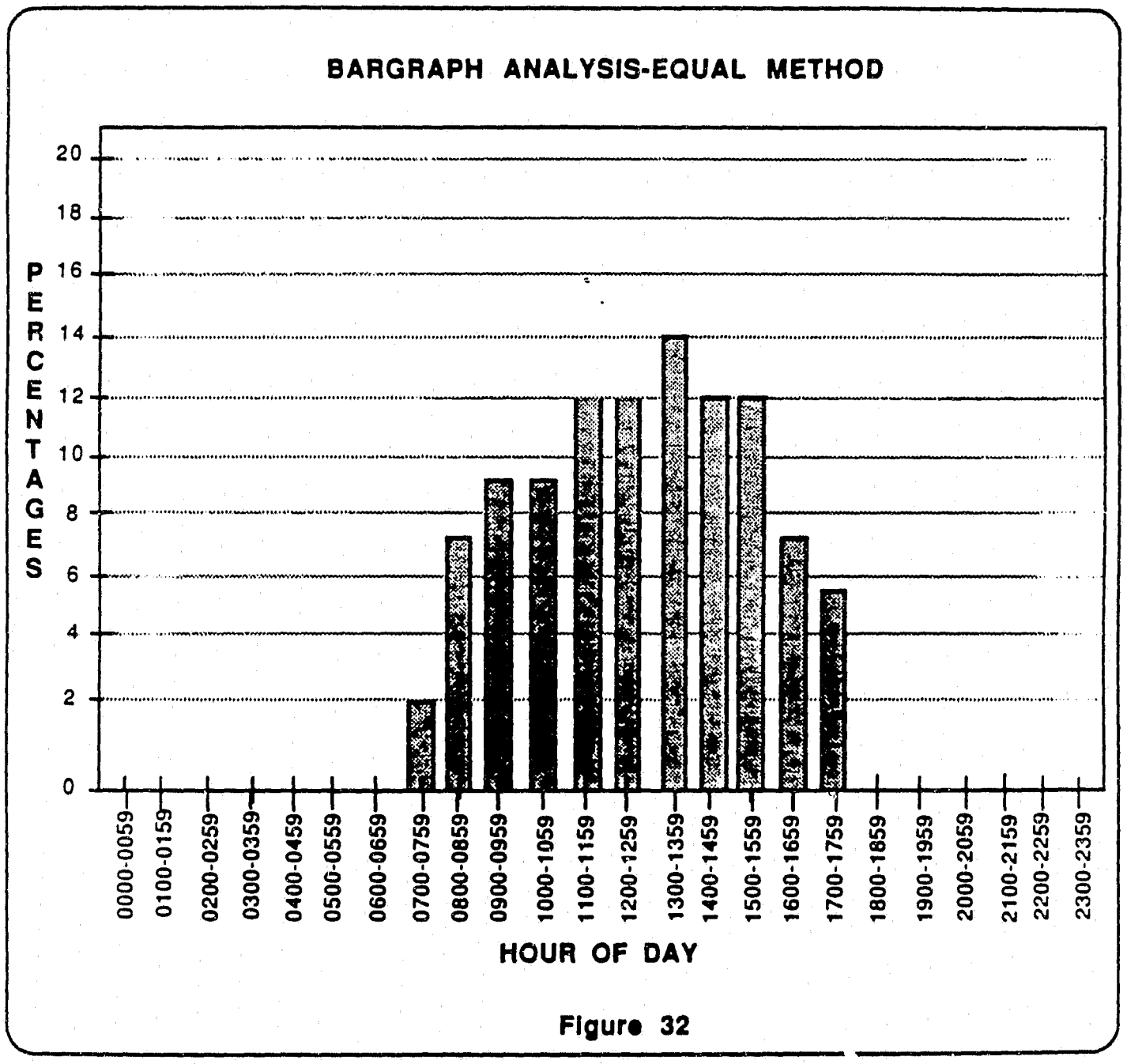

BARGRAPH ANALYSIS-EQUAL METHOD
PERCENTAGES
20
18
16
14
12
10
8
6
4
2
0
0000-0059
0100-0159
0200-0259
0300-0359
0400-0459
0500-0559
0600-0659
0700-0759
0800-0859
0900-0959
1000-1059
1100-1159
1200-1259
1300-1359
1400-1459
1500-1559
1600-1659
1700-1759
1800-1859
1900-1959
2000-2059
2100-2159
2200-2259
2300-2359
HOUR OF DAY

Figure 32

Time Span Crimes - Weighted Method:

The weighted method assumes that each hour in the time interval has an equal probability of being the hour during which the crime occurred. For example, when the time span is 0100-0200, we know with certainty that the crime took place during the one hour from 0100 to 0200, and assign that hour a value of 1. When the time span is 0100-0400, the crime could have occurred during any of the three one-hour periods defined by that time-span: it could have occurred between 0100 and 0200, between 0200 and 0300, or between 0300 and 0400. Since the crime may have occurred during any of the three one-hour periods defined, we assign a value of 1/3 to each of these periods. Once these values have been assigned for all associated crimes in the series, total points for each hour of the day are calculated, as is the grand total of points for the twenty-four hour period. Percentages can then be calculated and graphed.

The weighted method works well for a wide range of time spans, and allows the production of an easily interpretable graphic. In addition, the method permits the analyst to estimate the probability of future occurrences. One major drawback is that it amplifies the importance of small time spans; an exact time receives a full value point for the hour of the crime whereas the same hour will only receive 1/10th of a value point in a 10 hour time span.

To illustrate the weighted procedure, let's return to the crime report data we used earlier:

Step (1): Assign value points:

0900-1400 - There are five possible hours during which the crime could have occurred. Assign 0.20 (1/5) value points to each hour; 0900 to 0959, 1000 to 1059, 1100 to 1159, 1200 to 1259, and 1300 to 1359.

0845-1600 - There are 8 possible hours in this time span. (Remember, part of an hour, 0845 to 0859 in this case is treated as a whole hour). Assign a value point of 0.125 (1/8) each to 0800 to 0859, 0900 to 0959, 1000 to 1059, 1100 to 1159, 1200 to 1259, 1300 to 1359, and 1400 to 1459.

0800-1715 - There are 10 possible hours in this time span. Assign 0.100 (1/10) each to 0800 to 0859, 0900 to 0959, and so on through 1600 to 1659.

Step (2): Total the points for each hour. (See Table A)

0700-0759:	0.090	
0800-0859:	0.315	
0900-0959:	0.515	
1000-1059:	0.515	
1100-1159:	1.515	
1200-1259:	1.015	
1300-1359:	1.265	
1400-1459:	1.065	
1500-1559:	1.065	
1600-1659:	0.440	
1700-1759:	0.190	
	7.990	Column Total

Step (3): Grand total of points for the time period is 7.99 which, rounded, is:

8 Points

(NOTE: Theoretically, the grand total will ways equal the number of cases being analyzed. Since our total is 8 points and we are working with 8 cases—remember, one was not considered—we know our calculation is correct).

Step (4): Determine percentage of points by hour (round percentages):

0700-0759:	1%	(0.09/8) = .011 = 1%
0800-0858:	4%	(0.315/8) = .039 = 4%
0900-0959:	6%	etc.
1000-1059:	6%	
1100-1159:	19%	
1200-1259:	13%	
1300-1359:	16%	
1400-1459:	13%	
1500-1559:	13%	
1600-1659:	6%	
1700-1759:	2%	
	.99%	Column Total (Does not total 100% due to rounding).

TABLE A

Probability that crime occurred during a particular hour segment

HOUR SEGMENT / C.R.	0700-0759	0800-0859	0900-0959	1000-1059	1100-1159	1200-1259	1300-1359	1400-1459	1500-1559	1600-1659	1700-1759
1			0.2	0.2	0.2	0.2	0.2				
2		0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125		
3		0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
4	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
5					1.0						
6								0.5	0.5		
7		NOT CONSIDERED: TIME SPAN EXEEDS 24 HOURS									
8						0.5	0.5				
9							0.25	0.25	0.25	0.25	
TOTALS:	**0.09**	**0.315**	**0.515**	**0.515**	**1.515**	**1.015**	**1.265**	**1.065**	**1.065**	**0.44**	**0.19**

Step (5): Graph the results.

See Figure 33

Steps (6) and (7): Select any two intervals of your choice and determine the time spans and their combined probabilities:

Example: 1100 to 1600, 74% probability

Example: 1400 to 1700, 32% probability

Note: Practically speaking, it is usually desirable to give patrol officers the shortest time span with the highest probability. In this case, it would be the time span between 1100 and 1600 since it has 74% of the crime.

MIXED DATA:

When exact-time crimes and time-span crimes are mixed, consider employing one of the following:

(1) If most crimes are of the **exact time type**, use midpoint analysis for the time span crimes and integrate the values derived from them with those of exact-time crimes.

(2) If most crimes are of the **time-span type**, use either one of the bar graph methods.

(3) If you have approximately the same number of exact-time crimes and time-span crimes, use the weighted analysis method.

SOME THOUGHTS ON THE QUANTITY OF DATA:

Crime analysts are often interested in the quick detection of patterns, and frequently only have data for a week or a month upon which to base analyses. Data from a small number of crimes can produce highly variable results; one or two unusual cases can radically change the distribution of incidents over time.

How many incidents are necessary to avoid this problem? According to a statistical rule of thumb, an analyst needs enough data so that he/she may expect to see at least five cases in each category.

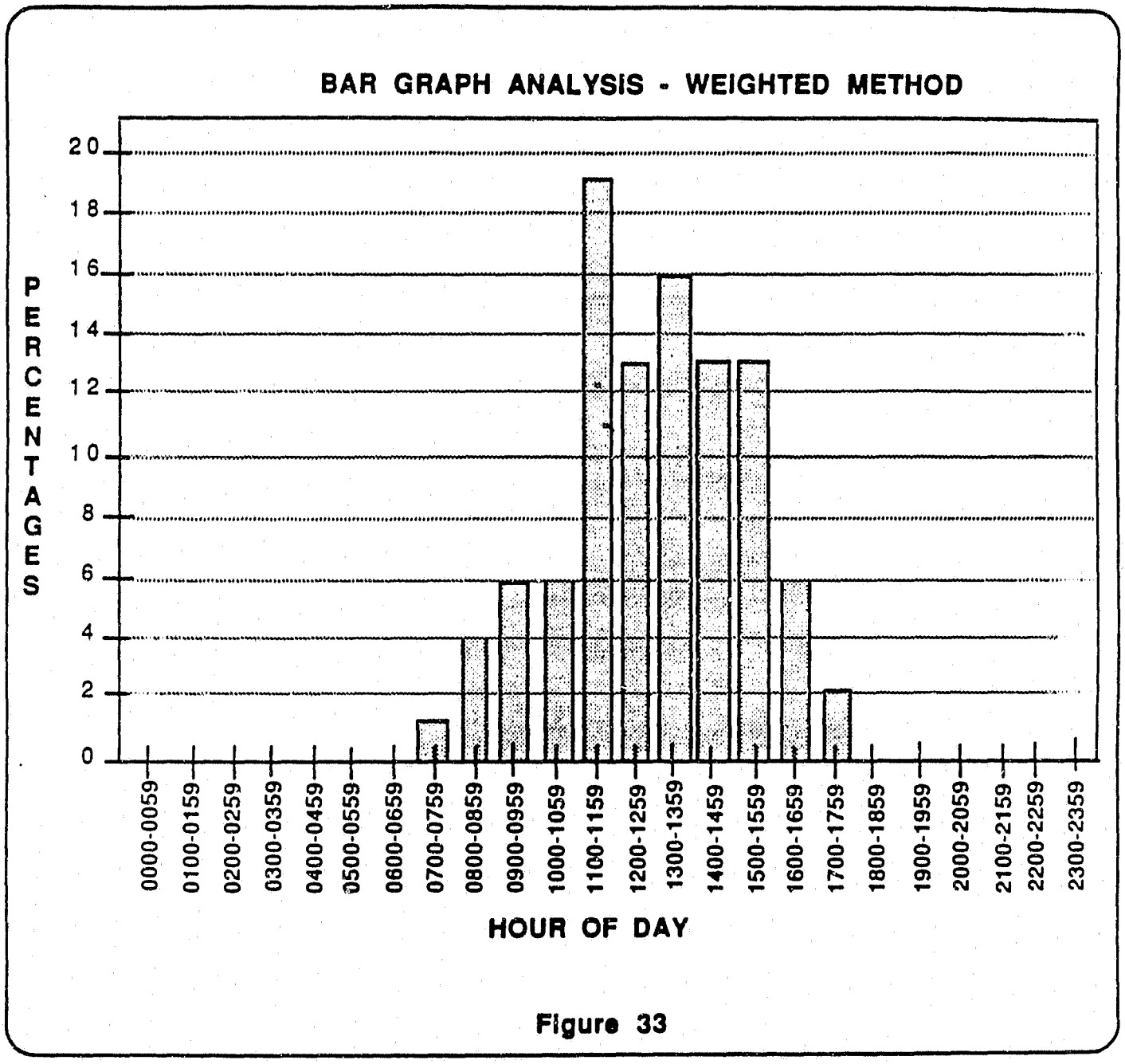

BAR GRAPH ANALYSIS - WEIGHTED METHOD
PERCENTAGES
20
18
16
14
12
10
8
6
4
2
0
0000-0059
0100-0159
0200-0259
0300-0359
0400-0459
0500-0559
0600-0659
0700-0759
0800-0859
0900-0959
1000-1059
1100-1159
1200-1259
1300-1359
1400-1459
1500-1559
1600-1659
1700-1759
1800-1859
1900-1959
2000-2059
2100-2159
2200-2259
2300-2359
HOUR OF DAY

Figure 33

A minimum of 35 incidents is required to analyze the distribution of crime over the seven days of a week (5 incidents X 7 days = 35 incidents), at least 60 incidents are required for time-of-day analyses (assuming 12 two-hour intervals per day X 5 incidents per interval = 60 incidents), and at least 420 (60 incidents X 7 days) incidents are required to analyze time-of-day distributions over all seven days in a week.

When there are too few incidents, a possible solution may be to reduce the number of categories by combining two or more of the original categories into a single category. In a day-of-week analysis, for example, Friday and Saturday could be combined into one category, and Tuesday and Wednesday into another. This reduces the number of categories to five: Sunday, Monday, Tuesday/Wednesday, Thursday and Friday/Saturday. Then following the rule requiring 5 cases per category, the minimum of 35 cases for a seven-day analysis would be reduced to 25 cases (5 cases X 5 categories = 25 cases) for a "day" analysis. The analysis using fewer days is less detailed and its subsequent conclusions more general. It would be impossible to distinguish a crime occurring early Friday morning from one occurring late Saturday night. If, however, all you have is a data set, general conclusions are better than none. An analyst may be hard pressed to defend the proposition that nothing can be done until the community suffers more rapes or robberies. Remember that all analysis must be accompanied by a statement of its limitations.

Deciding which categories to combine may be difficult. One general rule is to combine categories of *low frequency*. For example, if most burglaries occur at night (the high frequency categories), combine the *morning hours* (the low frequency categories) into a *single* category.

CHAPTER 15

ANALYZING PATTERNS OF LOCATION

ANALYZING PATTERNS OF LOCATION

Geographic analyses provide comparisons which may not be easily determined from simply looking at addresses on crime reports. Further, when a pin is used to indicate the location of one crime on a map, the relationship of that crime location to other similarly illustrated crimes becomes apparent. Geographic analysis can be performed by mapping, and by graphical and statistical methods.

Mapping techniques involve the use of a map to represent the actual geographical relationship between criminal events. A pin map displaying day or night residential burglaries over a given period of time is one example of a mapping technique.

Graphical methods include comparisons of prescribed geographical areas with crime data. A series of bar graphs, each listing percentages for particular crimes in specific areas over a given time period, gives the analyst an overall picture of those crimes throughout a jurisdiction.

Statistical methods of geographical data allow the analyst to identify crime patterns in beats, reporting areas or entire jurisdictions.

MAPPING TECHNIQUES:

Manual mapping techniques include pin maps, symbol maps, dot maps or any other means for depicting crimes by location.

The number of data elements to be recorded on a map often dictates the most effective technique. If the crime report number is to be recorded with the location of the offense, a colored dot or flag pin (using colored heads) map can be utilized. The colors indicate the type of crime. The report number should be written on the dot or the flag. If particular MO factors are to be recorded, various color-coded and marked pins can be employed to identify specific MO patterns.

The length of time a particular map or set of maps is to be maintained is also important. No absolute set of rules has been established regarding map maintenance time, but maps are best maintained for one to three months. Two maps may be maintained for each type of crime (one reflecting weekly or monthly information and the other year-to-date or quarterly information).

Map data should be stored so that it is easily retrieved. Pin maps can be recorded by photographic means; using two projectors to superimpose one figure over another is often effective. Color coded paper dots on acetate overlays of area maps facilitate data recovery for law enforcement agencies whose access to equipment is limited. Computer produced and coded area maps can be easily stored and retrieved by today's microcomputer systems.

Seven is the minimum number of maps most crime analysis units should maintain. Five crime types are well suited to geographical analysis: burglary, robbery, special theft classifications, auto theft and sex crimes. Two of these types (burglary and robbery) have logical sub classifications (commercial and residential for burglary, and armed and unarmed for robbery).

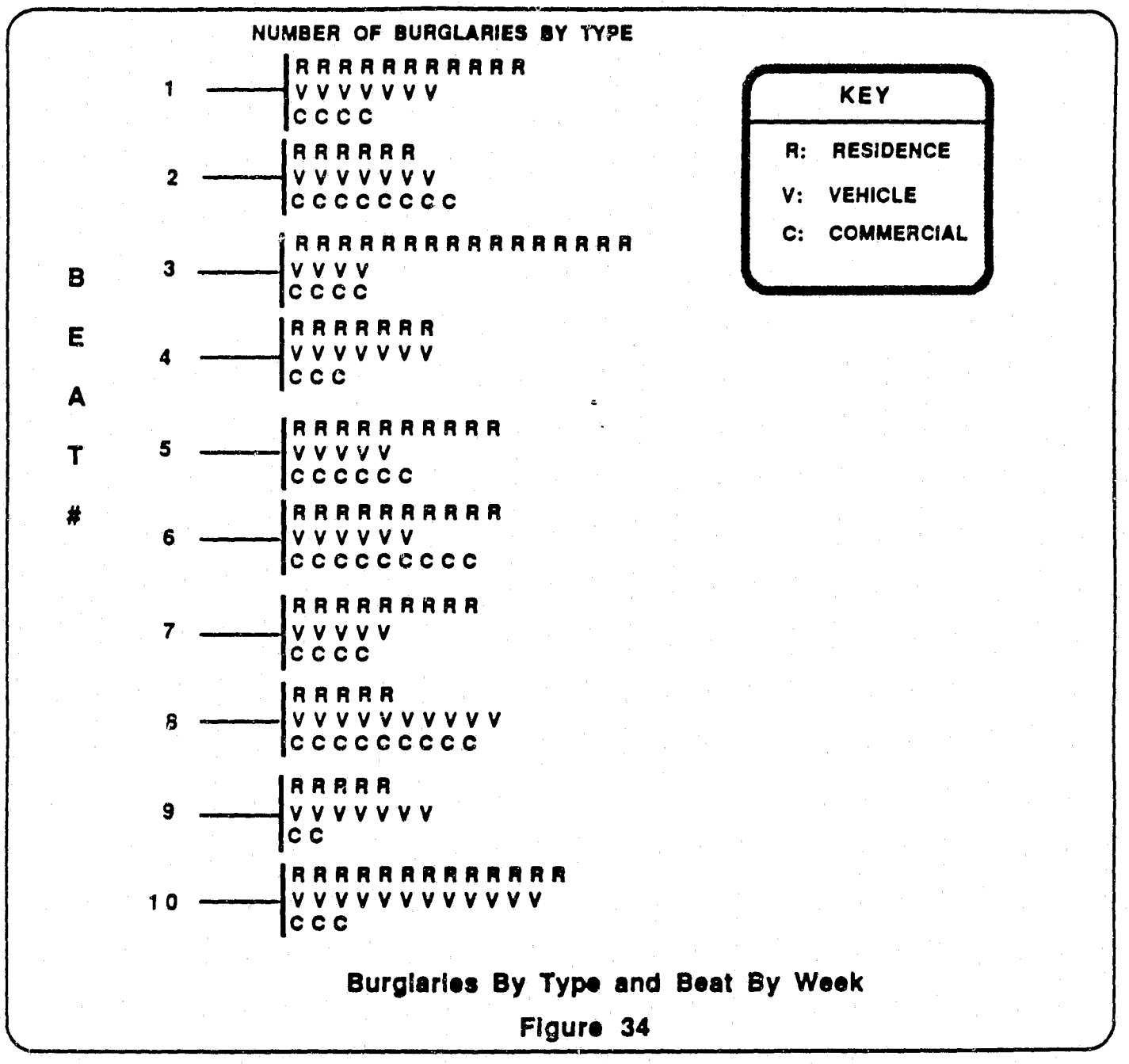
Three other informational maps have been found to be quite useful. One is designed to support career criminal apprehension programs by mapping the last known residences and specialties of known offenders. Another supports narcotics operations by indicating locations of crack and crash "pads", street corners where narcotics are sold and so on. A third map may be used to depict locations where stolen property is "fenced". Communities plagued by gang activities may find a map relating to gang "turfs" helpful in deploying field resources, identifying criminal groups (and individuals), and anticipating future inter-gang conflict. A department's ability to "read" spray-painted graffiti provides the basic data for such maps.

GRAPHICAL ANALYSIS:

Graphical analysis compares prescribed geographical areas to a body of compiled crime data. Compiling raw data into information which can be plotted on graphs is extremely useful for identifying crime trends. This method is well-suited to comparing criminal activity of a given type across different geographical areas.

Two examples of geographic-graphical analysis are illustrated in Figures 34 and 35. Figure 34 provides a comparison of differing types of burglaries in a 10 beat jurisdiction. This type of analysis is useful (when performed on as short a time basis as possible—weekly, rather than monthly) for identifying crime trends promptly.

Figure 35 illustrates a graphic useful for determining the relationship of the present year's crime to crime of previous years in a given geographic



Burglaries By Type and Beat By Week

Figure 34

Example of a Graphical Analysis of the Present 6-Month Period Compared to the Same Period of the Previous Year for Residential Burglaries

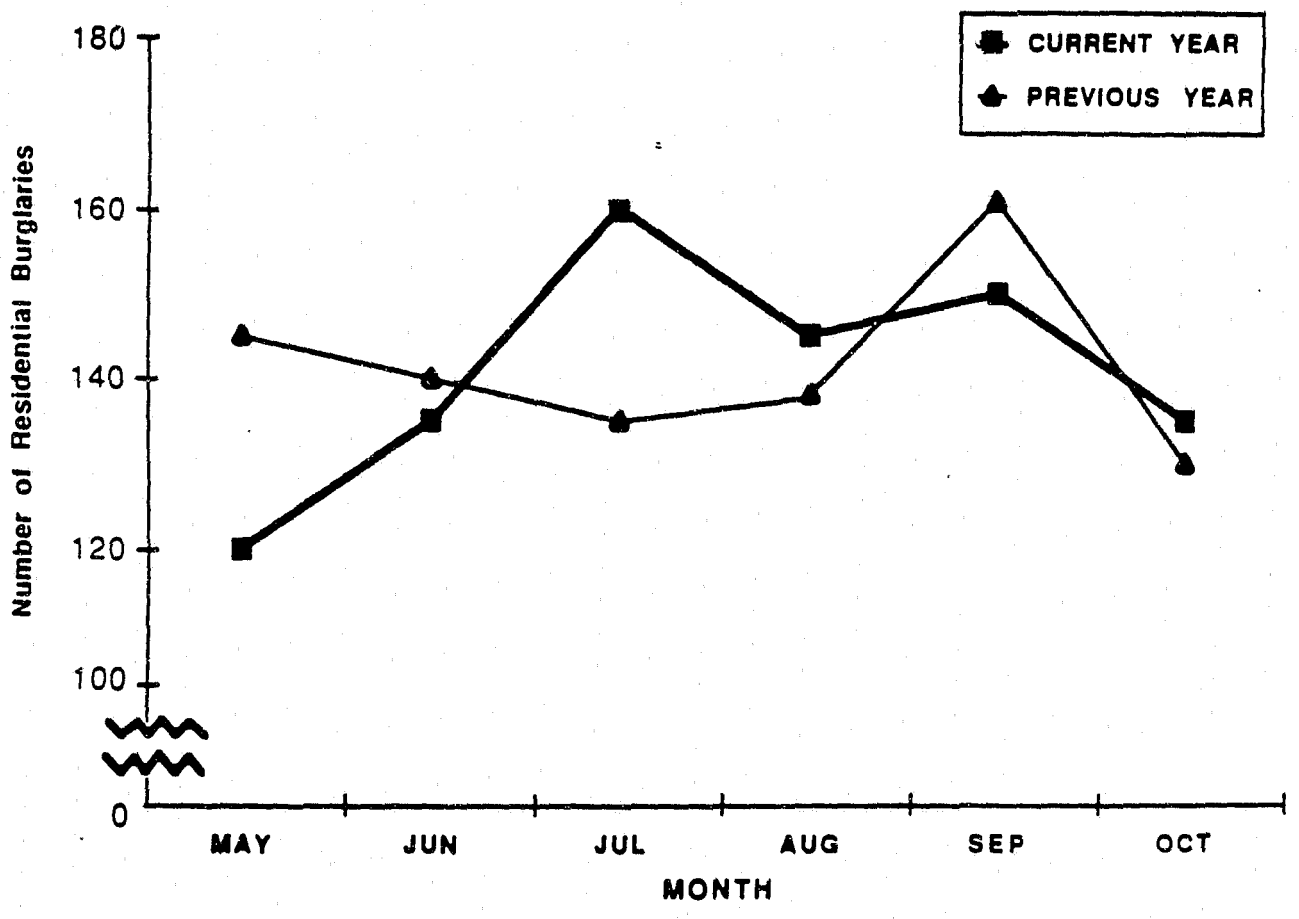


Figure 35

area. This type of graphic can be used for other, shorter, time periods such as month-to-month or by day-of-week.

A major contemporary use of geographic-graphical analysis is in the area of beat design and workload analysis. Suppose that a graphic such as the one shown in Figure 34 indicates that one or two beats in a jurisdiction are suffering the "lion's share" of certain types of crime. Such imbalance suggests that beat boundaries should be reconfigured to balance the workload on a geographical basis or that personnel should be reassigned to balance the workload on a per-officer basis. If time-span imbalances are identified, attention should be directed toward shift schedules.

STATISTICAL GEOGRAPHIC ANALYSIS:

Statistical analyses of crime information for geographic areas are useful for determining where, and for what purpose, tactical and special assignment personnel (e.g., directed patrol operations) should be deployed. A percentage analysis of purse snatchings and strong-armed robberies over a one month period might indicate that a significant percentage of these crimes were being committed in a restricted area. Such simple analysis allows management to develop programs and assign personnel to impacted areas for the purpose of suppressing crime and apprehending criminals.

A more sophisticated procedure of statistical graphical analysis involves the conversion of pin map data (which are essentially points on a graph) to specific areas of personnel deployment, independent of the beat structure of a jurisdiction. Assume that a jurisdiction has suffered a series of crimes and an MO analysis indicates these crimes are being committed by one person. One method to identify the need for a directed patrol effort would be to map the location of the crimes and "eyeball" the general area in which a specialized unit might deploy. Unfortunately, different people have different eyeballs and hence, the best we will ever achieve is an "educated guess".

The use of the standard deviation provides a more effective way to deploy a directed operation. However, before we can use this powerful statistical tool, we must convert conventional location data (street addresses) to another form. To illustrate this need, let's assume that two crimes have occurred: one at 123 Maple St. and the other at 456 Central Ave. The first step in computing the standard deviation requires that we compute the arithmetic mean of the basic data. What is the arithmetic mean of 123 Maple and 456 Central? If you answered that you don't know, you are in complete agreement with Messrs. Gottlieb and Arenberg, the authors of

this book. We don't know either. What is required is a method for converting street addresses, such as our Maple and Central examples, into numeric form where such concepts as an arithmetic mean make sense. This is done through the use of a grid system.

Figure 36 locates ten crimes that an MO analysis suggests have been committed by the same person. Each crime report has listed the address where the crime was committed, thus allowing us to lay out the problem on a conventional map.

Figure 37 is the same map, with one addition. Note that a pair of axes have been added, one labelled "North", and the other, "East". All axes are located such that the area being analyzed lies to the right of the "North" axis and above the "East" axis. It does not matter where the axes cross, except that the area under consideration must be in the northeast quadrant. If the area under analysis were a beach community on the Pacific Ocean, the "North" and "East" axes would intercept somewhere at sea. Note that each axis in Figure 37 has been scaled into intervals of 5. With this set of axes, actually an abbreviated form of a grid system, we can convert each of our crime locations into a pair of numbers. Converting the locations shown in Figure 37 to their respective grid locations, we get:

CRIME REPORT #	COORDINATES	
	EAST	NORTH
1	18	27
2	9	20
3	10	35
4	18	34
5	7	26
6	13	21
7	14	26
8	9	30
9	17	19
10	15	32
	130	270 Column Totals

Now that we have converted street numbers to grid numbers, we can apply the standard deviation to each set of grid coordinates. Since we dealt with computing the standard deviation earlier, let's get right to the results of the calculations and see how to apply this statistical tool to our example:

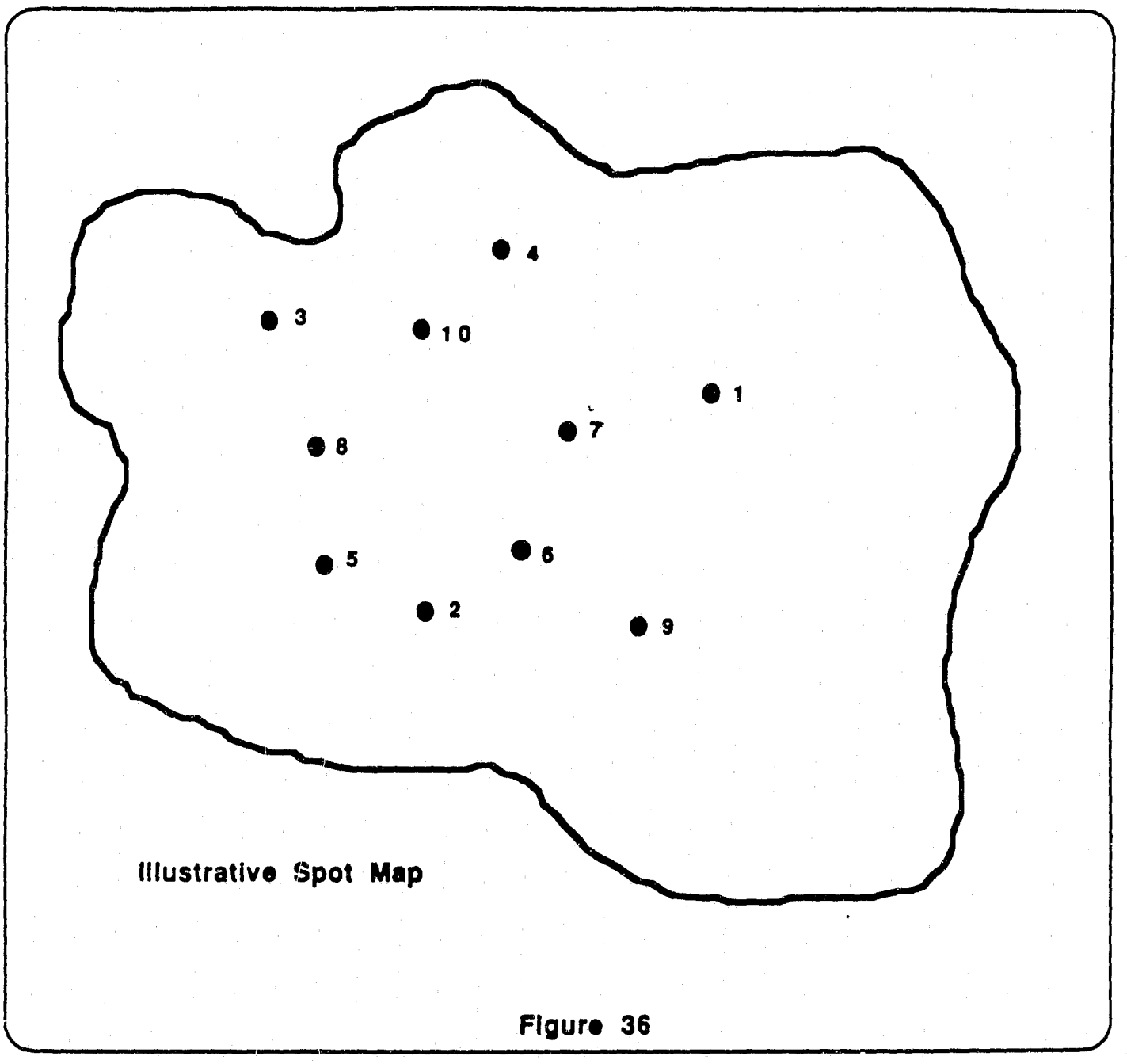
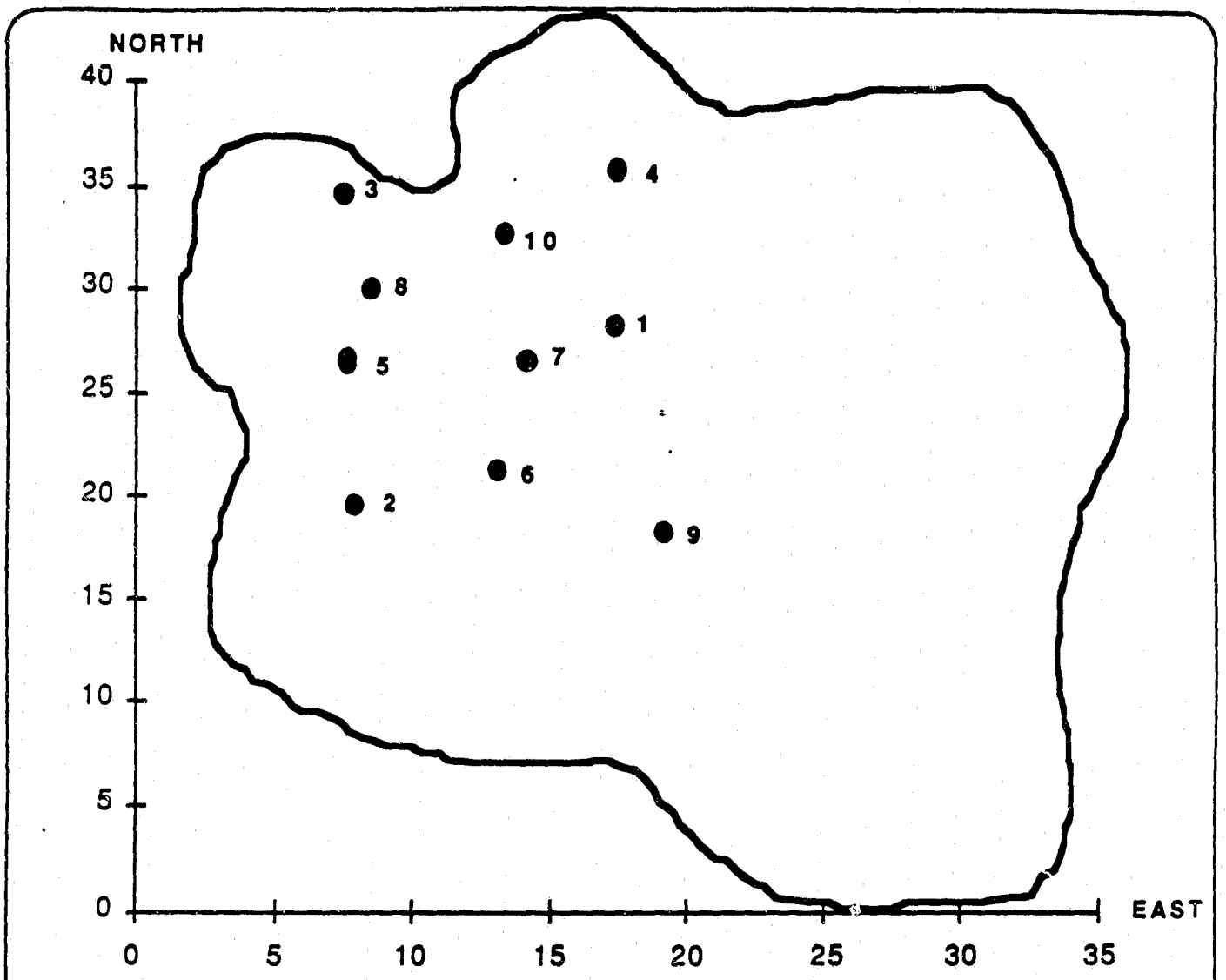


Figure 36



Spot Map with X-Y Coordinate System Added

Figure 37

Let's start with the East coordinates:

The mean average East coordinate = 130 / 10 = 13

and the standard deviation about this mean is +/- 4.06

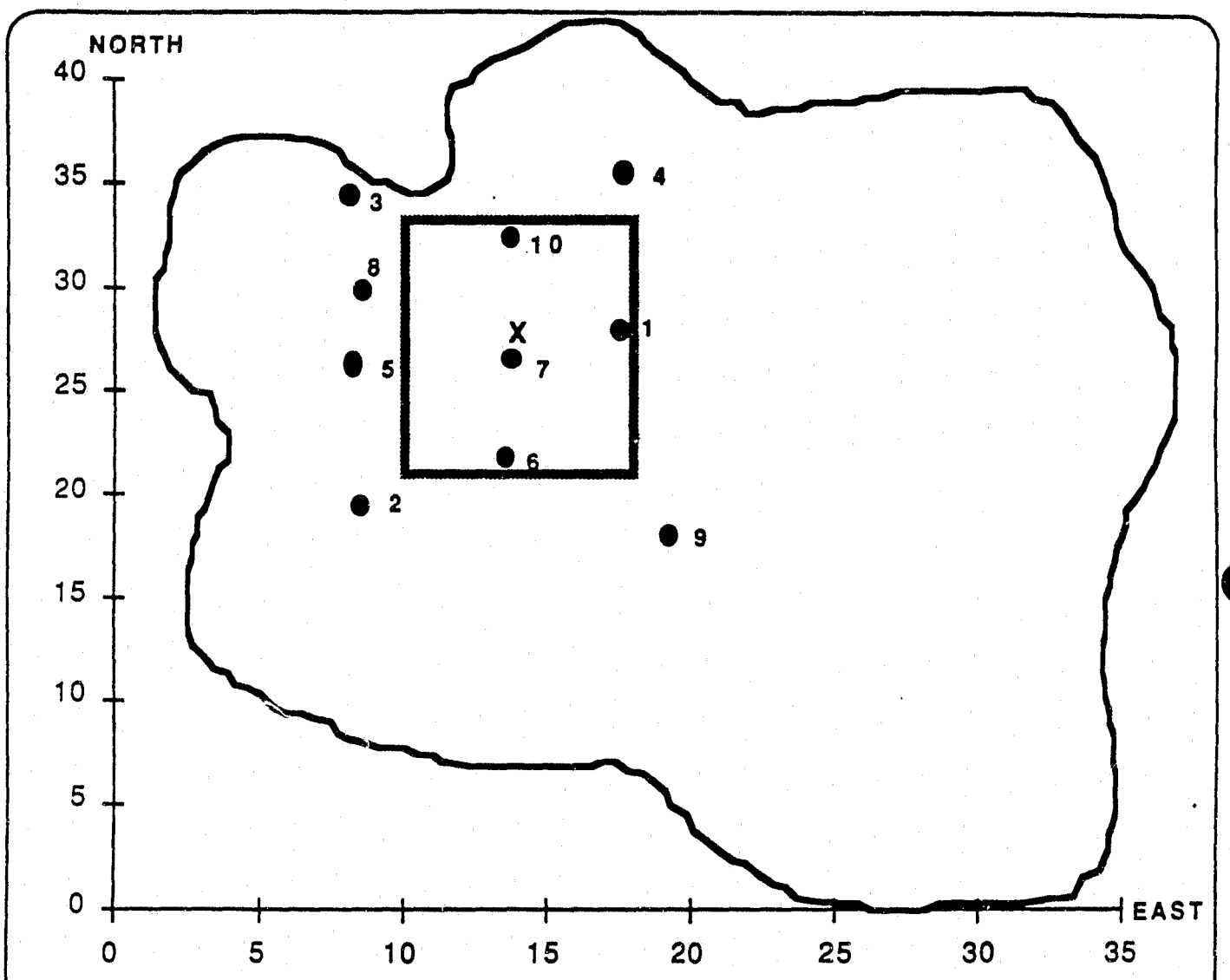
For the North coordinate:

The mean average North coordinate = 270 / 10 = 27

and the standard deviation about this mean is +/- 5.75

Point X (Figure 38) is located at coordinates 13 East and 27 North, the geographic center of the 10 crimes comprising our series. Note the rectangle denoted ABCD. The East and West boundaries (vertical lines) are 4.06 units to the right of the central point "X" (the "+" value) and 4.06 units to the left of the central point "X" (the "-" value). The North and South boundaries (the horizontal components of the rectangle) are 5.75 units up from point "X" (the "+" value) and 5.75 units down from point "X" (the "-" value). This rectangle now represents the geographic area in which 68% of the crimes (one standard deviation) have occurred. If the criminal continues this pattern, we may predict (with 68% certainty) that the criminal will commit his next crime within rectangle ABCD. If we were to double the distance from point "X" along all sides of the rectangle, we would expand the rectangle to include 95% of the expected area of the next occurrence (two standard deviations).

When we place these 68% and 95% rectangles on a piece of acetate, overlaying a map of our jurisdiction, we could convert our grid numbers to street names and intersections for patrol's use. This is very useful information for targeting a crime pattern or series.



Spot Map (One Standard Deviation Rectangle Added)

Figure 38

CHAPTER 16

RELATIONS AND PREDICTIONS

RELATIONS AND PREDICTIONS

We have long accepted the concept of "cause and effect"; do one thing and something else will occur. Sometimes the result of a cause is a surprise, such as the side effects of some medicine. Other times, we take a specific action (the cause) to create a specific result (the effect). Often the cause is controllable and, if the result is favorable, we continue; if not, we cease. Such relationships are often of considerable interest to law enforcement and we measure one factor (a cause) in order to determine another (the result). We might count the number of neighborhood watch programs operating and assume that the more programs we have in effect, the less burglaries we will have. We might expect that the number of assaults in a parking lot would decrease if lighting were improved. Or we might look to another community's changes in crime after a particular action has been taken, such as the building of a regional shopping center.

Each situation provides an example in which the change in one condition might be associated with change in a second condition; two conditions are seen to change in relation to each other. While we should not expect one condition to change a definite amount with each unit change in the other condition, clear trends indicating mutual change often do appear in pairs of variables.

THE CORRELATION COEFFICIENT:

In the world of crime analysis, we occasionally see two variables which change together, almost unit for unit. Under other conditions we might observe a tendency for one unit to change as the other unit changes a given amount, or we might see no relationship between two variables at all. Because the relationship between pairs of variables may range from very close to none at all, we need a technique for identifying the extent to which changes in one variable ("X") are reflected by changes in another ("Y"). This technique is found in standard correlational procedures.

Correlation, in nonstatistical terms, means there is a relationship between two conditions. In statistical terms, correlation refers to the quantitative relationship between two variables and is a measure with limits ranging from -1.00 to +1.00.

Suppose you were asked to guess the quantity of loot burglarized knowing only the shoe size of the burglar. Chances are shoe size alone will tell you nothing about the quantity stolen; there is generally no relationship

between these two variables. Such a condition would be indicated by a correlation coefficient of zero. If, however, you were given thirty pairs of shoes and were asked to guess the size of each right shoe from the corresponding size of every left shoe, you would probably guess correctly. In this case, the correlation coefficient would be +1.00 because the relationship between left shoe size and right shoe size is generally a perfect one.

Sometimes we find that as one condition increases, the other condition decreases. The higher a cadet places in his class in the police academy, the less likely he will fail to pass probation. If one condition increases as the other decreases, there is still a definite relationship between these two conditions. But, since one variable is decreasing as the other increases, the relationship is a negative (or inverse) one. If for every increase in "X" we have an equivalent decrease in "Y", we have a completely predictable correlation that is also negative. That correlation has a numerical value of -1.00.

Negative correlations are as useful as positive ones. The positive and negative signs placed on correlations tell us the direction of expected change in one variable as the correlated variable changes. If two variables increase or decrease together, the relationship is said to be positive, and their coefficient of correlation will be a positive number between 0 and +1.00. If two variables increase or decrease in opposite directions (one increases while the other decreases), the relationship between them is said to be negative and their coefficient of correlation will be a negative number between 0 and -1.00. If a change in magnitude of one variable tells us nothing about the condition of the other variable, there is no relationship between the two variables and their correlation coefficient will have a value of zero.

Most paired conditions in law enforcement do not change together perfectly. As a result, analysts see many more correlation coefficients between +/- 0.50 and +/- 0.60 than they see between +/- 0.90 and +/- 1.00. Do not expect perfect negative or positive relationships between pairs of variables; if you get a perfect relationship, check your work. Such correlations are rare. You probably "punched" a wrong button on your calculator or keyboard.

THE SCATTER DIAGRAM:

The relationship between two variables can be illustrated by plotting them on a bivariate graph, discussed previously in Chapter 11. If we have the following data:

X: 1, 2, 3, 4

Y: 5, 5.5, 6. 6.5

graphed on a bivariate format, these data would look like Figure 39. Note that as X increases a given amount, Y increases a proportionate amount, but the increments are of different size. The relationship is, therefore, perfect and positive and the plotted points lie in a straight line.

All pairs of variables, however, do not progress together. The relationship between them is often less than perfect even though there may be a clear trend for "Y" to increase with each unit increase in "X". Here is one example of this type of relationship:

X: 1, 2, 3, 4

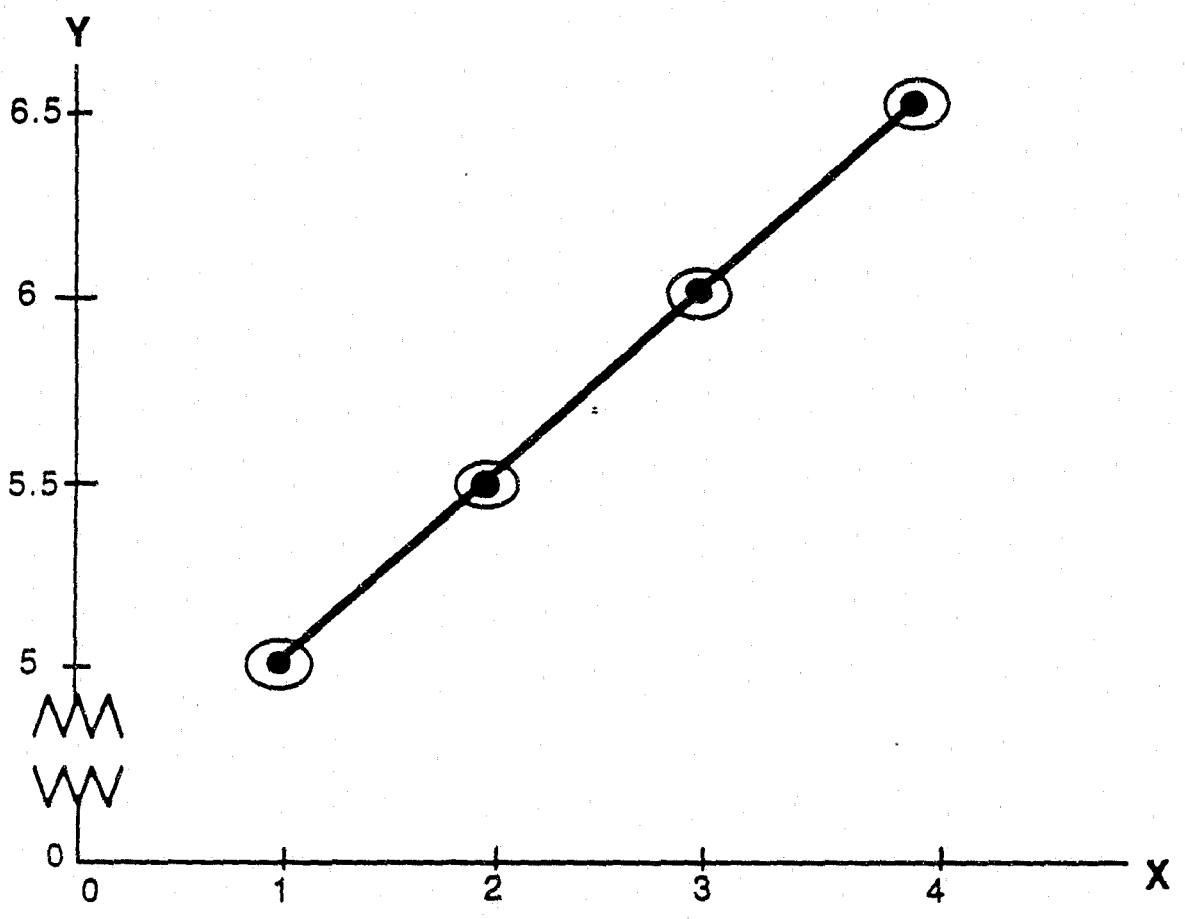
Y: 4.9, 5.7, 5.9, 6.6

Graphed, the data would look like Figure 40. The tendency for "Y" to increase with an increase in "X" is clear, but increases do not progress unit for unit. The plotted points fall near, but not exactly on, the straight line. Although the relationship is positive, it is not perfect and the correlation coefficient would be less than 1.00.

Similar examples illustrate other possible relationships. Figure 41 shows a perfect negative relationship; as "X" increases a unit, "Y" decreases a specific increment. Figure 42 shows a less than perfect negative relationship; as "X" increases a unit, "Y" decreases, but not exactly increment-for-increment. Figure 43 illustrates no relationship; a change in "X" tells us nothing about a change in "Y". We call bivariate graphs such as Figures 39, 40, 41, 42 and 43 scatter diagrams.

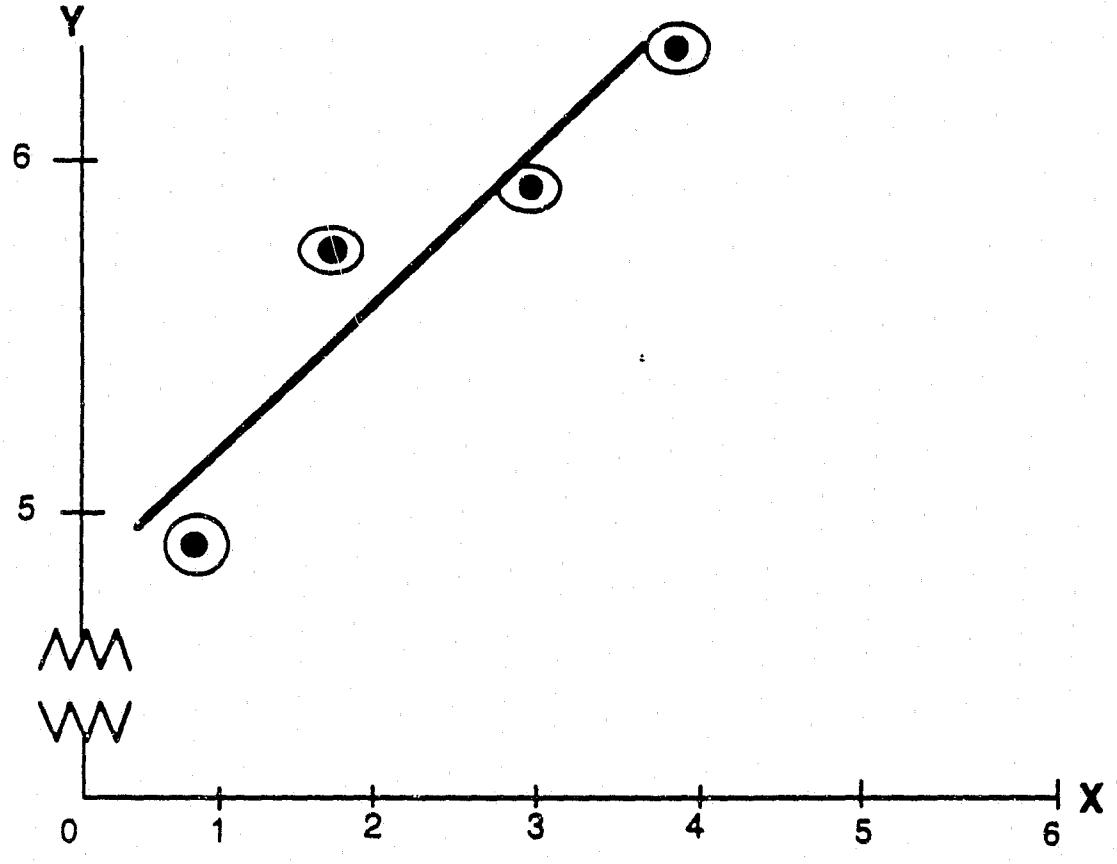
Computing the Correlation Coefficient:

Many hand-held calculators have been configured to compute correlation coefficients. The correlation coefficient is labelled "r" universally, so it shouldn't be difficult to find the appropriate discussion in your calculator



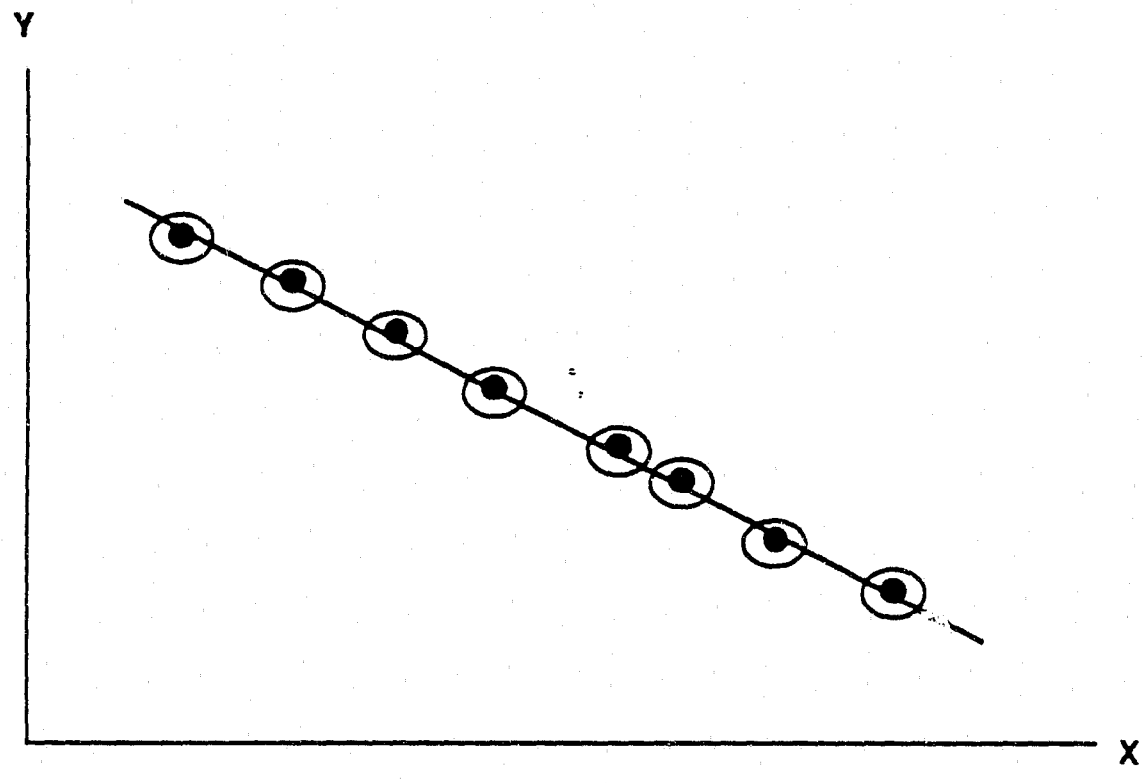
Bivariate Graph (Perfect Positive Correlation)

Figure 39



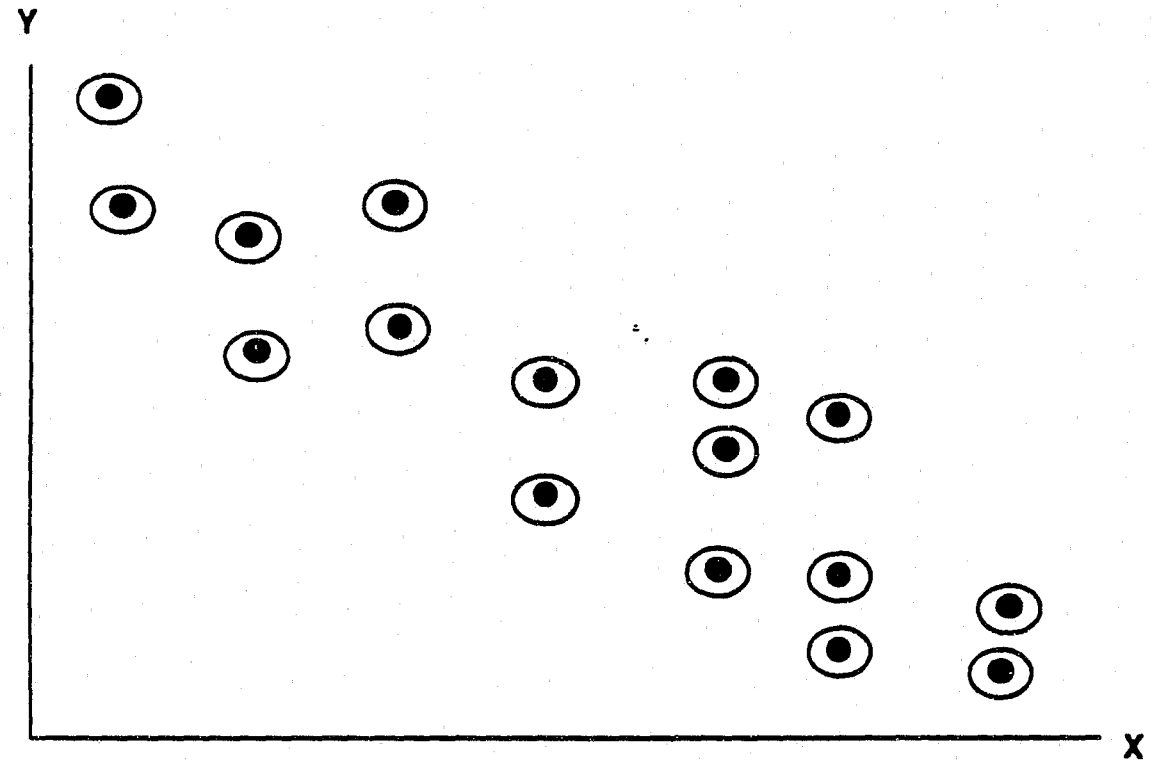
Bivariate Graph (Positively Correlated, but not Perfectly)

Figure 40



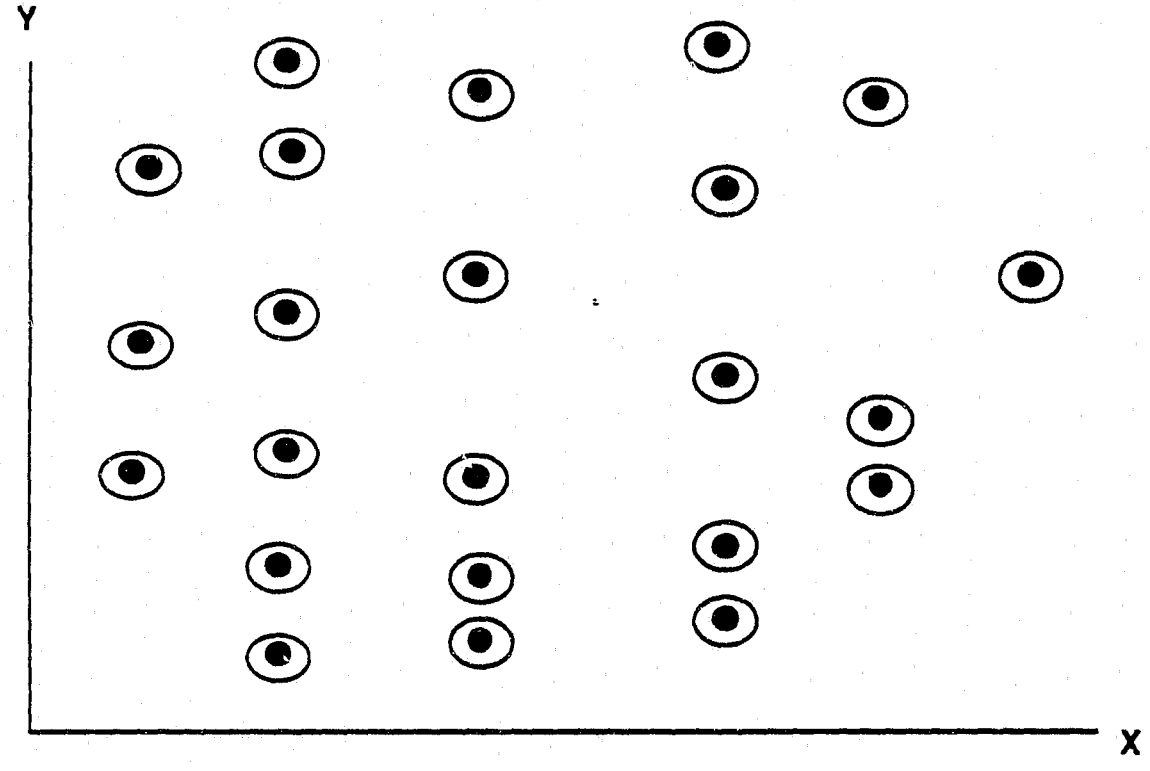
Bivariate Graph - (Perfect Negative Correlation)

Figure 41



Bivariate Graph - (Imperfect Negative Correlation)

Figure 42



Bivariate Graph - Correlation = 0 (No Correlation)

Figure 43

manual or to recognize a correlation coefficient when it shows up on your computer screen. The following are guidelines for interpreting the meaning of "r":

-1.00	perfect	negative	correlation
-0.800	to	-0.999	strong negative correlation
-0.600	to	-0.799	high negative correlation
-0.400	to	-0.599	moderate negative correlation
-0.200	to	-0.399	weak negative correlation
0.00	to	-0.199	negligible negative correlation
0.00	to	+0.199	negligible positive correlation
+0.200	to	+0.399	weak positive correlation
+0.400	to	+0.599	moderate positive correlation
+0.600	to	+0.799	high positive correlation
+0.800	to	+0.999	strong positive correlation
+1.00	perfect	positive	correlation

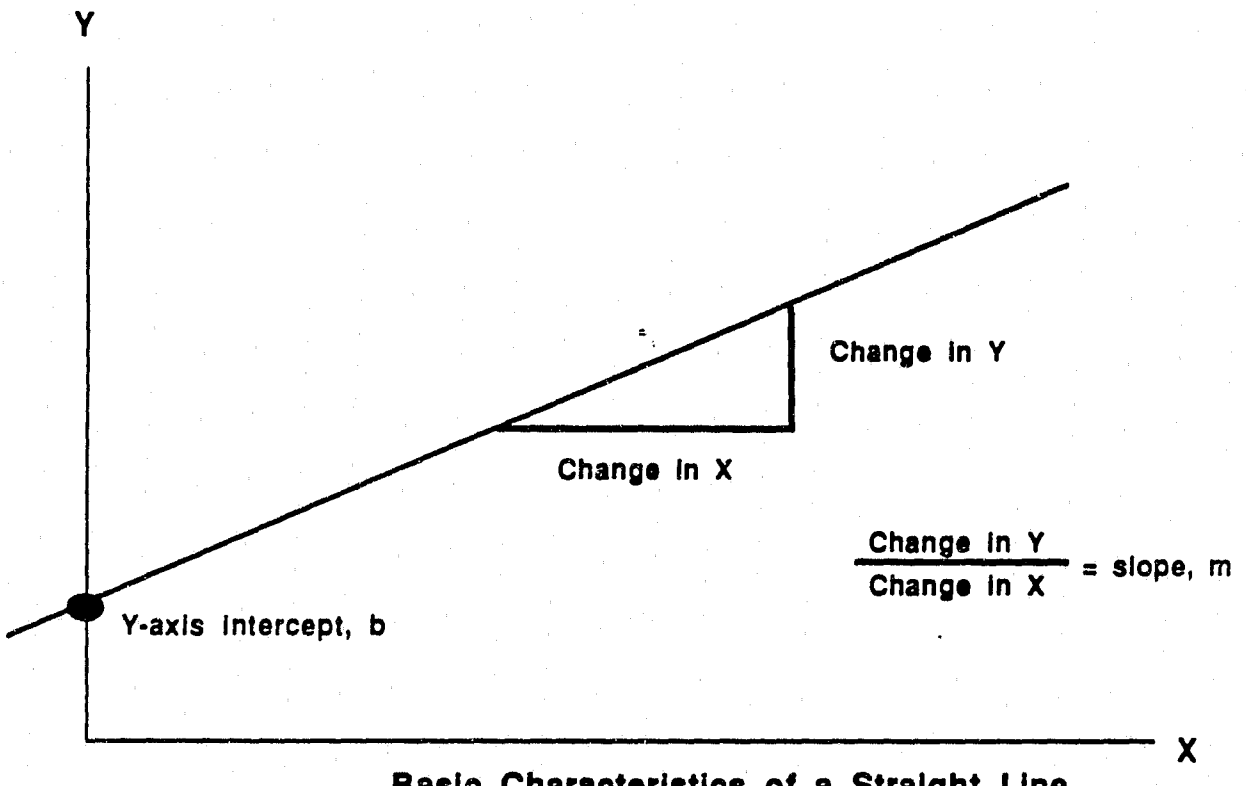
Cautionary Note:

A common mistake in the use of correlation coefficients is assuming that a change in one variable causes or is "caused" by a change in the other variable. Correlation analysis cannot determine cause and effect. If we were to show that a strong correlation existed between a cadet's standing in his academy class and the number of speeders he cites five years later, we are not indicating that one caused the other. We are simply observing the relationship between two variables. If the cause and effect does exist, it will take more sophisticated analysis to clearly demonstrate that relationship. Don't fall into the cause-and-effect trap!

LINEAR PREDICTIONS:

Correlation coefficients make it possible to predict one measure's relationship to another. One way to predict a value of "Y" when given a value of "X" (when a significant relationship exists between "X" and "Y") is to compute the line of best fit (regression line) on your scatter diagram. The method for computing this line involves finding the "least squares fit" to your data and is available on all statistical calculators and in all statistical computer software.

All straight lines are defined by two parameters: slope and the Y-axis intercept. Turn now to Figure 44. The slope is defined as the unit change in "Y" indicated by a unit change in "X". Statistical texts often refer to the slope by the letter "m". Every straight line, if drawn sufficiently long, will



Basic Characteristics of a Straight Line

Figure 44

intercept the Y-axis. The point at which this occurs is referred to as "b". The equation that determines these values is:

$$Y = mX + b$$

If the line goes downhill, "m" will be negative. If the line intersects the Y-axis below the X-axis, "b" will also be negative. And of course, "m" and "b" can be of different algebraic signs: use the algebraic sign your calculations indicate.

Crime analysts are often asked to predict future occurrences on the basis of past and current data. To apply the information given above to a "real world" situation, assume that it is February 1989 and your Chief is considering launching a new burglary prevention program. If he proceeds with the project, the Chief estimates that it will be six months (August 1989) before program results can be adequately determined.

Before he makes his final decision on the endeavor, the Chief requests you provide him with a prediction of how many burglaries are likely to occur six months from now if he *does not* implement the program. Your prediction will help him to decide if the burglary problem is serious enough to justify program implementation costs.

To formulate your prediction, you *arbitrarily* choose to examine nine of the last twelve months of burglary data (i.e. February through October of 1988). The key word above is "arbitrarily." You could just as easily select data from a twelve month, sixteen month or any other time frame to conduct your study. We just happened to pick February through October. We will use this data to predict how many burglaries will occur in August which is six months away. Let's assume your data is as follows:

1988 BURGLARIES BY MONTH

MONTH	NUMBER OF BURGLARIES
February	45
March	60
April	65
May	80
June	75
July	95
August	90

September 1	120
October	110

Since statistics deal with numbers, we must now convert the name of each month to a number. Since February is the second month of the year, for the sake of convenience, we will give it the number 2. March will be 3, etc. Having done that, we will redesign the above table. Months will be listed in an "X" column and burglaries will be listed in a "Y" column as shown below:

X	Y
2	45
3	60
4	65
5	80
6	75
7	95
8	90
9	120
10	110

The first thing you would do is plot the data as a bivariate graph. See Figure 45. Note that the data have an uphill trend. Working with a statistical calculator or statistical computer software, you would now enter the data from the X and Y columns into the calculator or computer and calculate the slope "m" and the Y-intercept "b". Your calculator or computer should reveal that:

$$m = +8.4$$

and

$$b = +31.7$$

These numbers, when substituted into the equation

$$Y = mX + b$$

will give you

$$Y = 8.4X + 31.7$$

To plot your line, find 31.7 on the Y-axis and make a point. From this point go one unit to the right and then go up 8.4 units and make a point. Draw a line through the two points you just made; the resulting line is the

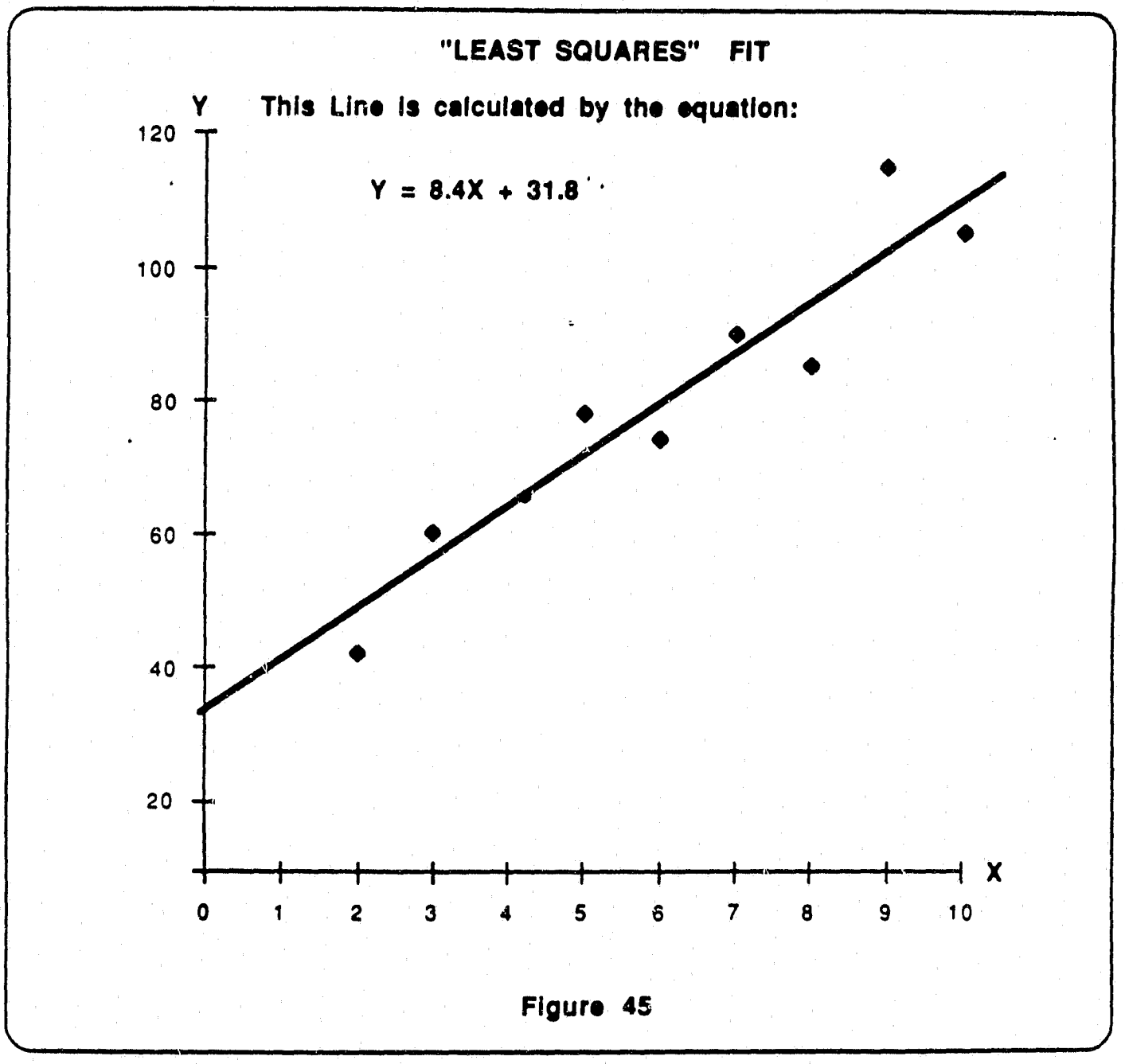

"LEAST SQUARES" FIT
Y
This Line is calculated by the equation:
Y = 8.4X + 31.8
120
100
80
60
40
20
0
1
2
3
4
5
6
7
8
9
10
X

Figure 45

line of best fit. Note: if "m" (+31.7 in this case) had been negative, you would have moved right one unit and then down 8.4 units.

You now know how to use the "line of best fit" for predictive purposes. At this point you are ready to make your prediction as to the number of burglaries that are likely to occur in August 1989.

Recall that your table ended with the data from October 1988. This was month 10. It is now February 1989. If the table was to continue, February would be month 14. August 1989, the subject of your interest, would be month 20. Since you wish to know how many burglaries ("Y") are likely to occur in August, you must substitute the number 20 for "X" in the equation as shown below:

$$Y = (8.4 \times 20) + 31.7$$

$$Y = 168 + 31.7$$

$$Y = 199.7$$

The value of Y could also have been obtained from an accurately constructed graph.

Thus, when X = 20, Y = 199.7. When rounded, this number is 200. Therefore, 200 burglaries are predicted to occur in August 1989 (month 20) and it is this number that you will give to your Chief.

A note of caution: a line of "best fit" can be constructed from any data, but the line does not always predict well for many law enforcement applications. If the correlation coefficient, "r", you calculated falls between -0.600 and +0.600, do not use linear projection—the correlation will probably be too weak to use for predictions. Linear projection is best used when "r" is +.8 or higher or -.8 or lower. When "r" is between +.8 and -.8, predictive equations other than linear should be considered. Further discussion of these other equations exceed the scope of this book. Readers are encouraged to obtain a commercial text or software package that explains their calculation and function.

RANGE OF ESTIMATE:

You will note that only one of the original data points in Figure 45 falls on the line of best fit. Some are above the line, others below. Your calculation for "Y", in the above example, 200 cases, will fall on the line because you

calculated it to fall on the line. But don't forget—it's only a prediction. However, there is no reason to believe that for X=20, the *actual* value for "Y" will fall on the line. The actual value of "Y" will not be known until sometime in the future and it may vary from what you predicted it to be. All predictions are merely "educated" guesses, based on acceptable statistical procedures. No statistically-based prediction will be, nor should it be expected to be, exact, and the analyst must have some method for determining over what range his or her estimate will fall.

One way to ascertain the range of an estimate is to determine the mean average difference between successive values of "X" as explained below:

Step 1: Compute the absolute difference between successive values of X.

Step 2: Compute the mean average of these differences using our original data:

X	Y	ABSOLUTE DIFFERENCE BETWEEN CURRENT AND PREVIOUS VALUE OF Y	
2	45	--	
3	60	15	(60-45 = 15)
4	65	5	(65-60 = 5)
5	80	15	etc.
6	75	5	
7	95	20	
8	90	5	
9	120	30	
10	110	10	
		105	Column Total

Values in the difference column were found by subtracting successive values of "Y" from each other; all algebraic signs are ignored. The average of the differences in this example is:

$$105/8 = 13.125$$

Our actual forecast of "Y" when X = 20 is 199.7 (from our equation for the line of best fit), +/- 13.125. The value of "Y" we would expect when X=20 would lie somewhere between 186.68 and 212.93, and we would be 50% confident that our estimate was correct. The 50% indicates that our

computations were based on the mean average as calculated in Step 2 above.

A more accurate method for determining the range of forecasted values requires calculating the "variation around the line". Using the standard deviation of point estimates, the analyst is able to estimate with a higher degree of accuracy. This procedure may be found in statistical software packages and elementary statistics textbooks and you are encouraged to familiarize yourself with it.

SEASONAL AVERAGING - METHOD (2):

All of the methods necessary to carry out the various steps of Seasonal Averaging - Method (2) presented below were covered in Chapter 12.

Consider the following data to represent the number of reported burglaries over a three year period:

	YEAR 1	YEAR 2	YEAR 3
JAN	50	65	75
FEB	45	70	80
MAR	55	65	70
APR	55	80	75
MAY	65	85	90
JUN	70	95	100
JUL	80	110	120
AUG	75	100	125
SEP	60	90	110
OCT	65	75	90
NOV	65	85	95
DEC	75	90	100

Step 1: Calculate the grand mean by summing all burglaries for the three year period and dividing this sum by 36, (2900/36 = 81).

Step 2: Calculate the mean for each month.

For January: (50+65+75)/3 = 63

For February: (45+70+80)/3 = 65
etc.

Step 3: Calculate the seasonal adjustment factor (SAF) for each month by dividing the monthly mean by the grand mean.

For January: 63/81 = 0.78

For February: 65/81 = 0.80

The process is continued for the rest of the months.

The first three steps of Method 2 as applied result in the following table:

	MEAN AVERAGE	SAF(*)
JAN	63	0.78
FEB	65	0.80
MAR	63	0.78
APR	70	0.86
MAY	80	0.99
JUN	88	1.09
JUL	103	1.27
AUG	100	1.23
SEP	87	1.07
OCT	77	0.95
NOV	82	1.01
DEC	88	1.09

* Seasonal Adjustment Factor

Step 4: Divide each data point by its seasonal adjustment factor (SAF).

For January of YEAR 1: 50/0.78 = 64

For January of YEAR 2: 65/0.78 = 83

For February of YEAR 3: 80/0.80 = 100
etc.

Step 4 results in the following:

	ORIGINAL DATA ADJUSTED FOR SAF		
	YEAR 1	YEAR 2	YEAR 3
JAN	64	83	96
FEB	56	88	100
MAR	71	83	90
APR	64	93	87
MAY	66	86	91
JUN	64	87	92
JUL	63	87	94
AUG	61	81	102
SEP	56	84	103
OCT	68	79	95
NOV	64	84	94
DEC	69	83	92

STEP 5: Fit a least squares line to the seasonally adjusted data. Remember: the months must be converted to numbers. Therefore, January of YEAR 1 = 1; January of YEAR 2 = 13; December of YEAR 1 = 12; June of YEAR 2 = 18; etc. The equation for your exemplary least squares line fitted to the seasonally adjusted data is:

$$Y = mX + b$$

Using your calculator or statistical computer software to solve the equation will give you the following result:

$$Y = 1.1X + 60.8$$

Where: X is the time period and

Y is the seasonally adjusted value

STEP 6: The analyst can now estimate the number of burglaries for any month in the not too distant future. For example, for June of YEAR 4 (that has an X value of 42), the predicted number of burglaries (Y) is:

$$Y = 60.8 + 1.1 \times 42 = 107$$

STEP 7: Dividing the linearized estimate for June (107) by the seasonal adjustment factor for June (which is 1.09 as shown in the chart in Step 2 above) gives us 107/1.09 = 98.16. Rounded, this is 98, the estimated number of burglaries for June, YEAR 4.

CHAPTER 17

ON CALCULATORS AND SOFTWARE

ON CALCULATORS AND SOFTWARE

CALCULATORS:

Many companies make statistical calculators which incorporate many of the procedures we have discussed or into which the procedures can be easily programmed. Should you decide to purchase a statistical calculator, be sure to choose one whose documentation you can read and understand!

COMPUTER SOFTWARE:

Because of budget limitations, we were unable to purchase and test for ourselves the wide variety of statistical software packages which are currently on the market. As such, we had to rely on product reviews or recommendations provided us by others to present the information which follows. Please note, however, that many packages which are not commented upon here are also available. We recommend that you visit your local computer store and determine for yourself which product(s) will best meet your needs.

The software package we finally obtained for ourselves was provided to us by SYSTAT, Inc. SYSTAT is unique in that a version is available both for the Macintosh and for the IBM-PC. This feature is useful if you are sharing information in a department that uses both IBM and Macintosh equipment. Nomenclature for statistical parameters is the same in both versions, facilitating communication. The package contains everything that's been discussed in this book, and more. SYSTAT, Inc. also produces a less extensive version (called MYSTAT) that does almost everything described in this book, but costs considerably less than SYSTAT. They also manufacture FASTAT, an easy-to-learn basic statistics and graphics package specifically designed to run on Macintosh equipment. For additional information, contact SYSTAT at:

SYSTAT Inc.
1800 Sherman Avenue
Evanston, Illinois 60201
(312) 864-5670

A major contender with SYSTAT is SPSS/PC+. SPSS stands for Statistical Package for the Social Sciences and SPSS/PC+ presents the IBM or IBM compatible user with a wide variety of statistical features. Authors of *Infoworld Magazine* (September 1, 1986) state that the package is fast and accurate and impressive in terms of its use of colors and auditory prompts to give users both flexibility and quality output. Further, the

documentation supplied with the package is purported to be excellent. For additional information contact:

SPSS Inc.
444 N. Michigan Avenue
Chicago, Illinois 60611
(312) 329-3500

STATGRAPHICS 3.0, manufactured by STSC Inc., is designed to run on IBM and IBM compatibles and may well generate the most impressive graphics of any statistcial packages on the market. *Infoworld Magazine* reviewers (July 31, 1989) state that the documentation is clearly written, a definite "must" for statstical packages, and that the STATGRAPHICS manual contains the best-written tutorial they have seen. On the downside, they felt that it was a bit sluggish unless used with a math coprosessor, and that it omits the newest graphics features of the competition such as multiple font types and data highlighting and brushing. Nonetheless, it was felt that STATGRAPHICS 3.0 was the best general stat package for quality-control analyses or for those needing a stat package that can be used without remembering a slew of commands. For additional information, contact:

STSC Inc.
2115 E. Jefferson Street
Rockville, Maryland 20852
(800) 592-0050

STATVIEW 512+ by BrainPower, Inc. has also been cited as an excellent package for use with Macintosh equipment. It provides every statistical function you will need for crime analysis work, plus a few others you may never need at all. The program easily imports data from other Macintosh applications (using text files or the Clipboard) or from other computers (using text files). Once data has been loaded into the program, variables are defined, analyses are run and graphic views are produced in record time. STATVIEW 512+ was the winner of the 1988 *Macworld Magazine* World Class Award. BrainPower, Inc. also offers three other programs: STATVIEW, an introductory statistics package; STAVIEW II, for use with a MAC II or a Plus/SE with a 68881 math coprosessor; and STATVIEW SE+GRAPHICS, a special version of STATVIEW II for the Macintosh SE. For additional information, contact:

BRAINPOWER Inc.
24009 Ventura Boulevard, Suite 250
Calabasas, California 91302
(818) 707-1712

As mentioned earlier, these are only a few of the many statistical software packages which are available. If you have the opportunity to do so, try before you buy. We suggest, however, that *before* you make a considerable investment in statistical software, you purchase an electronic calculator that has been configured to handle basic statistical computations. We have found that use of such a tool is a cost-effective way to get a good "feel" for statistical calculations, and an excellent method for identifying your needs before you select a software package for your computer.

BIBLIOGRAPHY

BIBLIOGRAPHY

Berge, C., *Theory of Graphs and its Applications*, John Wiley & Sons, New York, 1962.

Block, P. B., and Weidman, D. R., *Managing Criminal Investigations*, U.S. Department of Justice, 1975.

Brown, Dale K., *Calling the Police: Citizen Reporting of Serious Crime*, National Institute of Justice, 1984.

Brown, R. G., *Smoothing, Forecasting and Prediction of Discrete Time Series*, Prentice-Hall; Englewood Cliffs, N. J., 1963.

California State Department of Justice, *Introduction to Crime Analysis*, Department of Justice Training Center, "n.d."

Caplan, Marc, *Efficient Use of Police Resources*, National Institute of Justice, 1983

Chase, C. I., *Elementary Statistical Procedures*, Second Edition, McGraw-Hill Book Company, New York, 1976.

Chang, Samson K., et al., *Crime Analysis System Support: Descriptive Report of Manual and Automated Crime Analysis Functions*, International Association of Chiefs of Police, 1979.

Durand, D., *Stable Chaos*, General Learning Press, Morristown, N. J., 1971.

Fienberg, S. E. and Reiss, Jr. A. J., *Indicators of Crime and Criminal Justice: Quantitative Studies*, U. S. Department of Justice, 1975.

Gay, W. G. et al, *Improving Patrol Productivity: Volume I, Routine Patrol*, U. S. Dpeartment of Justice, 1977.

Grassie, R. G. et al, *Crime Analysis Executive Manual*, Integrated Criminal Apprehension Program, U. S. Department of Justice, 1977.

Grassie, R. G. et al, Crime Analysis System Manual, Integrated Criminal Apprehension Program, U. S. Department of Justice, 1977.

Grassie, R. G. and Hollister, J. A., *A Preliminary Guideline Manual for Patrol Operations Analysis*, Integrated Criminal Apprehension Program, U. S. Department of Justice, 1977.

Greenberg, D. F., *Mathematical Criminology*, Rutgers University Press, New Brunswick, N. J., 1979.

Local Government Police Management, ed. by Bernard L. Garmire, International City Management Association, c. 1982

Luce, R. D. and Raiffa, H., *Games and Decisions*, John Wiley & Sons, New York, 1958.

McGhee, J. W., *Introductory Statistics*, West Publishing Company, St. Paul, 1985.

Monroe, David G. and Garrett, Earle W., *Police Conditions in the United States, A Report to the National Commission on Law Observance and Enforcement*, Patterson Smith Reprint Series, 1968.

Moroney, M. J., *Facts From Figures*, Penguin Books, London, 1971.

Oberlander, L., Editor, *Quantitative Tools for Criminal Justice Planning*, U. S. Department of Justice, 1975.

Office of Criminal Justice Planning, *Career Criminal Apprehension Program Guidelines*, State of California, 1988.

Reinier, G. H., et al, *Crime Analysis in Support of Patrol, National Evaluation Program, Phase I Summary Report*, U. S. Department of Justice, 1977.

Reinier, G. H., et al., *Crime Analysis Operations Manual*, U. S. Department of Justice, Law Enforcement Assistance Administration, 1977.

Schack, S. et al, *Improving Patrol Productivity: Volume II, Specialized Patrol*, U. S. Department of Justice, 1977.

Silverman, E. N., and Brody, L. A., *Statistics—A Common Sense Approach*, Prindle, Weber, and Schmidt, Boston, 1974.

Slonim, M. J., *Sampling in a Nutshell*, Simon and Schuster, New York, 1960.

Timko, John J., Statistics for "Math Haters," (publisher unknown), 1985.

Tufte, E. R., *The Visual Display of Quantiitative Information*, Graphics Press, Cheshire, Connecticut, 1983.

U. S. Law Enforcement Administration, *Review of Patrol Operations Analysis: Selected Readings from ICAP Cities*, U. S. Department of Justice, 1978.

Wagner, H. M., *Principles of Operations Research*, Prentice-Hall, Englewood Cliffs, N. J., 1969.

Whitaker, G. P., *Understanding Police Agency Performance*, U. S. Department of Justice, 1984.

APPENDIX

CAREER CRIMINAL IDENTIFICATION WORKSHEET

STANISLAUS COUNTY SHERIFF'S DEPARTMENT

NAME: _____ DOB: _____ DATE: _____

S/O ID#: _____ CII#: _____

I. PRESENTLY UNDER INVESTIGATION FOR THE COMMISSION OR ATTEMPTED COMMISSION OF ONE OR MORE OF THE FOLLOWING FELONIES: (CHECK APPROPRIATE ITEM AND LIST FILE NUMBER)

FILE# _____

_____ 187	_____ 487.1,.2	_____ 10851
_____ 261 (1) THRU (7)	_____ 487.3	_____ 451 & 452
_____ 288	_____ 496.1 ONLY	_____ 11351 & 11352
_____ 211	_____ 459 1ST DEGREE ONLY	

II. AND (EITHER A, B, OR C)

A. WHO IS UNDER SUSPICION OF HAVING COMMITTED THREE OR MORE SEPARATE FELONIES NOT ARISING OUT OF THE SAME TRANSACTION:

	CRIME	WHEN	FILE#
1.			
2.			
3.			

B. WHO HAS PRIORS OF AT LEAST ONE CONVICTION IN THE FOLLOWING WITHIN THE LAST 10 YEARS EXCLUDING PRISON TIME (GIVE DATE & DISPO)

_____ 187	_____ 209	_____ 211	_____ 261	_____ 286
_____ 288(A)	_____ 288A	_____ 451	_____ 452	_____ 460.1

C. WHO HAS PRIORS OF AT LEAST TWO CONVICTIONS IN THE FOLLOWING WITHIN THE LAST 10 YEARS EXCLUDING PRISON TIME (GIVE DATE & DISPO)

_____ 460.1(2)	_____ 487	_____ 487.3	_____ 10851	_____ 496.1
_____ 211	_____ 211A	_____ 212.5	_____ 213	_____ 213.1
_____ 213.2	_____ 213.3	_____ 245	_____ 245.2	_____ 245.3
_____ 245(A)	_____ 207	_____ 245(B)	_____ 245(C)	_____ 245(A)(1)
_____ 245(A)(2)	_____ 11351	_____ 11352	_____ 11351.5	_____ 11351(A)
_____ 11352(A)	_____ 245(A)/W			

PREPARED BY:

SOURCE: S/O FILES _____
CII HISTORY _____
DA FILES _____

CC: CRIME ANALYSIS UNIT

STANISLAUS COUNTY SHERIFF'S DEPARTMENT

CRIME ANALYSIS UNIT

BOL FOR

INFORMATION ONLY

DATE 08-16-88 BULLETIN: 88-0002

NAME / AKA'S: _____

DESCRIPTION: _____

ADDRESSES: _____

OTHER: _____

DETAILS: _____

CAU INFO: _____

PAROLE INFO: _____

PROBATION: YES ___ NO ___

SUBMITTED BY: _____ DETAIL: _____ PHONE: _____

CONFIDENTIAL - LAW ENFORCEMENT USE ONLY

JIM TREVENA SHERIFF-CORONER PO BOX 858, MODESTO, CALIFORNIA 95353

STANISLAUS COUNTY SHERIFF'S DEPARTMENT
CRIME ANALYSIS UNIT

WANTED PERSONS BULLETIN

WANTED ON A WARRANT

DATE **BULLETIN:**

NAME_____ CHARGES_____

AKA_____ REPORT #_____

DOB_____ AGE____ RACE____ SEX___ WARRANT #_____

HGT_____ WGT_____ HAIR____ EYES____ ADDRESS(S)_____

SOC SEC #_____

FBI #_____ CII #_____

DL#_____ STATE_____

VEHICLE_____

R/O_____

AREAS OF ACTIVITY_____

DETAILS:_____

CAU INFO:_____

PAROLE INFO:_____

PROBATION: YES_____ NO_____

SUBMITTED BY:_____ DETAIL:_____ PHONE:_____

CONFIRM ALL WARRANTS - LAW ENFORCEMENT USE ONLY

JIM TREVENA SHERIFF-CORONER PO BOX 858, MODESTO, CALIFORNIA 95353

STANISLAUS COUNTY SHERIFF'S DEPARTMENT
CRIME ANALYSIS UNIT

WANTED PERSONS BULLETIN

STATUS REPORT

CANCELLATIONS

DATE 08-15-88

NAME	BULLETIN#	DATE ISSUED	DATE ARRESTED	ARRESTED BY
ROTH, BRADLEY MATTHEW	88-0063	07-28-88	09-06-88	DEP. DELNERO

STILL OUTSTANDING

NAME	BULLETIN	DATE ISSUED	WANTED BY
LVARADO, MARCUS	88-0007	01-08-88	DET. BLANUSA
BOOTH, DONALD	88-0015	01-15-88	DET. CERNY
CORDER, RANDY	88-0020	02-05-88	DET. DULANEY
RAMOS, JESUS	88-0023	02-09-88	GONZALES
ZAMORA, SANTIAGO	88-0024/87-0004	02-09-88	DET. PEDE
PUCKETT, ERIC	88-0029	02-23-88	DRUG ENFORCEMENT
TORRES, MAXIMINO	88-0030	02-23-88	DET. PEDE
BLACKSHEAR, GARY	88-0031	02-23-88	DET. PEDE
JOHNS, ROCKY	88-0032	02-25-88	DET. PROTINE
SZEPANIK, CHARMAINE	88-0033	03-15-88	DET. LUIZ

** OVER **

CONFIRM ALL WARRANTS - LAW ENFORCEMENT USE ONLY

JIM TREVENA SHERIFF-CORONER PO BOX 858, MODESTO, CALIFORNIA 95353

STANISLAUS COUNTY SHERIFF'S DEPARTMENT
CRIME ANALYSIS

WANTED PERSONS BULLETIN
STATUS MODIFICATION FORM

TO: CRIME ANALYSIS UNIT DATE: _____
FROM: _____ PHONE: _____

SUBJECTS NAME: _____
REGARDING WPB#: _____ FILE#: _____

CHECK CURRENT STATUS:

____ NO CHANGE, STILL WANTED AS BULLETIN WAS INITIALLY ISSUED

____ ARRESTED - CANCEL WPB
BOL CANCELLATION DATE _____
ARREST DATE AGENCY/AUTHORITY

_____

____ NO LONGER WANTED - CANCEL WPB
BOL CANCELLATION DATE _____
EXPLAIN CONDITIONS OF CANCELLATION:
DATE AGENCY/AUTHORITY REASON

_____

____ STATUS HAS CHANGED FROM I&B TO WARRANT
PROVIDE WARRANT# AND ANY ADDITIONAL INFORMATION
REQUIRED TO REISSUE AS WANTED ON WARRANT:

_____

_____

____ ADDITIONAL INFORMATION REQUIRES UPDATED WPB
EXPLAIN AND ATTACH NEW COMPLETED WPB FORM IF NECES-
SARY FOR CLARIFICATION:

_____

_____

FOR CRIME ANALYSIS USE ONLY:

STANISLAUS COUNTY SHERIFF'S DEPARTMENT
CRIME ANALYSIS UNIT

WANTED PERSONS BULLETIN

INFORMATION & BELIEF

DATE BULLETIN:

NAME _____ CHARGE _____
AKA _____ REPORT # _____
DOB _____ AGE ____ RACE _____ SEX _____ WARRANT # _____
HGT _____ WGT ____ HAIR _____ EYES _____ ADDRESS(S) _____

SOC SEC # _____

FBI# _____ CII# _____

DL# _____ STATE _____

VEHICLE _____

R/O _____

AREAS OF ACTIVITY _____

DETAILS: _____

CAU INFO: _____

PAROLE INFO: _____
PROBATION: YES ____ NO ____
SUBMITTED BY: _____ DETAIL: _____ PHONE: _____

CONFIDENTIAL - LAW ENFORCEMENT USE ONLY

JIM TREVENA SHERIFF-CORONER PO BOX 858, MODESTO, CALIFORNIA 95353

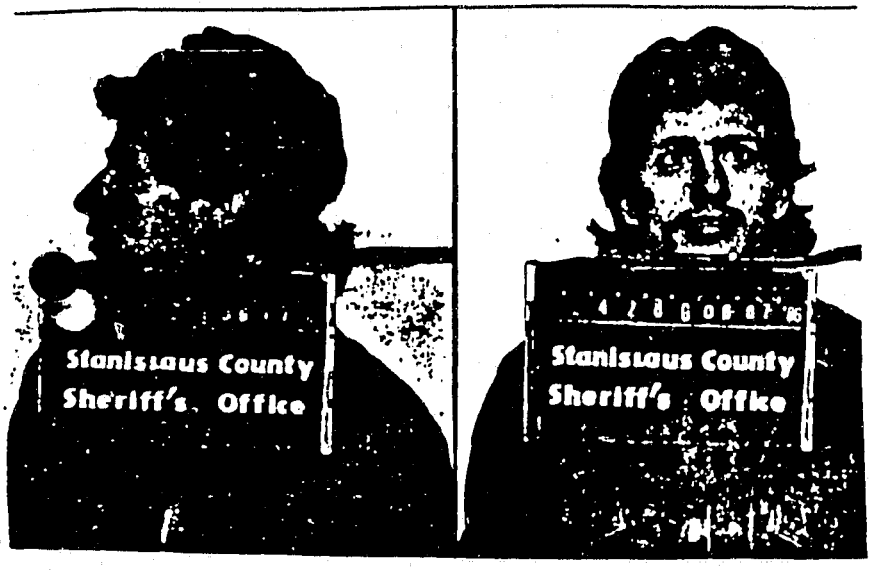
STANISLAUS COUNTY SHERIFF'S DEPARTMENT
CRIME ANALYSIS UNIT

WANTED PERSONS BULLETIN

INFORMATION & BELIEF

DATE 04-27-88 BULLETIN: 88-0045

NAME HODGE, JOHN CHRISTOPHER
AKA SALDIVAR, JOHN CHRISTOPHER
DOB 09-10-65 AGE 22 RACE W SEX M
HGT 5' 5" WGT 125 HAIR BRN EYES BRN



CHARGE 261.2 PC
REPORT # S8-06803
WARRANT #
ADDRESS(S) 2431 SYLVAN RD #3
MODESTO

SOC SEC # 568-29-7030

FBI# CII# A07680691

DL# C3273042 STATE CA

VEHICLE BLK VW BUG WITH
BLUE PIN STRIPING
R/O UNKNOWN

AREAS OF ACTIVITY MODESTO
AND CERES

*** OFFICER SAFETY ***

DETAILS: ON 04-18-88, SUSPECT HODGE ALONG WITH ANOTHER SUSPECT RICHARD ANTHONY SILER, WHO IS IN CUSTODY, TOOK A FEMALE TO T.I.D. LAT. #2 NEAR TEGNAR RD. WHERE BOTH SUSPECTS RAPED HER.
SUSPECT HODGE KNOWS HE IS WANTED AND WILL RUN

CAU INFO: PRIORS: 243 (B), 148, 240/242, 273.5, 460.1, 12020(A) PC
ADDITIONAL AKA(S): HODGE, CHRIS; HODGE, JON CHRISTOPHER

PAROLE INFO:
PROBATION: YES X NO
SUBMITTED BY: DET. DELEON DETAIL: CRIMES AGAINST PERSONS PHONE: 525-7956

CONFIDENTIAL - LAW ENFORCEMENT USE ONLY

JIM TREVENA SHERIFF-CORONER PO BOX 858, MODESTO, CALIFORNIA 95353

COLTON POLICE DEPARTMENT

CRIME ANALYSIS UNIT

CRIME PATTERN BULLETIN

Thursday, January 5, 1989

A tentative pattern of at least 6 burglaries has been identified in the area bounded by Laurel St on the north, 8th Street on the west, D Street on the south and Mount Vernon on the east.

CASE	LOCATION	DATE/TIME	DAY OF WEEK	ENTRY
88-31259	1119 N. La Cadena	12-09 1300	Fri	Pry Front Door
88-31646	370 E. B Street	12-13 2310	Tue	Pry Kitchen Window Screen
88-30762	1298 N. 8th Street	12-03 1450	Sat	Admitted by occupant (88 YOA)
88-32100	712 N. 11th Street	12-18 1930 12-19 1800	Fri Sat	Unknown means
88-32712	1270 N. 8th Street	12-26 1835	Mon	Unlocked rear door
88-32684	400 E. D Street	12-24 ???? 12-25 ????	Fri Sat	Pry Kitchen Door

Three suspect descriptions are available:

1. H/M/A 35 YOA 509 160 Bro Bro LSW Levis, Blu plaid shirt blue ski cap.
2. W/M/A 30's 508 220 Bro Hair LSW tan-khaki pants, jacket dark beanie.
3. H/M/? 505 165 Blk hair, NFD

Suspect has taken items he can carry by hand: jewelry, cash, small electronic devices, etc. Large valuable items have been left behind.

A POSSIBLE suspect is:

, P H/M/A 40 YOA 01/09/48 508 160
Blk Bro (CPD 8:)
No current address is on file.

His M.O. is similar to the one shown here. He was convicted of burglary in 19 (3 counts). He has a history of burglary, trespass, battery, heroin addiction, and traffic. See back for photo and map.

CONFIDENTIAL INFORMATION - FOR LAW ENFORCEMENT USE ONLY

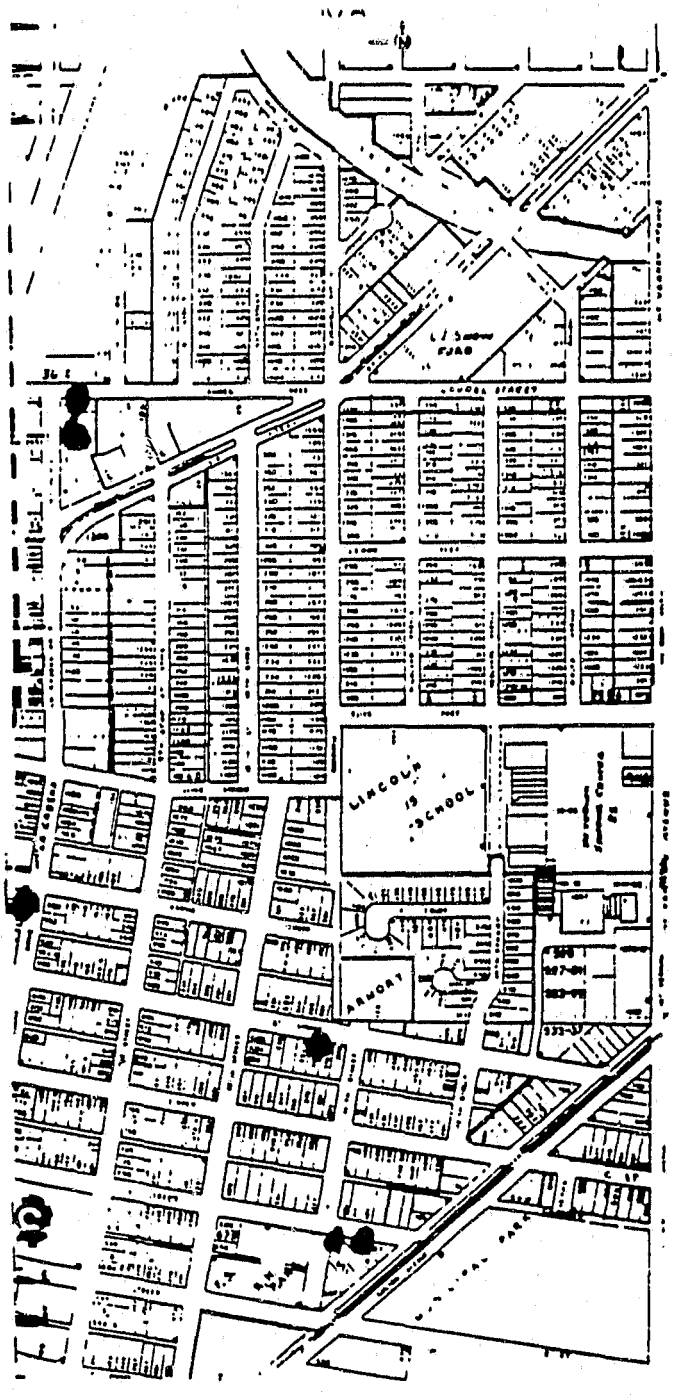
DISPOSE OF IN C.O.R.I. BASKET

Notify the Crime Analysis Unit if any arrests result from this Crime Pattern Bulletin.

COLTON POLICE DEPARTMENT

CRIME ANALYSIS UNIT

Photo taken 1979 (Most Current)



CONFIDENTIAL INFORMATION - FOR LAW ENFORCEMENT ONLY

INFORMATION IN THIS BULLETIN IS TO ASSIST LAW ENFORCEMENT OFFICERS IN THEIR INVESTIGATIONS ONLY. PERSONS APPEARING HEREIN ARE NOT NECESSARILY ASSOCIATED WITH OR PART OF A CRIMINAL ACTIVITY. UNLESS SPECIFICALLY INDICATED, THERE ARE NO WANTS OR WARRANTS KNOWN AND PROBABLE CAUSE TO DETAIN MUST BE DEVELOPED ON AN INDIVIDUAL BASIS BY FIELD OFFICERS.

LONG BEACH POLICE DEPARTMENT

CIB

CRIMINAL INFORMATION BULLETIN

BULLETIN #89-35 FEBRUARY 17, 1989

BEAT 9

RESIDENTIAL BURGLARIES

There were 29 residential burglaries reported during the period of January 2nd through February 10th.

Several burglaries occurred in the area of 11th St. south to 10th St. and St. Louis Ave. east to Ohio Ave. A total of 15 burglaries were reported in the vicinity of 17th St. south to Anaheim St. and Cherry Ave. east to Redondo Ave.

OCCURRENCE FACTS:

Most Common Time of Day:

2400-0759 hours	(06.9%)
0800-1559 hours	(48.3%)
1600-2359 hours	(44.8%)

Most Common Days of Week:

Sun	Mon	Tue	Wed	Thu	Fri	Sat
3	4	4	4	5	7	2

Method of Entry:

Broke/Remove Window	27.6%
Window Pried Open	10.3%
Door Pried Open	10.3%

Object of Attack: jewelry, television/VCR

Suspects:

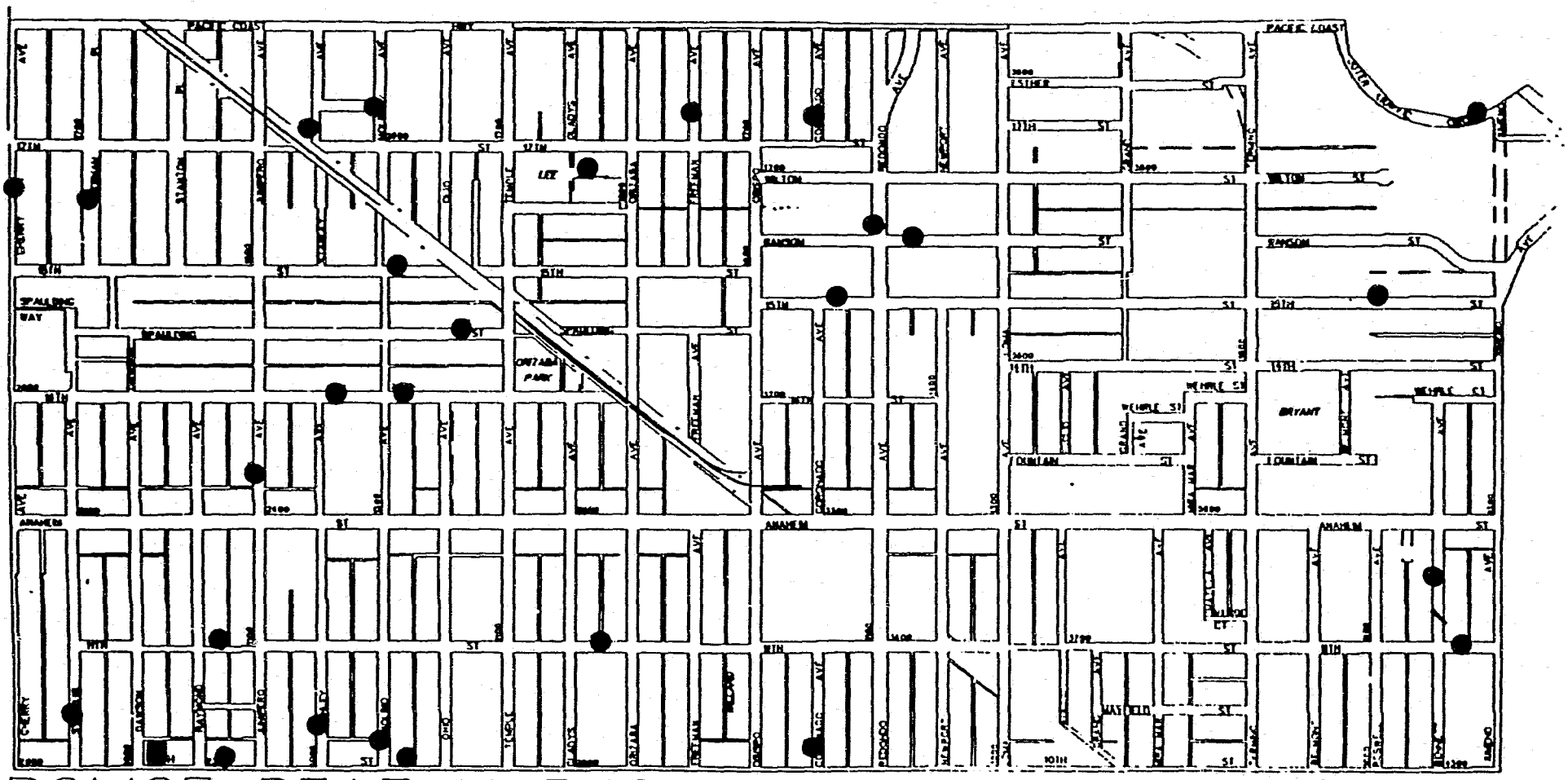
CR# 890-5904 M/B, 20's, 5-8/5-9, 190, blk wavy hair, drk compl, gray T-shirt, blk pants
Veh: Poss. Dodge Dart, early 70's, 2D, blk/yel

CR# 890-3275 M/B, 30's, 6-1, 150, blk short hair, plaid shirt, drk bro pants, tennis shoes
Veh: Metallic blu Hyundai, partial Lic# 2JZW57_

REFER: Corporal J. Johnson, Burglary Detail, extension 7351, or Karen McDade, Crime Analysis Unit, extension 6647.

RESIDENTIAL BU[illegible] ES BEAT 9
01/02/89-02/10/89

● Single Occurrences
■ Multiple Occurrences



POLICE BEAT MAP 9

LONG BEACH POLICE DEPARTMENT

CIB

CRIMINAL INFORMATION BULLETIN

BULLETIN #89-36 FEBRUARY 20, 1989

BEAT 11

AUTO THEFTS

Beat 11 has a high number of auto burglaries (see previous CIB's) as well as auto thefts each month. From January 22nd through February 11th, there were 24 auto thefts. Toyotas and Chevrolets were the most common vehicles stolen.

Sixty-two percent of the thefts occurred in the area around the Traffic Circle and south to Anaheim Street. Two vehicles stolen elsewhere were recovered at 4351 E. Willow and one was found at 5000 Airport Plaza Drive. See pin map on page 2 for locations.

Two suspects were arrested and one of the arrests was by LASO-Carson.

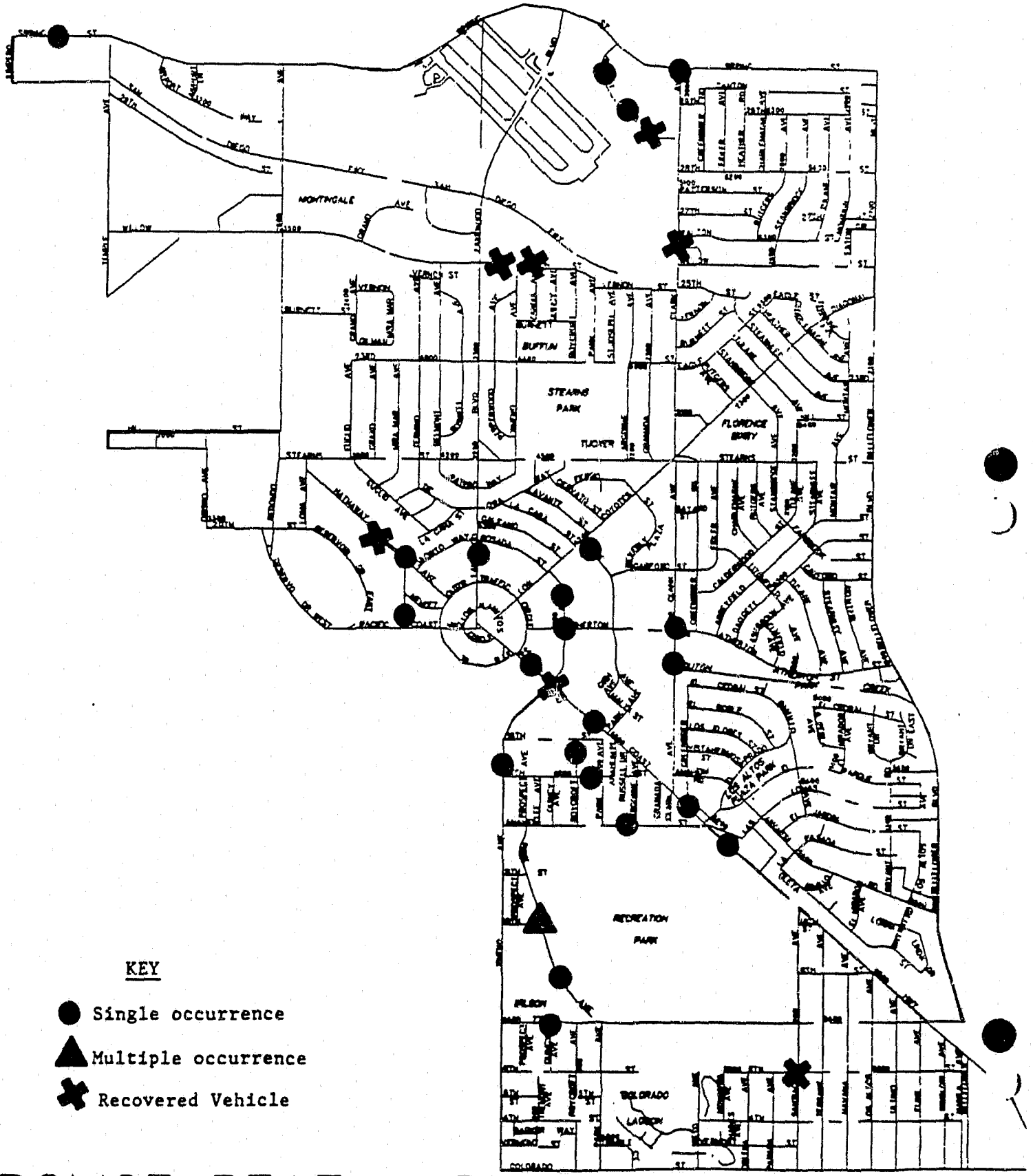
OCCURRENCE FACTS:

Most Common Time of Day:	2400-0759 hours (58.3%) 0800-1559 hours (20.8%) 1600-2359 hours (20.8%)
Most Common Days of Week:	Sun 2, Mon 5, Tue 4, Wed 2, Thu 5, Fri 2, Sat 4
Vehicle Makes:	20.8% Toyota (Celica, Corolla, MR2) 16.6% Chevrolet (Camaro, Citation) 12.5% Ford (PU) 12.5% Nissan (280ZX)
Suspects:	None described

REFER: Sergeant D. A. Skelton, Auto Theft Detail, extension 7362, or Karen Thielman, Crime Analysis Unit, extension 6647.

AUTO THEFTS

1/22 - 2/11/89



POLICE BEAT MAP 11

CHINO POLICE DEPARTMENT
MEMORANDUM

To: Officer M. Dell, Swing Patrol

From: Alan Bediamol, Crime Analyst

Subj: Crime Activity - Beat 3 and 4

Date: March 9, 1989

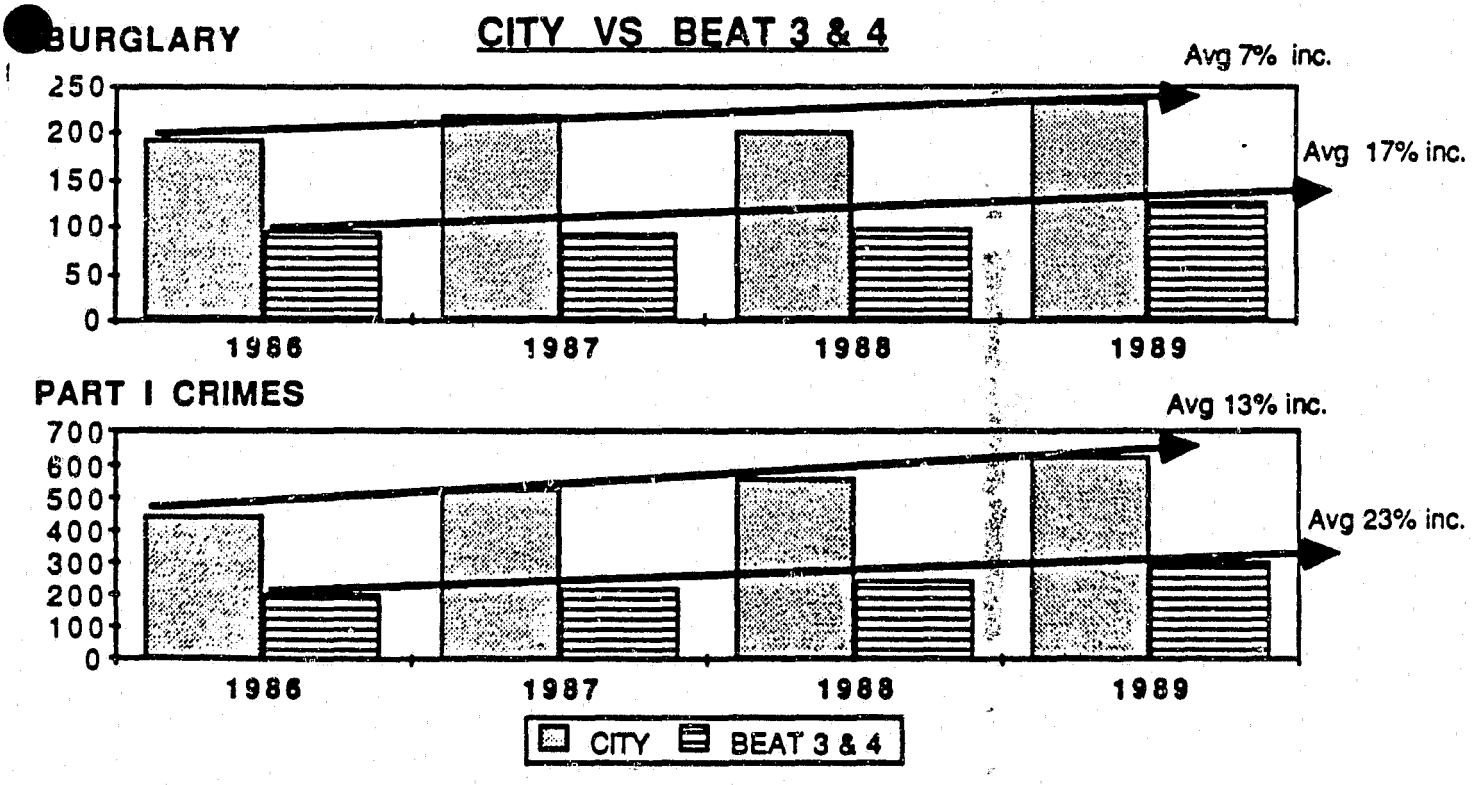
Per your request, a detailed area analysis was conducted in Beats 3 and 4. All crimes between 1986 and 1988 were retrieved, graphed and examined. Included in this report is an analysis of the CFS from May 1986 to May 1987 and an arrest analysis of narcotics in beats 3 and 4.

The information was then correlated to **identify trends for day of week and by time of day** and to identify the causation of the rise of the crime activity in beats 3 and 4. In addition, targeted crimes, locations, and possible known offenders were identified in the targeted areas. The following charts, graphs, and data will aid in developing a directed patrol for your shift.

EXECUTIVE SUMMARY:

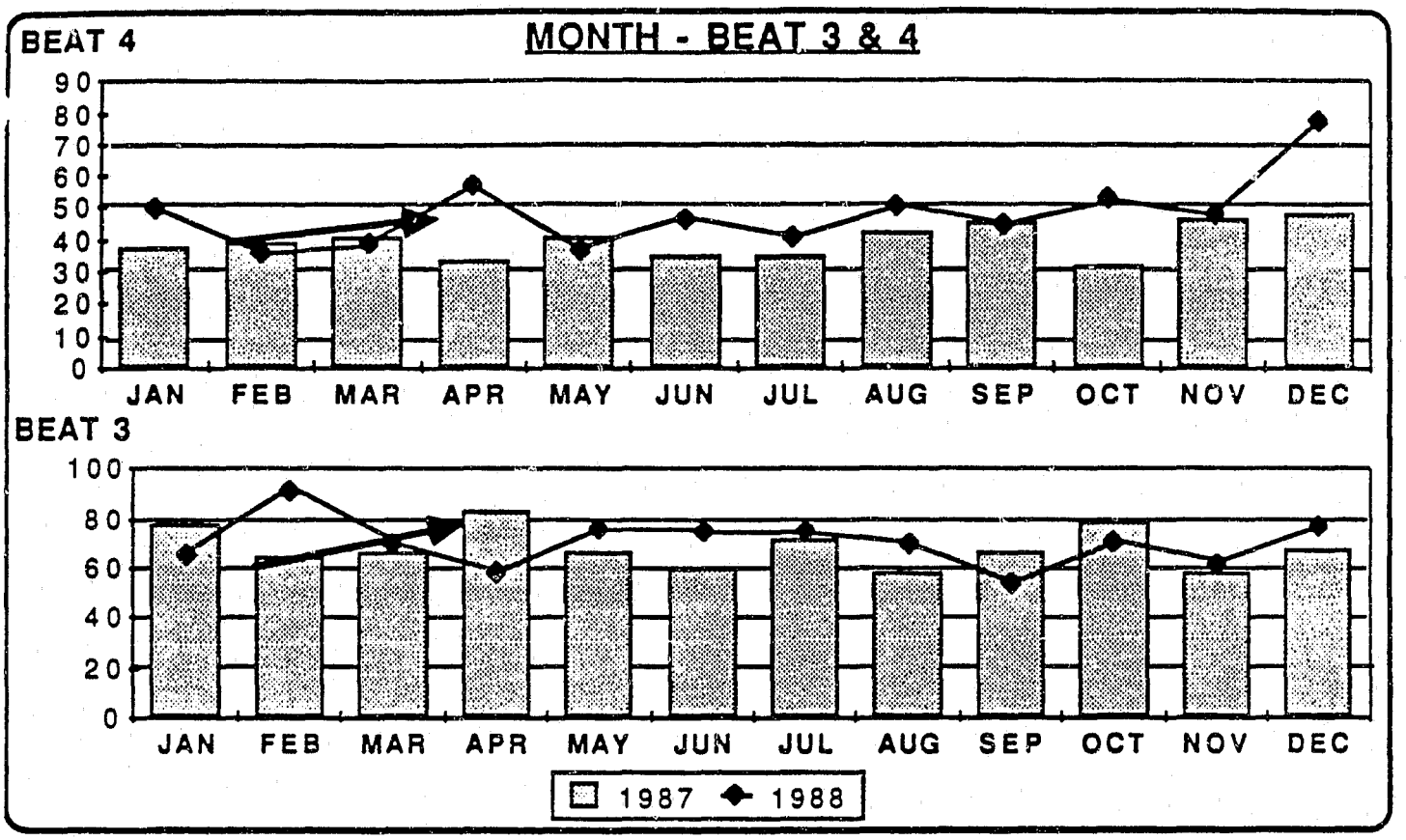
Since January 1, 1989, there was a total of 233 burglaries, of which **55%**(128 cases) occurred in Beats 3 and 4. As compared to the same time period in 1988, there was a total of 201 burglaries, of which **49%**(98 cases) occurred in Beats 3 and 4. This represents a significant increase of **31%** in the targeted area (Beat 3 & 4). Overall, there is a **12%** increase of burglaries city-wide for 1988 and 1989.

As shown in below graphs, the annual average of city-wide burglary is **7%** and the targeted area is **17%**. The city-wide Part I crimes annual average is **13%**. The targeted area had the highest average with a **23%** increase.



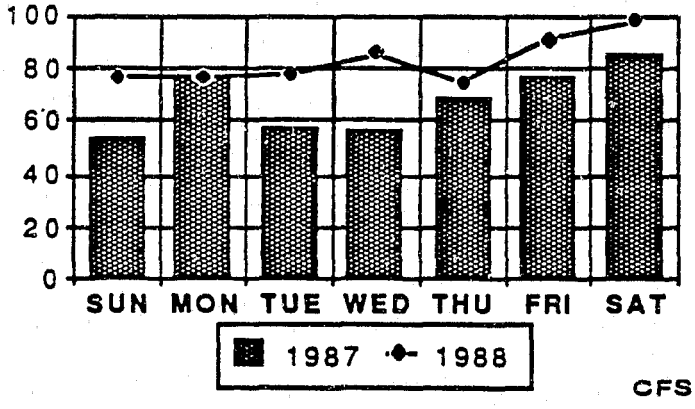
The above graphs display a positive growth for each variable. However, Beats 3 and 4 show a **stronger growth** because of ratio of 2 to 1. In essence, there are more burglaries and other part I crimes occurring in the targeted area. This movement is expected to continue through March 1989.

The below graphs show the 1987 and the 1988 monthly pattern of the Part I crime activity for Beats 3 and 4. As indicated, there will be a mild increase of activity during February and March in Beats 3 and 4. The Part I crime activity throughout the year (1989) will be active and consistent.

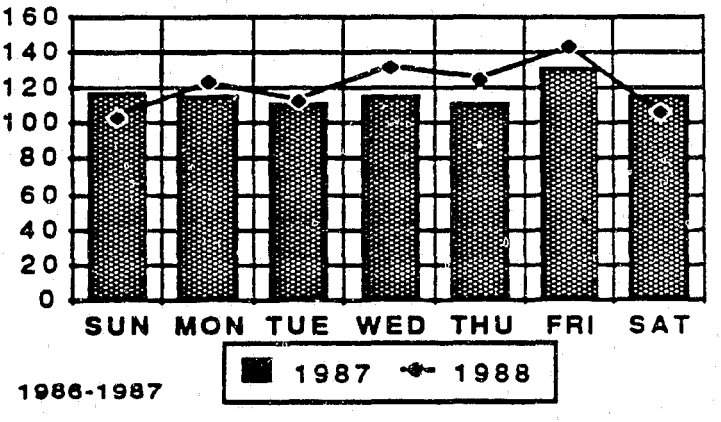


The day of week pattern is different for each Beat. The number of cases in Beat 4 starts to increase on Thursday and peaks out on Saturday. The pattern in Beat 3 seems to be more constant and consistent because the 1987 pattern is very similar to 1988.

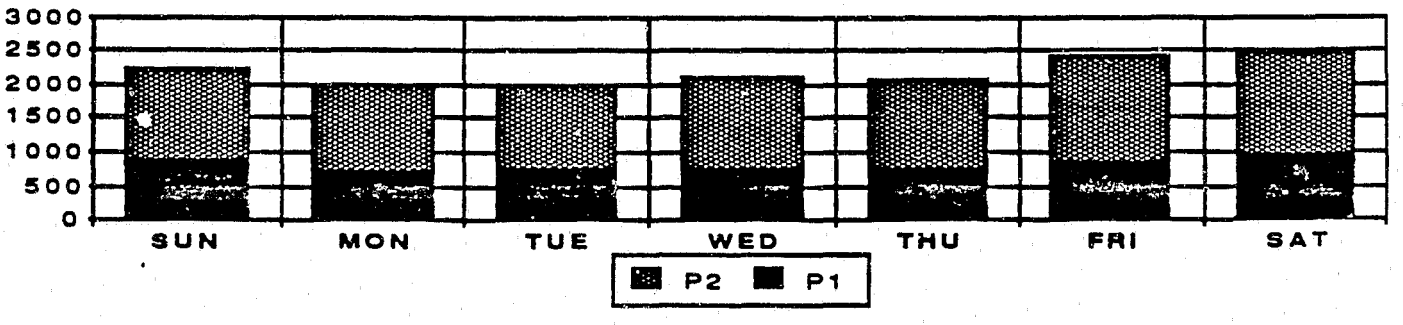
BEAT 4 - DAY OF WEEK



BEAT 3 - DAY OF WEEK

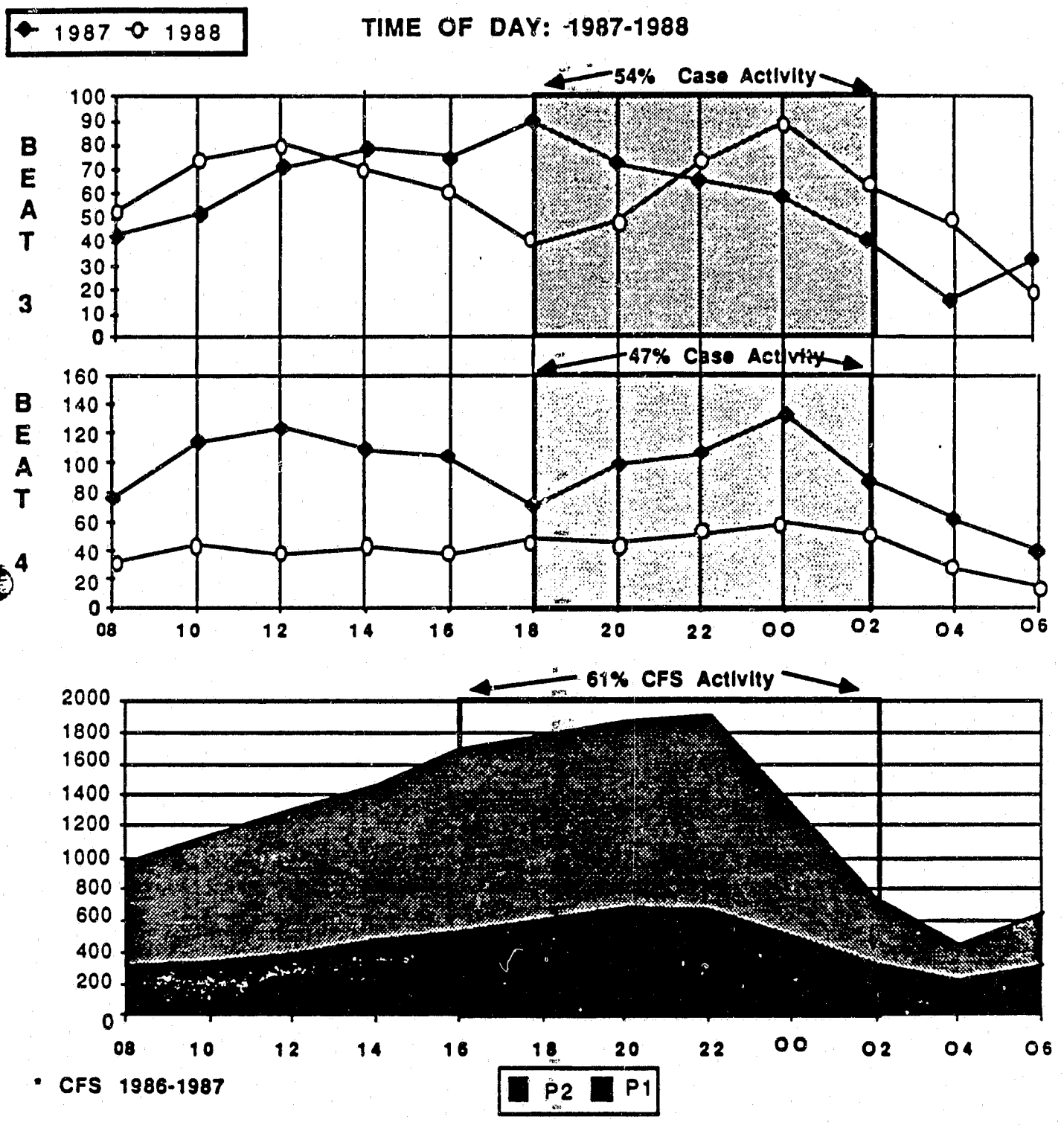


CFS: 1986-1987



The priority 1 calls are consistent during the week; however the Priority 2 calls start to increase on Friday and peak out on Sunday.

The case activity by time of day for Beats 3 and 4 occurred during the same time period. Beat 3 had an activity of 54% between 1800 and 0200 hrs and Beat 4 experienced a 47%. During this time spand, the yearly pattern of Beat 3 was not consistent. At 1800 hrs, the 1987 movement (which was the highest peak) decreased moderately while the 1988 pattern increased and peaked out at 0000 hrs. The time pattern for Beat 4 was consistent, but the growth rate in 1988 decreased. More importantly, the time pattern for both beats are similar because the volume of the case activity are within the time arameters.

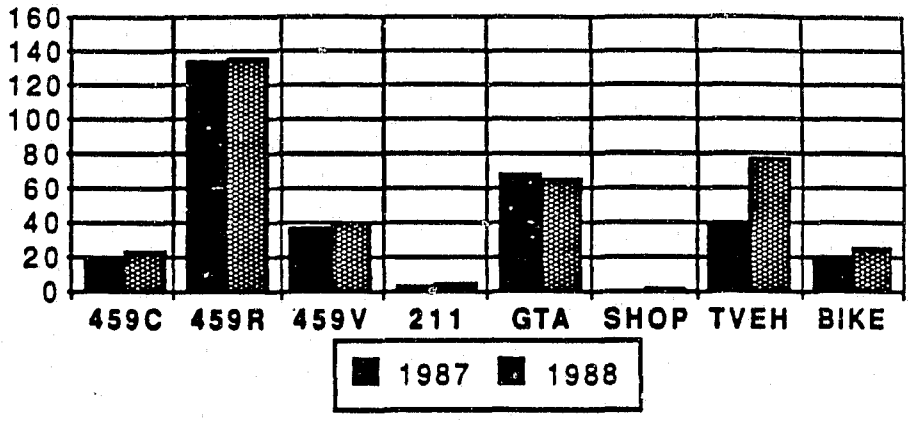


* CFS 1986-1987

Further examination revealed that the time characteristic in beats 3 and 4 is similar to the time pattern of Calls for Services. As shown in the above graph, the primary volume of priority 1 and 2 calls occurred between 1600 and 0200 hrs (61%).

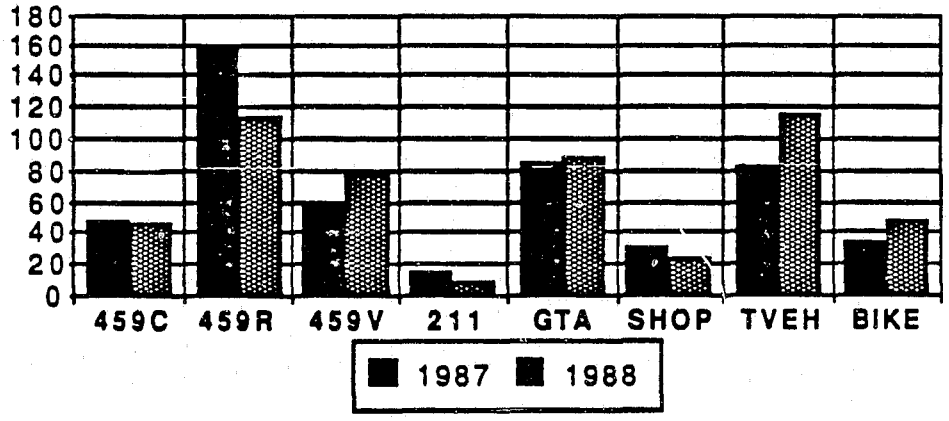
BEAT 4 - CRIME

The crime composition in Beat 4 is shown on the right. As can be seen, 459R, GTA, ·d Theft from Vehicle are the primary ·rgeted crimes. This pattern has existed in both years. 459V has been developing a positive growth rate.

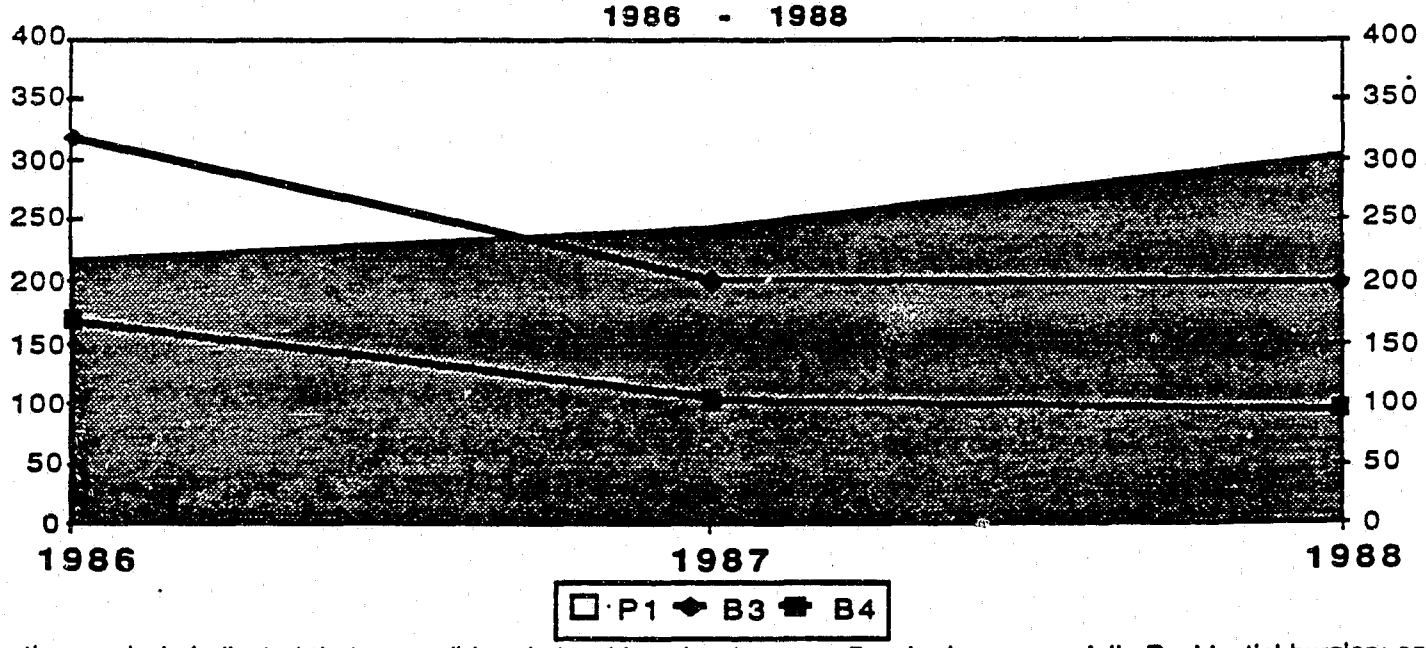


BEAT 3 - CRIME

The crime make up in Beat 3 has been similar to Beat 4. However, 459C, 459V, and Bike thefts have a mild growth in 1988.



PART I CRIME VS NARCOTIC ARRESTS B3 & B4
1986 - 1988



Further analysis indicated that a possible relationship exists between Part I crimes especially Residential burglary and Narcotic arrests in Beats 3 and 4. As can be seen in the above graph, a **negative trend** of the narcotic arrests in Beats 3 and 4 started in 1986 and continued through 1988. In comparison, the Part I Crimes developed a positive trend in 1986 ·d continued to 1988. This growth maybe attributed to the population increase and the demographic changes but additional research indicated that a large majority of the **illegal chemical dependant individuals** that were arrested had a case history of burglary.

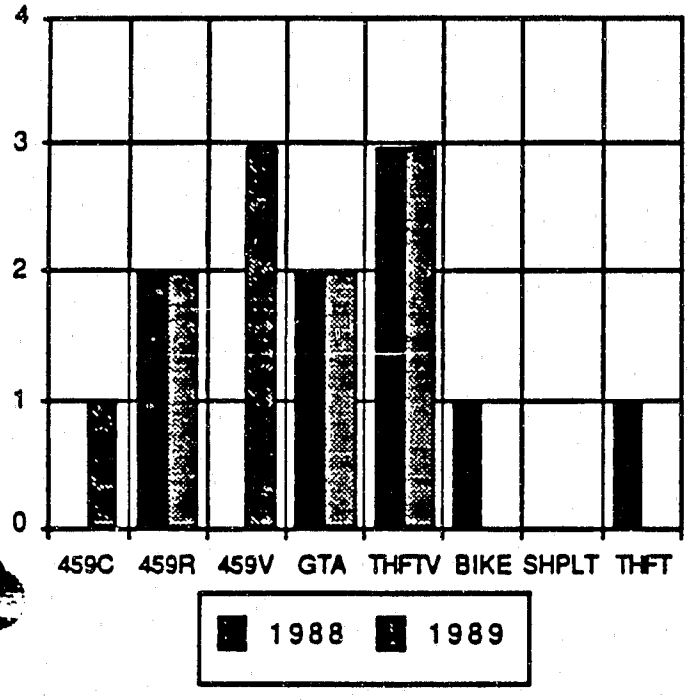
CHINO POLICE DEPARTMENT
INVESTIGATION - WEEKLY SUMMARY
CRIME AGAINST PROPERTY

DATE: MAY 24, 1989

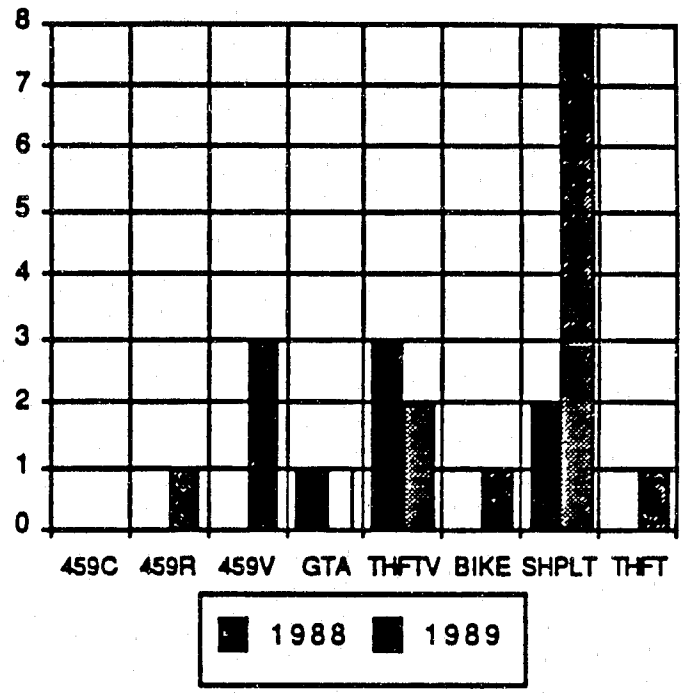
From May 23 to May 30, there was an increase of 18% of the targeted crimes citiwide as compared to the same time period last year. Beat 2 had the highest with 250%, but 57% was shoplifting. Beat 1 was second with 22%. Beat 3 and had an average decrease of 43%. The most notable crime decrease was 459R. Beat 3 had a decrease of 100% and Beat 4 experienced a 67% drop of 459R activity. In general, 459V had a strong growth citiwide compared to last year.

During this current time period, the majority of crimes involved vehicles. This trend has been developing during the past several months. We strongly recommend a Tactical Action Plan be implemented.

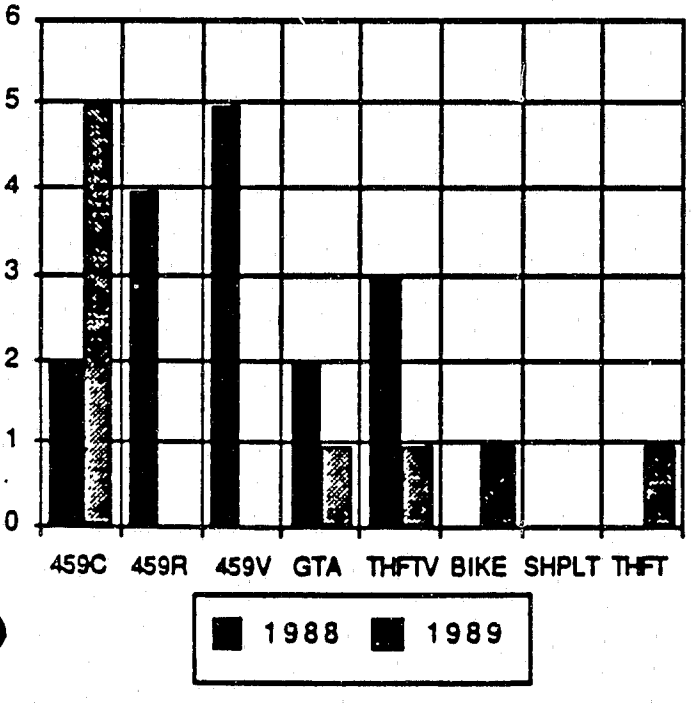
BEAT 1



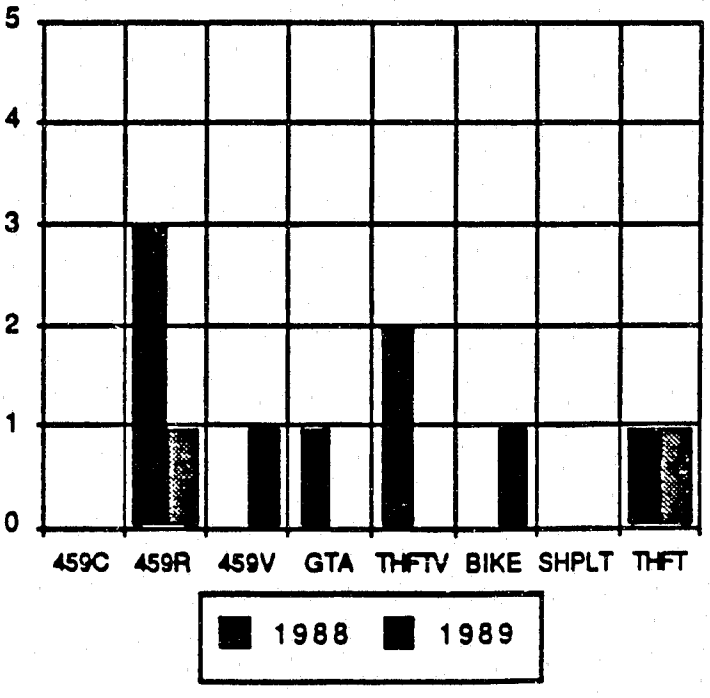
BEAT 2



BEAT 3



BEAT 4



* See backside for detailed information

INVESTIGATION BUREAU
WEEKLY SUMMARY 5/23 - 5/30

B1

	459C	459R	459V	GTA	THFTV	BIKE	SHPLT	THFT	Ttl	-/+ %
1988	0	2	0	2	3	1	0	1	9	
1989	1	2	3	2	3	0	0	0	11	22.2%

B2

	459C	459R	459V	GTA	THFTV	BIKE	SHPLT	THFT		
1988	0	0	0	1	3	0	2	0	6	
1989	0	1	3	1	2	1	12	1	21	250.0%

B3

	459C	459R	459V	GTA	THFTV	BIKE	SHPLT	THFT		
1988	2	4	5	2	3	0	0	0	16	
1989	5	0	0	1	1	1	0	1	9	-43.8%

B4

	459C	459R	459V	GTA	THFTV	BIKE	SHPLT	THFT		
1988	0	3	0	1	2	0	0	1	7	
1989	0	1	1	0	0	1	0	1	4	-42.9%

TTL	459C	459R	459V	GTA	THFTV	BIKE	SHPLT	THFT	*G/Ttl*	
1988=	2	9	5	6	11	1	2	2	38	
1989=	6	4	7	4	6	3	12	3	45	18.4%
	200%	-56%	40%	-33%	-45%	200%	500%	50%		

CURRENT TIME PERIOD: 45

459C	459R	459V	GTA	THFTV	BIKE	SHPLT	THFT
13%	9%	16%	9%	13%	7%	27%	7%

SAN DIEGO COUNTY SHERIFF'S DEPARTMENT

POST OFFICE BOX 2991
SAN DIEGO, CALIFORNIA 92112
TELEPHONE (619) 495-5600

JOHN F. DUFFY, Sheriff

SHERIFF'S CRIME ANALYSIS UNIT
CRIME SERIES BULLETIN
JUNE 6, 1989

"PIZZA PLACE RED BANDANNA" 211 SERIES

GENERAL

Since mid-March, the North County area has seen a series of robberies and attempts at Pizza Hut and Domino's restaurants. The events occur around closing time (2300 - 2400) usually with two armed suspects making entry, both usually wearing a red bandanna mask on the lower part of the face. On one occasion, one suspect wore a blue bandanna mask. Weapons have been fired (in some cases through a locked glass door to gain entry) though not at victims, and vehicle information is sketchy. Three or more suspects appear to be involved, all males, two black and one white. The black suspects have been described as having a military appearance and demeanor. Weapons involved have been described as .38 cal. revolver, .25 cal. automatic pistol, and twelve guage sawed-off shotgun. Fingerprint evidence has been collected at one crime scene (ES 89008385).

SUSPECT DESCRIPTIONS

SUSPECT #1 - Black male, 20-25, 5'6" to 6'0", 160-180 lbs., normal to muscular build, black hair with short thick Afro, brown eyes but described in one case as having very distinctive green eyes. Normally wears dark jeans and dark jacket but has also worn a red & black lumberjack or "Pendleton" shirt. Usually does the talking.

SUSPECT #2 - Black male, 20-25, 5'8" to 6'2", 170-190 lbs., thin to medium build, black hair, brown eyes. Wears dark pants and jacket or red & black/blue & black "Pendleton" shirt.

SUSPECT #3 - White male, 20-22, 6'0" to 6'2", 185-220 lbs., muscular/heavy build, long brown hair, eyes unk., dark jeans and jacket or "Pendleton" shirt.

POSSIBLE NAMES - An informant has said that he believes the two black males may be "Anthony" and "Richard" who live in the San Luis Rey valley area of Oceanside and who are involved with a group which calls itself "The Death Boys."

CASES

Juris.	Case #	Location	Time	Day	Date	Suspects	Vehic.
ES	89004456	Pizza Hut 1856 E. Valley Py. Escondido	2245	Tue	3/14/89	1 & 2	Unk.
SH	08928309	Pizza Hut 1463 W. Vista Way Vista	2359	Sat	3/25/89	1 & 2	'76 Brown Chev.
OC	89008984 (Attempt)	Domino's Pizza 545 S. Vista Bella Oceanside	0012	Fri	4/14/89	1 & 3	Unk.
OC	89009135	Domino's Pizza 545 S. Vista Bella Oceanside	2400	Sat	4/15/89	1 & 2	Unk.
OC	89009911	Domino's Pizza 545 S. Vista Bella Oceanside	2350	Sat	4/22/89	1	Unk.
ES	89008385	Pizza Hut 1856 E. Valley Py. Escondido	2325	Wed	5/17/89	1	Blue 2 Dr Chev.
SC	89-2642	Domino's Pizza 2241 El Camino Real San Clemente	2320	Thu	5/25/89	1 & 3	Unk.
SH	08943734	Domino's Pizza 1038 S. Mission Fallbrook	2315	Tue	5/30/89	1 & 2	Unk.
SH	08943884	Domino's Pizza 805 San Marcos Blvd. San Marcos	2250	Wed	5/31/89	1 & 2	Tan or White Escort
SH	08943858	Domino's Pizza 603 Sycamore Vista	2317	Wed	5/31/89	1 & 3	Unk.

STANISLAUS COUNTY SHERIFF'S DEPARTMENT

CHILD ABDUCTION

ABDUCTED CHILD

SUSPECT

ERIKA CHRISTINA ORTA

D.O.B. 10-22-85
HAIR: BROWN
EYES: BROWN
HEIGHT: 3' 0"
WEIGHT: 36 POUNDS

ANNIE ORTA

D.O.B. 4-27-67, 5'8" 130 LBS
BROWN HAIR, GREEN EYES
HAIR IS CUT CLOSE AROUND EARS. CRIMINAL HISTORY IN S.F. AND EAST BAY
CII#: A08258984

CHILD ERIKA ORTA IS WARD OF ALAMEDA COUNTY JUVENILE COURT, CASE NO. 134860, JUV COURT HAS ISSUED WARRANT TO SEIZE CHILD. SUSPECT MOTHER HAS NO RIGHT OF CUSTODY. CHILD ABDUCTED 11-25-88 WEARING PINK PAJAMAS, NO OTHER CLOTHING TAKEN. SUSPECT MAY BE TRAVELING WITH CLAUDIA LIMA. VEHICLE UNKNOWN.

WARRANT INFO: FELONY ARREST WARRANT #177963, MODESTO MUNICIPAL COURT, BAIL $10,000.00. CHARGE: 278 PENAL CODE - CHILD STEALING. IF CHILD IS LOCATED, SEIZE AND HOLD PER 279a PENAL CODE AND NOTIFY BELOW AGENCIES. TELETYPE MNEUMONICS 'MDS'

IF YOU HAVE ANY INFORMATION, PLEASE CALL:

DET. DAN SCHLOSS
CAC UNIT (209) 525-6448
24 HR # (209) 525-7933
CASE #S8-22820

OR

RAY HARTER (DA INVEST.)
CHILD ABDUCTION UNIT
(209) 525-5550
DA #177963

PREPARED BY THE CRIME ANALYSIS UNIT

DAILY BULLETIN

CHINO POLICE DEPARTMENT

CRIME ANALYSIS UNIT

MONDAY
MAR. 20, 1989

COURT DATE:
Adult: THU 4/20/89
Juv: TUE 4/18/89

OFFICER SAFETY

OFCR SAFETY INFORMATION
3/19/89, 1350 HRS, INC# 9319
- **SUSP:** BURKE, WILLIAM GARY, MW, 7/3/45, 5-07/HVY BLD, MUSCULAR, CDL/ K0508530. SUBJ IS EX-VIETNAM VET AND EX-FELON; HAS HISTORY OF 11550 AND 647F.
- **VEH:** WHI LIMO
- **M.O.:** SUBJ LEFT FRM 13368 NETZLEY, CH; THREATENED TO KILL ESTRANGED WIFE, COLETTE BURKE, WHO IS STAYING AT 931 S. MOUNTAIN #82 W/FRIEND. ALSO THREATENED TO KILL OFFICERS.
- **WPN:** POSS. ARMED W/.357 MAGNUM, AR 15 W/ARMOR PIERCING AMMO, AND A 9 MM.
- **REF:** INC'S # 9255, 9292

STOP AND HOLD

245PC SUSP FOR ONTARIO PD
3/19/89, 0952 HRS, INC# 3605
- **SUSP:** JAMES GLENN, NMA, 30'S, 5-08/170, RESIDES EITHER IN ONT. OR POMONA.
- **S/VEH:** MONTE CARLO, DIRTY WHI IN COLOR. FISTS.
- **REF:** DR# 1939, INC# 3592

459/496 PC FOR ONTARIO PD
3/19/89, 2202 HRS, INC# 3982
- **SUSP:** TRANSIENT "CHARLIE", WMA, 23-24 YRS, MED BLD/175#, SHLDR LNGTH HAIR-BLN OR LT. CURLY BRO. LSW/BB CAP, LNG SLV BLK SHRT, LEVIS. LONG PNK SCAR ON CHEST.
- **REF:** 89-3-1962/1967

STOP AND FI

23110B/245 PC FOR ONTARIO PD
3/19/89, 1656 HRS, INC# 3793
- **VEH:** 85-86 MAZDA 626, SMOKE GRY, LOWERED, DK TINTED WNDWS.
- **SUSP:** 4 MM'S, 18 & YOUNGER, NFD.
- **OCC:** I-10/MOUNTAIN
- **REF:** DR# 89-3-1954

MISSING PERSONS

MISSING ADULT, 3/19/89,
1104 HRS, INC 3649
- **SUBJ:** ENIDA CEDENO, CUBAN FEMALE, 58 YRS, 5-04/134, BLK/BRO, DK COMPLEXION. LSW/LT. BRO JUMPSUIT, BGE SHOES. ENROUTE TO INDIO FRM CHINO; NEVER ARRIVED.
- **REF:** RP-EDWIN SCHULZ, 619-329-5987

MISSING JUV/RUNAWAY
3/19/89, 1936 HRS, INC# 3889
- **SUBJ:** JESSE DUARTE, MM, 15 YRS, 5-08/100, BLK/BRO
- **OCC:** 13224 BENSON, BT. 2
- **REF:** 89-03-0636

APB

GTA FOR CHINO PD
3/19/89, 1956 HRS, INC# 172
- **VEH:** 77 FORD P/U, WHI, RED TAILGATE, WOODEN RACK, LIC/1F09893
- **SUSP:** BUFORD, WILLIS LOUIS, WMA, 6-00/160, BRO/BLU, RESIDES 12660 THOMAS, CHINO. FREQUENTS AREA OF GRAND & PARK IN POMONA.
- **REF:** DR# 89-03-0437
- **USE CAUTION**

GTA FOR ONTARIO PD
3/19/89, 1233 HRS, INC# 3679
- **VEH:** 77 FORD LTD, 2DR, GRY, DENT ON LT. SIDE, LIC/702SGD-EXP 3/10/89.
- **SUSP:** SUSP FIRST NAME DONNY OR DAWNELL, NFD.
- **OCC:** TAKEN FRM 301 E. CEDAR, ONT.
- **REF:** DR# 1946, INC# 3620

GTA FOR ONTARIO PD
3/19/89, 2049 HRS, INC# 3938
- **VEH:** 86 HYUNDAI, RED, 4DR, LIC/1SHZ859.
- **OCC:** TAKEN FRM T-BIRD, 1555 N. MOUNTAIN, ONT.
- **REF:** DR# 89-3-1980

PATROL REQUEST

13180 6TH ST, OLD TOWNE EMPORIUM, BT. 3
DUE TO LITTERING AND LOITERING IN THE AREA; OCCURS IN EVENING HOURS.
****** ATTENTION SWING SHIFT ******
3/19/89, 1110 HRS, INC# 3652

13042 6TH ST., BT. 3
DUE TO ATT 459 TO LOCATION.
3/19/89, 2116 HRS, INC# 225

H & S INFORMATION

11590 REG: WELLS RONALD RAY
3/14/89, 1630 HRS, A# 28410
- **SUBJ:** WM, 35 YRS, 5-08/180, BRO/BRO, TT'S-CROSS & HEART W/DAGGER ON RT FOREARM, CROSS W/FLOWERS ON LT FOREARM, CLOWNS AND WOMAN ON BACK TORSO.
- **ADDR:** 12607 TELEPHONE AV, CH. (W/SISTER)
- **PRLE:** AGNT-NASH, EXP 2/8/92.

CRIME INFORMATION

CRIME	LOCATION	TOD	DOW	DATE	SUSPECT/VEHICLE DESCRIPTION	PROPERTY STOLEN
488 VEH	5640 RIVERSIDE # 128 BT. 2	1301	SUN	3/19		PHONE ANTENNA
459 VEH	5140 REVERE ST #3 BT. 1	1448	SUN	3/19		CAR STEREO
488 VEH	12831 YORBA # 8 BT. 1	1510	SUN	3/19		
488	5537 PHILADELPHIA NORDSTROM RACK BT. 1	1523	SUN	3/19	NMA IN CUSTODY	
459 RES	6577 EDISON AV BT. 2	1627	SUN	3/19	2 MM'S. DRVR-DK. HAIR/MUSTACHE. S/VEH-OLDER DATSUN OR TOYOTA FASTBACK, ORANGE	VCR
488	4721 RIVERSIDE DR STATER BROS. BT. 3	1858	SUN	3/19	ADULT MALE IN CUSTODY	
488	12375 CENTRAL AV VONS PAVILIONS BT. 1	1923	SUN	3/19		CUSTOMER WALLET
459 VEH	5151 PHILADELPHIA #4 BT. 1	1103	SAT	3/18		
459 COM	12375 CENTRAL AV VONS PAVILIONS BT. 1	1415	SAT	3/18		CAN . MACHINE BROKEN IN
487 VEH	5775 RIVERSIDE BT. 4	1537	SAT	3/18		T-TOPS
211	12027 CENTRAL AV YUM YUM DONUTS BT. 1	2143	SAT	3/18	MM, UNK AGE, SHRT BLK COMBED BACK HAIR, LT COLOR SKI JCKT, DK. PANTS. SUSP TOLD CLERK HE HAD A GUN & KNIFE, NO WPN SEEN.	$20 IN ONES

PAROLEE OF THE WEEK

NAME:
AKA:
SEX: MALE
DOB: 03/09/64
DESCRIP: HISPANIC, 5-11/175, BRO/BRO, TT'S-"STEVEN" LT ARM, "BAD TO THE BONE" LT CHEST, DL# N9682090, SS# 551-61-2649
OFFENSE: PC 459, HS 11350
PAR/AGNT: NASH
PAROLED: 11/12/88
RESID:
VEH:
HIST/ARR: PC 487/148/135/4230/HS 11350
SPC/COND: ANTI-NARCOTIC TESTING; REG HS 11590

***** SUBJECT IS NOT A PAROLEE-AT-LARGE *****

OFFICER NOTES:

PERSONS APPEARING HEREIN ARE NOT NECESSARILY ASSOCIATED WITH CRIMINAL ACTIVITY. INFORMATION IS MERELY TO ASSIST OFFICERS IN THEIR INVESTIGATIVE FUNCTION AND IS INTENDED FOR LAW ENFORCEMENT OFFICERS ONLY. UNLESS SPECIFICALLY NOTED, THERE IS NO WARRANT OR WANTS AND PROBABLE CAUSE TO DETAIN MUST BE ESTABLISHED BY YOU.

CHINO POLICE DEPARTMENT CRIME ANALYSIS UNIT

WEEKLY ACTIVE WARRANT LIST

WEDNESDAY FEB. 8, 1989 **WARRANTS ACTIVE IN CHINO**

ATTENTION: PLEASE CONFIRM IF THE WARRANT IS ACTIVE BEFORE AN ARREST IS MADE

NAME	WARRANT	ISSUED	FILE	TYPE	CHARGE
BUGS BUNNY	FCH4734	10/24/88	039967	FEL	HS 11350A $7500.00
DOB : 8/29/69 **DES :** WMA, 5-04/145, BLN/HAZ **ADDR:** P.O. BOX 667 CHINO, CALIFORNIA 91708					
JOE DONUT	OCR8223	8/2/82	378588	B/W	PC FTA PC 487.3 PC 496 $1500.00
DOB : 8/23/44 **DES :** HMA, 5-04/150, BRO/BRO **ADDR:** P.O. BOX 667 CHINO, CALIFORNIA 91708					
JOHN DOE	NS8803569	2/1/89	01074873	B/W	VIOL/PROB VC 23152A $2500.00
DOB : 2/8/57 **DES :** F, 5-05/150, BRO/BLU **ADDR:** P.O. BOX 667 CHINO, CALIFORNIA 91708					
YOSAMETTI SAM	FCH4611	6/29/88	037173	FEL	PC 187A PC 664 $150,000.00
DOB : 8/4/64 **DES :** HMA, 5-08/140, BLK/BRO **ADDR:** P.O. BOX 667 CHINO, CALIFORNIA 91708					
MAE WEST SMITH	MCH11459	2/9/89	045346	B/W	PC FTA HS 11550 PC 602L $5000.00
DOB : 4/15/70 **DES :** WMA, 5-11/150, BLN/BLU **ADDR:** P.O. BOX 667 CHINO, CALIFORNIA 91708					
FERNANDO JOHNSON DOE	MWV10046	1/5/89	029963	MISD	HS 11377(A) HS 11550(A) HS FTA $1500.00
DOB : 1/3/64 **DES :** WMA, 5-05/120, BLK/GRN **ADDR:** P.O. BOX 667 CHINO, CALIFORNIA 91708					

CHINO POLICE DEPARTMENT
TARGETED CRIMES WEEKLY REPORT BY SHIFT
JUN 1989

**** G R A V E ****

	6/01	6/08		6/15				TREND			TTL
	#	#	+/-	#	+/-	#	+/-	Avg	s	y	#
211:	1	0	- 1	0				1	1	2	1
GTA:	6	2	- 4	1	- 1			8	6	11	9
459R:	5	2	- 3	1	- 1			12	11	12	8
459V:	2	1	- 1	0	- 1			2	2		3
459C:	0	0		1	1			1			1
VTHFT:	1	2	1	2				5	6	9	5
SHPLT:	1	0	- 1	1	1			1	1	3	3
G/TTL:	16	7	- 9	6	- 1					37	29

**** DAY ****

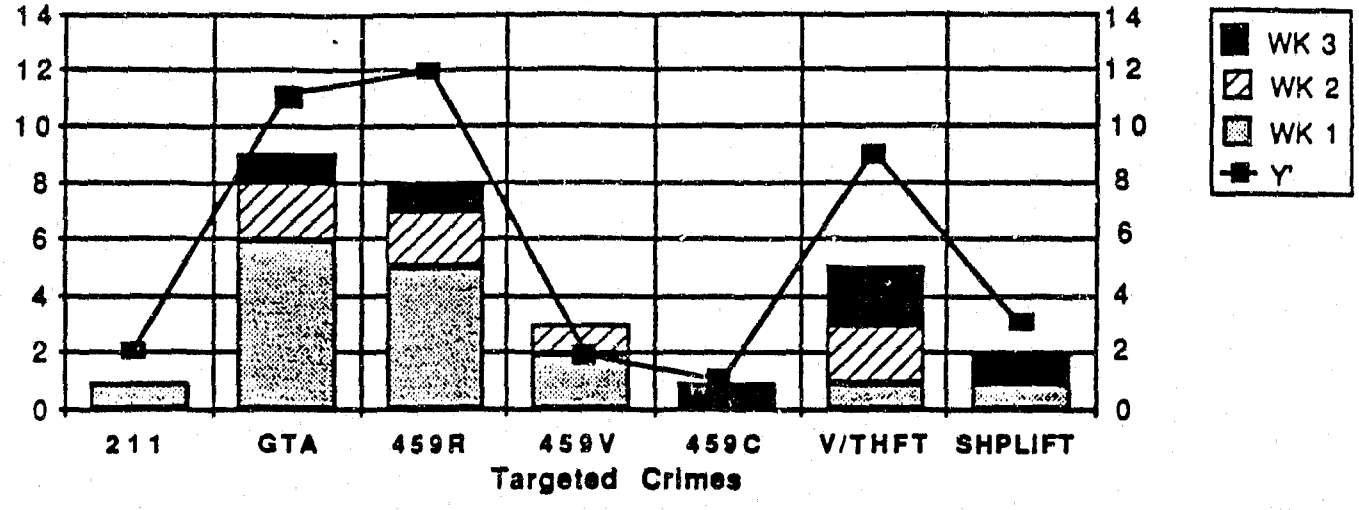
	6/01	6/08		6/15				TREND			TTL
	#	#	+/-	#	+/-	#	+/-	Avg	s	y	#
211:	0	0		0				2	1	4	0
GTA:	1	3	2	1	- 2			5	4	9	5
459R:	4	5	1	2	- 3			15	9	15	11
459V:	1	0	- 1	0				2	3	3	1
459C:	0	1	1	0	- 1			2	1	4	1
VTHFT:	2	1	- 1	0	- 1			4	4	9	3
SHPLT:	1	3	2	3				6	8	7	7
D/TTL:	9	13	4	6	- 7					51	28

**** S W I N G ****

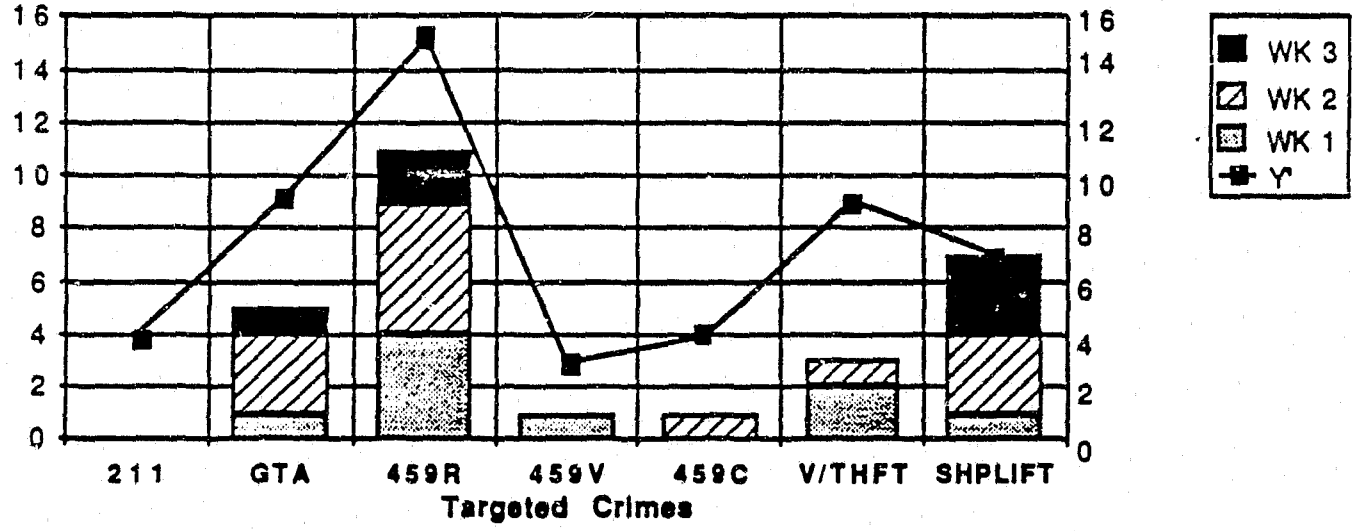
	6/01	6/08		6/15				TREND			TTL
	#	#	+/-	#	+/-	#	+/-	Avg	s	y	#
211:	1	0	- 1	0				3	2	1	1
GTA:	5	2	- 3	4	2			9	8	11	11
459R:	3	6	3	4	- 2			16	4	16	13
459V:	5	2	- 3	4	2			10	6	9	11
459C:	0	2	2	2				7	4	7	4
VTHFT:	3	1	- 2	7	6			13	9	13	11
SHPLT:	5	4	- 1	1	- 3			8	8	8	1
S/TTL:	22	17	- 5	22	5					68	61
TOTAL:	47	37	-10	34	- 3					156	118

WEEKLY SUMMARY -JUNE 1989

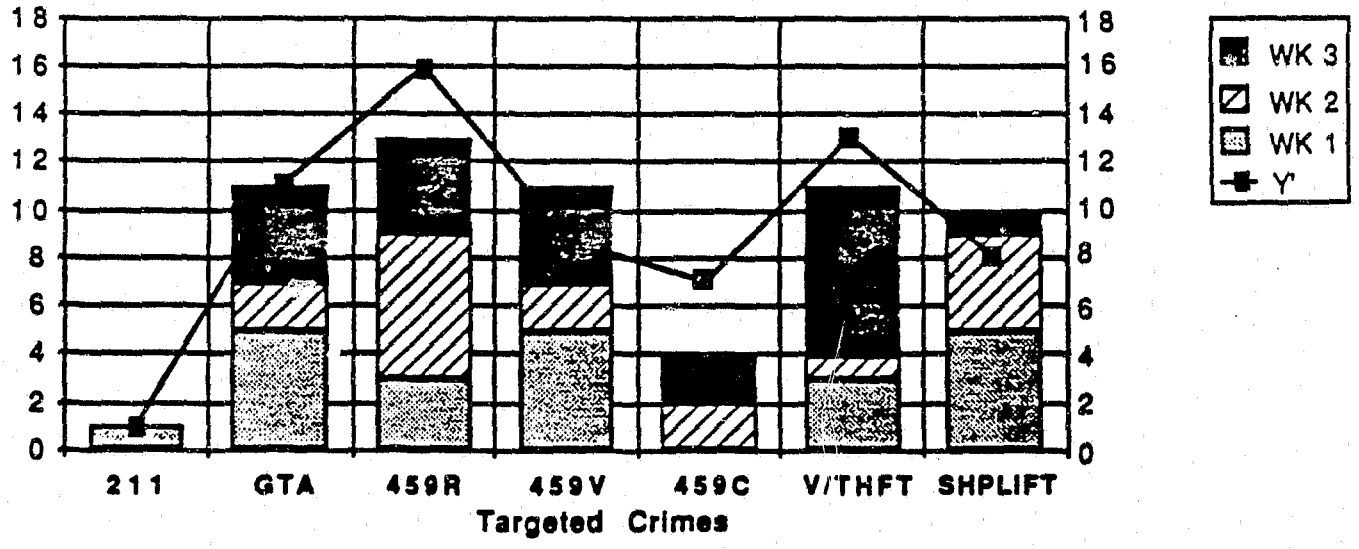
SHIFT: GRAVE



SHIFT: DAY



SHIFT: SWING



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