WHAT HAPPENED

AN EXAMINATION OF RECENTLY TERMINATED ANTI-FENCING OPERATIONS

A SPECIAL REPORT TO THE ADMINISTRATOR

1979

CRIMINAL CONSPIRACIES DIVISION
OFFICE OF CRIMINAL JUSTICE PROGRAMS
LAW ENFORCEMENT ASSISTANCE ADMINISTRATION
UNITED STATES DEPARTMENT OF JUSTICE
WASHINGTON, D.C. 20531

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TO: Henry S. Dogin, Acting Administrator, Law Enforcement Assistance Administration

THRU: J. Robert Grimes, Assistant Administrator, Office of Criminal Justice Programs

This special report was prepared to augment our collective understanding of Anti-Fencing operations and projects. It presents a critical examination of the events surrounding 20 Anti-Fencing operations and provides meaningful insights that will support further program development and planning. It is the belief of the Criminal Conspiracies Division that this document constitutes an important step in our continuing effort to take maximum advantage of the unique opportunities the Anti-Fencing program presents to gain new perspectives on property crime, property criminals and the criminal justice system's response to this problem. Further, additional areas in which more detailed inquiry is warranted are identified.

The data collection effort associated with this special report would not have been possible without the extrordinary efforts of Anti-Fencing project personnel from the many participating jurisdictions. The primary mission of these individuals is offensive law enforcement operations, not research. However, their cooperation in this endeavor, which frequently required them to work long hours, even while additional operations were underway, was exemplary.

James O. Golden
Director
Criminal Conspiracies Division

SUMMARY

THE ANTI-FENCING PROGRAM IS INTENDED TO ENABLE LAW ENFORCEMENT AGENCIES TO CONDUCT UNDERCOVER OPERATIONS TOWARDS THE APPREHENSION OF FENCES AND THIEVES, THE RECOVERY OF STOLEN PROPERTY, AND THE DISRUPTION OF STOLEN PROPERTY MARKETS. SINCE 1974, MORE THAN 60 OPERATIONS HAVE BEEN CONDUCTED IN 39 JURISDICTIONS. THIS DOCUMENT PRESENTS AN ANALYSIS OF THE PEOPLE WHO CAME TO SELL STOLEN PROPERTY, THE EFFECTS OF THE OPERATIONS ON THE CRIME RATES, AND THE STOLEN PROPERTY AND CONTRABAND RECOVERED. THE FINDINGS FROM THESE ANALYSES ARE SUMMARIZED BELOW:

- SUBJECTS WHO SELL STOLEN PROPERTY TO UNDERCOVER OPERATIVES IN ANTI-FENCING OPERATIONS ARE CONSIDERABLY OLDER THAN INDIVIDUALS ARRESTED NATIONALLY FOR PROPERTY CRIMES.
- NEARLY ONE IN FIVE OF THE SUBJECTS APPREHENDED AND/OR IDENTIFIED IN ANTI-FENCING OPERATIONS HAVE BEEN CLASSIFIED AS A FENCE.
- MOST SUBJECTS HAVE A PRIOR ARREST RECORD AND MANY HAVE LENGTHY CRIMINAL HISTORIES, WHILE SOME HAD LONG ESCAPED POLICE ATTENTION BECAUSE OF THEIR CAUTIOUS APPROACH TO CRIMINAL ACTIVITIES.
- PROSECUTORS ENJOY A VERY HIGH CONVICTION RATE FOR SUBJECTS ARRESTED IN ANTI-FENCING OPERATIONS.

- THE ANTI-FENCING PROJECTS EXAMINED SHOWED DECREASES IN PROPERTY CRIME AT THE TERMINATION OF THEIR OPERATIONS.
- FURTHER ANALYSIS FOCUSING ON THE IMPACT ON INCIDENCE OF THE INDIVIDUAL TYPES OF PROPERTY CRIMES IS STRONGLY INDICATED.
- THE ASSUMPTION THAT THE IMPACT IS MAXIMIZED AT TERMINATION MAY BE QUESTIONABLE, SINCE ADJUDICATION AND SENTENCING OFTEN TAKE PLACE OVER AN EXTENDED PERIOD OF TIME.
- UNDERCOVER PERSONNEL HAVE PAID A VERY SMALL PERCENTAGE OF FAIR MARKET VALUE FOR THE STOLEN PROPERTY RECOVERED.
- THE RECOVERED PROPERTY USUALLY HAS BEEN RETURNED TO THE VICTIM OR INSURANCE COMPANY.
- THE PROPERTY RECOVERED IN ANTI-FENCING OPERATIONS HAS RANGED FROM SMALL AUTO PARTS TO REMBRANDT PAINTINGS.

PRELIMINARY ANALYSIS SHOWS THAT THE ANTI-FENCING PROGRAM PROVIDES LAW ENFORCEMENT AGENCIES WITH AN OFFENSIVE CAPABILITY THAT COMPLEMENTS RATHER THAN SUPPLANTS THEIR ABILITY TO ADDRESS PROPERTY CRIME PROBLEMS.

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1. INTRODUCTION

The Law Enforcement Assistance Administration, through its Criminal Conspiracies Division, initiated the Anti-Fencing Program in late 1974. The Anti-Fencing Program enables law enforcement agencies to conduct undercover operations towards the apprehension of fences and thieves, the recovery of stolen property, and the disruption of stolen property markets. In these operations, undercover police officers pose as fences and conduct stolen property transactions with fences, thieves, and other property criminals. These undercover operations quickly acquired the nickname "STING" from a popular book that featured the elaborate deception of an organized crime figure.

The Anti-Fencing Program is predicated on the premise that theft is only the beginning of a very intricate system in which stolen property is acquired, converted, redistributed, and integrated into the legitimate property stream.* This system has been given the appellation, the Stolen Property Distribution System.

Since 1974, more than 60 Anti-Fencing operations have been conducted in 39 jurisdictions. The thousands of arrests and millions of dollars of stolen property recovered have received wide acclaim. However, this information alone does not provide a sufficient answer to some fundamental questions. What happened? Who were the people who came to sell stolen property to police undercover operatives? What impact did the project's operations have on the incidence of property crime in the jurisdictions in which they were conducted? What happened to the stolen property? This report is intended to provide some insights into the answers to these questions and, thus, contribute to the collective understanding of "What Happened?"

This report is based on data collected through the Anti-Fencing Program Reporting System, which was initiated by the Criminal Conspiracies Division to provide information in support of the Programs planning, development, and monitoring. The Anti-Fencing Program Reporting System also is intended to take maximum advantage of the unique opportunities the Program presents to gain new perspectives on property crime, property criminals, and the response of the criminal justice system to this problem.

*M. E. Walsh. The Fence--A New Look at the World of Property Theft. Contributions in Sociology, No. 21. Westport, CT: Greenwood Press, 1977.

This report is organized as follows:

- Chapter 2 presents an analysis of the subjects encountered in 20 Anti-Fencing operations.
- Chapter 3 presents an analysis of the impact on property crimes in three jurisdictions where Anti-Fencing projects were conducted..
- Chapter 4 presents an analysis of the stolen property purchased, its valuation, and its disposition.
- Appendices A, B, and C are, respectively, a report written by an undercover operative describing the nature of one operation, a discussion of the methodology used in measuring impact on the property crime rate, and a summary of crime index offenses cleared by arrest for 1977.

2. SUBJECTS ENCOUNTERED IN ANTI-FENCING OPERATIONS

In the mid 1970's, Anti-Fencing operations opened all across the country. In a variety of sites ranging from truck stops to warehouses to apartments, undercover police officers let it be known that they were prepared to purchase stolen property. Who were the people who came to sell stolen goods? This chapter presents an analysis of the subjects encountered in 20 operations terminated in 1977 and 1978. The analysis focuses on some specific questions regarding the individuals encountered in Anti-Fencing operations:

- How did they compare (i.e., by age, race, sex) with those arrested for property crimes nationally?
- What is known about their criminal histories?
- How many of these individuals were thieves? Fences?
- What levels of the Stolen Property Distribution System did they represent?
- Were many of these individuals involved with narcotics?
- Where did they live -- in the jurisdiction where the operation was conducted or outside its bounds?
- What happened in the criminal justice system to the individuals arrested at the termination of the operation?

It is hoped that this limited analysis will provide some fresh insights into the Anti-Fencing Program, the nature of property crime and property criminals, and the efforts of the criminal justice system to deal with the problem.

2.1 The Data

Descriptive information has been acquired through the Anti-Fencing Program Reporting System on the characteristics of 1,693 subjects encountered* during the course of 20 terminated Anti-Fencing operations. These figures represent approximately 37 percent of all the subjects arrested and 32 percent of the operations terminated since the beginning of the Program in 1974. The availability and quality of the data varied

*In reference to subjects, the term encountered includes persons identified and/or arrested during operations.

for the 20 operations and, therefore, for the 1,693 subjects. This largely was due to the fact, noted earlier, that reporting requirements were established well after many of the operations had terminated. The size of the sample examined for each of the issues discussed in the sections that follow is clearly stated in each section.

2.2 Age Groups of Subjects Encountered

The individuals arrested in the 20 terminated Anti-Fencing operations were considerably older than those arrested nationally, through more traditional means, for the five property crimes* in 1977. Table 2-1 below depicts the age groups for the 1,693 subjects encountered in the 20 Anti-Fencing operations.

TABLE 2-1

Age Groups of Subjects Encountered in 20 Anti-Fencing Operations
(Sample -- 1,693 Subjects)

Age Groups	Percent of Total
17 years and under	3
18 years to 20 years	13
21 years to 25 years	30
26 years to 30 years	25
Over 30 years	29

Consistently, the subjects encountered were adults (over 18), with many over 25 years of age. Approximately 3 percent of the subjects were juveniles, ranging from 0 to 12 percent of the subjects encountered. In comparison, the FBI Uniform Crime Reports (UCR) for 1977 indicate that the individuals most frequently arrested nationally for the five major property crimes were between 15 and 20 years old. Table 2-2 indicates that juveniles were responsible for a major portion of property crimes.

*The property crimes used in this context include: Robbery, Burglary, Larceny, Theft, Motor Vehicle Theft, Buying, Receiving or Possessing, and Stolen Property.

TABLE 2-2

Juveniles Among Those Arrested For Property Crimes Nationally in 1977

Property Crime	Percentage of All Arrestees Nationally Under 18 Years of Age
Robbery	32
Burglary	31
Larceny-Theft	43
Motor Vehicle Theft	53
Buying, Receiving, or Possessing Stolen Property	33

Over half (54 percent) of the subjects encountered by the 20 Anti-Fencing operations were 26 years of age or older. In the individual operations, these figures consistently clustered at the median (approximately 52 percent over 26 years of age. Table 2-3 shows that only 23.5 percent of those arrested nationally for the five major property crimes had reached the age of 25. Moreover, while 29 percent of the Anti-Fencing subjects were over 39 years old, only 14 percent of those arrested nationally for the five property crimes in 1977 were aged 30 and over.

TABLE 2-3

Age Groups of Property Crime Arrestees Nationally in 1977 (Rounded Percentages)

Under 18	18-20	21-24	25-29	30 and Over
44.5	18	13.6	9.5	14

It is apparent from this analysis that Anti-Fencing operations are identifying older (and presumably more experienced) property criminals than those arrested nationally through conventional police methods. To illustrate how property criminals encountered in an Anti-Fencing operation compare with those arrested by the parent police agency in the same jursidiction for the same period, Table 2-4 contrasts the subjects encountered in a 7-month Anti-Fencing operation with those arrested by the parent police agency for the same period. Again, the data reveals older Anti-Fencing subjects.*

*Typically, Anti-Fencing arrests do not find their way into the UCR.

TABLE 2-4

Property Crime Comparison of
Arrestees of One Operation and the Parent
Department During the Same Period
(Rounded Percentages)

	Under 18	18-20	21-24	25-29	30 and Over
Anti-Fencing Operation (7 Months -- 130 Arrestees)	0	12	20	36	32
Parent Police Department (7 Months -- 2820 Arrestees)	32	19	16	14	19

More than half (51 percent) of those arrested by the parent police department were under 21, compared with the 12 percent for the Anti-Fencing operation. Moreover, while one-third were 25 years of age or over for the parent department, more than two-thirds (approximately 68 percent) of those encountered in the Anti-Fencing operation had attained that age. Table 2-5 presents a similar examination in still another jurisdiction, contrasting those property criminals encountered in a 9-month Anti-Fencing operation conducted from July 1977 to March 1978 with those arrested by the parent police agency in 1976, 1977, and the first 9 months of 1978. From this longer perspective, it again is apparent that the Anti-Fencing operation netted juveniles at a far lower rate and older individuals at a significantly higher rate.

The consistent record of older subjects encountered in Anti-Fencing operations is not a chance occurrence. In general, operational personnel target the more mature and sophisticated thieves and fences. The undercover officers work discretely to ensure that the word of their "fencing" site is spread through *professional* criminal circles. The implications easily could be overstated; however, the data does appear to support to two preliminary findings:

- The Anti-Fencing Program is encountering individuals who are older and perhaps further along in their criminal careers than those arrested through more traditional means.

- The offensive capability provided by Anti-Fencing operations complements rather than supplants traditional enforcement activities with respect to property crime by arresting criminals who are successfully eluding these traditional methods.

TABLE 2-5

Property Crime Comparison of
Arrestees of One Operation and The Parent
Department
(Rounded Percentages)

	Under 18	18-20	21-24	25-29	30 and Over
Anti-Fencing Operation (9 Months -- 120 Arrestees)	2	16	24	19	39
Parent Police Department					
1976 (6333 Arrestees)	41	19	14	10	15
1977 (6270 Arrestees)	44	19	14	10	14
1978 (Jan - Sept) (4043 Arrestees)	36	20	16	11	16

2.3 Racial Composition of Subjects Encountered

Table 2-6 shows the racial composition of the subjects encountered in 20 Anti-Fencing operations.

TABLE 2-6

Race of Subjects Encountered in 20 Anti-Fencing Operations
(Sample - 1693 Subjects)

Race	Percent of Total
White	40
Black	55
Other	5

There is a great variance in the racial composition of the subjects encountered across the 20 operations. In five operations, fewer than 20 percent of the subjects encountered were black. In another five operations, more than 80 percent of the subjects encountered were black. The median was approximately 54 percent black.

A comparison of Tables 2-6 and 2-7 reveals that, in 1977, a significantly higher percentage of blacks and other minorities were arrested for the five property crimes in the Anti-Fencing operations than those arrested through more traditional means. However, both the national figures and the Anti-Fencing sample show blacks and minorities over-represented compared to their presence in the general population. There is no evidence to support a conclusion that a racial group was targeted specifically in *any* operation.

TABLE 2-7

Racial Aspects of Property Crime Arrests Nationally in 1977
(Rounded Percentages)

	White	Black	Other
Robbery	41	57	2
Burglary	69	29	2
Larceny-Theft	66	32	2
Motor Vehicle Theft	71	26	3
Buying, Receiving or Possessing Stolen Property	65	33	2
Property Crime (All)	65	33	2

A comparison of subjects encountered in a single Anti-Fencing operation with those arrested for property crimes by the parent police agency in the same jurisdiction during the same period is provided in Table 2-8. While the disparities are less pronounced, the pattern remains.

TABLE 2-8

Racial Aspects of Property Crime Arrestees of One Operation and Its Parent Department
(Rounded Percentages)

	White	Black	Other
Anti-Fencing Operation (7 Months -- 130 Arrestees)	30	68	2
Parent Police Department Arrests (7 Months -- 2820 Arrestees)	55	45	0

The operation was conducted in a jurisdiction whose population is approximately 15 percent black. As shown in Table 2-9, another operation conducted in a jurisdiction of similar demography yielded a different result. Table 2-9 contrasts the subjects encountered in an Anti-Fencing operation conducted in 1977-78 with those arrested for property crimes by the parent police agency in 1976, 1977, and the first 9 months of 1978.

TABLE 2-9

Racial Aspects of Property Crime Arrestees of Another Operation and Its Parent Department
(Rounded Percentages)

	White	Black	Other
Anti-Fencing Operation (9 Months -- 120 Arrestees)	98	1	1
Parent Police Department	60	35	5
1976 (6333 Arrestees)	60	35	5
1977 (6270 Arrestees)	60	34	6
1978 (Jan - Sept) (4043 Arrestees)	62	32	7

This particular operation netted almost exclusively white subjects. In contrast, the arrest figures for the parent police department closely parrallel the national experience.

The preponderance of black and minority subjects in the sample of those encountered in the 20 Anti-Fencing operations requires careful inspection, and two points must be considered:

- The racial composition of the general population in the areas in which operations were conducted appeared to be only a marginal consideration in the race of subjects encountered by the operation. (However, only limited demographic data were collected.)

- The Project Directors for operations who encountered high percentages of blacks and other minority subjects also noted high percentages of black and minority victims (complainants). The data with respect to complainants are subjective.

2.4 Sex of Subjects Encountered

The Uniform Crime Reports for 1977 indicate that of those arrested for the five property crimes,80 percent were male and 20 percent female. Table 2-10 shows these totals, together with the percentages for each of the five major property crimes. Of the five crimes, female arrests are significant only for larcenies.

TABLE 2-10

Sex of Property Crime Arrestees Nationally in 1977
(Rounded Percentages)

	Male	Female
Robbery	93	7
Burglary	94	6
Larceny-Theft	68	32
Motor Vehicle Theft	92	8
Buying, Receiving, or Possessing Stolen Property	92	8
Property Crime (All)	80	20

The subjects encountered in 20 Anti-Fencing operations are also predominantly male, as depicted in Table 2-11.

TABLE 2-11

Sex of Subjects Encountered in 20 Operations
(Sample - 1693 Subjects)

Sex	Percent of Total
Male	91
Female	9

Female subjects comprise only 9 percent of the total sample. Grouped for statistical averaging, five operations experienced as many as 10 percent female subjects. Female representation among the subjects encountered in all 20 operations ranged from 0 to 24 percent.

The limited numbers of females encountered in Anti-Fencing operations is partially explained by the fact that the bulk of female activity in property crime is shoplifting. However, recently terminated operations appear to be encountering increasing numbers of female subjects. This is a trend that bears watching, especially since many operations have begun to use female undercover operatives.

2.5 Prior Arrest Records of Subjects Encountered

Arrest records provide the most readily available information to gain insight into the criminal histories of individuals encountered in Anti-Fencing operations. Approximately 84 percent of the subjects who sold stolen property to undercover police fences, in the 19 Anti-Fencing operations on which data were available, had at least one prior arrest. Table 2-12 presents the prior arrest records of the subjects encountered in the 19 operations.

TABLE 2-12

Prior Arrest Records of Subjects Encountered in 19 Operations
(Sample - 1620 Subjects)

Prior-Arrest Groups	Percent
No Prior Arrests	16
1 to 5 Prior Arrests	52
6 to 10 Prior Arrests	17
Over 10 Prior Arrests	15

The majority of the subjects (52 percent) had between one and five prior arrests. The percentage of subjects who fell into this category varied across the 19 operations, ranging from 25 percent to 69 percent. In 15 operations, over 40 percent of the subjects encountered had between one and five prior arrests and, in 9 of these operations, this figure rose to over 50 percent.

Individuals with more than six prior arrests made up 32 percent of the sample. Subjects with six or more arrests comprised between 4 percent and 57 percent of the total for each of the operations. The median value for this category was 26 percent. In five operations, over 20 percent of the subjects encountered had more than 10 prior arrests. In one operation, subjects with more than 10 prior arrests made up nearly 40 percent of the total.

Quantitative data are not available with respect to the nature and quality of the offenses charged in these arrests. For example, it was not possible to distinguish between felony and misdemeanor arrests. However, a cursory examination of the charges reveals that the subjects encountered with previous records had been arrested for serious crimes, not petty or traffic offenses. As a group, the subjects had been charged with virtually every crime in the criminal code. Many had extensive arrest records for burglary, robbery, grand larceny, receiving stolen property, motor vehicle theft, possession of burglary tools, and related charges.

Subjects with no prior arrest comprised 16 percent of the sample. Across the 19 operations on which data were available, subjects identified with no prior arrest ranged from 4 percent to 32 percent of the totals. Generally, the operations found that approximately 15 percent of the subjects they encountered had no prior arrest record.

One cannot assume that this group of subjects with no prior records consists of law-abiding citizens who were enticed by the ready availablility of easy money. A closer imspection reveals that they generally fall into one of three groups: Elusive serious offenders, white collar criminals and corrupt officials, and youthful offenders.

The elusive serious offenders generally were older subjects who spoke freely with undercover officers concerning their years of criminal activity and simply had evaded apprehension successfully. The second group included such subjects as bank presidents, several millionnaires, an elected sheriff, and law enforcement officers. The third group was comprised of younger people with no *adult* record.

2.6 Types and Levels of Criminal Activity Encountered

The basic goal of the Anti-Fencing Program is the reduction of property crime through the identification and apprehension of career thieves* and more importantly, the identification and removal of the receiver of stolen property (the fence) from the Stolen Property Distribution System. Within this system, the thief moves the fruits of his crime to the fence, who pays for it in cash or contraband. The fence then manages the eventual resale of the property to the public, either directly or through other elements of the system (such as additional fences).

The Stolen Property Distribution System is manifested in a hierarchy of levels, from the addict thief and street fence to organized rings of truck hijackers and their organized outlets for stolen property. Figure 2-1 presents a simplified hierarchy of levels of property crime activity

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*In the Anti-Fencing Program, the term *thief* is used to generally describe a wide range of property criminals engaged in actively taking property from its proper owner.

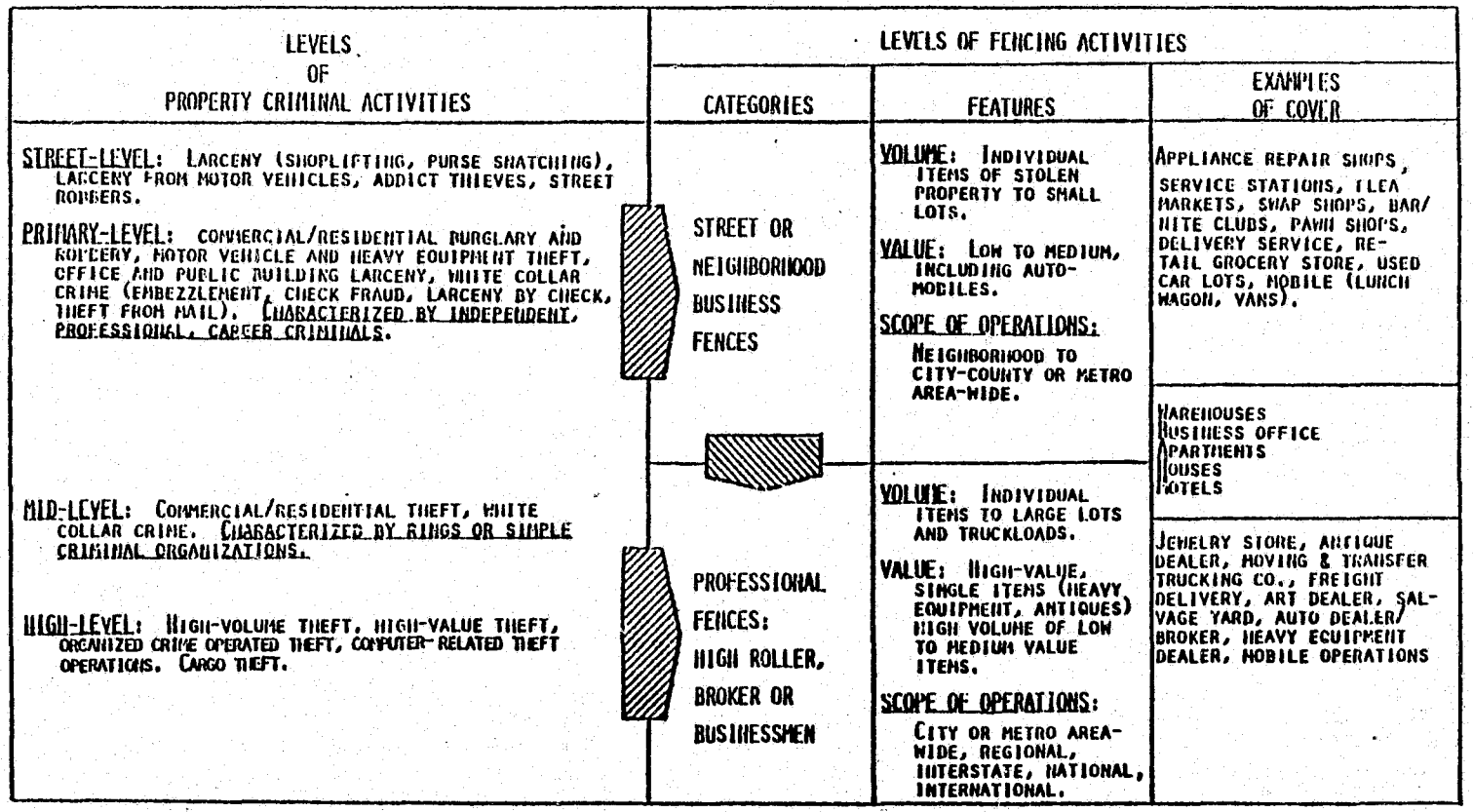

Figure 2-1. General Anti-Fencing Program Target Profile

used by Anti-Fencing project directors to plan operations. An examination of the levels of the subjects encountered will provide a perspective concerning their respective characteristics.

Table 2-13 presents the data regarding the types (thief or fence) and levels of 1362 subjects encountered in 18 operations. Subjective judgments were made by operational personnel regarding the type and level reported.

TABLE 2-13

Criminal Character and Level of Activity of Subjects Encountered In 18 Operations (Sample - 1362 Subjects)

Thieves	Percent
Street Level	58
Primary Level	14
Mid-Level	10
High Level	2
(All)	84
Fences	
Street Level	2.5
Primary Level	5
Mid-Level	6
High-Level	2.5
(All)	16

Approximately 84 percent of the subjects encountered were reported as thieves and 16 percent as fences, or a ratio of approximately 6:1. The 18 operations on which data were available reported that 58 percent of the subjects were street level thieves, while 42 percent were higher quality thieves or fences. The term *quality* refers to the level of property activity in which the subject is engaged. (For example, a mid-level fence would be a higher quality arrest than a street level.)

The data presented here do not lend themselves to easy interpretation. The preponderance of street level thieves probably is due to both a definitional problem and an operational tactic. Street level is a term often used by law enforcement personnel to connote a far broader range of predatory property criminals than that presented in Figure 2-1. Moreover, most Anti-Fencing operations initially target the street level to gain the basic intelligence necessary to move up in quality to the higher levels.

The 223 fences represented in the sample (16 percent) may suggest that the Program is meeting its objectives with respect to eliminating criminal receivers of stolen property. As the operations have continued to grow in sophistication, an increasing number of the subjects have been fences.

2.7 Subjects Encountered in Non-Property-Crime Offenses

In the course of penetrating the criminal community, it is apparent that Anti-Fencing operations frequently encounter criminal activity not directly related to property crime. Many operations have forwarded intelligence on these activities to interested agencies, and several operations have taken advantage of their unique position to take direct action. This has resulted in arrests for insurance fraud, corruption, bribery, smuggling, extortion, racketeering, obstruction of justice, conspiracy, distribution of counterfeit money, forgery, and distribution of narcotics.

Table 2-14 presents a profile of the subjects encountered in non-property-crime offenses.

TABLE 2-14

Characteristics of Non-Property-Crime Arrests in Five Anti-Fencing Operations

Operation*	Number of Non-Property Crime Arrestees	Average Age	Average Prior Arrests Per Arrestees	Description of Charges
1	18	36	1.7	Sale and distribution of narcotics, firearms, smuggling, gambling laws, arson, conspiracy to commit murder
2	13	30.5	2.1	Sale and distribution of narcotics, gambling, racketeering (RICO)
3	8	50.5	0	Extortion, bribery, racketeering (RICO)
4	17	29.3	1.1	Counterfeiting, distribution of counterfeit money
5	7	42	4.7	Extortion, loan sharking, weapons, violations (sale), bribery, accepting money under false pretences

*Operation 1 conducted in the U.S./Mexico border area.

Operation 2 conducted by local police in joint operations with the U.S. Internal Revenue Service.

Operation 3 arrestees included a county sheriff, an amusement machine operator, an auto parts salesman, and a former deputy and bailbondsman.

Operation 4 arrestees were members of a counterfeiting ring caught during joint operations of Secret Service and local police.

Operation 5 was a long-term (2 1/2-year) penetration of organized crime in an eastern city and port area.

2.8 Narcotics Related Encounters

The project directors from 18 Anti-Fencing operations made subjective judgements on whether an individual's contact with the undercover operation was drug-related. While no definition of the term *drug-related* was provided, it generally has been discussed in terms of thieves addicted to narcotics or of thieves and fences who conduct stolen property transactions in drugs. Table 2-15 indicates the subjectively reported narcotics-related encounters for 18 operations.

TABLE 2-15

Narcotics-Related Encounters with Subjects in 18 Operations
(Sample - 1232 Subjects)

Encounters	Number	Percent
Narcotics-Related (Addict-Thieves, Drug Fences, Narcotics Transactions)	368	30
Non-Narcotics-Related	864	70

Interpretation of these data are difficult; however, it appears that narcotics-related transactions are decreasing from earlier operations. Narcotics-related transactions are conducted at both the highest and lowest levels of the Stolen Property Distribution System. Several project directors have expressed their belief that the reduction in narcotics-related encounters is part of a general movement away from the street level and towards the higher levels of the system.

2.9 Residence of Subjects

Table 2-16 presents the reported data concerning whether the subjects encountered in 18 operations resided within or outside of the jurisdiction in which the operational site was located.

TABLE 2-16

Residence of Subjects Visiting 18 Operations
(Sample - 1232 Subjects)

	Number	Percent
Residing in General Area of Operational Site	1058	86
Residing Out-of Area or Out-of-State	174	14

The data provide an indication of the extent to which the subjects encountered operated over a wide area or were involved in interstate transportation of stolen property. No comparative data were available.

2.10 The Arrest of Subjects Encountered

The subjects who sell stolen property, deal in contraband, or otherwise are implicated in an Anti-Fencing operation commonly are arrested at the termination of each operation. The subjects -- sometimes as many as 300 in a single operation -- then must have their cases adjudicated in the local or Federal criminal justice system.

The arrested subject may be questioned in great detail, depending on the intelligence goals of the operation. This process often leads to an ample number of crime clearances.* For example, one operation arrested a 26-year-old known fence, which led to the clearance of 50 crimes. The number of crimes cleared averaged 4.2 per Anti-Fencing subject arrested.

2.11 The Disposition of Subjects Arrested

The availability of data on the disposition of subjects arrested was uneven. There were a number of reasons:

- Feedback from the prosecutors office or court system frequently is provided on an informal basis only.
- Some subjects arrested as a result of Anti-Fencing operations are prosecuted at the local level, some at the Federal, and some at both the Federal and local.
- Some operations, especially those that are regional or conducted close to a State border, have had cases adjudicated in as many as eight different courts.
- Several operations reporting data had terminated very recently, leaving most cases still pending.

The subjects arrested in Anti-Fencing operations face an average of three charges. Disparities among the various State codes for the same offense make it impossible to distinguish between felony and misdemeanor crimes in this report.

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*See Appendix C.

Figure 2-2 presents the disposition of 1088 persons charged in 17 Anti-Fencing operations. It is important to emphasize that the table is based on a one-person/one-disposition count, (i.e., additional pleas to multiple charges were not counted).

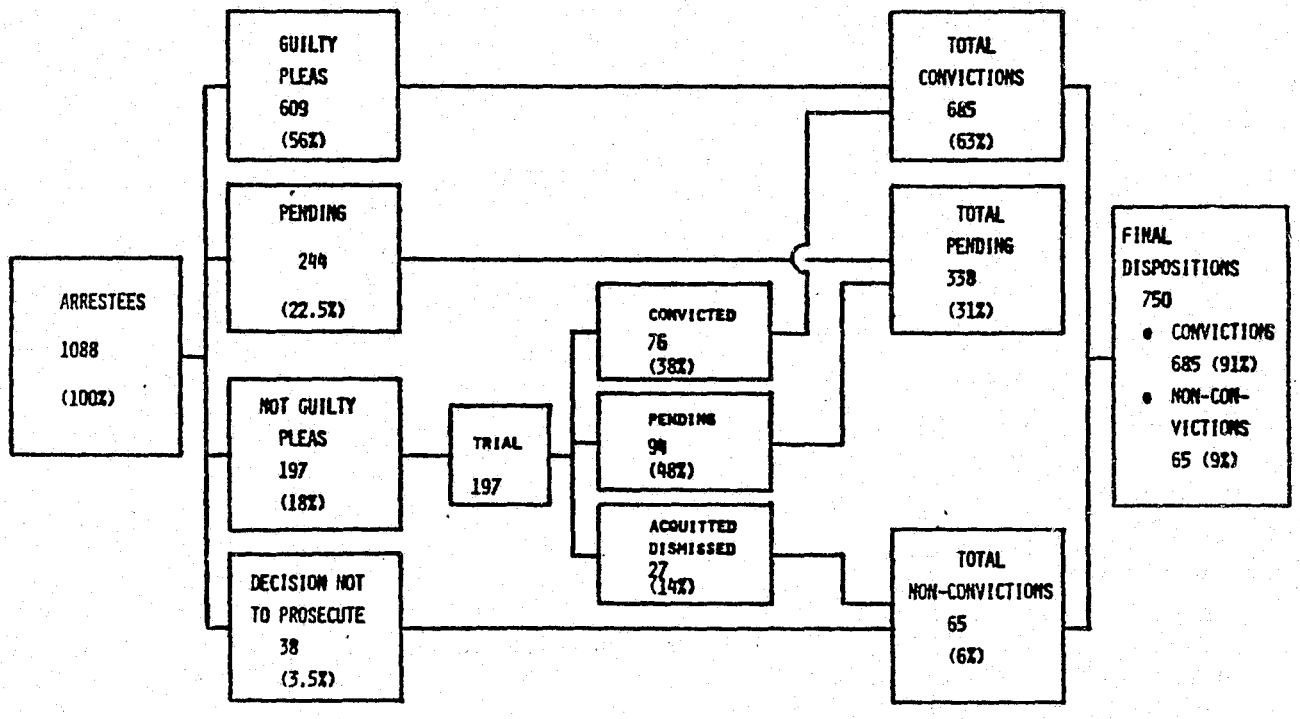

FIGURE 2-2

Disposition of 1088 Persons Charged
In 17 Anti-Fencing Operations

Over 91 percent of the subjects whose cases have reached a final disposition have been adjudicated guilty. It would appear that the videotaped evidence of the stolen property transactions and the active cooperperation between the prosecutors and the operations have had a considerable impact on the final dispositions. This impact seems to be manifested in three important ways:

- Very few subjects' cases (3.5 percent) are screened out by the prosecutor.
- Nearly 75 percent of the subjects simply plead guilty, early in the adjudication process.
- Of those subjects that have gone to trial and dispositions have been reached, 76 percent have been convicted.

The subjects whose cases are screened out by the prosecutor often were individuals who entered an Anti-Fencing site with one or more other individuals but took no direct part in the transaction. Some were screened out for the purpose of informant development. The percentage of Anti-Fencing subjects' cases filed by the prosecutor (3.5 percent) compares vary favorably with the persons arrested for property crimes nationally (e.g., 69 percent of the adults arrested for robbery were actually prosecuted, 73 percent for burglary, and 96 percent for larceny-theft).

It is reasonable to assume that the high percentage (three out of four) of Anti-Fencing subjects who plead guilty early in the adjudication process results in a significant saving in court costs. Almost one-third (60 out of 197) of the subjects who pleaded not guilty were from one operation, which skewed the figures and indicates that the rate of guilty pleas perhaps is even higher.

A comparison of the conviction rate for Anti-Fencing operations (91 percent overall) with the national data in Table 2-17, which depicts the disposition of adults prosecuted for property crimes nationally in 1977, provides additional insights into the adjudication of Anti-Fencing subject's cases.

TABLE 2-17

Disposition of Adults Prosecuted
For Property Crimes Nationally in 1977
(Rounded Percentages)

Property Crime	Convicted	Convicted of Lesser Offense	Case Dismissed or Acquitted
Robbery	57	10	33
Burglary	62	13	25
Larceny-Theft	74	5	20
Motor Vehicle Theft	56	12	32

Nationally, for adults actually prosecuted for one of the four crimes tabulated in Table 2-17, convictions for the substantive offense or a lesser offense did not exceed 79 percent in 1977.

2.12 Sentences of Convicted Subjects

Data were spotty concerning the sentences meted out to convicted subjects (those who either pleaded or were found guilty). The reasons are similar to those outlined in Section 2-11 for disposition data. Sentencing data were available from 11 operations.

Nearly four of every five (78 percent) convicted subjects who had been sentenced were incarcerated for periods ranging from 60 days to 99 years. Some 17 percent got probation, while the balance received fines or suspended sentences.

As was to be expected, there was considerable variance among the sentencing practices for the 11 operations. Table 2-18 depicts the percentage of convicted subjects incarcerated, the range of sentences, and the median sentence for each of the 11 operations. The figures are based on a one-subject/one-sentence count, and multiple sentences are not tabulated.

TABLE 2-18

Sentences of Subjects Convicted in 11 Anti-Fencing Operations

Operation	Percent of Convicted Subjects Incarcerated	Range of Sentences	Median Sentence
1	80	Low - 2 years High - 99 years	10 years
2	73	Low - 1 year High - 25 years	
3	82	Low - 70 days High - 10 years	
4	87	No data	
5	65	Low - 8 months High - 70 years	
6	69	Low - 6 months High - 10-50 years	2-10 years
7	83	Low - 90 days High - 5-14 years	2-5 years
8	91	Low - 2 years High - 15 years	1-10 years
9	71	Low - 6 months High - 6 years	
10	50	Low - 60 days High - 3 1/2-7 years	
11	54	Low - 2 years High - 20-40 years	4-9 years

The variance in sentencing may reflect either widely differing community standards or the relative ability of local criminal justice systems to absorb and process large numbers of subjects at one time.

Analysis of the disposition and sentencing data showed that additional information was needed. The large numbers of both pending cases and pending sentences emphasize the importance of time as the critical variable.

For example, the times from arrest to adjudication and from disposition to sentencing have crucial implications for proper measure of the Program's impact. The practicability of collecting this information in the Program Reporting System, as well as information on the pretrial release of Anti-Fencing subjects, are both areas that require careful examination.

2.13 Findings

Several trends are discernable from the analysis of the subjects encountered in 20 Anti-Fencing operations:

- Subjects who sell stolen property to undercover operatives in Anti-Fencing operations are considerably older than individuals arrested nationally for property crimes.

- Subjects encountered in Anti-Fencing operations are predominantly male.

- Anti-Fencing undercover operatives are encountering what appears to be a significant number of individuals engaged in criminal activity not directly related to property crime.

- Narcotics-related transactions are apparently decreasing.

- The majority of Anti-Fencing subjects live in the jurisdiction in which the operation was conducted.

- Minority subjects sometimes are encountered in Anti-Fencing operations in disproportion to their population in the operational areas. An analysis of minority victimization in the same areas appears to be warranted.

- Most subjects have a prior arrest record, and many have lengthy criminal histories.

- The arrest of Anti-Fencing subjects results in a considerable number of crime clearances.

- Prosecutors enjoy a very high conviction rate for subjects arrested in Anti-Fencing operations.

- While, many subjects receive stiff sentences, the critical variable of time from arrest to disposition and sentencing should be examined.

3. THE IMPACT ON THE INCIDENCE OF PROPERTY CRIME RESULTING FROM 3 ANTI-FENCING PROJECTS

The fundamental objectives of the Anti-Fencing Program are to apprehend thieves and fences, recover stolen property, and disrupt stolen property markets. Ultimately, the goal is to reduce the incidence of property crime. To delineate what happened to the incidence of property crime in the areas in which Anti-Fencing projects were conducted, this chapter presents a preliminary analysis of the impact on property crime rates of Anti-Fencing projects in three jurisdictions.

3.1 Methodology

There are several ways outlined in Anti-Fencing doctrine in which Anti-Fencing operations can affect the volume of property crimes occurring in a community:

- Undercover Anti-Fencing officers emphasize the the identification and incrimination of career and professional thieves, especailly burglars and larcenists, who are responsible for committing a disproportionate number of offenses in the community.

- Undercover officers also emphasize the identification and incrimination of fences. A fence taken off the street by arrest and jail leaves a number of thieves without an outlet for the property they steal, and without directions on what to steal for maximum payoff at minimum risk.

- The high conviction rates enjoyed by Anti-Fencing operations, due to the quality of the video evidence and the stiff sentences frequently meted out to repeat offenders, removes them from active participation in the Stolen Property Distribution System.

- Anti-Fencing operations have raised the level of risk of arrest and conviction for property criminals. The operations have interjected a feeling of insecurity into the thief/fence relationship, in that the thief no longer is sure his fence is not a policeman.

Anti-Fencing projects are conducted either locally (in a single jurisdiction) or regionally (in a number of jurisdictions), and they are designed to impact on the local (or regional) Stolen Property Distribution System. An Anti-Fencing project generally comprises a series of operations targeted against one or more levels of the system, often focusing on specific local or regional property crime problems. Within a project, it is not unusual for operations targeted against different levels to run concurrently. Many times, a second operation is started before the first operation ends. Several factors must be considered in an assessment of the impact of an Anti-Fencing operation on the incidence of property crime:

- Operations frequently are conducted for very specific purposes which may have no direct impact on the general incidence of property crime for the entire jurisdiction. For example, operations conducted for intelligence purposes clearly are not intended to have an immediate impact on the property crime rate.

- Every operation is different, with different targets and objectives. Drawing programwide inquiries from a sample of operations is extremely difficult.

- Overlapping or concurrent operations complicate the analysis required.

Much has been written concerning the difficulties of measuring changes in the incidence of crime related to a particular "treatment", because of the inability to control conditions and causative factors.

The design for the analysis presented herein is a time-series. Time-series analysis basically involves making periodic judgments on dependent variables (incidence of property crime) prior and subsequent to a treatment, which in this case, is the termination of an Anti-Fencing operation. One major advantage of time-series methodology is that this design allows a judgment to be made on whether an effect "increases or decays, or whether it is only temporarily or constantly superior to the effects of alternative interventions." (Glass et al., 1975)*

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*References are detailed in Appendix B.

The variety of time-series analysis employed uses a two step procedure. In the first sequence, the data are examined to determine which of a number of specific stochastic models adequately describes the nature of the series. In the second phase, the identified model is used to generate statistical tests for measuring change in a series that is attributable to a program or intervention. (See Appendix B.)

The three projects examined in this analysis were selected because: (a) The operations generally were targeted at a level where property crime impact could be expected; (b) operations generally were confined to a single jurisdiction; and (c) the ready availability of the data. The analysis of each of the three projects used the FBI Uniform Crime Reports' Monthly Return of Offenses Reported to the Police for the period from January 1974 to September 1978. The 57 months of data correspond favorably with Glass et al.'s postulate that at least 50 data points are necessary for a time-series analysis.

The preliminary nature of this analysis necessitated that the data utilized reflect only total property crime. For the purpose of this analysis, property crime was defined as the sum of robbery, burglary, larceny-theft, and motor vehicle theft. The analysis searched for impact at the termination of each operation, on the assumption that the arrests and attendant publicity would maximize any impact at that point. The data were analyzed using Glass's Correl Program (Bowers et al., 1975). A more detailed description of this procedure appears as Appendix B, which also defines the terminology employed.

3.2 Project A

Project A consisted of three operations conducted in a Western city with a population of approximately 385,000. The first operation (Phase I) was initiated September 1, 1976, and was terminated September 30, 1977. Phase I used three sites (a citizen's band (CB) radio shop, a used car lot, and an apartment) to conduct stolen property transactions. Phase II was initiated in June 1977 and terminated in May 1978, using a pool hall as the operational site. A third operation used an apartment and mobile operations from October 1977 to July 1978. The incidence of reported property crimes in the jurisdiction in which Project A was conducted is charted in Figure 3-1.

3.2.1 Time-Series Model Identification

The correlogram for property crime in the jurisdiction in which Project A was conducted is presented in Table 3-1, which includes only the first 10 of the 20 lags computed.

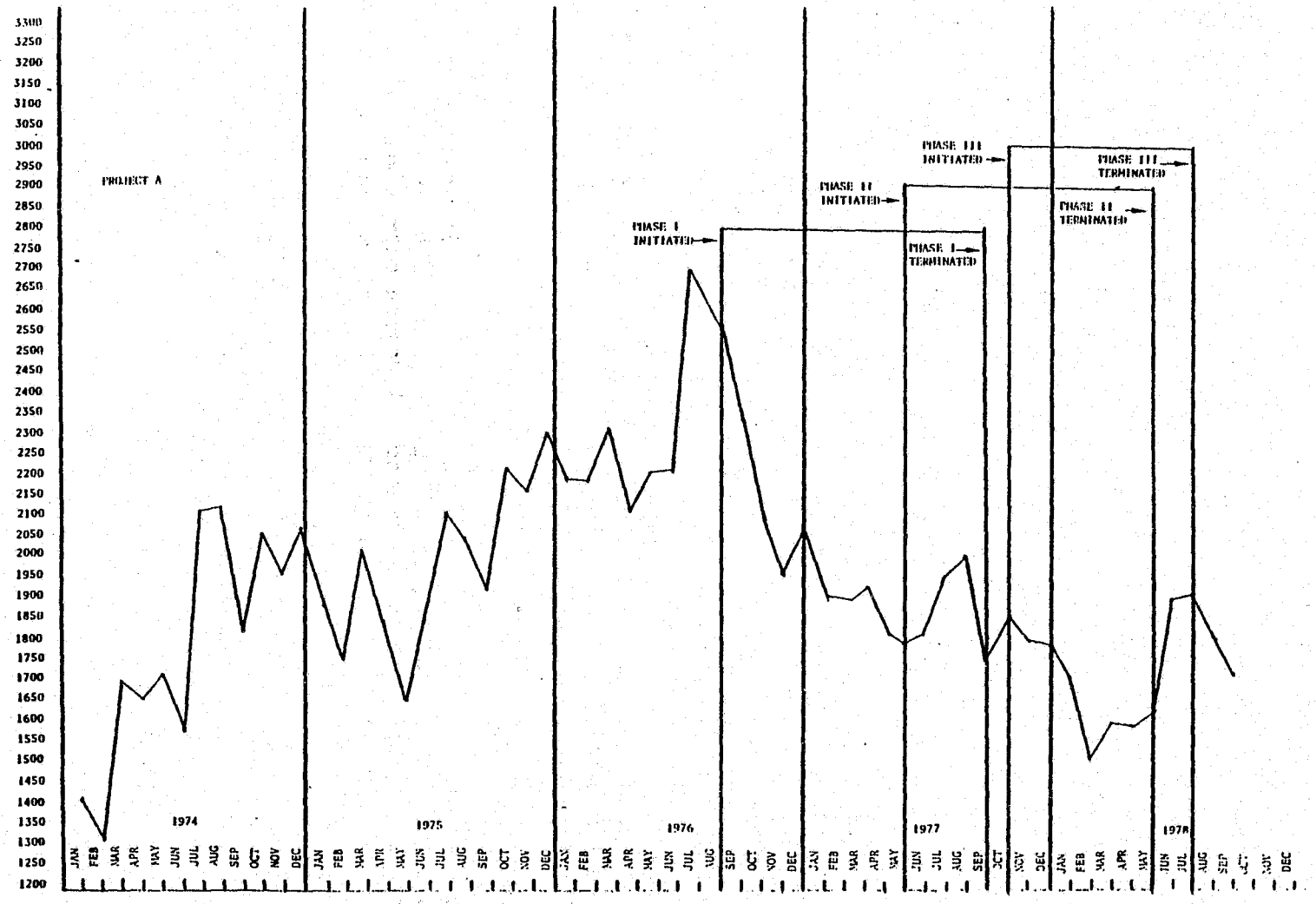

Figure 3-1. Incidence of Property Crimes in Jurisdiction A

TABLE 3-1

Correlogram for Property Crime--Jurisdiction A

Order of Differencing	Lag 1	2	3	4	5	6	7	8	9	10
1	.64	.39	.39	.35	.23	.01	.13	.14	.03	-.61
2	-.39	-.14	.04	.19	.06	-.44	.22	.06	.01	-.28
3	-.55	-.02	.02	.08	.17	.44	.28	-.02	.07	-.19

An examination of the correlogram reveals that the first-lag autocorrelation for first-differenced data is significantly different from zero (r = -.39, standard error = .18), while the autocorrelations for the next four lags are effectively equal to zero. However, the autocorrelations for lags 12 and 18 are robust (r = .44 and r = 41 respectively) suggesting the presence of a six-month cycle.

The time-series model best fitting the data tentatively was identified as an ARIMA* (0, 1, 1) with a six-month seasonal component. This type of model, called a multiplicative model, is the most powerful approach for detecting seasonal variations (Box and Jenkins, 1976).

3.2.2 Time-Series t-Statistics

The data were entered into a second analysis, using the TSX program, which compares a t-statistic assessing the change in level or slope of a time-series caused by an intervention or program. A design matrix was entered into the computer for three Anti-Fencing operations, two of which overlapped.

The results showed a decrease in crime following the third operation. However, the change was not statistically significant. Further analyses, first employing a 12-month seasonal cycle and then no seasonal components, also revealed no significant decrease.

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*Auto Regressive Moving Average Process, (Box and Jenkins 1970, 1976).

The results showed a statistically significant increase in the incidence of property crime between the completion of the second and the third Anti-Fencing operations ($t = +1.65$, $p < .05$). The fact that the second operation (Phase II) was limited in scope, together with the fragmented and specialized nature of the operation, make it unlikely that this increase is attributable to the project.

3.3 Project B

Project B was comprised of three operations conducted in a western city with a population of approximately 331,000. The first operation (Phase I) was initiated in July 1976 and terminated November 30, 1977. This operation was targeted at the street level and resulted in the arrest of nearly 60 subjects. Phase II, attempted to move up into the primary level and mid-level, and resulted in charges being filed against some 45 subjects. The second operation initated in December 1976 and terminated October 30, 1977. Phase III opened in June 1977 and terminated May 1978. This third operation netted 66 subjects, many of whom were fences. The incidence of reported property crime in the jurisdiction in which Project B was conducted is charted in Figure 3-2.

3.3.1 Time-Series Model Identification

The correlogram for property crime in the jurisdiction in which Project B was conducted is presented as Table 3-2, which again tabulates only the first 10 lags.

TABLE 3-2

Correlogram for Property Crime--Jurisdiction B

Order of Differencing	Lag* 1	2	3	4	5	6	7	8	9	10
0	.79	.69	.52	.39	.26	.10	.03	.01	-.04	-.02
1	.39	.24	-.17	.13	-.03	-.11	-.11	.08	-.21	.14
2	-.64	.36	-.20	.09	-.07	-.09	-.07	.19	-.27	.30

*Standard errors range from .18 to .25 for first differenced data.

The correlogram for Project B is similar to that in Project A (i.e., only the first-lag autocorrelation of first differenced data is significantly nonzero, while longer lags truncate or fall off to zero. Second differencing

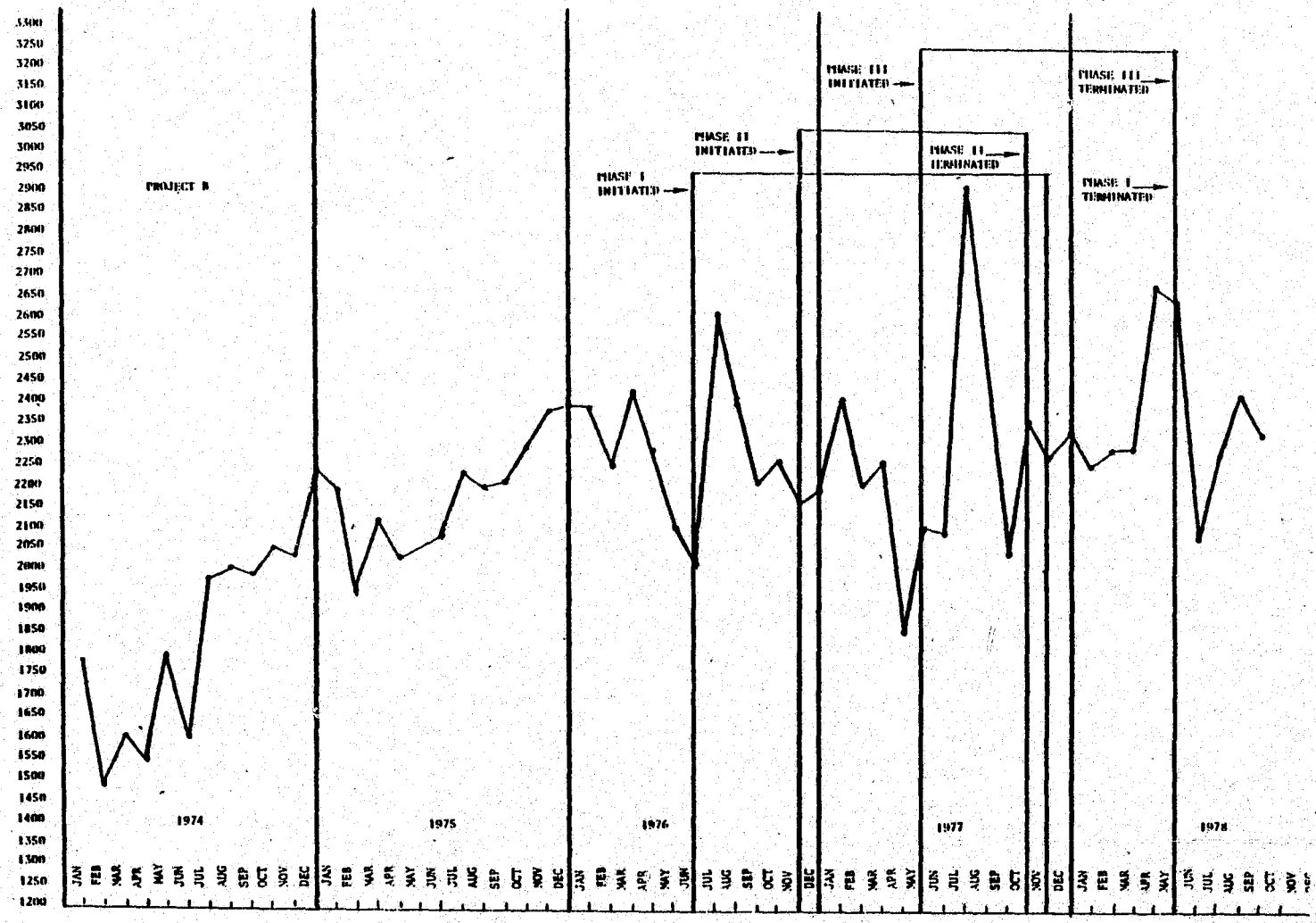

Figure 3-2. Incidence of Property Crimes in Jurisdiction B

does not add to the explanation of the model and, therefore, should be ruled out. A large positive autocorrelation was found at lag 12 but not at lags 24, 36, or 48. Thus, it must be concluded that there is no consistent seasonal variation in the data. The model tentatively was identified as an ARIMA (0, 1, 1) process.

3.3.2 Time-Series t-Statistic

The data were analyzed using the TSX program, with a design matrix specifying three interventions (i.e., Anti-Fencing operation terminations). The analysis showed no significant reduction in property crime following the first operation (t = -.48, degrees of freedom = 53). Following the second operation, the analysis showed an increase in property crime which, was not statistically significant (t = .30, df = 53).

The third operation resulted in a statistically significant reduction in property crime after termination (t = -1.70, df = 53, $p < .05$, one-tail). While further analysis is indicated, it is possible that the impact after the third operation is cumulative. The high number of fences identified in this operation may have been an important factor in the reduced incidence.

3.4 Project C

Project C was comprised of operations conducted in a midwestern jurisdiction with a population of 746,000. Phase I was initiated in August 1977 and terminated in March 1978. The operation targeted street and primary level thieves and fences. More than 100 subjects were arrested at termination, including 27 fences. The second operation was initiated in April 1978, following termination of the first, and was terminated at the end of October 1978. Because of the recent termination of Phase II, data were available for examination only of the first operation's impact. The incidence of reported property crime in the jurisdiction in which Project C was conducted is charted in Figure 3-3.

3.4.1 Time-Series Model Identification

The correlogram for property crime in the jurisdiction in which Project C was conducted is tabulated in Table 3-3.

TABLE 3-3

Correlogram for Property Crime--Jurisdiction C

Order of Differencing	Lag 1	2	3	4	5	6	7	8	9	10
0	.77	.57	.39	.31	.23	.14	.14	.07	.01	-.03
1	-.12	-.06	-.22	.04	.06	-.15	.11	-.03	-.02	-.19
2	-.49	.09	-.11	.05	.13	-.25	.18	-.04	.07	-.18

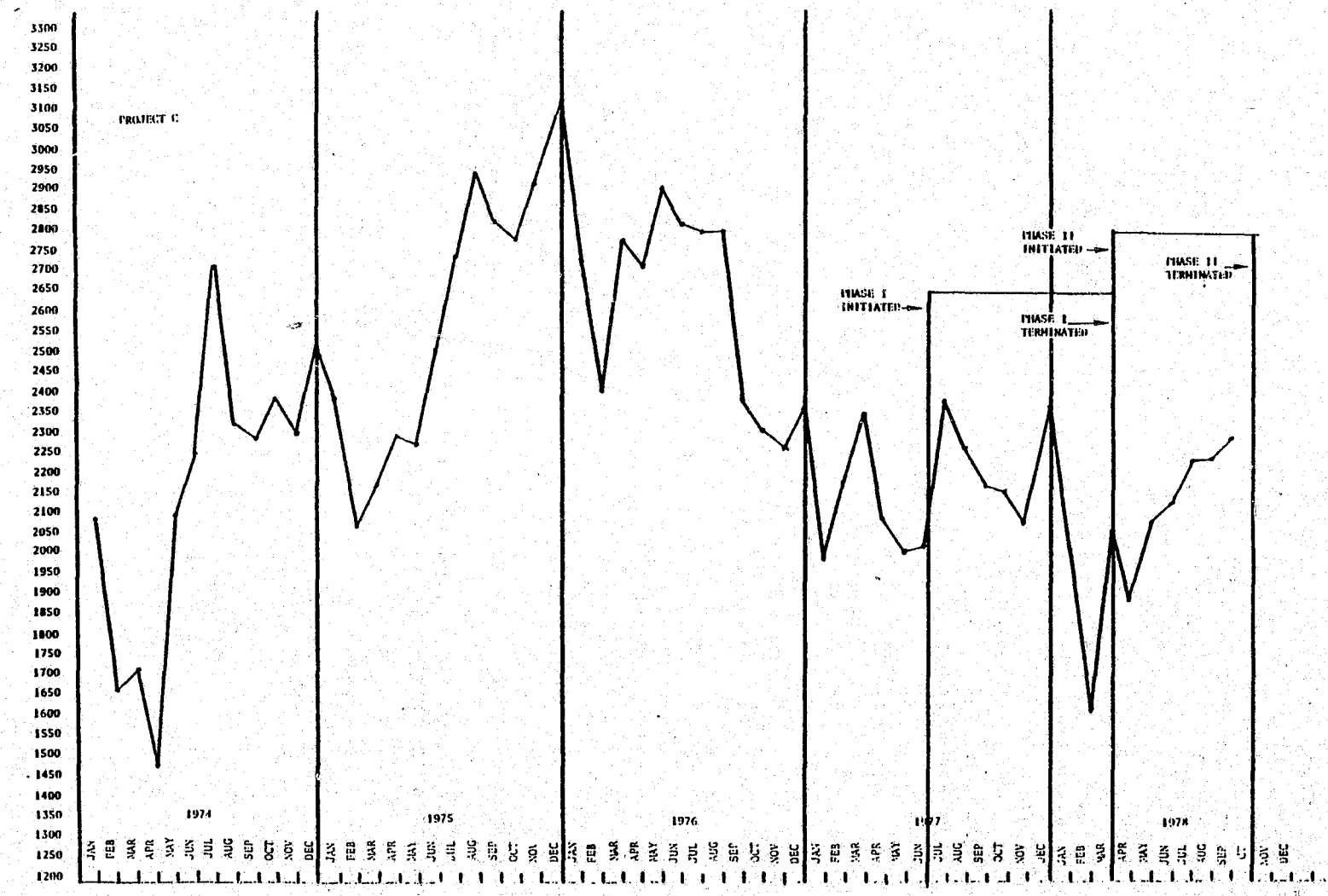

Figure 3-3. Incidence of Property Crimes in Jurisdiction C

The pattern tentatively identified in the correlogram fits the ARIMA (0, 2, 1) model, exhibiting second-order differencing and one moving-average parameter. The correlogram did not suggest a consistent seasonal variation.

3.4.2 Time-Series t-Statistic

The data were analyzed using the TSX program. A design matrix was entered into the computer specifying 51 previous and six post data points. The resulting t-statistic was -1.56. The analysis revealed a marginally significant reduction in property crime ($t = -1.56$, $p < .10$) following the termination of the first operation. This reduction may be attributable to the relatively high number of fences. However, further analysis will be required to determine whether the cumulative impact of both operations is significant.

3.5 Findings

The results of the time-series analysis of the three jurisdictions generally presents a positive, if cloudy, picture of the impact of the projects on the property crime rate. Project A and B both showed decreases following the third operation; however, only the reduction for Project B was statistically significant. Project C showed a marginally significant reduction following the first operation, while data from the second are not yet available. It is important to stress at this point the preliminary nature of this analysis. None of the projects examined had been completed, and all measurements represent midproject results.

The assumption that impact is maximized at termination may be questionable, since adjudication and sentencing seem to take place over a considerable period of time. Thus, incapacitation through removal from their operating environments is not immediate for the great majority of subjects. However, it would seem reasonable that deterrence would be maximized at termination and may be related to the levels of publicity associated with the termination. Additional analysis from a deterrence perspective is strongly indicated.

It was beyond the scope of this report to examine the data for more subtle impacts or for impact on the individual types of property crimes. This kind of analysis, as well as analysis employing still more sophisticated statistical techniques will serve as a major contribution to a collective understanding of the impact of Anti-Fencing projects on property crime. The postive nature of these preliminary indications suggests the importance of pursuing this effort in a timely fashion.

4. STOLEN PROPERTY RECOVERED IN ANTI-FENCING OPERATIONS

Anti-Fencing Program doctrine identifies the stolen property as the critical link between thieves and fences in the Stolen Property Distribution System. Since the inception of the Program, police undercover operations have recovered millions of dollars worth of stolen property. Chapter 4 focuses on several questions regarding the property recovered by Anti-Fencing operations:

- What types of property were recovered?
- How was the property appraised, or the value established?
- How much of the recovered property actually was stolen?
- How much was paid for the recovered property?
- How many stolen property transactions were conducted with each subject?
- What happened to the recovered property?

The data presently contained in the Anti-Fencing Program Reporting System is uneven with respect to stolen property.* The limited analysis presented in this chapter is based on data at varying levels of completeness from 27 operations. The stolen property recovered in these 27 operations represents approximately 40 percent of the stolen property recovered since commencement of the Anti-Fencing Program.**

4.1 Types of Stolen Property Recovered

Police undercover operatives have recovered a wide range of merchandise from thieves and fences. Some of the most common items purchased include automobiles, stereos, televisions, small appliances, and stolen checks and credit cards. Many operations also have recovered goods in bulk (truckloads), including foodstuffs, clothing, furniture, and office equipment, as well as the items noted previously. Several operations have recovered heavy farm and construction equipment and airplanes, as well as other large items.

Undercover personnel also have recovered unique items including pirated motion picture film, a Rembrandt painting, German securities, and a national art treasure from Thailand. Anti-Fencing projects also have recovered contraband goods that, because they are illegal, have no rightful owner. Such contraband has included drugs, explosives and weapons.

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*All projects have detailed inventories of the property recovered. However, many lacked the time and manpower required to meet the detailed reporting requirements of the Anti-Fencing Program Reporting System.

**Projects have been required to report the value of the stolen property recovered in each operation since 1974. To date property valued at $130.6 millions has been recovered.

4.2 Appraisal of Stolen Property

Stolen property generally is measured or quantified in terms of dollar value. The appriased value of the property stolen has important legal ramifications, since this value is a major factor in determining the chargeable offense and the possible sentence. Thus, the process of appraising stolen property recovered in Anti-Fencing operations must be careful and vigorous.

The appraisal of property always is a subjective process. Most Anti-Fencing projects reported that their appraisal procedures did not differ from established department policy (i.e., employing "experts" to establish "Fair Market Value"). Most also described the estimates as "conservative". Some property, especially of types not generally recovered, presented some difficulties with respect to appraisal. For example, one project was required to identify an expert to appraise certain Mexican artifacts. The value of stolen credit cards appears to have presented difficulties initially, since some minor discrepancies were evident in early reporting.

4.3 Recovered Property Identified as Stolen

Anti-Fencing Program doctrine underlies the importance of ensuring that the property is, in fact, stolen before expending project funds ("buy-money")* to recover it. In practice, most undercover operatives attempt to establish on camera the subject's knowledge that the property actually was stolen. This practice is reflected in the data presented in Table 4-1.

Approximately 96 percent of the property recovered in the 14 operations tabulated in Table 4-1 was identified as stolen. In 11 of the 14 operations, the recovered property identified as stolen was at least 90 percent of the total value of the property recovered. Detailed data concerning the discrepancy between property recovered and property recovered identified as stolen was available from two additional operations. These operations were excluded from the table because the reported value of the property recovered was disproportionately large and skewed the table. The two operations are summarized below:

- Operation 15 resulted in the recovery of $6.3 million worth of property, of which $2.2 million was identified as stolen. The difference reflects the purchase of $4 million worth of heroin (i.e., contraband).

- Approximately $42 million dollars of stolen property was recovered in Operation 16 of which $23 million proved to be stolen. Again, much of the remainder apparently was contraband.

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*The term identifies funds actually expended for the purchase of stolen property during operational transactions.

TABLE 4-1

Value of Property Recovered and
Property Identified in 14 Anti-Fencing Operations

Operation	Value of Property Recovered	Value of Property Recovered Identified as Stolen
1	$ 3,335,000	$ 3,335,000
2	1,488,760	1,449,210
3	1,049,983	1,047,215
4	1,020,000	1,008,000
5	897,794	841,576
6	1,244,022	1,217,974
7	502,019	425,000
8	1,500,000	1,300,000
9	989,000	985,000
10	264,835	221,320
11	1,000,293	989,548
12	747,791	746,318
13	945,682	903,700
14	890,153	849,041
TOTALS	$15,875,332	$15,318,902

4.4 Buy-Money Expended

Table 4-2 tabulates the buy-money expended for the recovery of all property and the value of the purchased property positively identified as stolen. Table 4-2 indicates that police undercover operatives paid approximately 7 cents for every dollar of stolen property recovered. In only 3 operations did the undercover personnel pay 10 cents or more per dollar of stolen property. Anti-Fencing Program doctrine which is based in part on Walsh's research,* states that undercover operatives should strive to pay less than 10 percent of the fair market value for stolen property.

*M. E. Walsh. The Fence -- A New Look at the World of Property Theft. Contributions in Sociology, No. 21. Westport, CT: Greenwood Press, 1977.

TABLE 4-2

Buy Money Expended for Stolen Property
Recovered in 14 Anti-Fencing Operations

Operation	Buy Money Expended For Purchase of Property	Value of Property Recovered Identified as Stolen	Buy Money Expended Per Dollar of Property Recovered Identified as Stolen
1	$ 155,929	$ 3,335,000	$ .05
2	73,604	1,449,210	.05
3	75,283	1,047,215	.07
4	41,000	1,008,000	.04
5	91,812	841,576	.11
6	74,289	1,217,974	.06
7	67,000	425,000	.16
8	137,000	1,300,000	.11
9	74,745	985,000	.08
10	47,421	221,320	.21
11	59,516	989,548	.06
12	18,533	746,318	.02
13	60,717	903,700	.07
14	115,000	849,041	.14
	$1,091,849	$15,318,902	$ .07

Again, the same two additional operations in which data was available were excluded from the table. It is interesting to note, however, that Operation 15 and 16 paid 4.5 cents and 1.2 cents on the dollar, respectively, for stolen property. Operation 16 was able to make many arrests immediately following individual transactions, thus actual financial outlays were minimized.

4.5 Numbers of Transactions With Subjects

The number of stolen property transactions a subject makes with undercover officers has been a subject of some controversy. Transactions conducted after a solid case has been made would only artifically inflate the property recovery figure. Table 4-3 quantifies the total stolen property transactions made during 18 operations. The transactions per project actually may be higher since several subjects often were involved in a single stolen property transaction.

Most projects reported have established policies for the number of transactions they will conduct with a single subject. The subject is permitted to continue transactions following a determination that a solid case has been made only if he is either identifying new subjects or

obtaining intelligence information. The average number of transactions per subject appears to reflect this policy.

TABLE 4-3

Stolen Property or Contraband Transactions
Made During 18 Operations (Sample - 1333 Subjects)

Number of Transactions	-	4791
Number of Subjects Involved	-	1333
Average Number of Transactions Per Subject		3.6

4.6 Disposition of Stolen Property

A cursory examination of the disposition of the recovered stolen property reveals that an overwhelming majority of it was returned to the owner (or appropriate insurer) in a timely fashion. Many operations developed elaborate ruses to return property to victims while the operation was still ongoing. This practice both satisfied the owner and prevented storage problems. Generally, the owner was asked to sign an affadavit and photographed with the property for evidentiary purposes.

4.7 Findings

An examination of the stolen property recovered in Anti-Fencing operations reveals:

- The property recovered in Anti-Fencing operations has ranged from a priceless painting to a four-barrel carburetor.
- While appraisal is a subjective process, established procedures are followed, since the appraisal value of the property has important legal ramifications.
- Undercover personnel paid a very small percentage of fair market value in buy-money for the stolen property recovered.
- The overwhelming majority of the property recovered was identified as stolen.
- Stolen property transactions with each subject were limited.
- The stolen property generally was returned to the victim or insurance company.

Further research focusing on the stolen property itself is necessary if further insight into the Stolen Property Distribution System is to be gained. Specifically, much could be learned concerning the actual impact of the project on the Stolen Property Distribution System, by examining the changes in the property crime patterns and trends over the life of the project (including individual operational terminations). As stated in the Anti-Fencing doctrine, "understanding the Stolen Property Distribution System is critical to impacting on it."

APPENDIX A

Prepared by
An Undercover Officer

The Operation, the activities and the people described herein are real. The names of places and people have been changed to insure privacy and security.

1. THE OPERATION

In mid 1977, a selected group of police officers was assembled to begin Operation XXX, a mock fencing organization set up under the cover of a music store. The members of the team were picked for their skill and expertise in various areas, as were the agents assigned from the U.S. Federal Bureau of Investigation (FBI) and the U.S. Treasury's Bureau of Alcohol, Tabacco, and Firearms (ATF).

Veteran detectives--knowledgeable in the art of identifying unknown defendants--were placed in the office and given the job of making order from chaos on the required paper work.

Officers who possessed skill in auto mechanics, carpentry, electronics, photography, and jewelry identification took their places in the budding organization. The chameleon-like undercover officers began contacting their informants and laying the ground-work. In sleazy night spots, bars, and pool halls, the word was circulated. Money-men were coming to town and would provide a lucrative outlet for "hot" goods.

Behind the scenes, valuable assistance was received throughout the operation from the Silver City Police Department's Intelligence, Stolen Goods, and Vice Details. In conjunction with the Silver County Sheriff's Office, State investigative agencies, the FBI, and the ATF, provided numerous informants, a myriad of information, and manpower to assist the infant organization. This spirit of cooperation continued during the long months that lay ahead.

The Silver County District Attorney's Office and the U.S. Attorney's Office spent many hours instructing officers about avoiding entrapment. The prosecutors continued to assist the group by critiquing the cases and making suggestions for perfecting operational techniques.

The Stolen Goods Detail kept office personnel informed of recent thefts and burglaries. A mutual back-scratching relationship developed through an exchange of information. When property was purchased through the store front operations, the Stolen Goods Supervisors were advised so they could clear the crime and not waste time and manpower on a case that had already been solved.

At 8:00 p.m., one midsummer evening, the overhead door of Blue Musis, Inc. opened for business. Suspect 10, Lew, a local motorcycle thief, brought a Kawasaki to sell. He rapped with the countermen, was paid for the cycle, and left--very impressed. Lew returned and brought his friends. The ball finally was rolling.

Blue Music, Inc. was the cover business for the new face in town. BMI, Inc. became known as a place where a thief could sell hot merchandise in a closed location, protected from the eyes of the police.

The "customer" would place a call from a nearby pay phone to let the countermen know he was coming. After being told that things were cool, he would park in the driveway, press an intercom buttom, and identify himself. The garage area door opened automatically on being activated inside the building. The customer backed his vehicle into the garage, little aware that armed cover men were watching him from camouflaged points. An electronic door to the office was opened by the countermen, allowing the thief to bring his merchandise into this area and complete the transaction. While the customer was in the office area, the cover men noted his tag number and vehicle description.

Cameras, concealed behind decorative Coors beer mirros, photographed the transaction in progress. A microphone, hidden beneath the counter, recorded the conversation. Later, in court, these tools proved to be invaluable. Jurors commented that they experienced a sick, eerie feeling watching an actual crime occur.

The fences at the BMI didn't have a lot of problems with their customers. However, police officers who were unaware of the operation got the word that some big fences were operating in town. They began conducting surveillance and reporting suspicious activities at the Blue Music, Inc. One incident involved the owner of a stolen pickup truck, himself a known fence. He was surprised to see his stolen vehicle being driven into the store front by a local thief. Enraged, the owner of the vehicle knocked out several windows and called uniformed officers. Both the thief and the undercover fence were jailed as a result.

2. THE THIEF

It would be impractical to summarize fully the personal history and activities of each defendant involved in Operation XXX. However, the following narrative attempts to paint a picture with words of one type of individual encountered during this investigation. No two individuals were exactly alike, but the same motives and many of the same characteristics became drearily familiar to the undercover officers working in the store front.

One individual, Suspect 22 or Tim, was born December 25, 1958, in Silver City. He is a skilled professional thief and street-level fence. By his own estimation, Tim earned close to $100,000 per year. He walked into a bar one Friday night with $6,000 in his jeans. By early morning, it was gone. Tim was the welcome customer of more than 50 major fences. His connections ranged across the State. At the end of this investigation, 36 felony charges had been filed in reference to his activities. Tim would gather a crew and start cruising in a residential area. He looked for cars with the motor running, whose owners had gone into the house to get warm and drink that last cup of coffee before work. On one occasion, Tim and his helpers brought six cars into the store front before 10:00 a.m. All of the vehicles had been stolen from the same block.

One of Tim's many specialties was rural residential burglaries. He and another thief, Dick, would take LSD and case a rural area. Several times they saw goats and cows and, hallucinating under the influence of the drug, thought the barnyard animals were uniformed police officers. Tim and Dick would shoot the beasts, and Dick would mutilate the dead or dying animals by cutting out the udders and genitals.

The countermen arranged to have Tim arrested. They advised uniformed officers that Tim was in a stolen vehicle at a certain location. A high-speed vehicle chase resulted and, when the dust cleared, Tim leapt from his vehicle and ran. He stumbled and fell, dropping his pistol. As his out-stretched fingers were closing around the butt of the gun, tragedy was averted by a patrol officer with a 12-gauge shotgun. Tim looked at the barrel of the shotgun, calculated the odds, and dropped the pistol. He was arrested without further incident.

Tim injected himself with amphetamines on a regular basis. He seldom slept and figuratively punched a timeclock with his stealing. He kept dozens of hats and wore a new one during each theft, which was his way of disguising himself. Tim now is in custody and faces a 70-year sentence is the state penitentiary.

3. DRUGS

In the early stages of this investigation, it became apparent that drugs and stolen goods fit together like a hand in a glove. Many local fences paid for stolen goods with drugs. Several thieves would take the money earned from selling stolen property and invest it in drugs, which they then sold for a larger profit. A very substantial number of the thieves encountered used drugs on a regular basis or were addicted to a specific drug.

The U.S. Drug Enforcement Administration, State, and Local Vice and Narcotics Detail supplied additional funds for drug purchases during this investigation. Narcotics defendants numbering 201 faced a total of 256 drug charges. Several drug defendants were instrumental in introducing undercover officers to sources of stolen goods. In many cases, officers initially bought drugs from a defendant and later purchased stolen property.

4. THE FENCES

Twenty-five active fences had felony cases filed in District and Federal Courts concerning their activities. Several other borderline fences also were arrested. Some of these defendants had no prior felony arrest records, which simply means that they were shrewd enough not to get caught until this investigation.

To illustrate the scope of their business activities, brief biographies follow of several individuals and groups of fences.

4.1 Suspects 204, 204A, 212, 256, 356

These six individuals formed the foundation of a crime structure that was well-organized and versatile. They reaped tremendous financial rewards from preying on the weaknesses of the young and lost. A stable of young callgirls was maintained, and each girl was supplied the heroin necessary to keep her working. If a girl showed signs of independence, she was beaten into submission and her drug supply was temporarily withdrawn.

When the organization received information concerning lucrative merchandise that could be obtained through burglary or theft, they would enlist some young thieves, preferably juveniles, to do the job. The payoff for the theives would be drugs. A group of overweight girls periodically would be sent to visit unscrupulous physicians for Preludin prescriptions. The organization would collect the drugs, give each girl one pill for her trouble, and sell the remaining pills for $5.00 apiece.

This group also arranged the theft of several interstate shipments, never committing the actual theft but reaping all of the profits.

4.2 Suspect 272

Jim is a likeable person, the good old country boy type. He has an engaging smile set off my missing front teeth. Underneath the rough exterior, he is a shrewd businessman who maintained several warehouses stocked with stolen goods. His previous arrest record includes theft of interstate shipments. Jim dealt in stolen property, primarily by the truckload. Connections in the Cotter area, across the state, were available to him for disposing of stolen cars. However, he liked doing business with the store front because it was closer. Jim would call the countermen and make arrangements to sell his merchandise. He would pay a driver $50 to bring it to the BMI and, after the driver left, Jim would come and collect payment.

Jim presently is serving a term of 19 years in the State penitentiary as a result of this investigation.

4.3 Suspect 2

Frank is a sharp dresser, well-groomed, with styled hair and expensive clothes. He supplied a ring of thieves with drugs and they supplied him with stolen cars, credit cards, and car titles. He did not steal but obtained the property from others.

Frank was a drug dealer and invested most of the money earned from the sale of property in dope. His main ambition was to work for the Mafia. He tried to look the part and affected dark sunglasses and dark suits. On the day of his arrest, he came to the store front to arrange to meet the syndicate bosses.

Frank presently is serving 15 years in the State penitentiary.

4.4 Suspects 74 and 84

Jerry and Art operated in a specialized manner. Jerry handled vehicles and interstate shipments, while Art handled guns. Jerry employed a group of juveniles to steal the merchandise. He would take the payoff and give the others a pittance. Art had the connections for trading in automatic weapons, as well as any other types of firearms.

Art recently was apprehended, and Federal authorities are presently trying to determine the sources of his gun supplies. Jerry is a fugitive and is wanted by both Federal and State authorities. He also is wanted for questioning in the beating of his ex-girlfriend.

4.5 Suspect 309

A female undercover officer began an investigation of Bob and his brothers. The officer posed as a prostitute and readily was accepted into the group. She observed thieves bringing hot goods into Bob's residence on five different occasions. He paid the thieves with cocaine or marijuana.

Drug traffic also was heavy. Surveillance personnel counted 27 vehicles coming and going during a two-hour period. The officer purchased a television from Bob, which finally was traced to a residential burglary in a nearby city. Charges are pending in this case.

4.6 Suspects 106 and 151

This husband-and-wife team lived in a neat, middle-class home and appeared to be a normal couple. They specialized in fencing items stolen from a shipping company by a ring of thieves in their employ. The goods were invariably new, still in the original cartons.

Undercover officers were aware that on three occasions, Homer had been offered employment with established local businesses. Homer told the officers that the winter months were too cold to work and that he could make more money with less effort fencing hot goods.

Homer and his wife had no prior records and received suspended sentences after fully cooperating with Federal authorities.

4.7 Suspects 127 and 240

Ed operated his business in the Silver City area, and Bill was based in the eastern part of the state. The technique employed was simple. Ed would befriend individuals working for appliance stores. After gaining their confidence, he would convince them to steal merchandise from their employers and sell it to him. Bill handled stolen vehicles and guns primarily. He would buy a load in another part of the State and bring it to Silver City to distribute.

Ed and Bill were observed to be both users and dealers in drugs. Towards the end of this investigation, there was a marked deterioration in the way they handled their business. They had become so dependent on drugs that it was increasingly difficult for them to function in a normal manner.

4.8 Suspect 323

Ray is a mental patient with a history of suicide attempts. He operates a small gas station on a main highway in the metropolitan area and uses the station as a front for his fencing business. Ray buys property from thieves who specialize in residential burglaries. His operation is small, and he deals with a select group of established connections.

4.9 Suspects 60 and 63

Larry and Rich are brothers, neither of whom has ever held a job. They live with their girlfriends and several children in a ramshackle shack on the north side of the city. All business activities are conducted in their residence, and the money they earn is reinvested in Preludin, which they use and deal.

Most northside thieves have fenced property through these brothers at some time.

4.10 Suspect 210

The term "den of thieves" accurately applies to the residence of this defendant. He controls a sophisticated, well-organized group of individuals involved in thievery and drug distribution. The residence resembles a fortress, with no knob on the outside of its solid-oak front door. A spiral staircase leads upstairs, and a trap door can be lowered which barricades this area. Howie has a lengthy prior criminal record, and he has been known to harbor fugitives at his residence for long periods of time. Undercover officers have observed as many as 30 people entering the residence during an hour's period to purchase drugs and sell hot property.

On one occasion, a female undercover officer entered the residence to make a drug purchase from Howie. He was not at home, so the officer talked with one of Howie's old ladies about drugs. During the conversation, the officer felt that she was being watched. She looked over her shoulder and was shocked to see three burly dudes closing in, one armed with a claw hammer. The officer didn't waste time with goodbyes and hastily left. She later determined that the characters staying at Howie's house knew that she had money. They had planned to rob her and were stopped only because of her quick reaction.

4.11 Suspect 59

Willie was a long-time southside fence, dealing primarily in guns and motorcycles. He traded drugs for the property and bootlegged whiskey on the side. Willie did not work, but he owned rental property

and lived well. He presently is serving one year in the Federal penitentiary.

4.12 Suspect 286

Dave owns an old service station in the packing town area. The pumps haven't worked since 1948, but he's been open for business every day. A guy can buy a bottle of whiskey after hours, get a little dope, or sell hubcaps, CBs, and stereo equipment. Dave's criminal record is long and diversified. When he was arrested during this investigation, he suffered a nonfatal heart attack. He presently is convalescing from his illness.

4.13 Suspects 169 and 170

This husband-and-wife team dealt in dope and stolen goods, operating primarily from their residence. Neither was employed and they lived exclusively from the proceeds of their fencing activities. On one occasion, a local thief traded credit cards and a checkbook taken during a strong-arm robbery for two hits of Dilaudid.

4.14 Suspects 322 and 301

Leo and Phil are typical of most of the individuals previously profiled. Both were drug users and dealers. They employed juveniles to steal for them and paid for the loot with drugs. They had an aversion to work and lived on the proceeds of illegal activities.

Phil recently was apprehended and is being held in the county jail until trial. Leo was bound over for jury trial and presently is out of jail on bond.

5. THE WOMEN IN OPERATION XXX

When the command selected personnel for this investigation, two women officers were included, and their number has since increased. The farsightedness of this decision was proven throughout the operation.

The purpose of this section is not to compare the performance of male and female officers but to demonstrate that female officers do have a definite place in covert activities. New territory was explored, and pairs of female officers posing as junkies and prostitutes created a new angle. A pair of officers posing as husband and wife netted 29 defendants.

When sitting in smokey barrooms, couples or mixed groups are not so conspicuous as two or more males. Many defendants commented after their arrest that they had never suspected the blue-jeans clad, long-

haired women of being police officers.

Silver City is one of several projects to employ women in the same operational capacity as men. Times are changing, and law enforcement personnel need to utilize all of the resources available. Undercover work demands resourcefulness and an open mind. New concepts must be tried to keep the good guys one step ahead of the bad guys.

6. AFTERMATH

The excitement of the raid is over, and the tedium of the courtroom has begun. However, the job is not completed. Other undercover phases are ongoing, and the paperwork continues.

Every two months, radiograms are issued on the outstanding fugitives. This policy already has resulted in the apprehension of six individuals. If the fugitives are kept in the forefront, some patrol officer may spot one of them on routine patrol and remember, "Hey, this guy is wanted."

Surrounding municipalities have been given lists of unclaimed property in the hope that a detective somewhere will recognize some of the items and help locate the owner.

The reward is not sending deserving folks to the penitentiary, it is hearing the victim's voice when he's told over the phone that you've recovered the car he never got around to insuring and seeing his face when you deliver it to him. This makes everything worthwhile.

APPENDIX B

Time-Series Methodology in Criminal Justice Evaluation

Prepared by
Tom Roth
(Adapted from material in preparation for publication)

1. INTRODUCTION

The classic pre/postexperimental design frequently has been criticized as an experimental approach in program evaluation (Guba, 1969). The design's requirements of random assignment to conditions, strong treatment control, and design stability are seldom attained in what one authority on evaluation, Carol Weiss, has described as "the turbulent setting of the action program." Quasi-experimental designs for projects that fail to meet the strict requirements of the experiment have been suggested by Campbell and Stanley (1963). (For other discussions, see Caporaso and Roos, 1973; and Cook and Campbell, 1976.)

One of the best designs for analyzing quasi-experimental data collected before, during, and after an intervention is the time-series design. Time-series analysis basically involves making periodic measurements on dependent variables prior and subsequent to a treatment. One major advantage of time-series methodology is that these designs allow the evaluator to judge whether an effect "increases or decays, or whether it is only temporarily or constantly superior to the effects of alternative interventions" (Glass et al., 1975). On the other hand, the simple pre/post design allows inferences only about average changes in level. This appendix summarizes developments in time-series analysis and proposes it as a general methodology for assessing the outcome of criminal justice programs.

In the simplest case, a time-series design would consist of periodic measures on a single dependent variable for one isolated intervention. Among other applications, Deutsch and Alt (1977) used this approach for evaluating the impact of a new gun control law in Massachusetts. However, this design has the possibility of several threats to its internal and external validity. For example, the effects of concurrent historical events can be responsible for any changes in the nature of the series. This historical threat to validity and other threats can be minimized or rendered less probable by employing one of several other designs.

The first of these more complicated designs is labeled by Glass et al. as a Multiple-Group/Multiple-Intervention design. With this approach, time-series data are collected for both the group that receives a program of intervention and one or more comparison groups that receive alternative interventions or no intervention. This approach is analogous to the treatment control design in classic experimental methodology.

In a frequently cited study, Campbell and Ross (1968) and Glass (1968) used a Multiple-Group/Multiple-Intervention design to control for historical events by comparing traffic fatality rates in Connecticut following a speeding crackdown (intervention) with the rates found in comparison States without a similar change in law (non intervention). If a change in level or direction in fatalities was found in the target State but not in other States, the effects of irrelevant historical events as an alternative explanations of treatment effects would be rendered less likely. However, Glass's results suggest that the speeding crackdown was effective in reducing fatalities.

The Multiple-Group/Multiple-Intervention design also can be expanded by adding other dependent variables. This design has been labeled the Interrupted Time-Series with Nonequivalent Dependent Variables (Cook and Campbell, 1975). With this latter design, time-series data are simultaneously collected for a subset of dependent variables that should be influenced by the intervention and for other variables for which, at least theoretically, no effect would be anticipated. Ross, et al. (1970) used such a design to demonstrate that a breath analyzer program in Britain reduced driving fatalities on weekends, when drunk driving was common, but not during commuting hours, when the pubs were closed.

2. TIME-SERIES MODELS

In the past, curve-fitting regression analyses usually have been proposed by analyzing time-series data (Caparaso and Ross, 1973; Mood, 1950; Walker and Lev, 1953) but, as pointed out by Glass et al., the key assumption of independence of data points underlying these tests is likely to be violated when sequential measures are taken over time. That is, if scores at one point in time are related to scores at a previous time, this suggests the presence of serial dependency or autocorrelation. If not taken into account, autocorrelation can serve to reduce error variance, resulting in a positively biased significance test. (Several examples are given in Jones and Vaught, 1972.) The presence of a positive autocorrelation may lead one to infer that a program had an effect when none would be detected with a more appropriate statistical test. This kind of mistaken inference generally is referred to as a Type I error. Time-series models of the kind developed by Box and Jenkins (1976) realistically assume that observations are autocorrelated. The use of Box-Jenkins models in time-series analysis is the focus of the remainder of this appendix.

Basically, the variety of time-series analysis that is recommended herein uses a two-step procedure. In the first sequence, the data are examined to determine which of a number of specific stochastic models adequately describes the nature of the series. In the second phase, the identified model is used to generate statistical tests for measuring the change in the level of slope in a series due to a program or

intervention. This procedure logically differs from the classical procedures that always begin with a model as given (e.g., analysis of variance) and subsequently constrain the data to fit the test's assumptions.

The general model employed for Directed Patrol evaluation is called the AutoRegressive-Integrated Moving Average model (ARIMA). This model was developed by Box and Jenkins (1970, 1976), and its usefulness for evaluation purposes was elaborated by Glass et al. (1975). In general, the ARIMA model is described by a combination of three parameters. The first parameter, the autoregressive parameter, describes a series in which an observation at one point in time is predictable from earlier observations. A first-order autoregressive series would be characterized by having observations at time t predicted to some extent by earlier observations t-1 to t-n.

The second parameter, which describes the dependency in the time-series, is the moving -averages parameter. Unlike the autoregressive dependency, a moving-average process assumes that one or a number of random shocks occur that are partially absorbed into a series. Thus, an observation t would be dependent on current random shock and a portion of a previous random shock in the series.

The third parameter, differencing, is needed to produce a stationary series. According to Glass et al., a "stationary series is one in which the series remains in equilibrium around a constant mean level, although its oscillations around the mean need not be random. If the series is not stationary, successive differences are taken until the resulting series is stationary." An example of a nonstationary series with a linear trend would consist of a time-series with the following data points: 1, 3, 5, 7, and 9. First differencing, or taking points t minus t_2 reduces the series in the following values 2(3-1), 2(5-3), 2(7-5), and 2(9-70. In this example, first differencing caused all of the data points to have a value of 2 and, hence, to reflect a stationary series. The Box-Jenkins models require stationarity to conduct the appropriate analyses. Caution is warranted in differencing data to produce stationarity, as Padia (1977) notes that overdifferencing can increase the probability of a Type II error of inference, wherein one erroneously concludes that there was no effect due to intervention.

Convention prescribes that the order of the autoregressive component be expressed first, followed by the order of differencing required to produce a stationary time-series and finally by the moving-averages term. Thus, an ARIMA (0, 1) model represents a time-series model that has no autoregressive term (order = 0), with first differencing containing one moving-average term.

3. MODEL IDENTIFICATION

How does one recognize which ARIMA model appropriately describes a time-series? To describe the model identification process, the concept of a correlogram must be introduced. Again borrowing from Glass, a scatterplot can be produced between each data point t and the data point one step removed from the original point t + 1. This scatterplot defines a lag-1 autocorrelation coefficient. Lag-2 correlations show the relationship between each measure and the measure two steps removed. The plot of these resultant autocorrelations as a function of the lag is called the correlogram of the series.

The correlogram derived from a time-series plot is used to identify the Stochastic model that best fits the raw data points. Each Stochastic model has a recognizable pattern of autocorrelations. For example, an autoregressive series correlogram is characterized by autocorrelations truncating or abruptly dropping to zero after a certain lag. The number of lags necessary to reach this cutoff represents the order of the process. On the other hand, a moving-average process decays exponentially or slowly after the first lag.

Conversely, the partial autocorrelation function for an autogressive process decays exponentially, while a moving-average partial autocorrelation tends to truncate to zero after a specific lag.

4. EXAMPLES OF THE MODEL IDENTIFICATION PROCESS

In October, 1976, the Kansas City, Missouri, Police Department installed 25 concealed cameras in commercial establishments in its East Patrol division, one of five divisions comprising the department's jurisdiction. The stores selected for installation were characterized by high levels of armed robberies and included motels, convenience stores, and fast-food restaurants. This example focuses on comparing the frequency of armed robberies at these sites before and after installation of the cameras. Figure 1 presents the monthly frequencies for the target stores.

The raw data, with 59 pre- and 12 postimplementation data points, were entered into a computer program (Correl; Bower, et al., 1975) to identify the autocorrelation function (or correlogram). The correlogram indicated that the autocorrelations for the zero- order-differenced data do not tend to go to zero (standard errors ranged from .12 to .2118 for the first 14 lags). For first-order differencing, only the first-lag autocorrelation (-39) was significantly different from zero, suggesting a tentative model identification of the time-series as an ARIMA (0, 1, 1) process. However, a test of the residuals between actual and forecasted values involving a chi-square goodness-of-fit test lent further support to the tentative model identifications as ARIMA (0, 1, 1) (Box and Jenkins, 1976).

After the model describing the robbery rate was identified as an ARIMA (0, 1, 1) process, the data were entered into a second computer program, TSX, which performed a least-squares analysis for all specific values of the appropriate moving-averages parameter, as identified from the correlogram. The TSX program outputted the values of the moving-averages parameter for which the residual sum-of-squares was minimized. At this point, t-tests for changes in the slope and level of the time-series were computed by the program and the statistical significance of the effects of the intervention determined.

Results of this analysis showed that the time-series t-statistic for change in the level of robbery was - 1.97, which showed a statistically significant reduction beyond the .05 level. The time-series analysis supports the contention that a change in the rate of robberies occurred at camera sites but was not sufficient in itself to permit the conclusion that the presence of cameras was the sole cause for reducing crime. Other competing factors must be considered. For example, camera sites were selected for having extremely high preprogram rates, and it is very likely that the postimplementation rates would regress back towards their baseline level without any intervention. This artifact, called regression to trend, cannot easily be ruled out in this example, although subsequent analyses of similar stores without cameras in East Patrol and other jurisdictions showed no significant reductions in crime (for more detail, see Roth, 1978).

5. DATA REQUIREMENTS FOR TIME-SERIES ANALYSIS

Glass et al. (1975) and Padia (1976) note that adequate model identification is difficult without a minimum of 50 points (the concealed camera example employed 71 data points). Furthermore, Jones and Vaught (1973) suggest, as a rule of thumb, that at least ten postintervention observations be obtained before attempting the type of analyses described in this paper. However, there are no hard rules for determining the appropriate length of the series.

6. SEASONAL VARIATION

The situation becomes very complicated when time-series have a seasonal or cyclic pattern that often is felt to typify crime-type data. For example, burglaries might be expected to increase in December (monthly), on weekends (weekly), or in the early evening (daily). To obtain an adequate baseline for separating a real effect from seasonal variation, Glass et al. (1975) recommend that one should observe four to five times the seasonal length of a series prior to an intervention. However, obtaining such data may prove costly or impractical in many evaluation settings.

Several methods have been proposed for "partialling out" the influence of seasonal variation. Stop-gap measures have included smoothing or deviating an observation around the average score for all identical months obtained from baseline data. Other approaches (i.e., covariance analysis and multiplicative time-series models) are just in the infancy of their development for evaluation purposes. (For a detailed treatment, see Glass et al., 1975; Box and Jenkins, 1976; and Bibbs.)

Box and Jenkins (1976) note that it should be possible to identify a model with a repetitive seasonal component of known length by examining its correlogram. For example, if the seasonal length corresponds to one year, significantly large autocorrelations should be found at lags 1, 12, 24, and 36. A detailed examination of the first 30 lags for the concealed camera example showed no significant autocorrelations occurring at regular intervels, as would be expected with a seasonal component.

7. MULTIPLE COMPARISONS

The last process in time-series analysis to be presented is the process of comparing two or more series in a treatment versus control or other multiple-group design. Several approaches have been offered for handling multiple comparisons, yet no one approach has proved totally satisfactory. Four procedures are briefly reviewed in this section.

Glass (1968) used a planned-comparison approach to test the level of traffic fatalities in Connecticut following a speeding crackdown versus a weighted average of fatality rates from four adjacent States. A t-ratio was computed, with the denominator or variance derived from the common residual differences between actual and predicted scores based on an ARIMA (0, 1, 1) forecasting model.

Gottman, et al., (1969) present a second approach to comparing two or more time-series. Gottman et al. derive a forecasting function from the baseline (preintervention data) of an ARIMA model and use it to forecast a group's scores during and after a treatment. Gottman's approach then compares actual versus predicted postimplementation scores by the process in that follows.

One sum-of-squares (SS_1) is computed by calculating the residuals between the actual postintervention scores and scores predicted from the control group's forecasting function. A second sum-of-squares (SS_2) is derived by applying the experimental group's own forecasting function to derive predicted scores and then subtracting these from actual data points. The formula for an f-test for assessing experimental versus control group differences is given by the equation:

$$f = \frac{(SS_1 - SS_2)/df_1}{(SS_1 + SS_2)/df_2}$$

where $df_1 = 2$ and $df_2 = N-2$.

Kelling et al. (1974) determined maximum-likelihood estimates of an ARIMA (0, 1, 1) model's moving-averages parameter. These estimates reflect the change in level of the time-series from each of the three conditions of their study (proaactive, reactive, and routine police patrol strategies). They subsequently tested the statistical significance of differences between conditions by entering the values of the moving parameter as averages in an unweighted-means analysis of variance (see Winer, 1971). However, Kelling et al. do not discuss their methodology for computing between and within group variation in their technical report. Moreover, since their analysis generally is not discussed in the literature, some questions exist concerning its validity.

Schnelle et al. (1975), in a study of the effects of police deployment strategies, simply examined each of several experimental and control time-series independently. If significant changes were found in the treatment group but not in the controls, it was concluded that the program was effective in reducing crime. This approach frequently is used as a stop-gap measure.

In summary, multiple-comparison procedures remain a thorny problem in time-series analysis. Glass and others are working on new and highly needed procedures.

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APPENDIX C

Crime Index Offenses Cleared by Arrest
(A Definition and Summary from the Uniform Crime Reports fo· 1977)

Law enforcement agencies clear a crime when they have identified the offender, have sufficient evidence to charge him, and actually take him into custody. Crimes are also cleared in exceptional instances when some element beyond police control precludes the placing of formal charges against an offender, such as a victim's refusal to prosecute after an offender is identified or local prosecution is declined because a subject is being prosecuted elsewhere for a crime committed in another jurisdiction. The arrest of one person can clear several crimes or several persons may be arrested in the process of clearing one crime.

In 1977, law enforcement agencies reported that, nationally, 21 percent of the Index crimes were cleared. During the year, law enforcement agencies cleared 75 percent of murder offenses, 51 percent of forcible rapes, 62 percent of aggravated assaults, and 27 percent of robberies. In connection with property crimes, police cleared 16 percent of the burglaries, 20 percent of the larceny thefts, and 15 percent of the motor vehicle thefts. Law enforcement agencies are able to clear a higher percentage of the crimes against persons, not only because of the more intense investigative effort afforded these violent crimes, but more importantly, because witnesses who can identify the perpetrators are often available.*

*U.S. Department of Justice. Federal Bureau of Investigation. Crime in the United States--1977. Uniform Crime Reports for the United States. Washington, D.C.: Government Printing Office, 1978. P 160.

*U.S. GOVERNMENT PRINTING OFFICE : 1979 0-281-380/1567

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