[redacted]

PREPARED BY
THE MAYOR'S CRIMINAL JUSTICE
COORDINATING COUNCIL

FRANK J. VACCARELLA, EXECUTIVE DIRECTOR

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ROGER L. JONES, EVALUATOR

[redacted] THE TARGET AREA CRIME SPECIFICS PROGRAM,
HIGH INTENSITY STREET LIGHTING,
is funded by the Law Enforcement Assistance
Administration, Grant Number 72-DF-06-0042-TA-5

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ORLEANS

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PRIDE BUILDS
NEW ORLEANS

MAYOR'S CRIMINAL JUSTICE COORDINATING COUNCIL

IMPACT EVALUATION REPORT

Project: High Intensity Street Lighting

Project Number: 72-DF-06-0042-TA-5

Subgrantee: New Orleans Public Service Incorporated (NOPSI)

Date of Report: July 1, 1975

Director of Evaluation: Robert Sternhell

Prepared by: Roger L. Jones
Projects Evaluation Specialist III

Evaluation Assistance: Stuart P. Carroll, Projects Evaluation Specialist III
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Suzanne Villar, Graphics

Grant Award:

LEAA	-- $99,282
Subgrantee	-- 15,988
Total Budget	--$115,270

Subgrant Period: 7/15/73 to 6/30/75

Authorized Official: Moon Landrieu
Mayor, City of New Orleans

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EXECUTIVE SUMMARY

The High Intensity Street Lighting Program is directed at the reduction of nighttime criminal offenses in two designated police zones in the city of New Orleans. Through increased illumination this project seeks to reduce the occurrences of certain offenses and increase the degree of safety on the streets. This project is one of eleven funded in New Orleans in July, 1973 to impact the rising rate of criminal activity in New Orleans.

Definitions and Study Objectives

The High Intensity Street Lighting Project is designed to impact on "nighttime crime". "Nighttime crime," for purposes of this study, is defined as those crimes that occur mostly at night (50% + 1) as opposed to during daylight hours. These crimes are to be impacted by "high intensity lights" which are defined as 400 watt mercury vapor lamps of 23,000 lumens intensity.

The focus of this study is the determination of the relationship between crime and increased lighting in two police zones in New Orleans. The study seeks to accomplish several

objectives:

1) To address the question of the existence of a definable category "nighttime crime."

2) To measure the impact of increased lighting on the rate of crime.

3) To measure the efficiency of program implementation.

Procedures

The first objective was satisfied by analyzing the results of studies in other cities with high intensity light projects and by analyzing cumulative data from 1970 through the project year, 1974. From these considerations a definition was structured and analyzed for its applicability to the research under scrutiny here and in other cities.

The second objective was satisfied by analyzing crime data for experimental, control, and adjacent areas for the hours of darkness and comparing this to daytime totals. Also, a summary treatment of this data was conducted through Time Series Analysis of data from January, 1970 - December, 1974. This longitudinal treatment of data gives an indication of shifts in trends and patterns of criminal activity.

Impact

The effect of the installation of new high intensity lights in police zones 6F and 6I in the city of New Orleans is negligible over the first nine months of project operations.

The patterns of offenses during the post-street lighting period is not appreciably different from the pre-street light period. The changes that occur tend to be random rather than associated with the degree of lighting change.

Costs

The allocation from the State Planning Agency for street lighting was $99,282. Actual expenditures were well below the estimated amount for the project, resulting in a project that could have been 40% larger based on available funds.

The only cost for this project were for equipment and maintenance of equipment after installation. No staff or office space was paid from this grant.

Recommendations

As a preliminary evaluation of the High Intensity Street Lighting Project the following recommendations are made:

1) That future programs such as this be correlated to pedestrian traffic, mobility, and context of the neighborhood in general.

2) That the installation of street lights be closely related to a crime-reduction model that is thoroughly researched.

3) That fund expenditure in New Orleans for new street lights have a sound theoretical basis that has measurable goals relating to crime reduction.

I

INTRODUCTION

The Problem

The rising rate of crime that occurs during the hours of darkness has been the focus of innovative types of programs that have sought to reduce not only the level of criminal activity but also the level of public fear that exists. The Target Area Crime Specifics Program in the City of New Orleans attempted to impact on this problem through high intensity street lighting that would increase the level of illumination on streets and thereby make the occurrence of crime less likely. More specifically, the Street Lighting Program was directed at "nighttime crime"*, and sought to reduce its rate of occurrence. The Street Lighting Program was funded by the Law Enforcement Assistance Administration, and was one of eleven target area projects that concentrated on specific areas of concern.

The basic premise of the Street Lighting Program was that by increasing the amount of light in an area, the incidence of selected offenses would decrease. In the original plan, the crimes identified were robbery, burglary, and auto theft.

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*"Nighttime Crime" in general covers those offenses that occur predominantly during the hours of darkness. A more detailed explanation is in the definition section.

However, a post-hoc investigation of the original plan for street lighting revealed that certain problems existed with the choice of these crimes, and closer scrutiny was in order. Moreover, problems were also discovered in the methodology and design sections of the original plan.

The Project

The Street Lighting Program was designated for police zones 6F and 6I and included the installation of high intensity street lights and their subsequent maintenance. The selection of this area was based on criteria that was stated in the Target Area Crime Specifics Plan as follows:

> "Among the characteristics to be considered in determining the specific locale for such a project are the amount of crime occurring in the area, the estimated extent of the juvenile delinquency problem, the density of population, and the general living conditions of the area"[1]

Utilizing this criteria, police zones 6F and 6I were selected as experimental areas for the street lighting project (Figure 1). The manner in which these criteria were used in the planning process, particularly as they led to the selection of zones 6F and 6I, will be explored under the headings baseline and demographic statistics later in this section.

Goals and Objectives

The goals of the project are as stated below:

Goals:

An overall reduction in nighttime crime perpetrated by juveniles and adults within the experimental area.

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[1] Target Area Crime Specific Plan, CJCC, p. 117.

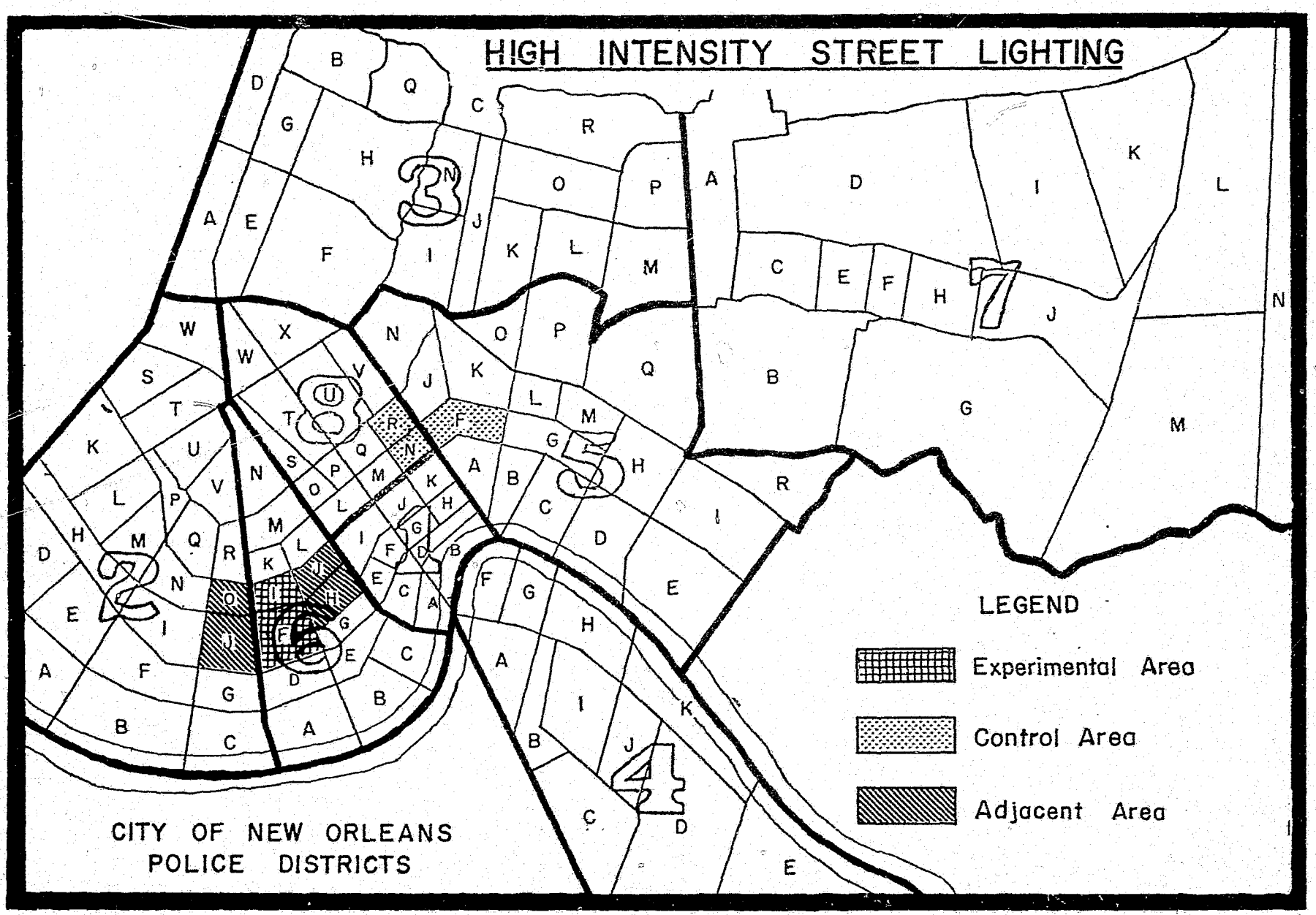
HIGH INTENSITY STREET LIGHTING
LEGEND
Experimental Area
Control Area
Adjacent Area
CITY OF NEW ORLEANS
POLICE DISTRICTS

FIGURE 1

A. The reduction of nighttime armed robberies.

B. The reduction of nighttime business burglaries.

C. The reduction of nighttime auto thefts.

D. The reduction of nighttime stranger-to-stranger street crimes.

Objectives:

1. The immediate installation of 559 new high intensity lights (400 watt-23,000 lumens intensity) at each corner and in the middle of each block of the area bounded by St. Charles, Jackson, Louisiana, and Claiborne.

2. Maintenance of lights by the Department of Utilities.

The goals and objectives of the project are basically the same as those in the original planning document. Two goals, dealing with apprehension rates and resident's perceptions of safety, were eliminated during revision because of their tertiary importance to the scope of the evaluation. The statistical treatment of both descriptive and analytic data is the major, almost sole, consideration of success or impact.

This report will document in the following pages activities and problems encountered from the planning process thru implementation, and also include problems encountered in the evaluative process.

Baseline Data

Crime Statistics - During the pre-planning period for the street lighting program, zone 6F had the highest incidence of

armed robbery against non-pedestrians in the city. In zone 6F, 76% of the business burglaries occurred at night with 68% occurring between midnight and 6:00 a.m. Similarly, over 74% of the auto thefts in zone 6F occurred at night. The figures for zone 6I, while less dramatic, support the pattern of nighttime crime found in zone 6F.

Table 1 shows the total incidence of selected offenses in the experimental area for the pre-planning years 1970-1972, and the percentage of these offenses occuring during the hours of darkness (6 p.m. - 6 a.m.). Though only the first six months of 1972 were used in the planning stage of the street lighting project, the full year statistics are included here. Additionally, the original use of armed robbery, business burglary and auto theft as the target crimes was enlarged to include assaults, simple robberies, thefts of value, purse-snatchings, pedestrian robberies, and strong arm muggings. These offense categories were added by the evaluator during the evaluation.

Based on figures that were available to planners, Table 1 indicates, in retrospect, a fairly high, but uneven incidence of business burglary, auto theft, and armed robbery at night in the experimental area. During 1970 and 1971, assaults and pedestrian robberies are also shown to occur with frequency. On the assumption that business burglary, auto theft, and armed robbery required a degree of stealth afforded by darkness, the CJCC selected zones 6F and 6I as the experimental area. This approach to defining nighttime

TABLE 1

TOTAL OCCURRENCE OF SELECTED OFFENSES IN THE EXPERIMENTAL AREA AND PERCENTAGE OCCURRING AT NIGHT BY YEAR AND OFFENSE CATEGORY

OFFENSES	1970		1971		1972	
	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT
ASSAULT	65	60.0	69	53.6	74	55.4
BUSINESS BURGLARY	139	59.0	181	64.6	96	49.0
SIMPLE ROBBERY	50	54.0	54	48.2	41	41.5
AUTO THEFT	267	58.1	274	64.2	229	61.1
THEFT-VALUE*	442	43.0	393	36.9	329	37.4
PURSE SNATCHING	53	54.7	64	43.8	68	30.9
PEDESTRIAN ROBBERY	94	60.6	105	46.7	143	42.0
STRONG-ARM-MUGGING	52	51.9	55	45.5	41	41.5
ARMED ROBBERY	245	58.8	191	43.5	170	40.6

*THEFTS CLASSIFIED BY VALUE OF PROPERTY STOLEN

SOURCE: N.O.P.D.

crime ultimately contributed to severe conceptual and analytic problems, that included selection of the control, and adjacent areas, and a decision as to the definition of "high-intensity". The aggregate affect of the flaws in the project's design and objectives was to hamper the potential impact of the street lights upon nighttime crime. This topic is discussed in some depth in the conclusion.

Demographic Statistics

The street lighting project was designated for police zones 6I and 6F, which have the boundaries of St. Charles, Louisiana, South Claiborne, and Jackson. In addition to having a high crime rate in relation to other zones of the city, the experimental area also had other demographic characteristics that were considered important with regard to patterns and trends of crime. Since many of these variables were not adequately identified during the planning phase, the evaluator altered the control and adjacent areas to make them comparable in (1) population, (2) racial composition, and (3) number and type of housing units, to the experimental area.

Original Selection of Areas

Neither the planning document nor the evaluation design adequately dealt with the selection of the target areas: experimental, adjacent, and control. The original selection procedure used crime statistics and the percentage of the population as black to derive the three areas. Major emphasis was placed on the identification and matching of high-crime zones.

The emphasis on crime as a predictor of area selection distorted the desirable match in demographic measures that describe "life style". As a result, although the experimental, control and adjacent areas were similar in crime rates, they were decidedly dissimilar in population, percentage black, density, and housing conditions. To remedy this condition, the control and adjacent areas were modified, using the variables indicated above.

Revised Selection Process

The objective of the revised selection procedure was comparability among the three areas. Table 2 shows the breakdown for the areas on the selected demographic variables: population, percentage black, black ownership, and persons per dwelling unit. The last is a measure of density, and is usually closely associated with high crime rates. Similarly, areas with a high concentration of renters tend to have higher crime rates per capita than an area that is primarily owner occupied.

A basic lesson acquired from this exercise suggests that for street lighting to be more effective, considerations such as density - population and housing, pedestrian traffic, mobility, economic conditions, stability, and size, must be reviewed, and a sound theoretical base established around these characteristics, prior to the institution of any new effort.

Factors such as mobility and pedestrian traffic are considered important variables in the assessment of lighting

TABLE 2

POPULATION AND HOUSING CHARACTERISTICS BY POLICE ZONE FOR EXPERIMENTAL, CONTROL, AND ADJACENT AREAS, AND CITY TOTAL FOR NEW ORLEANS

POLICE ZONE		POPULATION		HOUSING UNITS			
		TOTAL	PERCENT BLACK	TOTAL	PERCENT BLACK OWNERS	PERCENT BLACK RENTERS	PERSONS PER DWELLING UNIT
EXPERIMENTAL	6 F	16,991	87.9	5,160	13.2	86.8	2.89
	6 I	7,895	90.8	2,230	8.2	91.8	3.21
	TOTAL	24,886	88.8	7,393	11.7	88.3	2.99
ADJACENT	2 O	3,682	86.0	1,070	25.3	74.7	2.96
	2 J	8,411	71.2	2,592	22.5	77.5	2.31
	6 H	7,944	99.5	2,684	6.6	93.4	2.95
	6 J	1,957	99.0	664	10.1	89.9	2.92
	TOTAL	21,994	86.4	7,010	15.7	84.3	2.70
CONTROL	5 F	9,188	86.5	2,270	27.6	72.4	3.50
	8 N	6,758	96.8	2,055	11.2	88.8	3.18
	8 R	4,341	78.0	946	23.1	76.9	3.58
	TOTAL	20,287	88.1	5,271	20.4	79.6	3.39
ZONES	TOTAL	67,167	93.1	19,674	15.4	84.6	3.18
CITY	TOTAL	593,471	45.0	74,058	26.8	73.2	3.61

SOURCE: U. S. BUREAU OF CENSUS – CENSUS OF HOUSING: 1970
HC (3) - 101 BLOCK STATISTICS

appropriateness because of their relationship to the types of crimes under scrutiny. For example, street crimes such as pedestrian robbery, strong arm mugging, and assault are less likely to occur on a street with moderate pedestrian traffic than low traffic, since traffic increases the possibilities for identification and/or apprehension. (This assumes that some degree of observation and participation will come from other pedestrians not directly involved in the incident.) Similarly, if highly mobile pedestrian traffic exists in an area, different types of crimes will occur than if the traffic consists of residents of that area.

The experimental area is not a highly mobile area and does not have a high degree of pedestrian traffic. The absence of these characteristics could possibly be of importance in determining the overall impact of increased street lighting. For example, the absence of victims for perpetrators of crime should influence the frequency of certain types of crime (decreasing pedestrian robbery and increasing business burglary).

II

RESEARCH DESIGN

The High Intensity Street Lighting Project is directed at the reduction of "nighttime crime" occurrences through increased illumination of streets within two police zones in New Orleans. The basic premise is that by increasing illumination in these two zones, the possibility for successful criminal activity, without being identified, will be reduced, and as a consequence, the rate of crime should decrease.

Hypotheses

The hypotheses that evolved from the planning process are as follows:

(1) That auto thefts, burglaries, and armed robberies in the experimental area would decrease during the hours of darkness as the intensity of lights in the area increases.

(2) That as the intensity of light in the experimental area increases criminal activity will be displaced into adjacent areas.

Assumptions

A presumption is made in the specification of these hypotheses that there is a definable category that can be called "nighttime crime". That is, certain crimes are

affected more so than others by the increased lighting. Other assumptions made relative to street lighting are as follows:

(1) That crimes of stealth will be discouraged by increasing chances for identification of perpetrators, and thereby increasing clearance rates for crimes committed.

(2) That the incidence of offenses will be reduced by discouraging would-be offenders before crimes are committed.

(3) That an increase in the perceived level of safety of residents will be experienced in the experimental area.

(4) That crime will be displaced from the experimental area into adjacent areas that lack high intensity street lights.

(5) That a shift will occur in the overall pattern of crime in the experimental and adjacent areas due to the changes in lights, and that trends in other areas will not be affected.

(6) That despite changes in environment (lighting), potential offenders will not make adjustments to the new conditions but will seek an environment that is more conducive to criminal activity.

Definition of Terms

(1) Nighttime Crime: The planning document defined nighttime crime operationally as those crimes of burglary, robbery and auto theft that occur between the hours of 6:00 p.m. and 6:00 a.m. The absence of specificity in this definition required the formulation of a new definition.

As a starting point, the evaluator identified those crimes that occur more frequently at night than during the day (50% + 1). Additionally, crime categories were broken down (Table 1) so as to isolate particular sub-sets that would be uniquely "nighttime."

Studies conducted by the Law Enforcement Assistance Administration (LEAA)* suggested special emphasis be placed on the offenses of business burglary and auto theft. In the analysis of project impact, these crimes were added to design.

(2) High Intensity Lights

Other difficulties relate to the overall theory of nighttime crime which presupposes that the levels of

* Crime and Victims, A Report on the Dayton, San Jose, Pilot Study of Victimization. Carol B. Kalish. Statistics Division of NCJISS. LEAA. Washington, D. C. 1974

occurrence of certain crimes are affected by changes in the intensity of light. This assumption deserves scrutiny prior to any consideration of impact of the High Intensity Street Lighting Project. While there are possibilities that changes in light can affect crime levels, no definitive study has been made of the intensity of change required to initiate impact on crime occurrence. For example, the lights in New Orleans were changed from 175 watts, (8,000 lumens) to 400 watts (23,000 lumens) while in Portland, Oregon, the lights installed were only 175 (7,000 lumens). Though of weaker intensity than the lights removed in New Orleans, the Portland lights are expected to impact on stranger-to-stranger crimes in a manner similar to that anticipated for high intensity lights installed in the New Orleans experimental area. This factor suggests that if both projects can achieve similar goals with different inputs, then other variables must be present (that are not necessarily the lights or their intensity) that are affecting the change. With this possibility in mind, the New Orleans project should be viewed with extreme caution relative to impact and the effects of light installation.

> The proliferation of lighting projects in the last few years intended to impact on street crimes, vary considerably in cost, type of light selected, and anticipated results. This variance has caused a reliance on the use of definitions germane only to New Orleans. Therefore, for residential areas we will consider 400 watts (23,000 lumens) mercury vapor lights as high intensity lights.

Data Source and Maintenance

The evaluator uses crime statistics collected by the New Orleans Police Department and maintained (and updated) by the electronic data processing division of the Department of Finance, in the form of magnetic tapes. The tapes are transmitted by the EDP unit to a data processor used by the CJCC. The data processor re-created an offense file, of crimes committed prior to the installation of the lights, for the purpose of building an historical data base back through 1970. The historical file was regularly updated with offense information to provide the basis for a comparison of pre-project and post-project crime rates.

Measures

The Street Lighting Project is designed to impact on the rates of crime in the experimental area. For evaluation purposes, in addition to using the crime categories of auto theft, burglary, and armed robbery, as stated in the original planning

document, the following offense categories are also used as measures of impact:

Assault	Purse Snatching
Business Burglary	Pedestrian Robbery
Simple Robbery	Strong Arm Mugging
Theft-Value	

These additional categories are the result of a post-hoc investigation of the categories listed in the evaluation section of the original planning document, and a determination by the evaluator that additional categories should be tested.

The methods used to analyze these offense categories are changes, over-time, in frequencies and percentages and an analysis of trends exhibited by a summary measure - time series analysis. The first method of analysis, changes in frequencies over-time, will deal with the offenses in absolute numbers reported in the experimental, control, and adjacent areas and the fluctuations that occur in this number during night and day hours for the nine month, post-street light installation period.

The second method will compare changes in percentage rate for this same period for control, adjacent, and experimental areas. The changes noted by this method should reflect any shifts that are occurring in the rate of offenses during a time period or in the rate of occurrences of one offense as compared to total offenses. The consideration of percentages and frequency changes, over-time, permits an analysis of changes in the rate of offenses reported during night and day, and

provides a means of answering the basic question of the impact of the street lighting project on reducing crime during the hours of darkness.

The third method of analysis is a summary treatment of data and a review of trends that result. Street lighting is expected to impact on criminal activity in a predictable manner in that pre-project and post-project periods will be distinctively identifiable in their level and pattern of occurrence. Time series analysis presents a means of discerning the degree of impact by noting the effects of an intervention (increased lighting) on the slope and level of observations of criminal activity in the selected areas of study. In defining slope and level we are discussing the linear relationship between the rate of occurrence of crime and the changes that occur through time.

For example, if (I) represents an intervention, a resultant change in level would be depicted as in Figure 2 (a), where an increased level of occurrence is shown without a change in the slope. Figure 2 (b) shows a change in level, upwards, followed by a change in slope (direction of drift). Figure 2 (c) shows a change in slope. The definitions depicted in this figure are:

Level - the amount of occurrence of an event.

Slope - changes in direction of drift of the amount of occurrence resulting from an intervention.

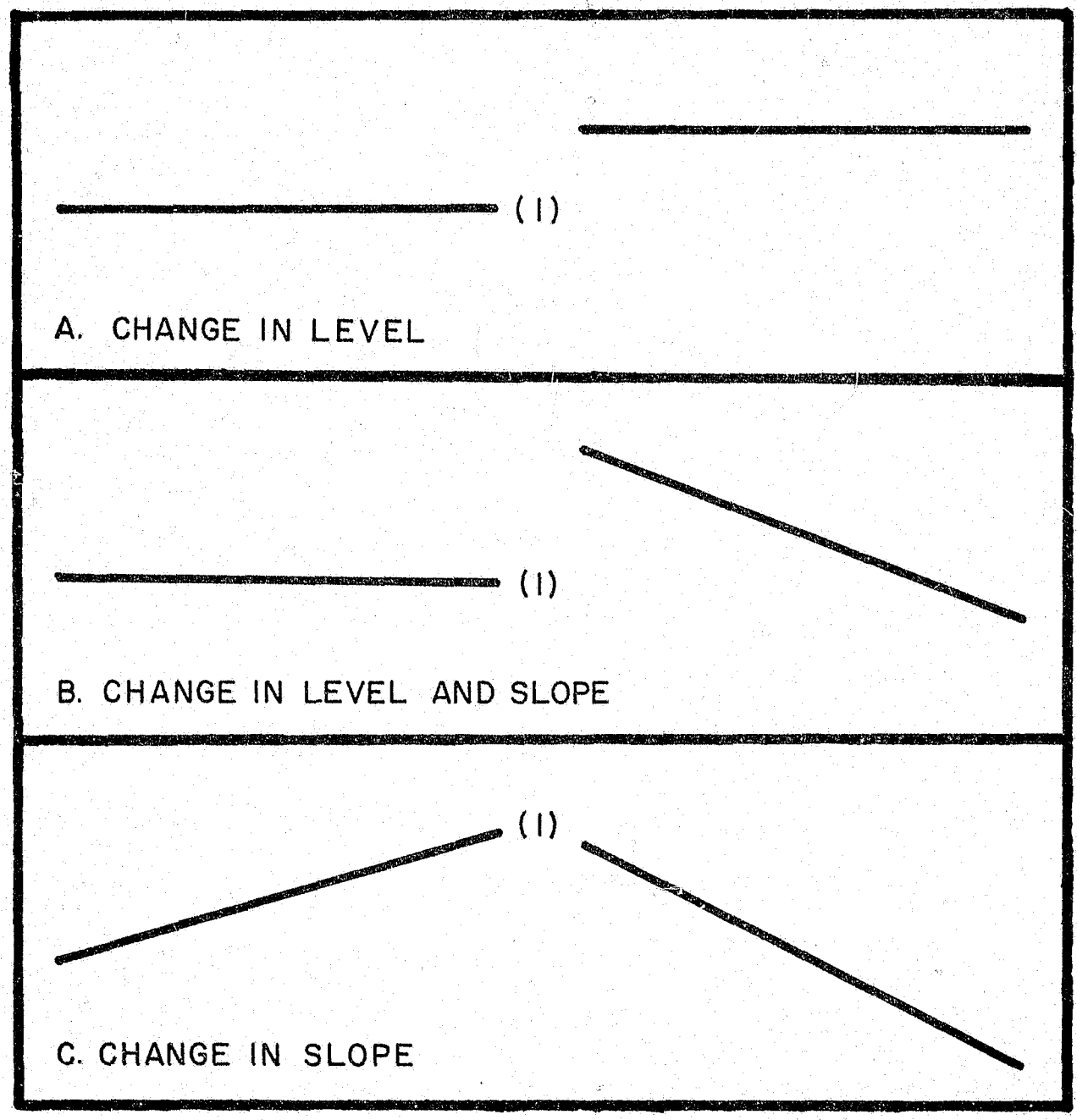

FIGURE 2

INTERVENTION EFFECTS ON THE LEVEL AND SLOPE OF EVENTS IN A TIME SERIES EXPERIMENT

Time series, as a measure of impact, presents a method of analysis based on changes in the above noted level and slope of plotted events in an intervention experiment. Based on the resulting patterns, predictions can be formulated that yield the effects anticipated over a given period of time. These forecasts are in some cases more important than the immediate results experienced after an intervention. This capability is of particular interest relative to the street lighting project.

Since an immediate, abrupt change did not result after the street lighting intervention, it was determined by the evaluation unit that a mentod of predicting the future outcome of effects might prove useful. This prediction capacity permits a study of street lighting that is longitudinal, with a greater possibility for establishing and monitoring milestones that the project should achieve through time. This potential, though long range, is the most reliable measure of project impact of the three noted above.

Each of the methods above will consider criminal activities in the experimental, control, and adjacent areas during the hours of darkness. The results of this analysis will determine the impact that the street lighting project has had on nighttime crime in the experimental area.

The measures in this report use data for the nine month project period in all analysis. This factor must be considered to understand the scope and limitation of this preliminary evaluation.

III

IMPACT

The data in this section is based on a nine month period, April - December, for each of the years considered. This period corresponds to the project period of post-street light installation and the four previous years used as baseline. The data noted in yearly frequencies and percents reflects project year and not calendar year for experimental, control, and adjacent areas.

Experimental Area Frequency and Percent Distribution

Business Burglary

Table 4 shows from 1970 - 1973, 62% of all business burglaries occurred between 6:00 p.m. and 6:00 a.m. Also, during this same period, 50% of all business burglaries occurred during the six-hour period, midnight - 6:00 a.m. 1973 had the highest nighttime percentage occurrence of 67%. The total occurrence of business burglaries in any given year ranged from a high of 129 reported offenses in 1973 to a low of 72 in 1972. In 1970, there were 113 and in 1971 there was an increase to 120. From 1970 - 1974, 51% of all business burglaries occurred between 6:00 p.m. and 6:00 a.m.

The period from 1970 to 1974 in Table 4 shows fluctuations from year to year with a decrease in 1974 just as the pattern of the previous four years would suggest.

Though a decrease was experienced from 1973-74, the data tends to suggest randomness rather than a relationship between increased lighting in the experimental area and the rate of crime. However, a review of the control and adjacent area should clarify this point.

Auto Theft

Table 5 shows 63% of auto thefts occurring between 6 p.m. - 6 a.m. from 1970-1974. The fluctuations shown in this table for the experimental zone are similar to those for business-burglary in the direction of percentage change. Each year has over 57% of the crimes occurring between 6:00 p.m. and 6:00 a.m. There is less than five percent variation, plus or minus, from the average rate of occurrence at night over the five year period. The frequency of total occurrence of auto thefts decreases in 1971 and 1972, and increases in 1973 and 1974.

Theft-of-Value

Table 6 shows frequencies in the experimental area for total occurrences of thefts-of-value. Thefts in the experimental area occurred at a decreasing rate from 1970-1973. In 1970 there were 346 total reported thefts-of-value while in 1973 the total had decreased to 232.

Thirty-nine percent of the thefts-of-value from 1970-74 were reported to have occurred between 6 p.m. - 6 a.m. In 1970 the highest percentage occurrence at night of the five year period was experienced.

Strong Arm Muggings

Table 7 shows strong arm mugging in the experimental area decreasing in night occurrences from 1970-1974. Thirty-eight percent of the strong arm muggings from 1970-1974 were reported to have occurred between 6 p.m. - 6 a.m.

Purse Snatching

Purse snatchings in the experimental area occurred at a decreasing rate at night until 1974, while fluctuating slightly for total frequencies. Though the frequency of total occurrence is fluctuating, the frequency and percentage of occurrence at night are decreasing as shown in Table 8 for the period 1970-1973.

Pedestrian Robberies

Table 9 shows a range of frequencies from 57 to 94 per total reported pedestrian robberies in the experimental area. The percentages for occurrences at night ranges from 37% to 63%. The frequencies and percentages have decreased each year from 1970-1974 with the exception of 1972 for occurrences of night pedestrian robberies.

The characteristics exhibited by the rates of criminal activity for the offenses above provides a basis for the determination of impact in the experimental area. However, in addition to this data we will compare the trends and rates of activity that occurred during this same period for the

control and adjacent area. The section that follows will attempt to determine if significant impact has resulted from installation of high intensity lights in the experimental area.

Control and Adjacent Areas - Frequency and Percent Distribution

Business Burglary

Table 4 shows business burglary occurring at a higher rate at night from 1970-74 in both control and adjacent areas than in the experimental area. The control and adjacent areas had 58% and 64%, respectively, occurring at night while the experimental area had only 51%. The rate of percentage occurrence at night ranged from 62% in 1973 to 74% in 1970 in the control area, while in the adjacent area the range was from 58% to 73% at night. In 1974, the experimental and adjacent areas show decreases in the percentage occurrence at night while the control area increases. The frequencies during 1974 decreased for all three areas.

Auto Theft

Auto thefts in the experimental area occurred at a higher rate at night from 1970-74 than in either control or adjacent areas. Table 5 shows fluctuations across all three areas in frequencies and percentage of night auto thefts. The control area rate ranges from a low of 35% in 1974 to a high of 72% in 1970 for nighttime occurrences. The adjacent area ranges from 54% in 1970 to 69% in 1974. The experimental area has a smaller spread in its range of 58% in 1970 to 67% in 1974.

Both control and adjacent show a larger frequency distribution per auto thefts than the experimental area in every year except 1971. All three areas experienced increases in frequencies in 1974 over 1973 figures.

Theft-Value

Table 6 shows theft-value decreasing each year except for 1972 in the control areas. In 1974 both the experimental and adjacent areas show increases in the frequency of theft-value. The rates of occurrence over the five-year period for control and adjacent areas at night are 44% and 39%, respectively. The control area frequencies ranged from 193 in 1970 to 153 in 1974. The adjacent area rates ranged from 477 in 1971 to 266 in 1973. The rate of occurrence in the adjacent area exceeds that of both experimental and control areas from 1970-74. Table 6 shows increases in both the experiment and adjacent areas in the frequency of occurrence of thefts-value.

Strong-Arm-Mugging

Table 7 shows the number of observations of strong-arm-muggings are lower than for the other crimes considered herein. The frequencies for the control area range from 6 in 1970 to 12 in 1974. The adjacent area ranged from 37 in 1972 to 55 in 1971. The percentage occurrences at night exceed 50% in 1970 and in 1971 in the experimental and adjacent areas respectively, and is 50% in 1971 and 1973 in the control area.

Purse-Snatching

Purse-snatching occurred usually during the day as shown by percentages in Table 8. The control and adjacent areas had 31% and 33% occurring at night from 1970-74. The frequencies for the adjacent area ranged from 49 in 1970 and 1973 to 106 in 1971. Table 8 shows only 1970 with a percentage occurrence over 50% at night and that is in the control area.

Pedestrian Robbery

Table 9 shows 49% and 43% of the pedestrian robberies occurred at night in the control and adjacent areas, respectively. The adjacent area frequencies ranged from 74 in 1970 to 148 in 1974. The control area frequencies ranged from 14 in 1971 to 33 in 1972.

There is no appreciable difference in the pattern of offenses during the post-street lighting period than during the pre-street light periods for either of the offense categories noted above. Control and adjacent areas tend to fluctuate randomly, as does the experimental area with no apparent relationship to either lighting or the lack of it. The above statistics give little indication that a reduction in crime has resulted in the experimental area that can be attributed to the high intensity street lighting program.

TABLE 3

SIMPLE ROBBERY

TOTAL NUMBER OF OFFENSES OCCURRING DAILY AND PERCENTAGE OCCURRING AT NIGHT BY AREA AND YEAR*

	1970		1971		1972		1973		1974	
	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL
EXPERIMENTAL	55.0	40	47.5	40	50.0	28	31.8	22	20.0	25
CONTROL	42.9	7	70.0	10	25.0	8	40.0	10	54.5	11
ADJACENT	48.9	45	51.8	56	37.8	37	36.8	38	39.2	51

Source: N.O.P.D.
Prepared by: C.J.C.C.

*YEAR DENOTES PROJECT YEAR APRIL-DECEMBER

TABLE 4

BUSINESS BURGLARY

TOTAL NUMBER OF OFFENSES OCCURRING DAILY AND PERCENTAGE OCCURRING AT NIGHT BY AREA AND YEAR*

	1970		1971		1972		1973		1974	
	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL
EXPERIMENTAL	61.1	113	64.2	120	48.6	72	67.4	129	63.2	87
CONTROL	73.5	132	71.4	84	70.1	67	61.9	84	68.4	76
ADJACENT	68.1	182	58.0	112	72.5	80	65.0	137	59.1	115

Source: N.O.P.D.
Prepared by: C.J.C.C.

*YEAR DENOTES PROJECT YEAR APRIL–DECEMBER

TABLE 5

AUTO THEFT

TOTAL NUMBER OF OFFENSES OCCURRING DAILY AND PERCENTAGE OCCURRING AT NIGHT BY AREA AND YEAR*

	1970		1971		1972		1973		1974	
	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL
EXPERIMENTAL	57.5	200	63.3	199	61.7	100	64.9	131	66.5	182
CONTROL	71.7	244	55.3	170	59.5	131	60.7	135	34.7	190
ADJACENT	53.9	280	56.6	281	59.6	228	54.2	214	69.4	229

Source: N.O.P.D.
Prepared by: C.J.C.C.

*YEAR DENOTES PROJECT YEAR APRIL-DECEMBER

TABLE 6

THEFT-VALUE

TOTAL NUMBER OF OFFENSES OCCURRING DAILY AND PERCENTAGE OCCURRING AT NIGHT BY AREA AND YEAR*

	1970		1971		1972		1973		1974	
	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL
EXPERIMENTAL	42.5	346	36.1	291	37.2	239	36.6	232	40.5	262
CONTROL	46.1	193	38.5	174	48.1	185	42.5	181	43.1	153
ADJACENT	37.7	435	35.6	477	420	324	43.2	266	40.4	374

Source: N.O.P.D.
Prepared by: C.J.C.C.

*YEAR DENOTES PROJECT YEAR APRIL–DECEMBER

TABLE 7

STRONG-ARM-MUGGING

TOTAL NUMBER OF OFFENSES OCCURRING DAILY AND PERCENTAGE OCCURRING AT NIGHT BY AREA AND YEAR*

	1970		1971		1972		1973		1974	
	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL
EXPERIMENTAL	55.0	40	47.6	42	40.0	35	31.8	22	20.0	25
CONTROL	33.3	6	50.0	12	22.2	9	50.0	10	25.0	12
ADJACENT	45.8	48	52.7	55	40.5	37	35.9	39	33.3	51

Source: N.O.P.D.
Prepared by: C.J.C.C.

*YEAR DENOTES PROJECT YEAR APRIL-DECEMBER

TABLE 8

PURSE SNATCHING

TOTAL NUMBER OF OFFENSES OCCURRING DAILY AND PERCENTAGE OCCURRING AT NIGHT BY AREA AND YEAR*

	1970		1971		1972		1973		1974	
	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL
EXPERIMENTAL	48.9	45	40.8	49	29.1	55	16.7	66	23.1	39
CONTROL	57.1	7	47.4	19	16.7	6	8.7	23	41.7	12
ADJACENT	40.8	49	26.4	106	29.4	51	42.9	49	33.9	59

Source: N.O.P.D.
Prepared by: C, J. C. C.

*YEAR DENOTES PROJECT YEAR APRIL-DECEMBER

TABLE 9

PEDESTRIAN ROBBERY

TOTAL NUMBER OF OFFENSES OCCURRING DAILY AND PERCENTAGE OCCURRING AT NIGHT BY AREA AND YEAR*

	1970		1971		1972		1973		1974	
	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL
EXPERIMENTAL	63.3	79	46.6	73	41.5	94	42.9	70	36.8	57
CONTROL	44.4	18	57.1	14	42.4	33	56.5	23	43.3	30
ADJACENT	54.1	74	52.9	102	36.6	112	37.1	89	39.9	148

Source: N.O.P.D.
Prepared by: C.J.C.C.

*YEAR DENOTES PROJECT YEAR APRIL-DECEMBER

Time Series Analysis

The summary treatment of baseline and program period data is an attempt to determine whether trends of the project period differ from those of the baseline months. The criminal activities selected for this analysis have a rate of occurrence that is above 50% reported at night. The offense categories, business burglary and auto theft, tend to reflect those characteristics previously defined in this report as germane to "nighttime crime".

Relating to impact, time series will be presented by discussion of the level and slope of occurrence patterns for the two offenses noted above, and with discussion of the general trends that these patterns represent. The presentation that follows will show business burglary and auto theft individually.

The pre-project or baseline period is 51 months, from January 1970 - March 1974, and the project period is 9 months from April 1974 - December 1974. The data that follows details the findings based on these periods.

Business Burglary

During the pre-project period business burglaries occurred at a stable rate with almost no change in the level of offenses in the experimental area. Over the 51 month period the level changed by such a small amount that the plot of Figure 3 appears as a straight line. After the interrupt there was an abrupt change of level downward, but with an increasing slope, suggesting that the rate of offenses after the interrupt is increasing.

The post-interrupt effects are similar in both control and adjacent areas to that noted above for business burglary in the experimental area. However, during the pre-interrupt period both areas were different from the experimental area in that the occurrence of offenses was at a decreasing rate. Other than their difference, all three areas, after the interrupt, show varying positive slopes and are increasing in level.

Auto Theft

In the experimental area, auto thefts occurred at a decreasing rate during the pre- and post-interrupt periods. There was an abrupt upward change in level after the interrupt and a more pronounced downward drift in slope. In the adjacent and control areas during the pre-project period a decreasing slope is shown (Figures 7 & 8) though more pronounced in the control area. After the interrupt the downward drift of the slope of the adjacent area increases, while in the control area the downward drift is decreasing and the slope is leveling.

The use of time series analysis in this evaluation permits a summary treatment of data in addition to the existing descriptive methods noted earlier. The trends depicted in Figures 3 - 11 provide comparative data on changes occurring in the rates of criminal activities, for the offenses under study, after the interrupt period. Due to the limited number of observations available after the interrupt (the installation

of the lights), and the size of each observation, there is great reluctance to make a definitive assessment of the impact of the lights on selected offenses. The data suggests, however, that no change has occurred, and that shifts in level are random. The final impact report will briefly review the long-term effect (if any) of the lights, and provide a check of this preliminary conclusion.

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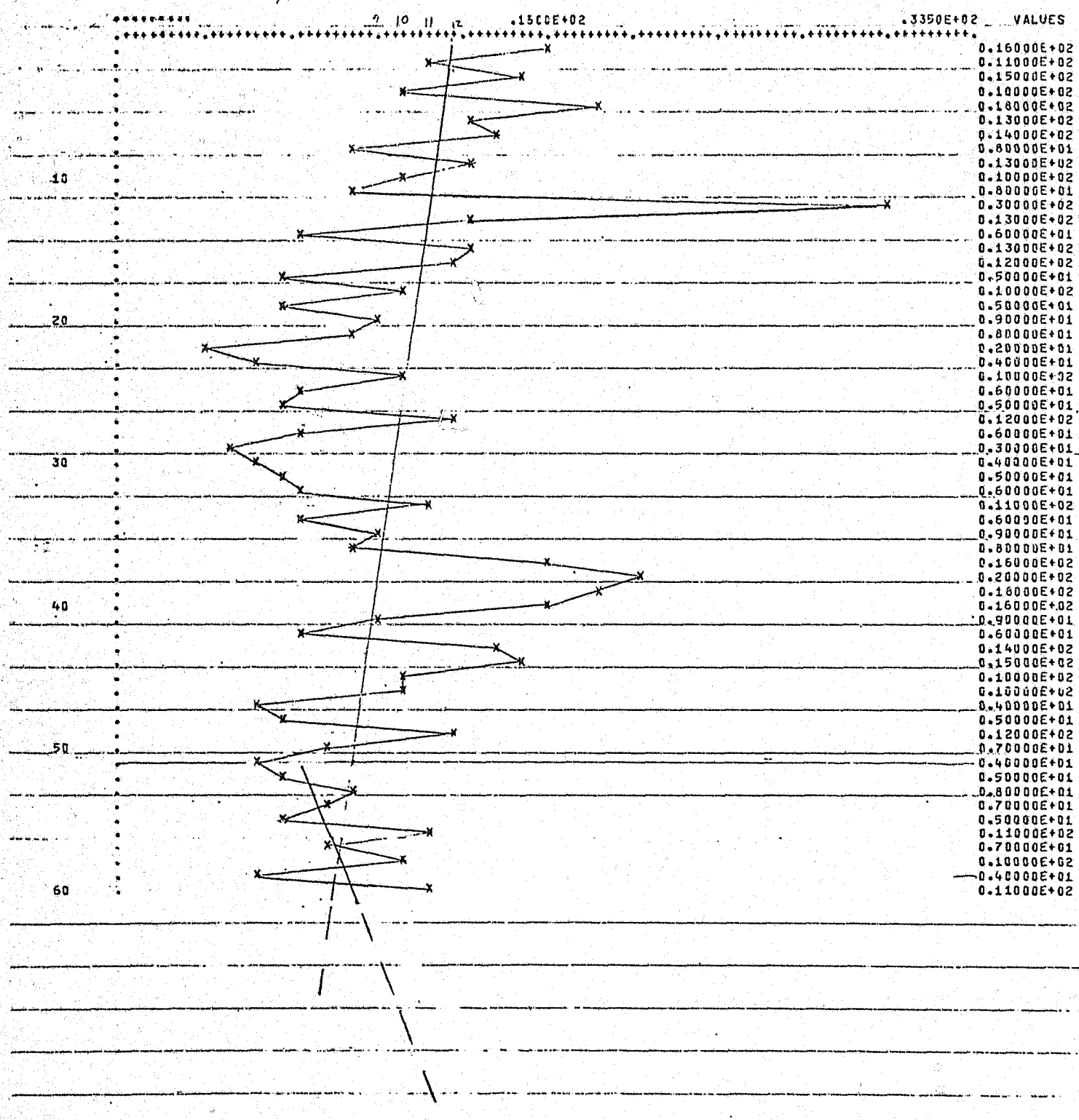

NEW CONTROL AREA BUSINESS BURGLARY

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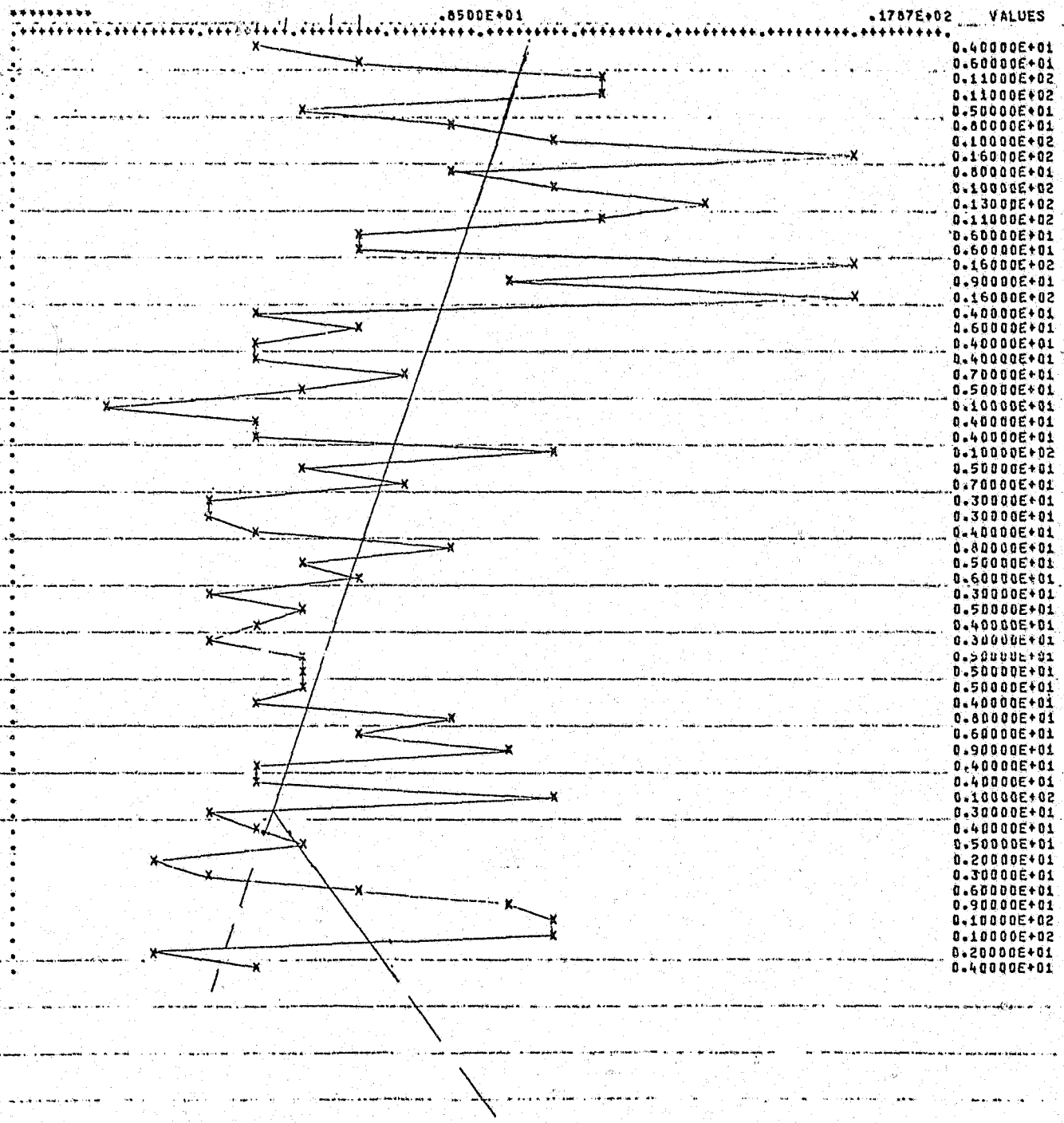

EXPERIMENTAL AREA BUSINESS BURGLARY

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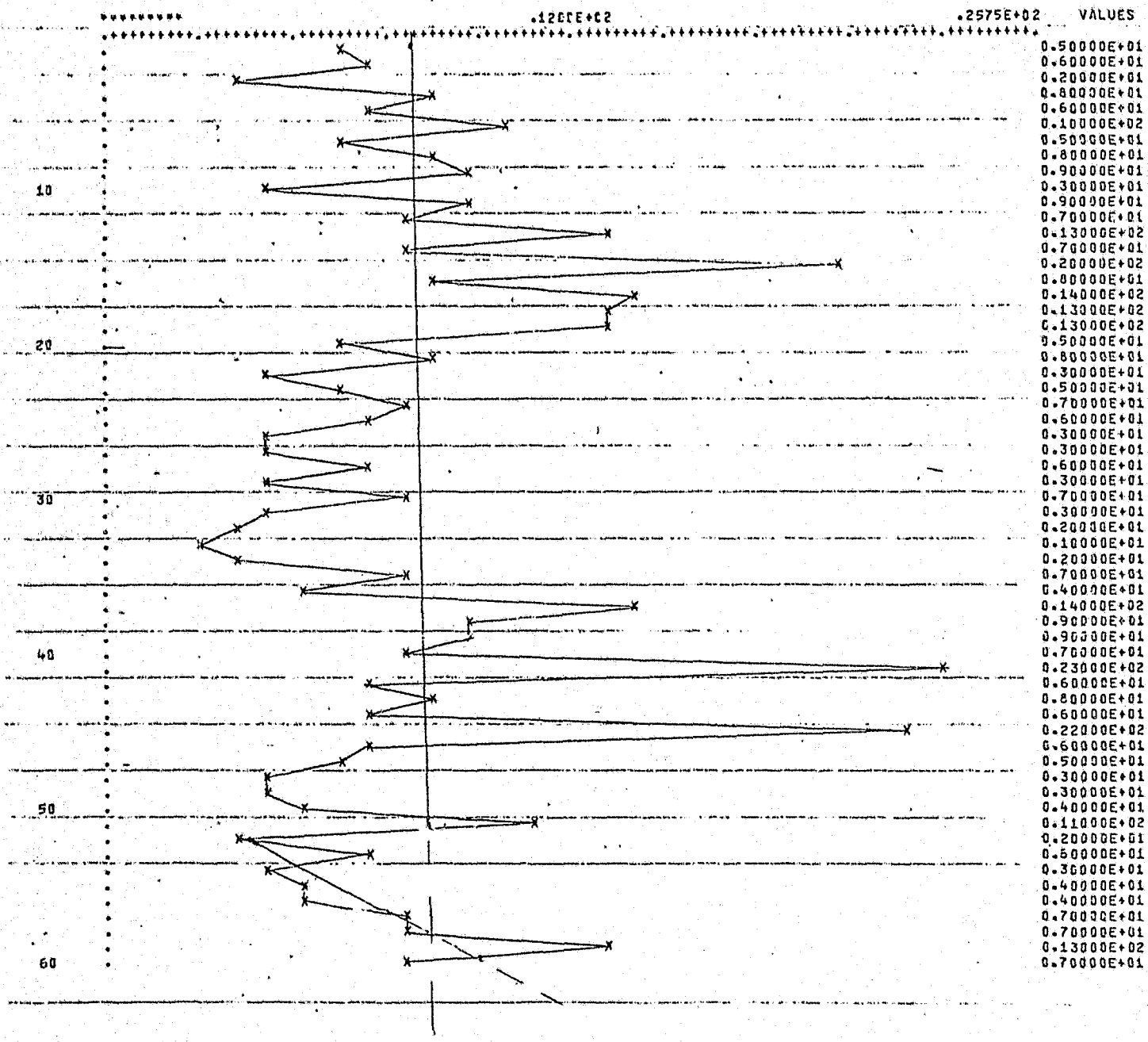

ADJACENT AREA AUTO THEFT

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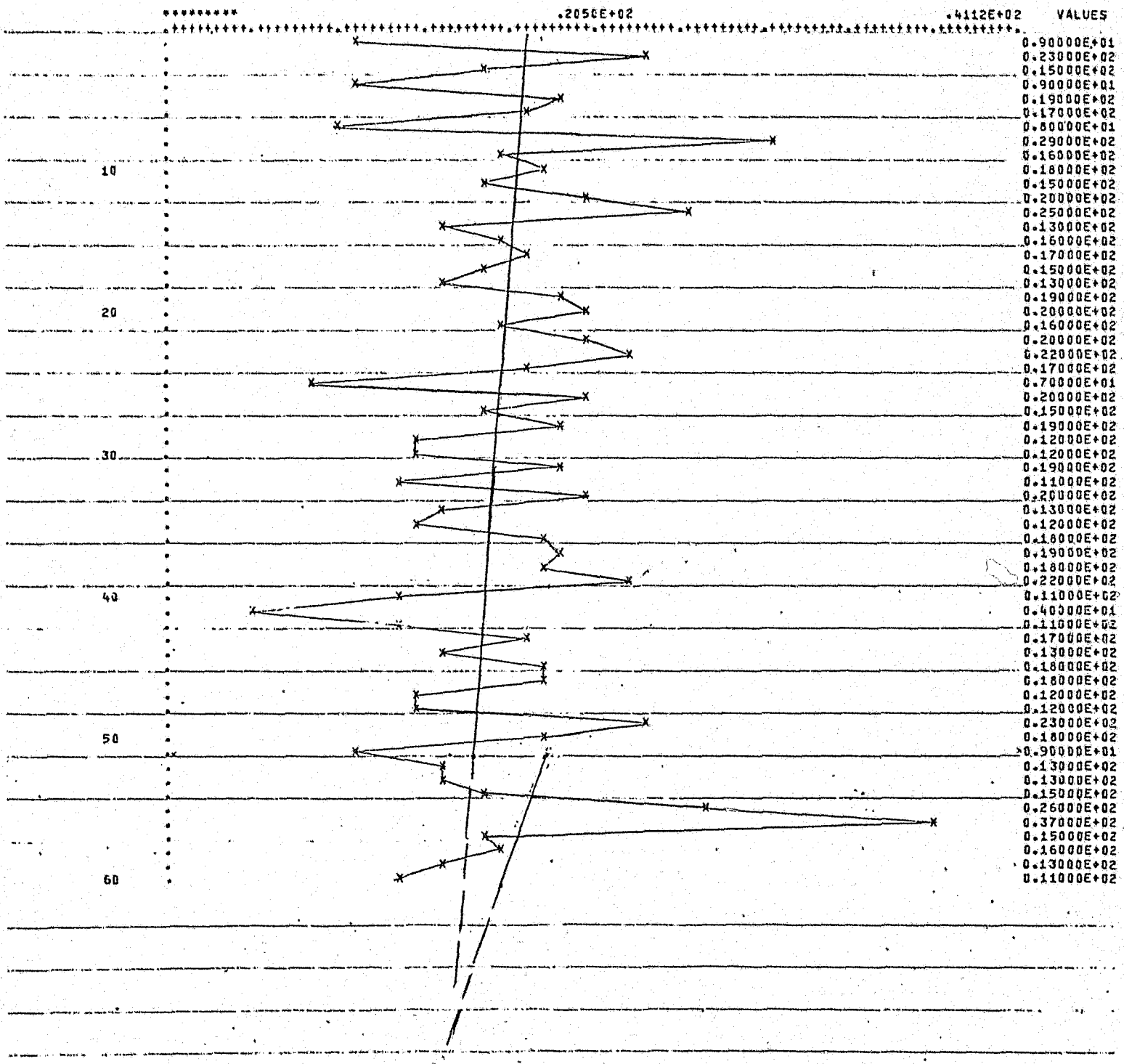

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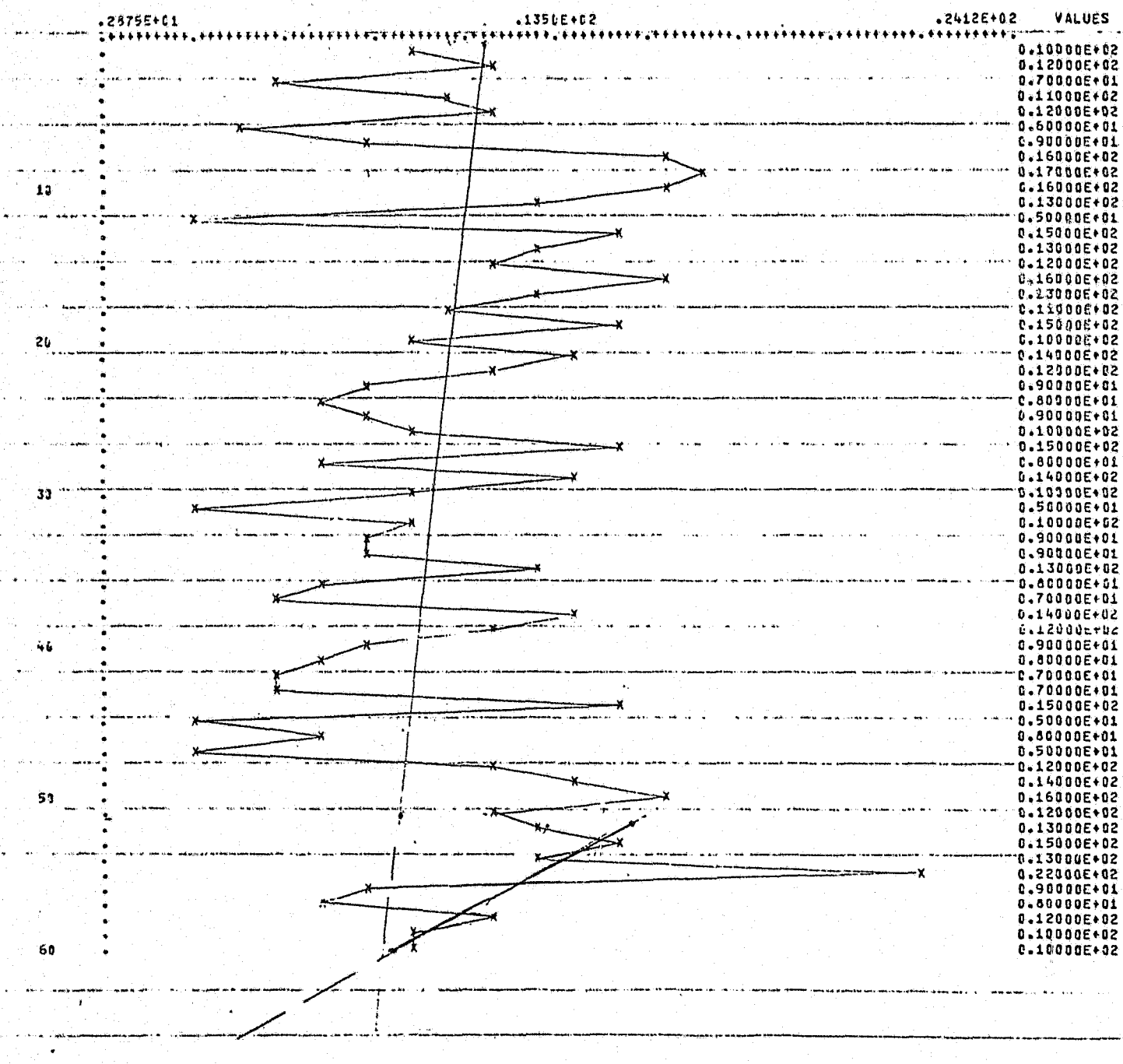

NEW CONTROL AREA AUTO THEFT

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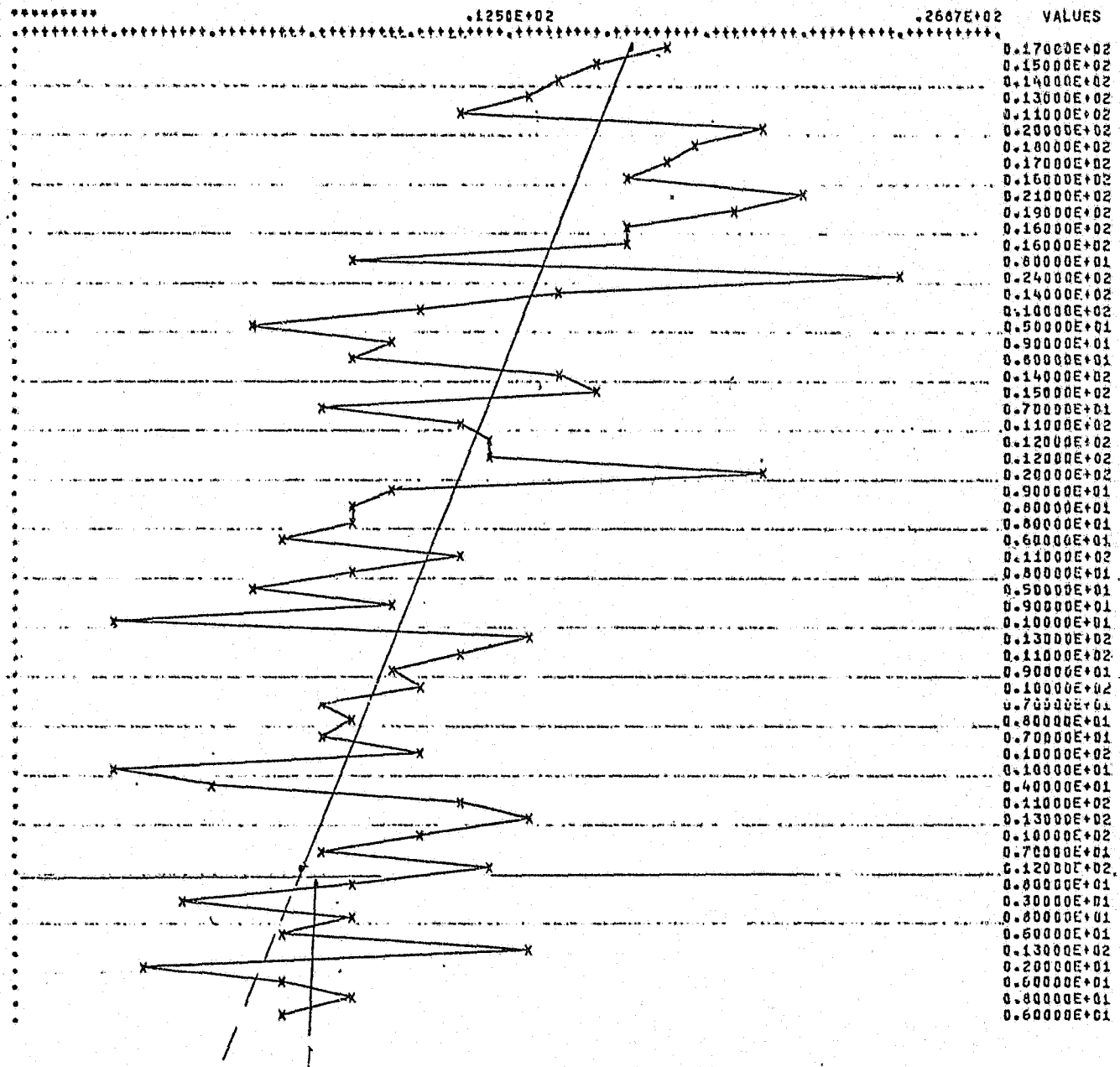

ADJACENT AREA TOTAL

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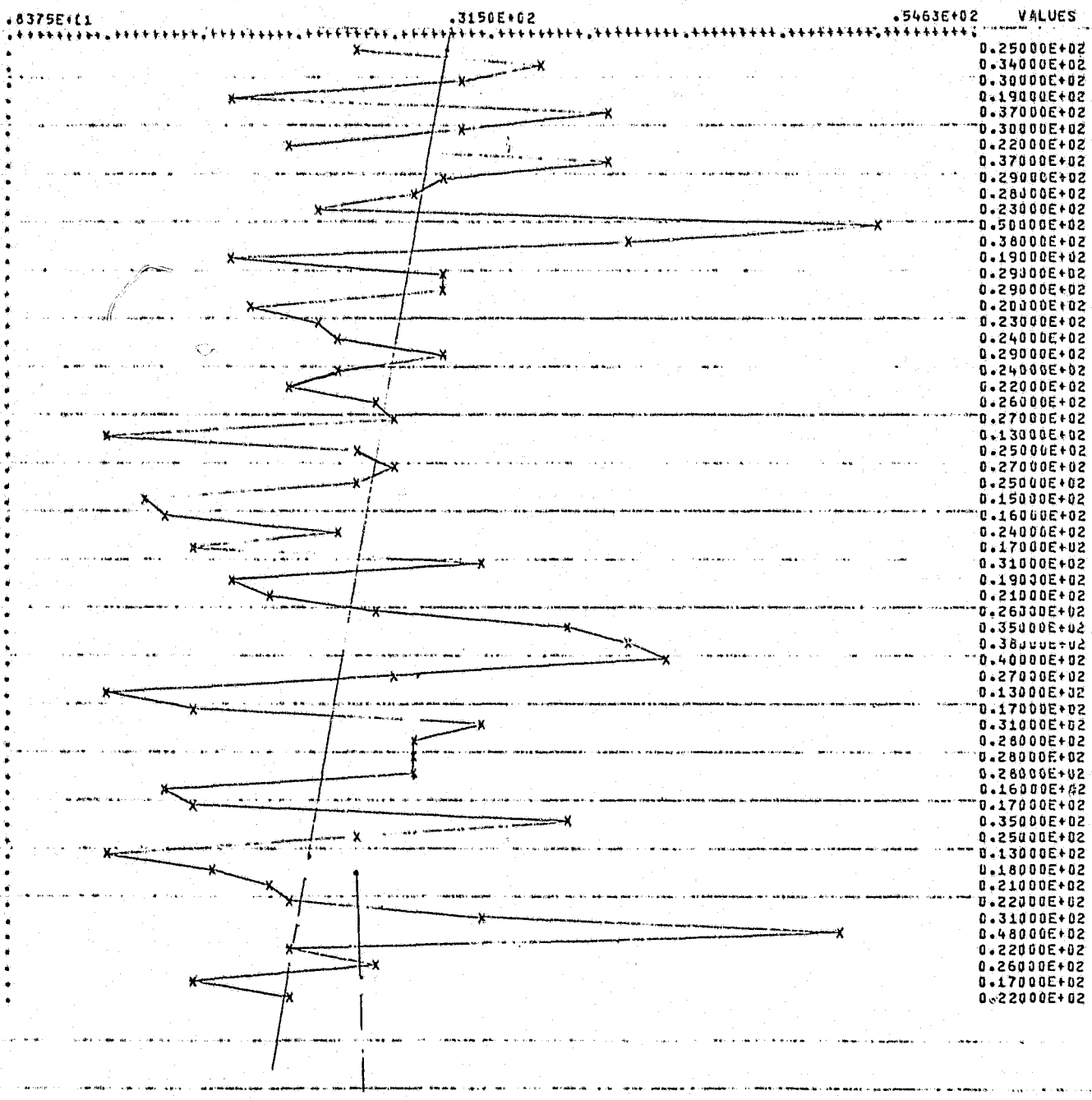

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NEW CONTROL AREA TOTAL

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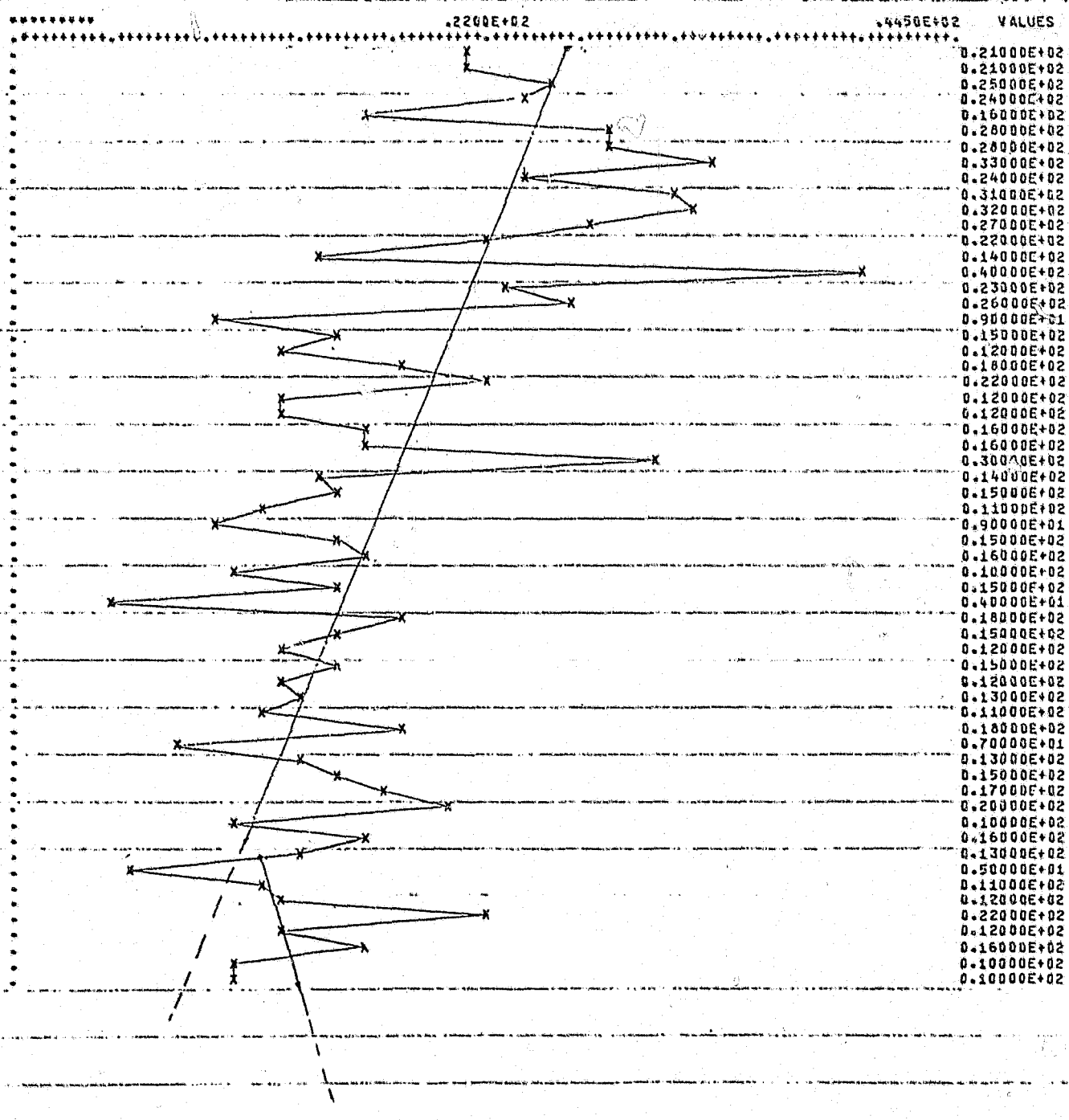

EXPERIMENTAL AREA TOTAL

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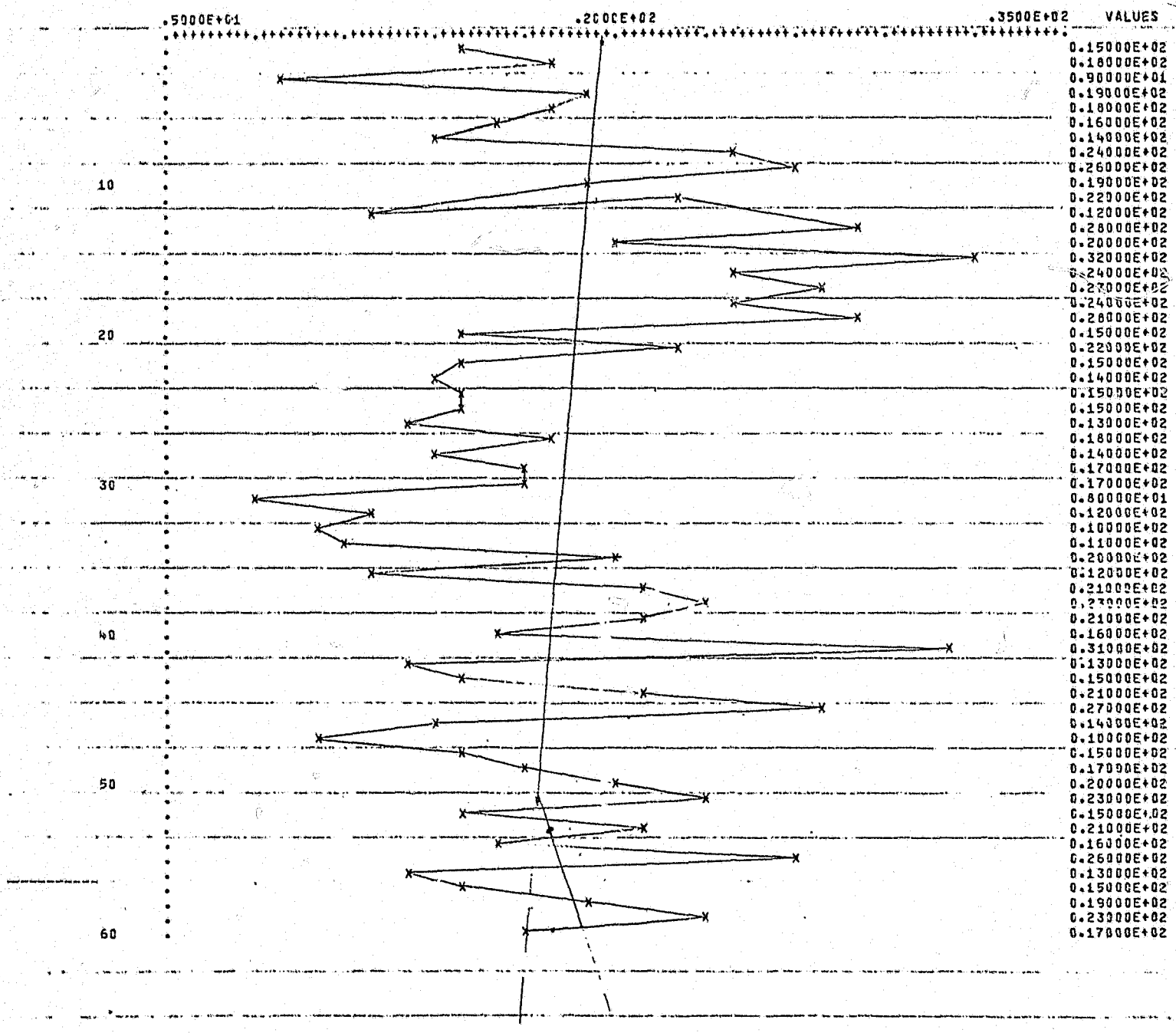

IV

PROJECT COSTS

The High Intensity Street Lighting Project was allocated $111,126 by LEAA for purchase of 559 lights of 400 watt (23,000 lumens) intensity. The amount actually requested from the State Planning Agency was only $99,282, which was based on New Orleans Public Service estimates of cost. Due to cost savings by NOPSI, actual expenditures for this program were only $63,000. A balance of $48,126 remains from the LEAA allocation for this program.

TABLE 10

LEAA Fund Allocation	SPA Allocation Requested	ESTIMATED Expenditures	LEAA Fund Estimated Balance
$111,126	$99,282	$63,000	$48,126

Street light installation was completed well inside the May 1, 1974, deadline, thereby resulting in an additional savings of funds for installation time as well as the savings on purchase of the lights themselves. In fact, the project could have been 40% larger than it was, based on projected expenditures of the remaining funds at the same rate.

V

CONCLUSIONS

The data presented in this impact study suggests that after nine months there is no demonstrable reduction in the commission of nighttime crimes. In those cases in which programs fail to impact their goals, the evaluator is mandated to inquire into the factors contributing to the lack of impact. Although this report is only a preliminary evaluation, and future assessments may uncover some degree of impact, there are a sufficient number of conceptual problems associated with street lighting that minimize the probability of a successful impact. This section will focus on those conceptual problems, describe their effects upon the program, and suggest criteria that should be used in the future development of street lighting programs.

The concept of nighttime crime, because it has never been adequately defined by criminal justice theoreticians, may ultimately be found to have no useful meaning. The conceptual problems of "nighttime offenses" have profoundly affected both the implementation of the project and its evaluation. Perhaps the primary problem has been the practice of designating a crime as "nighttime" because its rate of occurrence after dark is somewhat greater than 50%. In a narrow statistical sense, the designation may be appropriate. In a broader

sociological perspective, where distinctions take on ideational significance, such a designation is useless. The phrase nighttime crime takes on meaning only if there is some quality or collection of qualities about nighttime that are intimately related to the commission of certain offenses. In this respect, the strongest possible relationship would posit nighttime as a necessary pre-condition to the offense. A hypothetical example of this relationship would be the commission of nearly 100% of all incidents of auto theft at night. As the percentage of that crime committed after dark decreases, the power of the concept as an explanatory variable also decreases. In actual practice, the most frequently committed nighttime crimes in the experimental zone, auto theft and business burglary, occurred at a rate of less than 65%. Other "nighttime" crimes hovered around the fifty percent figure.

The implications of these figures for the "theory of nighttime crime", and more particularly, for the use of street lighting as a device to reduce "nighttime crime", are serious enough to generate questions regarding the wisdom of street lighting programs. The radical increase in illumination, as a weapon used to reduce crime rates, assumes that the commission of certain offenses requires near or total darkness. With the addition of high intensity lights, the calculus of the street context is designed to be affected through a recognition

by the potential perpetrator that his every move is visible to persons in the near vicinity. The intended effect is to discourage the commission of crimes where lights are being used.

There are, however, several errors of omission and logic in the street lighting model. The most significant problem is the lack of specificity with regard to (1) the identification of offenses whose method of operation will be affected by increased lighting, and (2) an analysis of the circumstances in which lighting will have optimal effect.

A primary problem in the street lighting concept is the assignment of meaning to the term nighttime crime. All available planning literature links nighttime to darkness. That is, the quality of nighttime most important to the commission of nighttime crimes is the absence of light, or darkness. This definition implies two assumptions: not only do certain crimes require darkness as a pre-condition, but that street lighting will effectively intervene in the method of operation used in the commission of these crimes.

This analysis suggests that the concept underlying the street lighting model is incomplete, because the assumptions of the definition are unproven. First, very few crimes require darkness. Second, those that do, cannot be impacted by street lights. With the possible exception of auto theft and business burglary, no other crimes can be accurately identified as nighttime. Street crimes such as purse snatching, pedestrian

robbery, and strong arm mugging occur as often in the daylight as at night. Even auto theft and business burglary show frequency distributions of close to forty percent during daylight hours. Of auto theft and business burglary, the logistics of both crimes would rule out the latter as a potential impact objective. Police reports substantiate that entrance into businesses for purposes of burglary occurs either at the rear or side of the establishment, where high intensity lights do not reach. Further, there are no available standards to use in assessing the level of illumination necessary to impact the business burglary MO.

We are forced to conclude that the lack of specificity in the definition of the problem severely restricts the prospect of successful impact. Ideally, the analysis that precedes the installation of the lights should ask those questions that explore the viability of the street lighting concept. It should be emphasized, however, that to comment on this topic is to call into question not only the planning procedures of the CJCC, but more importantly, to raise fundamental issues with regard to the export and distribution of concepts and models by the "parent" agency, the Law Enforcement Assistance Administration.

In light of the funding exigencies of local planning agencies, and the close institutional relationship between the LEAA and the local agencies, the sharing and promotion

of program models is often a critical factor in the success of the CJCC's and the LEAA. The promotion and distribution of viable demonstration programs is a key to the effective operation of all criminal justice planning bodies, and it is the obligation of both the federal agency and the local planning body to invest sufficient rigor in the generation of program models. It is the evaluator's assessment that the street lighting program has served an extremely valuable function for the New Orleans CJCC, because it has brought to the fore a tendency to uncritically accept packaged programs without sufficiently investigating either the usefulness of programs to New Orleans, or the concepts around which programs are formed.

The evaluator, because he is aware of the organizational, temporal and fiscal constraints of the local criminal justice planning process, is reluctant to dismiss the problem as simply a case of "bad local planning." Rather, the LEAA probably requires a mechanism to insure that those programs it recommends to local agencies be sufficiently thought through, and that specific conditions of the program's application be identified prior to endorsement.

VI

RECOMMENDATIONS

The logic of the problem of reducing the rate of selected crimes that occur fairly frequently at night, suggests that the "qualities" of nighttime crime be re-defined. In most instances, the relationship between the commission of the crime and the night is not darkness, but instead, the absence of people. Although the installation of high intensity lights may not be the critical factor in the inducement of both greater pedestrian traffic and police presence, it may play a role in changing the context of the neighborhood. Moreover, street lights may be particularly appropriate in those neighborhoods where pedestrian traffic could be easily increased. However, as a crime-reduction model, based on the results of a preliminary impact analysis, street lighting is not effective.

APPENDIX

Appendix A

Data used in the text is based on the post-street light installation period (April - December, 1974) and the same period for the previous four years as baseline. The following data is based on crime statistics for the calendar years 1970 - 1974. The data is presented here to illustrate the extent of data considerations.

TABLE I-A

PEDESTRIAN ROBBERY

TOTAL NUMBER OF OFFENSES OCCURRING DAILY AND PERCENTAGE OCCURRING AT NIGHT BY AREA AND YEAR

	1970		1971		1972		1973		1974	
	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL
EXPERIMENTAL	60.6	94	46.7	105	42.0	143	40.7	91	39.2	74
CONTROL	48.0	25	57.7	26	33.3	42	42.9	35	42.5	40
ADJACENT	51.6	93	55.4	130	42.0	169	43.5	115	42.5	181

Source: N.O.P.D.
Prepared by: C.J.C.C.

TABLE 2-A

ASSAULT

TOTAL NUMBER OF OFFENSES OCCURRING DAILY AND PERCENTAGE OCCURRING AT NIGHT BY AREA AND YEAR

	1970		1971		1972		1973		1974	
	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL
EXPERIMENTAL	60.0	65	53.6	69	55.4	74	61.9	97	51.7	91
CONTROL	65.2	46	57.9	57	57.9	38	54.1	34	48.8	43
ADJACENT	76.8	69	59.6	104	60.0	110	39.2	102	48.4	95

Source: N.O.P.D.
Prepared by: C.J.C.C.

TABLE 3-A

SIMPLE ROBBERY

TOTAL NUMBER OF OFFENSES OCCURRING DAILY AND PERCENTAGE OCCURRING AT NIGHT BY AREA AND YEAR

	1970		1971		1972		1973		1974	
	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL
EXPERIMENTAL	54.0	50	48.2	54	41.5	41	27.6	29	26.7	30
CONTROL	50.0	10	58.8	17	41.7	12	43.8	16	46.7	15
ADJACENT	47.5	59	52.8	72	42.6	54	39.2	51	38.8	67

Source: N.O. P.D.
Prepared by: C. J. C. C.

TABLE 4-A

BUSINESS BURGLARY

TOTAL NUMBER OF OFFENSES OCCURRING DAILY AND PERCENTAGE OCCURRING AT NIGHT BY AREA AND YEAR

	1970		1971		1972		1973		1974	
	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL
EXPERIMENTAL	59.0	139	64.6	181	49.0	96	73.6	163	63.5	115
CONTROL	69.4	170	66.7	135	67.0	97	61.3	106	69.0	100
ADJACENT	70.6	235	59.5	163	74.3	109	67.5	212	60.3	151

Source: N.O.P.D.
Prepared by: C.J.C.C.

TABLE 5-A

AUTO THEFT

TOTAL NUMBER OF OFFENSES OCCURRING DAILY AND PERCENTAGE OCCURRING AT NIGHT BY AREA AND YEAR

	1970		1971		1972		1973		1974	
	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL
EXPERIMENTAL	58.1	267	64.2	274	61.1	229	69.0	184	67.5	252
CONTROL	70.8	325	59.7	253	62.3	199	61.6	198	52.0	198
ADJACENT	54.0	367	59.2	360	54.9	324	57.0	307	68.8	304

Source: N.O.P.D.
Prepared by: C.J.C.C.

TABLE 6-A

THEFT-VALUE

TOTAL NUMBER OF OFFENSES OCCURRING DAILY AND PERCENTAGE OCCURRING AT NIGHT BY AREA AND YEAR

	1970		1971		1972		1973		1974	
	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL
EXPERIMENTAL	43.0	442	36.9	393	37.4	329	38.9	293	40.8	326
CONTROL	44.7	262	41.5	246	46.7	270	43.2	2.41	42.6	209
ADJACENT	36.2	544	35.8	657	41.7	473	42.3	357	42.5	487

Source: N.O.P.D.
Prepared by: C.J.C.C.

TABLE 7-A

ARMED ROBBERY

TOTAL NUMBER OF OFFENSES OCCURRING DAILY AND PERCENTAGE OCCURRING AT NIGHT BY AREA AND YEAR

	1970		1971		1972		1973		1974	
	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL
EXPERIMENTAL	58.8	245	43.5	191	40.6	170	45.4	141	49.9	128
CONTROL	52.4	84	49.3	69	52.3	88	43.2	81	43.8	80
ADJACENT	49.3	207	37.4	227	41.8	232	43.5	184	49.2	264

Source: N.O. P.D.
Prepared by: C. J. C. C.

TABLE 8-A

STRONG-ARM-MUGGING

TOTAL NUMBER OF OFFENSES OCCURRING DAILY AND PERCENTAGE OCCURRING AT NIGHT BY AREA AND YEAR

	1970		1971		1972		1973		1974	
	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL
EXPERIMENTAL	51.9	52	45.5	55	41.5	41	31.0	29	23.3	30
CONTROL	27.3	11	50.0	18	35.7	14	43.8	16	18.8	16
ADJACENT	44.4	63	56.7	67	43.6	55	38.5	52	34.3	67

Source: N.O.P.D.
Prepared by: C.J.C.C.

TABLE 9-A

PURSE SNATCHING

TOTAL NUMBER OF OFFENSES OCCURRING DAILY AND PERCENTAGE OCCURRING AT NIGHT BY AREA AND YEAR

	1970		1971		1972		1973		1974	
	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL	% NIGHT	TOTAL
EXPERIMENTAL	54.7	53	43.8	64	30.9	68	18.1	72	21.2	52
CONTROL	61.5	13	44.4	27	22.2	18	20.7	29	46.7	15
ADJACENT	40.9	66	28.7	136	25.0	80	41.5	65	35.0	80

Source: N.O.P.D.
Prepared by: C.J.C.C.

Appendix B

The data that follows are products of the Time Series Analysis performed on crime data. The tables presented herein can be matched with their corresponding graphs in the text (denoted as Figures 3 - 11). No conclusions will be offered in this section, only a presentation of statistical data from the Time Series operation for those inclined to pursue the methodology of this evaluation. The following legend will apply to symbols for all tables on all three areas:

Symbol	Meaning
CONS	Constant
XO	Change in level
X1	Change in slope
X2	Pre-project slope
X1 + X2	Project slope

EXPERIMENTAL AREA BUSINESS BURGLARY
3 INDEPENDENT VARIABLES
60 OBSERVATIONS

VAR-COV MATRIX OF REG COEFFICIENTS

	CONS	XO	X1	X2
CONS	1.75687			
XO	0.85285	13.13442		
X1	0.05117	-1.76310	0.36443	
X2	-0.05117	-0.04920	-0.00197	0.00197

	REG COEFFICIENTS	STANDARD ERRORS	T-RATIOS
CONS	7.30980	1.32547	5.51488
XO	-5.91579	3.62414	1.63233
X1	0.86350	0.60368	1.43039
X2	0.00317	0.04436	0.07140

MEANS

Y= 7.16667	XO= 0.15000	X1= 0.75000	X2= 30.50000

ANALYSIS OF VARIANCE & RESIDUAL RANDOMNESS TESTS

MULTIPLE R-SQUARE	=	0.04879
F-LEVEL	=	0.95742
EST EQN VARIANCE	=	21.74765
SUM SQ RESID	=	1217.86823
DURBIN-WATSON	=	1.78830
NEGATIVE RESIDUALS	=	38.00000
POSITIVE RESIDUALS	=	22.00000
NUMBER OF RUNS	=	31.00000
Z= 0.59887	(RESIDUALS ARE RANDOM)	

Prepared by : CJCC

Source of Data : NOPD
Source of Analysis : Data Industries

ADJACENT AREA BUSINESS BURGLARY
3 INDEPENDENT VARIABLES
60 OBSERVATIONS

VAR-COV MATRIX OF REG COEFFICIENTS

	CONS	XO	X1	X2
CONS	1.95591			
XO	0.94947	14.62244		
X1	0.05697	-1.96285	0.40572	
X2	-0.05697	-0.05478	-0.00219	0.00219

	REG COEFFICIENTS	STANDARD ERRORS	T-RATIOS
CONS	12.03529	1.39854	8.60563
XO	-2.15410	3.82393	0.56332
X1	0.41161	0.63696	0.64622
X2	-0.07828	0.04681	1.67234

MEANS

Y = 9.63333	XO = 0.15000	X1 = 0.75000	X2 = 30.50000

ANALYSIS OF VARIANCE & RESIDUAL RANDOMNESS TESTS

MULTIPLE R-SQUARE	=	0.08137
F-LEVEL	=	1.65335
EST EQN VARIANCE	=	24.21148
SUM SQ RESID	=	1355.84289
DURBIN-WATSON	=	1.46571
NEGATIVE RESIDUALS	=	33.00000
POSITIVE RESIDUALS	=	27.00000
NUMBER OF RUNS	=	29.00000
Z = -0.44726	(RESIDUALS ARE RANDOM)	

Prepared by : CJCC

Source of Data : NOPD
Source of Analysis : Data Industries

CONTROL AREA BUSINESS BURGLARY
3 INDEPENDENT VARIABLES
60 OBSERVATIONS

VAR-COV MATRIX OF REG COEFFICIENTS

	CONS	XO	XI	X2
CONS	0.85988			
XO	0.41742	6.42851		
XI	0.02505	-0.86293	0.17837	
X2	-0.02505	-0.02408	-0.00096	0.00096

	REG COEFFICIENTS	STANDARD ERRORS	T-RATIOS
CONS	9.29804	0.92730	10.02702
XO	0.44042	2.53545	0.17371
XI	0.33605	0.42233	0.79569
X2	-0.10271	0.03104	3.30947

MEANS

Y= 6.48333	XO= 0.15000	XI= 0.75000	X2= 30.50000

ANALYSIS OF VARIANCE & RESIDUAL RANDOMNESS TESTS

MULTIPLE R-SQUARE	=	0.17554
F-LEVEL	=	3.97432
EST EQN VARIANCE	=	10.64417
SUM SQ RESID	=	596.07345
DURBIN-WATSON	=	1.63493
NEGATIVE RESIDUALS	=	36.00000
POSITIVE RESIDUALS	=	24.00000
NUMBER OF RUNS	=	27.00000
Z= -0.76009	(RESIDUALS ARE RANDOM)	

Prepared by : CJCC

Source of Data : NOPD
Source of Analysis : Data Industries

EXPERIMENTAL AREA AUTO THEFT
3 INDEPENDENT VARIABLES
60 OBSERVATIONS

VAR-COV MATRIX OF REG COEFFICIENTS

	CONS	XO	XI	X2
CONS	0.94813			
XO	0.46026	7.08829		
XI	0.02762	-0.95150	0.19667	
X2	-0.02762	-0.02655	-0.00106	0.00106

	REG COEFFICIENTS	STANDARD ERRORS	T-RATIOS
CONS	11.91843	0.97372	12.24008
XO	6.21858	2.66238	2.33572
XI	-0.67531	0.44348	1.52276
X2	-0.04136	0.03259	1.26901

MEANS

Y= 11.08333	XO= 0.15000	XI= 0.75000	X2= 30.50000

ANALYSIS OF VARIANCE & RESIDUAL RANDOMNESS TESTS

MULTIPLE R-SQUARE	=	0.09542
F-LEVEL	=	1.96914
EST EQN VARIANCE	=	11.73661
SUM SQ RESID	=	657.25029
DURBIN-WATSON	=	1.91605
NEGATIVE RESIDUALS	=	32.00000
POSITIVE RESIDUALS	=	28.00000
NUMBER OF RUNS	=	32.00000
Z= 0.29648	(RESIDUALS ARE RANDOM)	

Prepared by : CJCC

Source of Data : NOPD
Source of Analysis : Data Industries

ADJACENT AREA AUTO THEFT
3 INDEPENDENT VARIABLES
60 OBSERVATIONS

VAR-COV MATRIX OF REG COEFFICIENTS

	CONS	XO	XI	X2
CONS	2.51595			
XO	1.22133	18.80934		
XI	0.07328	-2.52488	0.52189	
X2	-0.07328	-0.07046	-0.00282	0.00282

	REG COEFFICIENTS	STANDARD ERRORS	T-RATIOS
CONS	17.19843	1.58617	10.84271
XO	4.31259	4.33697	0.99438
XI	-0.23573	0.72242	0.32631
X2	-0.04760	0.05309	0.89664

MEANS

Y = 16.21667	XO = 0.15000	XI = 0.75000	X2 = 30.50000

ANALYSIS OF VARIANCE & RESIDUAL RANDOMNESS TESTS

MULTIPLE R-SQUARE	=	0.02902
F-LEVEL	=	0.55781
EST EQN VARIANCE	=	31.14404
SUM SQ RESID	=	1744.06635
DURBIN-WATSON	=	1.93434
NEGATIVE RESIDUALS	=	32.00000
POSITIVE RESIDUALS	=	28.00000
NUMBER OF RUNS	=	35.00000
Z = 1.08127	(RESIDUALS ARE RANDOM)	

Prepared by : CJCC

Source of Data : NOPD
Source of Analysis : Data Industries

CONTROL AREA AUTO THEFT
3 INDEPENDENT VARIABLES
60 OBSERVATIONS

VAR-COV MATRIX OF REG COEFFICIENTS

	CONS	XO	X1	X2
CONS	1.29622			
XO	0.62923	9.69060		
X1	0.03775	-1.30082	0.26888	
X2	-0.03775	-0.03630	-0.00145	0.00145

	REG COEFFICIENTS	STANDARD ERRORS	T-RATIOS
CONS	16.47373	1.13852	14.46946
XO	0.28243	3.11297	0.09073
X1	0.17953	0.51853	0.34623
X2	-0.19620	0.03811	5.14875

MEANS

Y = 10.66667	XO = 0.15000	X1 = 0.75000	X2 = 30.50000

ANALYSIS OF VARIANCE & RESIDUAL RANDOMNESS TESTS

MULTIPLE R-SQUARE	=	0.39830
F-LEVEL	=	12.35632
EST EQN VARIANCE	=	16.04545
SUM SQ RESID	=	898.54526
DURBIN-WATSON	=	1.85755
NEGATIVE RESIDUALS	=	29.00000
POSITIVE RESIDUALS	=	31.00000
NUMBER OF RUNS	=	24.00000
Z = -1.81628	(RESIDUALS ARE RANDOM)	

Prepared by : CJCC

Source of Data : NOPD
Source of Analysis : Data Industries

EXPERIMENTAL AREA TOTAL
3 INDEPENDENT VARIABLES
60 OBSERVATIONS

VAR-COV MATRIX OF REG COEFFICIENTS

	CONS	XO	X1	X2
CONS	2.59911			
XO	1.26170	19.43102		
X1	0.07570	-2.60833	0.53913	
X2	-0.07570	-0.07279	-0.00291	0.00291

	REG COEFFICIENTS	STANDARD ERRORS	T-RATIOS
CONS	19.22824	1.61217	11.92690
XO	0.30279	4.40806	0.06869
X1	0.18819	0.73426	0.25630
X2	-0.03819	0.05396	0.70775

MEANS

Y = 18.25000	XO = 0.15000	X1 = 0.75000	X2 = 30.50000

ANALYSIS OF VARIANCE & RESIDUAL RANDOMNESS TESTS

MULTIPLE R-SQUARE	=	0.00964
F-LEVEL	=	0.18172
EST EQN VARIANCE	=	32.17340
SUM SQ RESID	=	1801.71027
DURBIN-WATSON	=	1.68602
NEGATIVE RESIDUALS	=	35.00000
POSITIVE RESIDUALS	=	25.00000
NUMBER OF RUNS	=	23.00000
Z = -1.92058	(RESIDUALS ARE RANDOM)	

Prepared by : CJCC

Source of Data : NOPD
Source of Analysis : Data Industries

ADJACENT AREA TOTAL
3 INDEPENDENT VARIABLES
60 OBSERVATIONS

VAR-COV MATRIX OF REG COEFFICIENTS

	CONS	XO	XI	X2
CONS	5.13013			
XO	2.49035	38.35304		
XI	0.14942	-5.14833	1.06415	
X2	-0.14942	-0.14367	-0.00575	0.00575

	REG COEFFICIENTS	STANDARD ERRORS	T-RATIOS
CONS	29.23373	2.26498	12.90684
XO	2.15850	6.19298	0.34854
XI	0.17588	1.03158	0.17050
X2	-0.12588	0.07581	1.66052

MEANS

Y = 25.85000	XO = 0.15000	XI = 0.75000	X2 = 30.50000

ANALYSIS OF VARIANCE & RESIDUAL RANDOMNESS TESTS

MULTIPLE R-SQUARE	=	0.04803
F-LEVEL	=	0.94181
EST EQN VARIANCE	=	63.50401
SUM SQ RESID	=	3556.22477
DURBIN-WATSON	=	1.67964
NEGATIVE RESIDUALS	=	31.00000
POSITIVE RESIDUALS	=	29.00000
NUMBER OF RUNS	=	29.00000
Z = -0.51273	(RESIDUALS ARE RANDOM)	

Prepared by : CJCC

Source of Data : NOPD
Source of Analysis : Data Industries

CONTROL AREA TOTAL
3 INDEPENDENT VARIABLES
60 OBSERVATIONS

VAR-COV MATRIX OF REG COEFFICIENTS

	CONS	XO	XI	X2
CONS	2.88208			
XO	1.39907	21.54656		
XI	0.08394	-2.89231	0.59783	
X2	-0.08394	-0.08072	-0.00323	0.00323

	REG COEFFICIENTS	STANDARD ERRORS	T-RATIOS
CONS	25.77176	1.69767	15.18067
XO	0.72285	4.64183	0.15573
XI	0.51558	0.77320	0.66682
X2	-0.29891	0.05682	5.26063

MEANS

Y = 17.15000	XO = 0.15000	XI = 0.75000	X2 = 30.50000

ANALYSIS OF VARIANCE & RESIDUAL RANDOMNESS TESTS

MULTIPLE R-SQUARE	=	0.38216
F-LEVEL	=	11.54624
EST EQN VARIANCE	=	35.67626
SUM SQ RESID	=	1997.87030
DURBIN-WATSON	=	1.81727
NEGATIVE RESIDUALS	=	33.00000
POSITIVE RESIDUALS	=	27.00000
NUMBER OF RUNS	=	27.00000
Z = -0.97344	(RESIDUALS ARE RANDOM)	

Prepared by : CJCC

Source of Data : NOPD

Source of Analysis : Data Industries

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