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THE LIMITS OF LIGHTING: THE NEW ORLEANS EXPERIMENT IN CRIME REDUCTION

PREPARED BY
THE MAYOR'S CRIMINAL JUSTICE
COORDINATING COUNCIL

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

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MAYOR'S CRIMINAL JUSTICE COORDINATING COUNCIL
FINAL IMPACT EVALUATION REPORT

Project: High Intensity Street Lighting

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Subgrantee: New Orleans Public Service, Inc. (NOPSI)

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INDEX OF CHARTS, TABLES, AND FIGURES

<u>Chart</u>	<u>Page</u>
1 Total Occurrence of Selected Offenses in the Experimental Area and Percentage Occurring at Night by Year and Offense Category.....	5

<u>Figure</u>	
I Map of Study Area	8

<u>Table</u>	
1 offense Rates for Nighttime Auto Theft: A Pre-Post Comparison, Checking for Slope	13
2 Offense Rates for Nighttime Auto Theft: A Comparison of Means (\bar{X}), Checking for Level	13
3 Offense Rates for Nighttime Assaults: A Pre-Post Comparison, Checking for Slope	14
4 Offense Rates for Nighttime Assaults: A Comparison of Means (\bar{X}), Checking for Level	14
5 Offense Rates for Nighttime Business Burglaries: A Pre-Post Comparison, Checking for Slope	15
6 Offense Rates for Nighttime Business Burglaries: A Comparison of Means (\bar{X}), Checking for Level	15
7 A Monthly Breakdown for Nighttime Auto Thefts: 1970-1976.....	21
8 A Monthly Breakdown for Nighttime Assaults: 1970-1976.....*	22
9 A Monthly Breakdown for Nighttime Business Burglaries: 1970-1976.....	23
10 Correlation Coefficients - Auto Theft.....	24
11 Correlation Coefficients - Business Burglary.....	25
12 Correlation Coefficients - Assault.....	26

EXECUTIVE SUMMARY

A high intensity street lighting program was funded by the Law Enforcement Assistance Administration in July, 1973, as part of an eleven-project Target Area Crime Specifics Program. The present report is the second of two evaluation studies on the effects of the lighting on nighttime crime rates. This report covers the period of operation (i.e., installation) beginning in April, 1974, and uses reported offense data from January, 1970, through August, 1976.

The report is one of thirteen Target Area evaluations conducted by the Evaluation Unit of the New Orleans Criminal Justice Coordinating Council. These reports have been published and are available upon request.

Objectives and Methodology

The installation of high intensity (400 watt mercury vapor) lighting was an attempt by the city of New Orleans to deal with nighttime offenses in high crime areas. The previous report focused on the logic of the planning process and discussed the errors in the assumptions used by the program plan. These problems are summarized in the present report, with special emphasis on the limits of program success as a

Findings

No positive (i.e., decreases in crime rates) effects were observed in the experimental area that were not also visible both city-wide and in the adjacent areas. Although crime rates for business burglary, auto theft, and assault generally decreased, the magnitude of that decrease was nearly always greater city-wide and in the adjacent areas. Additionally, the trend toward reduced offense rates began prior to the installation of the lights.

Conclusions

There is no evidence that street lighting affected the commission of any of the targeted crimes. Overall reductions in offenses (city-wide) are undoubtedly the product of a mix of factors that are undocumented. These outcomes are not unexpected, given the vague definition of the street lighting/crime reduction model. Future deployment of street lights in New Orleans should take into account the findings of this evaluation.

INTRODUCTION

The present report is the second of two evaluation studies on the effects of high intensity street lighting on nighttime crime rates. The reader is referred to the initial report. Crime Reduction Through Increased Illumination, for additional project information.¹

The street lighting program was one of eleven Target Area Crime Specifics Programs funded by the Law Enforcement Assistance Administration in July and August of 1973. Evaluation of the eleven programs was built into the original grant and has been implemented by the Evaluation Unit of the New Orleans Mayor's Criminal Justice Coordinating Council,

Because the Street Lighting program involved no personnel (other than those required to install new lamps and poles), and no activities other than the installation of the lights, no process evaluation is included in this report. It should be noted, however, that the installation timetable was maintained by the New Orleans Public Service, Inc. and that total costs were well below the initial estimates.² Thus, the process or implementation objectives were met.

¹The complete citation: Crime Reduction Through Increased Illumination: A Preliminary Evaluation of the Impact of High intensity Street Lighting, Roger Jones, New Orleans Criminal Justice Coordinating Council, July, 1975.

² See the initial report for a more complete discussion of costs and installation.

A well lighted area eliminates the opportunity for stealth and enhances the probability of a crime being detected while in progress..."

Unfortunately, there is no further discussion in the Plan of the nature of the relationship between darkness and crime. Thus, in the initial evaluation report considerable time was spent on a discussion of problems in the logic of the program, A number of flaws in the lighting/crime relationship were found and delineated. Among these logical flaws were:

1. The failure to specify the role and meaning of light with regard to the commission of crimes. For example, there was no clarification of the proper location of the lights in terms of the specific offenses, i.e., where should a light be located to best discourage business burglaries.
2. The absence of working hypotheses regarding level of illumination and height of the lights.
3. The selection of geographic areas by total (day and night) crime rates, rather than by nighttime rates.
4. The failure to assess the role of causation with regard to darkness for crimes in which 40-50% occur during the day. What role, if any, does darkness play in these crimes?
5. A clear explanation of why particular crimes would be affected by lighting.

As a consequence of these problems with the concept of street lighting and crime, the evaluator was required to make some assumptions about which crimes might be most susceptible to the lighting that was installed, and to re-examine the theory of crime reduction through high intensity lighting.

Chart 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
1 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
1 ARMED ROBBERY	245	58.8	191	43.5	170	40.6

* THEFTS CLASSIFIED BY VALUE OF PROPERTY STOLEN

SOURCE: N.O.P.D.

Objectives

Objectives are defined as those tasks required in order for the program to become operational. Usually objectives are quantified in order to measure the extent to which the tasks were carried out. The street lighting objectives are listed below*

1. The installation of 559 high intensity lights (400 watt; 23,000 lumens) prior to May 1, 1974. The lights were to be installed at each corner and in the middle of each block in an area coterminous with two police district zones, 6F and 6I. (See Figure I)
2. The maintenance of the lights by the Department of Utilities,

The reader should note that during the planning phase, there was no discussion of the height of the lamps, their spread, or the removal of obstacles.

Goals

Goals are defined as the ultimate purpose of the program and are derived from the needs identified in the program's problem statement, in the case of the street lighting project, each of the three goals relate to the reduction of reported crime rates. These goals are:

1. A decrease in the frequency of nighttime business burglaries.
2. A decrease in the frequency of nighttime assaults.
3. A decrease in the frequency of nighttime auto thefts.

II RESEARCH DESIGN

The evaluation of changes in crime rates in the experimental area is not susceptible to any single summary measure. In order to assess the impact of the lighting, I have selected two adjacent areas as control groups and have used three statistical measures.

The two control areas are south and east of the experimental zone. Initially, areas both west and north were also selected but were abandoned when it was discovered that the offense frequencies were low and the variance was small. Figure 1 identifies the experimental area and the two control areas.

In addition to the control areas, I have used city-wide data (excluding the lighting area, but including the adjacent areas) as a further source of comparison. The logic I have used in making the comparison is as follows. Does the change in crime rate in the experimental zone differ (i.e., is the magnitude of change greater) from the city-wide total? If so, is this difference reflected in changes in the control areas? That is, can we determine whether what has occurred is a result of the lights or is a product of some combination of environmental factors?

In taking this approach, I have accepted the real limitations inherent in analyzing street lighting effects. I have assumed that if street lighting is to be considered

111

DATA

The information used in the study is taken from the New Orleans Police Department criminal history offense tapes. Those tapes were processed by the University of New Orleans Computer Research Center. Drs. Peggy Lentz and John Wildgen, of the Department of Urban Studies and Political Science, respectively, worked with the evaluator to assess the validity of the data. That is, the frequencies derived from the tapes were compared, where possible, to the frequencies manually maintained by the Police Department. Because a number of initial inconsistencies were found, a substantial amount of time was spent in reformatting the tapes and redefining the data items. In this process, Ronald Stritzinger of the New Orleans Police Department Data Section was of great help. We were able to validate, through comparison, data on auto thefts and assaults. It is hoped that the program changes for these two offenses also reduced the error level for business burglaries.

Table 1

OFFENSE RATES FOR NIGHTTIME AUTO THEFT:
A PRE-POST COMPARISON, CHECKING FOR SLOPE

	1970	1973	% Change	1973	1975	% Change
Lighting District	172	120	-30%	120	95	-20%
City	5,449	4,033	-25%	4,033	3,669	- 9%
East Control Group	143	98	-31%	98	102	+ 4%
South Control Group	171	149	-12%	149	131	-12%

Table 2

OFFENSE RATES FOR NIGHTTIME AUTO THEFTs
A COMPARISON OF MEANS (\bar{X}), CHECKING FOR LEVEL

	\bar{X} Pre (51 mo.)	\bar{X} Post (29 mo.)	% Change
Lighting District	13.35 (681)	9.48 (275)	-28%
City	399.43 (20,371)	300.48 (8,714)	-24%
East Control Group	10.74 (548)	8.62 (250)	-19%
South Control Group	13.09 (668)	9.82 (285)	-24%

Table 5

OFFENSE RATES FOR NIGHTTIME BUSINESS BURGLARIES:
A PRE-POST COMPARISON, CHECKING FOR SLOPE

	1970	1973	% Change	1973	1975	% Change
Lighting District	107	120	+12%	120	84	-30%
City	3,254	2,622	-19%	2,622	2,353	-10%
East Control Group	126	68	-46%	63	43	-36%
South Control Group	157	104	-33%	104	86	-17%

Table 6

OFFENSE RATES FOR NIGHTTIME BUSINESS BURGLARIES:
-A COMPARISON OF MEANS (X), CHECKING FOR LEVEL

	\bar{X} Pre (51 mo.)	\bar{X} Post (29 mo.)	% Change
Lighting District	9.00 (459)	6.68 (194)	-25%
City	236.00 (1,236)	193.00 (5,603)	-18%
East Control Group	6.78 (346)	4.03 (117)	-40%
South Control Group	9.20 (543)	8.37 (243)	- 9%

CONCLUSION AND DISCUSSION

The information presented in this report supports a conclusion that the high intensity street lights that were installed in two New Orleans police zones did not change the pattern or frequency of the target crimes of business burglary, assault or auto theft.

As to their effect on the thinking, morale, and behavior of residents, these questions have not been studied. While it is always desirable that citizens should "feel safer", it is a cruel joke to give equal evaluative weight to perceptions of safety. Ideally, and over the long run, citizens will feel safer if crime decreases.

Aside from the conceptual problems discussed in the text that relate to the New Orleans program, there is still a more general question to ponder. Can we reasonably expect "innovations" such a street **lights to** reduce crime rates? My conclusion, **based on the present study and a reading of other reports,³ is that street lighting tends to be peripheral to the central issue, which is the individual behavior of persons committing criminal acts***

³Data supporting street lighting as a crime reduction tool is usually imprecise and poorly defined. The best summary of the literature is provided in a working paper by Public Systems Evaluation, Inc., issues in Street Lighting and Crime, James M. Tien, Ph.D., Vincent F. O'Donnell, and Pitu B. Mirchandani, Ph.D., July, 1976, for the Law Enforcement Assistance Administration*

As a means of further analyzing the street lighting data, both a time series analysis and a stepwise regression were implemented. Included in the Appendix are (1) graphs of the time series and (2) correlation coefficients. The correlations are among four variables that describe different aspects of the street lighting data for the 79 month period (50 months prior to installation, and 29 months afterward). Two of the measures are dummy variables (with codes of either 1 or 0), the slope and lights. Lights is the intercept and is a measure of the existence of the new high intensity lamps during a designated month. Slope is self-explanatory, with all pre-light values equal to "0". Pre-crime refers to the value (i.e., the number) of an offense for the first month in the prediction model. Late crime refers to the value of that offense for the second month, where the objective of the test was to predict month two from month one.

The correlations shown in Tables 10, 11 and 12 in the Appendix support the findings reported in the text. With respect to interpretation, we would expect a strong negative relationship between slope and late crime in the lighting area if the experiment were successful. Concomitantly, we would expect this relationship, both city-wide and in the central areas, to show no association, or even a positive association. With the exception of assault, the findings do not support the predictive hypothesis. City-wide decreases in auto theft and business burglary are of a greater magnitude than the lighting

Table 7

A MONTHLY BREAKDOWN FOR NIGHTTIME AUTO THEFTS: 1970-1976

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Lighting District	1970	13	16	14	13	14	9	11	22	17	20	13	10	172
	1971	23	17	17	17	20	16	18	11	15	19	20	15	208
	1972	12	14	17	15	15	9	5	11	8	14	13	9	142
	1973	9	14	15	10	5	8	9	14	8	6	8	14	120
	1974	12	18	9	11	11	16	19	10	9	13	12	11	151
	1975	7	11	9	11	7	12	9	3	9	4	4	9	95
	1976	8	9	8	10	11	9	5	8					68
City	1970	372	391	374	414	433	479	482	555	446	520	470	513	5,449
	1971	450	459	528	464	422	359	427	446	450	512	446	415	5,378
	1972	402	454	465	413	330	354	377	426	402	274	284	348	4,529
	1973	356	308	392	346	269	343	375	357	331	320	312	324	4,033
	1974	329	308	345	312	315	321	386	411	370	312	308	300	4,017
	1975	367	416	366	320	277	284	281	323	298	226	266	245	3,669
	1976	275	250	262	236	216	215	272	284					2,010
East Control Group	1970	8	11	12	4	11	11	11	25	10	13	15	12	143
	1971	11	11	11	15	10	8	12	14	10	18	18	12	150
	1972	7	16	8	11	10	10	18	9	13	5	9	9	125
	1973	10	8	13	6	4	6	5	5	12	10	9	10	98
	1974	15	10	7	7	7	12	11	16	15	15	6	9	130
	1975	9	7	10	7	6	11	10	5	8	7	12	10	102
	1976	8	7	7	6	7	2	10	3					50
South Control Group	1970	11	9	16	13	13	17	17	19	10	15	14	17	171
	1971	18	19	15	9	15	14	18	12	7	16	15	13	171
	1972	10	20	19	9	8	11	12	11	16	5	13	6	140
	1973	8	11	24	5	13	9	13	14	12	13	12	15	149
	1974	9	13	15	8	11	17	7	14	9	4	9	8	124
	1975	16	19	14	8	9	13	7	17	8	7	5	8	131
	1976	11	6	7	10	9	2	15	7					67

Table 9

A MONTHLY BREAKDOWN OF NIGHTTIME BUSINESS BURGLARIES: 1970-1976

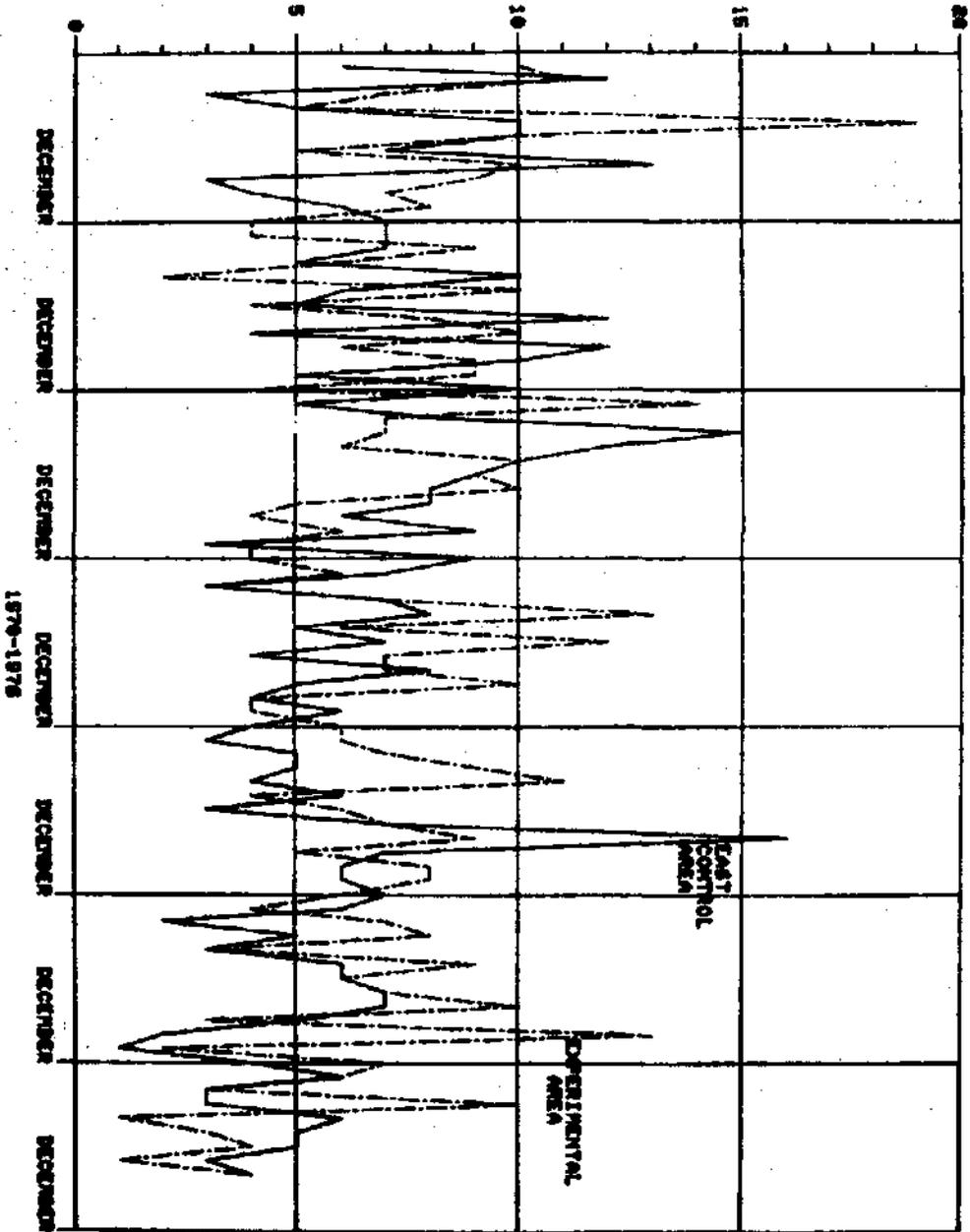
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Lighting District	1970	5	7	4	12	9	8	10	13	12	7	10	10	107
	1971	17	11	24	12	14	16	17	5	9	5	5	10	145
	1972	7	3	2	6	4	5	4	5	3	5	10	9	63
	1973	12	8	10	23	7	7	4	9	23	7	6	4	120
	1974	5	7	12	2	9	3	3	4	8	6	15	8	82
	1975	15	11	15	3	5	4	3	9	3	5	3	8	84
	1976	6	9	9	5	2	7	10	4					52
City	1970	234	225	273	264	302	280	292	304	259	275	235	311	3,254
	1971	308	277	337	237	250	215	216	254	271	211	219	271	3,066
	1972	221	189	254	235	183	212	192	214	200	173	170	170	2,413
	1973	210	182	252	233	214	201	234	244	220	190	184	258	2,622
	1974	241	212	228	200	228	219	231	210	256	206	172	245	2,648
	1975	247	196	228	182	195	220	204	195	200	189	135	162	2,353
	1976	155	158	136	152	195	183	161	143					1,283
East Control Group	1970	14	11	13	11	10	10	11	3	12	11	9	21	126
	1971	12	6	10	4	3	3	4	9	5	4	4	6	70
	1972	3	4	9	6	2	3	3	5	7	8	11	5	66
	1973	7	3	7	8	5	7	4	8	5	4	6	4	68
	1974	8	6	2	5	3	9	4	9	7	4	6	6	69
	1975	9	2	4	5	3	5	4	5	2	1	2	1	43
	1976	2	2	2	4	2	4	4	1					21
South Control Group	1970	15	11	12	16	9	7	16	18	14	9	11	19	157
	1971	21	11	20	17	10	13	7	4	16	5	7	8	139
	1972	6	9	8	13	5	5	7	11	16	9	8	11	108
	1973	8	2	12	6	8	11	8	10	10	7	9	13	104
	1974	13	6	16	16	23	18	17	12	11	6	10	7	155
	1975	6	12	10	8	8	4	6	6	8	8	8	2	86
	1976	3	3	7	3	3	14	7	7					47

Table 11

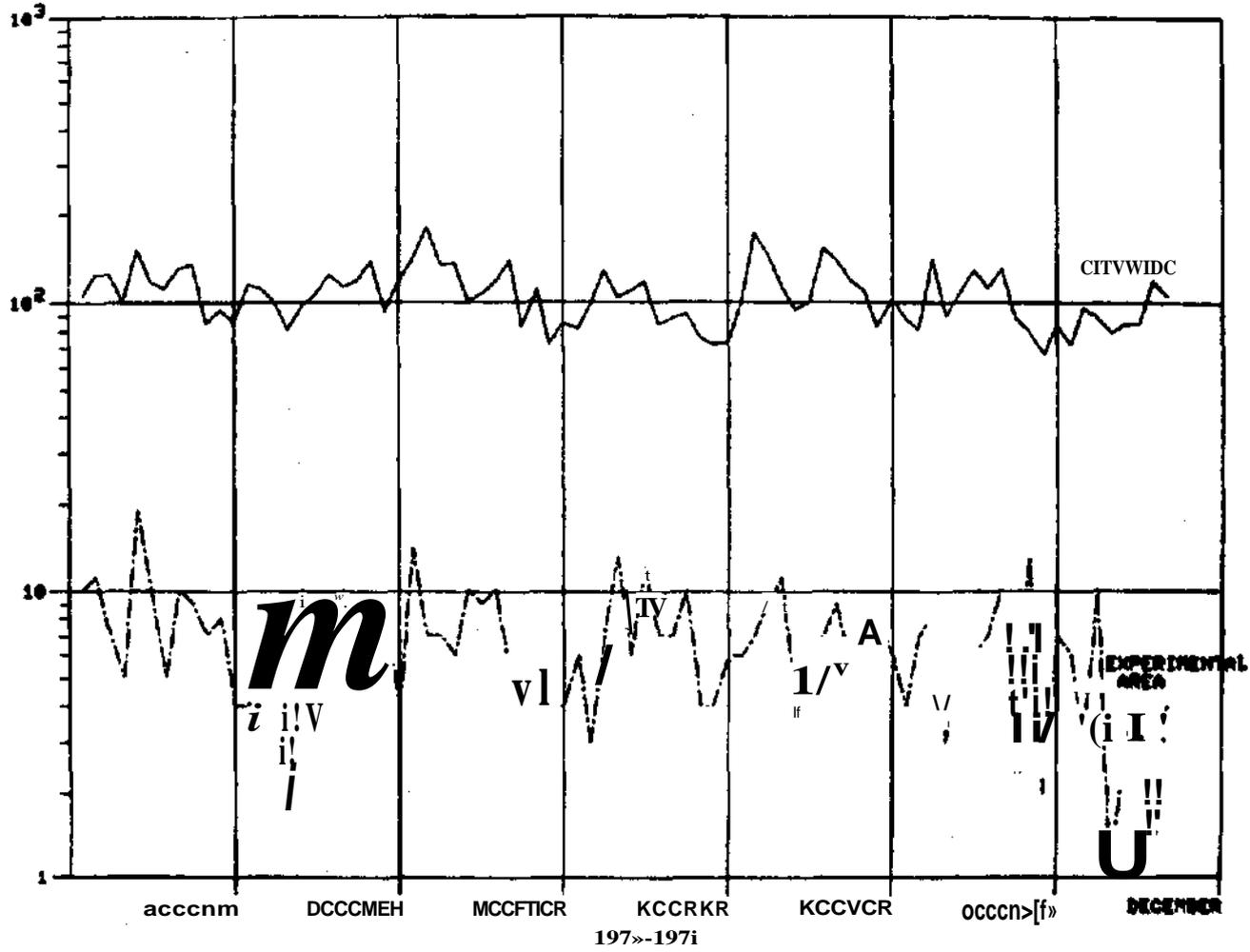
CORRELATION COEFFICIENTS
BUSINESS BURGLARY

	Slope	Pre-Crime	Lights	Late Crime
<u>CITY-WIDE:</u>				
Slope	1.000	-.355	.979	-.418
Pre-Crime	-.355	1.000	-.459	.660
Lights	.979	-.459	1.000	-.481
Late Crime	-.418	.660	-.481	1.000
 <u>EAST CONTROL AREA:</u>				
Slope	1.000	-.115	.820	-.259
Pre-Crime	-.115	1.000	-.408	.493
Lights	.820	-.408	1.000	-.388
Late Crime	-.259	.493	-.388	1.000
 <u>SOUTH CONTROL AREA:</u>				
Slope	1.000	.258	.815	.103
Pre-Crime	.258	1.000	-.155	.450
Lights	.815	-.155	1.000	-.190
Late Crime	.103	.450	-.190	1.000
 <u>LIGHTING AREA:</u>				
Slope	1.000	.120	.818	-.170
Pre-Crime	.120	1.000	-.199	.290
Lights	.818	-.199	1.000	-.240
Late Crime	.170	.290	-.240	1.000

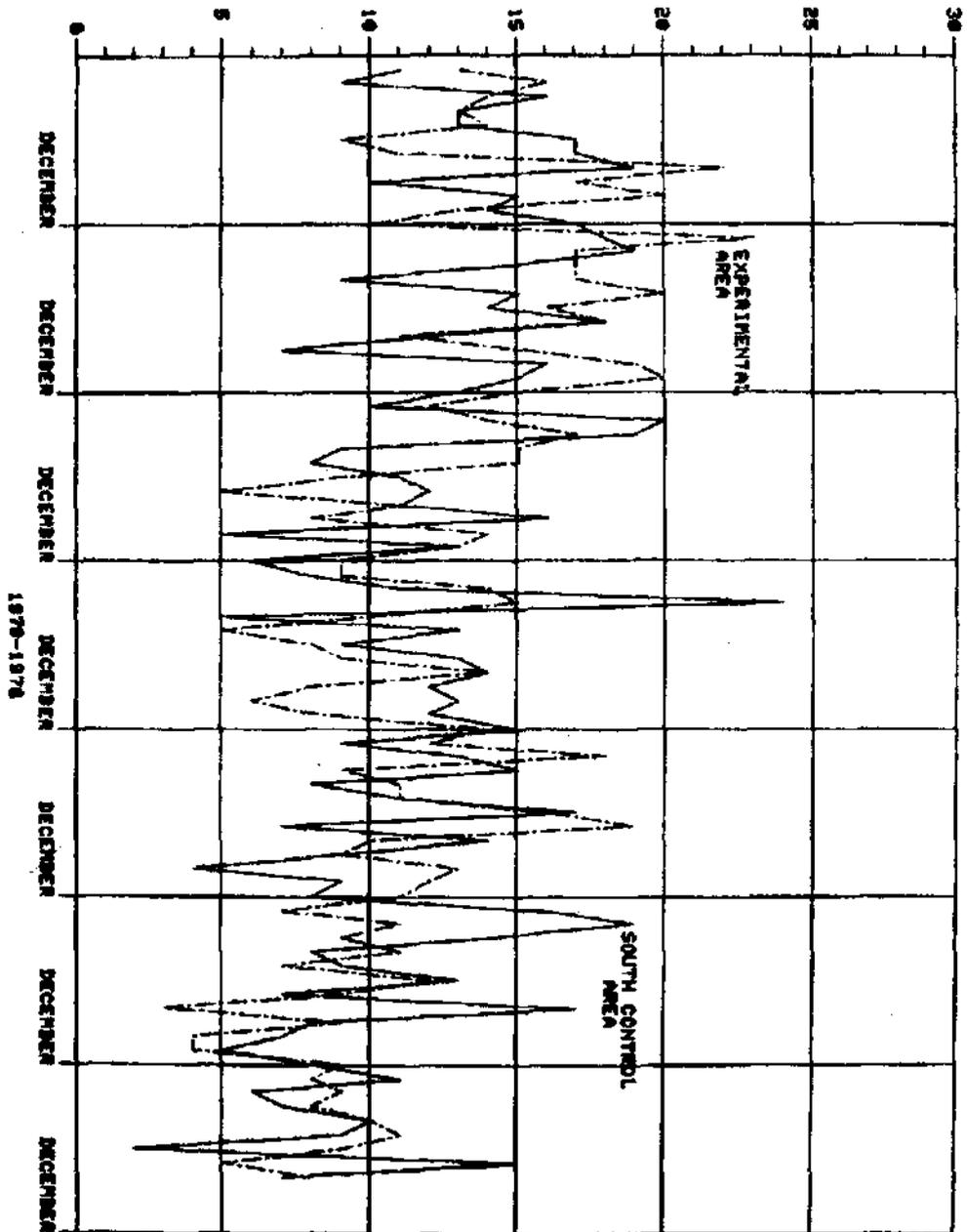
21 * RESULTS OF EXPERIMENTAL



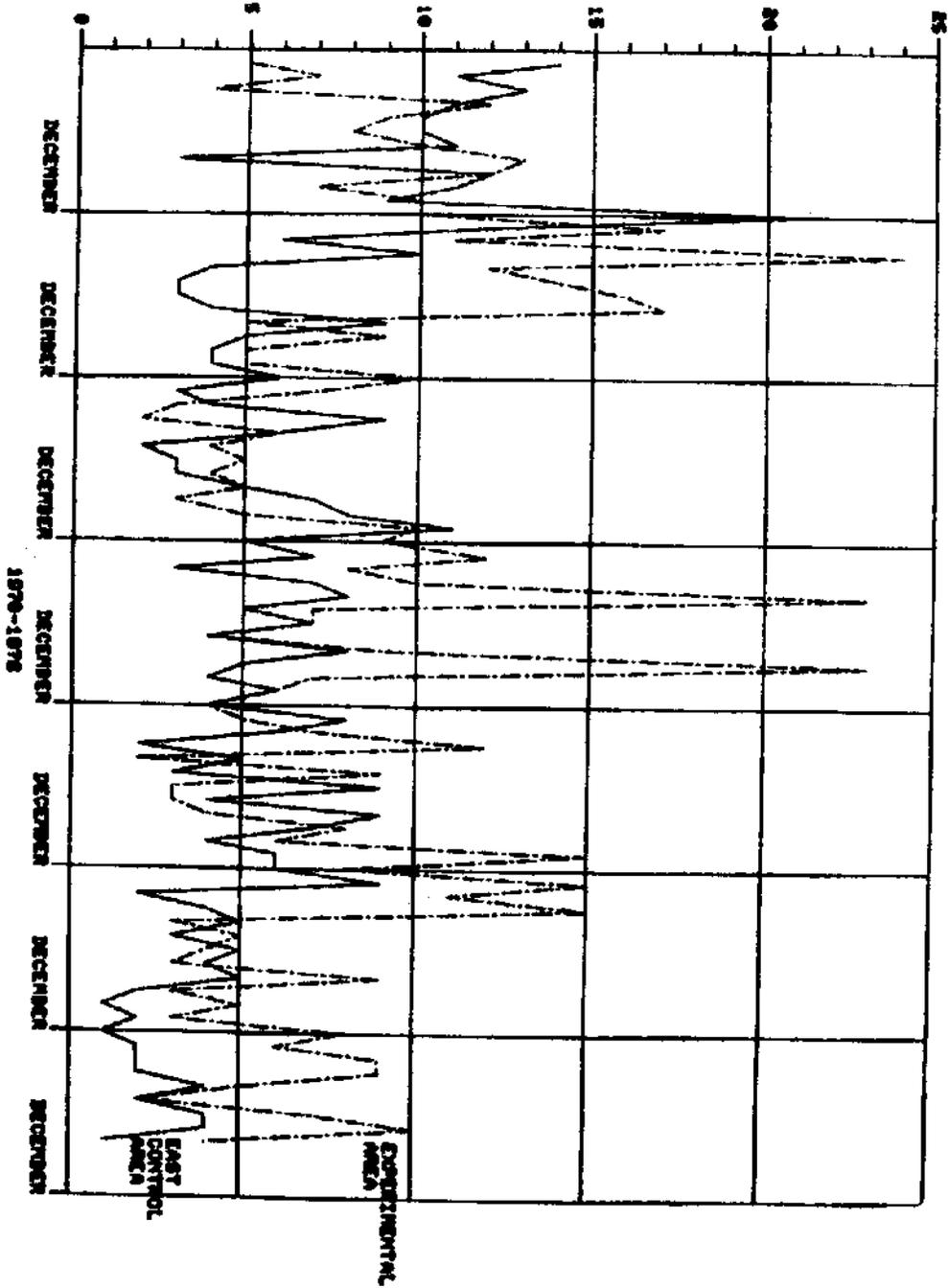
N10HT Tint ASSAULTICITYUDE US. CXPMIHCNTAL



NIGHT TIME AUTO THEFT: SOUTH US. — EXPERIMENTAL



NIGHT TIME BUSINESS SURVEILLANCE
 **EXPERIMENTAL**



NIGHT TIM MJINCM »Ur6UMViCITVUIDC US. CPMXKMTM,

