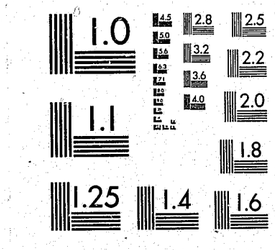

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THE PREVENTION AND CONTROL OF ROBBERY

VOLUME III

THE GEOGRAPHY OF ROBBERY

By

Susan Wilcox

THE CENTER ON ADMINISTRATION OF CRIMINAL JUSTICE
University of California, Davis

April 1973

The Prevention and Control of Robbery
Volume Three

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THE GEOGRAPHY OF ROBBERY

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The Prevention and Control of Robbery

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Chapter One

THE STUDY

Where crime occurs is important. Important to citizens trying to avoid the impact of crime on their lives, important to the police in their efforts to prevent and deter crimes, and important to planners and other officials who have responsibilities for generating and implementing physical and environmental changes that may affect crime.

Despite this importance there has been relatively little study of the spatial patterns of crime within the city, particularly in recent years and particularly of specific crimes. This study is an attempt to determine the patterns of robbery in a medium-sized American city--Oakland, California.

The crime of robbery involves the taking of property from another by means of force or fear. It encompasses muggings, yokings and holdups, and makes up a high percentage of all violent street crime. Concern about "safety in the streets" is in large part concern about robbery.

A. The Data

Oakland was chosen for this study because the city has all the problems of a typical core city and because the Oakland Police Department, which over the years has developed an excellent record keeping system, was willing to cooperate with the study. The Oakland Police Department made available its records for robbery for the years 1966, 1967, and 1968.

Records for pursesnatching, a crime very similar to robbery in that it involves a sudden taking of property from another but which does not involve the use of force, were also made available.

A total of 6,580 records were made available as shown in Table 1.

[Insert Table 1]

Both crimes were increasing during this period as indicated in the table, and particularly during 1968, which was by far the highest year for robbery-type crimes to that date.

The information available included the date and time of the robbery; age, sex, and race of the victim; house number and street code, premise type, census tract, and police beat of the robbery site; and the value and object of the robbery.

Additional information was added to the Oakland Police Department's data from the police reports in order to more accurately pinpoint the location of the offense. The address of the robbery site was located upon a map of the city which contained an X-Y coordinate network. This coordinate system was then recorded along with the crime report information for use in computerized mapping of the robberies. The grids in this network were located 400 feet apart, making each grid square 160,000 square feet, or approximately a half block. With this network for locating the offenses computer printer plot maps were developed using the Symap program. Each point of these computer produced maps represents the tally of robbery and pursesnatch occurrences in the grid square. In addition to the coordinate information the street making the nearest intersection with the street on which the robbery occurred was coded. The robbery data was then locationally accessible by:

X-Y grid coordinate location
Census tract in which the offense occurred
Police beat in which the offense occurred

Table 1

Robberies and Pursesnatches - 1966-68

	Robbery	Pursesnatch	Total
1966	1052	268	1320
1967	1404	420	1824
1968	2733	703	3436
Total	5189	1391	6580

Street on which the offense occurred
Street intersection nearest the offense

B. The City

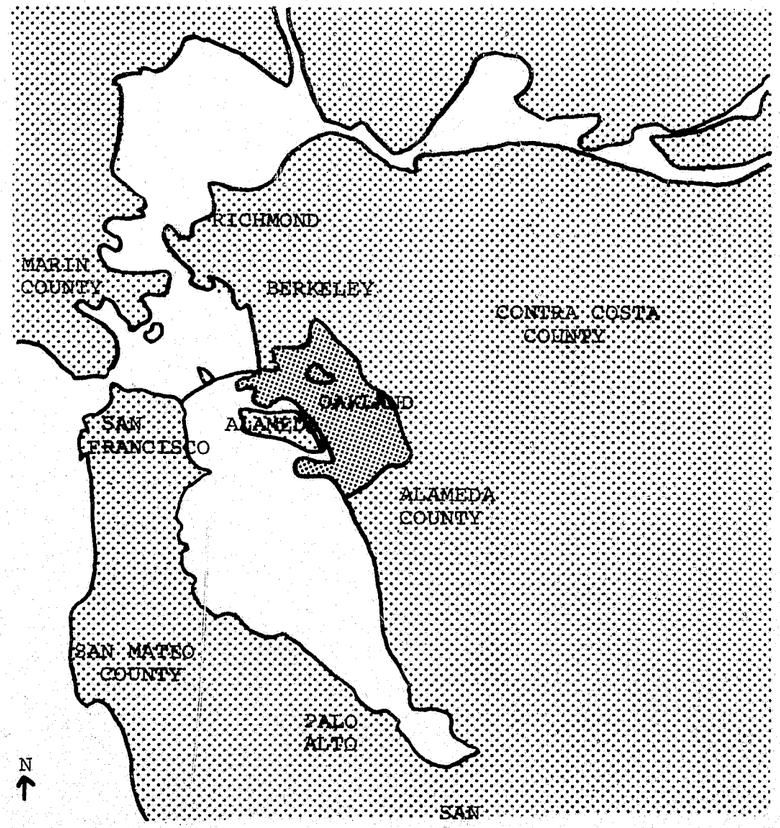
Oakland is a city of 360,000 located on the mainland side of the San Francisco Bay. It has all the characteristics of the core of a much larger urban area. Encompassing about 54 square miles, it is the second largest city of a metropolitan area of three million people and is situated in the middle part of a string of urban cities along the eastern side of the Bay. Flanked by Berkeley on the north and San Leandro on the south, Oakland, as shown in Map 1, is physically composed of two areas, a "flatland" area next to the Bay and a "hill" area further inland. The waterfront is largely industrial; further inland is a section of older houses, and beyond that there is a rather undefined downtown, commercial core. Radiating out from this downtown core area are a number of major arteries along which there are long, thin commercial strips. Beyond these, the hill area, largely residential, rises into the coast range which goes up to nearly 2,000 feet. Oakland completely surrounds the small city of Piedmont.[1]

[Insert Map 1]

Using the point mapping method, there are approximately 9,200 grid squares of approximately a half block area each in the city of Oakland. Approximately 3,000 of these areas are either water-covered or are areas such as tide flats or high hills that are essentially not in the inhabited part of the city.

Map 1

San Francisco Bay Region



Chapter Two

ROBBERY IN THE CITY

The most significant spatial fact about robbery in Oakland is that for most parts of the city robbery is a relatively rare event.

During the three-year study period, 1966-68, Oakland had one of the highest robbery rates in the country and the number of robberies in the city had climbed to historically high levels. Despite these high rates, however, over 4,000 or more than two thirds, of the approximately 6,200 half block-sized areas of the city that are neither watercovered, vacant or too hilly for occupation, had no robberies or pursesnatches during the entire three-year period. Only 2,059 of the areas had a robbery or pursesnatch during this period, as shown in Table 2. And of this number 864 had only one such event. Thus only 19 percent of the approximately 6,200 possible grid squares contained more than one robbery or pursesnatch offense. Overall more than 25 percent of the robberies and prusesnatches occurred within less than four percent of the inhabited grid squares. Even in these grid squares, however, robbery was not a daily or a weekly event. Only one grid square averaged as many as one offense per month and few were even close.

[Insert Table 2]

Nor were the areas which did have robberies during the study period evenly distributed throughout the city.

--First, robbery is heavily concentrated in the flatlands, and particularly near the Bay.

--Second, this concentration diminishes with increasing distance from the Bay.

Table 2

Number of Grid Squares With Robberies and Pursesnatches
1966-1968

Number of Robberies and Pursesnatches in Grid Square	Number of Grid Squares	Percent of All Occupied Grid Squares in the City	Cumulative Percent All Grid Squares Excluding Those Without a Robbery
0	4141	66.8	--
1	864	13.9	13.9
2	427	6.9	20.8
3	234	3.8	24.6
4	135	2.2	26.8
5	91	1.5	28.3
6	66	1.0	29.3
7-8	94	1.5	30.8
9-10	50	0.8	31.6
11-20	78	1.3	32.9
21-50	19	0.3	33.2
Above 50	1	-*	33.2
Total	6200	100.0	33.2

*Less than .02 percent.

--Third, even within the general areas of concentration in the flatlands, there are large areas of little or no robbery.

--Fourth, there is a heavy concentration along certain major streets.

The robbery distribution shown on Map 2 is the pattern for the total sample of all robbery and pursesnatch offenses during the three-year period. Separate distributions for armed, and strongarm robberies are shown on Maps 3 and 4. These distributions are essentially the same as that for all robberies as a group: a concentration in the flatlands with the concentration decreasing as the distance from the Bay increases.

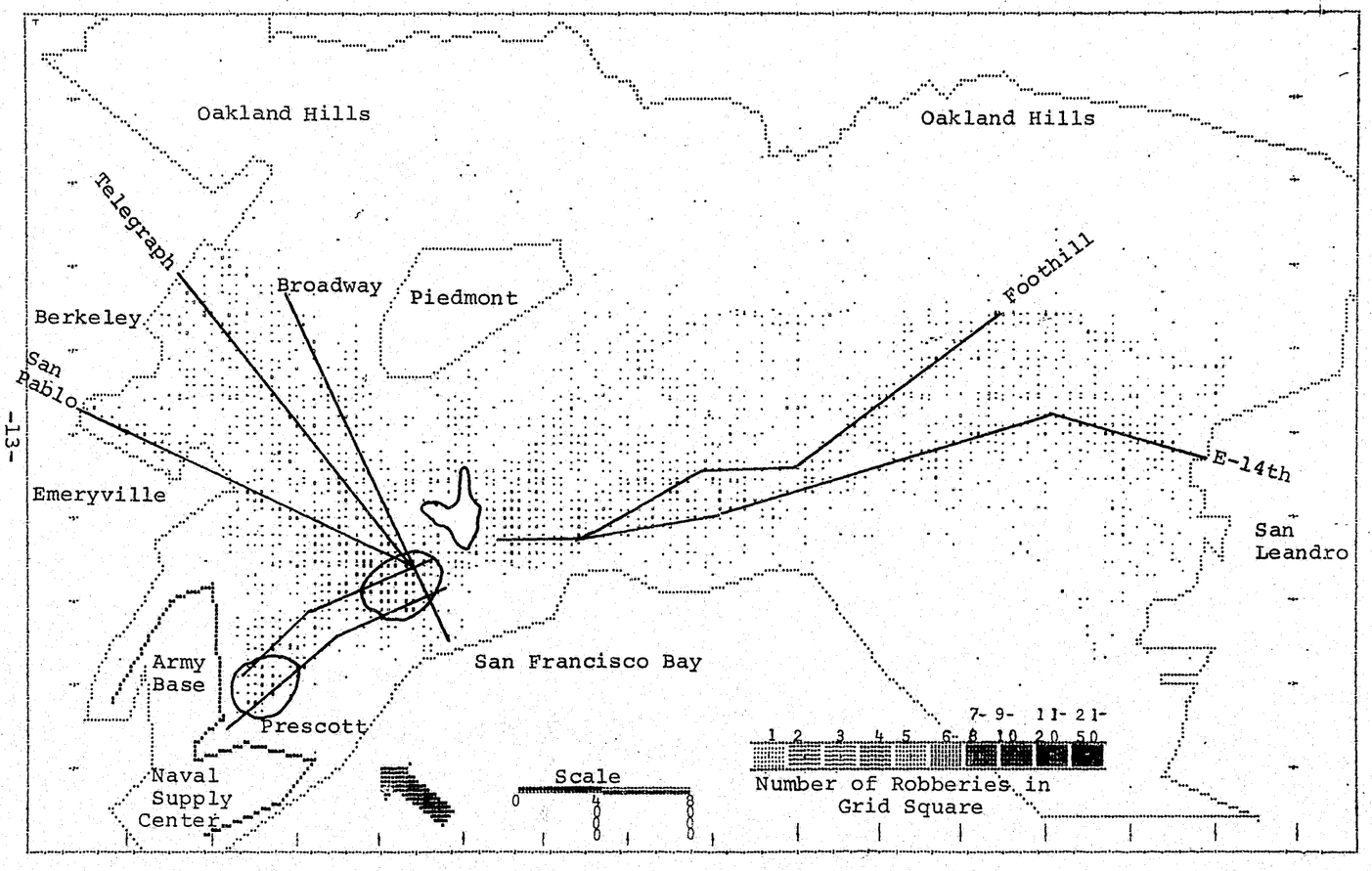
The distribution for pursesnatches, shown on Map 5, however, differs from the total robbery distribution and differs strongly from the armed and strongarm distributions.

[Insert Maps 2, 3, 4 & 5]

If all robberies are broken down by sex of the victim and the pursesnatches grouped together with the female armed and female strongarm robberies, the resulting distribution is similar to that for the pursesnatches alone and quite different from the distribution formed by grouping the male armed and male strongarm robberies. The major, overriding difference between the two patterns is the absence of female robbery victimization in two areas of high robbery concentration in the northwestern portion of the city and to the west of the heart of the downtown. Both of these areas of robbery focus are a result of male victimization only. Female robberies are much more concentrated in the areas to the east of

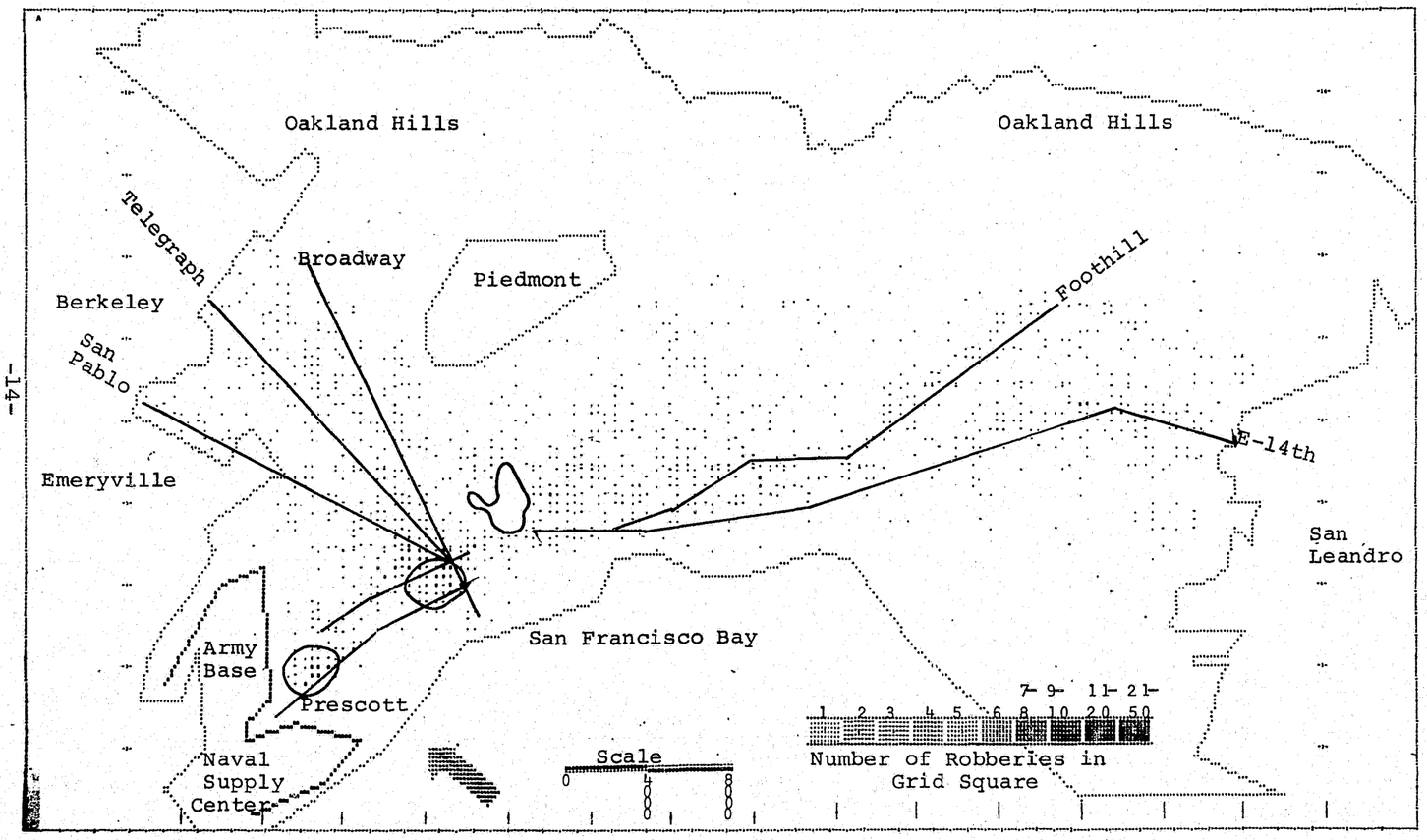
Map 2

Total Robbery - 1966-1968



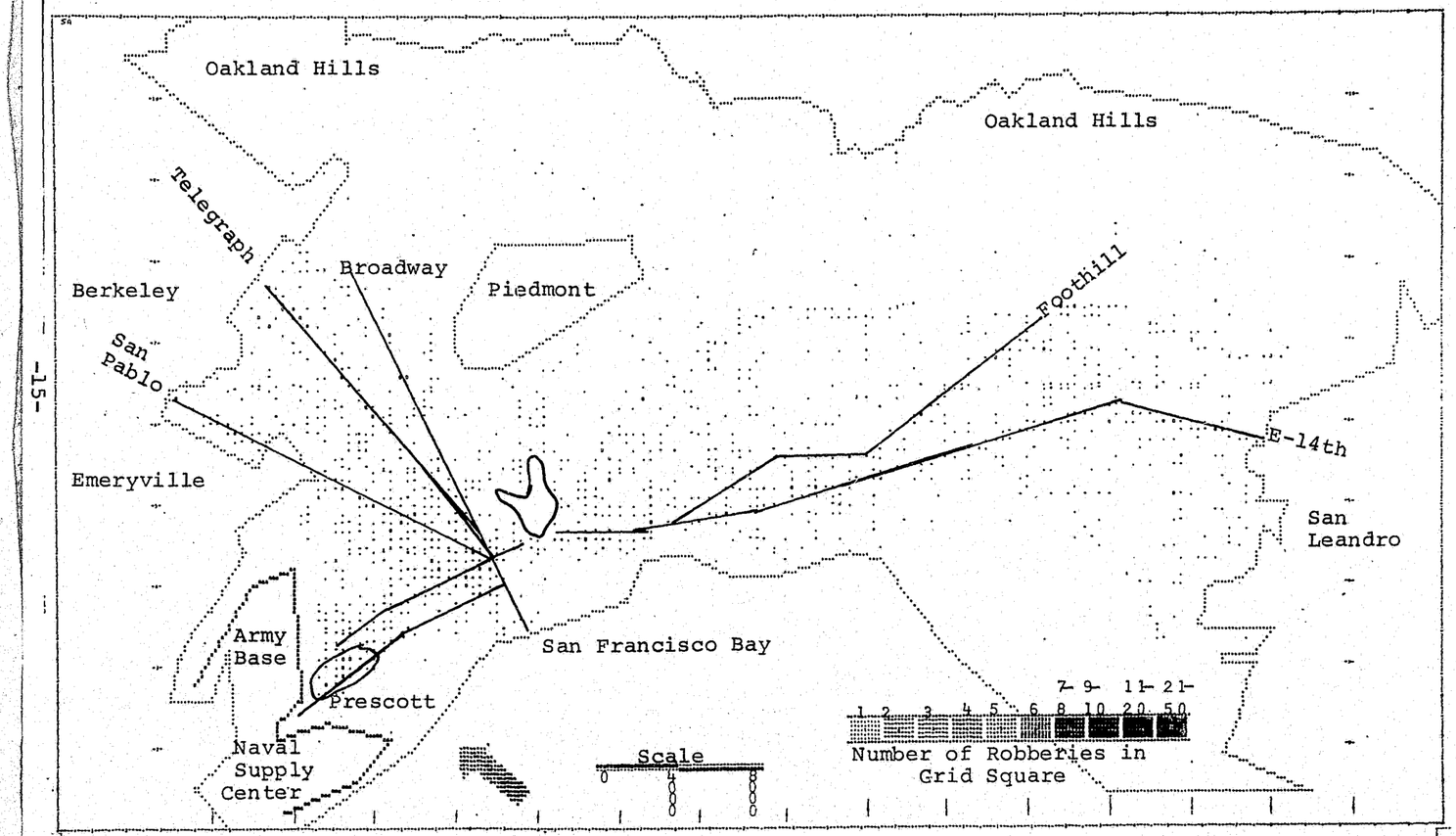
Map 3

Armed Robbery - 1966-1968



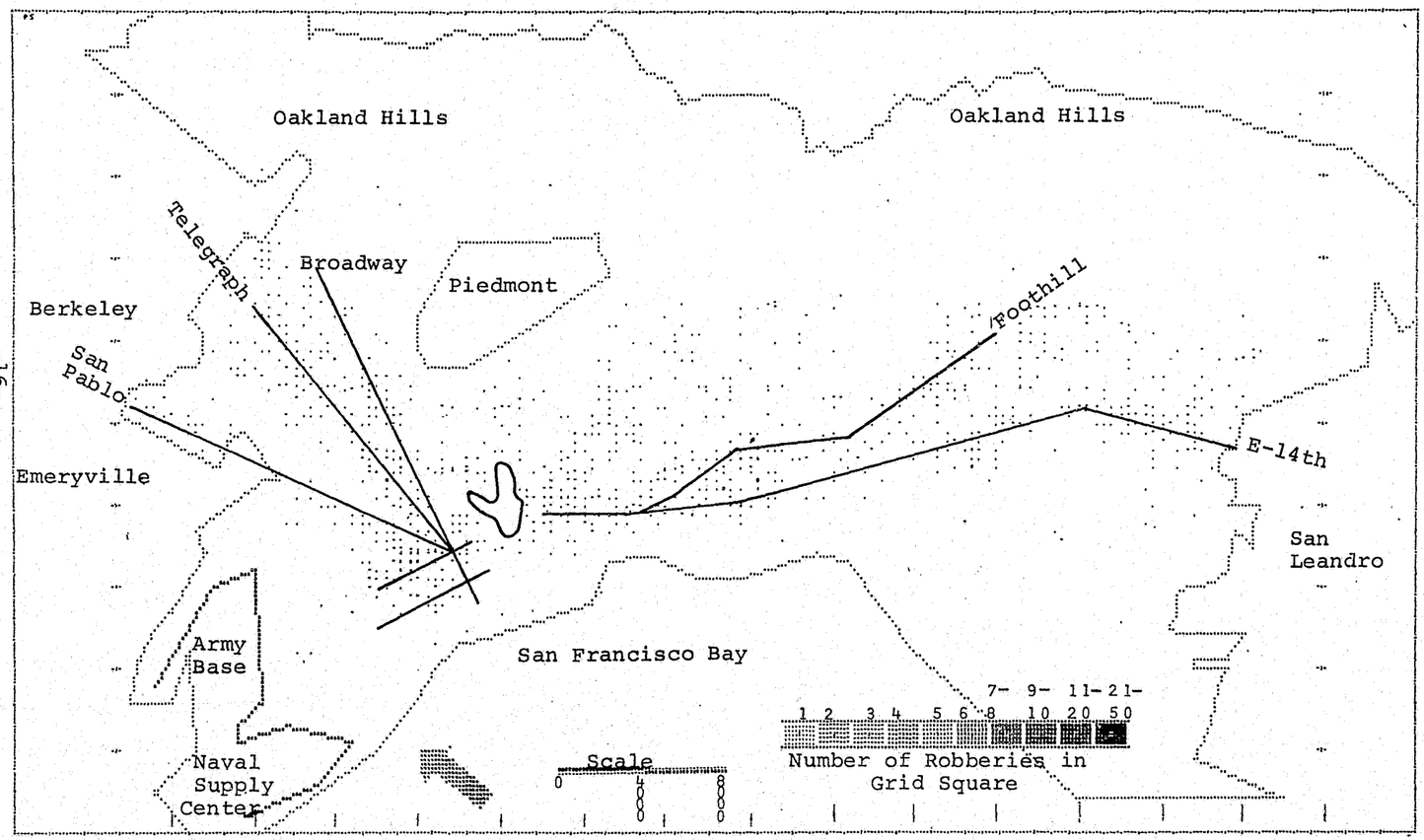
Map 4

Strongarm Robbery - 1966-1968



Map 5

Pursesnatches - 1966-1968



the high male victimization. If there is a focus at all, it is about a few major streets of the city.

A. Robbery on Major Traffic Arteries

Robbery in Oakland is heavily concentrated on a few major streets. Thirty-six major traffic and business arteries, 25 of which are shown in Table 3, contain about 50 percent of the robberies--even though these streets cover a distance of only 76 miles, less than one-fifteenth of the total street distance in the city.[2]

[Insert Table 3]

The concentration on the major streets is greater for armed robbery (59 percent) than for strongarm (43 percent) or purse-snatch (37 percent), as shown in Table 4.

[Insert Table 4]

If the neighboring areas of these few streets are considered and robberies within a half block on either side of these streets included, the amount of robbery accounted for increases to 67 percent of the total, as shown in Table 5.

[Insert Table 5]

The table showing robbery frequencies on each of the major streets does not take into account the varying lengths of the city streets. In order to make the street figures comparable between

Table 3

Major Robbery Streets

Street	Number	Percent
East 14th Street	508	7.7
MacArthur	276	4.2
Foothill	257	3.9
San Pablo	235	3.6
Telegraph	235	3.6
Broadway	179	2.7
Grove	139	2.1
7th Street	123	1.9
12th Street	98	1.5
Bancroft	91	1.4
Fruitvale	85	1.3
14th Street	76	1.2
East 12th Street	65	1.0
Market	65	1.0
16th Street	64	1.0
Jefferson	58	0.9
Willow	60	0.9
23rd Avenue	59	0.9
Park Avenue	47	0.7
Washington	55	0.8
Shattuck	49	0.7
8th Street	45	0.7
East 18th Street	46	0.7
15th Street	47	0.7
San Leandro	47	0.7
Total	3009	45.8

Table 4

Robberies and Pursesnatches on Major Streets

	Percent
Armed	59
Male	57
Female	66
Strongarm	43
Male	52
Female	37
Pursesnatch	37
Female strongarm and pursesnatch combined	37
Total	50

Table 5

Proximity of Robberies and Pursesnatches to Major Streets
(In Percent)

	Major Street	Within a Half Block	Further Than Half Block
Armed	59.0	13.6	27.5
Male	57.1	14.9	28.0
Female	66.0	8.8	25.2
Strongarm	42.9	19.6	37.5
Male	51.9	20.0	28.1
Female	37.3	19.4	43.3
Pursesnatch	37.0	19.3	43.7
Female strongarm and pursesnatch	37.0	19.3	43.6
Total	50.2	16.8	33.0

streets of differing lengths, the number of robberies per thousand feet of street were calculated and listed in Table 6.

[Insert Table 6]

B. Site Characteristics

Thirty-one percent of all robberies occurred in areas of the city classified as commercial landuse, as shown in Table 7.[3] Other landuse classifications including industrial, park, vacant, freeway, and low density residential landuse are all very low in robbery occurrence, as may be seen by comparing Map 2 (total robbery) with Map 6 (generalized landuse).

[Insert Table 7 & Map 6]

While commercial landuse contains the largest percentage of each robbery subtype, the second ranking landuse type varies by type of robbery. High density residential landuse is the second most important landuse for male nonarmed robbery, low medium density residential is second in female nonarmed, and medium density is second for armed robbery.

While the major type of landuse in which robberies occurred is commercial and the majority of robberies occurred upon the major streets, the most important kinds of premise--the specific setting for the offense independent of the landuse--for robbery are street and sidewalk, liquor store, small grocery store, and gas station. The most important premise type for robbery as a whole is the street and sidewalk. This type accounts for 71 percent of the male and 83

Table 6

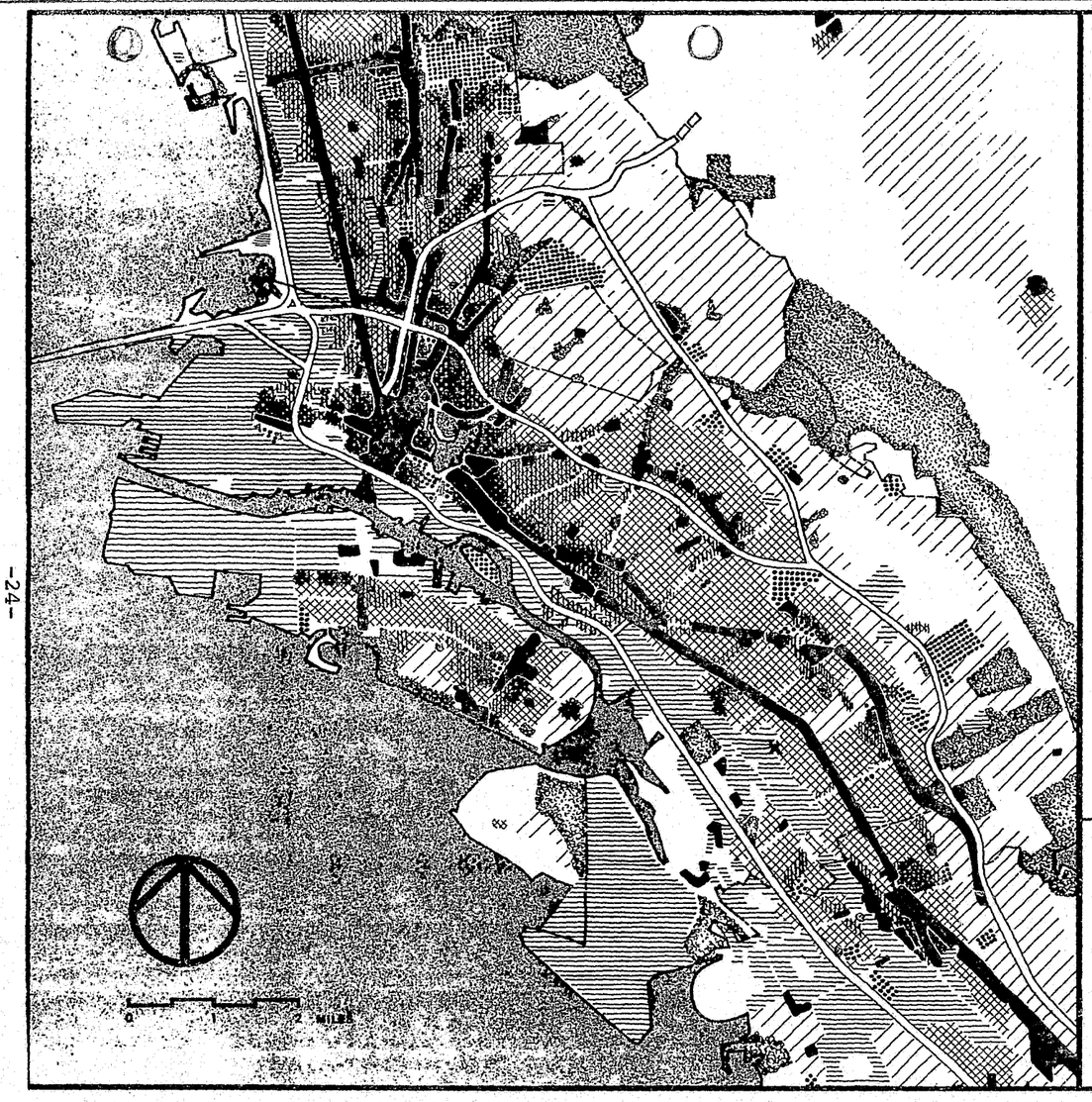
Major Streets - Robberies per 1000 Feet of Length

Street	Length in Miles	Robberies per 1000 Feet
East 14th Street	7.0	13.8
MacArthur	9.1	5.8
Foothill	5.5	8.9
San Pablo	3.7	17.3
Telegraph	3.4	13.2
Broadway	4.3	7.9
Grove	3.9	6.8
7th Street	2.9	8.7
12th Street	2.6	7.2
Bancroft	5.2	3.3
Fruitvale	2.8	5.9
14th Street	2.2	6.9
East 12th Street	3.4	3.6
Market	3.7	3.4
16th Street	1.6	7.5
Jefferson	0.9	11.1
Willow	1.2	9.1
23rd Avenue	2.0	5.5
Washington	0.8	1.1
Park	2.0	5.1
Shattuck	1.3	7.1
8th Street	2.8	3.0
East 8th Street	0.8	11.2
15th Street	0.8	10.9
San Leandro	3.7	2.4
Average	3.1	7.5

Table 7

Landuse of Robbery Sites
(In Percent)

	Total (N=6510)	Armed (N=1758)	Male Nonarmed (N=726)	Female Nonarmed (Including Pursesnatch) (N=812)
Commercial	31.2	32.0	36.9	26.4
Low medium density residential	14.8	13.6	11.2	18.6
Medium density residential	14.6	15.2	11.7	15.6
High density residential	12.5	9.2	14.7	15.7
Industrial	4.3	6.1	5.4	1.0
Freeway	3.1	3.6	3.2	2.3
Government or institution	1.7	1.1	1.3	2.9
Low density residential	1.6	1.6	1.1	1.8
Park	0.9	0.7	0.8	1.3
Vacant	0.3	0.5	0.4	0.1
No information	15.0	16.2	13.2	14.4
Total	100.0	100.0	100.0	100.0



Map 6

- Commercial
- High-Density Residential
- High Medium-Density Residential
- Low Medium-Density Residential
- Industrial, Utility, or Transportation
- Low-Density Residential
- Institutional or Governmental
- Park or Recreational
- Vacant

LAND USE

Source:

DeMARS and WELLS and JACK T. SIDENER Urban Design Consultants

OAKLAND CITY PLANNING DEPARTMENT 701 DIVISION

percent of the female nonarmed robbery. There is however, a great deal of difference in the premise of occurrence between armed and nonarmed robberies. Only 24 percent of the armed robberies occurred in the street and sidewalk premise type. Armed robbery is, however, much higher in the business type of premise codes due to the fact that many robberies of commercial establishments are armed. When premise codes are tallied by their code groupings, as may be seen in Table 8, armed robbery is higher in the business premises group while nonarmed robbery is higher in the open space group.

[Insert Table 8]

Table 8

Premise Type of Robbery Sites
(In Percent)

Grouped Premise Types	Total (N=6580)	Armed (N=2994)	Male Armed (N=2341)	Female Armed (N=638)	Male Strongarm (N=1348)	Female Strongarm (N=797)	Purse-Snatch (N=1391)	Female Nonarmed (N=2188)
Open space	61.0	29.3	32.2	19.4	80.5	88.6	94.0	92.0
Dwellings	5.2	6.4	5.9	8.5	5.3	5.4	2.2	3.4
Finance	1.6	3.3	2.0	8.2	0.3	0.0	0.0	0.0
Public places	1.8	1.3	1.5	1.7	3.7	1.1	0.9	1.0
Business, commercial	26.3	53.1	50.8	61.6	6.2	3.8	1.7	2.4
Transportation	2.8	5.2	6.6	0.2	1.3	0.4	0.3	0.3
Schools	0.6	0.1	0.2	0.0	2.0	0.4	0.3	0.3
No information	0.8	1.0	0.9	0.5	0.7	0.4	0.6	0.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Chapter Three

COMMERCIAL ROBBERY

Commercial robbery is even more concentrated than robbery as a whole. All of the city's 1989 commercial robberies for the three-year period occurred in only 12 percent of the grid squares for the city.[4]

Commercial robbery is also highly concentrated along the major thoroughfare streets. Over 65 percent of the commercial robberies occurred on one of the major robbery streets. An additional nine percent of the commercial robberies occurred within a half block of these major streets, making a total of over 75 percent occurring on or within a half block of a major robbery street, as shown in Table 9. (See also Map 7.)

[Insert Table 9 and Map 7]

Interestingly the center of the city does not appear to account for a particularly high proportion of the commercial robberies. Most of the central business district of Oakland is contained in census tracts 19 and 29. These census tracts together contain only 3.8 percent of the commercial robbery, as shown in Table 10, while the two census tracts adjacent to them, census tracts 13 and 18, together contain 4.2 percent of the commercial robbery. However, the central area averages two robberies per grid square while the adjacent areas average only one. As may be seen in Map 7, when the central area is compared to the area above West Grand Avenue, especially between Telegraph Avenue and Market Street (census tract 13), it becomes

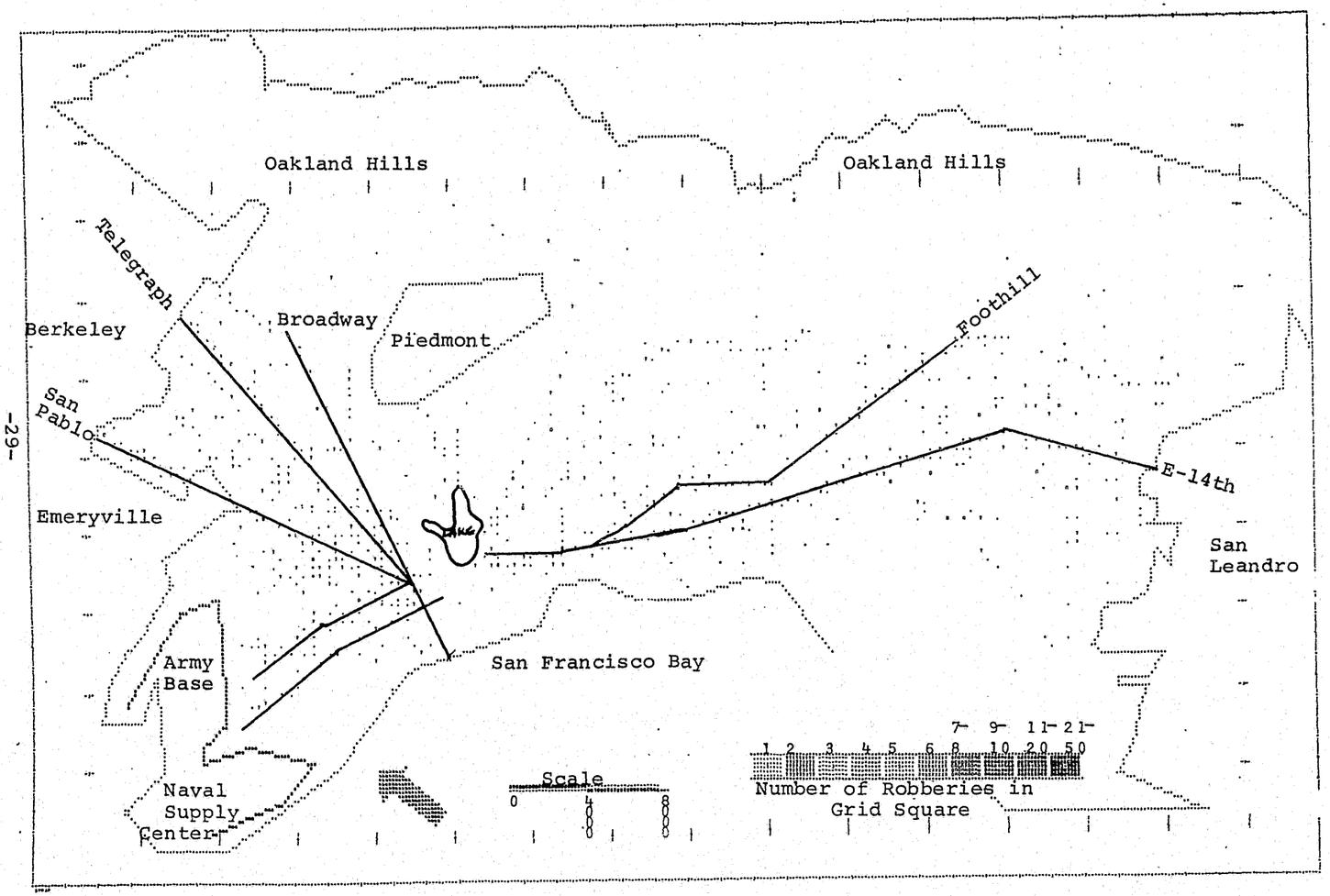
Table 9

Proximity of Commercial Robbery to Major Streets

	Percent
On major streets	68.5
Within half block	9.0
Further than half block	22.5

Map 7

Commercial Robbery - 1966-1968



evident that the outlying commercial and thoroughfare streets of the city appear to attact much greater amounts of commercial robbery than does the central business district.

[Insert Table 10]

This can also be seen by comparing the downtown streets (14th, 16th, Grove, and Broadway) with the major arterial streets (San Pablo and East 14th), as shown in Table 11.

[Insert Table 11]

The robbery of a commercial enterprise includes both the robbery of the inside of a store and the delivery boy on the street. This latter group is, however, so small that only 5 percent of the commercial robberies occurred on the city street or sidewalk. Only about 35 percent of those commercial robberies for which there was information occurred within a commercial landuse area. This is far less than the 37 percent which occurred in residential landuse areas, as shown in Table 12.

[Insert Table 12]

This high percentage of commercial robberies in residential areas may be due in part to robbery in the fringes about the commercial areas. It is undoubtedly primarily due, however, to victimization of stand-alone establishments which are the only commercial establishment on a block or one of a small cluster of

Table 10

Commercial Robbery by Census Tract

Census Tract	Number of Commercial Robberies	Percent of Commercial Robberies in City	Size of Grid Squares	Number of Commercial Robberies Per Grid Square
Central District				
19	38	1.9	20	1.9
29	37	1.9	16	2.3
Adjacent Areas				
13	39	2.0	28	1.4
18	43	2.2	42	1.0
20	19	1.0	19	1.0
23	14	0.7	17	.8
28	10	0.5	41	.2
30	13	0.7	51	.2

Table 11

Commercial Robbery on Major Thoroughfare Streets
By Length of the Street

Street	Commercial Robberies	Length of Street in 1000 feet	Commercial Robberies Per 1000 feet
East 14th Street	259	36.8	7.0
Foothill	113	28.9	3.9
San Pablo	117	13.6	8.2
Telegraph	135	17.8	5.5
Broadway	74	22.6	4.6
Grove	55	20.4	3.9
7th Street	24	14.2	6.4
12th Street	21	13.6	4.9
14th Street	28	11.9	3.7
16th Street	14	8.5	5.4
23rd Avenue	25	10.8	2.3

Table 12

Landuse of Site of Commercial Robbery

Landuse	Number	Percent
Commercial	698	35.1
Low medium density residential	292	14.7
Medium density residential	296	14.9
High density residential	112	5.6
Low density residential	32	1.6
Industrial	111	5.6
Freeway	76	3.8
Government or institution	19	1.0
Park	9	0.5
Vacant	7	0.4
No information	337	16.9
Total	1989	100.0

commercial establishments. The establishments which have the highest commercial robbery rates are those which tend to locate independently of other businesses. This is especially true for the three major victimization premise types of gas station, liquor store, and small grocery store. Together these three types of establishments account for 50 percent of the commercial robberies, as shown in Table 13.

[Insert Table 13]

The landuses in which a major portion of the liquor and small grocery store commercial robberies occur are medium and low-medium density residential. However, these landuses do not contribute equally to gas station robberies which tend to occur more frequently in commercial landuse areas, as shown in Table 14.

[Insert Table 14]

The low percentage of commercial robberies within commercial landuse and the correspondingly higher proportion within the residential landuse areas is due partly to the fact that over half of the city of Oakland is residential landuse. Table 15 shows both the number of commercial robberies within each landuse and the number for each grid square of that kind of landuse. Viewed this way, commercial robberies are nearly six times as dense in commercial landuse as within residential landuse. Also of note is the relatively high density of commercial robbery within industrial landuse areas. This is not demonstrated in the previous tables due to the small amount of this type of landuse throughout the city.

Table 13

Most Frequent Premise Types of Commercial Robbery

Premise	Number	Percent
Gas station	447	22.5
Liquor store	288	14.5
Small grocery	253	12.7
Street and side walk	103	5.2
Bar - saloon	81	4.1
Supermarket	66	3.3
Lunch counter - cafe	112	5.6
Motel	57	2.9
Cleaners	57	2.9
Drug store	45	2.3
Bank	41	2.1

Table 14

Commercial Robbery Sites - Landuse and Premise
(In Number of Robberies 1966-68)

Premise	Commercial Landuse	High Density Residential	Medium Density Residential	Low Medium Density Residential	Total Residential	Industrial	Freeway	Total*
Gas station	176	16	79	37	136	49	27	447
Liquor store	91	27	58	38	125	7	20	288
Small grocery	52	24	42	74	149	9	9	253
Bar-saloon	33	2	10	15	27	7	1	81
Supermarket	19	3	14	5	22	3	0	66
Lunch counter	26	0	7	9	16	1	0	54
Street and sidewalk	17	14	20	21	60	5	2	103

*Low density residential, park and vacant landuse types not shown due to low occurrences. They are included in total column.

[Insert Table 15]

When the same calculations are performed for the three highest premise types--gas stations, liquor stores and small groceries--the density of gas station robberies, as shown in Table 16, in industrial landuse is also shown to be much greater than that indicated in Table 14.

[Insert Table 16]

Overall the two strongest features of the commercial robbery distribution are the concentration of robberies upon the major streets of the city and the concentration of robberies within commercial landuse.

Table 15

Landuse of Commercial Robbery Sites

	Number of Robberies	Number of Grid Squares	Number of Robberies Per Grid Square
Commercial	698	606	1.15
High density residential	112	653	0.17
Medium denisty residential	296	1263	0.23
Low medium density residential	292	1578	0.18
Low density residential	32	1086	0.03
All residential (combined)	732	4580	0.16
Industrial	111	339	0.33
Freeway	76	381	0.20
Government or institution	19	261	0.07
Park	9	648	0.01
Vacant	7	600	0.01
No information	337	-	--

Table 16

Commercial Robbery - Landuse
(In Number of Robberies per Grid Square)

Landuse	Number of Grid Squares	Gas Station	Liquor Store	Small Grocery
Commercial	606	0.29	0.15	0.09
Industrial	339	0.14	0.02	0.03
Total residential	4580	0.2	0.03	0.03
Freeway	381	0.7	0.05	0.02
Vacant, park, institution and no information	1509	0.006	0.004	0.004

Chapter Four

INDIVIDUAL ROBBERY

While individual robberies are more frequent than commercial robberies (they make up over 64 percent of the robberies and purse-snatches during the three-year study), they are far less concentrated than commercial robberies. As compared with only 12 percent for commercial robbery, individual robberies occur in over 27 percent of the city's occupied grid squares, as shown in Table 17.

[Insert Table 17]

With the exception of two particular areas of high concentration, the distribution of individual robbery in the city closely follows the pattern for commercial robbery:

--along the major thoroughfare streets.

--decreasing in frequency with distance from the Bay.

I. MAJOR INDIVIDUAL MALE ROBBERY AREAS

Ninety percent of the individual robberies in the two areas of high concentration were against male victims. There are no similar concentrations of female individual robberies. The only area of individual robbery involving a concentration of female victims is a small area in the downtown business district just north and east of the downtown skid row area. However, even in this area, only 45 percent of the victims were female.

The two areas, the Prescott area located in the far northwestern portion of the city and a downtown area just west of the central

Table 17

Number of Grid Squares with Robberies

Number of Robberies in Grid Square	Total	Commercial	Individual	Individual Male	Individual Female
0	4141	5427	4508	5263	4962
1	864	365	855	590	757
2	427	163	374	164	253
3	234	77	148	77	90
4	135	60	99	34	65
5	91	28	62	22	28
6	66	29	40	15	19
7-8	94	25	59	15	17
9-10	50	15	23	4	4
11-20	78	9	22	9	5
21-50	19	2	10	7	0
Over 50	1	0	0	0	0
Total	6200	6200	6200	6200	6200

business district, are similar in some respects. Both contain a number of bars and taverns, both have some skid row aspects, and both serve as a meeting place for prostitutes and their customers. Together these two areas account for approximately ten percent of the total individual robberies, but only 1.3 percent of the city's population, and less than one percent of the 6,200 inhabited grid squares, as shown in Table 18.

[Insert Table 18]

The greatest concentration of individual male robberies is in the Prescott area. Encompassed by census tract 15, this area accounts for 9.8 percent of the individual male strongarms and 13.5 percent of the individual male armed robberies, for a total of 11.2 percent of all individual male robberies. Located near the Bay, the Oakland Army Base and the U.S. Naval Supply Center, this area is the oldest area of the city and is the heart of one of the Bay Area's oldest black residence areas.[15]

The center of the robbery concentration in this area is Seventh and Willow Streets, the core of a neighborhood shopping area dotted with eating establishments and bars. There were 58 individual male robberies about the intersection of these two streets during the three-year period and over ten in every grid square touching on Seventh Street for a four-block area.[16] (See Map 8.) This intersection has the highest concentration of robbery in the entire city.

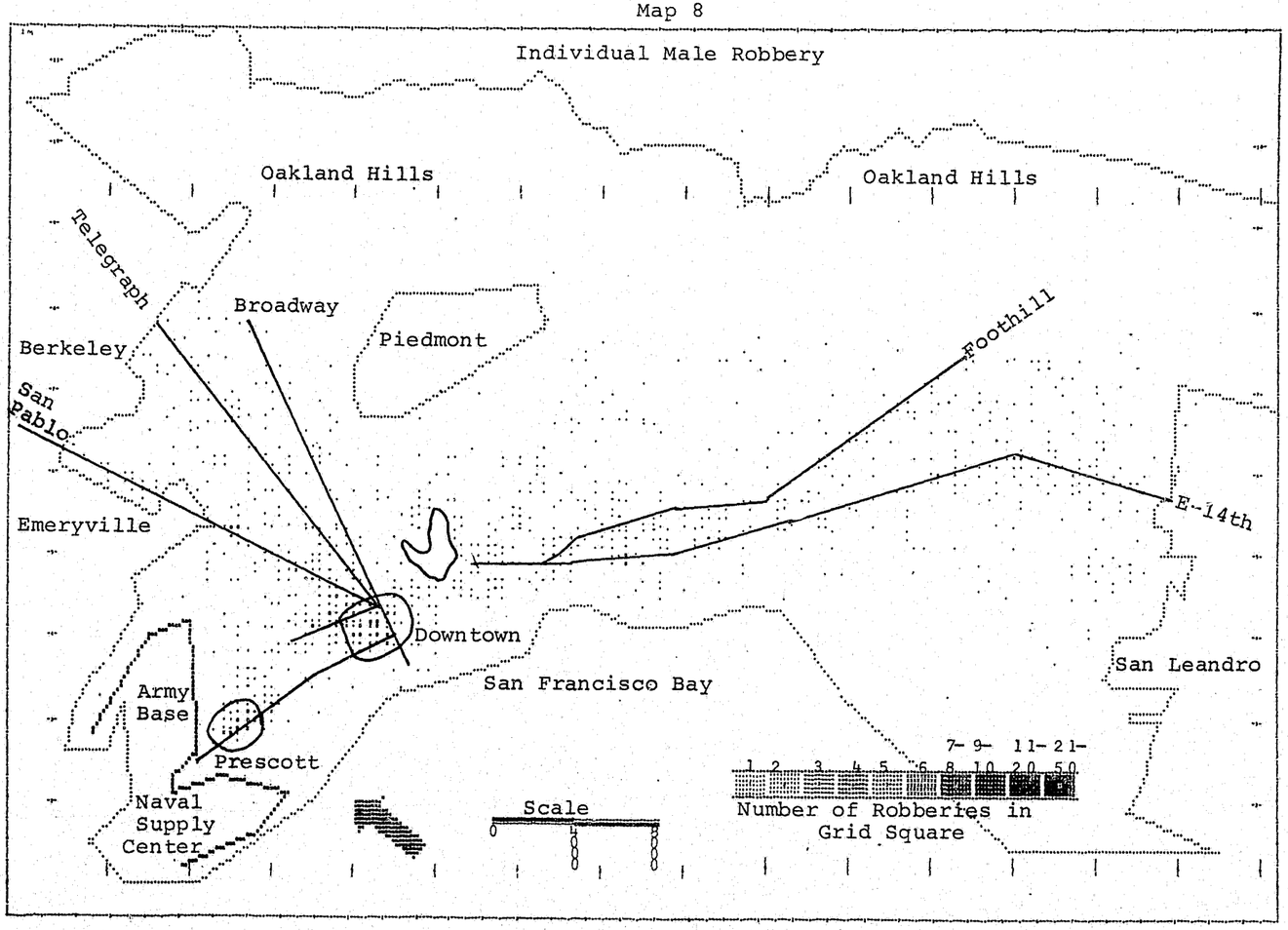
[Insert Map 8]

Table 18

Areas of Individual Robbery Concentration
(In Percent)

	Citywide Robbery	Citywide Population	Citywide Grid Squares
Prescott	5.5	0.9	0.28
Downtown	4.5	.4	0.37
Both Areas	10.0	1.3	0.65

Map 8


Individual Male Robbery
Oakland Hills
Oakland Hills
Telegraph
Broadway
Piedmont
Berkeley
San Pablo
Foothill
E-14th
Emeryville
Downtown
San Leandro
San Francisco Bay
Army Base
Prescott
Naval Supply Center
Scale
1 2 3 4 5 6 7- 8 9- 10 11- 20 21- 50
Number of Robberies in Grid Square

In contrast to the more or less residential character of the broader Prescott neighborhood, the downtown area of robbery concentration is one which was once the commercial heart of the city, but which has now become a somewhat seedy fringe of the city's economic life. This six-block area can be divided into two sections. Farthest from the Bay is a mixed residential and commercial area whose residents are largely elderly persons living in the many small boarding houses. Closer to the Bay is a much more blighted section, with large numbers of hotels and bars catering to single men. Together these two sections account for ten percent of the individual male strongarm robberies, six percent of the individual male armed robberies, and a total of nine percent of all individual male robberies.

Over 43 percent of the individual male robberies in the Prescott area were armed, in contrast to a city-wide average of 36 percent, and only 27 percent in the downtown skid row area. The Prescott total was the highest of any census tract in the city.

In both areas the victims are often persons other than the residents. The Prescott neighborhood has a predominantly young, black population, as shown in Table 19, while the victims are largely young whites. Many of them are undoubtedly servicemen from the nearby army base seeking to take advantage of the night life in the area. The downtown area, on the other hand, has an older white population but a very balanced victim breakdown. Black victims in the downtown area are much younger than the white victims and correspond in age to the citywide average for robbery victims. Victims in both areas are in the below 50 age group more often than the average for the city.

[Insert Table 19]

Table 19

Characteristics of Residents

	Total Population	Percent White	Median Age Male
Prescott	3,293	3.5	19.7
Central District	3,947	85.9	52.6

Source: U.S. Department of Commerce, Bureau of the Census, U.S. Censuses of Population and Housing 1960, Final Report PHC(1)-137, Census Tract, San Francisco-Oakland, California, Standard Metropolitan Statistical Area, Table P-1.

The fact that older males do not show up as victims in the downtown skid row area as frequently as their proportion of the population does not mean that these men are not the targets of robberies in these areas. Rather this is a reflection of the preponderance of victimization of nonresidents, and possibly of some lack of reporting of crimes by derelicts and inhabitants.

Other than these two major areas, only a few areas contain clusters of individual male robberies. One such cluster of individual male robberies is an area of small concentration about the intersection of San Pablo Boulevard and MacArthur Freeway. This area may be a reflection of the individual male robbery in the nearby city of Emeryville where the conditions are similar to those in the Prescott area (a rundown commercial strip development containing many bars and saloons surrounded by old, dilapidated houses). A second area of high individual male robbery is in the Fruitvale district about the local commercial center of the neighborhood, while a third area is located about an East Oakland commercial district (at Ninety-eighth Avenue and East Fourteenth Street).

II. INDIVIDUAL MALE ROBBERY

The great majority, almost 75 percent, of the individual male robberies occur in the open on a city street or sidewalk, as shown in Table 20. Less than nine percent occurred indoors.

[Insert Table 20]

This high proportion of individual male robberies occurring on city streets and sidewalks holds for each landuse type, as shown in

Table 20

Individual Male Robbery: Premise Type of the Offense Site
(In Percent)

	Total (N=1960)	Armed (N=710)	Strongarm (N=1250)
Sidewalk	47.0	48.9	45.8
Street	26.9	21.7	29.6
Parking lot	5.0	6.9	4.0
City park	3.2	3.3	3.2
Private yard	2.2	1.3	2.6
Apartment	1.6	2.3	1.3
Hotel	1.2	1.1	1.1
Bar - saloon	1.2	1.7	1.0
Gas station	1.0	1.4	0.7
Other (premises with less than 1% of Individual Male Robbery each)	10.7	11.4	10.4

Note: Only premise types which accounted for one percent or more of Individual Male Robbery were included.

Table 21.

[Insert Table 21]

Over 35 percent of the individual male robberies occur in commercial landuse areas. This is far more than that for any other landuse type, as shown in Tables 22 and 23. Both strongarm and armed robbery are highest in commercial landuse areas, while both occur in moderate levels in industrial and high density residential landuse areas.

[Insert Tables 22 and 23]

While there thus appears to be some correspondence between commercial areas and the incidence of individual male robberies, this focus appears to be more dependent upon the nature of the commercial area than its mere existence. Fringe-type night life and skid row type activities appear to some extent to be spread in little pockets, with each poverty area of the city containing its own such area. The relative frequency of individual male robberies in the commercial areas of the poverty neighborhoods suggests a relationship between individual male robbery and such areas.

This relationship between fringe-type night life and individual male robbery is visible to a substantial extent in the times that individual male robberies occur. Sixty-eight percent of these offenses occur in the evening hours between six p.m. and two a.m., as shown in Figure 1. While the peak periods for the two types of individual male robbery differ, both increase greatly at eight p.m. and continue to increase until one a.m. The increase in armed

Table 21

Individual Male Robbery: Street Premise Compared with Landuse of Occurrence
(In Percent)

Landuse	Street Premise	All Premise Types
Commercial	35.5	35.4
Low medium density residential	10.4	10.2
Medium density residential	13.3	12.8
High density residential	15.8	15.4
Industrial	6.0	5.7
Freeway	3.5	3.3
Government or institution	1.2	1.4
Low density residential	1.1	0.9
Park	0.8	0.2
Vacant	0.4	0.4
No information	12.0	13.2

Table 22

Individual Male Robbery: Landuse of Occurrence
(In Percent)

	Total (N=1968)	Armed (N=699)	Strongarm (N=1250)
Commercial	35.5	31.1	37.9
Low medium density residential	10.1	9.4	10.4
Medium density residential	12.7	14.9	11.3
High density residential	15.5	18.9	15.3
Low density residential	1.0	1.0	1.0
Industrial	5.7	6.3	5.4
Freeway	3.4	3.7	3.2
Government or institution	1.4	1.3	1.4
Park	1.2	1.7	0.9
Vacant	0.5	0.8	0.4
No information	13.2	13.8	12.8
	100.0	100.0	100.0

Table 23

Individual Male Robbery Sites
Number of Robberies per Grid Square of Landuse

	Total	Armed	Strongarm
Commercial	1.18	0.36	0.79
High density residential	0.47	0.17	0.30
Medium density residential	0.20	0.08	0.11
Low medium density residential	0.13	0.04	0.08
All residential (combined)	0.17	0.06	0.10
Industrial	0.34	0.13	0.20
Government or institution	0.11	0.03	0.07
Freeway	0.17	0.07	0.10
Park	0.04	0.02	0.02
Vacant	0.02	0.01	0.01

individual male robberies during the evening hours is much more constant than that of strongarm robberies. In addition, the percentage of strongarm robberies drops sharply at midnight and does not surpass armed robbery until two a.m.

[Insert Figure 1]

These times of peak concentration vary to some extent by season, as shown in Figure 2. Individual male robbery is the only type of robbery with a relatively high percent of robbery during the summer, as shown in Figures 2 and 3. Commercial and individual female robberies are high in both the fall-winter and summer periods.

[Insert Figures 2 and 3]

The influence of darkness can be seen in both the summer and the winter months, as shown in Figure 4. In August dusk comes around nine p.m.; in December around six p.m. In both months there is a sharp increase in robbery between the hour before sunset and the hour of sunset. The change between August and December in the hour in which this evening increase takes place strongly suggests a connection between dusk and individual male robbery rather than a connection with the end of the working day.

[Insert Figure 4]

The duration of the period of high robbery, however, seems to be connected more to an evening recreation cycle, as the period ends

Figure 1

Individual Male Robbery
By
Time of Day of Offense

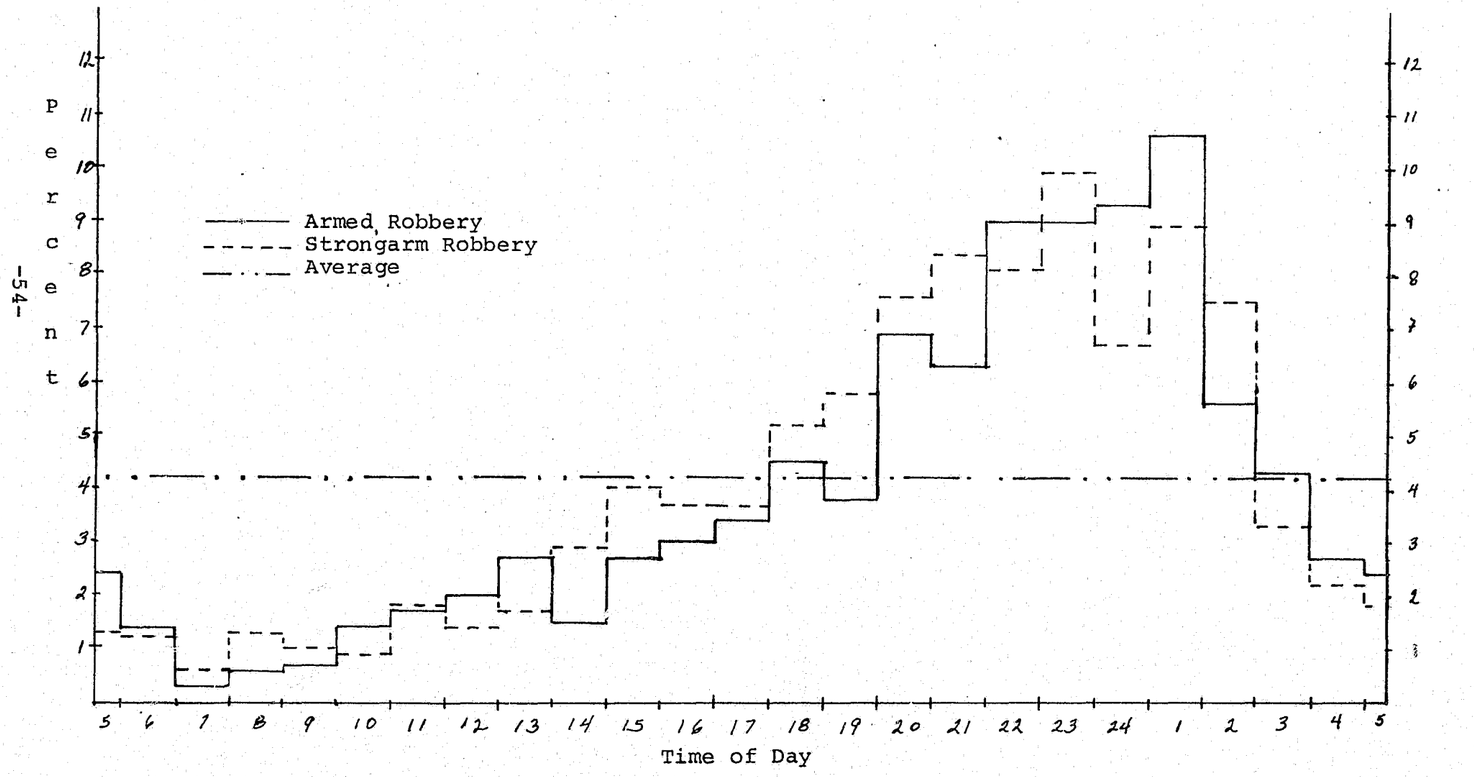


Figure 2

Individual Male Robbery
By
Month of Offense

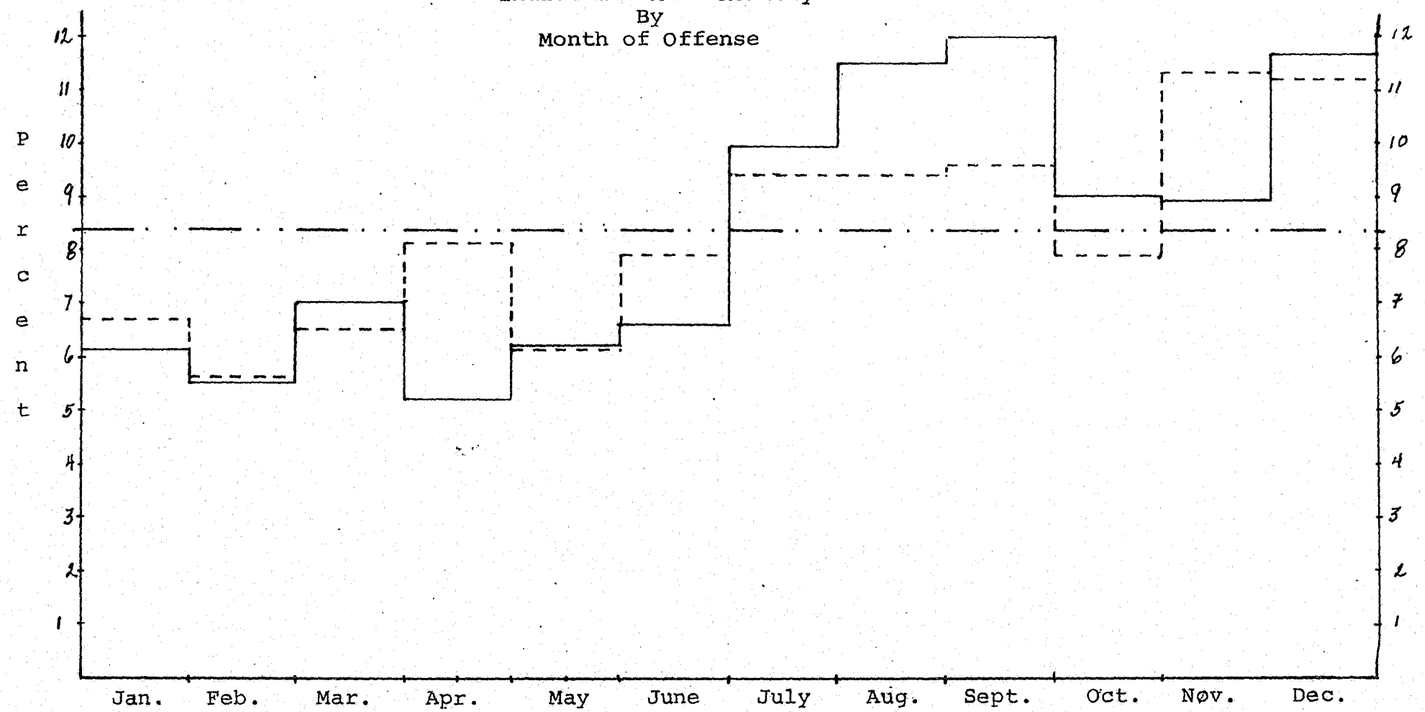


Figure 3

Month of Robbery

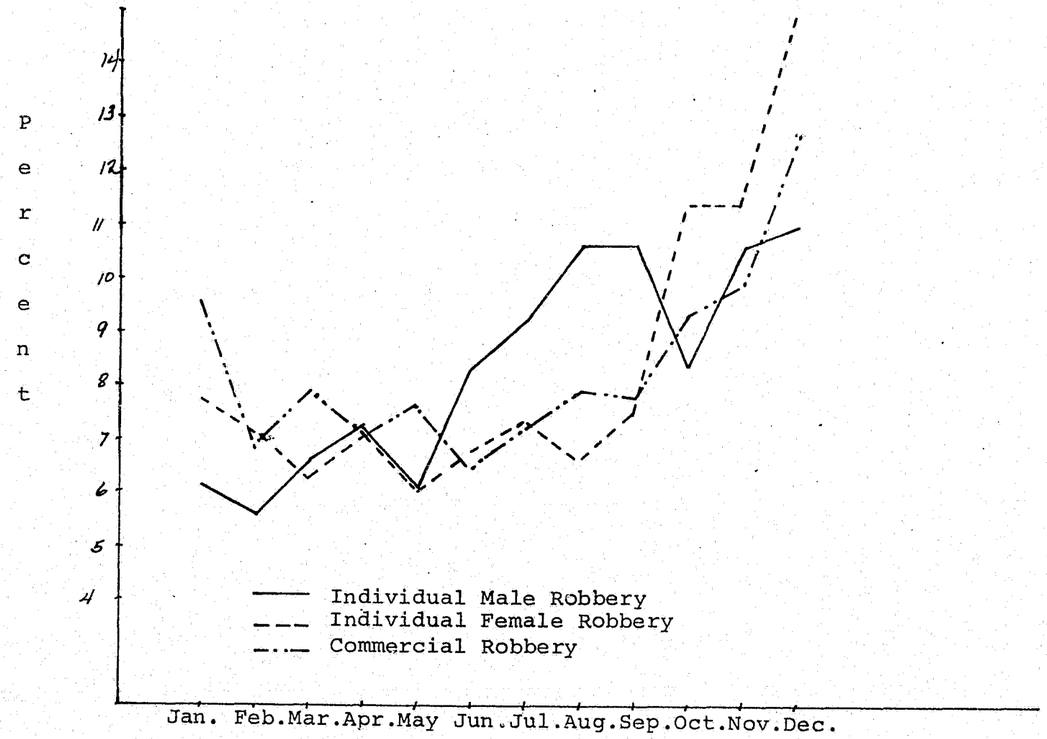
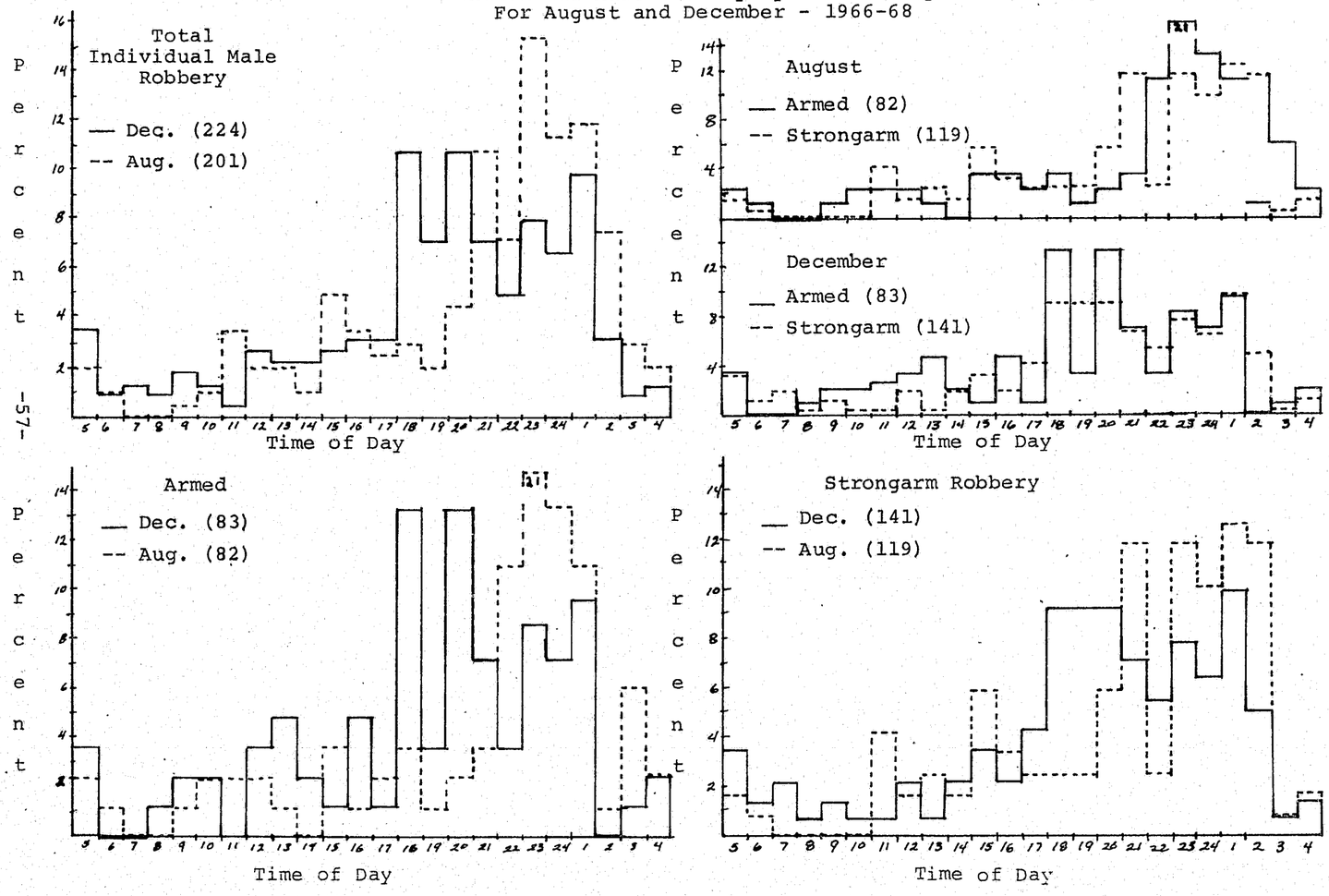


Figure 4

Individual Male Robbery by Time of Day
For August and December - 1966-68



about the same hour of the day for both months. The August high robbery time period is thus shorter, starting at nine p.m. and ending at two a.m., while the December period starts at six p.m. and ends at the same time. Because the August period is shorter, it might be supposed that this would mean fewer overall robberies. This is not true, however. Both months are about the same. The August evening peaks, however are higher than those for December.

In both months the early darkness periods have a much higher rate of armed than strongarm robbery, while the period after midnight has a higher rate for strongarm than for armed. The trend toward armed robberies in the early evening hours is much stronger in August than in December.

There does not appear to be very much variation in age between armed and strongarm individual male robbery victims. Twenty-one to 30 year olds are somewhat more frequently encountered in armed robberies, while victims between 51 and 60 years of age make up a higher proportion of strongarm robberies, as shown in Figure 5.

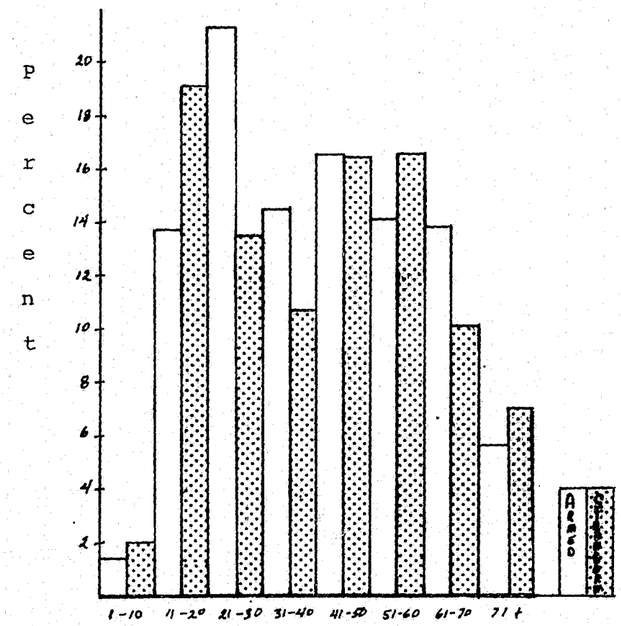
[Insert Figure 5]

White victims are involved in over 75 percent of the individual male robberies, as shown in Figure 6. Over half of these white victims are over 40 years of age. For this over 40 age group the percentage involved in armed and strongarm offenses is nearly equal for each age grouping. The 11 to 20 age group (mostly late teens), however, includes a much larger percentage of strongarm robbery victims while the 21 to 30 age group has a much larger percentage of armed robberies.

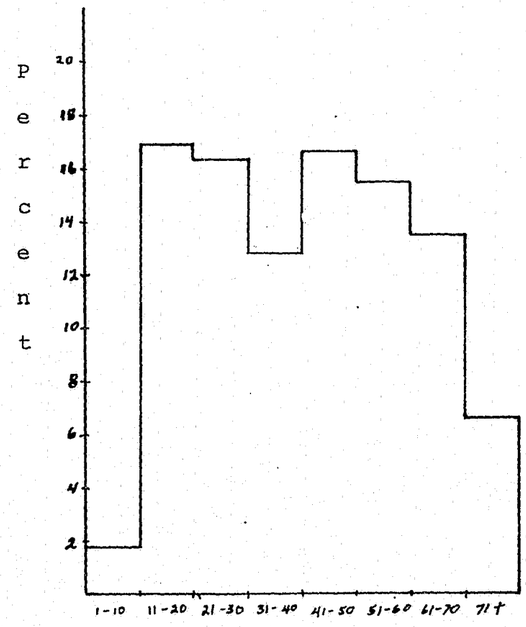
Figure 5

Individual Male Robbery
By
Age of Victim

Armed and Strongarm



Total



[Insert Figure 6]

The pattern for black victims is considerably different, as shown in Figures 7 and 8. The black victims are slightly younger, and there are differences in the percentage involved in armed and strongarm robberies. The very young males, 11 to 20 years, and the middle aged males, 41 to 50 years, are high in strongarm victimization while the 21 to 40 age groupings show a high proportion of armed robbery victims.

[Insert Figures 7 and 8]

III. INDIVIDUAL FEMALE ROBBERY

While individual male robberies occur in only 15 percent of the city grid squares, individual female robberies spread over 20 percent. The two types are nearly equal, however, in the proportion of robberies occurring in grid squares with only one offense--63 percent for individual male and 61 percent for individual female. Roughly two percent (2.1) of the grid squares with at least one individual male offense contain nine or more robberies. In contrast, only a small proportion (0.7 percent) of the grid squares with individual female robberies have more than nine offenses and none have more than 20, as shown in Table 17.

Not only are the individual male robberies clustered about the major thoroughfare streets more than are the individual female robberies but they are also much more heavily concentrated in the northern third of the city; 56 percent of the individual male

Figure 6
Individual Male Robbery
By
Race of Victim

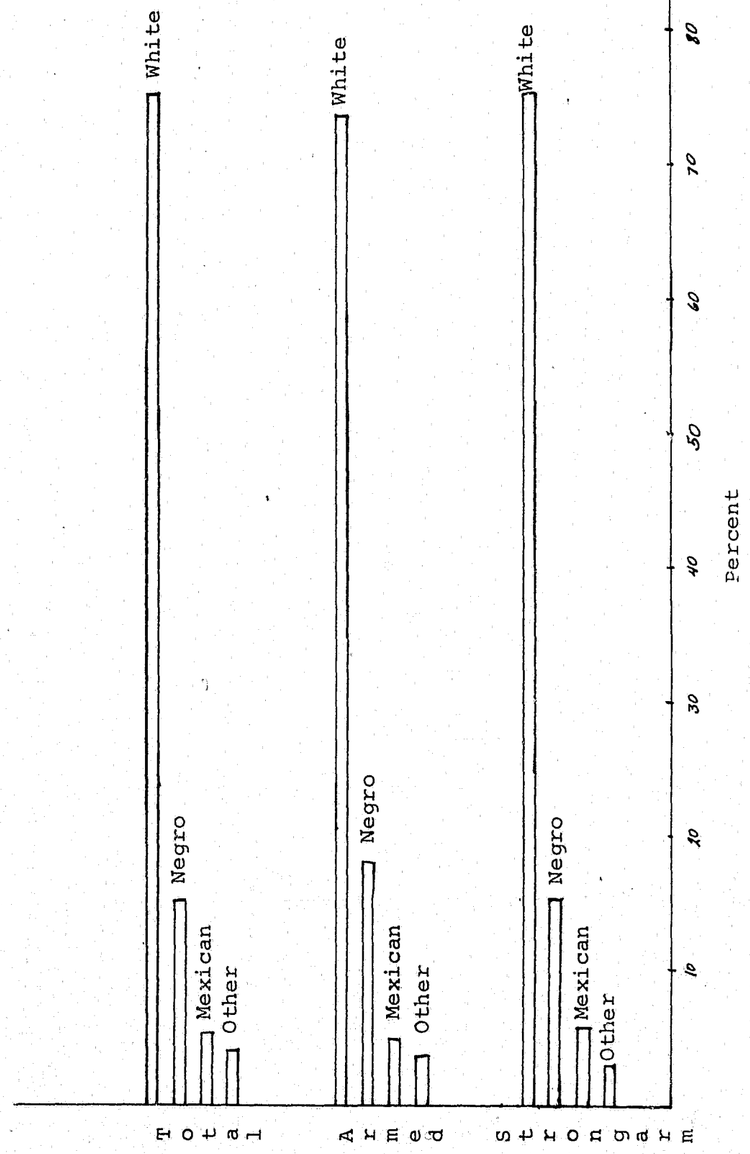
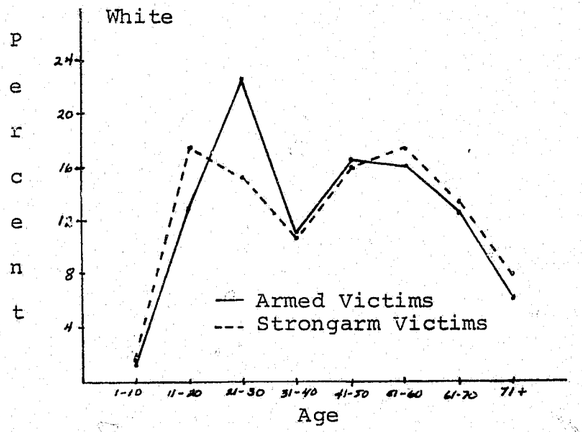


Figure 7

Individual Male Robbery



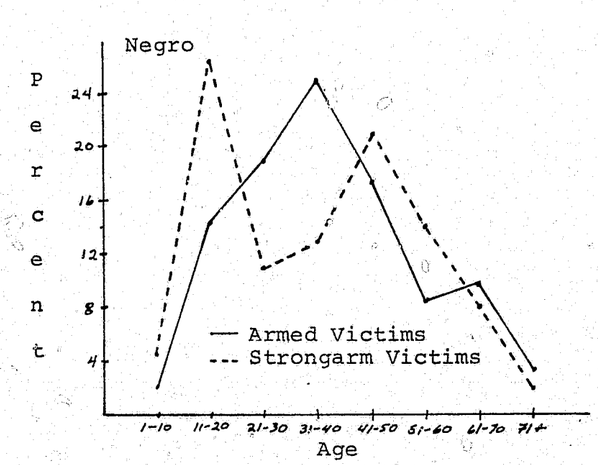
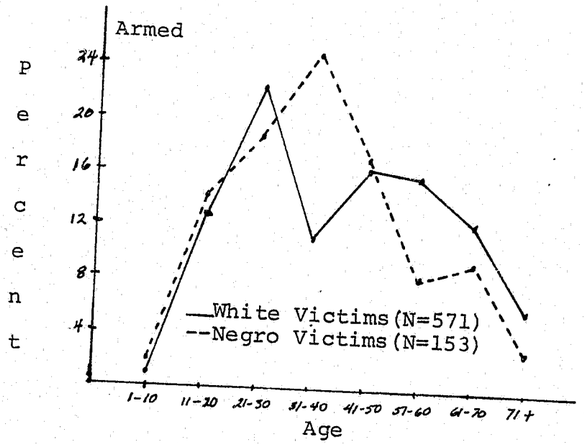
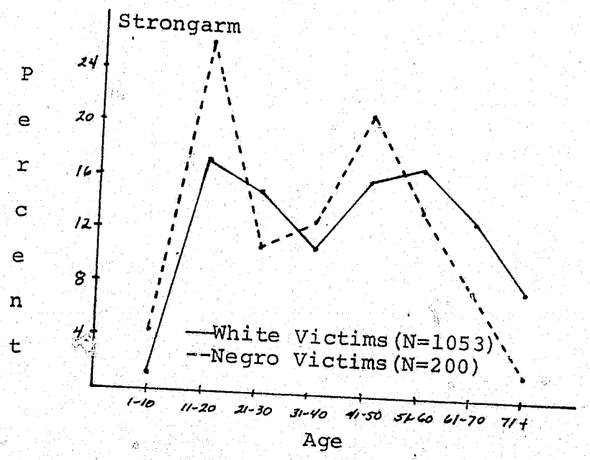


Figure 8

Individual Male Robbery





robberies being in this area as compared with only 41 percent of the individual female robberies.[7]

Moreover, the areas of concentration for male robberies are all but void of female robberies. This is especially true of the Prescott neighborhood where there are only 15 individual female robberies in contrast to 220 individual male robberies. In the downtown skid row area there were 28 individual female robberies as compared with 159 individual male robberies.

Somewhat surprisingly the major downtown shopping districts are also not areas of frequent individual female robbery. Rates are quite low for the prime commercial centers of the Kaiser Center area--Broadway to Lake Merritt, Twentieth to West Grand Avenue--and the older shopping corridor of Broadway--Twelfth to Seventeenth Streets.

On the northeast side of the core shopping strip, however, there is something of a concentration of individual female robberies. (See Map 9.) This is an area of mixed landuse and has a large number of commercial and service establishments, government office buildings and some hotels and large, older homes which cater to elderly persons. There are also a number of open parking lots which attract shoppers and employees of the core area buildings. Census tract 19 approximates this area of intense individual female robberies. As may be seen in Table 24, this census tract, which contains only 20 grid squares, accounts for 4.5 percent of the individual female offenses.

[Insert Table 24 and Map 9]

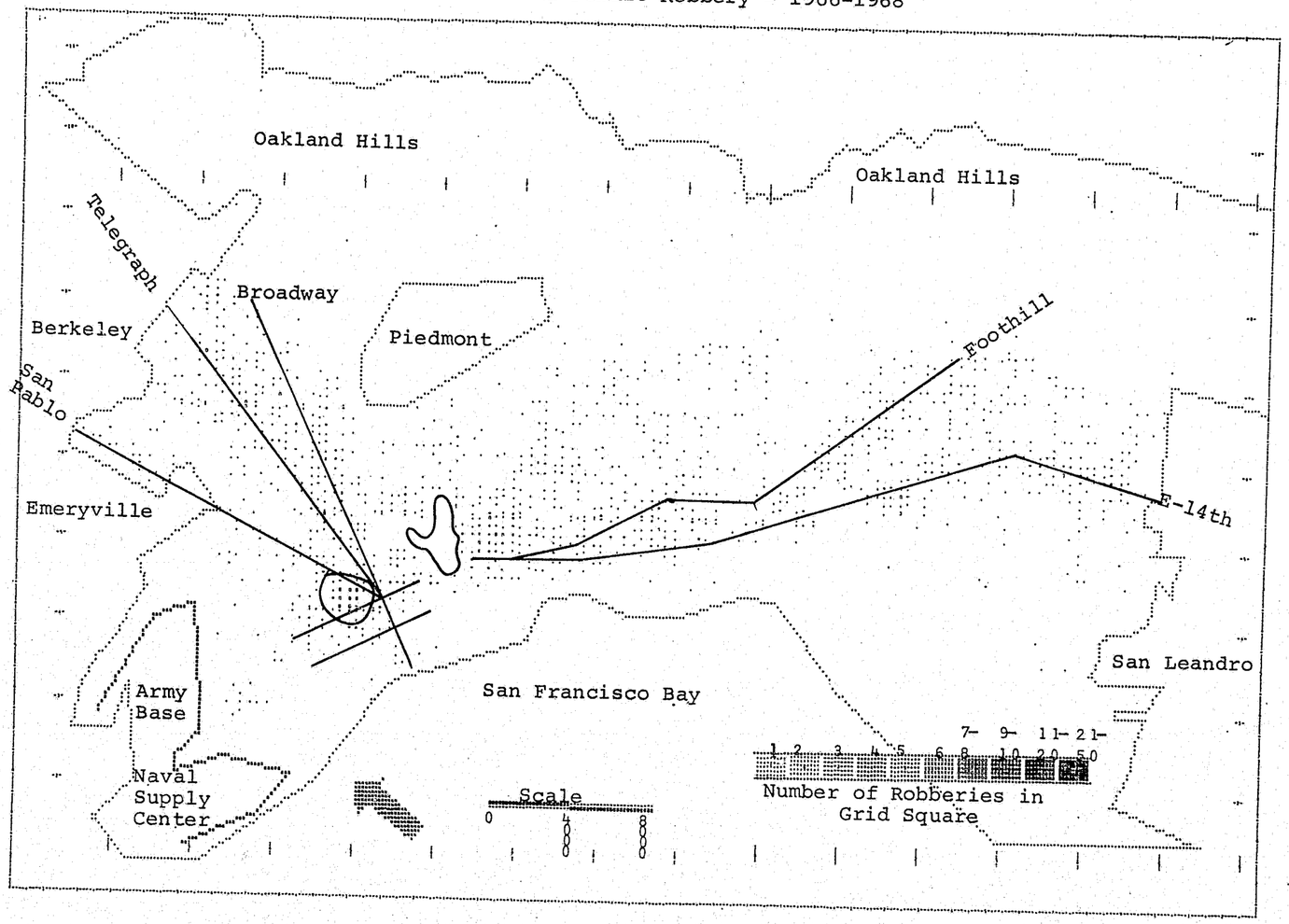
Table 24

Individual Female Robberies and Pursesnatches
Percent of Offenses Per Grid Square in
High Census Tracts

Census Tract	Percent of City Total Individual Female Offenses	Number of Grid Squares in Census Tract	Percent of City Total Per Grid Square
19	4.5	20	0.22
10	4.1	101	0.04
18	3.7	42	0.09
26	3.6	34	0.16
53	3.4	50	0.06
33	3.4	50	0.06
52	3.0	54	0.05
27	3.0	25	0.12

Map 9

Individual Female Robbery - 1966-1968



While this is the most intense area of individual female robbery, there are several additional areas of moderate concentration focused about neighborhood shopping districts. (See Map 9.) Just as the downtown concentration of individual female robberies was on the fringe of the major shopping areas, these additional areas of concentration are clustered about the neighborhood shopping districts rather than directly within them. These clusters about the neighborhood shopping districts account for over 20 percent of the grid squares with three or more robberies and 42 percent of the grid squares with six or more offenses.

The general lack of concentration in female robberies can also be seen in the relatively low percentages of individual female robberies on major streets--only 36 percent as compared to 51 percent of the individual male robberies and 68 percent of the commercial robberies. Only 56 percent of the individual female robberies occurred within a half block of the major streets, while over 70 percent of the individual male robberies were this close to the major streets.

This spread of individual female robberies away from the major streets and over more territory is also reflected in the landuse of the robbery sites. Individual female robberies occur in residential landuse areas (total and low medium density) more often than either commercial or individual male robberies.

The individual female robbery occurs in the open in 93 percent of the offenses, as shown in Table 25, primarily in the streets. Only 6.3 percent of the individual female robberies occurred indoors.

[Insert Table 25]

Table 25

Individual Female Robberies and Pursesnatches

	Premise of Occurrence (In Percent)
Open space	93.0
Indoors	6.3
Dwellings	2.8
Public and government institutions	1.1
Commercial enterprises	1.8
Transportation	0.3
Schools	0.3
Finance	0.0
No information	0.8

The most vulnerable hours for individual female victims are from one p.m. to ten p.m., as shown in Figure 9. This includes the prime shopping hours for both the daytime and the evening.

[Insert Figure 9]

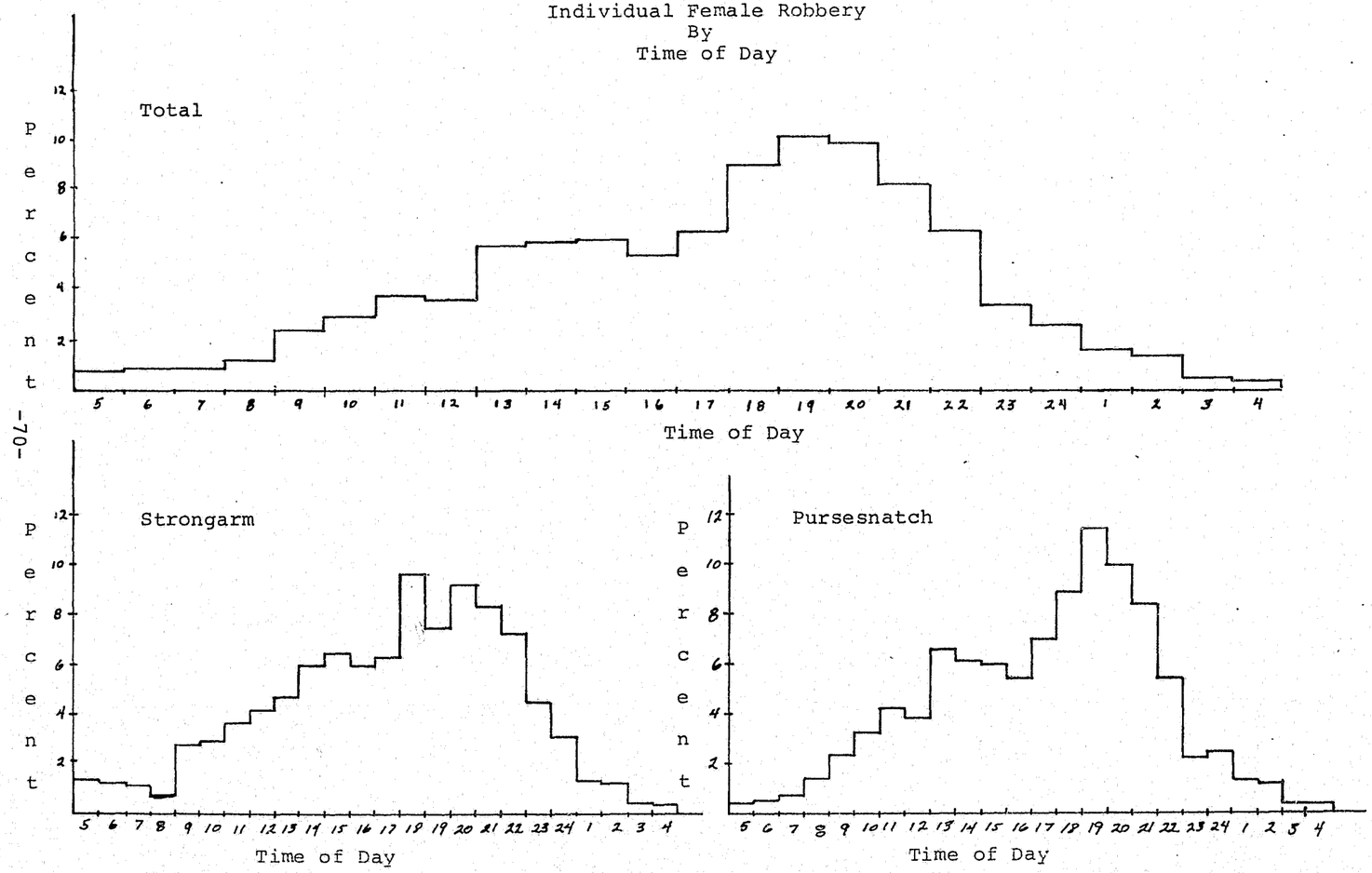
These offenses are concentrated in the winter and fall months, as shown in Figure 3 above. The decrease in robberies during the summer and spring may be due in part to increased daylight but is probably related to the decline in shopping activity after the Christmas season as well.

The concentration of individual female robberies about the shopping districts along with the occurrence of individual female robberies during the shopping hours and in the open on the street suggests a strong connection between journey from work or shopping in core areas to parking on or exiting from the fringes of these areas as a situation of vulnerability. The increased number of individual female robberies during the months of November and December may well result from the combination of the increase in evening shopping due to the Christmas season and the cover of darkness for the robbery offender due to the early nightfall during this period. Elderly white women appear to be particularly vulnerable to this kind of victimization.

Of special note is a small concentration of individual female robberies in an area of low density in the Elmhurst section along East Fourteenth street in the southern portion of the city. The robberies in this area cluster in two distinct groups, one centering upon the location of several public housing projects and the other

Figure 9

Individual Female Robbery
By
Time of Day



CONTINUED

1 OF 2

a minor commercial area serving the surrounding neighborhood. Robberies from these two areas spread into the residential neighborhoods toward the Bay but not into the neighborhoods going away from the Bay. The area going toward the Bay combines a high concentration of young black families and a much lower concentration of older whites, and is the only area of high individual female robbery and high black residential population in the city.[8] Other areas of the city with high black populations have only a moderate amount of individual female robbery. In addition, nowhere else in the city is there any sizeable number of individual female robberies in an area of low density residential landuse.

Chapter Five

A COMPARISON WITH SOME EARLIER RESEARCH

A. The Ring Theory

Perhaps the most important single work in the field of crime area studies is that of Clifford R. Shaw and Henry D. McKay on Chicago in the 1920's and 30's.[9] The general purpose of their work was to describe the ecological relationships between the residence of an offender and the physical form of the urban area. In their very ambitious Chicago study, Shaw and McKay collected data on eight groups of individuals including 51,859 male school truants, 43,298 juvenile delinquents, and 7,541 adult offenders and studied their activities during the period from 1900 to 1927. For each individual offender the home address, offense, age, sex, and other items were collected. Each offender's residence was plotted on a map. Then ratios of offenders to total population of similar age and sex were calculated and mapped for specific areas of the city, census tracts, and square mile areas. The distributions were fit to E.W. Burgess' theory of radial expansion, which suggests that a city expands radially from its center, forming a series of concentric zones. This theory was based upon studies of urban growth in the Chicago area and describes five basic zones for this city. They are in order from the center outwards:

> "(a) an inner central business district; (b) a transition zone surrounding the central business district with residential areas being 'invaded' by business and industry from the inner core; (c) a working-class residential district; (d) a zone of better residences with single-family dwellings; and (e) an outer zone of commuting with suburban areas and satellite cities."[10]

This theory as applied to delinquency was accepted as being "in the

main correct as far as the city of Chicago is concerned." The data was analyzed by square mile areas, concentric zones, and radial lines of gradient, all centering on the Chicago Loop. Map 10 is an example of the type of maps used in their analysis.

[Insert Map 10]

The Shaw and McKay study concluded that:

1. "There are marked variations in the rate of school truants, juvenile delinquents, and adult criminals between different areas in Chicago."

2. "Rates of truancy, delinquency, and adult crime tend to vary inversely in proportion to the distance from the center of the city."

3. There is a "marked similarity in the distribution of truants, juvenile delinquents, and adult criminals in the city."

4. "The difference in rates of truancy, delinquency, and crime reflect differences in community backgrounds."

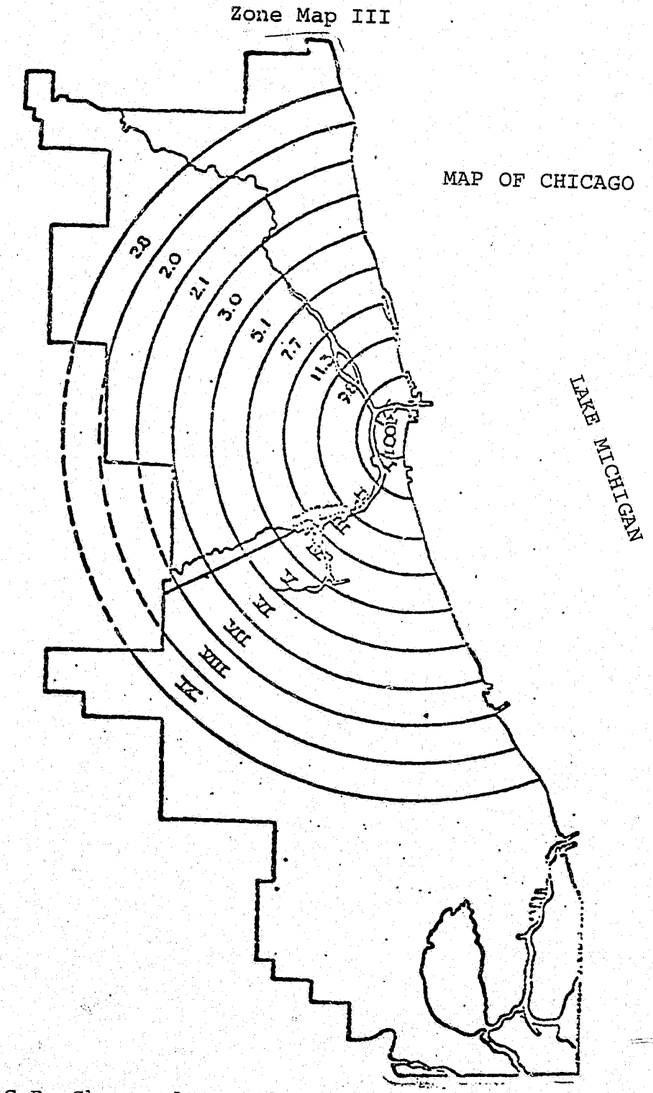
5. "The main high rate areas of the city...have been characterized by high rates over a long period."

6. "The rate of recidivism varies directly with the rate of individual delinquents and inversely with the distance from the center of the city."[11]

These conclusions were interpreted into general theories. Shaw and McKay theorized that delinquency was related to the situations resulting from city growth, since (a) the highest rates of delinquency were found in areas adjacent to the central business district and large industrial centers; (b) these areas were found to be in a process of transition from residential areas to areas of business and industry; and (c) these areas were characterized by physical deterioration, decreasing population, and disintegration of conventional culture. They also theorized that with the disintegration of the

Map 10

Ring Pattern of Delinquency Rates



Source: C.R. Shaw and H.D. McKay, Delinquency Areas: A Study of the Geographic Distribution of School Truants, Juvenile Delinquents, and Adult Offenders in Chicago (Chicago: University of Chicago Press, 1929).

community as a unit of social control in such areas, the resistance to delinquent and criminal patterns continually weakens until the attitudes and behavior of delinquency become accepted.[12]

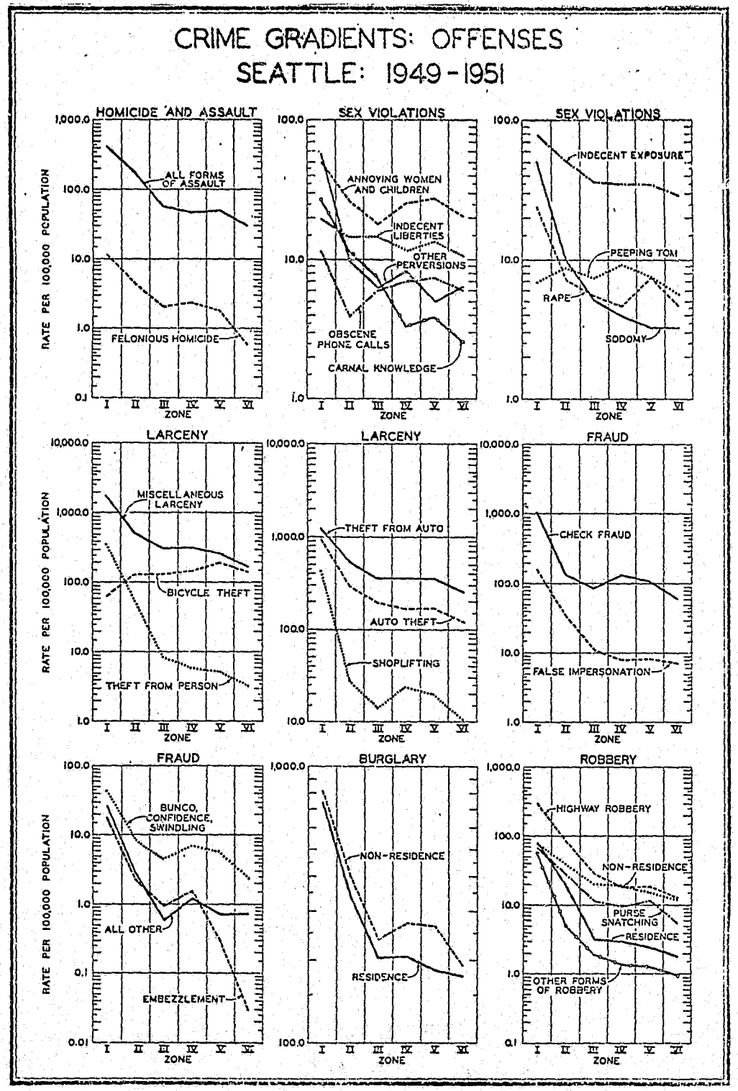
The studies of Shaw and McKay did not distinguish crime patterns by type of crime. Their analysis of patterns was based upon the residences of all juveniles and adults coming before the courts in the study period. The analysis consequently says little about either the distribution of special kinds of offenses or offenders such as truants, felons, pickpockets or burglars. The specific distribution of robbery was not discussed.

A more recent study by Calvin Schmid of Seattle dealt with both the location of offenses and the residence of the offender.[13] The distance from the center of the city for many of the individual crime types were calculated, as shown in Figure 10. While Schmid's classifications of robbery are somewhat different from those used in the present study, there are many similarities between his results and the general pattern of robbery in Oakland.

[Insert Figure 10]

The city of Oakland has, like the cities studied by Shaw and McKay and Schmid, had a growth pattern that has generally moved outward in a series of expanding circles--starting with the Bay but with a severe distortion due to the older, denser, more urban city in the northern area in contrast to the lower density, suburban nature of the southern area.

Figure 10



Source: Calvin Schmid, Urban Crime Areas, Part II, American Sociological Review, XXV, 10 (1960), p. 664.

If allowance is made for this distortion, however, the resulting gradients for robbery for Oakland are very similar to Schmid's for Seattle--with commercial and male individual robbery decreasing sharply from the commercial heart of the city to the suburban fringe, while individual female robbery occurs in both the commercial center of the city and the midland area of the city with very little occurring in the low density residential areas.

B. Central District

The Schmid study of Seattle also included a more detailed analysis of crime in the core area of the city. This area was found to contain 15.5 percent of the population, 47 percent of the offenses known to the police, and 60 percent of the arrestees for the study periods of 1949-1951 for the offenses and 1950-1951 for arrestees.[14] The proportion of robbery in this area, however, was only 16 percent for highway robbery, 8 percent for nonresidential robbery, 20 percent for residential and 26 percent for other kinds.

The percentage of the city's total robbery offenses was almost the same in the skid row area as in the central business district, as shown in Table 26. The skid row area, however, had only two-thirds of the population of the central business district and only one third of the area. Pursesnatch was the only robbery-type crime that was markedly less in the skid row area.

[Insert Table 26]

While the skid row area contained fewer total offenses than the central business district, it accounted for the highest number of

Table 26

Offenses for the Central Business District and Skid Row Areas Seattle, 1949-1951
(In Percent of Citywide Offenses for Each Crime)

	Central Business District	Skid Row
Population	5,189	3,551
Area, square miles	.3	.1
Assault	11	15
Felonious homicide	22	15
Miscellaneous larceny	16	5
Shoplifting	55	3
Theft from person	31	20
Check fraud	31	3
False impersonation	19	18
Bunco	20	8
Other fraud	27	25
Embezzlement	21	2
Burglary	7	5
Robbery, highway	16	16
Robbery, nonresidential	8	5
Pursesnatching	13	5
Robbery, residential	20	19
Other forms of robbery	26	22

Source: Calvin Schmid, Urban Crime Areas, Part II, American Sociological Review, XXV, No. 10 (1960), p. 658.

arrestees per 100,000 population for 24 of the 33 crime categories studied. In contrast with the pattern for offenses, however, robbery was not one of the 24 categories for which arrests were concentrated in the skid row area. Surprisingly, the arrest rate for robbery in the central business district was more than twice that of the skid row area, as shown in Table 27.

[Insert Table 27]

Distributional data for arrests is not included in this study. The pattern of robbery offenses in the central district of Oakland is, however, similar to that found by Schmid. Because of the high number of robberies in the Prescott area, the density of robbery in the central district is not the highest in the city. The dispersion pattern in the central district, however, is similar. Thus, the grid squares of the central district with ten or more robberies during the study period are all considerably distant from the major shopping areas, with the highest concentrations occurring in the downtown skid row area, and in an area north of San Pablo Avenue and east of Fourteenth Street.

The central business district of Oakland is longitudinal in shape, with a length of about 15 blocks. Having migrated from the waterfront, its prosperity and condition vary a great deal, partly by age. Like the areas of concentration in Seattle the areas of concentration in Oakland are on the fringes. There is virtually no robbery about the high class shopping and office area of the Kaiser Center, and very little in the area south of Broadway. Overall the robbery concentrations in the Oakland central district, as may be

Table 27

Arrests for the Central Business District and Skid Row Areas Seattle, 1950-1951
(In Percent of City Wide Arrests for Each Crime)

	Central Business District	Skid Row
Assault	8	16
Felonious homicide	10	16
Petty larceny	11	18
Automobile theft	4	1
Shoplifting	9	20
Other forms of larceny	13	29
Bunco, confidence, swindling	7	31
Other forms of fraud	19	4
Burglary	4	7
Prostitution	14	9
Robbery	16	7

Source: Calvin Schmid, Urban Crime Areas, Part II, American Sociological Review, XXV, No. 10 (1960), p. 659.

seen in Map 11, are very low when the three-year span of the data is considered.

[Insert Map 11]

When the distribution of the subtypes of robbery is considered, there is a considerable difference between the commercial and individual robbery patterns. The commercial robbery pattern, which is sparser than the individual robbery pattern, concentrates in the area between the "uptown" and "downtown" shopping districts, an area of many small shops and a lower level of activity than the major downtown areas, as shown in Map 12. The shops in this area appear to be more vulnerable than those in the denser shopping districts. Individual robberies in this area, however, are quite low as compared with other areas of the central district. The denser areas of commercial activity, with large department stores and finer shops, have a much lower commercial robbery rate.

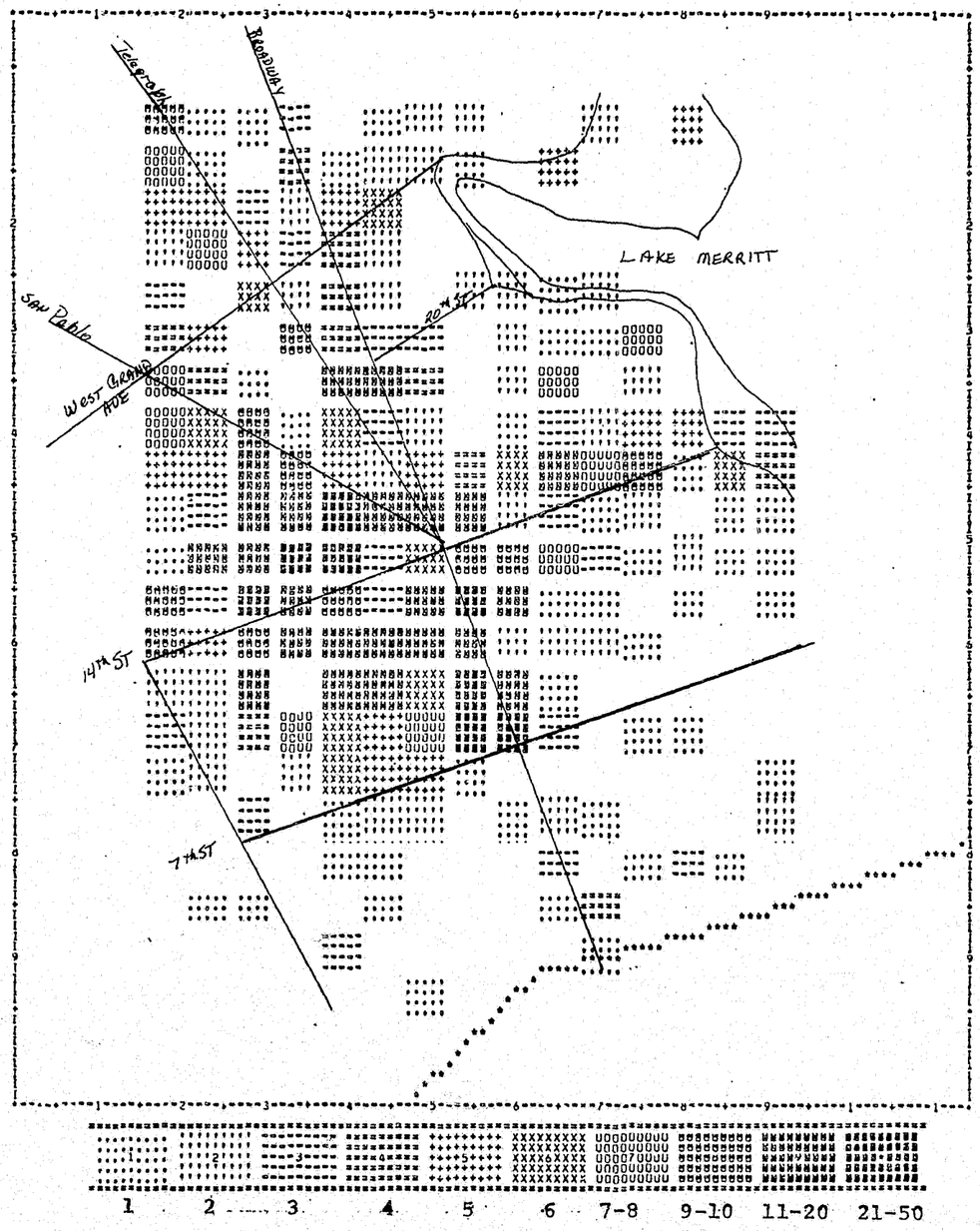
[Insert Map 12]

Individual robbery in the central business district parallels the distribution of total robbery. Individual female robberies are highest, however, in the more blighted areas below Thirteenth Street and in the commercial and office areas away from both the busy shopping areas, as shown in Map 13. Individual male robbery is highest in areas that have been left behind by progress, such as those with old hotels, apartments and rooming houses, as shown in Map 14.

[Insert Maps 13 & 14]

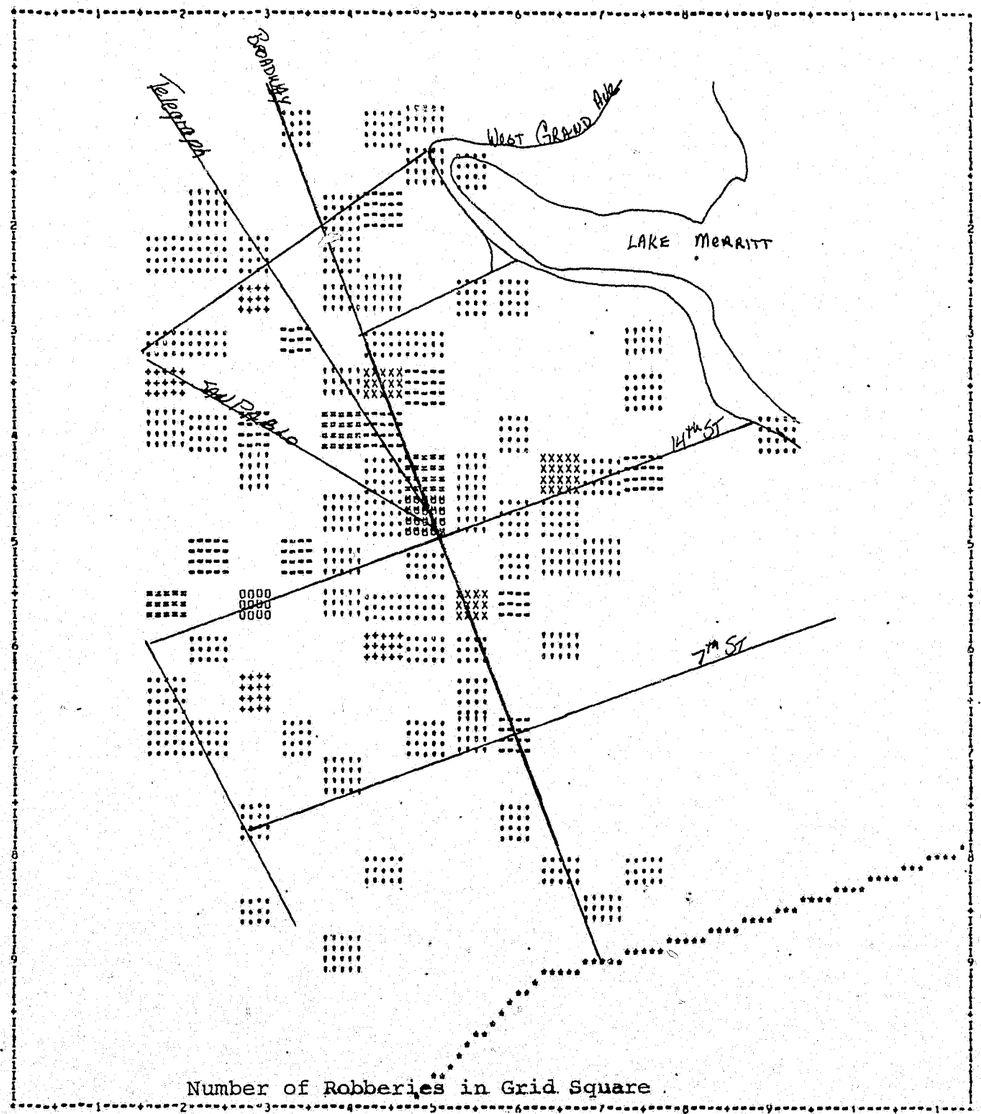
Map 11

Total Robbery - Downtown Oakland



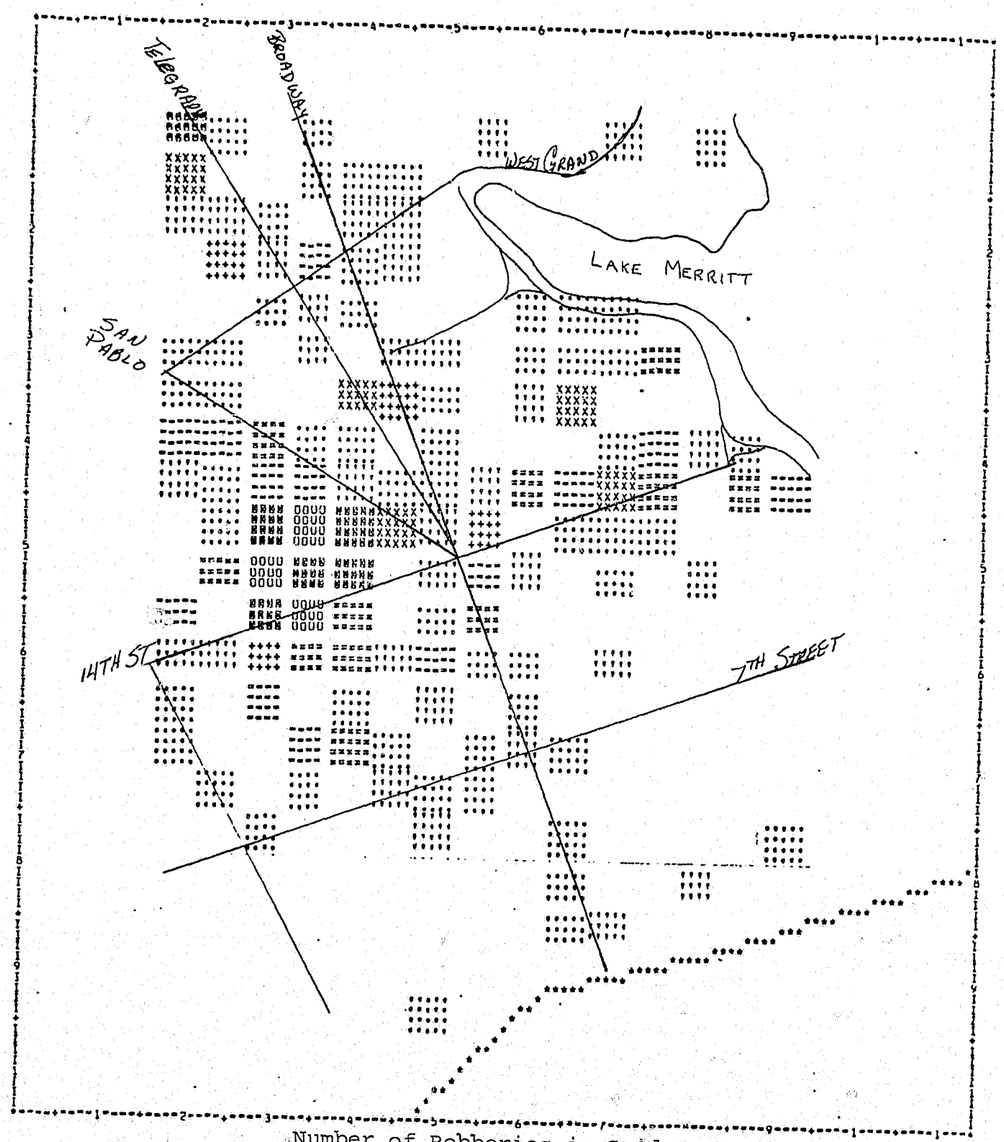
Map 12

Commercial Robbery - Downtown



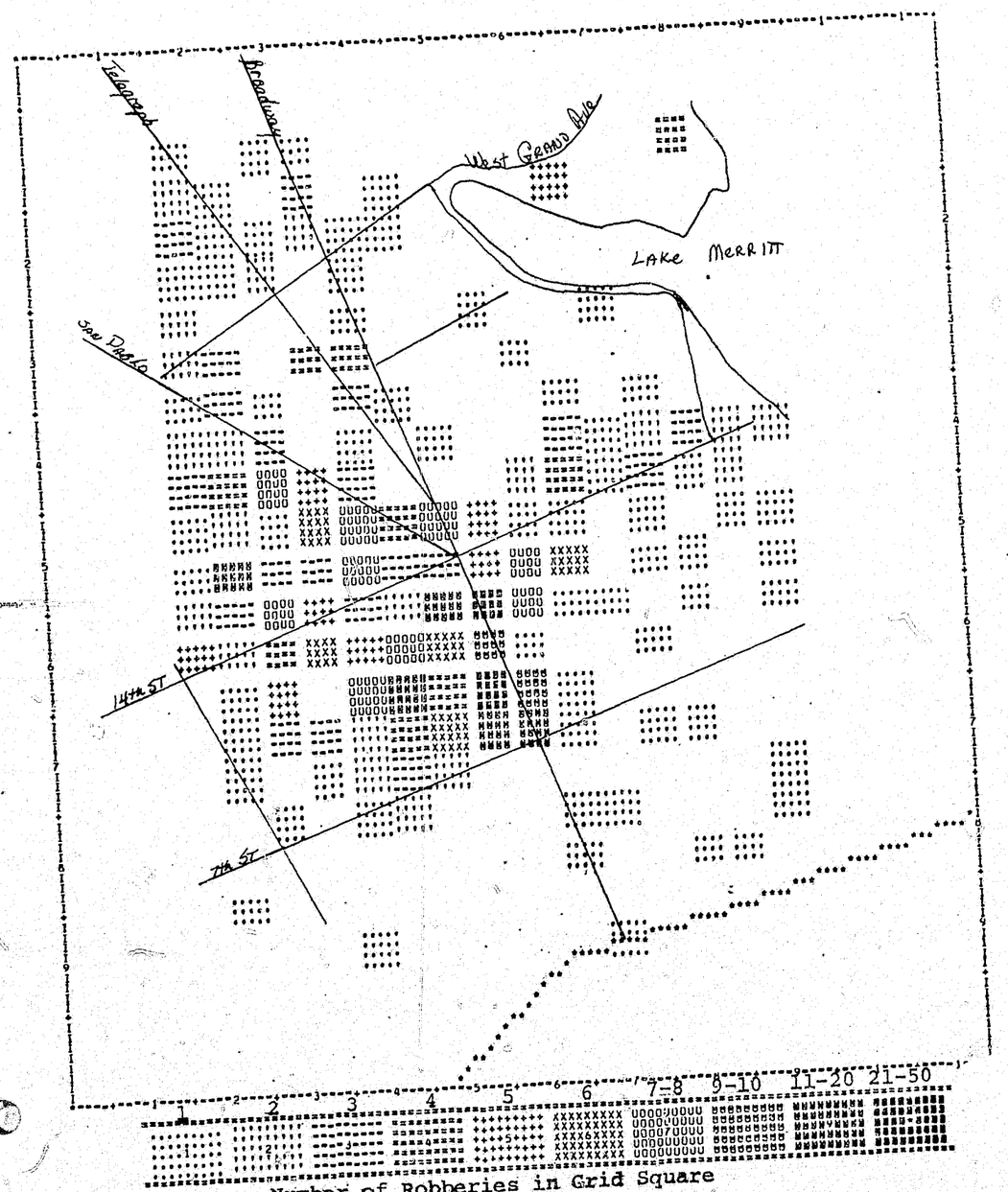
Map 13

Individual Female Robbery - Downtown



Map 14

Individual Male Robbery - Downtown



The only portion of the central business district in which both individual male and female robberies are high is an area of mixed office and residential buildings east of Fourteenth Street and north of Broadway. The major daytime employment sites in this area are a group of government and private office buildings.

The individual female robbery concentration decreases slowly on the north and east while the male robbery pattern remains relatively uniform over the area north of San Pablo Avenue. While there are few individual female offenses west of Fourteenth Street, the individual male robbery occurrence becomes denser toward the skid row area. This area contains the major portion of the individual male robberies concentrated in the central area.

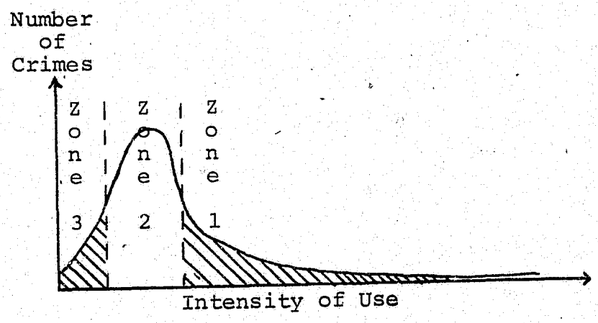
C. A Theory of Intensity

A recent study of crime distribution, and the only such study focusing wholly on the crime of robbery, was a study by Schlomo Angel. Beginning with the assumption that crimes on the street are influenced both by the presence of witnesses, which deter crimes, and the presence of victims which make them possible, this study postulated that different types of landuse would affect "the probability that a witness would show up in effective range during the time it takes to perpetrate the offense."[15] This theory is illustrated in Figure 11 which maps the level of robbery as the intensity of landuse and street use increase. If the intensity of landuse is very low, this theory suggests that the level of crime will be low. The scarcity of potential victims reduces the availability of opportunity. This is Zone 1 in Figure 11.

[Insert Figure 11]

Figure 11

Robbery Occurrence in Relation to the Intensity of Use

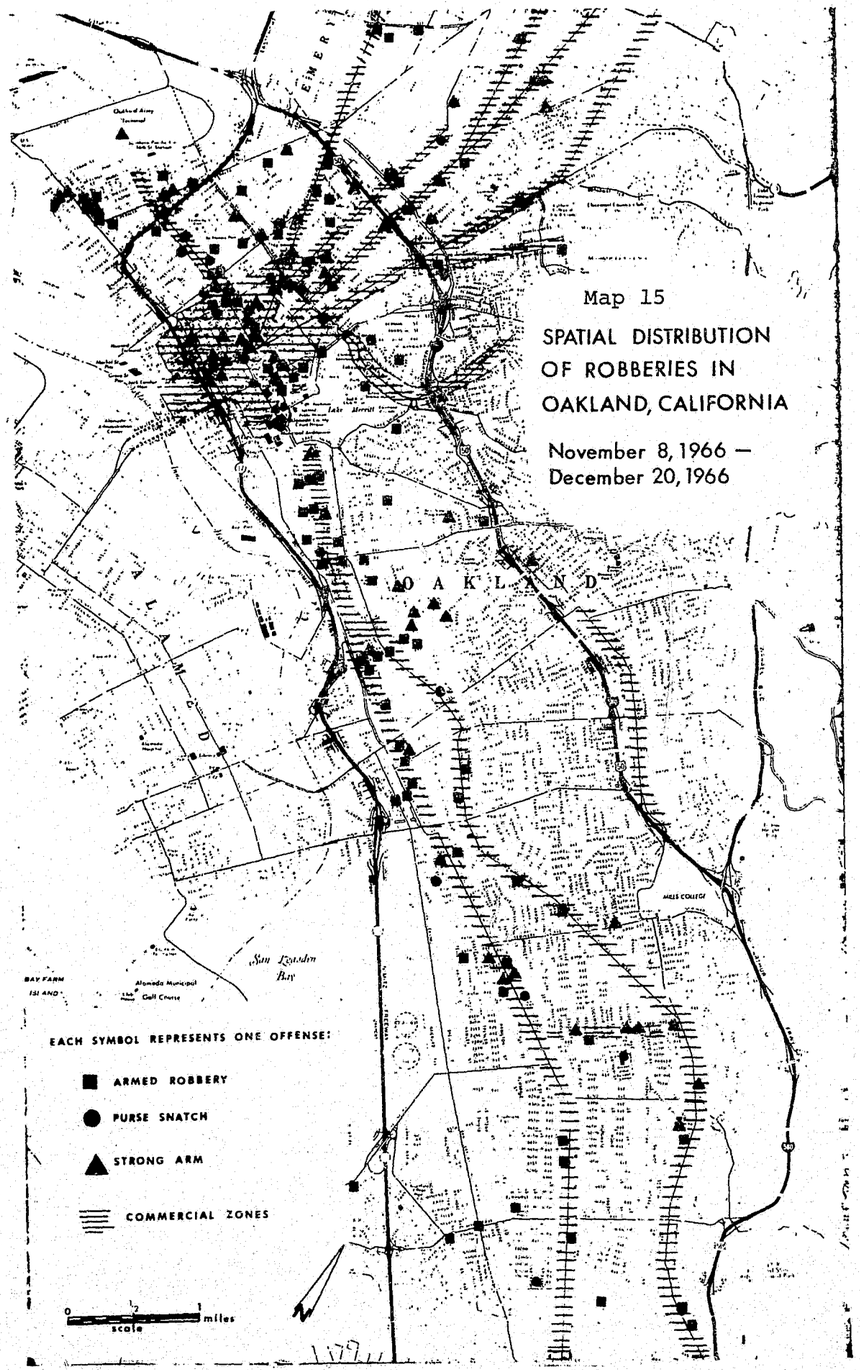


Source: Schlomo Angel, Discouraging Crime Through City Planning, Working Paper No. 75 (Berkeley: Center for Planning and Development Research, Univ. of California), February 1968, p. 16.

As the intensity of use increases, the number of potential victims available increases sufficiently to attract the attention of potential offenders, but people are not sufficiently numerous to provide witnesses. This situation is called the "critical intensity zone", Zone 2, and is the situation in which most street crimes are theorized to take place. When the intensity of use is very high, Zone 3, the level of activity is high enough to create a number of witnesses adequate to deter the potential offender.[16]

Using data from Oakland this study found most robberies to occur within a block of a commercial artery. (See Map 15.) Very few robberies were found to occur in low density, middle income residential areas or the higher priced shopping and restaurant areas. The lack of available victims in the middle and upper income residential areas and the presence of good witnesses, and "conscious" citizens of the higher income levels were held accountable for the lack of robbery in these areas. The occurrence of robbery within a block of the commercial arteries was considered to be generated by the movement of persons from reasonably crowded commercial areas into less populous side streets on their way to cars or nearby residences.[17] These findings were considered to be supportive of the idea that street crimes are highest in a zone of critical intensity. Using this as a basis, Angel developed several theoretical models for street and commercial area design which he felt might help in reducing the number of critical intensity zones and ultimately the number of street crimes.

[Insert Map 15]



Source: Schlomo Angel, Discouraging Crime Through City Planning, Working Paper No. 75 (Berkeley: Center for Planning and Development Research, Univ. of California), February 1968, p. 15.

The Angel theory of critical intensity seems clearer in the case of the individual female robbery pattern than in the male. In the central district the level of individual female robbery was greatest for the fringe areas away from the very active shopping districts. Here large numbers of the shoppers are drawn for parking. Similarly in the major neighborhood shopping districts individual female robbery is higher in the area around the shopping centers than in the centers themselves. The majority of the major shopping districts are surrounded by high density and medium high density residential landuse. However, these higher density areas do not appear to provide a sufficient level of activity to perform the surveillance that is said to be necessary to prevent criminal activity. The individual male pattern, while concentrated to a substantial extent on the streets, is less clearly influenced by the level of street activity as opposed to such other factors as certain neighborhoods.

Angel also suggested that on the major streets themselves there existed levels of traffic congestion--very low and high congestion--which provided optimum cover for the offender to commit his offense. (See Figure 11.) He reasoned that at a high level of congestion the necessity for automobile drivers to keep watch on the traffic prevents them from observing crime on the sidewalks or in stores while at a low level of congestion there is so little street traffic that the motorist goes faster and thus there is a lower probability of a passing motorist seeing an offense or getaway taking place. At an intermediate level drivers were seen as providing some protection to the streets and stores nearby.

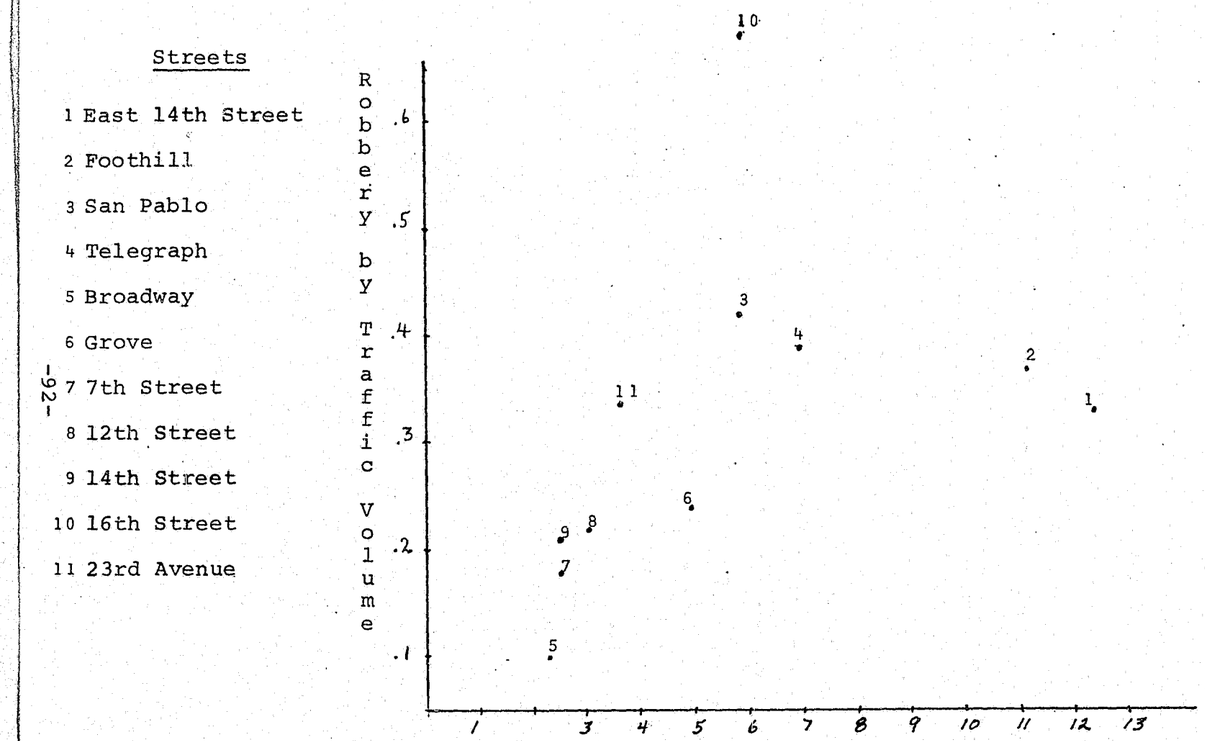
If true, this theory should have a particular effect on commercial robbery which is heavily concentrated on the streets. A street by street comparison was therefore made of the number of robberies relative to the amount of traffic. This ratio (called the congestion ratio) was then compared in Figure 12 with the number of robberies per 1,000 feet of street. The results of this comparison indicate two clusters of streets, each representing a distinct area of the city. Thus the streets of the downtown area are grouped as low in both number of robberies per 1,000 feet of street and in robberies per traffic volume. The southern streets, on the other hand, have higher levels of commercial robbery both per traffic volume and per 1,000 feet of length, spreading in a horizontal band about the mid .30's level of congestion-robbery ratios. Of note is the clustering of the two major northern area streets of San Pablo and Telegraph which carry much of the traffic between central Oakland and the cities north. Broadway, a street which carries a great deal of commuter traffic has the lowest rate of commerical robbery per street traffic of any street in the city with a ratio of only .10.

[Insert Figure 12]

It is not clear what levels of street traffic would be high, low and intermediate in terms of the Angel suggestions concerning the impact of traffic upon robbery. The fact that relationship between commercial robbery and both street traffic and length of street is similar for the streets which are similar in location and function suggests, however, that at least at their level of street traffic, the differences in traffic volume make no substantial difference in the number of robberies.[19]

Figure 12

Commercial Robberies By Traffic Volume And Length Of Street



In another recent study of crime patterns and urban design, the landuse of major urban arterial streets was said to influence the extent to which the criminal activity penetrated into the residential areas through which the streets passed. Specifically, the lack of sufficient on-site parking for commercial and entertainment areas was found to be a factor in bringing victims into the poorly lit residential sectors in search of parking. The attraction for offenders was such that high mugging and theft from automobile rates resulted in the side street areas. A second finding of this study of the City of Detroit by Gerald Leudtke was a relationship between the frequency of pedestrian traffic in commercial areas and the commercial robberies. In general, as Table 28 demonstrates, the heavier the pedestrian traffic the less the likelihood that stores in the area would be robbed.[20]

[Insert Table 28]

The studies of Leudtke and Angel suggest that the nature of the robbery site rather than its location within the city is more important to understanding its occurrence.

Table 28

Amount of Pedestrian Traffic in General Area of Commercial Robbery Sites
(In Percent of Sites)
Detroit 1969-70

	Day	Night
Very busy, crowding	0.0	0.0
Busy, no crowding	6.4	0.0
Moderate pedestrian traffic	25.4	1.8
Light pedestrian traffic	30.9	2.7
Sporadic pedestrian traffic	36.4	77.3
No pedestrian traffic	0.9	18.2

Source: G. Luedtke, D. Lystad, J. Kozlowsky and S. Hamerink, Crime and the Physical City: Neighborhood Design Techniques for Crime Reduction, A Pilot Study Prepared for the National Institute of Law Enforcement and Criminal Justice (Detroit, Michigan: Gerald Luedtke and Associates, n.d.), p. 27A.

Chapter Six

SOME PROBLEMS OF SPATIAL ANALYSIS

Any analysis of the spatial characteristics of a phenomenon such as crime will inevitably encounter problems of scale and of particularity. Is the subject the forest or the trees? If the area to be discussed is to be broken up into parts for the purpose of comparison and analysis, what should be the size of the various parts? Does their shape matter or is it irrelevant? Should the data be standardized in some way--in terms of area, population or some other characteristic especially related to the phenomenon?

By far the largest amount of crime area analysis that takes place is that performed by police departments. At one level this may be through the use of pinmaps which record each individual crime, usually for a short period of time, and for the purpose of picking up any short term problems or trends that should be dealt with more or less immediately. At another level this will be through the regular maintenance of statistics for an area such as a beat or a census tract. These may be used to some extent for short term analysis but are also likely to be used over longer periods such as a month or year for general comparative purposes and for such things as manpower allocation.

A. Analysis In Terms of Standard Areas

The use of standard areas such as beat or census tracts in this kind of way facilitates comparison with other data that is also maintained with reference to the same kind of area unit, including other crimes, population data, social and economic data, and a myriad of other possible things ranging from firealarms to

peanut consumption. Census tracts in particular are useful in this kind of way.

The extent to which area units of this type only approximate the equality necessary for meaningful comparisons is often overlooked, however. If beat 19 is the largest in the city in terms of area and at the same time has the greatest number of robberies in the city, it is not at all unusual to hear that beat 19 is "high in robbery", even if it has a relatively low density of robbery per unit of area. For some purposes, of course, the density may be irrelevant. But the distinction may be missed, even when it is the central issue.

This problem can be illustrated in terms of the Oakland data. The city, which covers about 54 square miles, has 29 police beats and 72 census tracts. The police beats average over 1.8 square miles each. The census tracts average three fourths of a square mile in area, but range in size from census tract 72 with over 619 grid squares to tract 23, with only 17 grid squares.

The census tract which contains the highest number of robberies, census tract 15, has a very low number of robberies per grid square area, 1.5, while another census tract which has fewer robberies, census tract 19, has over 16 robberies per grid square. The rankings of the high census tracts by number of robberies per grid square and number per unit of population are shown in Table 29. The variation is enormous.

[Insert Table 29]

This same change of the rank of the highest robbery area occurs

Table 29

Robbery by Census Tracts
1966-68

Census Tract Number	Number of Robberies	Size in Grid Squares	Population (1960)	Rank by Number of Robberies	Rank by Number of Robberies Per Grid Square	Rank by Number Per Person
15	283	183	7261	1	15	5
18	237	42	6775	2	4	9
19	237	20	2359	3	1	2
68	224	160	7831	4	6	12
20	217	19	1588	5	2	1
70	211	101	5213	6	13	6
53	197	50	5419	7	8	8
69	191	88	7591	8	12	15
52	184	54	5547	9	9	11
63	158	83	4105	10	14	7
57	145	48	5575	11	10	13
33	145	50	6340	12	11	16
26	138	34	5408	13	7	14
27	132	25	3840	14	5	10
29	92	16	1128	15	3	3
23	85	17	1292	16	6	4

with beat areas. Oakland police beat 17, for example, contains the highest number of robberies while the density of robbery in this beat is one eighth that of the density of police beat five and equal to the density in a beat with almost half the number of robberies, beat 22.

Standardization of the data into numbers per square mile or per 100,000 persons is often made to eliminate these differences between areas. Display of the data in map form can also be helpful in making the reader aware of the variations.

A second problem with respect to the use of standard areas relates to the homogeneity of the phenomenon within the area. The recording of the data by beat or census tract implies to some extent that the crime occurs uniformly over the area. This assumption of homogeneous distribution within a census tract or police beat can be very misleading for robbery.

An analysis of the robbery distribution in the area of census tract 15 illustrates this problem. Census tract 15 is the highest robbery census tract in the city. However, there is an intense concentration of robbery in this census tract upon the street which makes up the boundary with census tract 21, as shown in Figure 13A. The robbery concentration in this four block section is the most intense in the entire city. However, when this robbery concentration is displayed by census tract it is spread out over the entire area of census tracts 15 and 21. When this same area is considered by the police beat area, the area of concentration is within one beat area. However, this area also includes large areas with no robbery at all, as may be seen by comparing the distributions in Figure 13.

FIGURE 13

[Insert Figure 13]

This problem of homogeneity within the area of analysis is multiplied many times over when the distribution of the phenomenon has linear tendencies, and is made even worse if the line of the linear pattern also happens to be the boundary of the various areas. Both these problems occur with respect to robbery in Oakland.

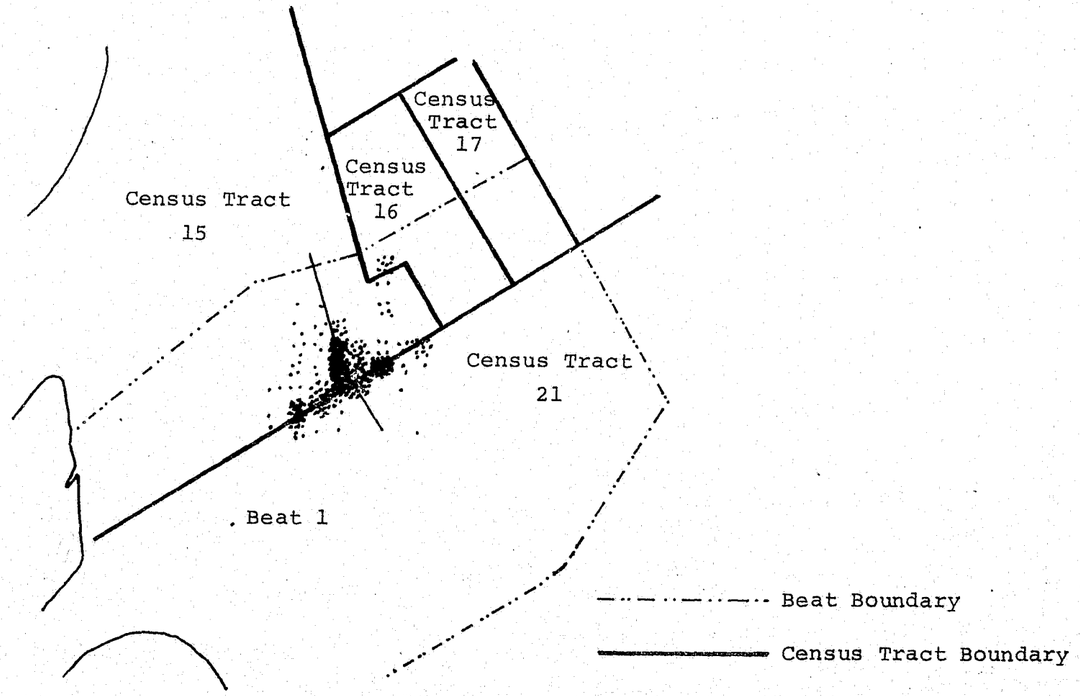
The pattern of robbery when plotted by the actual location of the offense is linear with concentrations focused upon the major streets of the city. This pattern of concentration is not evident when viewing the maps of robbery plotted by census tract and police beat areas. The major street in Figure 14, East 14th Street, is also a boundary for several of the census tracts. (See Figure 14.) In each of the census tracts that use this thoroughfare as a boundary there is very little robbery away from this street. The census tract map of the area, however, necessarily generalizes the occurrence of robbery over the entire area of the census tracts involved. Thus, a census tract map, such as Figure 14, shows large areas bounded by the major streets as having a relatively high robbery frequency, when over 70 percent of each tract shown has relatively little robbery.

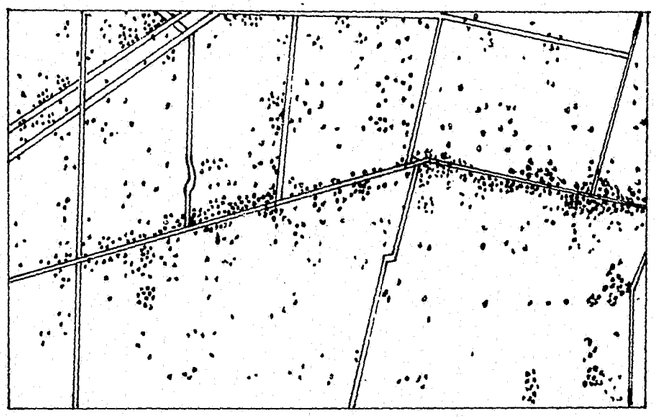
The same problem exists when robbery is plotted by police beat areas. Police beat areas are larger in size than census tracts. When police beats are used for mapping, the robberies which occur about the major streets are even further generalized into larger areas, as shown in Figure 14.

[Insert Figure 14]

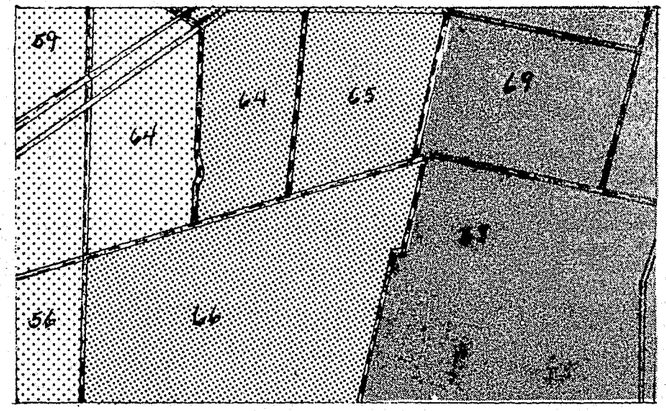
Figure 13

Robbery in the Prescott Neighborhood - 1966-1968

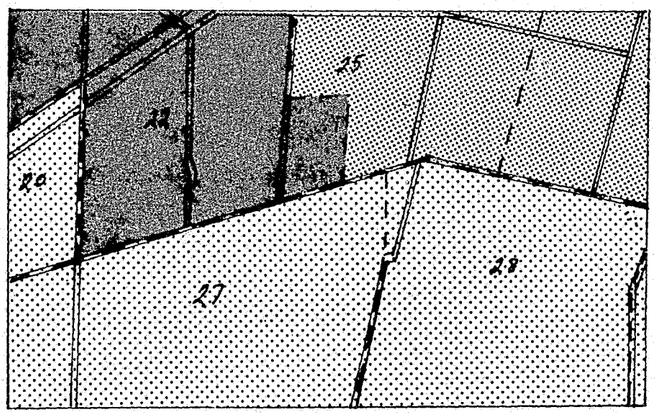




Each dot equals one robbery.



Census Tract Areas



Police Beat Areas

Figure 14

Robbery on East 14th Street and Adjoining Areas

Legend: Darker areas indicate a greater number of robberies.

Clearly census tracts and police beats distort the actual pattern of robbery so that some nonrobbery areas are shown to have high robbery rates. There are no existing standard units for describing urban areas, however, which do not contain the same kind of limitations.

To deal with this problem the St. Louis Police Department has developed a system of small areas called "Pauly" blocks. Each of these is between four and six city blocks in size, and for St. Louis there are about 400, or about three and a half times more than the number of census tracts. Even the Pauly blocks, however, generalize highly clustered events such as robbery into possible nonevent areas. The size of the Pauly block area is sufficiently small, however, that a reasonably accurate city-wide pattern may be determined.[21]

More recently the St. Louis department, in order to obtain even more precise information, has developed a method of mapping the site of traffic calls and criminal activity which uses the actual location of the offense.[22] Maps are produced for each of the nine districts of the city by a computer pen plotting system using actual addresses. When there are more than five events within a quarter of a mile in radius a circle is drawn upon the map in that area. Areas of dense occurrence are characterized by the numbers of circles.

B. Analysis By Actual Location

For the purpose of the present study, a unit of analysis

was sought that would minimize any invalid generalization of the robbery pattern, be independent of the street pattern of the city, but which would nevertheless allow some generalizations to be made. The use of a grid system of fine gradation was ultimately decided upon. A coordinate system capable of displaying a linear distribution and large enough to be practical for coding was then sought. Little guidance was found, however, for development of an optimal size of study unit.

What general guidelines there are seem accurate enough, but not very helpful in concrete cases. Thus, the level of detail of the data on a map is said to depend upon a combination of the scale of the available base map and the requirements of the mapping symbolism.[23] Since a map is an abstraction of reality in which the symbol represents the occurrence of a real phenomenon,[24] both the size and character of the symbol and the adoption of an appropriate scale to display the symbol are important.

While a square grid coordinate system is independent of the street pattern, its utiiity varies with the size of the grid unit. The larger the area of each grid unit, the less clear the clustering of robbery about the streets. As the size approaches a census tract in area, the robbery distribution obviously becomes similar to the distribution of the census tract map and the focus upon the major streets is lost. As the size of the grid unit decreases the street focus becomes clearer, as shown in Figure 15. (The subfigures show the results of a decreasing grid size.) Since the street focus of robbery tends to cluster within a half city block of the major streets, a grid area which approximates this size was chosen (Figure 15D).

[Insert Figure 15]

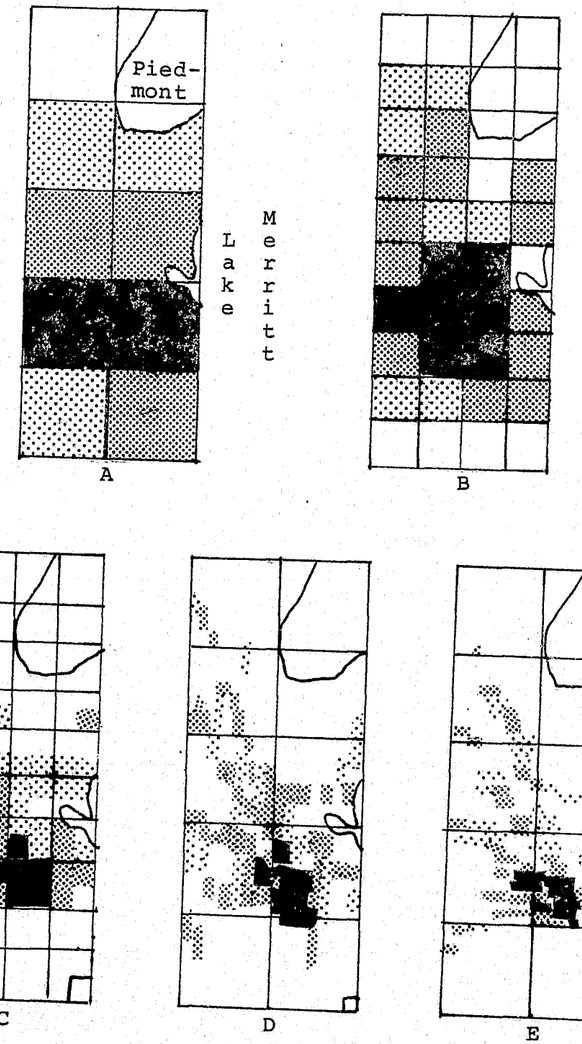
The visibility using this method of analysis of robbery patterns is considerably better with the large, 39" x 26" maps originally produced than with the 8 1/2" x 11" reproductions necessarily used in this report. It is difficult in the smaller version either to show the basic events or to add additional information such as street patterns that would aid in the analysis.

This method of analysis and those now being used by the St. Louis department are still in their infancy. Their cost and their ultimate potential on any basis of wide-scale use either for short range tactical problems or for longer range analysis and planning has not yet been determined. They seem to offer, however, a great deal of promise and to warrant further experimentation and development.

Figure 15

Robbery Distribution in Central Oakland - 1966-1968
With Varying Size of Mapping Unit

(Robbery Increases With Intensity of Shade)



FOOTNOTES

1. Oakland City Planning Department, Options for Oakland: a Summary Report on the Oakland 701 Project (Oakland, California: Oakland City Planning Department), December 1969, pp. 77-79.
2. Letter from Alex Zuckermann, Lirarian, Oakland City Planning Department, August 4, 1971.
3. The landuse data was taken from a survey conducted in 1965 by the Oakland Planning Commission's 701 Study staff. This land-use system is very generalized and stresses the landuse of the block rather than the individual parcel. With such a system the landuse is a reflection of the neighborhood rather than the site's individual function. The neighborhood grocery and even the supermarket, if located apart from other commercial establishments, would be considered within a noncommercial landuse area. Thus while commercial robbery may not occur without the involvement of a business of some sort it quite often does occur in a noncommercial landuse area. The generalization of this land-use system resulted in a large number of grid areas, 15 percent, with no landuse information. While this is unfortunate, the use of such a generalized landuse base shows the basic function of the area of the site of the robbery rather than the site's uniqueness within an area.
4. Commercial robberies are those offenses whose victims were in commercial enterprises. They consist of only 30 percent of the robberies during the three year period, 1966-1968. These

robberies, as well as robbery of individuals--64.5 percent of the robberies--will be discussed in greater depth. The remaining 5.5 percent of the robberies were either residential robberies or transportation robberies. Because of the small number of these two robbery types, they will not be discussed separately.

5. In 1960 there were 3,293 persons living in this census tract of which 94.5 percent were black; the mean average income for this area was only $3,153 as compared with $6,303 for the city. The Prescott area is surrounded on two sides by a large and shabby industrial port area and on the other sides by the Nimitz Freeway. The area may easily be classified as a ghetto with near complete isolation from the rest of the city. The majority of the housing consists of old, dilapidated Victorian style multifamily wood frame houses of which over 80 percent were built before 1909. There is also a large federal housing project covering two city blocks that is only one block from the Seventh Street commercial strip, the focus of the individual male robbery concentration.
6. The entire length of Seventh Street contains 88 robberies with an additional 92 robberies within a half block of Seventh. As may be seen on Map 13, all but approximately 25 of the robberies on Seventh Street were in the Prescott area. The second major street of this area, Willow Street, contains 50 individual male robberies with an additional 34 robberies within a half block of Willow.

7. The City of Oakland may be divided into northern and southern sections by dividing the city with a line connecting the Bay, Lake Merritt and the southern boundary of the City of Piedmont. There is a definite difference between the density of residential areas as well as type of commercial activity between the two areas.
8. During the period of 1960 to 1966 the nonwhite population of the area increased from 17,076 to 28,820 a 69 percent increase while the white population decreased from 16,149 to 9,170, a 58 percent decrease. Of note is the decrease in the median age of the nonwhite population due to the increase in younger families: from 18.8 to 14.9 years of age for males and from 20.0 to 17.2 for females. At the same time the median age of the white population remained virtually unchanged, going from 27.9 to 26.7 years for males and 29.8 to 29.7 years for females. (Oakland City Planning Department, East Oakland: a 701 Subarea Report, Oakland, California: Oakland City Planning Department), 1969, p. 9.
9. Clifford Shaw and Henry D. McKay, Juvenile Deliquency and Urban Areas, (Chicago: University of Chicago Press), 1947.
10. Peter Haggett, Location Analysis in Human Geography, (New York: St. Martin's Press), 1966, p. 177.
11. Shaw and McKay, supra note 9, pp. 204-206.
12. Id., pp. 202-203.
13. Calvin F. Schmid, "Urban Crime Areas, Part II," American Sociological Review, XXV, No. 10, (1960), pp. 664-665.
14. Id., pp. 655-678.

15. Schlomo Angel, Discouraging Crime Through City Planning, Working Paper No. 75 (Berkeley: Center for Planning and Development Research, Univ. of Calif.), February 1968, pp. 16-18.
16. Ibid.
17. Id., pp. 12-15.
18. The congestion-robbery ratio is the ratio of the number of robberies per 1000 vehicles per day per length of street.
19. All of the streets discussed have a similar speed limit (25 m.p.h.). Thus, the speed of the traffic has little influence upon the differences between the robbery concentrations.
20. Gerald Luedtke, Donald Lystad, James Kozlowsky and Stephen Hamerink, Crime and the Physical City: Neighborhood Design Techniques for Crime Reduction, a pilot study prepared for the National Institute of Law Enforcement and Criminal Justice (Detroit: Gerald Luedtke and Associates), n.d., pp. 5-6.
21. Interview with Dr. Nelson B. Heller, Metropolitan Police Department of St. Louis, March 3, 1973.
22. Ibid.
23. Benjamin J. Garnier, Practical Work in Geography (New York: St. Martin Press, Inc.), 1963, p. 73.
24. John P. Cole and Cuchlaine A. M. King, Quantitative Geography: Techniques and Theories in Geography (New York: John Wiley and Sons, Ltd.), 1969, pp. 468-469.

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