# CRIME IMPACT STATEMENTS: A STRATEGY SUGGESTED FROM THE STUDY OF CRIME AROUND BARS

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ABSTRACT:

Increasing concern is evolving over the predictive power of various criminalistic approaches to crime. The capacity to produce predictive and reliable estimates about the impact of various programmatic and strategic goals on crime and community is necessary to a scientific screening of these goals. The capacity to produce "crime impact statements" is a necessary component of this screening process. In this paper, we propose an approach to developing crime impact statements based on a microgeographic methodology. Empirically derived examples demonstrate how and to what extent we can predict the actual impact of various geographic factors in determining expected crime impacts.

# CRIME IMPACT STATEMENTS: A STRATEGY SUGGESTED FROM THE STUDY OF CRIME AROUND BARS

Criminal justice planning is undertaken largely as a response to crime problems in a community. As a response oriented process, this planning is typically implemented to combat and offset the impact of crime and crime-related problems. The advent of crime prevention planning, however, has opened up a new vista of approaches for combating crime. The prevention of crime before it occurs is the basis of this type of planning. However, development of crime prevention programs is a difficult process without the development of guidelines and standards around which to develop programs and program evaluations. Part of the problem in developing guidelines and evaluation standards is the development of reliable *predictive* measures of crime and crime-related attributes. Until these predictive measures are developed, prevention planning and evaluation strategies are largely intuitive and subject to critique.

Here we present a method for predictive analysis of crime at a limited level and propose a means for deriving *crime impact statements* which can feed directly into strategic planning for crime prevention. The method described is based on the distributional charactieristics of crime which can be attributed to the geographic location of individual sites.

## PROBLEM DEFINITION

Crime patterns can be derived from the geographic distribution of offenses in a given area. Police planners have long viewed the geographic distribution of crime as a critical informational input for their tactical planning for patrolling and apprehension strategies. Further, these same planners have viewed long term patterns as critical for their strategic planning processes and have derived numerous programs focusing on the assignment of geographic boundaries for administrative units such as precincts, or patrol zones.

Additionally, the geography of crime has been proposed as the basis for the assignment of community resources for combating various types of crime problems, predominantly burglary and related crimes against property.

However, these approaches have focused on the global distribution of crimes over entire cities and have generally focused on distributing resources as a direct function of global patterns. Little attention has been paid to the less global characteristics of the distribution of crime around individual sites, i.e., the microgeography of crime.

The approach proposed here focuses on the types of crime patterns which can be derived from the analysis of the geography of crime with respect to individual sites. This approach has been intuitively approached for a long time and has been evolved from "common wisdom" assessments of causes of crime. Typical examples have included the assignment of cause to bars, group homes, halfway houses, adult entertainment establishments, book-making shops, and similar *sites* which theoretically attract criminals or act as points from which criminal acts are disseminated.

The theoretical basis for these assignments of "causality" are usually unformulated. For example, it is common wisdom that a drunk leaving a bar is more likely to commit a crime than are the gentry leaving the opera. The articulation of the theoretical basis for the assignment of causal relationships is crucial to understanding the microgeography of crime. Clearly, more attention must be given to these theoretical relationships before analysis can proceed much further. However, here we are less concerned with the articulation of theory and more concerned with the demonstration of the importance of deriving theory to aid in the understanding of the phenomena described here.

We have taken as *a priori* the assumption that for some types of crimes, and some types of sites, there is a distinct geographic pattern that can be derived for the distribution of crime around individual sites. Further, we assume that given the derivation of such a distribution, the actual impact of the site on crime can be derived and transformed into a crime impact assessment of individual sites, and sites of a similar character.

The approach taken for this evaluation is derived from *distance decay analysis* common to urban geographic studies. Distance decay analysis is a methodology which measures the density of events in relationship to the location of a single site or node.[1] The assumption

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[1]With the lack of well developed theory, it is difficult to determine the behavioral characteristics of a node determined to be associated with crime. Two possibilities exist: First, the node can serve as a site from which crime events emanate. In this case, would-be criminals are released from the node into the community. Such a model would be appropriate for an intoxication hypothesis which would suggest that people go to a bar as citizens, and leave intoxicated as would-be criminals. The second case suggests that a node serves as a site which attracts criminals. In this case, would-be criminals are attracted to the node as part of their occupational activity. Such a model would be appropriate for an entertainment class hypothesis which would suggest that criminals go to a certain type of establishment because the psychological attributes of that establishment are concomitant with their personalities. Having found and satisfied their entertainment needs, they then revert to their occupation proximate to the entertainment facility. Our differentiation between classes of bars based upon their entertainment licensing might tend to discount the second hypothesis to the favor of the first. Thus, it might be possible that a bar serves as a node from which criminal events *emanate*, rather than a node to which criminal events are *attracted*.

tested by distance decay analysis is that the closer one gets to the node, the more events, or crimes, occur. Thus, the node is theoretically assumed to be a point from which events or crimes emanate or are drawn toward. In order to develop a distance decay analysis, one generates a *distance decay curve* as shown in Figure 1.

> The uses of a Distance Decay Analysis are:
>
> a) to ascertain whether the crime rate changes systematically as one approaches a specific geographic location;
>
> b) to ascertain the direction of this change, i.e., whether the crime rate increases or decreases as the site is approached; and
>
> c) to estimate the magnitude of the change in the crime rate as one approaches the site.

For crime analysis, various statistics can be generated which tend to confirm conclusions based on the slope of a distance decay curve. A chi-square test can be utilized to indicate whether or not the distribution of events is nonuniform. Further, a signs test can be used to estimate the probability of a slope being positive, negative, or zero. The application and implications of these tests are discussed more fully in Appendix A.

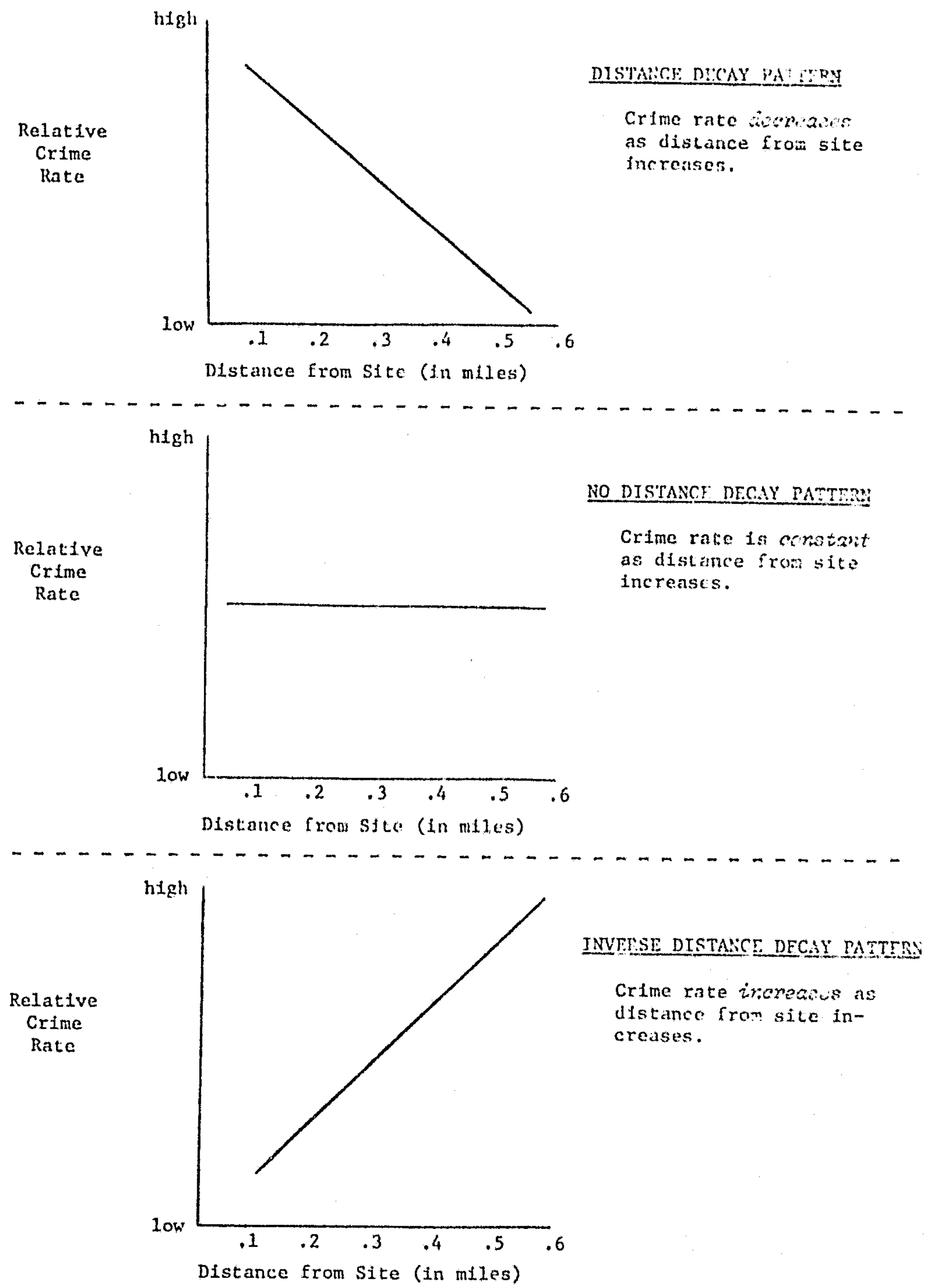
Armed with distance decay analysis, and an understanding in the limitations of such an analysis, it is relatively easy to assess both the relationship between an individual site and crime, and the probable impact of the site on crime in the area.

## AN APPLICATION: CRIME AROUND BARS

Our project utilized a distance decay analysis to assess the impact of various types of "on sale" liquor establishments, or bars, on various types of crimes. Our analysis was based upon the crude theory discussed earlier, that persons leaving bars were more likely to commit crimes than persons leaving other sites. Bearing with the conventional wisdom, we focused on the analysis of assaults and their relationship to bars. One hundred and fifty-seven bars in Minneapolis were analyzed in this study. Data for the study was derived from 4,357 assaults recorded by the Minneapolis Police Department for the period July 1, 1974, through June 30, 1975. The addresses of both bars and offenses were processed to compute X-Y location coordinates for analysis by specially developed distance decay analysis software. Bars were divided into license classes: A, B, and C, corresponding to the class of entertainment and the alcohol

FIGURE 1

AN INTERPRETIVE GUIDE TO DISTANCE DECAY CURVES[a]




[a]These are pure types. Actual curves may display some amount of random variation and/or curvilinearity.

service licensed for each bar. (In Minneapolis, Class A indicates full entertainment, and C indicates beer sales only.)

Distance decay characteristics were generated for each bar, as well as aggregate characteristics for each class of bars, and for all bars. Summary data for this analysis is given in Appendix C.

Generally, we found that between 2 and 3 times the expected level of assault occurred proximate to the average bar in the city. As shown in Appendix C, this varied from bar to bar. We further observed that about half of all bars did not display the characteristic negative slope indicated by the theoretical assumptions of this method of analysis. Thus, we were able to conclude that although the average bar had a clear impact on the geographic distribution of assault, not all bars had an observable impact. Indeed, some bars can easily be classified as "safe" in that they seem to have been located at sites not characterized by the occurrence of assaults.

This analysis served to demonstrate both the utility of distance decay analysis in assessing the crime impact of classes of sites, as well as giving an estimate for the impact of crime generated by individual sites. In order to develop an estimate for the crime impact of the site, we developed a hypothetical model of how the geography of crime would be distributed in the absence of a bar. The methodology for this analysis is discussed in Appendix B.

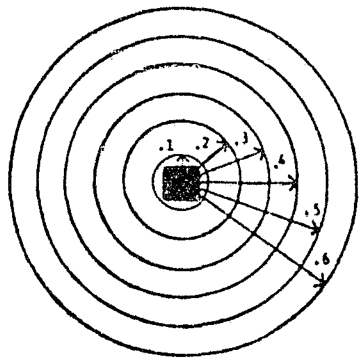
For individual sites, it is possible to make an impact assessment for how many crimes would not occur *in the absence of the site*. For the average bar, we were able to estimate that 12 assaults would not occur if the bar site were vacant. For individual sites, estimates ranged from zero assaults to as high as 90. Unfortunately, we were unable to obtain time-series data which included opening and closing dates of various establishments. Such data is critical as baseline data for verifying the assumptions discussed here and determining a precise value for the crime impact of individual bars, or classes of bars. Collection of this type of data and application via the methodology discussed here is a critical step toward the final formulation of crime impact assessments for bars as well as other sites believed to be causally linked to crime.

## APPENDIX A

## DISTANCE DECAY ANALYSIS APPLIED TO CRIME ANALYSIS

Distance decay analysis is drawn from urban geography as a class of analysis which associate points with distributions of events. The basic assumption tested by a distance decay analysis is that a single point can be demonstrated to be associated with related events by measuring the density of events as a direct function of the distance of the events from the point. If we think in formal terms, we are stating that the density of crimes is a function of the distance from the site. In order to derive this function, we must first select measures of distance and density. Our research has indicated that from crime-related geographic associations, distance increments of tenth miles out to roughly one-half or 6 tenth miles are appropriate for discerning micro-geographic patterns. Density measures are taken to be the proportion of crimes per square mile in each incremental band radiating from the site to be analyzed. The appropriate coefficients derived for this analysis are shown in Appendix B.

## CONSTRUCTING A DISTANCE DECAY CURVE




Distance of .6 mile study area around the site of interest.

Site

1. Count the number of crimes within each band.
2. Transform each count into a crime proportion by dividing by the sum of all crimes within .6 miles of the site of interest.
3. Transform each crime proportion into a relative crime rate by dividing by the proportion of the total area in that band (see table below).
4. Plot the resulting crime rates for each band against the distance for site.

### DISTANCE DECAY CRIME WORK SHEET

| DISTANCE TO SITE (miles) | COUNT OF CRIMES[1] | CRIME PROPORTION[2] | AREA PROPORTION | RELATIVE CRIME RATE[3] |
|---|---|---|---|---|
| 0 through .1 | | | .0278 | |
| .1+ through .2 | | | .0833 | |
| .2+ through .3 | | | .1389 | |
| .3+ through .4 | | | .1944 | |
| .4+ through .5 | | | .2500 | |
| .5+ through .6 | | | .3056 | |
| SUM OF CRIMES: | | | | |

[1]Count of crime incidents within band.

[2]Count of crime incidents within band divided by sum of incidents for all bands.

[3]Crime proportion divided by area proportion.

The relationship between crime density distance is assumed to be of the form:

$$D = F \text{ (distance)}$$

where $D$ is the density of crime, and $F$ denotes the function relating distance to density. For our purposes, it is unnecessary to derive the empirical function $F$, which can easily be derived using simple or polynomial regression techniques. Our primary concern is with deriving the characteristic slope of $F$, or $F'$. We can simplistically observe that if $F' < 0$ then a distance decay effect is present. If $F' \geq 0$ then a distance decay effect is not present. Our analysis has focused on determining the degree to which we can assert that $F' < 0$.

Two tests have been employed to derive indications of the nonrandomness of $F'$. The first is a classic chi-square statistic which reports whether events in the space are uniformly distributed. A significant chi-square is taken to indicate nonuniformity in the space.

The second test is the signs test applied to the difference between distance decay coefficients in a band of lesser radius and a band of greater radius. Since we have six bands, we are making five comparisons and trying to assess the degree to which the coefficients vary in relation to each other. Where the signs of all five comparisons are negative (i.e., each band's coefficient is less than that of the band immediately inscribed to it), then we can assume a probability of $1/2^5$ to the observed slope of the overall distance decay curve.

Where all three tests, the distance decay curve, the chi-square, and the signs test indicate significant negative slopes, a distance decay effect is assumed to be observed in the data.

## APPENDIX B

## CRIME IMPACT ASSESSMENT USING DISTANCE DECAY ANALYSIS

In order to assess the impact on crime that a site has in a community, we ideally need to have a baseline analysis which details how crime rates have changed when a new site has been established within a community. Such analysis would allow us to pin point the exact change in crime caused by the introduction of a new site in an area.

However, it is often the case, as in our analysis, that such baseline data and analysis is not available. It is still possible to *estimate* what the impact of a site might be given certain assumptions based on distance decay analysis.

Recall that distance decay analysis is based upon the division of the proportion of crimes by the proportion of area in bands of increasing radii from a site. In the perfect case where crime is unrelated to the site, we would find a distribution like that shown in Table 1.

TABLE 1

DISTANCE DECAY COEFFICIENTS FOR THE PERFECTLY UNIFORM DISTRIBUTION

| | RADIUS FROM SITE (IN MILES) | | | | | |
|---|---|---|---|---|---|---|
| | .1 | .2 | .3 | .4 | .5 | .6 |
| $\frac{\text{Proportion of crimes}}{\text{Proportion of area}}$ | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Proportion of area | .0278 | .0833 | .1389 | .1944 | .2500 | .3056 |

The average Class A, B, and C bar in Minneapolis has a distribution like that shown in Table 2.

TABLE 2

DISTANCE DECAY COEFFICIENTS FOR THE AVERAGE MINNEAPOLIS BAR

| | RADIUS FROM SITE (IN MILES) | | | | | |
|---|---|---|---|---|---|---|
| | .1 | .2 | .3 | .4 | .5 | .6 |
| Proportion of assaults / Proportion of area | 2.721 | 1.484 | 1.110 | .975 | .877 | .777 |

If we assume that this nonuniform distribution of assaults is due solely to the bar, then we can make an estimate of how many assaults are "caused" by the presence of the bar. For a conservative estimate, let us assume that only the assaults within the first tenth mile band are caused by the bar. In order to calculate the impact of the bar on assaults, we perform the following computational steps:

1. Find the average assaults per square mile for all bars (for Minneapolis the value is 244 per square mile)

2. Find the expected number of assaults in the first tenth mile band for the bar: (multiply 224 times the proportion of a square mile represented by a ring of 0.1 mile radius: 0.0314) = 7.037

3. For the average Minneapolis bar, the bar's impact on assaults is: 2.721 X 7.037 - 7.037 = 12.11.

In other words, the average bar was statically related to an additional 12 assaults per year, *given the assumptions made above.*

For a particular bar, we can do similar types of analysis, relating the bar to either bars of the same class, or bars in the immediate vicinity, or in relation to all bars. For example, one bar studied could be calculated to have had the following crime impact when related to all other bars.

1. Average assaults per square mile for sample bar = 377.083

2. Expected number of assaults in the first tenth mile band = 0.0314 X 377.083 = 11.840

3. The calculated impact of this bar is now the total number of assaults observed within the first tenth mile ring, 101, minus the expected number of assaults, 11.840 or: 101 - 11.840 = 89 assaults.

The number of crimes statistically associated with the average bar may vary slightly by the class of the bar or the geographic location within the city. For classes of bars, the distance decay coefficients derived for the Minneapolis sample are shown in Table 3.

TABLE 3

DISTANCE DECAY COEFFICIENTS BY CLASS OF BAR

| Proportion of assaults / Proportion of area | CLASS | RADIUS FROM SITE (IN MILES) .1 | .2 | .3 | .4 | .5 | .6 | N |
|---|---|---|---|---|---|---|---|---|
| | A | 2.866 | 1.741 | 1.160 | .933 | .878 | .698 | 55 |
| | B | 2.345 | 1.448 | 1.054 | 1.002 | 1.052 | .687 | 9 |
| | C | 2.644 | 1.318 | 1.073 | .995 | .861 | .848 | 93 |
| | TOTAL | 2.721 | 1.484 | 1.110 | .975 | .877 | .777 | 157 |

## APPENDIX C

## DISTANCE DECAY CHARACTERISTICS OF ALL SAMPLED MINNEAPOLIS BARS

| SITE | NUMBER OF CRIMES ANALYZED | PROPORTION OF CRIMES/PROPORTION OF AREA — Radius from Node .1 | .2 | .3 | .4 | .5 | .6 | CHI-SQUARE | P | CRAMER'S V |
|---|---|---|---|---|---|---|---|---|---|---|
| Al's Place | 34 | 1.1 | 0.4 | 1.3 | 0.9 | 0.7 | 1.3 | 2.0 | | 0.1726 |
| Anchor Inn | 359 | 2.0 | 0.9 | 0.9 | 1.3 | 1.0 | 0.9 | 8.0 | – | 0.1054 |
| Andrews Hotel Cocktail | 445 | 4.2 | 2.4 | 1.3 | 1.2 | 0.3 | 0.7 | 103.5 | –* | 0.3410 |
| Andy's Place | 49 | 2.2 | 3.2 | 0.7 | 1.5 | 0.5 | 0.5 | 10.7 | | 0.3297 |
| Archie's Bunker | 74 | 0.0 | 0.5 | 0.5 | 0.8 | 0.9 | 1.8 | 11.4 | +* | 0.2772 |
| Arthur's | 43 | 1.7 | 1.1 | 0.7 | 0.8 | 1.4 | 0.8 | 1.6 | | 0.1376 |
| Augies Theatre | 450 | 4.2 | 2.5 | 1.4 | 1.1 | 0.3 | 0.7 | 106.0 | –* | 0.3432 |
| Beamish's Bar | 42 | 1.7 | 2.3 | 1.0 | 0.7 | 1.1 | 0.6 | 3.5 | | 0.2051 |
| Beanie's Lounge | 304 | 6.4 | 0.9 | 0.9 | 0.4 | 1.0 | 1.0 | 51.7 | * | 0.2915 |
| Bears Den | 315 | 2.3 | 1.2 | 0.7 | 1.1 | 0.8 | 1.1 | 10.8 | | 0.1309 |
| Bill's Place | 83 | 0.0 | 0.6 | 1.0 | 0.6 | 0.7 | 1.7 | 10.0 | + | 0.2456 |
| Bismark Corporation | 313 | 1.7 | 1.0 | 1.1 | 0.8 | 0.9 | 1.1 | 4.2 | | 0.0823 |
| Black Angus | 724 | 0.5 | 0.4 | 0.9 | 1.7 | 1.0 | 0.8 | 51.0 | * | 0.1877 |
| Boyds Bar | 264 | 1.1 | 0.4 | 0.6 | 1.1 | 0.7 | 1.5 | 19.6 | * | 0.1925 |
| Bradys Bar | 480 | 7.8 | 2.9 | 0.9 | 0.9 | 0.6 | 0.3 | 176.4 | –* | 0.4287 |
| Brass Rail | 450 | 4.2 | 2.5 | 1.3 | 1.1 | 0.3 | 0.7 | 105.8 | –* | 0.3429 |
| Busters Northstar Bar | 506 | 0.9 | 1.1 | 2.6 | 1.2 | 0.7 | 0.3 | 111.3 | * | 0.3346 |
| C C Tap | 373 | 1.1 | 1.0 | 0.7 | 1.3 | 1.1 | 0.9 | 8.5 | – | 0.1070 |
| Cafe Di Napoli | 529 | 5.7 | 2.8 | 1.5 | 0.6 | 0.6 | 0.5 | 149.8 | –* | 0.3763 |
| Cafe Di Napoli Lounge | 529 | 5.7 | 2.8 | 1.5 | 0.6 | 0.6 | 0.5 | 151.0 | –* | 0.3777 |
| Calhoun Apts Co | 10 | 0.0 | 1.2 | 2.2 | 1.0 | 0.4 | 1.0 | 0.5 | | 0.2765 |
| Calhoun Beach Rest. | 14 | 2.6 | 1.7 | 1.5 | 0.0 | 0.3 | 1.6 | 5.5 | | 0.4425 |
| Carousel Lounge | 563 | 4.2 | 1.4 | 1.0 | 1.3 | 0.7 | 0.6 | 56.4 | –* | 0.2238 |
| Cassius Bar and Play | 362 | 3.2 | 0.5 | 0.6 | 1.1 | 1.1 | 1.0 | 22.6 | * | 0.1767 |
| Charlies Cafe | 508 | 0.2 | 0.3 | 1.1 | 0.9 | 1.7 | 0.7 | 60.0 | * | 0.2431 |
| Chatter Box II | 38 | 0.9 | 0.9 | 0.6 | 1.2 | 0.9 | 1.1 | 0.9 | | 0.1078 |
| Club 46 | 38 | 5.7 | 1.9 | 0.6 | 0.8 | 0.2 | 1.3 | 10.4 | | 0.3705 |
| Copper Squirrel | 445 | 4.2 | 2.4 | 1.3 | 1.2 | 0.3 | 0.7 | 102.4 | –* | 0.3392 |
| Cork and Fork | 503 | 2.1 | 3.8 | 1.6 | 0.6 | 0.7 | 0.4 | 143.4 | * | 0.3775 |
| Cos and Steves Bar | 34 | 3.2 | 1.4 | 0.4 | 0.2 | 0.9 | 1.5 | 7.7 | | 0.3369 |
| Court Bar Cafe | 571 | 0.4 | 0.7 | 0.9 | 2.2 | 0.8 | 0.6 | 79.5 | * | 0.2639 |
| Cozy Lounge Inc. | 251 | 0.7 | 0.5 | 0.4 | 0.8 | 1.0 | 1.6 | 25.1 | * | 0.2235 |
| Dannys Bar | 50 | 0.7 | 1.9 | 0.1 | 0.4 | 1.8 | 0.9 | 11.4 | * | 0.3376 |
| Dannys Bar and Cafe | 302 | 6.4 | 0.9 | 1.0 | 0.3 | 1.2 | 0.8 | 58.9 | * | 0.3124 |
| Dantis Bar | 509 | 5.9 | 1.4 | 0.8 | 0.5 | 1.0 | 0.8 | 72.9 | –* | 0.2676 |
| Daytons | 545 | 2.1 | 3.2 | 1.4 | 1.1 | 0.5 | 0.5 | 118.5 | –* | 0.3297 |
| Donaldson Medical Bl. | 556 | 2.0 | 2.3 | 1.9 | 1.1 | 0.5 | 0.5 | 103.7 | –* | 0.3054 |
| Duffs Inc. | 544 | 3.6 | 3.1 | 1.6 | 0.8 | 0.5 | 0.5 | 138.2 | –* | 0.3565 |
| Duffys Tavern | 72 | 10.0 | 0.5 | 0.4 | 0.9 | 0.7 | 0.9 | 19.4 | * | 0.3666 |
| Dulonos Pizza | 289 | 0.9 | 1.7 | 1.0 | 0.7 | 0.9 | 1.1 | 8.4 | | 0.1207 |
| Dustys Bar | 61 | 0.0 | 0.8 | 0.7 | 0.5 | 1.8 | 0.9 | 8.0 | | 0.2561 |
| Eden Fruit Market | 205 | 1.2 | 1.7 | 1.0 | 0.9 | 1.0 | 0.8 | 4.3 | | 0.1029 |
| Edgewater Inn Corp. | 33 | 2.2 | 1.5 | 0.2 | 0.5 | 0.7 | 1.7 | 6.3 | | 0.3088 |
| Elis Bar | 561 | 4.5 | 0.5 | 1.0 | 0.9 | 1.3 | 0.6 | 61.5 | * | 0.2341 |
| Elks | 36 | 2.0 | 1.3 | 0.2 | 0.4 | 1.3 | 1.3 | 5.5 | | 0.2772 |
| Elks Lodge | 285 | 0.8 | 1.3 | 0.9 | 0.8 | 1.0 | 1.1 | 2.5 | | 0.0667 |
| Elsies Liquor Lounge | 36 | 0.0 | 0.7 | 0.4 | 1.6 | 0.6 | 1.5 | 5.4 | | 0.2750 |
| First & Last Chance | 41 | 2.6 | 0.9 | 0.9 | 0.4 | 1.3 | 1.1 | 3.6 | | 0.2086 |
| Fitzs Bar | 42 | 1.7 | 1.7 | 1.2 | 0.5 | 1.2 | 0.8 | 3.0 | | 0.1899 |
| Flame Cafe Inc. | 469 | 5.1 | 2.2 | 0.8 | 0.7 | 0.6 | 1.0 | 77.2 | –* | 0.2868 |
| Fountain Room Inc. | 649 | 0.7 | 0.7 | 2.4 | 0.9 | 0.8 | 0.7 | 74.2 | * | 0.2390 |
| Franks Bar | 136 | 7.9 | 0.6 | 0.8 | 0.4 | 1.1 | 0.9 | 29.6 | * | 0.3301 |
| Fuji Ya | 189 | 0.2 | 0.1 | 0.8 | 1.0 | 1.3 | 1.2 | 19.4 | * | 0.2267 |

| SITE | NUMBER OF CRIMES ANALYZED | PROPORTION OF CRIMES/PROPORTION OF AREA Radius from Node | | | | | | CHI-SQUARE | P | CRAMER'S V |
|---|---|---|---|---|---|---|---|---|---|---|
| | | .1 | .2 | .3 | .4 | .5 | .6 | | | |
| Gay 905 Happy Hour | 443 | 4.2 | 2.4 | 1.3 | 1.2 | 0.3 | 0.7 | 103.7 | -* | 0.3421 |
| Gayety Annex | 348 | 0.4 | 1.2 | 0.9 | 1.3 | 1.3 | 0.6 | 18.8 | * | 0.1645 |
| Goofys Bar | 455 | 1.7 | 3.2 | 1.7 | 1.0 | 0.4 | 0.5 | 113.3 | * | 0.3528 |
| Guthrie Theatre Foun. | 305 | 0.1 | 0.1 | 0.1 | 0.8 | 1.3 | 1.6 | 69.3 | +* | 0.3372 |
| Haberdashery Restaurant | 51 | 4.9 | 1.6 | 1.6 | 1.5 | 0.3 | 0.4 | 14.1 | -* | 0.3717 |
| Halek Hotel | 155 | 6.7 | 1.6 | 0.3 | 0.9 | 0.6 | 1.0 | 30.9 | * | 0.3156 |
| Harrys Cafe | 657 | 0.4 | 0.6 | 2.1 | 1.3 | 0.8 | 0.6 | 72.8 | * | 0.2353 |
| Hennepin Square | 21 | 1.7 | 0.6 | 0.7 | 1.5 | 1.0 | 0.9 | 0.9 | | 0.1439 |
| Hexagon Bar | 70 | 10.8 | 0.5 | 0.7 | 0.5 | 0.8 | 0.8 | 20.0 | * | 0.3778 |
| Hi Lo 29 | 527 | 5.7 | 3.5 | 1.0 | 0.6 | 0.6 | 0.5 | 163.5 | -* | 0.3939 |
| Hills Cafe | 710 | 0.6 | 0.4 | 0.5 | 2.0 | 1.1 | 0.7 | 83.3 | * | 0.2423 |
| Howies Bar | 121 | 4.5 | 0.8 | 1.5 | 0.9 | 0.9 | 0.7 | 11.9 | * | 0.2214 |
| Hub Cap Pub | 524 | 5.6 | 1.8 | 1.6 | 0.8 | 0.7 | 0.5 | 108.7 | -* | 0.3221 |
| Ichabods Restaurant | 544 | 2.4 | 3.3 | 1.3 | 1.1 | 0.4 | 0.5 | 125.1 | * | 0.3391 |
| Irvs Bar | 133 | 7.8 | 0.8 | 0.8 | 0.4 | 1.1 | 0.9 | 26.9 | -* | 0.3179 |
| James Broiler | 529 | 5.7 | 2.7 | 1.6 | 0.6 | 0.5 | 0.5 | 147.9 | -* | 0.3739 |
| Jax Cafe | 54 | 2.0 | 0.2 | 0.7 | 1.0 | 0.6 | 1.6 | 6.8 | | 0.2504 |
| Joe and Petes 2 1/2 | 51 | 4.9 | 0.9 | 1.7 | 1.5 | 0.4 | 0.5 | 11.8 | * | 0.3407 |
| King of Clubs | 59 | 0.6 | 0.4 | 1.1 | 1.0 | 1.1 | 1.1 | 1.6 | | 0.1159 |
| Knight Cap Bar | 56 | 1.9 | 1.5 | 1.4 | 0.9 | 0.9 | 0.8 | 2.2 | - | 0.1411 |
| Lees Liquor Bar | 488 | 0.1 | 0.2 | 2.0 | 1.3 | 0.7 | 0.9 | 69.3 | * | 0.2666 |
| Little Jacks Steak House | 27 | 0.0 | 0.9 | 2.9 | 0.6 | 1.2 | 0.4 | 7.5 | | 0.3726 |
| Lyndale Recreation | 298 | 1.2 | 1.3 | 1.2 | 0.9 | 0.6 | 1.2 | 11.2 | * | 0.1370 |
| Mama Rosa Deli Restaur. | 100 | 5.0 | 0.7 | 0.8 | 0.2 | 1.4 | 1.0 | 19.8 | * | 0.3144 |
| Mannings Cafe | 16 | 0.0 | 0.8 | 1.8 | 1.6 | 0.7 | 0.6 | 2.0 | | 0.2522 |
| Maurers Cafe and Bar | 211 | 0.2 | 0.1 | 0.1 | 0.3 | 1.3 | 1.9 | 70.2 | +* | 0.4077 |
| Mayslack | 54 | 2.7 | 1.1 | 2.0 | 1.0 | 0.7 | 0.6 | 6.2 | - | 0.2390 |
| Mikes Bar | 155 | 7.0 | 1.5 | 0.3 | 0.9 | 0.6 | 1.0 | 31.4 | * | 0.3185 |
| Mill Inn Bar | 201 | 0.2 | 1.3 | 1.5 | 0.4 | 0.6 | 1.5 | 26.7 | +* | 0.2576 |
| Minneapolis Club | 583 | 0.5 | 0.7 | 0.8 | 2.3 | 0.8 | 0.6 | 87.7 | * | 0.2742 |
| Minnesota Bar | 132 | 1.4 | 1.1 | 0.3 | 1.6 | 0.5 | 1.3 | 17.1 | * | 0.2541 |
| Minnesota Music Hall | 522 | 0.2 | 0.3 | 1.0 | 0.9 | 1.7 | 0.8 | 57.3 | * | 0.2343 |
| Mister Arthurs Lounge | 352 | 2.4 | 0.9 | 1.0 | 0.7 | 1.1 | 1.0 | 9.5 | | 0.1164 |
| Mister Nibs | 72 | 10.0 | 0.5 | 0.5 | 0.9 | 0.8 | 0.8 | 18.4 | * | 0.3579 |
| Moby Dick Inc. | 491 | 7.4 | 3.0 | 0.9 | 0.9 | 0.5 | 0.4 | 167.1 | -* | 0.4125 |
| Monte Carlo Bar and Cafe | 282 | 0.3 | 0.1 | 0.4 | 1.1 | 1.7 | 1.0 | 44.2 | * | 0.2801 |
| Moose Lodge No. 38 | 60 | 0.0 | 0.6 | 1.0 | 1.1 | 1.1 | 1.1 | 2.4 | + | 0.1399 |
| Mouseys Bar | 563 | 4.2 | 1.4 | 1.0 | 1.3 | 0.7 | 0.6 | 58.3 | -* | 0.2275 |
| Minneapolis Aerie No. 34 | 82 | 1.3 | 3.1 | 0.4 | 0.6 | 0.6 | 1.2 | 14.0 | * | 0.2923 |
| Minneapolis Athletic Club | 519 | 0.2 | 1.2 | 2.0 | 1.2 | 0.6 | 0.7 | 54.3 | * | 0.2286 |
| Murrays Inc. | 501 | 2.2 | 3.7 | 1.7 | 0.5 | 0.8 | 0.3 | 157.6 | * | 0.3966 |
| My Brothers Place | 186 | 3.3 | 2.2 | 1.1 | 0.6 | 0.7 | 1.0 | 20.3 | * | 0.2338 |
| Nankin Cafe | 545 | 2.1 | 3.2 | 1.4 | 1.1 | 0.5 | 0.5 | 118.5 | -* | 0.3297 |
| Northeast Patio | 58 | 0.6 | 0.4 | 1.1 | 0.9 | 1.2 | 1.1 | 1.7 | | 0.1207 |
| Nyes Bar | 44 | 0.8 | 0.5 | 1.3 | 0.9 | 0.7 | 1.3 | 1.7 | | 0.1379 |
| Old Triangle Bar | 100 | 5.0 | 0.7 | 0.8 | 0.2 | 1.4 | 1.0 | 19.8 | * | 0.3144 |
| One O One Bar | 59 | 0.0 | 0.4 | 1.3 | 0.3 | 0.7 | 1.8 | 11.7 | +* | 0.3149 |
| Pearsons Saloon | 72 | 10.0 | 0.5 | 0.4 | 0.9 | 0.7 | 0.9 | 19.4 | * | 0.3666 |
| Porkys Drive-In | 94 | 2.3 | 1.7 | 1.3 | 0.8 | 0.9 | 0.8 | 4.4 | - | 0.1531 |
| Procna on Main | 52 | 0.7 | 0.0 | 1.2 | 1.3 | 0.8 | 1.2 | 5.6 | | 0.2329 |
| Rainbow Bowl | 130 | 7.2 | 1.1 | 0.7 | 0.6 | 0.8 | 0.9 | 20.7 | * | 0.2823 |
| Richards Cafe | 375 | 2.9 | 1.0 | 0.3 | 0.6 | 1.8 | 0.9 | 70.6 | * | 0.3072 |
| Richies Bar | 603 | 0.2 | 0.3 | 1.3 | 1.2 | 1.0 | 1.0 | 35.2 | * | 0.1707 |
| Roaring 20's | 473 | 6.1 | 2.8 | 0.8 | 0.9 | 0.7 | 0.4 | 125.1 | -* | 0.3637 |
| Ruscianos Inc. | 355 | 3.0 | 0.6 | 0.6 | 0.9 | 1.3 | 0.9 | 24.3 | * | 0.1852 |
| Russ Pub | 50 | 1.4 | 1.9 | 1.2 | 1.4 | 0.5 | 0.8 | 4.8 | | 0.2200 |
| Russells Bar | 325 | 3.0 | 0.6 | 0.6 | 0.5 | 1.4 | 1.1 | 29.8 | -* | 0.2142 |
| Scarpellis | 442 | 1.1 | 1.5 | 1.9 | 0.9 | 0.5 | 0.9 | 37.6 | * | 0.2061 |
| Schooner Tavern | 74 | 1.9 | 1.1 | 0.3 | 3.0 | 0.4 | 0.4 | 29.0 | -* | 0.4423 |
| Skips Bar BQ Inc. | 229 | 0.6 | 1.2 | 1.1 | 1.1 | 1.0 | 0.8 | 2.6 | - | 0.0754 |
| Skyway Lounge | 509 | 8.3 | 2.5 | 1.6 | 0.4 | 0.6 | 0.4 | 200.6 | -* | 0.4439 |
| Sokols Bar | 47 | 0.0 | 1.5 | 0.5 | 0.9 | 1.3 | 1.0 | 3.5 | | 0.1939 |

APPENDIX C--(Continued)

| SITE | NUMBER OF CRIMES ANALYZED | PROPORTION OF CRIMES/PROPORTION OF AREA — Radius from Node .1 | .2 | .3 | .4 | .5 | .6 | CHI-SQUARE | P | CRAMER'S V |
|---|---|---|---|---|---|---|---|---|---|---|
| Spaghetti Emporium | 443 | 1.0 | 1.9 | 1.9 | 1.1 | 0.7 | 0.5 | 57.9 | -* | 0.2557 |
| Sprint Inn | 60 | 0.0 | 0.8 | 0.6 | 1.2 | 1.6 | 0.7 | 5.8 | | 0.2200 |
| Stardust Lanes Inc. | 74 | 8.3 | 1.3 | 0.1 | 0.9 | 0.8 | 0.9 | 20.3 | * | 0.3707 |
| Stockholm Bar | 363 | 3.0 | 0.6 | 0.7 | 1.2 | 1.0 | 1.0 | 18.5 | * | 0.1596 |
| Stub and Herbs Cafe | 36 | 1.0 | 0.3 | 1.2 | 0.3 | 0.1 | 2.3 | 15.7 | * | 0.4672 |
| Sun Saloon Inc. | 57 | 1.3 | 0.8 | 1.9 | 0.9 | 0.7 | 0.9 | 3.2 | | 0.1666 |
| Sundance Inc. | 359 | 1.4 | 1.6 | 1.2 | 0.7 | 0.6 | 1.2 | 19.0 | * | 0.1625 |
| Swallow Cocktail Lounge | 500 | 8.1 | 2.7 | 1.5 | 0.4 | 0.6 | 0.4 | 194.8 | -* | 0.4413 |
| Tempo 21 East | 174 | 1.4 | 2.6 | 0.4 | 0.5 | 0.9 | 1.2 | 24.6 | +* | 0.2660 |
| Ten Twenty Nine Bar | 37 | 1.9 | 0.0 | 1.6 | 1.0 | 1.0 | 1.0 | 4.0 | | 0.2333 |
| The Blue Ox | 7.6 | 0.5 | 0.2 | 0.5 | 0.6 | 2.0 | 0.9 | 124.1 | * | 0.2944 |
| The Corral | 315 | 3.5 | 1.2 | 0.4 | 1.2 | 0.7 | 1.1 | 29.2 | * | 0.2153 |
| The Curtis Hotel | 752 | 0.4 | 0.2 | 0.4 | 0.7 | 1.9 | 1.0 | 126.8 | * | 0.2904 |
| The Dark Room Inc. | 311 | 3.2 | 1.8 | 0.8 | 0.6 | 0.8 | 1.1 | 26.2 | * | 0.2052 |
| The Dutchmans Bar Inc. | 530 | 2.6 | 2.3 | 0.8 | 1.1 | 0.8 | 0.7 | 45.5 | -* | 0.2073 |
| The Establishment | 680 | 0.4 | 0.7 | 1.1 | 1.6 | 1.1 | 0.6 | 42.8 | * | 0.1775 |
| The Guest House Hotel | 508 | 0.2 | 0.3 | 1.1 | 0.9 | 1.7 | 0.7 | 61.1 | * | 0.2452 |
| The Home | 327 | 1.7 | 1.3 | 1.0 | 0.7 | 0.6 | 1.4 | 20.1 | -* | 0.1754 |
| The Joint | 227 | 4.8 | 0.4 | 0.1 | 1.1 | 1.4 | 0.9 | 45.4 | * | 0.3161 |
| The Little Wagon Inc. | 371 | 2.6 | 1.1 | 0.3 | 0.4 | 1.5 | 1.1 | 56.1 | * | 0.2749 |
| The Longhorn Inc. | 478 | 4.6 | 2.4 | 1.5 | 0.9 | 0.6 | 0.4 | 107.2 | -* | 0.3349 |
| The Pine Tavern | 63 | 1.1 | 0.6 | 0.5 | 1.4 | 1.5 | 0.7 | 5.4 | | 0.2062 |
| The Spinning Wheel | 83 | 1.3 | 1.0 | 0.9 | 0.7 | 0.9 | 1.3 | 2.0 | | 0.1099 |
| The Womans Club of Mpls. | 381 | 0.3 | 0.5 | 0.8 | 1.7 | 1.1 | 0.8 | 26.4 | * | 0.1862 |
| Three O One Bar | 329 | 0.2 | 0.1 | 0.9 | 0.9 | 1.3 | 1.2 | 29.3 | * | 0.2109 |
| Three Thousand One Club | 78 | 1.8 | 0.9 | 1.7 | 0.5 | 0.2 | 1.6 | 20.3 | * | 0.3609 |
| Tonis M & M | 60 | 0.0 | 0.8 | 0.6 | 1.2 | 1.6 | 0.7 | 5.8 | | 0.2200 |
| Tony Jards River Gar | 34 | 2.1 | 0.7 | 0.8 | 0.5 | 0.5 | 1.8 | 6.1 | | 0.2991 |
| Tower Inn | 680 | 0.4 | 0.7 | 1.1 | 1.6 | 1.1 | 0.6 | 42.5 | * | 0.1769 |
| Uncle Sams | 500 | 8.1 | 2.7 | 1.5 | 0.4 | 0.6 | 0.4 | 198.1 | -* | 0.4451 |
| Union Bar Inc. | 46 | 7.0 | 1.0 | 1.9 | 0.6 | 0.9 | 0.4 | 12.0 | * | 0.3608 |
| Uptown Bar and Cafe | 168 | 2.4 | 0.9 | 1.0 | 1.3 | 0.7 | 1.0 | 5.4 | | 0.1265 |
| Valli Pizza | 47 | 10.7 | 0.8 | 0.8 | 1.0 | 0.3 | 0.8 | 14.9 | [illegible] | 0.3979 |
| Vescios Italian Restaurant | 47 | 7.7 | 1.8 | 0.8 | 1.0 | 0.3 | 0.8 | 11.8 | * | 0.3541 |
| Viking Bar | 100 | 5.0 | 0.7 | 0.8 | 0.2 | 1.4 | 1.0 | 19.8 | * | 0.3144 |
| Walker Art Center | 305 | 0.1 | 0.1 | 0.1 | 0.8 | 1.3 | 1.6 | 69.[illegible] | +* | 0.3372 |
| Whirlpool Bar | 213 | 0.0 | 1.9 | 0.9 | 0.5 | 0.6 | 1.6 | [illegible].3 | * | 0.2712 |
| Wig and Bottle | 34 | 2.1 | 0.7 | 0.8 | 0.5 | 0.5 | 1.8 | 6.1 | | 0.2991 |
| Williams Pub | 175 | 1.6 | 1.0 | 0.9 | 1.3 | 1.2 | 0.6 | 7.2 | - | 0.1435 |
| Workas Bar | 63 | 1.7 | 0.4 | 0.7 | 0.8 | 1.3 | 1.1 | 3.4 | | 0.1631 |
| 200 Club | 133 | 7.8 | 0.8 | 0.8 | 0.4 | 1.1 | 0.9 | 26.9 | -* | 0.3179 |

* Signifies significance at less than or equal to 0.05 level for chi-square.
\- Signifies significance at less than or equal to 0.065 level for negative slope.
\+ Signifies significance at less than or equal to 0.065 level for positive slope.

END