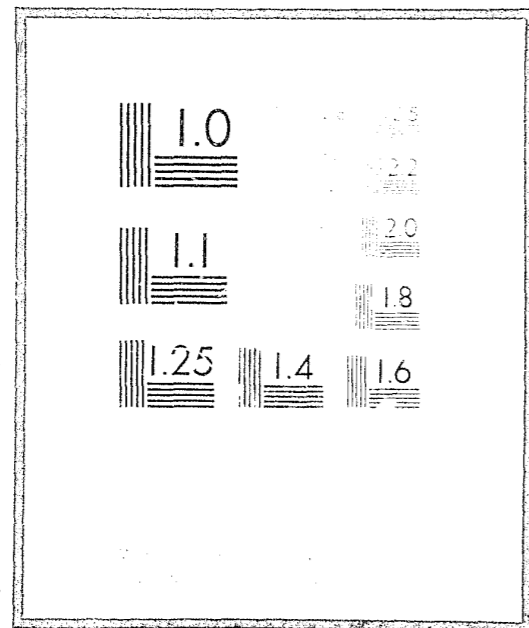# NCJRS

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# MINNESOTA

# GOVERNOR'S COMMISSION ON CRIME PREVENTION AND CONTROL

# RESEARCH REPORT

37203

The Identification of Target Areas
for Criminal Justice Planning

A Research Report
Produced
by the
Research Unit
and
Statistical Analysis Center

Governor's Commission on
Crime Prevention and Control
444 Lafayette Road
St. Paul, Minnesota 55101

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for Criminal Justice Planning.

# Table of Contents

I. Introduction

The aim of the target area selection project has been to develop an analytic method that can identify areas of Minnesota where the criminal justice system has especially difficult problems. The method described in this report should aid state and local planners in better concentrating the available resources in the areas of greatest need.

We know, of course, that the largest cities have the most crime. Thus if the crime rate were the only criterion for allocating planning or action resources, they would all go to the major cities. Crime is an important problem, however, in Minnesota's smaller cities and rural areas, and the main task here is to find additional, objective criteria that will assist planners in allocating resources among these communities. Until now, there has been a lack of data upon which to base such planning decisions.

In making funding decisions or in providing technical assistance, planners are also concerned about how likely the criminal justice problems in a locality are to be eased by the commitment of more resources there. From what little we do know about crime, we must expect that many of its causes are beyond the control of the criminal justice system. Among factors that have been found to be related to crime are the number of juveniles in the population, the income level, the unemployment rate, and the population density. None of these might easily be changed by the criminal justice system. In other words, we need to do more

than identify areas with problems; we need to identify areas with problems that we might do something about. How we identify such areas is itself a difficult problem, however; and in this report we present only a partial solution.

Briefly, our method of analysis is to locate those areas of the state that have substantially more crime, or criminal justice problems, than have other regions of comparable social and economic status. That is, we might expect a certain level of crime in an area simply owing to the socio-economic factors over which the criminal justice system has no control. But, if an area has much more crime than "expected" (from its socio-economic status), we may be seeing the effects of other, local conditions or problems that are more likely to be helped through criminal justice planning. This report identifies areas of Minnesota that do have unexpected crime problems. The analysis, however, is too broad to tell us what might be done to solve these problems. This will require a further, more intensive study of the identified target areas by state or regional planners.

An additional purpose of this project has been to test the feasibility of analyzing crime, socio-economic, and demographic data in order to bring this kind of information into the planning process. We hope that the method described in this report will be useful to other states and planning agencies.

II. Selecting Target Areas

For several reasons, the county is the best unit for our
analysis. There are enough counties in Minnesota (87) for a
valid statistical analysis. We have good census data on the
socio-economic conditions in each county; and, more importantly to
planning, each county contains a nearly complete criminal
justice system which is relatively independent of those in
other counties. Crime statistics are available for each
county in the annual state publication Minnesota Crime Information
(Bureau of Criminal Apprehension, St. Paul).

Our procedure is to compare counties having similar
characteristics and determine which have greater than expected
problems. The statistical technique that gives us an "expected"
level of crime (or of any other index) in each county is multi-
variate regression analysis. We treat crime as a function of the
several background socio-economic variables. Given the value
of these variables in each county, the regression analysis tells
us how much crime to expect from these factors alone. This
technique also shows how much above or below the expected value
the crime level is in any county. Arbitrarily, we have designated
those counties having a crime rate more than one standard
deviation above the expected value as target counties. This group
will usually be about 15% of the total counties. (Conversely, we
can also discover which counties have lower crime rates than
expected and, perhaps, investigate reasons for their success.)

The socio-economic variables used in this analysis were

population size, the percentage of population that are juveniles, the unemployment rate, and the average family income. (Some additional variables were also examined but discarded as being either unreliable or of no additional explanatory power.) This census data is for the year 1970 while crime data is for 1974. We do not expect, however, that this discrepancy in years will noticeably affect the results of our analysis, which is not very sensitive to small errors or changes in the variables. Also included, as potential explanatory variables, were the levels of expenditure for police, courts, and corrections in each county. This is to identify counties where a lack of expenditure may be a major source of problems.[1] Since we wish to examine patterns of crime outside the high crime urban areas, we have excluded Hennepin and Ramsey counties from the analysis.

In contrast to the usual purposes of a regression analysis, this analysis is not concerned with which of the independent variables (the socio-economic variables) best explain or predict the crime rate. Our concern is with variation in crime rate that is not explained or predicted by the independent variables, whatever they may be.

As it turns out, the independent variables together account

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[1]Financial data was compiled from unpublished computer print-outs made available from the Law Enforcement Assistance Administration (NCJISS division). This data was gathered by the Bureau of the Census. Summary financial information is in Expenditure and Employment Data for the Criminal Justice System, 1974, Government Printing Office, Washington, D.C. 20402

for about 40% of the variation in crime rate among the counties. By conventional social science standards, this is a fairly high level of "explained"variation, implying that socio-economic factors are indeed highly related to crime. But since we have not selected the independent variables in the context of any theory of crime, we cannot assert that these variables explain or cause crime. For the purposes of this analysis, the results of the regression show that the independent variables are useful and reasonable for comparing counties against one another and for helping us identify counties where other than socio-economic factors may be involved in causing crime.

Had we included additional socio-economic factors, the unexplained variation might have been further reduced. Nevertheless, the fact that 60% of the crime rate is not explained by the socio-economic variables used here indicates a strong potential for reducing crime where factors unrelated to the socio-economic variables are involved. Our method does not give a flawless decision rule for selecting target counties, but it does give a much improved chance over what one would obtain through a random selection of counties.

A regression analysis was carried out for several criminal justice system indicators (the dependent variables), including the crime rate for all types of crimes together; the crime rate for Part I crimes only (the crimes of homicide, rape, robbery, aggravated assault, burglary and theft); the expenditure on police services, and the number of adult arrests. For target area

selection, the primary interest here is on the crime rate variables.
The analysis of the other two dependent variables is meant to
provide information on whether the target counties have problems
directly related to arrest rates or police expenditure. We next
present a list of target counties for each of these system
indicators. Technical details of the regression analysis are
reported in the Appendix.

III. Crime Rate Target Counties

Counties having substantially more than the expected crime rates, given the socio-economic level of the county, are (alphabetically):

Brown
Cass
Chisago
Kandiyohi
Otter Tail
Pennington
Pipestone
Scott
Washington
Wilkin

The counties of Chisago, Otter Tail and Washington are exceptionally above the expected level (more than two standard deviations).

Counties with crime levels substantially below that expected are:

Benton
Carver
Chippewa
Cottonwood
Isanti
Kanabec
Murray
Renville
Rice
Rock
Sherburne
Sibley
Stearns
Todd
Waseca
Watonwan

## IV. Part I or "Serious" Crime Rate Target Counties

These counties have Part I crime rates much _above_ the expected levels:

Aitkin
Blue Earth
Cass
Chisago
Cook
Crow Wing
Koochiching
Pennington
Polk
Wilkin
Winona

The counties of Cass, Cook, Crow Wing, Pennington and Wilkin were exceptionally high.

Much _lower_ than expected Part I rates occur in:

Chippewa
Clearwater
Kanabec
Marshall
Murray
Renville
Rice
Sherburne
Steele
Todd

## V. Adult Arrests Target Counties

One indication of the success of local law enforcement is the number of arrests in relation to the number of crimes reported and the socio-economic factors. Where the number of arrests is relatively low, there may be problems in the delivery of police services of unusual difficulties in the solution of many crimes, as when the perpetrators might be often from other jurisdictions. Counties with substantially <u>fewer</u> than expected adult arrests, given the socio-economic levels and the crime rate, are:

> Brown
> Cass
> Chisago
> Goodhue
> Pine
> Pipestone
> Redwood
> Rice
> St. Louis
> Stearns
> Todd
> Washington
> Winona

Rice, Stearns, and Washington are especially low.

## VI. Police Expenditure Target Counties

Spending much less than expected are:

Clearwater
Dakota
Isanti
Mille Lacs
Washington

Also below average, but not as much, are:

Chippewa
Crow Wing
Nicollet
Otter Tail
Scott

VII.  Summary of Findings

The counties that ranked unexpectedly high on either total
or Part I crime rates are shown in Figure 1, a map of Minnesota
which also depicts the Crime Commission's regions.  Any conclusions
one might draw from these results should be tempered with the
fact that all crime data is subject to yearly fluctuation and to
reporting errors or incompleteness.  Nevertheless, we can make
some general observations.  First, several counties appear on
more than one list of target counties and also show problems of ex-
ceptional degree on at least one of the lists.  These include
Chisago, Washington, Pennington, Cass and Wilkin counties.  Close
to these rank Otter Tail, Crow Wing and Cook.  Note that several
of these counties adjoin one another:  Chisago and Washington,
Cass and Crow Wing, Wilkin and Otter Tail.  Moreover, these last
two clusters of counties form a nearly single, contiguous region
in west-central Minnesota.  It may well be that this large region
has a common origin to its crime problems.  The same may be true
of the Chisago - Washington area.

We cannot determine from this kind of analysis exactly what
the cause of these relatively high crime rates is, nor what should
be done about them.  These questions can only be answered through
a more intensive analysis of the nature of crime in the affected
region.  Such an analysis should also weigh the trend in crime
rate over recent years in the target counties.

Looking at the counties that are unexpectedly high in either
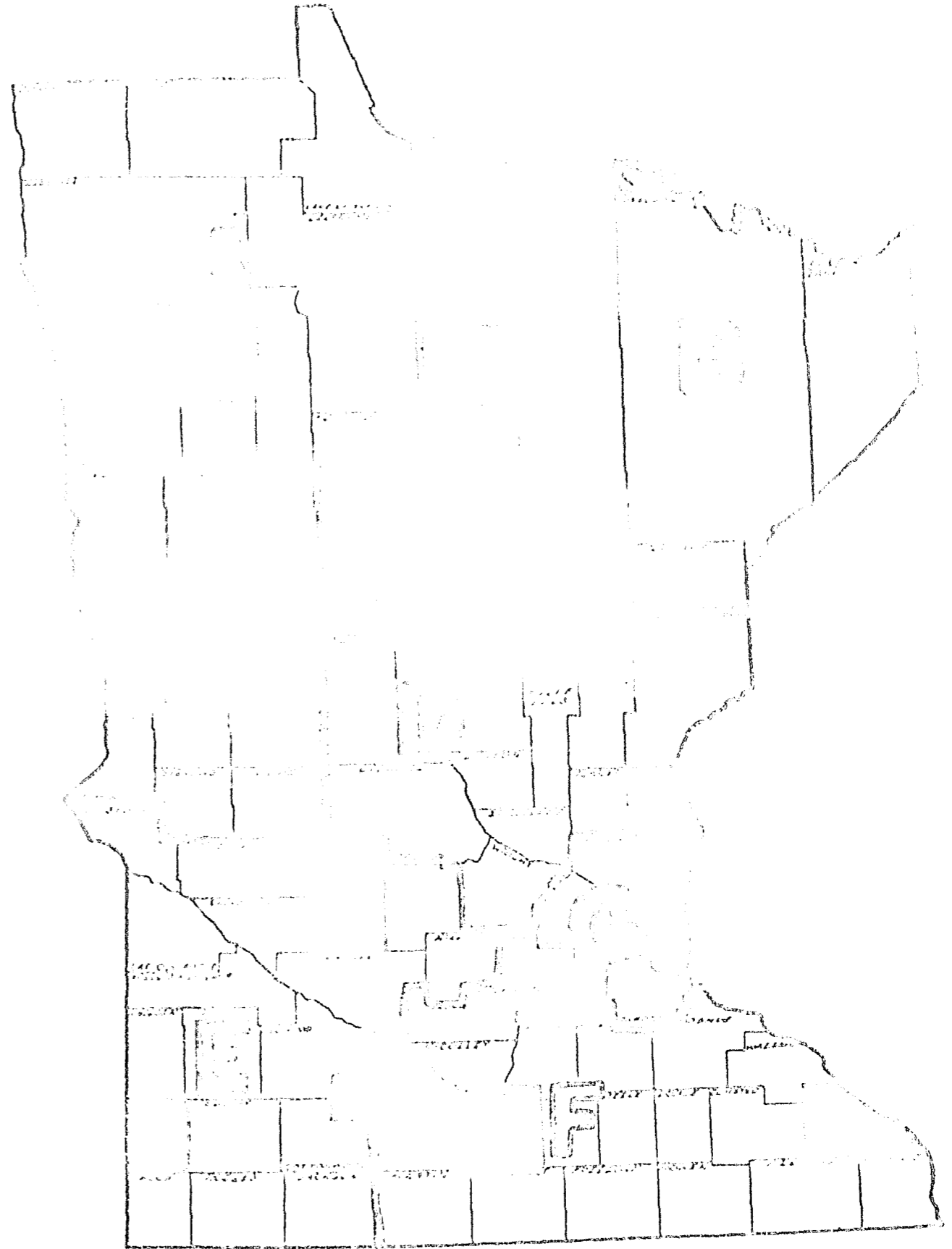Part I or total crime rates (Figure 1), we find that all regions

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Figure 1. Counties with higher than expected crime rates.

of the state are represented.  By Crime Commission regions we have

this distribution:

Region A    -   Pennington, Polk
Region B    -   Aitkin, Cook, Koochiching
Region C    -   Otter Tail, Wilkin
Region D    -   Cass, Chisago, Crow Wing
Region E    -   Kandiyohi, Pipestone
Region F/9  -   Blue Earth, Brown
Region F/10 -   Winona
Region G    -   Scott, Washington

Note, however, that some of the contiguous target counties lie

in different regions.  This points to a need for interregional planning

where a common crime problem is indeed found.

Several of these relatively high  crime counties also

appear on target lists for low arrests and low police expenditure.

This suggests that an unexpectedly high crime rate may be

partially due to an inadequate number of arrests or the result

of too low a level of expenditure on police services.  The

regression analysis also indicates (by the negative values

of the coefficients - B, in the Appendix) that crime rate

may be slightly higher in a county with low police or court

expenditure, other factors equal.  The significance level

of this finding does not, however, permit us to make any strong

conclusion about whether increased criminal justice expenditures

will necessarily reduce crime.

VIII.  Conclusion

        This analysis has concentrated on crime rate in the identification

of target counties because of the availability of fairly good data

on crime in Minnesota.  In future analyses this method of target

selection shall be expanded to locate specific problem areas in

county-level criminal justice systems.  For example, to identify

a problem in the court subsystem, one might study the number of

court dispositions or the conviction rate in relation to other

system variables such as the arrest rate and the expenditure on

court services.  Even without further research, however, we

believe that this project has identified areas of Minnesota well

suited to target area criminal justice planning.

## Regression equations (linear)

A) For the dependent variable: crime rate per 1000 population

| Independent Variable | Coefficient B/error | $R^2$ | Simple Correlation | Significance Level |
|---|---|---|---|---|
| Population | 0.000615/.000332 | .18 | .42 | .069 |
| % Juvenile | -.849/2.68 | 0 | -.10 | .753 |
| % Unemployed | .961/.836 | 0 | -.11 | .255 |
| Av. Income | 0.00798/.00241 | .15 | .53 | .002 |
| Corrections $ * | -.0152/.0392 | .01 | .22 | .698 |
| Courts $ * | -.0373/.0285 | .02 | .32 | .196 |
| Police $ * | -.00591/.0171 | 0 | .39 | .688 |
| Constant | -29.3/52.5 | | | .578 |

Standard deviation = 23.1; total explained variance $R^2$ = 36%. n=83 counties.

B) For the dependent variable: Part I crime rate per 1000 population

| Independent Variable | Coefficient B/error | $R^2$ | Simple Correlation | Significance Level |
|---|---|---|---|---|
| Population | 0.000340/.000147 | .23 | .48 | .024 |
| % Juvenile | -1.72/1.19 | .01 | -.17 | .154 |
| % Unemployed | 1.18/0.37 | .05 | .10 | .002 |
| Av. Income | 0.00298/.00107 | .08 | .42 | .007 |
| Corrections $ * | 0.00124/.0174 | 0 | .32 | .943 |
| Court $ * | -0.0217/.0126 | .03 | .37 | .090 |
| Police $ * | -0.00370/.00759 | 0 | .47 | .628 |
| Constant | 11.6/23.2 | | | .621 |

Standard deviation = 10.2; total $R^2$ = 40%; n=83.

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* Expenditures are in 1000 dollars and exclude capital outlays.