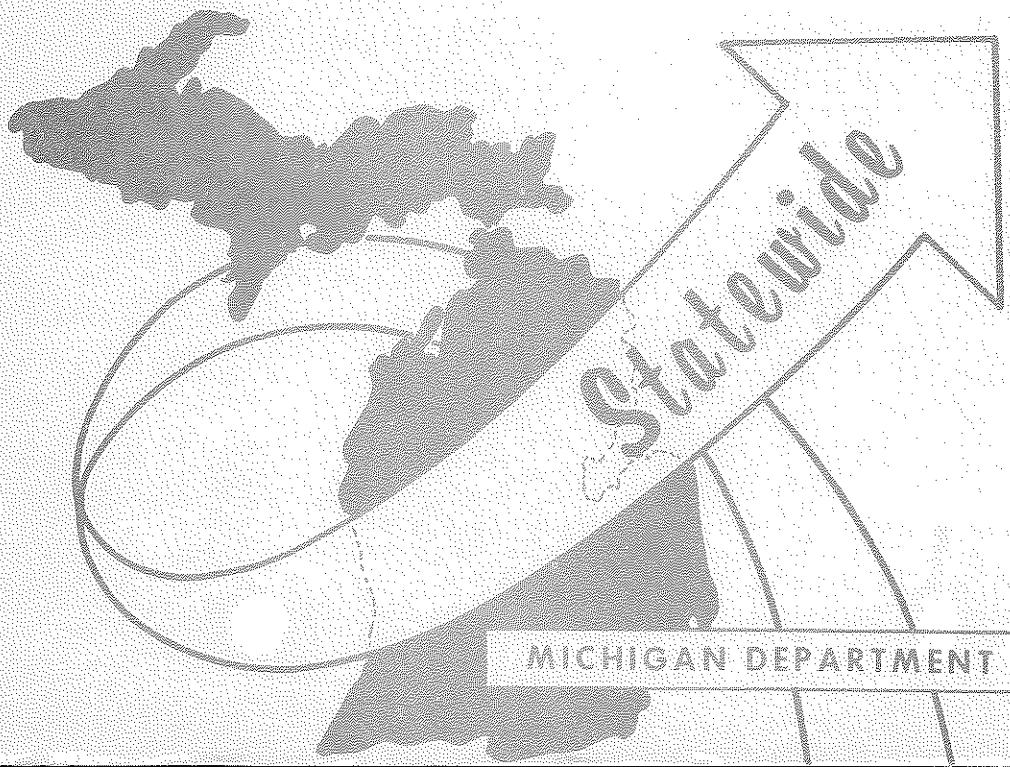
Statewide Transportation Analysis & Research

STATEWIDE TRANSPORTATION MODEL
MULTIPLE APPLICATIONS:

COMMUNITY COLLEGE
SERVICE-AREA ANALYSIS
Report no. 1
PART A



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STATEWIDE TRANSPORTATION MODEL MULTIPLE APPLICATIONS:

COMMUNITY COLLEGE SERVICE-AREA ANALYSIS

Report no. 1

PART A

With the Participation of:
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

STATE OF MICHIGAN

WILLIAM G. MILLIKEN, GOVERNOR

DEPARTMENT OF STATE HIGHWAYS

STATE HIGHWAYS BUILDING -- POST OFFICE DRAWER K -- LANSING, MICHIGAN 48904

JOHN P. WOODFORD, STATE HIGHWAY DIRECTOR

October 18, 1973

Mr. Sam F. Cryderman
Deputy Director
Bureau of Transportation Planning

Dear Mr. Cryderman:

The following report was completed in conjunction with inquiries from Mr. David Bland, Coordinator of Community College Affairs, Department of Education. The decision was reached that elements of the Statewide Transportation Modeling System could supply some valuable information for use in evaluating proposed community college districts. While initially completed to fulfill this request, the report also demonstrates the reversibility of the Statewide Modeling System by looking at the information from a highway planning perspective. The following pages were completed using a 1965 highway network as a basis, however, the impact of proposed highways on educational facilities could easily have been undertaken.

This report was completed by Mr. Alan R. Friend of the Statewide Studies Unit under the supervision of Mr. Richard E. Esch.

Sincerely,

Keith E. Bushnell
Engineer of Transportation
Survey and Analysis Section

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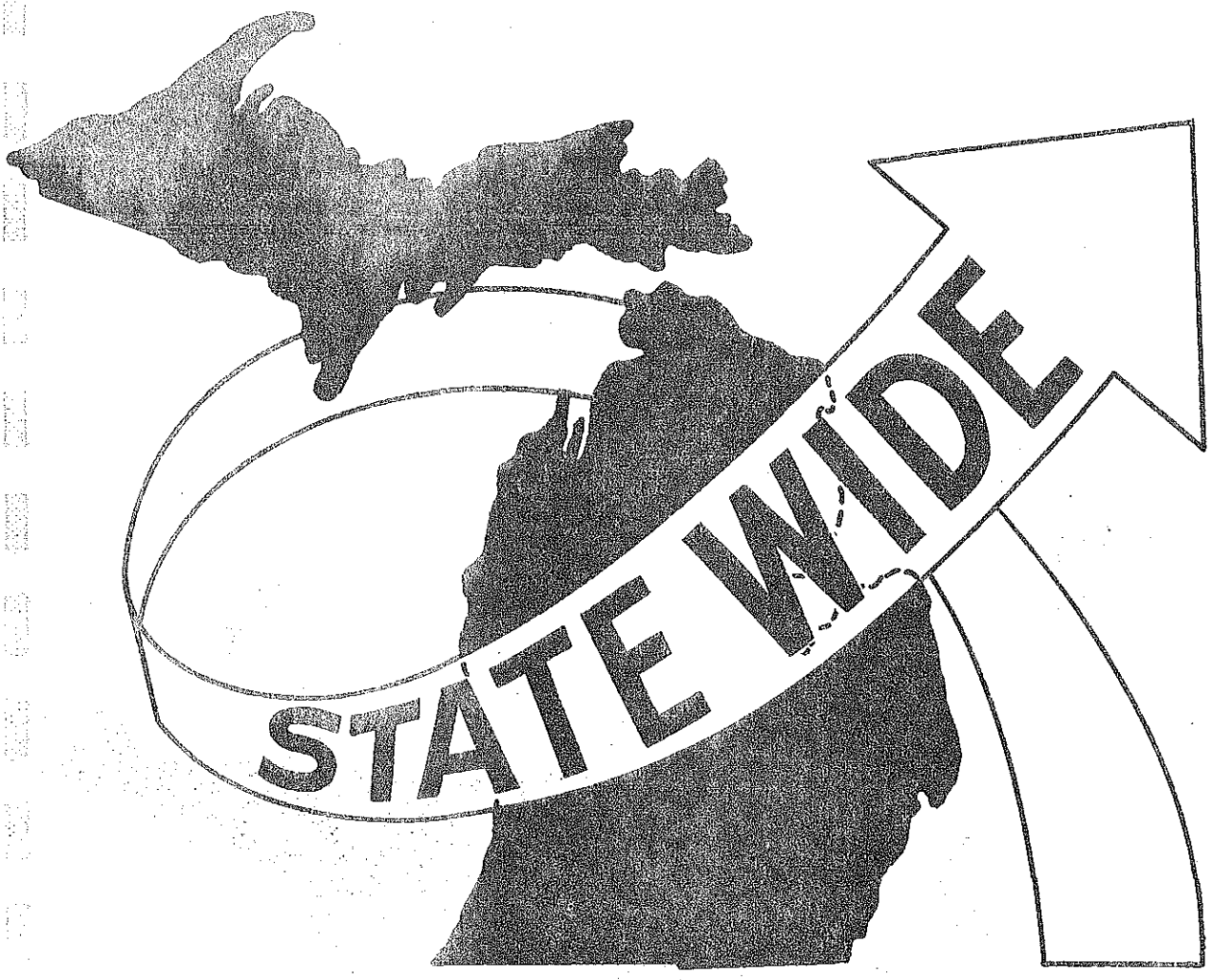
COMMUNITY COLLEGE SERVICE AREA ANALYSIS

BY

ALAN R. FRIEND

PREFACE



PREFACE

This report documents another diverse application of Michigan's Statewide Transportation Modeling System. While the following pages are directly applicable to highway planning, a variety of people outside the highway department have been excited over the unique information which they have been able to obtain to allow them to make more effective decisions concerning many of the planning tasks confronting them. A list of these applications may be seen in Figure 1.

The following report was compiled in response to inquires by the Department of Education. The report was completed with the cooperation of Mr. David Bland, Coordinator of Community College Affairs, Department of Education. No attempt is made to make any specific recommendations regarding Community College district boundaries. The purpose of the report is three-fold:

1. To provide basic information to the Department of Education which may assist their evaluation of proposed Statewide Community College Districts.

2. To illustrate the kinds of information which the Statewide Transportation Modeling System is capable of producing for use in the planning of educational institutions.

3. To illustrate the use of educational institutions in conjunction with the Statewide Modeling System as a tool in highway planning.

FIGURE 1

INTER-DEPARTMENTAL TEST PROJECTS

DEPARTMENT OF NATURAL RESOURCES

- STATE PARK PLANNING
- RIFLE RANGE

AERONAUTICS

- AIRPORT PLANNING

DEPARTMENT OF COMMERCE

- INDUSTRIAL SITE ANALYSIS
- RECREATION INDUSTRY ANALYSIS

DEPARTMENT OF STATE

- REGIONAL OFFICE PLANNING

DEPARTMENT OF PUBLIC HEALTH

- HOSPITAL PLANNING
- ACCIDENT LOCATION ANALYSIS

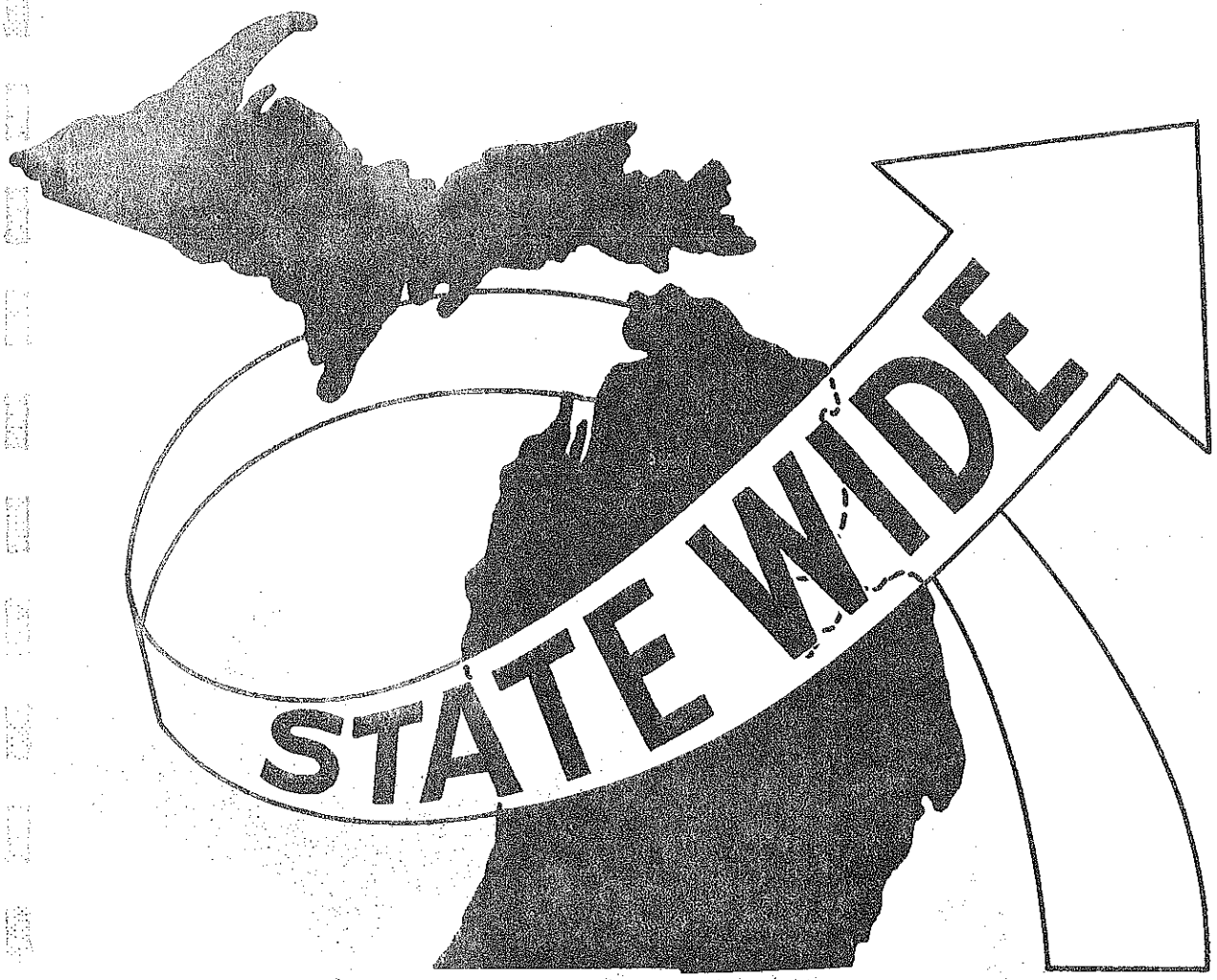
DEPARTMENT OF TREASURY

- DATA COLLECTION CENTER ANALYSIS

EXECUTIVE OFFICE

- LEGISLATIVE PLANNING - AMBULANCE SERVICE

INTRODUCTION



INTRODUCTION

One of the tasks presently facing the Department of Education is to investigate a statewide system of community college districts.

To assist in this task information is desirable concerning:

1. Location of community colleges.
2. Socio-economic characteristics of the population.
3. The transportation system which connects the people with the community colleges.

This brings us to Michigan's Statewide Transportation Modeling System.

This system, which was originally designed for use in forecasting future traffic volumes, has been found to fulfill far more functions than had originally been conceived. The Statewide Model divides Michigan into 508 sub-areas or zones (see Figure 2). All information about these zones is associated with a point centrally located (approximate population center) within each area. The movement of traffic takes place on the highway network shown in Figure 3. The movement from zone to zone begins and ends at these centrally located points called centroids. The travel time between zones is determined from average speeds based upon MDSHT speed studies. It should be emphasized that these are not speed limits but effective speeds for all vehicles. To account for trips beginning and ending within the same zone a small intra-zonal driving time is included for each zone. Figure 4 represents a portion of the network in the Muskegon Area.

FIGURE 2

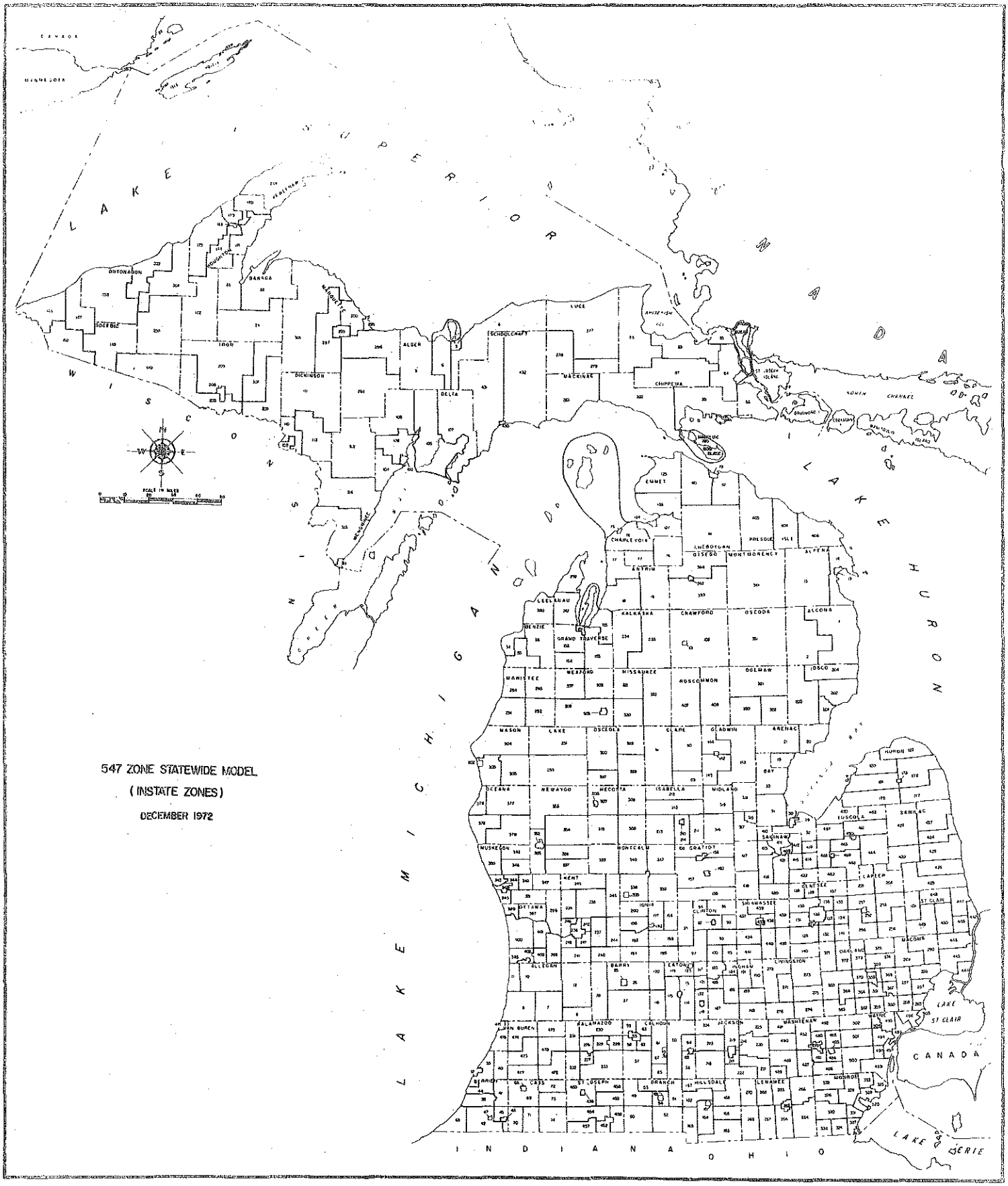
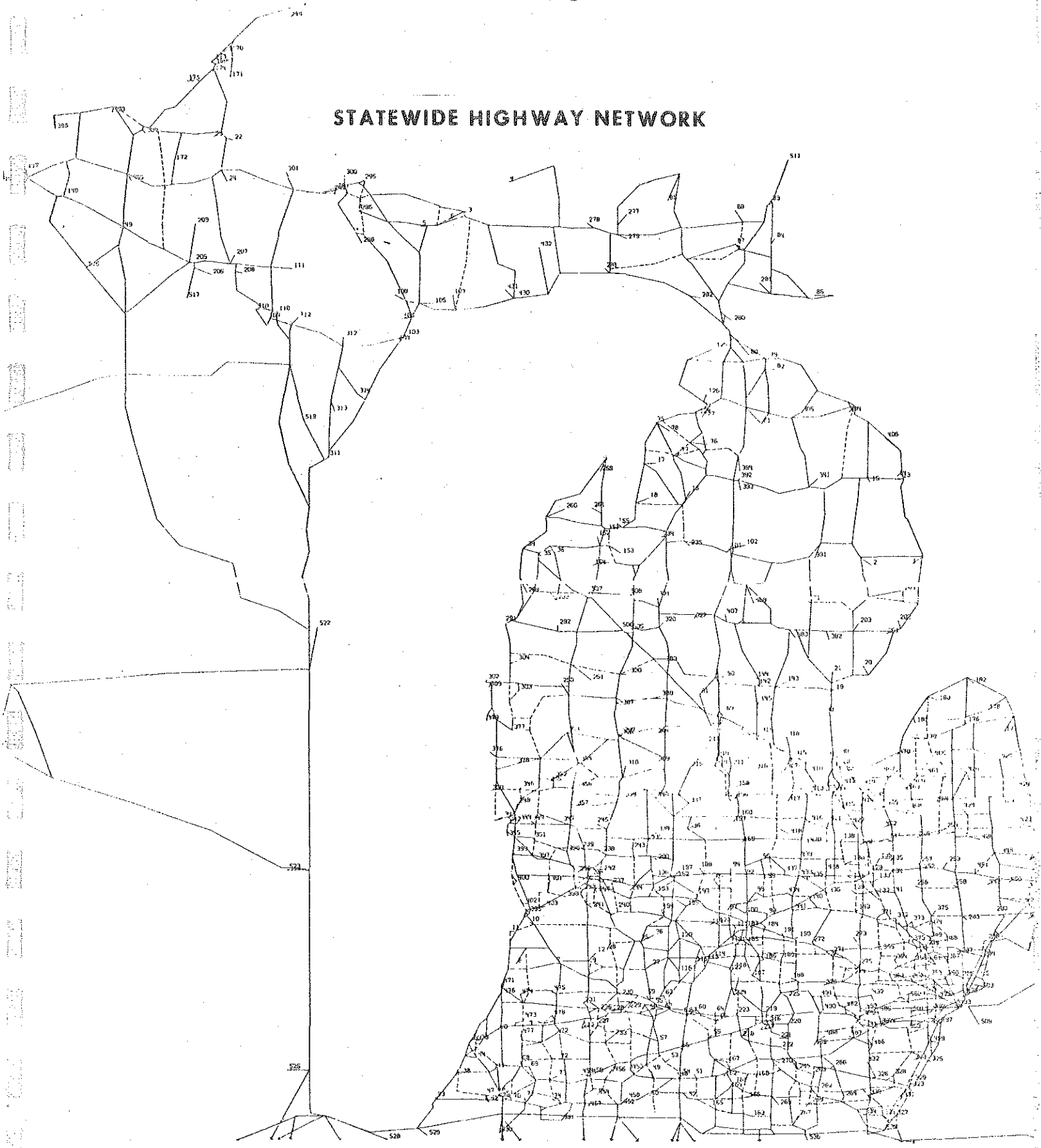

547 ZONE STATEWIDE MODEL
(INSTATE ZONES)
DECEMBER 1972
LAKE SUPERIOR
LAKE MICHIGAN
LAKE HURON
LAKE ST CLAIR
LAKE ERIE
CANADA
WISCONSIN
INDIANA
OHIO

FIGURE 3

STATEWIDE HIGHWAY NETWORK



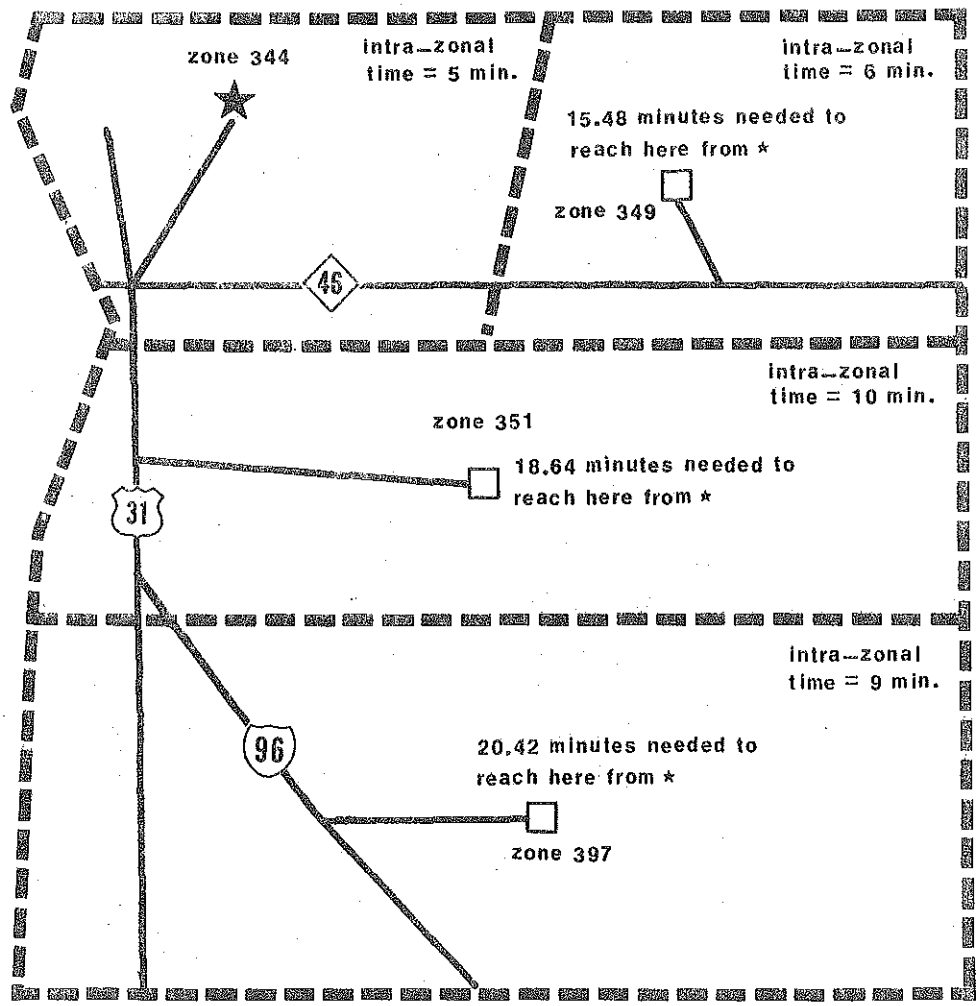
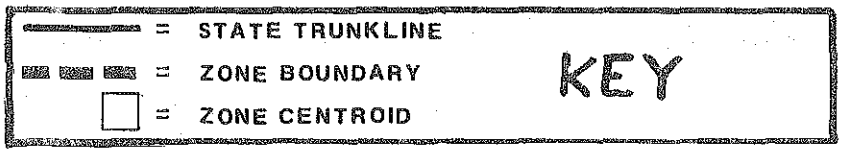


FIGURE 4—PORTION OF NETWORK



The Statewide Transportation Modeling System also contains a public and private facility file. A list of subfiles available is provided in Figure 5. Notice that community colleges are among this list. Each facility is located by associating it with one of the 508 zones in Figure 2.

Another major file in the system is a statewide socio-economic file. Figure 6 illustrates the types of information available. Again

FIGURE 5

STATEWIDE FACILITY FILE

HISTORIC SITES
HOSPITALS
AIRPORTS
WHOLESALE TRADE CENTERS
MAJOR PARKS
NON-PUBLIC COLLEGES
PUBLIC COMMUNITY COLLEGES
CITIES OVER 30,000 POPULATION
UNEMPLOYMENT OFFICES
MENTAL HEALTH CENTERS
CERTIFIED INDUSTRIAL PARKS
MICHIGAN'S UNIVERSITIES
SKI AREAS
SNOWMOBILE TRAILS
CBD w/5,000 POPULATION
TRUCK TERMINALS
STATE POLICE POSTS
DAILY NEWSPAPERS
WEEKLY NEWSPAPERS
SEWAGE TREATMENT FACILITIES
TOURIST ATTRACTIONS
BUS TERMINALS
MANUFACTURERS
CAMPSITES

FIGURE 6

STATEWIDE SOCIO-ECONOMIC DATA FILE *

GENERAL CHARACTERISTICS OF POPULATION

SCHOOL ENROLLMENT BY TYPE OF SCHOOL
YEARS OF SCHOOL COMPLETED
CITIZENSHIP BY AGE

INCOME CHARACTERISTICS OF POPULATION

FAMILY INCOME
INCOME BY OCCUPATION AND SEX
RATIO OF FAMILY INCOME TO POVERTY LEVEL

LABOR FORCE CHARACTERISTICS OF POPULATION

EMPLOYMENT BY AGE
EMPLOYMENT BY OCCUPATION AND SEX
EMPLOYMENT BY INDUSTRY AND SEX

SOCIAL CHARACTERISTICS OF POPULATION

AGE BY SEX
TYPE OF FAMILY
MARITAL STATUS

AREA CHARACTERISTICS

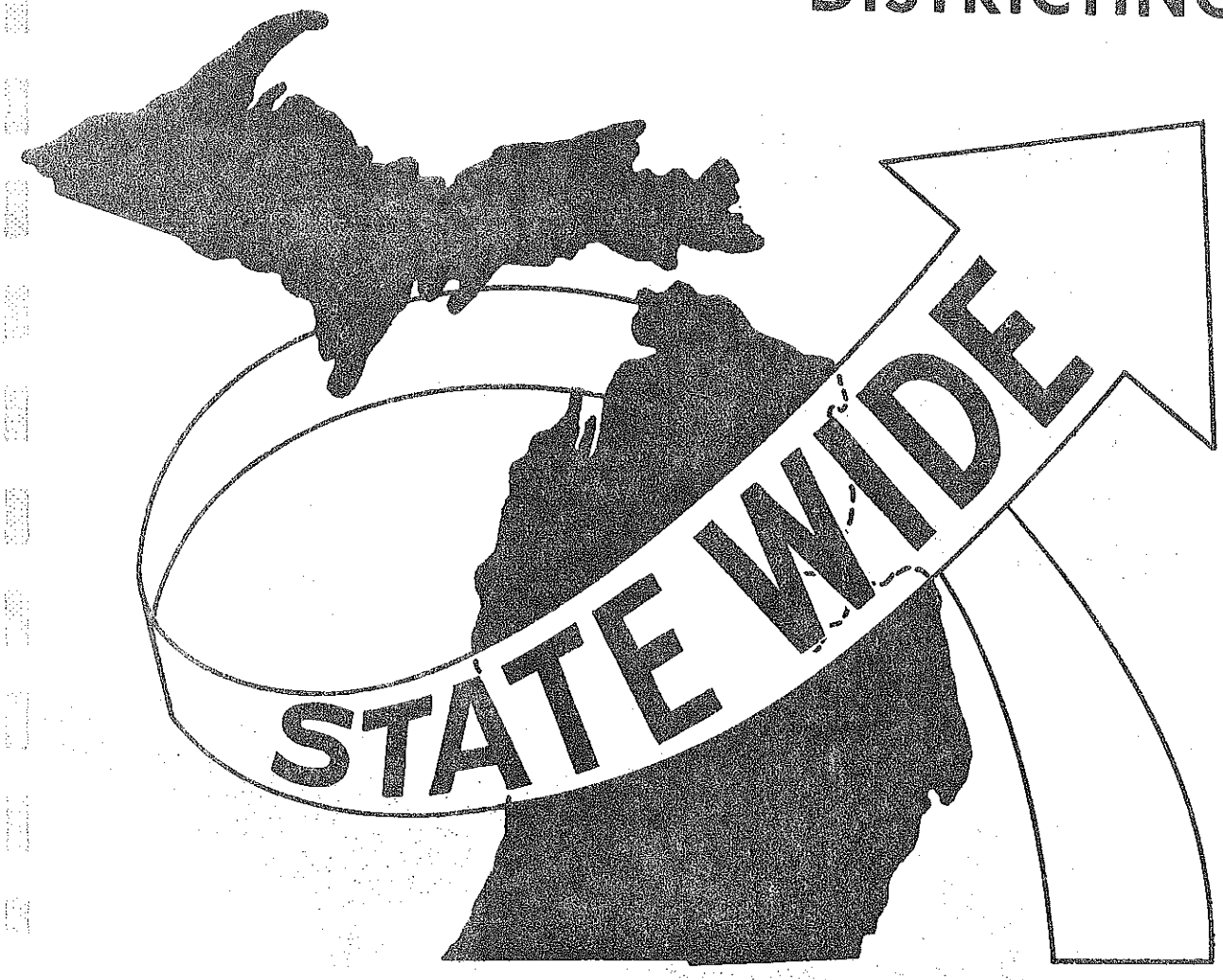
LAKE FRONTAGE
ASSESSED VALUATION
WATER AREA

*THOSE ITEMS LISTED HERE ARE SAMPLES TAKEN FROM THE COMPLETE FILE WHICH CONTAINS OVER 700 ITEMS.

this information is provided on a zone basis.

Thus, Michigan's Transportation Modeling System seems to be able to supply basic data to assist in the planning of community college facilities or service areas. The next section contains the results of applying these three basic files (Statewide Highway Network, Statewide Socio-Economic Data File Statewide Public and Private Facility File) to the planning of community college districts.

INFORMATION FOR COMMUNITY COLLEGE DISTRICTING



INFORMATION FOR COMMUNITY COLLEGE DISTRICTING

Four basic kinds of data were selected from the socio-economic file. They are:

1. Labor Force
2. Employment by Industry
3. Family Income
4. Education Completed

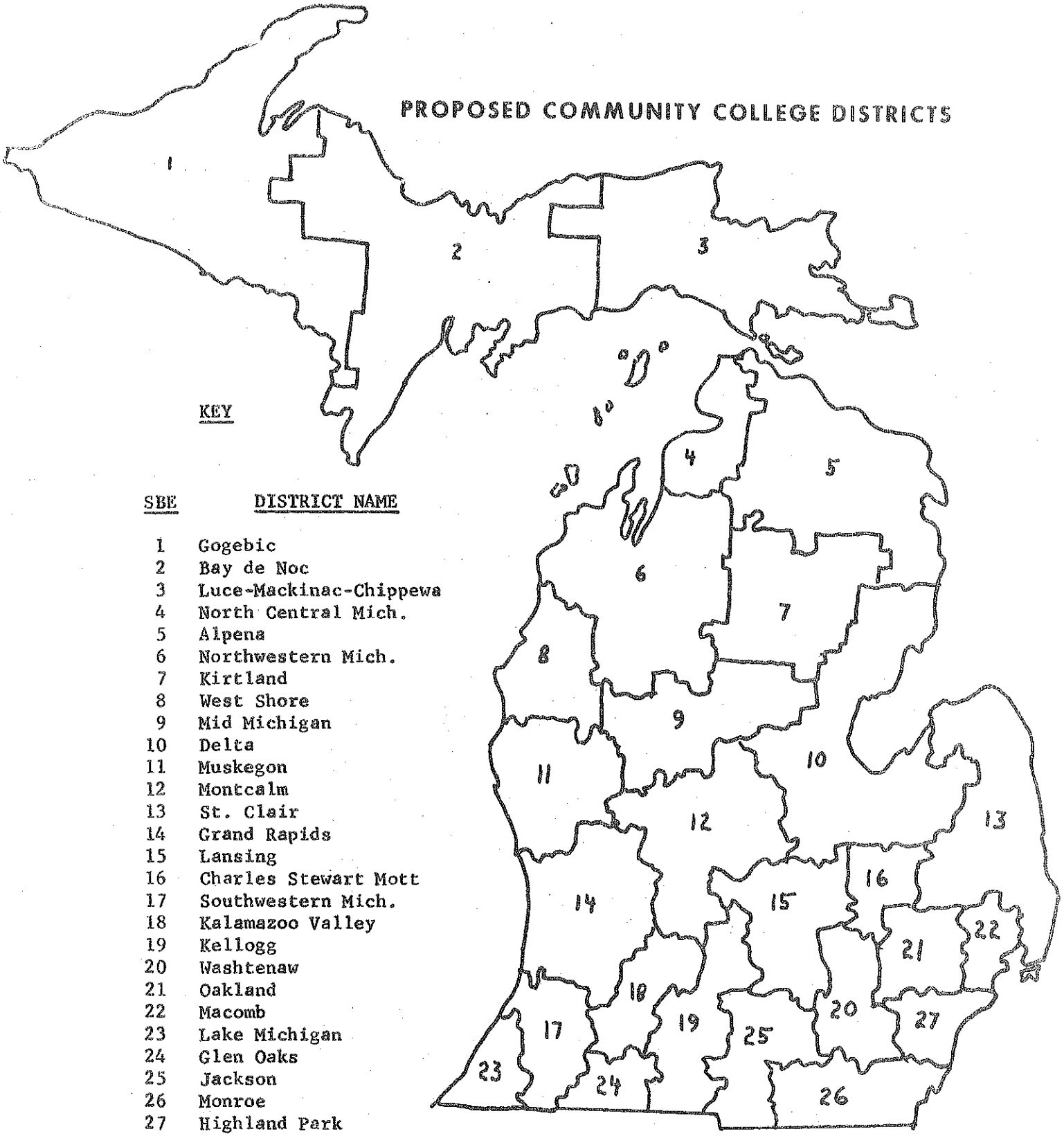
This data is available at the zone level (Figure 2) or at a district level. The State Board of Education has proposed that statewide community colleges be setup as shown in Figure 7. The Michigan Community College Association has proposed the plan seen in Figure 8. The 29 community colleges involved are listed in Figure 9.

A sample for the zone level data on income is shown in Figure 10. Each column represents different income groups. These income groups from left to right are:

1. Under $ 5,000
2. $ 5,000- 7,999
3. $ 8,000- 9,999
4. $10,000- 11,999
5. $12,000- 14,999
6. $15,000- 24,999
7. Over $25,000

FIGURE 7

PROPOSED COMMUNITY COLLEGE DISTRICTS

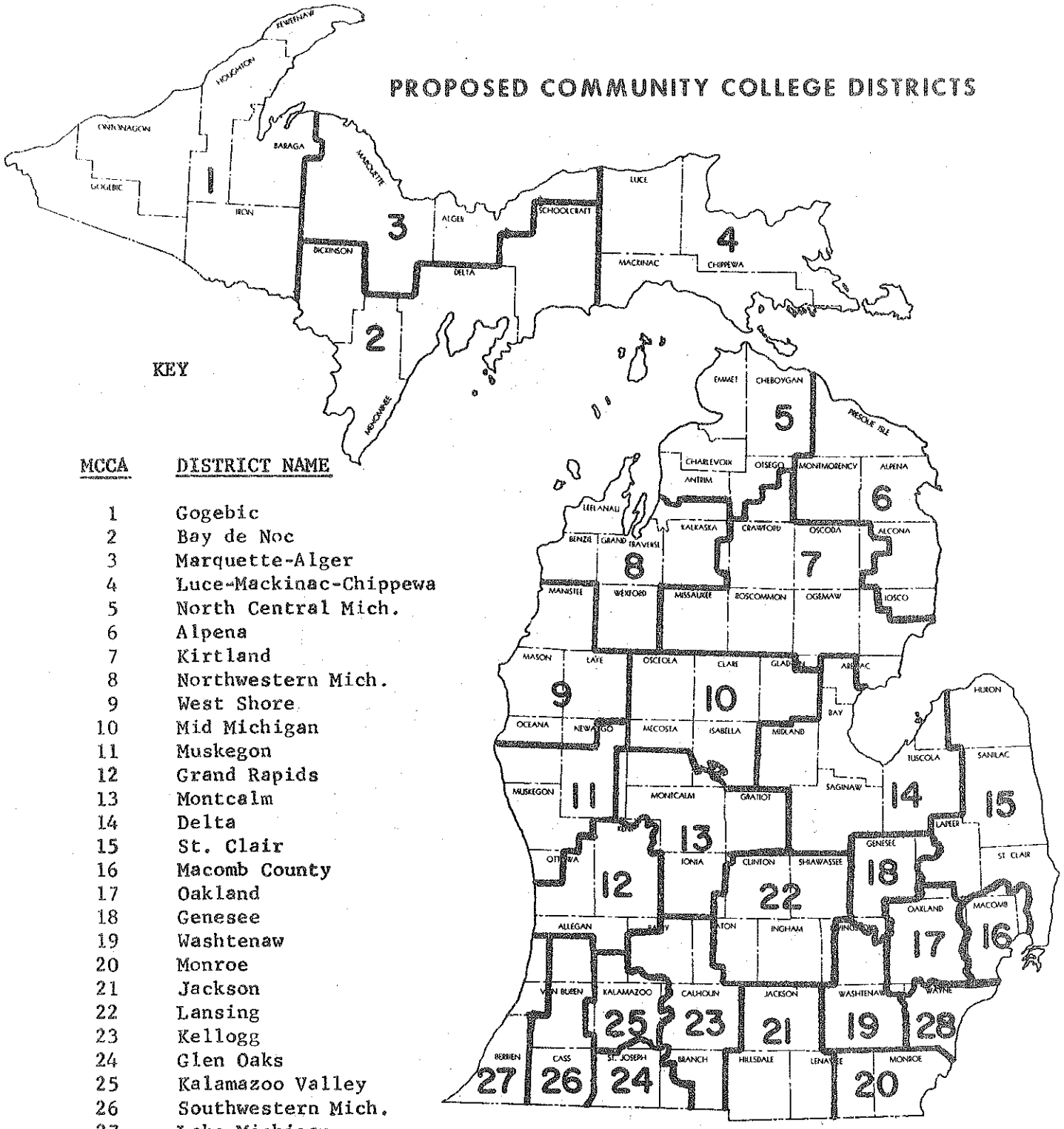


KEY

SBE	DISTRICT NAME
1	Gogebic
2	Bay de Noc
3	Luce-Mackinac-Chippewa
4	North Central Mich.
5	Alpena
6	Northwestern Mich.
7	Kirtland
8	West Shore
9	Mid Michigan
10	Delta
11	Muskegon
12	Montcalm
13	St. Clair
14	Grand Rapids
15	Lansing
16	Charles Stewart Mott
17	Southwestern Mich.
18	Kalamazoo Valley
19	Kellogg
20	Washtenaw
21	Oakland
22	Macomb
23	Lake Michigan
24	Glen Oaks
25	Jackson
26	Monroe
27	Highland Park Henry Ford Schoolcraft Wayne County

FIGURE 8

PROPOSED COMMUNITY COLLEGE DISTRICTS



MCCA	DISTRICT NAME
1	Gogebic
2	Bay de Noc
3	Marquette-Alger
4	Luce-Mackinac-Chippewa
5	North Central Mich.
6	Alpena
7	Kirtland
8	Northwestern Mich.
9	West Shore
10	Mid Michigan
11	Muskegon
12	Grand Rapids
13	Montcalm
14	Delta
15	St. Clair
16	Macomb County
17	Oakland
18	Genesee
19	Washtenaw
20	Monroe
21	Jackson
22	Lansing
23	Kellogg
24	Glen Oaks
25	Kalamazoo Valley
26	Southwestern Mich.
27	Lake Michigan
28	Highland Park Henry Ford Schoolcraft Wayne County

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ZONE	FALL '70 ENROLLMENT	X	Y	COLLEGE	
013	927	22743	18617	ALPENA COMMUNITY COL	(1)
032	6004	21738	14813	DELTA COL	(2)
039	2533	17230	11240	LAKE MICHIGAN COL	(3)
055	3203	19490	11830	KELLOGG COMMUNITY COL	(4)
069	941	17805	10920	SOUTHWESTERN MICH COMM COL	(5)
090	610	20270	16010	MID MICHIGAN COMMUNITY COL	(6)
103	904	16230	20383	BAY DE NOC COMMUNITY COL	(7)
124	734	20050	19430	NORTH CENTRAL MICHIGAN COL	(8)
128	8659	22257	13465	GENESEE COMMUNITY COL	(9)
146	645	10940	22460	GOGEBIC COMMUNITY COL	(10)
151	1712	18895	17925	NORTHWESTERN MICHIGAN COL	(11)
183	7230	20680	12800	LANSING COMMUNITY COL	(12)
217	3635	20930	11360	JACKSON COMMUNITY COL	(13)
232	2996	18570	11570	KALAMAZOO VALLEY COMM COL	(14)
236	5417	18630	13390	GRAND RAPIDS JUNIOR COL	(15)
286	34422	23598	12196	MACOMB CO COMMUNITY COL	(16)
303	550	17590	15935	WEST SHORE COMMUNITY COL	(17)
329	1691	22690	10750	MONROE CO COMMUNITY COL	(18)
338	686	19620	14095	MONTCALM CO COMMUNITY COL	(19)
344	3856	17680	14160	MUSKEGON COMMUNITY COL	(20)
361	30143	23070	12430	OAKLAND COMMUNITY COL	(21)
408	515	20690	17190	KIRTLAND COMMUNITY COL	(22)
442	2842	24580	13380	ST CLAIR CO COMMUNITY COL	(23)
453	861	18850	10770	GLEN OAKS COMMUNITY COL	(24)
480	4009	22290	11600	WASHTENAW COMMUNITY COL	(25)
493	3558	23350	11920	HIGHLAND PARK COL	(26)
493	12500	23394	11820	WAYNE CO COMMUNITY COL	(27)
494	11241	23080	11740	HENRY FORD COMMUNITY COL	(28)
502	5296	22720	12015	SCHOOLCRAFT COL	(29)

FIGURE 9

COMMUNITY COLLEGES

FIGURE 10

PERCENT OF FAMILIES IN VARIOUS INCOME GROUPS

BY ZONE

18.9	21.6	19.1	13.0	14.0	11.7	0.3	164
24.5	22.6	15.6	13.0	12.2	11.5	0.5	165
24.6	19.1	14.7	17.1	16.4	6.7	1.5	166
24.4	23.5	16.0	16.5	8.9	9.5	1.2	167
19.7	21.3	15.9	10.9	11.3	10.2	2.7	168
30.0	27.4	12.8	9.5	8.4	9.0	2.9	169
44.5	25.5	12.9	7.8	4.1	4.8	0.4	170
47.3	23.0	12.2	6.7	7.7	3.0	0.0	171
32.9	25.7	14.4	13.4	3.4	10.3	0.0	172
52.5	26.2	11.1	2.7	2.2	5.3	0.0	173
30.1	24.5	13.3	8.5	8.0	12.0	3.6	174
35.0	32.1	12.8	9.3	6.8	3.9	0.0	175
20.9	15.9	15.0	12.2	20.4	11.2	4.3	176
30.6	23.1	13.5	12.3	11.8	7.9	0.9	177
28.6	25.3	13.3	8.6	9.1	12.8	2.3	178
27.1	25.6	12.2	11.9	13.0	8.8	1.4	179
24.7	24.1	13.3	9.1	14.0	12.8	2.0	180
29.5	19.7	17.3	10.5	8.2	11.6	3.2	181
42.5	20.8	13.5	11.5	5.9	3.3	2.4	182
14.6	14.2	14.2	13.6	16.9	21.2	5.3	183
8.5	10.0	8.8	11.8	16.3	31.5	13.1	184
9.8	13.1	16.4	17.9	18.1	20.5	4.0	185
10.0	13.5	16.1	16.2	18.2	21.3	4.7	186
17.8	16.3	15.8	14.3	16.0	15.8	3.5	187
20.2	15.5	16.2	14.7	14.4	15.8	3.2	188
21.5	17.0	12.0	15.9	18.0	12.2	3.3	189
13.3	20.3	15.1	10.8	15.5	19.0	6.0	190
12.7	8.5	12.4	18.4	18.1	27.0	2.8	191
12.9	17.8	19.4	13.4	16.3	17.2	3.0	192
18.7	19.2	20.2	13.3	13.8	12.7	2.1	193
24.5	16.5	19.4	14.1	12.5	8.4	2.5	194
13.2	17.8	19.3	11.5	19.1	19.1	0.0	195
16.7	20.2	20.7	13.6	17.1	8.2	3.1	196

The zone number occurs in the right most column. For example, in zone 183 (Lansing and East Lansing) 14.6% of the families have an annual income under $5,000. The complete list for all zones in the state is available under separate cover in Part B of this report.

Figure 11 shows this same information summarized to the State Board of Education (SBE) districts. District 16 (which Lansing lies within) has 13.5% of the families with incomes below $5,000. A sililar list exists for the MCCA districts. Again this information is contained in Part B.

To better illustrate the data contained in list form, shaded maps of the State of Michigan such as the one in Figure 12 can be produced. This Figure illustrates the income data concerning families with less than $5,000 annual income. According to key at lower left, those areas with the darkest shading have 31% to 53% of the families with incomes of less than $5,000. Areas with the lightest shading have less than 9% of the families with the $5,000 income.

Maps have been completed for seven income categories and for four categories of education-completed. These maps are a valuable tool to obtain a broad overview and to determine regional variations throughout the state. It is interesting to compare the map showing density of incomes below $5,000 (Figure 12) with the map showing those not completing high school (Figure 13). For comparing the various income levels, all seven maps were produced with the same shading scale and combined onto one page (see figure 14). An additional map showing assessed valuation was also produced (Figure 15). The entire set of maps is available in Part B.

FILE: GINPSB/ QSIWD MON 9/17/73 02:59PM

LESS $5	5-8	8-10	10-12	12-15	15-25	OVER 25	DIST.
31.1	24.9	16.1	11.7	8.4	6.4	1.4	1
22.2	24.3	15.0	13.8	10.8	9.4	1.6	2
27.7	27.9	14.4	10.4	10.6	7.8	1.2	3
22.4	23.1	15.0	12.9	12.0	11.5	3.1	4
28.2	23.0	15.3	12.4	10.3	9.7	2.1	5
23.6	23.2	15.4	12.6	11.9	11.3	2.0	6
35.2	23.8	11.6	9.5	8.6	8.8	2.3	7
24.9	23.6	16.6	13.7	10.4	8.6	2.2	8
27.5	23.4	15.4	12.0	10.6	9.4	1.6	9
15.2	15.5	15.4	15.4	16.3	18.1	4.0	10
18.4	19.6	17.1	14.8	14.4	13.0	2.7	11
19.7	21.1	16.7	14.2	13.3	12.3	2.5	12
19.9	17.6	15.6	13.8	14.6	15.2	3.1	13
13.8	16.4	16.1	15.7	16.9	16.8	4.2	14
13.6	15.5	15.1	14.8	17.1	19.0	5.0	15
13.5	14.2	14.6	14.8	17.4	20.8	4.9	16
12.4	13.8	14.8	14.4	17.6	22.8	4.3	17
8.1	8.9	10.3	12.3	17.1	30.1	13.2	18
7.7	8.6	11.3	14.3	22.0	30.9	5.3	19
17.3	16.7	15.6	14.6	16.5	15.9	3.5	20
20.8	19.6	15.5	14.1	13.5	14.1	2.4	21
18.0	19.1	15.0	14.5	15.8	14.7	2.8	22
14.7	15.5	14.4	14.5	17.2	19.9	3.6	23
15.2	16.3	16.1	15.0	16.3	17.1	4.1	24
11.4	12.8	12.2	13.2	16.9	26.1	7.5	25
13.0	14.8	15.3	15.8	17.9	19.6	3.4	26
15.0	13.0	12.8	13.6	16.9	23.5	5.3	27

FIGURE II

INCOME
BY
SBE DISTRICT

PERCENT OF FAMILIES WITH INCOMES OF

1	2	3	4	5	6	7
LESS $5,000	5,000-7,999	8,000-9,999	10,000-11,999	12,000-14,999	15,000-24,999	25,000 OVER

8

SBE DISTRICT

FIGURE 12

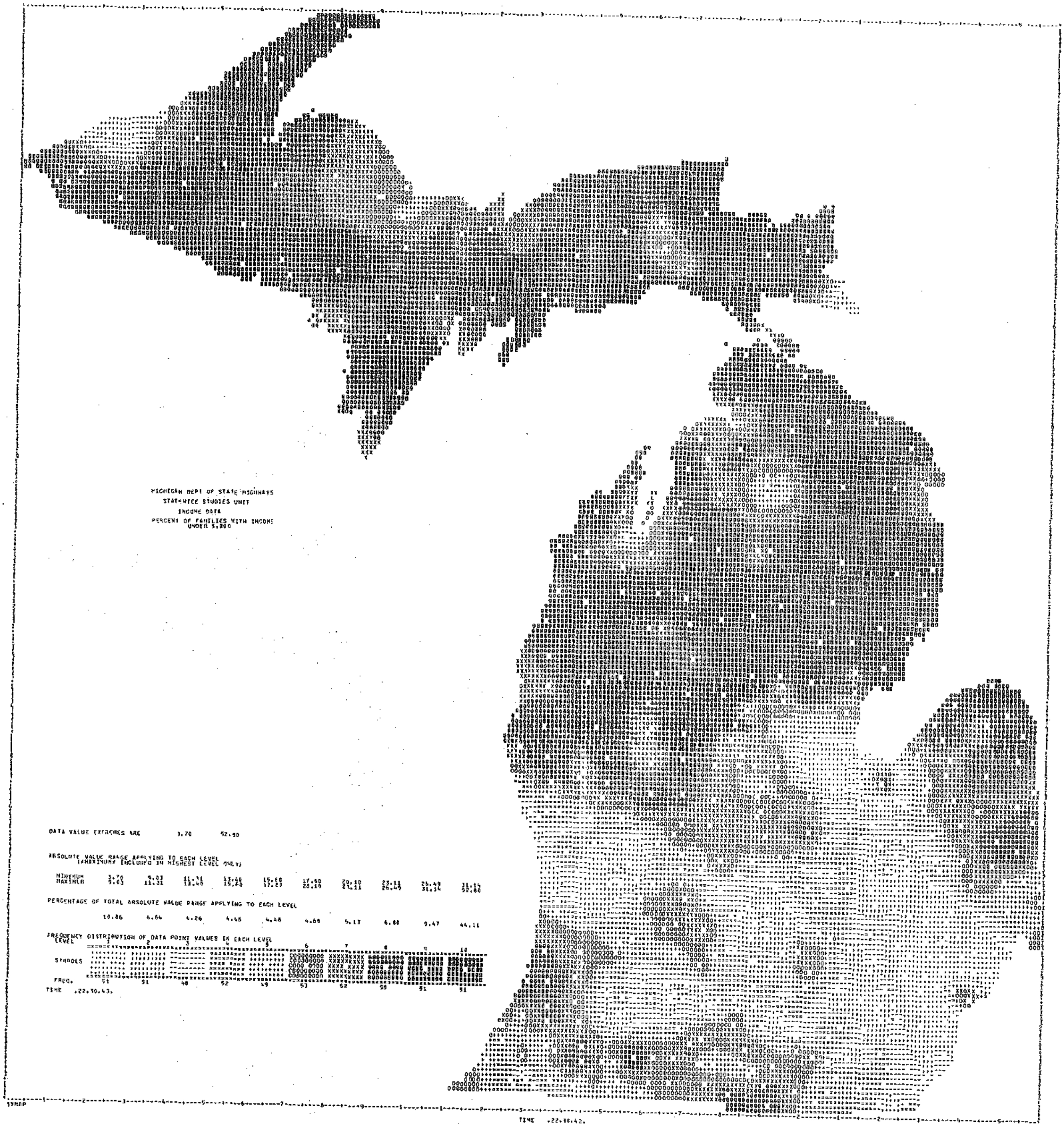

MICHIGAN DEPT OF STATE HIGHWAYS
STATEWIDE STUDIES UNIT
INCOME DATA
PERCENT OF FAMILIES WITH INCOME
UNDER 5,000
DATA VALUE EXTREMES ARE 3.70 52.90
ABSOLUTE VALUE RANGE APPLYING TO EACH LEVEL
(MAXIMUM INCLUDED IN HIGHEST LEVEL ONLY)
MINIMUM
MAXIMUM
PERCENTAGE OF TOTAL ABSOLUTE VALUE RANGE APPLYING TO EACH LEVEL
10.86 4.64 4.26 4.46 4.48 4.69 5.13 6.60 9.47 44.11
FREQUENCY DISTRIBUTION OF DATA POINT VALUES IN EACH LEVEL
LEVEL 1 2 3 4 5 6 7 8 9 10
SYMBOLS
FREQ. 51 51 48 52 49 53 52 50 51 51
TIME .22.30.43.
SYMAP

FIGURE 13

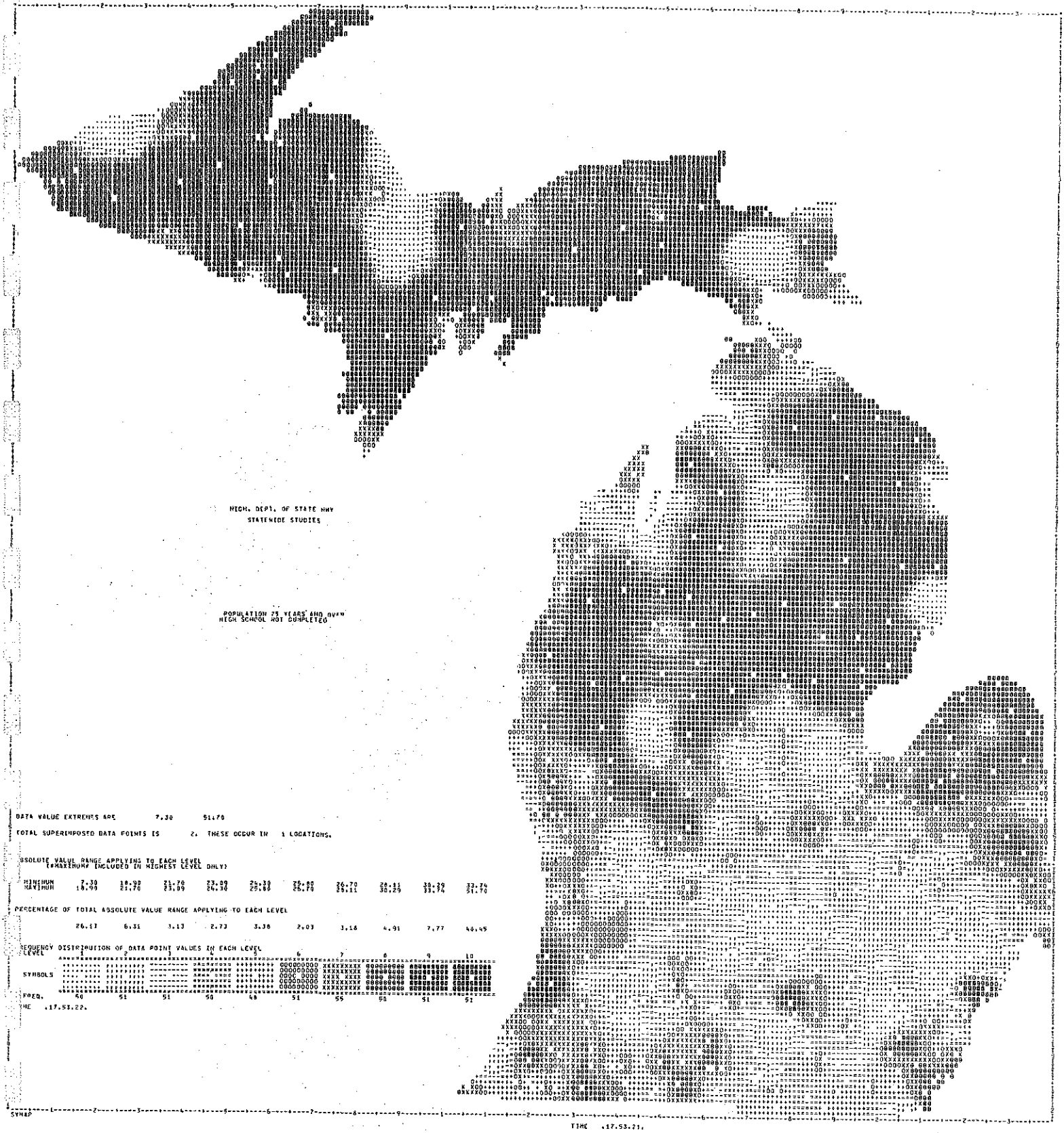
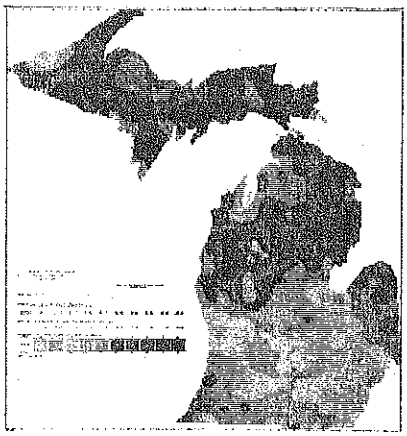
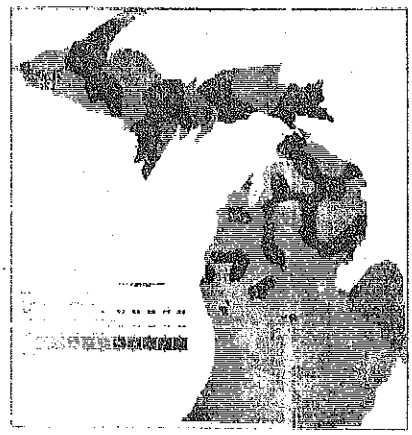

HIGH. DEPT. OF STATE HWY
STATEWIDE STUDIES
POPULATION 25 YEARS AND OVER
HIGH SCHOOL NOT COMPLETED
DATA VALUE EXTREMES ARE 7.30 51.70
TOTAL SUPERIMPOSED DATA POINTS IS 2. THESE OCCUR IN 1 LOCATIONS.
ABSOLUTE VALUE RANGE APPLYING TO EACH LEVEL
(*MAXIMUM* INCLUDED IN HIGHEST LEVEL ONLY)
MINIMUM 7.30 18.98 21.70 27.89 29.38 35.80 36.70 38.11 38.29 43.74 43.74
MAXIMUM 18.09 21.70 27.09 34.50 29.80 35.70 38.11 38.29 43.74 51.70
PERCENTAGE OF TOTAL ABSOLUTE VALUE RANGE APPLYING TO EACH LEVEL
26.17 6.31 3.13 2.73 3.38 2.03 3.16 4.91 7.77 40.45
FREQUENCY DISTRIBUTION OF DATA POINT VALUES IN EACH LEVEL
LEVEL 1 2 3 4 5 6 7 8 9 10
SYMBOLS
FREQ. 50 51 51 50 48 51 55 50 51 51
TIME .17.53.22.
SYNAP
TIME .17.53.23.

FIGURE 14

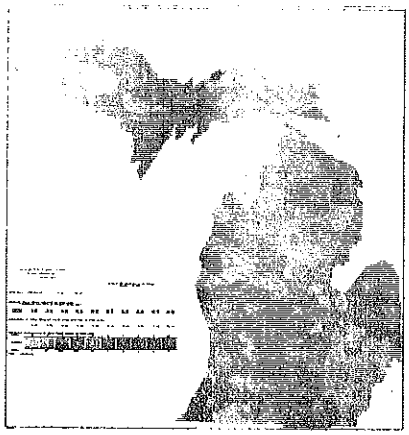
FAMILY INCOME DENSITY



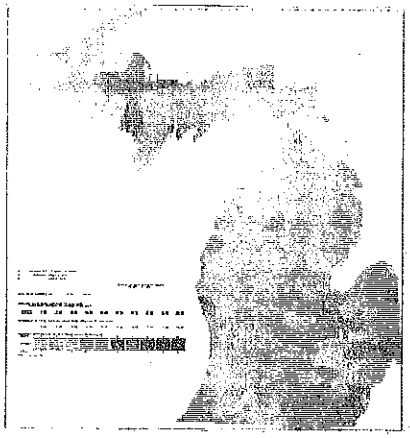
Under $ 5,000



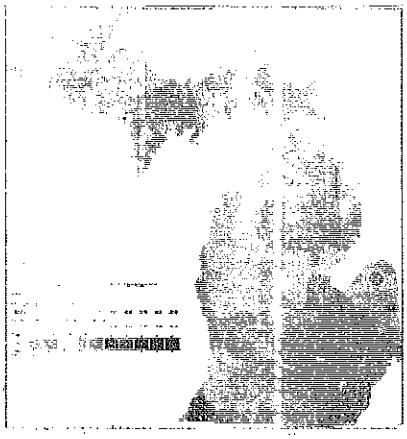
$ 5,000 - $ 7,999



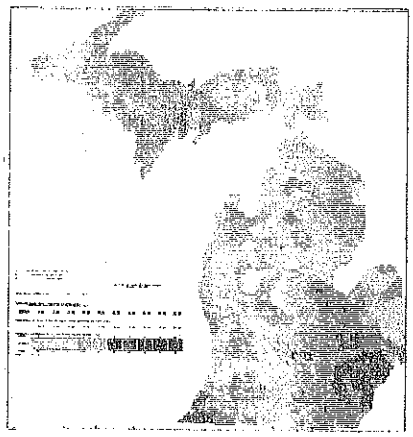
$ 8,000 - $ 9,999



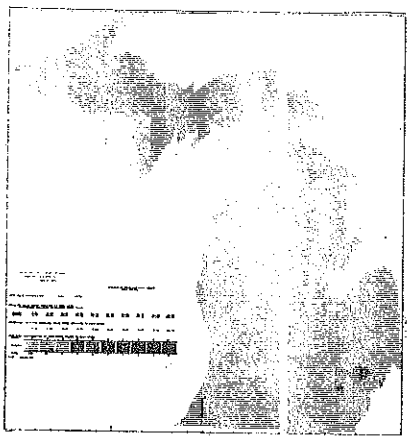
$ 10,000 - $ 11,999



$ 12,000 - $ 14,999

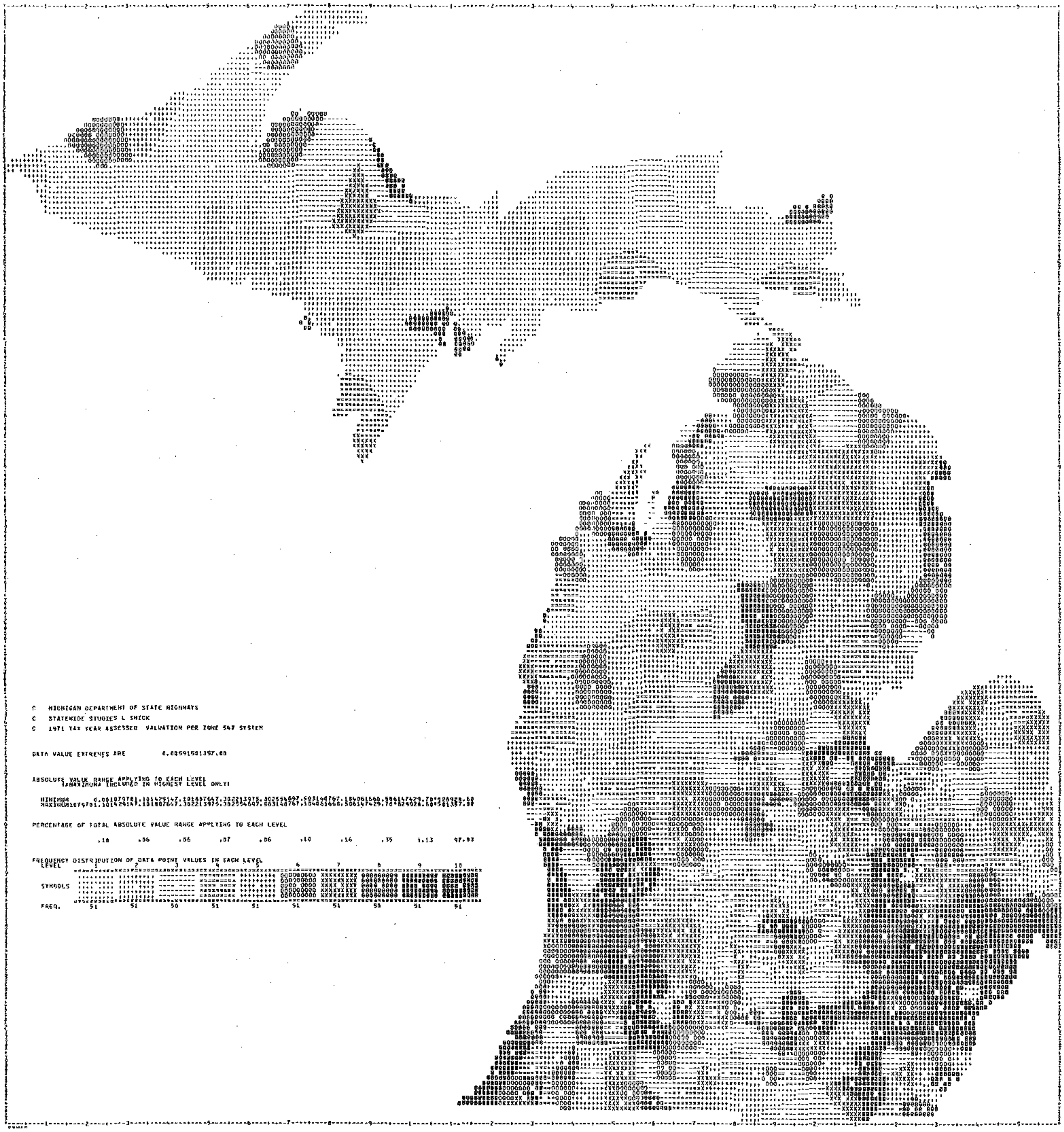


$ 15,000 - $ 24,999



$ 25,000 And Over

FIGURE 15


C MICHIGAN DEPARTMENT OF STATE HIGHWAYS
C STATEWIDE STUDIES L SHICK
C 1971 TAX YEAR ASSESSED VALUATION PER ZONE 547 SYSTEM
DATA VALUE EXTREMES ARE 0.00591501357.00
ABSOLUTE VALUE RANGE APPLYING TO EACH LEVEL
(MAXIMUMS INCLUDED IN HIGHEST LEVEL ONLY)
PERCENTAGE OF TOTAL ABSOLUTE VALUE RANGE APPLYING TO EACH LEVEL
.10 .06 .06 .07 .06 .10 .16 .35 1.13 97.03
FREQUENCY DISTRIBUTION OF DATA POINT VALUES IN EACH LEVEL
LEVEL 1 2 3 4 5 6 7 8 9 10
SYMBOLS
FREQ. 51 51 50 51 51 51 51 50 51 51

From another perspective the frequency distribution of the various income groups allows one to better understand the range of values throughout the state. Taking, for example, the income group under $5,000 it can be seen from Figure 16 that no zones have more than approximately 54% of the families in a zone with an income less than $5,000, while most zones have between 10 and 20% of the families with incomes below $5,000.

So far the information has concerned characteristics of the population without mention of the community colleges or the highway system which links the population with these community colleges. To address this task we turn to a procedure developed by the Statewide Studies Unit referred to as "Proximity Analysis". In general this process allows one to accumulate socio-economic data within specified driving-time bands from a given set of facilities. Also, every zone in the state (Figure 2) is examined to see how well it is served by the surrounding facilities. The details of this process are explained in a previous report titled Proximity Analysis: Social Impacts of Alternate Highway Plans on Public Facilities.

This process has been used with the community colleges and the information on education-completed. The following categories have been summarized within 0-15, 15-30, 30-45, and 45-60 minutes driving-time bands of each zone containing a community college facility:

Persons 25 years and older who have:

1. Not completed high school
2. Completed high school
3. Completed 1-3 years college
4. Completed 4 or more years college

FIGURE 16

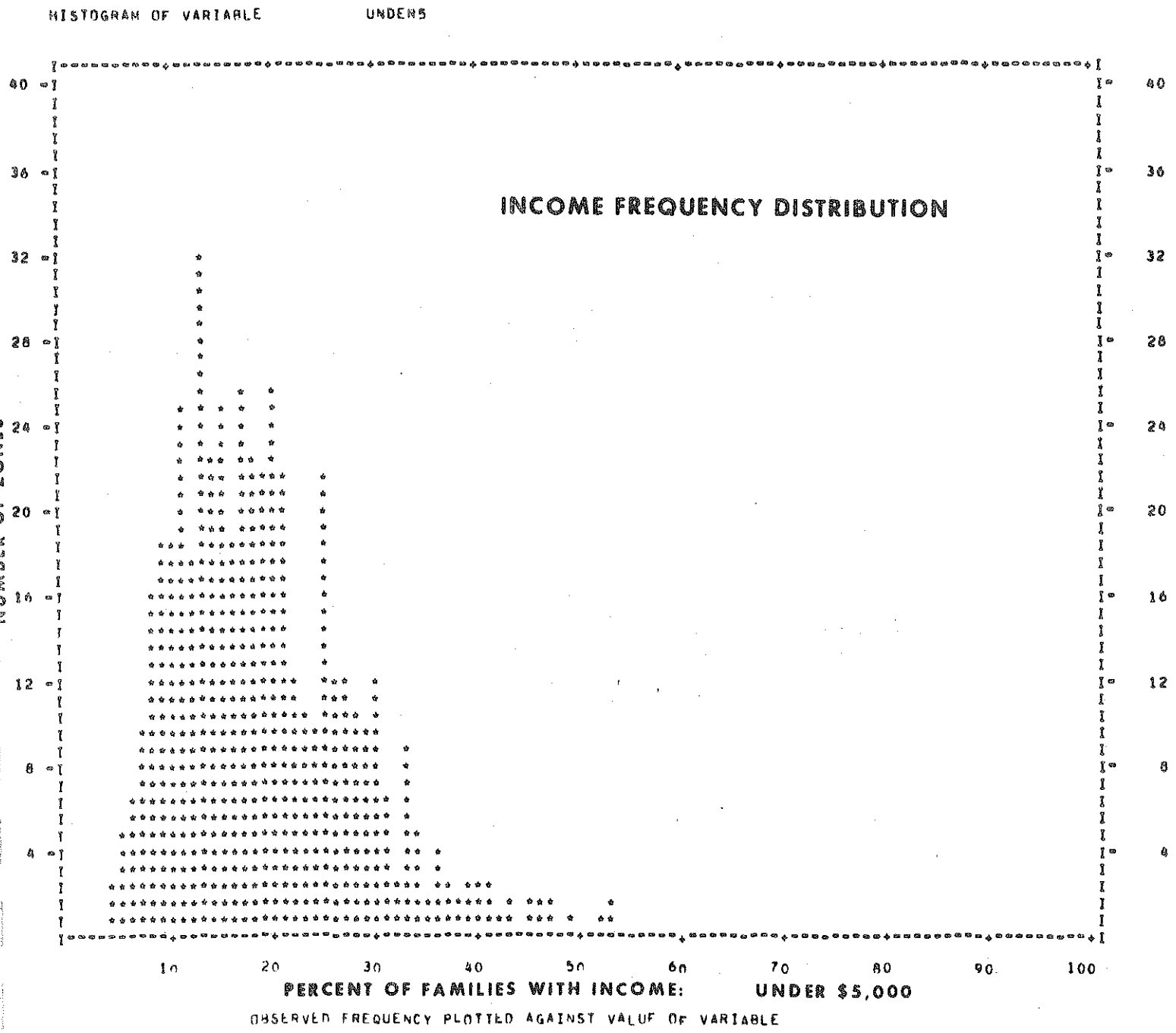

HISTOGRAM OF VARIABLE UNDER5
INCOME FREQUENCY DISTRIBUTION
NUMBER OF ZONES
40
36
32
28
24
20
16
12
8
4
10
20
30
40
50
60
70
80
90
100
PERCENT OF FAMILIES WITH INCOME: UNDER $5,000
OBSERVED FREQUENCY PLOTTED AGAINST VALUE OF VARIABLE

Figure 17 illustrates the information concerning those who have not completed high school for zone 183 (Lansing and East Lansing) which contains one community college (Lansing Community College). The table shows for example, that within 60 minutes of the community college there are 141,168 who have not completed high school (from population 25 years old and over) and there are 2 community colleges (one being the college within zone 183 itself). Figure 18 shows this information summarized for MCCA district 22. (Lansing Community College is in district 22.) In MCCA district 22 81,197 are within 60 minutes of Lansing Community College. The complete district summaries for MCCA and SBE districts are contained in Part B.

A statewide summary of the above four categories is contained in Figure 19.

Thus far, proximity analysis has produced information about the population which serves the community colleges. The process also examines every zone in the state to see how well it is served by the surrounding community colleges within the specified driving-times. A sample of this information can be seen in Figure 20. Produced separately is a list of those zones not served (i. e. no community college within longest driving-time specified, 60 minutes in this case).

All proximity results may be seen in Part B.

PROXIMITY OF HS NOT COMPL

DATA FOR ZONE 183
HS NOT COMPL = 30093
NUMBER OF COMM COLLEGE = 1
TOTAL CAPACITY = 7230

	0- 15	0- 15
HS NOT COMPL	34172	34172
PERCENT OF TOTAL HS NOT COMPL	1.573	1.573
COMM COLLEGE	1	1
HS NOT COMPL/COMM COLLEGE	34172.00	34172.00

	15- 30	0- 30
HS NOT COMPL	21727	55899
PERCENT OF TOTAL HS NOT COMPL	1.000	2.573
COMM COLLEGE	0	1
HS NOT COMPL/COMM COLLEGE	0.00	55899.00

	30- 45	0- 45
HS NOT COMPL	21534	77433
PERCENT OF TOTAL HS NOT COMPL	0.991	3.564
COMM COLLEGE	0	1
HS NOT COMPL/COMM COLLEGE	0.00	77433.00

	45- 60	0- 60
HS NOT COMPL	63735	141168 ←
PERCENT OF TOTAL HS NOT COMPL	2.934	6.498
COMM COLLEGE	1	2 ←
HS NOT COMPL/COMM COLLEGE	63735.00	70584.00

FIGURE 17

PROXIMITY OF THOSE NOT COMPLETING HIGH SCHOOL TO LANSING COMMUNITY COLLEGE

SPECIAL AREA SUMMARY
CC DISTRICT 22

ZONES INCLUDED IN AREA 22 ARE...

92	93	94	95	96	97	98	99	100	113
114	115	117	118	119	121	122	123	183	184
185	186	187	188	189	190	191	199	272	433
434	435	436	437	438	439	440	441		

COMM COLLEGE IN AREA 22 = 1
TOTAL CAPACITY = 7230
HS NOT COMPL IN AREA 22 = 81197

TIME BAND	HS NOT COMPL	PERCENT OF TOTAL HS NOT COMPL IN AREA22
0- 15	34172	42.085
15- 30	21727	26.758
30- 45	19301	23.771
45- 60	5997	7.384

FIGURE 18

DISTRICT 22 SUMMARY

PROXIMITY OF THOSE NOT COMPLETING HIGH SCHOOL

FIGURE 19

STATEWIDE PROXIMITY ANALYSIS

HS NOT COMPL PROXIMAL TO ANY COMM COLLEGE

TIME BAND	HS NOT COMPL	PERCENT OF TOTAL HS NOT COMPL
0- 15	1309439	60.271
15- 30	441185	20.307
30- 45	201921	9.294
45- 60	95992	4.418

HS COMPLETED PROXIMAL TO ANY COMM COLLEGE

TIME BAND	HS COMPLETED	PERCENT OF TOTAL HS COMPLETED
0- 15	875268	56.541
15- 30	371252	23.982
30- 45	152198	9.832
45- 60	65872	4.255

1-3 YR COLLG PROXIMAL TO ANY COMM COLLEGE

TIME BAND	1-3 YR COLLG	PERCENT OF TOTAL 1-3 YR COLLG
0- 15	265295	59.607
15- 30	104574	23.496
30- 45	38787	8.715
45- 60	15302	3.438

4+ YR COLLEG PROXIMAL TO ANY COMM COLLEGE

TIME BAND	4+ YR COLLEG	PERCENT OF TOTAL 4+ YR COLLEG
0- 15	270825	62.459
15- 30	101135	23.324
30- 45	33452	7.715
45- 60	10777	2.485

SERVER PROXIMITY

ZONE		SERVICE ZONES	COMM COLLEGE	CAPACITY	HS NOT COMPL/COMM COLLEGE	HS NOT COMPL/CAPACITY
1	0- 15MIN.	0	0	0	0.00	0.00
1	0- 30MIN.	0	0	0	0.00	0.00
1	0- 45MIN.	1	1	927	2112.00	2.28
1	0- 60MIN.	1	1	927	2112.00	2.28
2	0- 15MIN.	0	0	0	0.00	0.00
2	0- 30MIN.	0	0	0	0.00	0.00
2	0- 45MIN.	0	0	0	0.00	0.00
2	0- 60MIN.	0	0	0	0.00	0.00
3	0- 15MIN.	0	0	0	0.00	0.00
3	0- 30MIN.	0	0	0	0.00	0.00
3	0- 45MIN.	0	0	0	0.00	0.00
3	0- 60MIN.	0	0	0	0.00	0.00
4	0- 15MIN.	0	0	0	0.00	0.00
4	0- 30MIN.	0	0	0	0.00	0.00
4	0- 45MIN.	0	0	0	0.00	0.00
4	0- 60MIN.	0	0	0	0.00	0.00
5	0- 15MIN.	0	0	0	0.00	0.00
5	0- 30MIN.	0	0	0	0.00	0.00
5	0- 45MIN.	0	0	0	0.00	0.00
5	0- 60MIN.	0	0	0	0.00	0.00
6	0- 15MIN.	0	0	0	0.00	0.00
6	0- 30MIN.	0	0	0	0.00	0.00
6	0- 45MIN.	0	0	0	0.00	0.00
6	0- 60MIN.	0	0	0	0.00	0.00
7	0- 15MIN.	0	0	0	0.00	0.00
7	0- 30MIN.	0	0	0	0.00	0.00
7	0- 45MIN.	1	1	2994	2929.00	0.98
7	0- 60MIN.	3	3	10946	976.33	0.27
8	0- 15MIN.	0	0	0	0.00	0.00
8	0- 30MIN.	0	0	0	0.00	0.00

CAPACITY = 1970 ENROLLMENT

FIGURE 20

PROXIMITY OF COMMUNITY COLLEGES

TO ALL ZONES

As noted throughout the text the detailed and complete information is assembled in Part B under separate cover. A breakdown of the four categories of information contained there follows:

1. Income

   Number and Percent of Families with incomes of:

   a. Less than $ 5,000
   b. $ 5,000- 7,999
   c. $ 8,000- 9,999
   d. $10,000- 11,999
   e. $12,000- 14,999
   f. $15,000- 24,999
   g. Over $25,000

   Available in SYMAP's, district and zone summaries.

2. Education Completed

   Number and Percent (of total population) of persons 25 years old and over who have:

   a. Not completed high school
   b. Completed high school
   c. Completed 1-3 years college
   d. Completed 4 or more years college

   Available in SYMAP's, district and zone summaries.

   The following proximity information is also available:

   (1) Proximity of above population groups within 0-15, 15-30, 30-45, 45-60 minutes driving-time of community colleges.

(2) Proximity of community colleges to every zone in the state.

(3) List of zones not served.

3. Labor Force

Number and Percent (of total population) of persons

a. Employed

b. Unempolyed

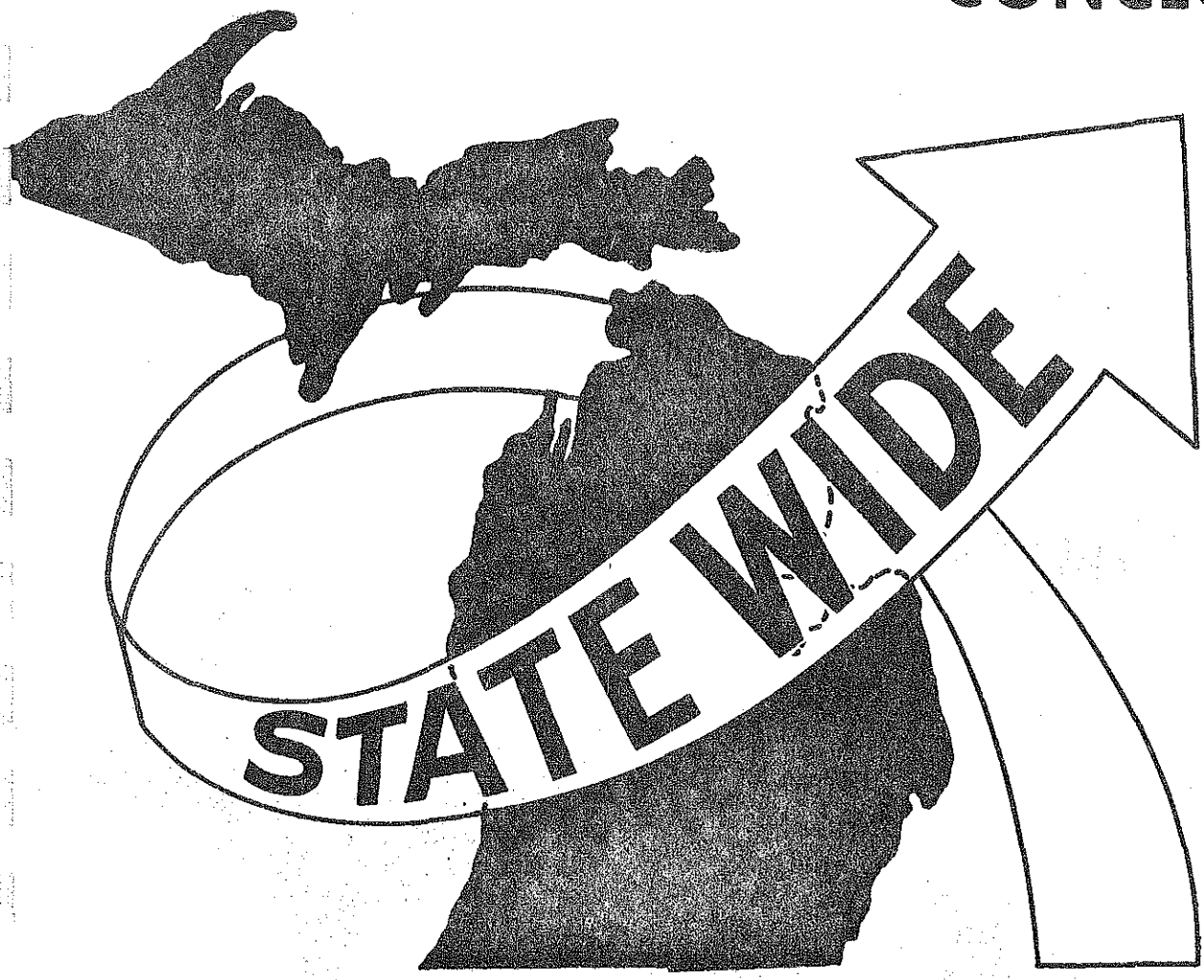
c. In labor force

Available in district and zone summaries

4. Industry

Number of persons 16 years older employed in various types of industry. There are 41 industry types.

CONCLUSION



CONCLUSION

The source of information and techniques for displaying and analyzing this information is the Statewide Transportation Modeling System. This report serves as another example of the multiple benefits of such a system.

While the original purpose here was to aid in the area of statewide educational planning, the process can be used from the perspective of highway planning. The impact of proposed roads on educational facilities (or any other type of facility) can now be tested before roads are built.

This system for analyzing and displaying information can pave the way for greater inter-agency cooperation and mutual benefit. For the first time there is a way (proximity analysis) to examine the possibility of either building new roads or new facilities to improve the service of statewide facilities to the public.

It is hoped that the specific information contained herein will assist in the planning of the statewide community college districts. Questions about the use of other information or techniques to assist in the evaluation of these districts may be directed to the Statewide Studies Unit, Michigan Department of State Highways.