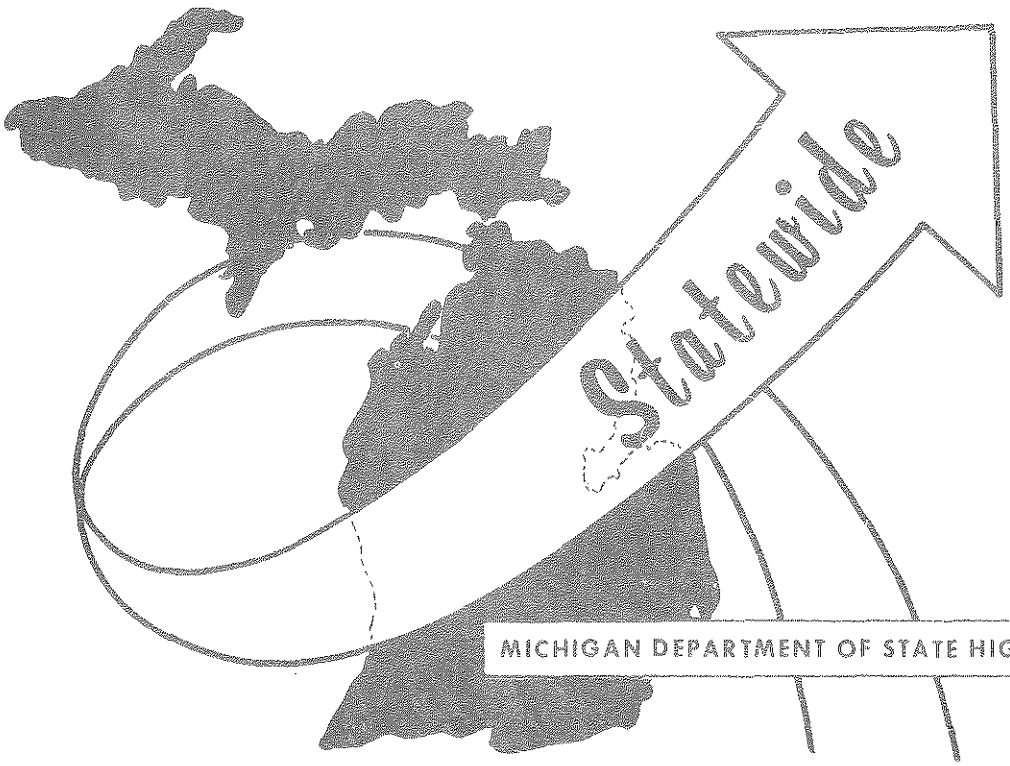
Statewide Transportation Analysis & Research

MICHIGAN'S
STATEWIDE TRAFFIC FORECASTING
MODEL

VOL. V · PART B

DEVELOPMENT OF THE STATEWIDE SOCIO–ECONOMIC DATA BANK FOR TRIP GENERATION – DISTRIBUTION

STATEWIDE STUDIES
DECEMBER, 1972



MICHIGAN DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION

MICHIGAN DEPARTMENT

OF

STATE HIGHWAYS AND TRANSPORTATION

BUREAU OF TRANSPORTATION PLANNING

MICHIGAN'S
STATEWIDE TRAFFIC FORECASTING
MODEL

VOL. V - PART B

**DEVELOPMENT OF THE
STATEWIDE SOCIO–ECONOMIC DATA BANK
FOR TRIP GENERATION – DISTRIBUTION**

STATEWIDE STUDIES
DECEMBER, 1972

STATE OF MICHIGAN

WILLIAM G. MILLIKEN, GOVERNOR

DEPARTMENT OF STATE HIGHWAYS

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

December 19, 1972

Mr. Sam F. Cryderman
Engineer of Transportation Planning
Transportation Planning Division

Dear Mr. Cryderman:

A complete data file for input to various phases of the Transportation Planning Process has long been awaited within the Transportation Survey and Analysis Section. The progress of the Statewide Studies Unit in the area of statewide modeling has brought about the creation of such a file. The Socio-Economic Data Bank is the result of a combined effort to strengthen and expand upon the original trip generation-distribution equations. It is now also intended as input to the proximity analysis process for measuring a large range of social, economic, and environmental impacts of alternate highway plans. Indeed, the wide range of information included within this data bank lends itself to "multi-department" applications.

This report, which deals with the collection and organization of the data within the Socio-Economic Data Bank was prepared by Mr. W. Thomas Franklin of the Statewide Studies Unit, under the supervision of Mr. Richard E. Esch.

Sincerely,

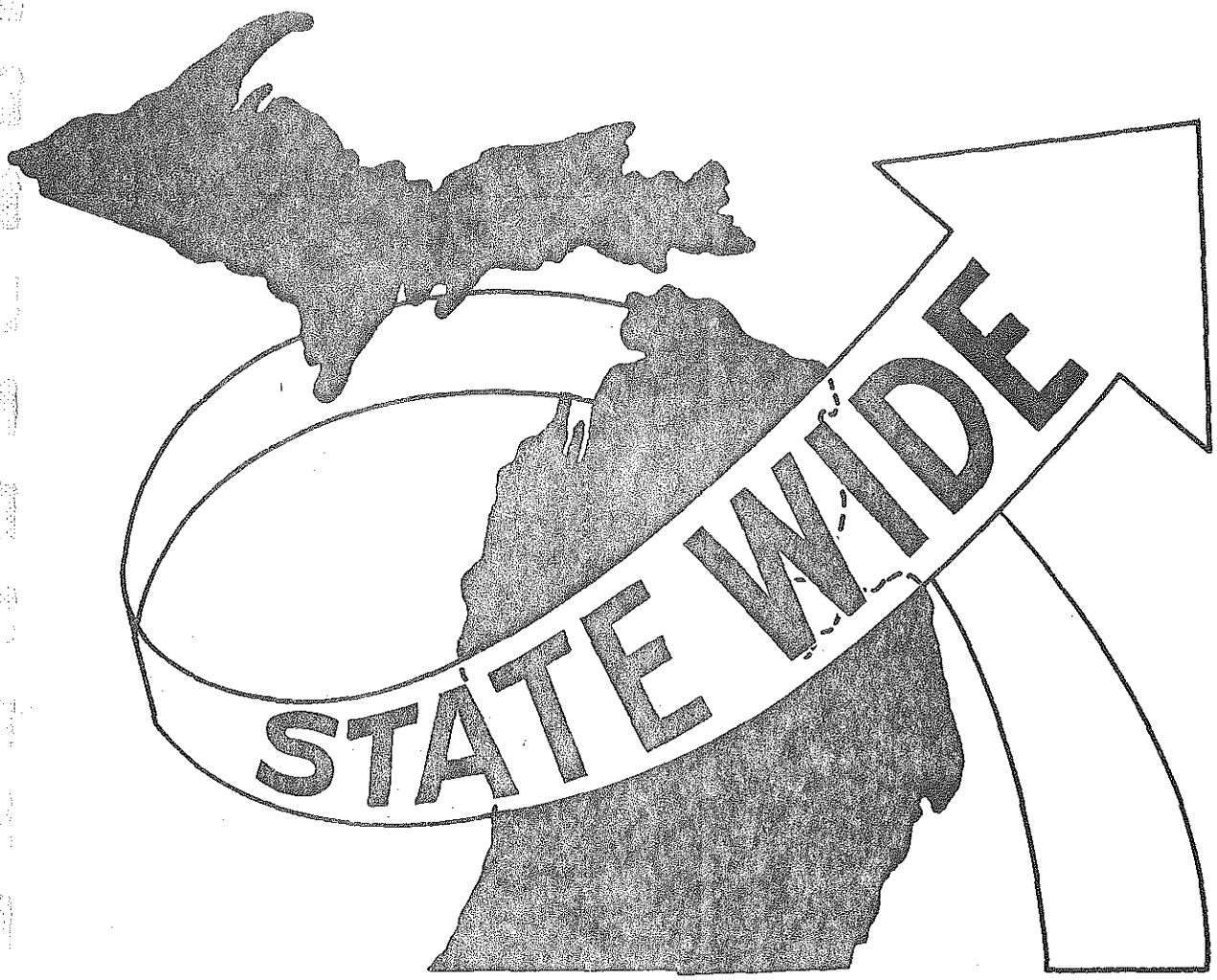
Keith E. Bushnell

Keith E. Bushnell
Engineer of Transportation
Survey and Analysis Section

MICHIGAN
THE GREAT LAKE STATE

TABLE OF CONTENTS

PREFACE



PREFACE

This is the fifth volume in a series of reports dealing with the development of a statewide traffic forecasting model for the State of Michigan. The previous reports in this series are:

I	Objectives and Work Progress
I-A	Proceedings of the Statewide Traffic Forecasting Model Workshop
I-B	Traffic Forecasting Applications, Single and Multiple Corridor Travel
I-C	Truckline Turnbacks Analysis
I-D	Proximity Analysis: Social Impacts of Alternate Highway Plans on Public Facilities
I-E	Cost-Benefit Analysis
II	Development of Network Models
III	Multi-level Highway Network Generator - Segmental Model
III-A	Semi-Automatic Network Generator using a "Digitizer"
IV	Total Model Calibration - 547 Zone Process
V-A	Travel Model Development Reformation -- Trip Data Bank Preparation

Volume V has been divided into five areas dealing with the development of an origin-destination trip data file, a socio-economic data file and the processes needed to develop a calibrated statewide trip generation-distribution travel model. The following describes the breakdown of Volume V:

A. Reformation -- Trip Data Bank Preparation

B. SOCIO-ECONOMIC DATA BANK DEVELOPMENT

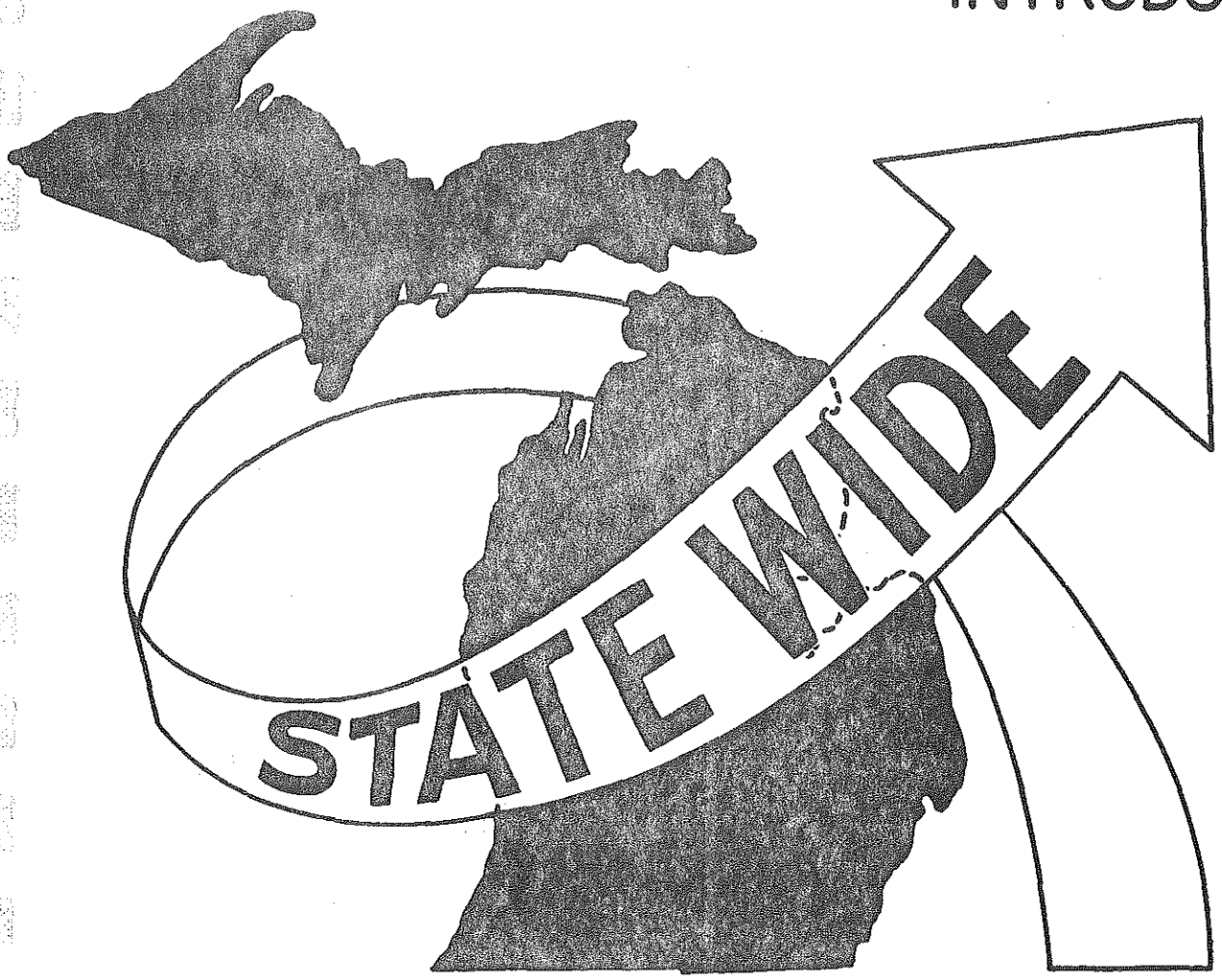
C. Travel Characteristics Analysis -- Preliminary Model Selection

D. Trip Generation Model Calibration

E. Trip Distribution Model Calibration

This report is part B of Volume V entitles DEVELOPMENT OF THE STATEWIDE SOCIO-ECONOMIC DATA BANK FOR TRIP GENERATION - DISTRIBUTION. It deals with the types of data collected and their sources, the application of this data within the Department and selected future applications. This file has been used as one of the basic input files to the social and public services impact analysis process required in recent Federal Highway Legislation.

INTRODUCTION



INTRODUCTION

With the growing demands on the Michigan Department of State Highways for future traffic forecasts on the trunkline system, the need for the development of an efficient method of forecasting this traffic became more apparent. The development of a statewide model required that an efficient means of analyzing socio-economic data must be defined. This data file when used in combination with various computer programs enables the Department to predict travel throughout the state highway system. The Statewide Model developed for Michigan's use employs a gravity model travel forecasting technique which relies primarily on zonal population and time between zones to predict trips.

The original models developed in 1965 were based on the actual trip data collected in ten origin-destination studies. As use of this model bacame more extensive, it was evident that with additional input variables in the mathematical equations for trip generation and distribution, better forecasting results could be obtained. It was then decided what types of data would be desirable for model refinement or other possible model applications which might be feasible in the near future. The travel analysis zones around which this socio-economic data bank has been defined appear in Figure 1 and Figure 2. This system includes 508 Michigan (instate) zones and 39 outstate zones.

FIGURE 1

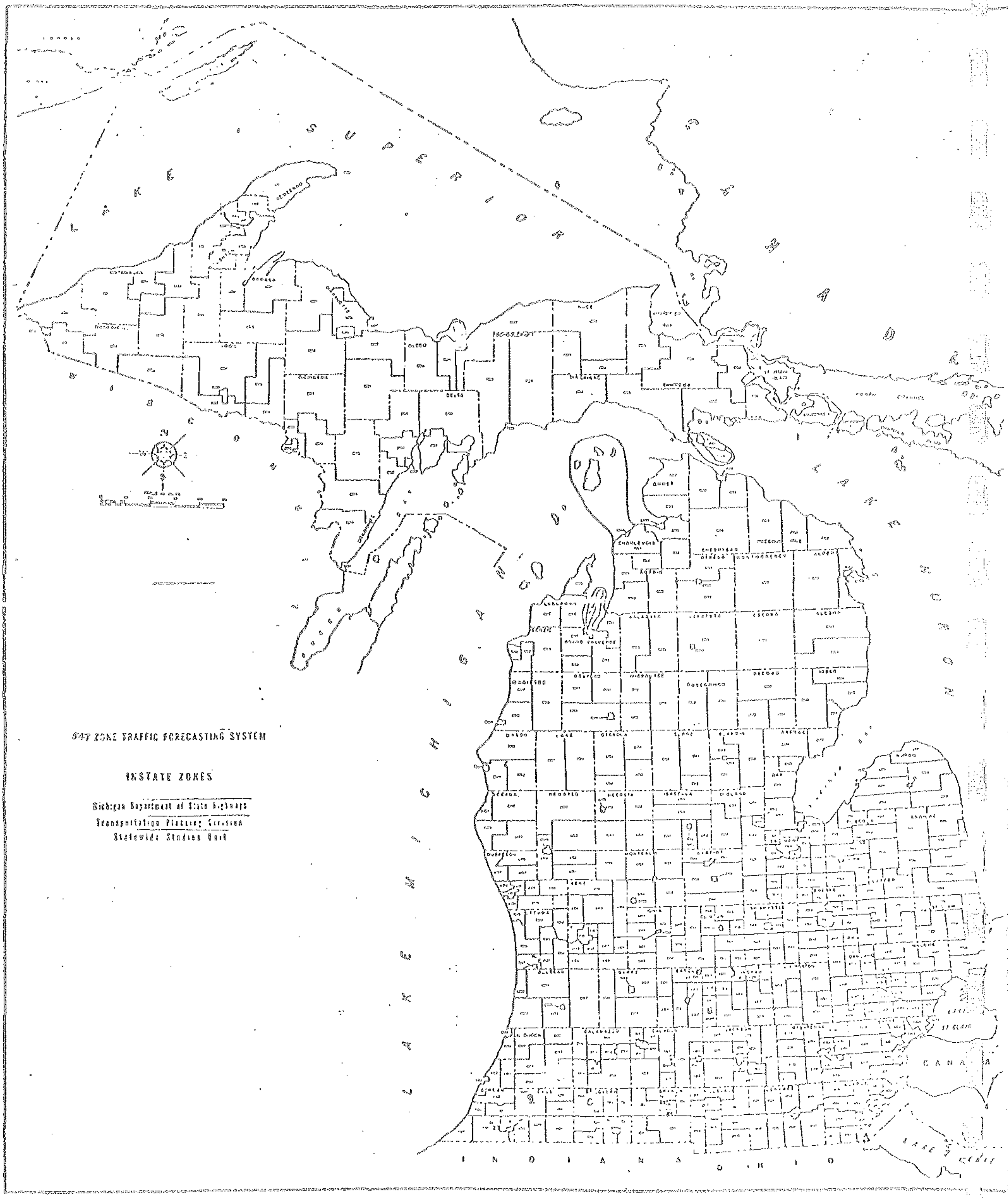

LAKE SUPERIOR
CANADA
LAKE MICHIGAN
547 ZONE TRAFFIC FORECASTING SYSTEM
INSTATE ZONES
Michigan Department of State Highways
Transportation Planning Division
Statewide Studies Unit
INDIANA
OHIO
LAKE ERIE

FIGURE 2


ONTARIO
N
W
E
S
MINNESOTA
WISCONSIN
MICHIGAN
NEW YORK
IOWA
PENNSYLVANIA
ILLINOIS
INDIANA
OHIO
WEST VIRGINIA
MISSOURI
KENTUCKY
547 ZONE TRAFFIC FORECASTING SYSTEM
OUTSTATE ANALYSIS ZONES
MICHIGAN DEPARTMENT OF STATE HIGHWAYS
TRANSPORTATION PLANNING DIVISION
STATEWIDE STUDIES UNIT

The zonal population data was the start of the socio-economic data bank. As additional statewide model applications arose, other computer programs were defined which utilized data in this file, and thus the Socio-Economic Data Bank became more diffuse in its contents. Looking ahead, possible future file applications were considered and the structure of the data bank was finalized.

The final version of the Socio-Economic Data Bank is comprised of two basic systems. The first system is a specific file containing selected 1960, 1965 and 1970 information. This data was collected and put directly into the data bank. Other fields of data were created by manipulating original data, i.e., achieved by combining existing file information. The second file consists of all of the 1960 and 1970 census data. The reason for this arrangement is the frequency with which these two files are accessed. The first, or specific file is accessed more often and was thus grouped as one. The two census files are available for use, but thus far have not been nearly as frequently accessed as the first.

To date, the information contained in the specific file is as follows:

Zonal Population

Land Area

Water Area

Developed Lake Frontage

Recreational Facilities

Hospitals

Urban, Suburban, Rural Designation

Population Density

Surrounding Population

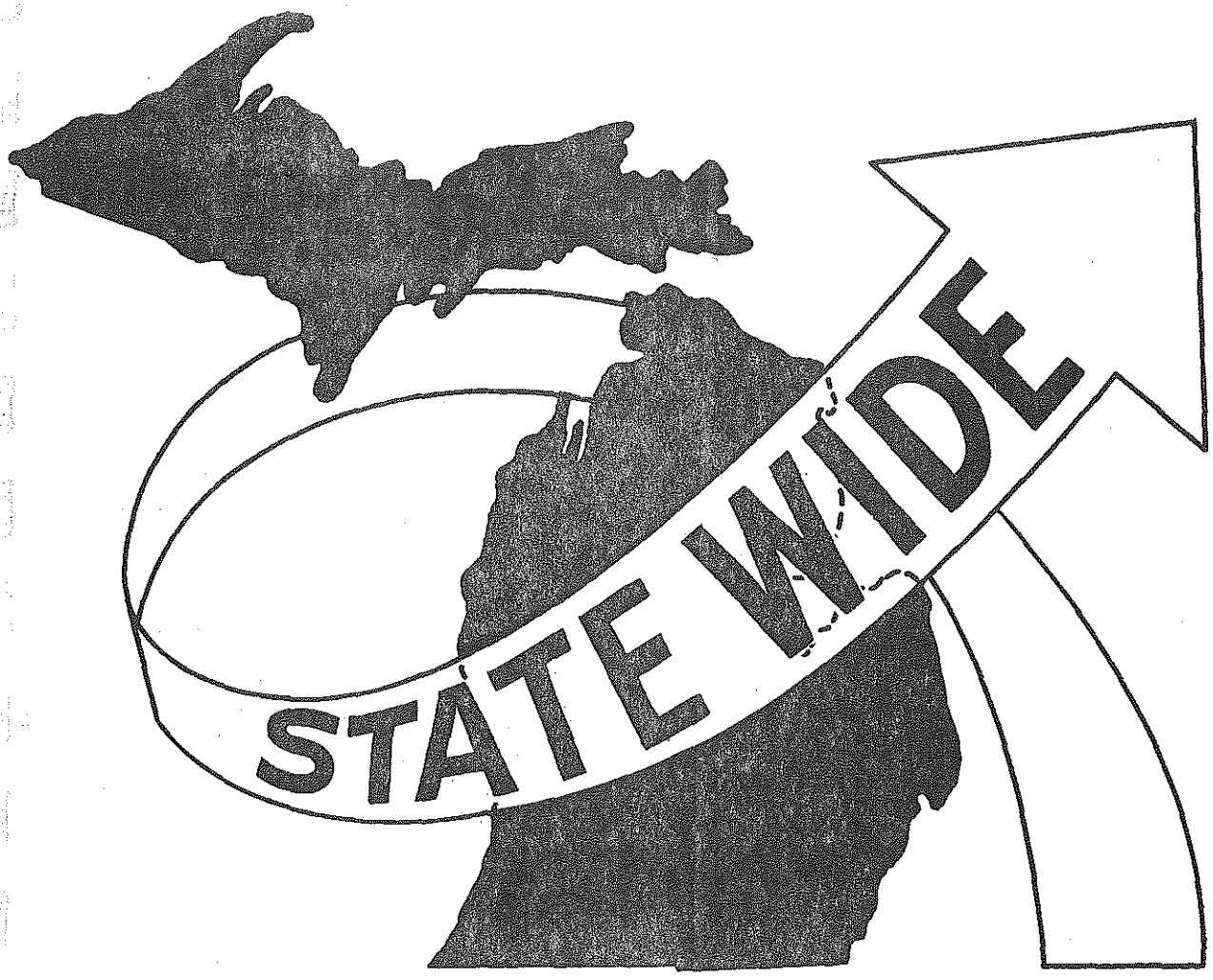
Accessibility Index

Retail Sales Tax

Employment

State Educational Institutions

SOCIO-ECONOMIC DATA SOURCES



SOCIO-ECONOMIC DATA SOURCES

The following section is devoted to the sources of the data currently in our Socio-Economic Data Bank, and deals briefly with the form this data was in when it was originally collected. The actual processes used to transform the data into its present state will be discussed in the section titled "Socio-Economic Data Manipulation and Zonal Summarization."

Zonal Population

The base year used in development of the statewide traffic forecasting model was 1965. The population in the file was gathered from a report titled Preliminary Population Projections for Small Areas in Michigan, published by the Michigan Department of Commerce. This 1965 population was derived using the 1940-1960 census data at township and city level of detail and projecting to 1965 by means of the following regression equation:

$$P = a + (b) \log t$$

where P = population

$$t = \frac{\text{Year} - 1930}{10}$$

(i.e., 1940:1, 1950:2, etc.)

a and b = regression coefficients

In the derivation of these projections, consideration was given to county level population projections issued in the report Michigan Population - 1960 to 1980 by the Population Studies Center, University of Michigan in cooperation with the State Resource Planning Division, Michigan Department of Commerce.

Figure 3 illustrates the form the original data was in when it was received by the Statewide Studies Unit.

Land and Water Area

The land and water areas were collected using the Area Measurement Report, number 24 from the U.S. Department of Commerce, Bureau of the Census. All measurements are based on 1960 census statistics and are defined on townships and city boundaries. An example of the data in its initial form is shown in Figure 4.

Developed Lake Frontage

Data used for Developed Lake Frontage was obtained from the Department of Natural Resources. Personnel from their office had previously collected this information from a field survey (see Figure 5) and upon request supplied a computer listing of data for each county. A sample of this computer listing for Alcona County appears in Figures 6a and 6b.

Recreational Facilities

This data was collected from county maps supplied by the Department of Natural Resources. Each map indicates facilities such as state and county parks and campgrounds, federal and state forests, public fishing sites, roadside parks, etc. (Figure 7). These maps are updated periodically and changes are made to the data file when applicable.

POPULATION FOR SMALL AREAS IN MICHIGAN

ALCONA COUNTY

TABLE 1
POPULATION

	HISTORICAL			PROJECTED				
	1940	1950	1960	1965	1970	1975	1980	2000
TWPS + COMBINATIONS								
ALCONA	296	363	381	384	381	377	390	429
CALEDONIA	448	592	654	667	666	668	696	787
CURTIS	644	683	664	651	625	606	613	631
GREENBUSH	223	355	536	536	553	570	607	732
GUSTIN	666	683	696	670	644	625	632	652
HARRISVILLE	992	1083	1274	1227	1209	1197	1235	1354
HAWES	557	618	624	617	599	586	598	634
HAYNES	412	395	368	349	328	311	309	297
MIKADO	614	557	617	564	538	517	519	522
MILLEN	291	299	318	305	295	287	292	305
MITCHELL	320	228	220	180	158	139	128	88
TOTALS =	5463	5856	6352	6150	5996	5883	6019	6431

FIGURE 3

Table 1.–AREA OF COUNTIES, MINOR CIVIL DIVISIONS, AND PLACES OF 1,000 OR MORE INHABITANTS: 1960

("U" denotes an unincorporated place)

County and minor civil division	Area (square miles)			Population		County and minor civil division	Area (square miles)			Population	
	Total	Land	Inland water	Total	Per square mile		Total	Land	Inland water	Total	Per square mile
THE STATE	58216	56818	1398	7823194	137.6	ANTRIM COUNTY—Continued					
						JORDAN TWP	34.5	34.5	...	272	7.9
ALCONA COUNTY	696	677.5	18.5	6352	9.4	KEARNEY TWP	34.6	33.6	1.0	731	21.0
						MANCELONA TWP	70.6	70.4	0.2	1962	27.9
ALCONA TWP	65.8	60.1	5.7	381	6.3	MANCELONA	1.0	1.0	...	1141	1141.0
CALEDONIA TWP	70.0	66.0	4.0	654	9.9	REMAINDER OF TOWNSHIP	69.6	69.4	0.2	821	11.8
CURTIS TWP	70.6	68.9	1.7	664	9.6	MILTON TWP	38.9	25.3	13.6	673	26.6
GREENBUSH TWP	27.2	25.7	1.5	536	20.9	STAR TWP	33.6	33.6	Z	294	8.8
GUSTIN TWP	36.5	36.2	0.3	696	19.2	TORCH LAKE TWP	20.8	14.9	5.9	296	19.9
HARRISVILLE	0.6	0.6	...	487	811.7	WARNER TWP	35.4	35.4	...	225	6.4
HARRISVILLE TWP	31.7	31.7	...	787	24.8						
HAWES TWP	70.5	69.1	1.4	624	9.0	ARENAC COUNTY	369	367.4	1.6	9860	26.8
HAYNES TWP	35.9	35.0	0.9	368	10.5						
MIKADO TWP	70.4	70.4	...	617	8.8	ADAMS TWP	36.0	36.0	...	327	9.1
						ARENAC TWP	34.3	34.3	...	666	19.4
MILLEN TWP	71.1	70.5	0.6	318	4.5	AU GRES	1.5	1.5	...	584	389.3
MITCHELL TWP	143.8	143.3	0.5	220	1.5	AU GRES TWP	38.0	36.4	1.6	523	14.4
						CLAYTON TWP	32.0	32.0	...	572	17.9
ALGER COUNTY	934	904.9	29.5	9250	10.2	DEEP RIVER TWP	35.7	35.7	...	1119	31.3
						LINCOLN TWP	22.4	22.4	...	733	32.7
AU TRAIN TWP	152.9	141.2	11.7	508	3.6	MASON TWP	31.7	31.7	...	603	19.0
BURT TWP	234.4	227.5	6.9	457	2.0	MOFFATT TWP	32.2	32.2	...	347	10.8
GRAND ISLAND TWP	28.0	23.0	5.0	40	1.7	OMER	1.2	1.2	...	322	268.3
LIMESTONE TWP	74.2	73.8	0.4	330	4.5						
MATHIAS TWP	69.5	68.4	1.1	742	10.8	SIMS TWP	11.9	11.9	...	249	20.9
MUNISING	9.6	5.3	4.3	4228	797.7	STANDISH	1.0	1.0	...	1214	1214.0
MUNISING TWP	200.1	200.0	0.1	1408	7.0	STANDISH TWP	27.7	27.7	...	1068	38.6
ONOTA TWP	87.2	87.1	0.1	183	2.1	TURNER TWP	32.1	32.1	...	767	23.9
ROCK RIVER TWP	78.3	78.3	Z	1354	17.3	WHITNEY TWP	31.3	31.3	...	766	24.5
ALLEGAN COUNTY	837	825.8	11.2	57729	69.9	BARAGA COUNTY	925	900.8	24.2	7151	7.9
ALLEGAN	4.9	4.4	0.5	4822	1095.9	ARVON TWP	131.1	124.2	6.9	307	2.5
ALLEGAN TWP	31.9	29.2	2.7	2404	82.3	BARAGA TWP	185.3	184.7	0.6	2311	12.5
CASCO TWP	38.5	38.5	...	2009	52.2	COVINGTON TWP	195.6	192.3	3.3	839	4.4
CHESHIRE TWP	35.1	34.3	0.8	1034	30.1	L'ANSE TWP	253.6	248.2	5.4	3501	14.1
CLYDE TWP	35.2	34.5	0.7	1575	45.7	L'ANSE	2.3	2.3	...	2397	1042.2
DORR TWP	36.3	36.3	...	2313	63.7	REMAINDER OF TOWNSHIP	251.3	245.9	5.4	1104	4.5
FILLMORE TWP	31.9	31.9	...	1877	58.8	SPURR TWP	159.6	151.5	8.1	193	1.3
GANGES TWP	33.4	32.7	0.7	1672	51.1						
GUNPLAIN TWP	35.1	34.9	0.2	2796	80.1	BARRY COUNTY	571	554.2	16.8	31738	57.3
HEATH TWP	35.3	35.0	0.3	1283	36.7						
HOLLAND (PT)	5.0	5.0	...	2637	527.4	ASSYRIA TWP	36.3	36.3	...	1472	40.6
HOPKINS TWP	36.0	35.9	0.1	1766	49.2	BALTIMORE TWP	35.7	35.3	0.4	1229	34.8
LAKETOWN TWP	21.8	21.8	...	1814	83.2	BARRY TWP	35.7	34.8	0.9	2026	58.2
LEE TWP	35.3	35.2	0.1	1327	37.7	CARLTON TWP	35.0	34.6	0.4	1342	38.8
LEIGHTON TWP	36.3	36.0	0.3	1951	54.2	CASTLETON TWP	35.6	35.2	0.4	2511	71.3
MANLIUS TWP	35.4	35.4	...	1429	40.4	NASHVILLE (PT)	1.6	1.6	...	1453	908.1
MARTIN TWP	36.4	35.7	0.7	1963	55.0	REMAINDER OF TOWNSHIP	34.0	33.6	0.4	1058	31.5
MONTEREY TWP	36.2	36.2	Z	1146	31.7	HASTINGS	5.3	5.3	...	6375	1202.8
OTSEGO	1.6	1.6	Z	4142	2588.8	HASTINGS TWP	30.1	30.0	0.1	1593	53.1
OTSEGO TWP	34.9	34.5	0.4	2564	74.3	HOPE TWP	35.6	33.1	2.5	1311	39.6
OVERISEL TWP	34.5	34.5	...	1608	46.9	IRVING TWP	36.3	36.3	...	1270	35.0
PLAINWELL	1.3	1.3	...	3125	2403.8	JOHNSTOWN TWP	36.2	34.9	1.3	1998	57.2
SALEM TWP	36.3	36.3	...	1459	40.2	MAPLE GROVE TWP	35.4	35.4	...	1068	30.2
SAUGATUCK TWP	28.2	27.8	0.4	2662	95.8	NASHVILLE (PT)	0.3	0.3	...	72	240.0
TROWBRIDGE TWP	34.7	33.9	0.8	1331	39.3	REMAINDER OF TOWNSHIP	35.1	35.1	...	996	28.4
VALLEY TWP	34.1	32.4	1.7	425	13.1	ORANGEVILLE TWP	35.7	34.3	1.4	1402	40.9
WATSON TWP	35.6	35.4	0.2	1065	30.1	PRAIRIEVILLE TWP	36.3	32.4	3.9	1715	52.9
WAYLAND TWP	36.0	35.2	0.8	3450	98.0	RUTLAND TWP	35.6	34.8	0.8	1675	48.1
WAYLAND	1.3	1.3	...	2019	1553.1	THORNAPPLE TWP	35.3	34.9	0.4	2288	65.6
REMAINDER OF TOWNSHIP	34.7	33.9	0.8	1431	42.2	MIDDLEVILLE	1.0	1.0	...	1196	1196.0
						REMAINDER OF TOWNSHIP	34.3	33.9	0.4	1092	32.2
ALPENA COUNTY	590	564.6	25.4	28556	50.6						
						WOODLAND TWP	35.7	35.2	0.5	1471	41.8
ALPENA	8.2	7.4	0.8	14602	1984.1	YANKEE SPRINGS TWP	35.5	31.5	4.0	992	31.5
ALPENA TWP	118.0	106.3	11.7	6616	62.2						
GREEN TWP	77.8	68.5	9.3	811	11.8	BAY COUNTY	451	447.3	3.7	107062	239.3
LONG RAPIDS TWP	54.2	54.2	...	886	16.3						
MAPLE RIDGE TWP	53.0	50.9	2.1	907	17.8	AUBURN	1.0	1.0	...	1497	1497.0
OSSINEKE TWP	104.9	103.4	1.5	1188	11.5	BANGOR TWP	14.5	13.8	0.7	11686	846.8
SANBORN TWP	43.5	43.5	...	1413	32.5	BAY CITY	11.0	10.0	1.0	53604	5360.4
WELLINGTON TWP	53.1	53.1	...	344	6.5	BEAVER TWP	34.2	34.2	...	1783	52.1
WILSON TWP	77.3	77.2	0.1	1709	22.1	ESSEXVILLE	1.4	1.3	0.1	4590	3530.8
						FRANKENLUST TWP	22.7	22.3	0.4	1481	66.4
ANTRIM COUNTY	520	475.5	44.5	10373	21.8	FRASER TWP	34.1	33.8	0.3	2608	77.2
						GARFIELD TWP	35.5	35.5	...	982	27.7
BANKS TWP	45.9	45.5	0.4	1216	26.7	GIBSON TWP	35.6	35.6	...	758	21.3
CENTRAL LAKE TWP	31.3	27.6	3.7	1238	44.9	HAMPTON TWP	30.3	30.0	0.3	5387	179.6
CHESTONIA TWP	36.1	36.1	...	274	7.6						
CUSTER TWP	35.2	35.1	0.1	293	8.3	KANKAKEE TWP	32.6	32.2	0.4	3357	104.3
ECHO TWP	35.6	35.2	0.4	471	13.4	MERRITT TWP	32.1	32.1	...	1762	54.9
ELK RAPIDS TWP	11.7	7.1	4.6	1243	175.1	MONITOR TWP	36.8	36.8	...	6568	178.5
ELK RAPIDS	1.7	1.4	0.3	1015	725.0	MOORE FOREST TWP	36.0	36.0	...	920	25.6
REMAINDER OF TOWNSHIP	10.0	5.7	4.3	228	40.0	PINCONNING	0.8	0.8	...	1329	1661.3
FOREST HOME TWP	32.3	24.5	7.8	738	30.1	PINCONNING TWP	37.5	37.2	0.3	2113	56.8
HELENA TWP	23.4	16.7	6.7	447	26.8	PORTSMOUTH TWP	21.0	20.8	0.2	3213	154.5
						WILLIAMS TWP	34.0	34.0	...	3404	100.1

... Represents zero. Z Rounds to zero.

FIGURE 4

FIGURE 5

701 LAKE INVENTORY FORM #I
Michigan Department of Conservation

Sheet____of____

______________County

LIST SURVEY PERSONNEL: ______________ ______________ ______________

Section	Group	Column heading	Entry	Col.
LAKE AS A WHOLE		County Number	C	1
		Lake Number	Code	2
		Lake Name		3
		Lake Size	Acres	4
		Lake Origin	C	5
		Watershed Code	C	6
		Lake Depth & Character	C	7
		General Lake Setting	C C C	8 9 10
		Fishing Quality	C	11
	WATER AREA USES	Waterfowl Use	C	12
		Special Boating Regulations?	C	13
		Conflict of Interests?	C C C	14 15 16
		Boating	Intensity L M H	17 18 19
		Fishing	Intensity L M H	20 21 22
		Swimming	Intensity L M H	23 24 25
		Hunting Intensity	C	26
		Lake Inlet	C	27
		Lake Outlet	C	28
		Total Shore Length	Miles	29
PRIVATE SHORELINE		County Number		
		Lake Number		
		TOTAL PRIVATE SHORE		30
	OCCUPIED	Recreational or Residential	Mi.	31
		Other (roads, power lines, industry)	Mi.	32
		Total	Mi.	33
	UNOCCUPIED	Upland	Mi.	34
		Lowland	Mi.	35
		Wetland	Mi.	36
		Total	Mi.	37
	PUBLIC USE	Boat Launch	C	38
		Picnic & Swimming	C	39
		Camping	C	40
		ACQUISITION	C	41
		SIGNIFICANT VALUES OF PRIVATE SHORE	Codes	42
		County Number		
		Lake Number		
TOTAL PUBLIC SHORELINE		DESIGNATED (use Form II)	Mi.	43
		UNDESIGNATED (continue this form)	Mi.	44
PUBLIC UNDESIGNATED SHORELINE		AGENCY CODE	C	45
	PARCEL CENTER	Township	N-S	46
		Range	E-W	47
		Section	Sec.	48
		OCCUPIED	Mi.	49
	UNOCCUPIED	Upland	Mi.	50
		Lowland	Mi.	51
		Wetland	Mi.	52
		Total	Mi.	53
RECREATIONAL CHARACTER OF PUBLIC UNDESIGNATED SHORELINE	SWIMMING	Class A	Mi.	54
		Class B	Mi.	55
		Class C	Mi.	56
		Class D	Mi.	57
		Not Suitable	Mi.	58
	CAMPING & DAY USE	Class A	Code	59
		Class B	Code	60
		Class C	Code	61
		Class D	C	62
	CAR ACCESS	No. Roads to Frontage	No.	63
	If No Roads	Priority of Need	C	64
		Road Length Needed	Miles	65
		Construction Difficulty	C	66
		Private land a factor?	C	67
	BOAT LAUNCH	Priority of Need	C	68
		Construction Difficulty	C	69
		New Location Recommended?	C	70
		WATERFOWL & FURBEARERS HABITAT	Code	71
		Pike Spawning Value	C	72
		Reliability Index	C	73
		OTHER SIGNIFICANT VALUES	List Codes	74-76
NOTES				

Col.
1-4 FROM: "MICHIGAN LAKE INVENTORY BULLETINS"
5 LAKE ORIGIN
#1.-Natural Lake #3.-Impoundment
#2.-Natural Lake with Dam #4.-Excavated Lake
6 WATERSHED CODE - (See Maps)
7 LAKE DEPTH & CHARACTER
#1.-Marsh & Bog--brown water
#2.-Marsh Lake - Grassy, clear water
#3.-Warm Water - Stratified, shallow
#4.-Warm & Cold Water--2 story--WW & Trout Species
#5.-Cold Water - Trout only
8-10 GENERAL LAKE SETTING (Select up to 3, enter the most predominant in Col. 8, least in Col. 10)
#0.-Low & Wet
#1.-Low & Moist
#2.-Level & Dry
#3.-Gently Rolling
#4.-Steeply Rolling or High Bluff
#5.-Low Shelf, moist or wet, backed by #4
#6.-Low shelf, dry, backed by #4
#7.-Low bluff, backed by moist or wet
#8.-Low bluff, backed by level dry land
#9.-Low bluff, backed by gently rolling
11 FISHING QUALITY
#0.-Poor #1.-Medium #2.-Good
12 WATERFOWL USE
#0.-None to Insignificant #2.-Medium
#1.-Low #3.-High
13 SPECIAL BOATING REGULATIONS?
#0.-No #1.-Yes

Col.
14-16 CONFLICT OF INTERESTS: (Select up to 3, enter only one in each column)
#0.-None significant
#1.-Swimmers - High-speed boaters
#2.-Swimmers - Skiers
#3.-Divers - Boaters
#4.-High-speed boaters - Fishermen
#5.-Skiers - Fishermen
#6.-Divers - Fishermen
#7.-Any Use - Duck Use
#8.-Waste from municipal or industrial sources entering Lake. Select as one of the three, if present.
17-19 BOATING USE CONFLICT
#0.-None
#1.-10% of water surface
#2.-20% " " "
#3.-30% " " "
#4.-40% " " "
#5.-50% of water surface
#6.-60% " " "
#7.-70% " " "
#8.-80% " " "
#9.-90-100% of water surface
20-22 FISHING USE (Same as above, Boating)
23-25 SWIMMING USE OF SHORELINE
#0.-None to Insignificant
#1.-Up to 10% of Shore
#2.-" " 20% " "
#3.-" " 30% " "
#4.-" " 40% " "
#5.-Up to 50% of Shore
#6.-" " 60% " "
#7.-" " 70% " "
#8.-" " 80% " "
#9.-" " 90% and over
26 HUNTING INTENSITY
#0.-None to Insignificant #2.-Medium
#1.-Low #3.-High
27 LAKE INLET (See 28)

Col.
28 LAKE OUTLET (Select the major or most significant one)
#0.-None
#1.-Intermittent
#2.-Non-Boatable
Boatable, but not to another boatable lake:
#3.-by Man-powered craft
#4.-by Motor (outboard)
#5.-by Motor (inboard)
Boatable to another boatable lake:
#6.-by Man-powered craft
#7.-by Motor (outboard)
#8.-by Motor (inboard)
29-37 SHORELINE MEASUREMENTS (enter to nearest 1/10 mile)
38-40 PUBLIC USE OF PRIVATE SHORELINE (Total capacity of private commercial facilities)
38 BOAT LAUNCHING (Capacity based on parking)
#0.-None
#1.-Up to 10 car & tr. spcs.
#2.- 11 to 25 " " " "
#3.- 26 to 50 " " " "
#4.- 51 to 75 " " " "
#5.- 76 and over
39 PICNICKING & SWIMMING (Number of family units or parking capacity)
#0.-None
#1.-Up to 10
#2.-11 to 50
#3.-51 to 100
#4.-101 to 200
#5.-201 to 500
#6.-Over 500

Col.
40 CAMPING (number of family units)
(Same codes as above, Col. 39)
41 ACQUISITION (Select One)
Not Needed: #0.-No public land & none needed
#1.-Public ownership adequate for all needs
#2.-Excess public ownership on this lake
Needed:
#3.-Low priority
#4.-Medium priority
#5.-High priority
42 SIGNIFICANT VALUES (List up to 3, the most significant first)
#00.-None
#01.-Scenic
#02.-Historic
#03.-Boating
#04.-Swimming
#05.-Camping
#06.-Remoteness & non development
#07.-Geology
#08.-Fish habitat
#09.-Waterfowl habitat
#10.-Fishing
#11.-Hunting
#12.-Private recreation or residential development
43 DESIGNATED PUBLIC SHORELINE
44 UNDESIGNATED PUBLIC SHORELINE
See Fold II for definitions. For designated shoreline less than 0.1 mi. place an X in this column. (for example: fishing sites with less than 0.1 mi. front)
Note: Character of designated shoreline to be described on Form II.

Col.
45 AGENCY CODE
#00.-Nat'l Park Serv.
#01.-US Forest Serv.
#02.-US Fish & Wildlife Serv.
#03.-Other Federal
#04.-State Parks & Rec.
#05.-State Forestry
#06.-State Game
#07.-State Fish
#08.-Other State
#09.-Regional Author.
#10.-Co. Road Comm.
#11.-Co. Parks
#12.-Co. Forest Adm.
#13.-Other Co. Ag.
#14.-Township
#15.-Municipal
49-53 OCCUPIED, Upland, Lowland, Wetland (For explanations see map on reverse side of Fold II)
54-58 SWIMMING, Classes A,B,C,&D (For definitions see Fold I)
59-62 CAMPING, Classes A,B,C,&D (not suitable) Enter one digit, 1 to 9, to indicate acreage, 10 acres to 90 or more. See Fold I
63-67 CAR ACCESS:
63 Number of Driveable Roads to the Frontage
64-67 If No Roads:
64 What is the Priority of Need for One?
#0.-no need #2.-moderate need
#1.-low need #3.-high need
65 Road length needed (nearest 1/10 mi.)

Col.
66 Road Construction Difficulty:
#0.-no difficulty #2.-difficult
#1.-little diff. #3.-extremely diff.
67 Is Private Land a Factor in Access?
#0.-no #1.-yes
68-70 BOAT LAUNCHING
68 Priority or Need for a Ramp:
#0.-none #1.-low #2.-high
69 Construction Difficulty: (Same as Col. 72)
70 This Site Not Suitable for Launching, a New Site is Recommended?
#0.-no #1.-yes
71 WATERFOWL & FURBEARERS HABITAT
#0.-none #2.-medium #4.-excellent
#1.-poor #3.-good
72 VALUABLE PIKE SPAWNING AREA?
73 RELIABILITY INDEX ( )
#0.-high #1.-medium #2.-low

Col. 74-76 Other Significant Values (List up to 3)
#0 - None
#1 - Scenic
#2 - Historic
#3 - Wildnerness
#4 - Geologic Interest
#5 - Timber
#6 - Part of a Lake Cluster

MICHIGAN LAKE INVENTORY -- PRIMARY DATA

DEPT. OF CONSERVATION--RECREATION RESOURCE PLANNING & WATER RESOURCES COMMISSION

COUNTY NUMBER 1 NAME ALCONA

LAKE NUMBER 0018 NAME MIDDLE INDIAN

ITEM NO. ---LAKE AS A WHOLE INFORMATION--CARD NO.1----------

1 LAKE SIZE 9 ACRES . SHORELINE-WATER AREA RATIO= 0.9
INVALID SHORE LENGTH/WATER AREA RATIO

2 TOTAL SHORELINE LENGTH 0.4 MILES
THERE ARE 0.3 MILES OF PRIVATE AND 0.1 MILES OF PUBLIC SHORELINE.

3 GENERAL LOCATION= TWP. 25 NORTH, RANGE 6 EAST, SECTION 11
4 LAKE ORIGIN-- NATURAL LAKE
5 WATERSHED CODE 59, AUSABLE
6 LAKE DEPTH & CHAR.-MARSH LAKE--GRASSY,CLEAR WATER
7 LAKE INLET-- NON-BOATABLE
8 LAKE OUTLET--NON-BOATABLE
9 GENERAL LAKE SETTING= LOW AND MOIST

12 BOATING INTENSITY-LOW-NONE
13 BOATING INTENSITY-MEDIUM-NONE
14 BOATING INTENSITY-HIGH---NONE
15 SPECIAL BOATING REGULATIONS--NO

16 FISHING QUALITY--MEDIUM
17 FISHING INTENSITY-LOW----NONE
18 FISHING INTENSITY-MEDIUM-NONE
19 FISHING INTENSITY-HIGH---NONE

20 SWIMMING INTENSITY-LOW----NONE TO INSIGNIFICANT
21 SWIMMING INTENSITY-MEDIUM-NONE TO INSIGNIFICANT
22 SWIMMING INTENSITY-HIGH---NONE TO INSIGNIFICANT

23 WATERFOWL USE--LOW
24 HUNTING INTENSITY--NONE TO INSIGNIFICANT
25 CONFLICT OF INTERESTS-NONE SIGNIFICANT

PRIVATE SHORELINE INFORMATION---CARD NO. 2----------

29 TOTAL PRIVATE SHORELINE 0.3-MILES

30 RESIDENTIAL OR RECREATIONAL 0.0-MILES
31 OTHER-ROADS, POWER LINES, INDUSTRY, ETC 0.0 MILES
32 TOTAL OCCUPIED SHORE 0.0-MILES

33 UPLAND 0.1-MILES
34 LOWLAND 0.2-MILES
35 WETLAND 0.0-MILES
36 TOTAL UNOCCUPIED SHORE 0.3-MILES

37 PUBLIC USE OF PRIVATE SHORE, BOAT LAUNCH-NONE
38 PUBLIC USE OF PRIVATE SHORE, PICNIC & SWIMMING-NONE
39 PUBLIC USE OF PRIVATE SHORE, CAMPING-NONE
40 ACQUISITION AS OF 1965-NO PUBLIC LAND & NONE NEEDED
41 SIGNIFICANT VALUES----SCENIC
42 BOATING
FISHING

FIGURE 6a

INVENTORY -- PRIMARY LAKE

DEPT. OF CONSERVATION--RECREATION RESOURCE PLANNING & WATER RESOURCES COMMISSION

COUNTY NUMBER 1 NAME ALCONA

LAKE NUMBER 0018 NAME MIDDLE INDIAN

ITEM NO.----PUBLIC UNDESIGNATED SHORELINE INFORMATION---CARD NO.3---

44 ADMINISTERING AGENCY=STATE FORESTRY

44 GENERAL LOCATION= TWP. 25 NORTH, RANGE 6 EAST, SECTION 10

49 OCCUPIED 0.0 MILES

50 UNOCCUPIED UPLAND 0.1 MILES
51 UNOCCUPIED LOWLAND 0.0 MILES
52 UNOCCUPIED WETLAND 0.0 MILES
53 UNOCCUPIED TOTAL 0.1 MILES

-------RECREATIONAL CHARACTER OF SHORELINE------

54 SWIMMING--CLASS A 0.0 MILES
55 SWIMMING--CLASS B 0.0 MILES
56 SWIMMING--CLASS C 0.0 MILES
57 SWIMMING--CLASS D 0.0 MILES
58 NOT SUITABLE 0.1 MILES

59 CAMPING+DAY USE--CLASS A NONE
60 CAMPING+DAY USE--CLASS B NONE
61 CAMPING+DAY USE--CLASS C NONE
62 CAMPING+DAY USE--CLASS D UP TO 10 UNITS

----CAR ACCESS----
63 NUMBER OF ROADS TO FRONTAGE 0
64 PRIORITY OF NEED FOR ROADS=NONE
65 ROAD LENGTH NEEDED 0.1 MILES
66 CONSTRUCTION DIFFICULTY--NO DIFFICULTY
67 IS PRIVATE LAND A FACTOR--YES

----BOAT LAUNCH----
68 PRIORITY OF NEED=NONE
69 CONSTRUCTION DIFFICULTY--NO DIFFICULTY
70 NEW LOCATION RECOMMENDED=NO

71 ----WATERFOWL AND FURBEARERS HABITAT=MEDIUM
72 ----PIKE SPAWNING VALUE=NONE
73 ----OTHER SIGNIFICANT VALUES=SCENIC
74 PART OF A LAKE CLUSTER

TOTAL DESIGNATED SHORE 0.0 MILES, UNDESIGNATED 0.1 MILES.

FIGURE 6b

MICHIGAN
DEPARTMENT OF NATURAL RESOURCES
ROSCOMMON COUNTY

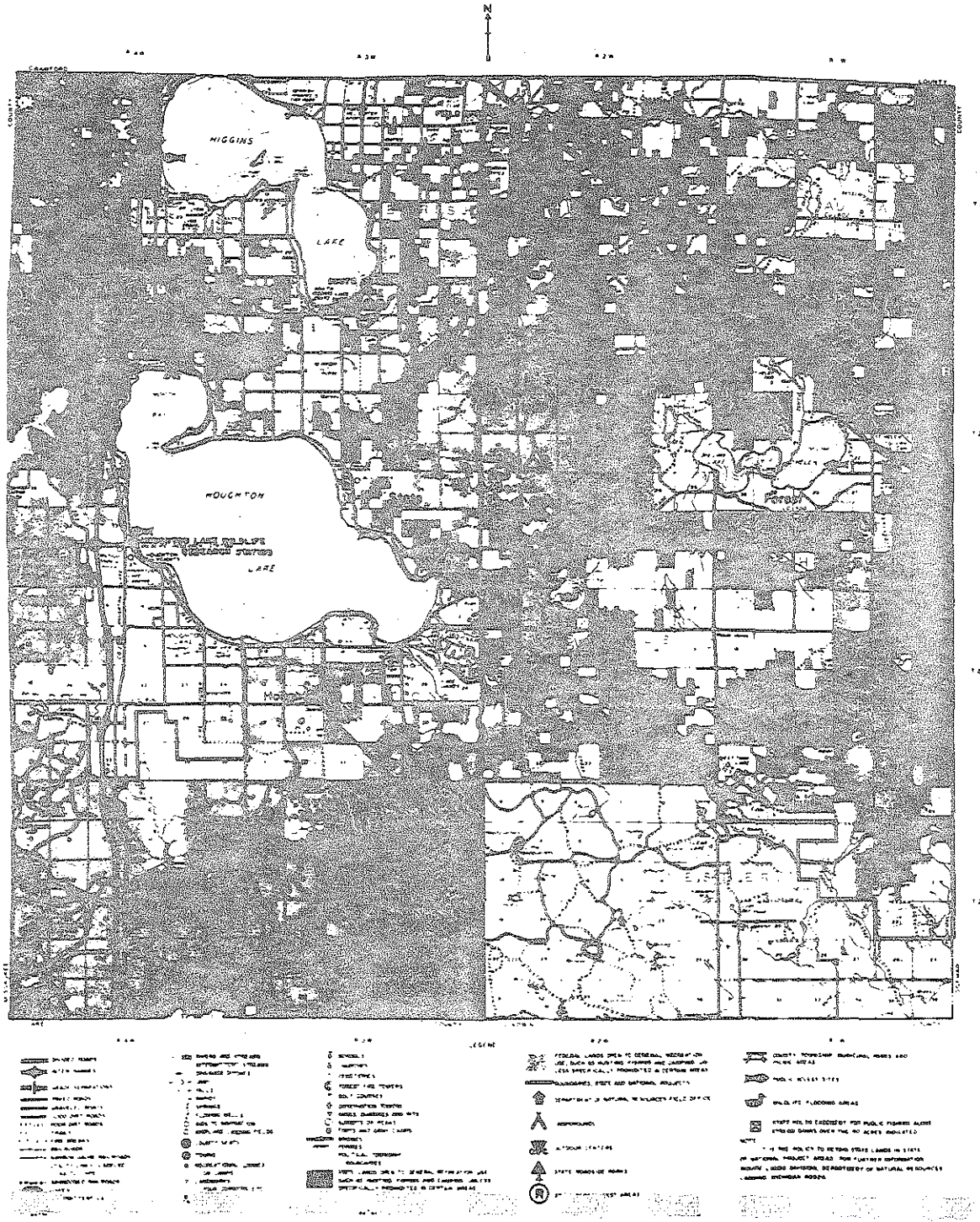


FIGURE 7

Hospitals

The information on hospitals for the socio-economic data bank was acquired by using the Directory of Hospitals and Nursing Care Facilities Homes for the Aged, prepared by the Bureau of Health Facilities, Michigan Department of Public Health. Data was in the form illustrated in Figure 8.

Urban-Suburban-Rural Designation

Data under this heading was obtained by reviewing the analysis zones and subjectively labeling each zone according to its development characteristics. Population density along with county and city maps were used in this process.

Population Density

By combining the Land Area and Zonal Population sections of the file, Population Density was put into the data bank using the equation:

$$\text{Population Density} = \frac{\text{Zonal Population}}{\text{Zonal Area (in sq. miles)}}$$

Surrounding Population

Surrounding population was originally obtained along with the trip generation and distribution package from Arthur D. Little, Inc. A computer listing is shown in Figure 9 illustrating the output of the program that calculates surrounding population.

Accessability Index

The accessibility index for each zone is calculated using a standard computer program from Michigan's

County Facility Name	Street Address	City & Zip Code	LICENSED BED CAPACITY	CERTIFICATIONS	
				Medi-care	Medi-caid
Alger County					
MUNISING MEMORIAL HOSP	SAND POINT ROAD	MUNISING 49862	34	X	X
Allegan County					
ALLEGAN HEALTH CENTER	555 LINN STREET	ALLEGAN 49010	89	X	X
COMMUNITY HOSPITAL	130TH AVENUE	DOUGLAS 49406	32	X	X
PIPP COMMUNITY HOSPITAL	411 NAOMI STREET	PLAINWELL 49080	36	X	X
Alpena County					
* ALPENA GENERAL	1501-1511 W CHISHOLM	ALPENA 49707	165	X	X
Arenac County					
* STANDISH COMMUNITY HOSP	805 WEST CEDAR	STANDISH 48658	81	X	X
Baraga County					
BARAGA COUNTY MEMORIAL	770 N MAIN STREET	LANSE 49946	70	X	X
Barry County					
PENNOCK HOSPITAL	1009 W GREEN STREET	HASTINGS 49058	102	X	X

* Licensure includes longterm care unit.

FIGURE 8

INDEX NO.	ZONE	PO	PO +PE	NI	SRT NI	ALPHA	BETA
1	101.	5928.000	8867.500	5239.256	72.383	4.068	155.460
2	102.	1185.000	5306.000	1539.784	39.240	2.603	61.287
3	201.	3677.000	4823.000	3340.619	57.798	2.162	98.721
4	202.	2038.000	2038.000	1876.476	43.318	15.200	163.497
5	203.	2276.000	3483.750	2244.712	47.378	3.178	98.123
6	204.	577.000	5392.000	933.269	30.549	0.620	23.262
7	301.	10961.000	86256.000	12412.129	111.410	0.648	86.797
8	302.	8290.000	21913.250	7861.523	88.665	1.414	102.066
9	303.	14104.000	105023.750	15372.179	123.985	0.682	89.236
10	304.	13302.000	66693.000	13535.313	116.341	0.705	75.631
11	305.	5264.000	57901.250	6886.254	82.983	0.476	27.709
12	306.	14664.000	93254.500	15444.191	124.275	0.859	100.066
13	401.	13805.000	28868.500	11849.893	108.857	0.505	74.882
14	402.	10625.000	28868.500	9865.502	99.325	0.434	63.331
15	403.	6278.000	18493.000	6271.299	79.192	1.820	103.423
16	501.	3509.000	7819.500	3543.917	59.531	1.454	27.802
17	502.	3646.000	9532.750	3779.848	61.480	2.464	102.777
18	503.	5457.000	12770.000	5299.016	72.794	2.342	107.842
19	601.	3515.000	31250.250	4616.588	67.945	0.410	42.123
20	602.	3015.000	11819.000	3447.011	58.711	1.633	87.152
21	603.	4619.000	14097.750	4804.777	69.316	0.662	65.502
22	701.	4403.000	7312.500	4101.548	64.043	2.757	61.768
23	702.	2433.000	7074.250	2690.653	51.873	1.855	68.390
24	703.	953.000	3702.750	1238.404	35.191	2.754	50.883
25	801.	6501.000	51421.500	7804.675	88.344	0.347	55.415

Population

Population + Surrounding Population

Generated trips

Generated trips (sq. root)

FIGURE 9

Transportation Planning Analysis Computer Package. This program produces an output listing as indicated in Figure 10.

Retail Sales Tax

Figures 11a and 11b are examples of the rough data collected for use under the file heading Retail Sales Tax. This data was acquired using the Monthly Research and Statistical Bulletin published by the Treasury Division of the Michigan Department of Revenue.

Employment

The Michigan Employment Security Commission was the source of the employment entry into the specific portion of the Socio-Economic Data Bank. The employment figures were taken from a standard Labor Force and Employment estimate form (Figure 12).

State Educational Institutions

Data pertaining to this section of the file was collected using the Directory of Institutions of Higher Education, published by the Higher Education Planning and Coordination Services Unit of the Department of Education. The file now contains the name of the college or university, the enrollment (Fall of 1970) and the statewide model coordinates for the school's location within the state.

Figure 13 is an illustration of a page from this catalogue.

ZONE	
1	68235
2	69058
3	10256
4	9267
5	9989
6	10077
7	266396
8	266101
9	266227
10	266223
11	266420
12	266268
13	28523
14	27574
15	25035
16	39948
17	29339
18	32278
19	175752
20	162807
21	175525
22	14756
23	14717
24	14772
25	265315
26	172690
27	265296
28	264936
29	267988
30	175573
31	267988
32	267988
33	175614
34	30500
35	32094

FIGURE 10

FIGURE IIa

TABLE IV SALES TAX COLLECTIONS BY COUNTIES, SELECTED CITIES (10,000 OR OVER) AND EIGHT

COUNTY & CITY	POPULATION(a)	# OF RETURNS	TOTAL SALES TAX COLLECTED MAY 1965	BUILDING MATERIAL	GENERAL MERCHANDISE	FOOD
ALCONA COUNTY	6,100	157	20,812.10	872	1,281	4,084
ALGER COUNTY	8,900	175	23,380.18	751	3,903	6,626
ALLEGAN COUNTY	54,200	873	198,744.01	16,634	6,776	61,378
ALPENA COUNTY	28,900	453	140,408.62	8,183	14,353	42,024
ALPENA	14,600	343	132,304.75	7,664	13,656	37,414
ANTRIM COUNTY	10,400	248	30,105.58	5,099	1,092	12,641
ARENAC COUNTY	9,500	247	49,241.90	2,542	1,126	14,483
BARAGA COUNTY	7,400	143	24,633.17	1,807	2,512	8,698
BARRY COUNTY	28,800	500	84,023.84	8,561	5,309	32,829
BAY COUNTY	106,000	1,436	651,171.43	29,579	79,851	151,004
BAY CITY	52,600	1,021	559,328.40	24,510	70,911	119,466
BENZIE COUNTY	8,000	177	27,634.20	3,226	1,106	8,368
BERRIEN COUNTY	154,100	2,359	816,121.99	56,912	85,747	237,015
BENTON HARBOR	20,400	633	290,058.92	15,044	61,964	82,247
NILES	14,400	417	158,301.72	6,993	15,614	45,342
ST JOSEPH	12,100	244	136,190.08	5,879	3,098	32,450
BRANCH COUNTY	34,700	574	150,876.68	14,324	8,336	39,185
CALHOUN COUNTY	137,300	1,819	802,685.18	44,751	58,223	229,298
BATTLE CREEK	43,300	1,104	599,628.95	31,520	49,349	160,866
ALBION	12,600	211	93,643.41	3,299	6,604	28,120
LAKEVIEW						
CASS COUNTY	37,200	547	118,866.57	8,963	3,855	37,817
CHARLEVOIX CO	14,000	329	58,944.17	4,158	676	19,515
CHEBOYGAN CO	13,800	358	64,141.09	5,905	2,578	19,139
CHIPPEWA COUNTY	35,800	597	135,750.74	9,127	19,216	32,266
SAULT ST MARIE	20,400	365	113,287.05	4,203	15,449	25,440
CLARE COUNTY	12,100	340	57,388.59	4,017	2,999	19,164
CLINTON COUNTY	41,900	497	129,673.54	16,149	4,747	38,789
CRAWFORD COUNTY	5,200	144	25,003.62	1,257	1,465	8,460
DELTA COUNTY	33,800	608	163,347.84	8,284	14,494	64,376
ESCANABA	15,200	344	130,346.38	5,306	12,431	49,169
DICKINSON COUNTY	24,300	491	103,528.80	5,964	9,081	26,291
EATON COUNTY	52,200	703	195,657.27	11,239	7,691	66,970
EMMET COUNTY	16,100	428	95,095.42	9,803	10,708	23,970
GENESEE COUNTY	401,700	3,925	2,575,754.79	137,577	261,221	630,071
FLINT	210,300	2,837	2,114,334.21	103,398	251,391	517,549
GLADWIN COUNTY	10,200	203	39,299.85	3,235	1,811	12,503
GOGEBIC COUNTY	22,000	455	83,100.63	5,740	13,523	27,774
IRONWOOD	9,300	245	58,692.08	2,585	10,464	19,309
GRAND TRAVERSE	35,300	633	245,782.64	21,673	20,410	40,145
TRAVERSE CITY	19,200	486	236,114.10	20,673	20,318	44,783
GRATIOT COUNTY	37,500	637	197,720.58	11,988	10,235	48,177
HILLSDALE COUNTY	33,800	574	143,434.41	12,255	12,382	38,333
HOUGHTON COUNTY	34,900	635	126,239.26	7,619	13,232	41,612
HURON COUNTY	34,500	656	140,597.45	10,641	6,244	39,675
INGHAM COUNTY	222,700	2,557	1,671,826.35	83,949	205,363	368,357
LANSING	120,500	1,793	1,423,392.08	60,332	194,386	290,483
EAST LANSING	32,300	175	108,223.51	3,215	8,057	33,405
IONIA COUNTY	43,600	646	176,579.22	9,502	6,300	52,211
IOSCO COUNTY	20,700	465	73,948.07	7,753	2,327	22,311
IRON COUNTY	15,900	301	60,790.53	2,846	3,906	18,750
ISABELLA COUNTY	35,200	467	148,632.22	10,689	12,893	38,148
MT PLEASANT	15,200	298	132,254.25	8,851	12,047	31,710
JACKSON COUNTY	133,900	1,640	759,632.33	44,048	78,040	209,557
JACKSON	51,400	1,205	671,563.08	33,641	76,230	179,709
KALAMAZOO CO	174,600	2,052	1,113,857.21	69,029	107,120	294,632
KALAMAZOO	84,100	1,633	972,264.53	53,903	104,669	236,501
KALKASKA COUNTY	4,400	107	15,724.07	1,498	400	3,609
KENT COUNTY	378,200	4,798	2,515,472.40	189,774	232,745	617,257
GRAND RAPIDS	209,500	3,726	2,097,015.50	144,306	205,723	510,425
WYOMING	51,700	130	99,654.27	10,202	22,783	34,792
EAST GR RAPIDS	11,100	17	7,564.94	2,789	569	65
KEWEENAW COUNTY	2,500	35	13,055.00	456		2,425
LAKE COUNTY	5,200	138	12,104.37	1,301	1,528	5,745
LAPEER COUNTY	43,400	572	161,818.99	10,077	8,057	49,023
LEELANAU CO	9,400	164	25,013.02	2,221	1,622	10,730
LENAWEE COUNTY	75,700	1,260	363,579.33	27,030	26,722	110,082
ADRIAN	19,800	452	213,443.91	12,500	21,222	54,962
LIVINGSTON CO	39,600	575	164,243.22	12,207	4,460	49,020
LUCE COUNTY	7,200	110	25,018.20	1,230	1,418	8,167
MACKINAC COUNTY	10,600	265	28,036.28	3,033	1,462	10,101
MACOMB COUNTY	478,000	4,257	2,837,301.89	202,595	340,300	780,001
WARREN	118,700	962	620,772.08	82,300	99,178	226,392
ROSEVILLE	55,800	388	470,045.76	10,204	176,413	86,832
EAST DETROIT	49,900	413	464,760.19	41,300	1,168	108,312
ST CLAIR SHORE	85,100	576	330,652.03	8,795	9,009	107,621
MT CLEMENS	24,100	770	397,777.10	13,717	47,914	110,606
CENTERLINE	11,100	130	69,204.92	13,993	289	28,282
MANISTEE COUNTY	19,200	391	86,554.56	6,341	8,454	26,672
MARQUETTE COUNTY	61,400	783	228,759.04	12,612	21,828	61,819
MARQUETTE	21,800	318	119,281.25	8,288	14,776	20,188
MASON COUNTY	21,700	404	101,481.85	4,827	6,399	35,907
MECOSTA COUNTY	21,800	361	85,967.93	6,515	5,465	26,366
MENOMINEE COUNTY	24,300	401	60,189.64	3,402	4,941	25,084
MENOMINEE	11,200	202	37,202.40	1,579	3,197	17,004

TABLE IV SALES TAX COLLECTIONS BY COUNTIES, SELECTED CITIES (10,000 OR OVER) AND EIGHT

COUNTY & CITY	POPULATION(a)	# OF RETURNS	TOTAL SALES TAX COLLECTED MAY 1965	BUILDING MATERIAL	GENERAL MERCHANDISE	FOOD
MIDLAND COUNTY	52,500	561	265,728.26	19,198	25,874	69,316
MIDLAND	28,600	388	246,115.83	17,717	24,058	61,416
MISSAUKEE COUNTY	6,400	122	14,719.48	810	1,218	4,377
MONROE COUNTY	103,400	1,276	395,784.76	16,677	29,114	113,914
MONROE	23,300	613	301,159.48	9,019	27,159	82,588
MONTCALM COUNTY	37,200	666	181,709.34	10,156	6,388	55,630
MONTMORENCY CO	4,200	127	16,343.76	2,261		4,726
MUSKEGON COUNTY	152,700	1,764	802,643.10	45,793	66,939	213,493
MUSKEGON	46,900	1,175	557,107.99	25,742	61,346	160,627
MUSKEGON HTS	20,100	257	146,148.83	5,280	2,326	19,627
NEWAYGO COUNTY	24,700	433	86,865.30	7,068	3,450	27,051
OAKLAND COUNTY	723,800	7,229	5,030,383.27	285,018	630,224	1,297,616
PONTIAC	84,800	1,410	1,052,591.22	37,862	161,234	237,966
ROYAL OAK	84,200	772	489,438.98	26,408	24,848	156,309
FERNDALE	31,900	407	445,193.73	11,673	14,201	65,804
OAK PARK	37,500	353	195,709.62	13,241	15,085	89,606
SOUTHFIELD	35,300	441	627,816.66	41,287	296,811	87,604
MADISON HTS	35,300	210	132,487.57	14,740	26,492	58,853
BERKLEY	23,700	224	309,310.63	4,362	1,397	35,885
HAZEL PARK	26,400	291	118,332.14	9,814	25,624	45,741
BIRMINGHAM	26,500	475	487,729.82	34,439	6,175	107,660
TROY	20,700	196	94,191.27	3,652	15,001	51,631
CLAWSON	15,400	121	114,906.35	5,050	26,678	54,614
OCEANA COUNTY	16,600	289	50,808.19	4,551	1,545	18,518
OGEMAW COUNTY	9,200	247	40,410.04	3,977	1,839	13,843
ONTONAGON COUNTY	11,100	186	32,361.64	2,399	3,358	12,038
OSCEOLA COUNTY	13,500	265	43,491.42	5,383	2,284	13,640
OSCODA COUNTY	3,500	130	10,661.25	1,500	1,323	3,052
OTSEGO COUNTY	8,400	215	47,784.87	3,614	1,445	11,241
OTTAWA COUNTY	106,300	1,445	462,325.84	46,257	27,379	130,343
HOLLAND	25,500	551	242,830.79	19,896	18,601	63,391
GRAND HAVEN	11,400	234	107,577.96	3,071	5,261	30,583
PRESQUE ISLE CO	13,000	218	44,392.23	3,609	574	14,105
ROSCOMMON COUNTY	7,300	380	37,386.12	5,179	765	11,195
SAGINAW COUNTY	196,500	2,300	1,189,584.65	77,420	127,394	295,637
SAGINAW	100,600	1,718	1,042,311.98	64,676	124,339	246,541
ST CLAIR COUNTY	105,800	1,513	520,221.72	31,071	61,987	161,507
PORT HURON	36,100	745	371,212.56	20,906	56,548	106,931
ST JOSEPH COUNTY	42,300	828	199,674.13	12,626	11,151	53,146
SANILAC COUNTY	32,900	571	122,789.58	10,336	6,562	34,888
SCHOOLCRAFT CO	8,400	218	32,861.14	2,393	2,390	10,984
SHIAWASSEE CO	55,000	780	262,986.78	15,000	23,955	78,033
OWOSSO	17,700	389	151,045.18	9,049	20,790	52,221
TUSCOLA COUNTY	43,800	653	169,329.57	14,366	9,189	53,785
VAN BUREN COUNTY	50,700	849	207,437.12	13,637	4,937	67,372
WASHTENAW COUNTY	185,100	1,952	1,132,372.80	66,775	91,605	315,093
ANN ARBOR	72,700	942	666,684.43	39,444	69,898	156,437
YPSILANTI	22,900	474	316,519.41	12,145	17,737	111,645
EASTLAWN						
WAYNE COUNTY	2,657,300	28,496	17,063,621.56	746,584	2,033,967	4,428,141
DETROIT	1,628,700	20,242	11,035,519.26	539,230	1,043,624	2,833,343
DEARBORN	113,800	1,412	1,007,938.83	41,640	117,638	292,616
HIGHLAND PARK	36,700	395	375,110.82	7,133	83,173	74,530
HAMTRAMCK	33,100	473	264,818.26	8,015	17,066	61,350
WYANDOTTE	43,800	539	291,579.08	11,036	13,071	69,446
ALLEN PARK	38,000	242	212,517.69	5,642	22,984	81,249
LINCOLN PARK	55,100	401	437,520.63	9,928	134,052	110,242
SOUTHGATE	29,700	135	217,444.66	586	99,109	82,479
RIVER ROUGE	18,300	194	152,171.70	1,610	2,309	26,278
ECORSE	17,600	188	66,753.31	613	2,054	37,015
LIVONIA	74,900	629	818,840.88	43,510	212,028	193,346
INKSTER	37,600	271	146,196.71	7,833	14,184	65,871
GROSSE PTE PRK	15,200	69	15,371.03	491		6,183
TRENTON	19,100	199	87,410.31	9,531	3,229	25,179
WAYNE	22,000	451	388,507.98	11,910	6,806	80,014
GROSSE PTE WDS	18,900	131	47,867.63	3,221		21,844
MELVINDALE	13,300	141	28,006.00	1,258	112	13,681
GROSSE PTE FRM	12,000	66	44,524.98	371	14,466	8,885
HARPER WOODS	20,100	117	340,556.58	1,399	159,216	43,653
GARDEN CITY	40,000	337	216,682.01	4,666	75,835	75,858
WEXFORD COUNTY	18,600	383	105,342.02	6,448	7,316	27,984
CADILLAC	10,200	270	94,446.15	5,686	7,195	21,931
TOTAL MICHIGAN	8,030,000	98,766	47,014,853.80	2,656,004	4,952,199	12,468,644
OUT OF STATE		2,067	94,540.99	1,438	265	12,301
GRAND TOTAL	8,030,000	100,833	47,109,394.79	2,657,442	4,952,464	12,480,945

(a)Data from Michigan Department of Health estimates July 1, 1963.

U.S. population June 1965 - 194,538,000 Increase from June 1964 - 2,570,000

wesc 3221
(Rev. 12-62)

Note: Use reporter pencil only. Write with heavy pressure.

LABOR FORCE AND EMPLOYMENT ESTIMATES
(St. Clair County)

Area: Port Huron
Period: 1965 Revised BM Series: 3'65

ITEM	January	February	March	April	May	June	July	August	September	October	November	December	Monthly Average
I. TOTAL LABOR FORCE	34,000	34,200	33,600	34,100	34,700	35,400	35,200	35,000	34,400	34,400	34,500	34,800	34,500
II. AGRICULTURAL EMPLOYMENT	1,300	1,400	1,400	1,700	1,900	2,000	2,100	2,100	1,800	1,600	1,400	1,300	1,700
III. NON-FARM LABOR FORCE	32,700	32,800	32,200	32,400	32,800	33,400	33,100	32,900	32,600	32,800	33,100	33,500	32,900
IV. UNEMPLOYMENT	2,400	2,400	1,900	1,500	1,200	1,200	1,200	1,500	1,300	1,000	1,300	1,600	1,500
A. Unemployment as % of total labor force	7.1	7.0	5.7	4.4	3.5	3.4	3.4	4.3	3.8	2.9	3.8	4.6	4.3
V. WORKERS INVOLVED IN LABOR-MANAGEMENT DISPUTES	-	-	-	-	-	-	200	-	-	-	-	-	-
VI. TOTAL NON-FARM EMPLOYMENT	30,300	30,400	30,300	30,900	31,600	32,200	31,700	31,400	31,300	31,800	31,800	31,900	31,300
A. Self-employment (including domestic)	4,500	4,500	4,400	4,500	4,600	4,700	4,800	4,600	4,500	4,400	4,400	4,400	4,500
B. WAGE AND SALARY WORKERS	25,800	25,900	25,900	26,400	27,000	27,500	26,900	26,800	26,800	27,400	27,400	27,500	26,800
1. MANUFACTURING INDUSTRIES	10,000	10,100	10,100	10,200	10,200	10,300	9,800	9,900	10,000	10,200	10,300	10,300	10,100
a. Durable goods industries	7,100	7,100	7,200	7,300	7,300	7,400	7,100	7,000	7,100	7,200	7,300	7,300	7,200
(1) Lumber and wood products (24)	100	100	100	100	100	100	100	100	100	100	100	100	100
(2) Furniture and fixtures (25)	--	--	--	--	--	--	--	--	--	--	--	--	-
(3) Metal industries	4,200	4,100	4,200	4,200	4,200	4,300	4,200	4,100	4,200	4,200	4,200	4,100	4,200
(a) Primary metal products (33)	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
(b) Fabricated metal products (34)	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
(4) Machinery (non-electrical) (35)	1,300	1,300	1,300	1,400	1,400	1,300	1,300	1,300	1,300	1,300	1,300	1,400	1,300
(5) Electrical machinery (36)	--	--	--	--	--	--	---	--	--	--	--	--	-
(6) Transportation equipment	1,000	1,000	1,000	1,000	1,000	1,000	900	900	1,100	1,200	1,300	1,300	1,100
(a) Motor vehicles & equipment (371)	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
(b) Other transp.,equip.(372-375,379)	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
(7) Other durable goods (19, 32, 38, 39)	500	500	600	600	600	500	500	500	300	400	400	400	500
(a)													
b. Non-durable goods industries	2,900	3,000	2,900	2,900	2,900	2,900	2,800	2,900	3,000	3,000	3,000	3,000	2,900
(1) Food and kindred products (20)	500	500	400	400	500	500	500	500	500	500	400	400	500
(2) Textile mill products & apparel(22,23)	100	100	100	100	100	100	100	100	100	200	200	200	100
(3) Paper and allied products (26)	700	700	700	700	700	700	800	800	800	800	800	800	800
(4) Printing, publishing & allied (27)	200	200	200	200	200	200	200	200	200	200	200	200	200
(5) Chemicals, petroleum & related (28,29)	700	700	700	700	700	700	700	700	700	700	700	700	700
(6) Other non-durable goods (21, 30, 31)	700	800	800	700	700	700	500*	600	600	600	600	600	700
(a)													
2. NON-MANUFACTURING INDUSTRIES	12,200	12,300	12,300	12,700	13,200	13,600	13,700	13,600	13,400	13,500	13,500	13,500	13,100
a. Construction (15-17)	1,100	1,100	1,000	1,200	1,400	1,600	1,500	1,400	1,200	1,300	1,200	1,100	1,200
b. Transp., commun., & utilities (40-49)	2,500	2,500	2,500	2,500	2,600	2,600	2,600	2,600	2,600	2,600	2,700	2,700	2,600
c. Wholesale trade (50)	700	700	700	700	700	700	800	800	800	800	700	700	700
d. Retail trade (52-59)	4,100	4,100	4,100	4,300	4,400	4,500	4,400	4,400	4,500	4,500	4,500	4,700	4,400
e. Finance, real estate & insurance (60-67)	700	700	700	700	700	700	800	800	800	800	800	800	800
f. Service (70-89) & Misc.	3,200	3,300	3,200	3,200	3,400	3,500	3,600	3,600	3,500	3,500	3,500	3,400	3,400
g. Mining (10-14)													
(1)													
3. GOVERNMENT	3,500	3,500	3,500	3,500	3,500	3,600	3,300	3,300	3,300	3,700	3,700	3,700	3,500
a. Federal	300	300	300	300	300	300	300	300	300	300	300	300	300
b. State	100	100	100	100	100	100	100	100	100	100	100	100	100
c. Local	3,100	3,100	3,100	3,100	3,100	3,200	2,900	2,900	2,900	3,300	3,300	3,300	3,100

Asterisk indicates that a labor dispute involving more than 100 workers existed in that industry.

FIGURE 12

SECTION I: Public Four-Year Colleges And Universities

CENTRAL MICHIGAN UNIVERSITY
Mt. Pleasant 48858 **517-774-3151**

STUDENT BODY: coed; CALENDAR SYSTEM: semester; HIGHEST OFFERING: beyong master's but less than doctorate; TYPE OF PROGRAM: terminal occupational below the bachelor's level, liberal arts and general, teacher preparatory; ENROLLMENT FALL 1970: 16,247; ACCREDITATION CODE: N, chem, mus, ted.

President	Dr. William B. Boyd
Provost	Dr. Charles J. Ping
Coordinator Space Utilization	Mr. A. W. Coen
Vice Provost - Instruction and Research	Dr. Ernest L. Minelli
Coord. Institutional Research	Dr. R. Adam Sauerbrun
Vice Provost - Business	Mr. J. Ronald Tubbs
Vice Provost - Administration	Dr. Neil S. Bucklew
Vice President - Public Affairs	Mr. Arthur E. Ellis
Registrar	Mr. George N. Lauer
Vice Provost - Student Services	Dr. Albert S. Miles
Director of Admissions	Mr. Austin J. Buchanan
Director of the Library	Mr. John W. Weatherford
Director of Alumni Association	Mr. D. W. Carr
Director of Placement	Mr. Charles D. Alexander
Dean of Arts and Sciences	Dr. R. V. Dietrich
Dean Health - Phy. Ed-Recreation	Dr. William V. Theuniissen
Dean of Graduate School	Dr. Olaf W. Stag
Dean Business Administration	Dr. W. Lyle Wilhite
Dean of Education	Dr. Curtis E. Nash
Dean of Fine and Applied Arts	Dr. Frank S. Stillings
Dean of Offcampus Education	Dr. J. D. Marcus

EASTERN MICHIGAN UNIVERSITY
Ypsilanti 48197 **313-487-1849**

STUDENT BODY: coed; CALENDAR SYSTEM: other; HIGHEST OFFERING: beyond master's but less than doctorate; TYPE OF PROGRAM: terminal occupational below the bachelor's level, 2-yr wholly or principally creditable toward bachelor's, liberal arts and general, teacher preparatory, professional; ENROLLMENT FALL 1970: 22,619; ACCREDITATION: N, chem, mus, ot, ted.

President	Dr. Harold E. Sponberg
Vice President for Instruction	Dr. B. K. Nelson
Vice Pres. Business and Finance	Mr. L. E. Profit
Vice Pres. for Student Affairs	Dr. James B. Campbell
Exec. Dir. of Univ. Relations	Mr. Gary Hawks
Director of Univ. Budgets	Mr. Richard W. Hall
Director of Placement	Mr. Richard J. Nisbet
Dir. of Administrative Systems	Mr. James N. Finzel
Dean Records and Teacher Cert.	Dr. Everett L. Marshall
Dean Admission & Financial Aid	Mr. R. F. Gilden
Dean of Students	Dr. L. S. Maclean
Dean of Arts and Sciences	Dr. D. F. Drummond
Dean of the Graduate School	Dr. Omer Robbins
Dean of Business	Dr. Earl A. Roth
Dean of Education	Dr. Allen S. Myers
Dean of Academic Services	Dr. Valmore Goines
Dean Summer & Evening Session	Dr. Julius M. Robinson
Dean of International Studies	Dr. R. Stanley Gex
Librarian	Mr. Albert P. Marshall
Director of Field Services	Mr. Earl K. Studt
Dir. Alumni - Dir. Development	Mr. Lonny G. Head
Dir. Special Projects - Research	Mrs. Lee Katz
Asst. Vice Pres. for Bus. & Finance (Physical Plant and Development)	Mr. Rene E. Hauser

FERRIS STATE COLLEGE
Big Rapids 49307 **616-796-9971**

STUDENT BODY: coed; CALENDAR SYSTEM: quarter; HIGHEST OFFERING: 4 or 5 year baccalaureate degree granting program; TYPE OF PROGRAM: terminal occupational below the bachelor's level, liberal arts and general, teacher preparatory, professional; ENROLLMENT FALL 1970: 9,057; ACCREDITATION CODE: N, da, dh, dt, phar, xt.

President	Dr. Robert L. Ewigleben
Vice Pres. Administrative Affairs	Dr. J. W. Wenrich
Vice Pres. Business Operation	Dr. C. W. Rhodes
Vice Pres. for Academic Affairs	Dr. James V. Farrell
Vice Pres. for Student Affairs	Mr. Edward Linta
Vice Pres. for Col. Rel. & Dev.	Mr. Stanley J. Dean
Asst. Vice Pres. for Bus. Oper.	Mr. George A. Hartford
Asst. V.P. for Alum. Aff. and Dev.	Mr. Max E. Smith
Comptroller	Mr. Ralph L. Erlewine
Dean of Educ. Planning	Dr. John L. Johnson
Dean of Student Services	Mr. Donald F. Rankin
Dean of Student Life	Dr. Donald T. Suit
Director of Learning Center	Dr. Charles F. Ritchie
Educational Facilities Coord.	Dr. Bill H. Schulte
Dir. Admissions & Registration	Mr. Karl S. Walker
Librarian	Mrs. Goldie T. Nott
Registrar	Mr. Mahlon J. Herrick
Counselor for Men	Mr. Thomas G. Walsh
Counselor for Women	Dr. Mary McClelland
Director of Computer Center	Vacant
Placement Director	Mr. Robert A. Large
Dean of Business	Dr. Richard T. Adams
Dean of Pharmacy	Dr. Richard A. Ohvall
Dean of General Education	Dr. Donald G. Butcher
Dean Technical & Applied Arts	Dr. S. E. Bychinsky
Dean of Teacher Education	Vacant
Dean Health Sciences and Arts	Mr. Aaron L. Andrews

GRAND VALLEY STATE COLLEGE
Allendale 49401 **616-895-6611**

STUDENT BODY: coed; CALENDAR SYSTEM: quarter; HIGHEST OFFERING: 4 or 5 year baccalaureate degree granting program; TYPE OF PROGRAM: liberal arts and general, teacher preparatory; ENROLLMENT FALL 1970: 3,301; ACCREDITATION CODE: N.

President	Mr. Arend D. Lubbers
Vice Pres. for Academic Affairs	Vacant
Vice Pres. Student Affairs	Mr. Kenneth Venderbush
Vice Pres. College Relations	Mr. Roy Lumsden
Vice Pres. for Administration	Mr. Arthur C. Hills
Business Manager	Mr. Ronald Van Steeland
Physical Plant Manager	Mr. Robert Romkema
Director of Libraries	Mr. Stephen Ford
Registrar	Mr. R. Bruce Tweddale
Director of Admissions	Mr. William P. Putnam
Dir. Financial Aid & Placement	Mr. Kenneth Fridsma
Director of Computer Center	Mr. Gordon Stegink
Dean College Arts & Sciences	Mr. Glenn Niemeyer
Dean Thomas Jefferson College	Mr. T. Dan Gilmore

LAKE SUPERIOR STATE COLLEGE
Sault Ste. Marie 49783 **906-632-6841**

STUDENT BODY: coed; CALENDAR SYSTEM: quarter; HIGHEST OFFERING: 4 or 5 year baccalaureate degree granting program; TYPE OF PROGRAM: terminal occupational below the bachelor's level, 2-yr wholly or principally creditable toward bachelor's, liberal arts and general, teacher preparatory, professional; ENROLLMENT FALL 1970: 1,668; ACCREDITATION CODE: N, tech.

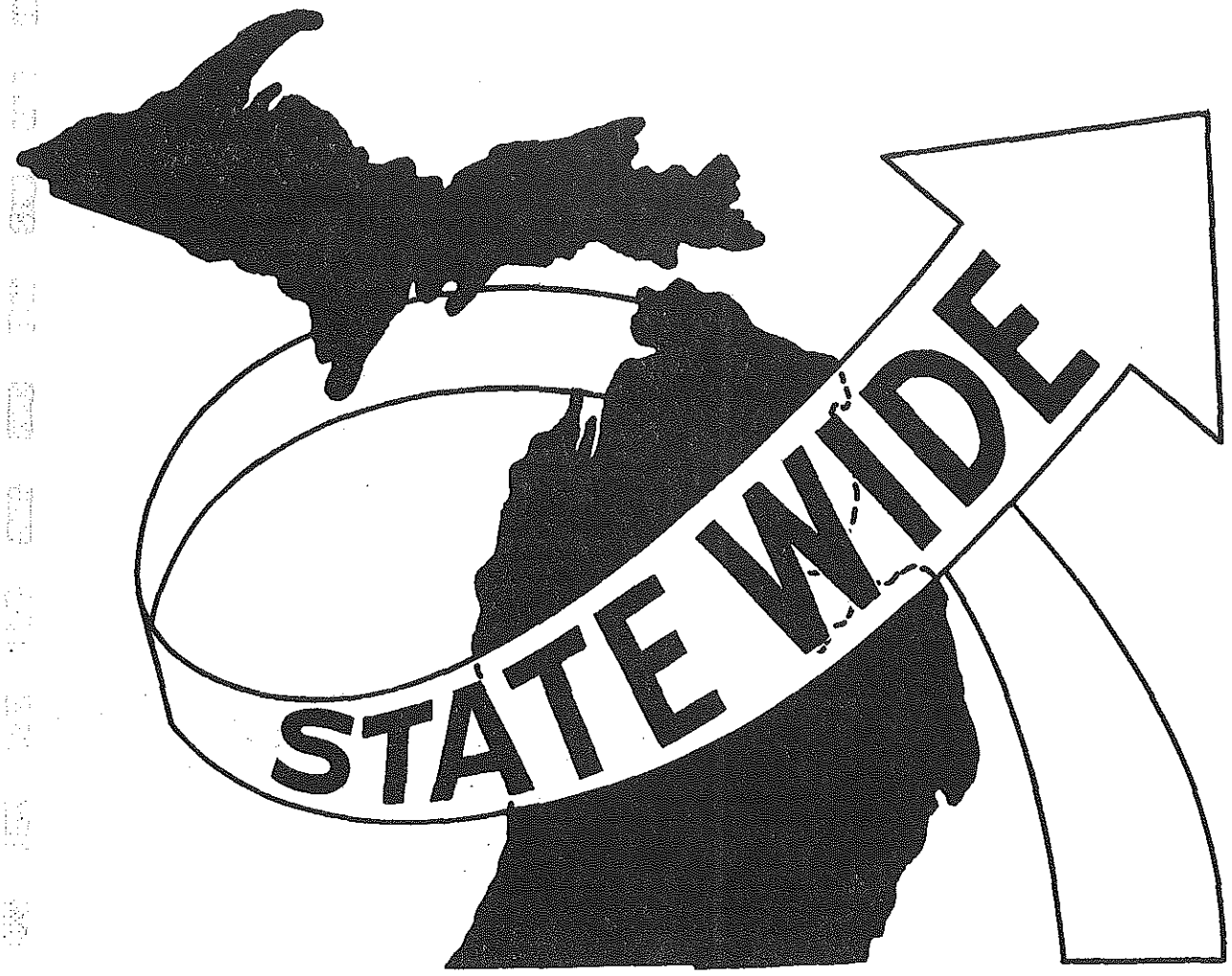
President	Dr. Kenneth J. Shouldice
Vice Pres. for Academic Affairs	Dr. Kenneth F. Light
Vice Pres. for Business Affairs	Mr. Lyle F. Shaw
Registrar	Mr. Duane R. Graham
Dean of Admissions	Mr. James E. Honkanen
Director of the Library	Mr. Charles E. Nairn
Director of Regional Services	Mr. Walter M. Gendzwill
Dean of Students	Dr. Harry E. Pike
Assistant to the President	Dr. John M. Matheson
Director of College Relations	Mr. W. T. Rabe
Director of Placement	Mr. Paul E. Ripley
Director of Computer Services	Mr. Robert L. Otto

MICHIGAN STATE UNIVERSITY
East Lansing 48823 **517-355-1855**

STUDENT BODY: coed; CALENDAR SYSTEM: quarter; HIGHEST OFFERING: doctorate; TYPE OF PROGRAM: terminal occupational below the bachelor's level, liberal arts and general, teacher preparatory, professional; ENROLLMENT FALL 1970: 44,092; ACCREDITATION CODE: N, bus, chem, eng, for, jour, med, mus, nur, sw, ted, vet.

President	Dr. Clifton R. Wharton, Jr.
Provost	Dr. John E. Cantlon
Acting Vice Pres for Business	Mr. Roger E. Wilkinson
Vice Pres. Research and Develop.	Dr. Milton E. Muelder
Vice Pres. for Special Projects	Dr. G. A. Sabine

Socio-Economic Data Manipulation And Zonal Summarization



SOCIO-ECONOMIC DATA MANIPULATION AND ZONAL SUMMARIZATION

The choices of the various data entries in the Socio-Economic Data Bank were originally dependent upon three objectives. The initial effort was to satisfy the data requirements for developing a trip generation-distribution model for Michigan. This file included zonal population and surrounding population. Next, data was needed as input to an updated version of the original trip generation-distribution model. This file was comprised of employment, population density, accessibility index, and urban-suburban-rural designation. Lastly, data was collected for use in the development of a separate vacation travel model. Water area, developed lake frontage, recreational facilities and retail sales tax are included within this category. The data manipulation and summarization required to develop a statewide zonal data file will be discussed in the following paragraphs.

Zonal Population

For use in the working version of the trip generatiin model acquired from Arthur D. Little, Inc., zonal population was the intial entry into the Socio-Economic Data Bank. As indicated in Figure 3, the raw population was listed by township or city within each county. The first step taken in transforming this population into useable data for the file involved transferring the original data from the table onto coding forms to be keypunched. Each record consisted of a zone number, township or city name, and the 1965 population (Figure 14).

STATE OF MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

Form 1720

Columns 1–4	Columns 6–26	Columns 27–30
0101	HARRISVILLE TWP	1227
0101	GREENBUSH TWP	536
0101	CALEDONIA TWP	667
0101	ALCONA TWP	384
0101	GUSTIN TWP	670
0101	HAWES TWP	617
0101	HAYNES TWP	349
0101	MIKADO TWP	564
0102	MITCHELL TWP	180
0102	MILLEN TWP	305
0102	CURTIS TWP	651

FIGURE 14

After keypunching, the cards were loaded onto a computer disk file by means of a standard program and accessed by a remote terminal linked with the computer. A program was then written to accumulate all like zone numbers, sum their populations, and write this information onto a new disk file in a specified format. A second standard program was then run on this file to produce a card deck used as input to the trip generation program of the model calibration process. The disk file from which these cards were punched remained as a permanent disk file and the start of the Socio-Economic Data Bank.

At a later date, it was decided to add to the zonal populations the projections from 1970-2000 in five year increments. Using the same data base as for the 1965 population, the 1985, 1990, and 1995 populations were interpolated. At this time, the 1970 census figures for Michigan populations was available and adjustments were made to the original projections using the following method:

$$\frac{\text{Actual 1970 Population}}{\text{Projected 1970 Population}} \times \text{Projected year (i.e., 1975, 1980 . . . 2000)}$$

When all the adjustments were finalized, these totals were also coded onto keypunch coding forms. Again each record contained zone number, township or city name, and the populations for 1970-2000 incremented every five years. A slight modification was made to the original program for accumulation of 1965 populations mentioned above, and a population deck punched out for each specified year.

This second file was then merged with the original master file. All programs were run through the use of the terminal located within the Unit.

The conversion process for each data entry was very similar. To avoid repetition in the following discussion, as each additional data bank item is covered, only variation in data manipulation techniques from those just discussed will be defined.

Surrounding Population

Surrounding Population was originally obtained along with the trip generation package from Arthur D. Little, Inc. Surrounding population, as defined by the consultants was derived by taking percentages of population within pre-selected "time bands" around the population center of a specified zone. These time bands are in the increments 0-20 minutes, 20-30 minutes, and 30-40 minutes of travel time from the study zone based on existing roads and their travel time. In the original equation, the surrounding population for any specified zone was said to be 100 percent of the population within the 0-20 minute band, 50 percent of the population within the 20-30 minute band, and 25 percent of the population within the 30-40 minute band.

The actual surrounding population which was input to the Socio-Economic Data Bank was calculated by a computer program supplied by the consultants.

As mentioned in the introduction, it was the intention of the Statewide Studies Unit to produce a more realistic

version of the existing trip generation model. In order to accomplish this, additional input variables were identified to update the equations originally designed by the consultants. The next four data entries comprise the information collected to satisfy that goal.

Population Density

This section of the file was the first effort to expand the reliability of the model by inputing more variables into the original mathematical equations for trip generation. This data was used to stratify the zone system for future model calibration runs. The idea behind the use of population density lies in the reasoning that a large population confined within a small area will likely generate trips differently than a similar population distributed over a large area. At this point, the land area data was added to the data bank and, with the aid of a small computer program, was combined with zonal population to produce population density.

Urban-Suburban-Rural Designation

This section of the Socio-Economic Data Bank is related to population density and surrounding population. Population density was used along with a measure of subjectivity in determining whether each zone was to be designated as an urban zone, a suburban zone, or a rural zone. This type of designation was intended to help in future trip generation models by stratifying surrounding population according to zonal characteristics. The original trip generation model

made no such distinction and did not predict trips realistically in certain situations.

Accessibility Index

The accessibility index for each zone is calculated using a standard program from Michigan's Transportation Analysis computer package. This program assigns a relative accessibility index to each zone based on a combination of driving time to that zone and the socio-economic characteristics of that zone. The driving time is calculated by a "skim tree" program which is a time table (on magnetic computer tape) of the shortest path between zones in travel minutes based on existing speeds and distances of the highway network. The zonal characteristics are input by the use of cards, with its particular data. These characteristics may include, for instance, any of the data entries mentioned so far. The accessibility index for each zone in the Socio-Economic Data Bank is based on zonal population within 60 minutes driving time of that zone.

The output from the program used to calculate the accessibility index may be specified as cards. This eliminated the keypunching process and the cards were loaded directly onto a disk file and merged with the master.

Employment

While attempting to provide an employment variable for an updated trip generation model, the problem of "level of detail" arose. The most reliable source for this data was the Michigan Employment Security Commission.

Zonal employment figures as input to the equation for trip generation are thought to be more desirable than resident labor force (which was available at township level), the distinction being the total number of people actually employed in a particular zone as opposed to the number of employed people residing in that same zone. The value of "employment by zone" would lend itself favorably to the gravity model situation. However, county level data was the finest aggregation possible from this or any other source, and solutions are being sought to remedy this situation.

An attempt at a solution to the problem of subdividing county totals into the analysis zone size by using mailing address failed. The addresses of all businesses operating within the state and employing six or more persons is available on magnetic computer tape from the Michigan Employment Security Commission. However, in the case of a large department store (which is one of a nation-wide chain) the address of the "home-based" office is given. In many instances, this was an out of state address.

A plan to use zip code also proved fruitless as zip code boundaries sometimes meandered about without apparent reason except to cover the extent of each specified mailman's route; i.e., boundaries often crossed each other any number of times and attempts to group them within any definite cordon line was impossible.

As of this date, employment exists as a separate file derived through the process of manual coding, key-punching, and the use of the terminal. When a solution to the problem of how to "break down" the data to zonal level is reached, this file will be merged onto the master.

The third objective in the Socio-Economic Data Bank collection process was the search for data that could be used as input to a separate vacation model development process. Data collected for this phase was intended to supply information about the recreational potential of each of the zones in the 547 zone system.

Water Area

Water Area data was collected on the theory that the recreational attractiveness of a zone is correlated with the number of lakes within that zone. It was, however, also decided that water area as a gross total should not be used solely as an indicator of recreational attractiveness; that unaccessible lakes, or marshland should receive less attention than a developed lake. To accomodate this, developed lake frontage was obtained from the Department of Natural Resources.

Developed Lake Frontage

Under this file heading, water area was broken down into eight categories including:

1. Lake size
2. Total shoreline
3. Total private shoreline

4. Private occupied shoreline (developed shoreline)

5. Private wetland (swamps, marshes, and flooding areas)

6. Total public shoreline

7. Public occupied shoreline (State parks, boat landings etc.)

8. Public wetland

Recreational Facilities

The portion of the Socio-Economic Data Bank under this heading lists the number of public facilities contained in each zone. These include state and county parks and campgrounds, boat landings, roadside parks, etc. Again, sole dependence on this factor alone does not lend itself to a completely accurate indication of a zone's recreational attractiveness. For instance, Oakland County contains nine state parks. This is decisively more than any other county, although it is not considered a highly recreational county. However, when used in conjunction with the other data collected (including retail sales tax, discussed below) a good indication of recreational attractiveness can be measured. The number of facilities were manually totaled at the 547 zone level using the maps illustrated in Figure 7.

Retail Sales Tax

Retail sales tax data was collected in an attempt to further stratify the 547 zone system into a Recreational-Non Recreational breakdown. It was the Unit's philosophy that the degree of fluctuation of retail sales was highly correlated with the type of travel in most areas. By analyzing a yearly chart of the tax on these sales, a distinction can

be made between areas as to their recreational potential. This was done by studying the retail sales tax per capita and noticing when this area "peaked" or reached a high in sales. For a non-recreational area, the graph of retail sales tax per capita peaked around December, indicating Christmas shopping. The remainder of months remained virtually constant. A recreational area produced a drastic incline between June and August, indicating an influx of money spent during the season when people were vacationing away from home.

Problems began at this phase of the collection process as these sales are reported only at the county level, with subdivisions for each city of population 10,000 or greater in that county. At the county level, the graph of retail sales tax per capita vs. the 12 months of the year 1965 produced a proportional likeness to the variance of trips generated by that county over a yearly period (Figures 15a and 15b). The same type of graph showed that a recreational county and all cities in that county with reported sales tax figures produced curves that were similar to each other (Figures 15c and 15d). With this in mind, when data for a zone was not available, the total sales tax for the county was distributed among each zone in relation to its percentage of population within that county.

Hospitals

This addition to the data bank was included as a result of Section 109 (h) of the Federal-Aid Highway Act of 1970.

FIGURE 15a

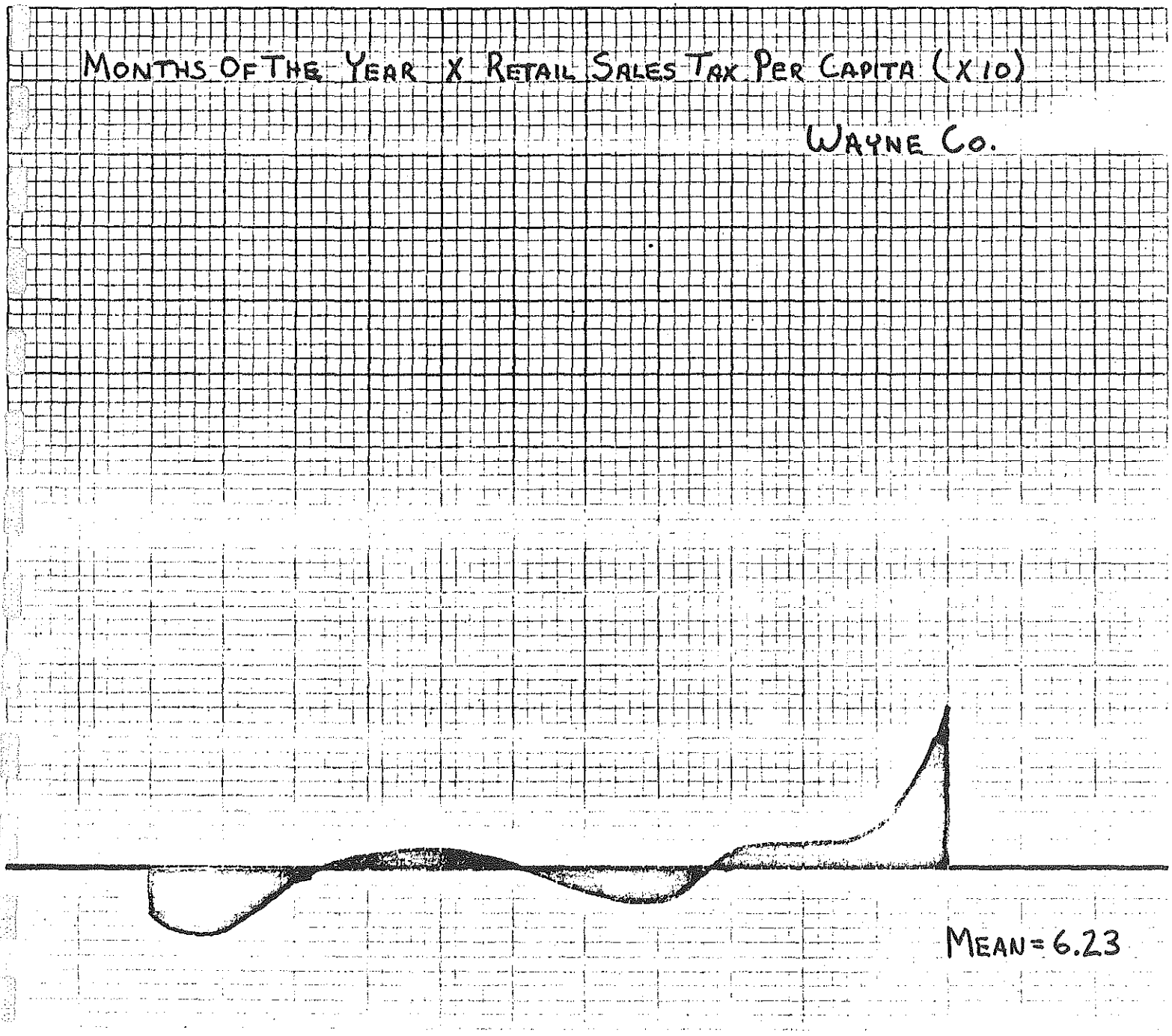

MONTHS OF THE YEAR X RETAIL SALES TAX PER CAPITA (X10)
WAYNE CO.
8
7
6
5
4
MEAN = 6.23
1 2 3 4 5 6 7 8 9 10 11 12

FIGURE 15b

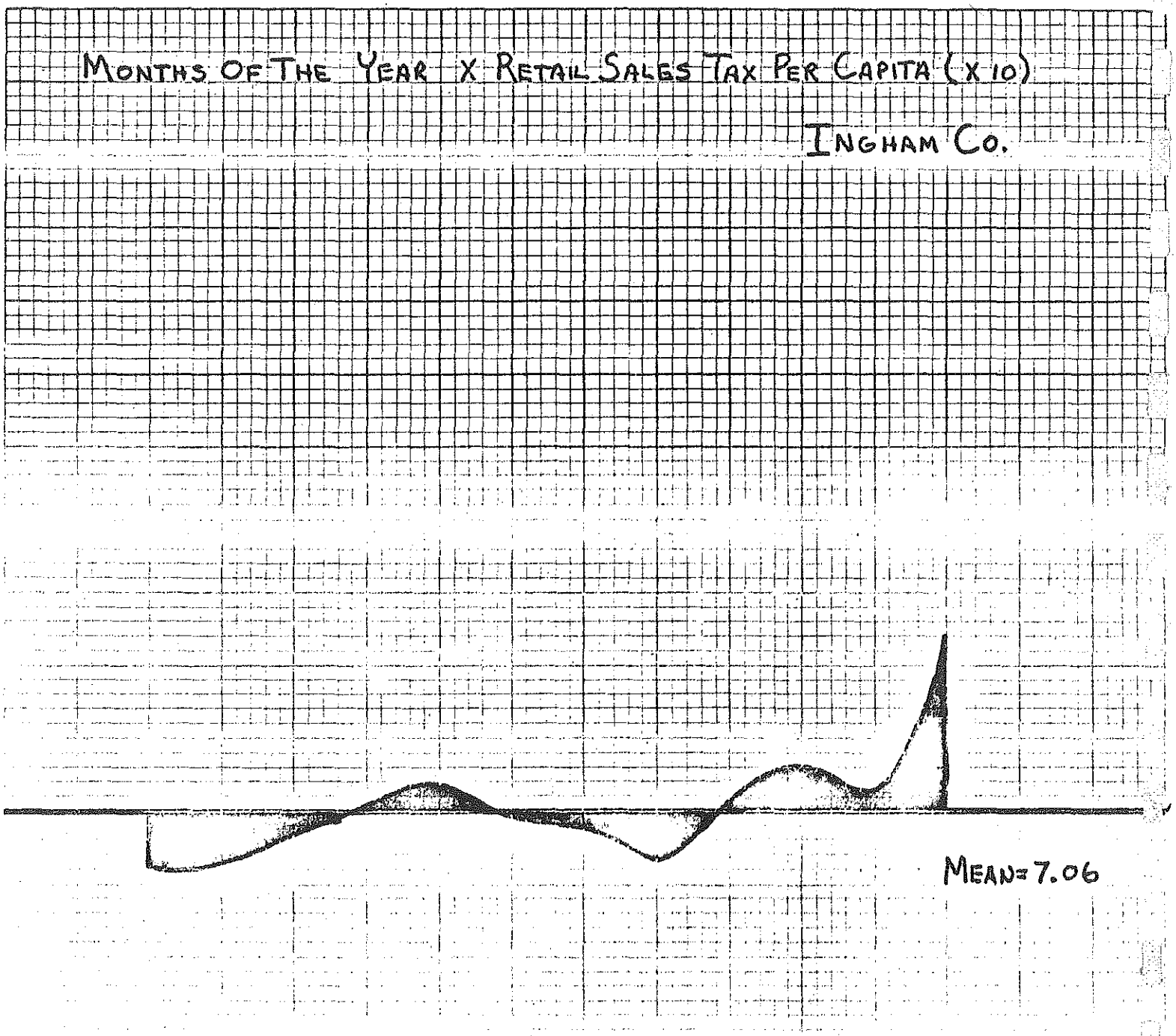

MONTHS OF THE YEAR X RETAIL SALES TAX PER CAPITA (X 10)
INGHAM CO.
9
8
7
6
MEAN=7.06
1 2 3 4 5 6 7 8 9 10 11 12

FIGURE 15c

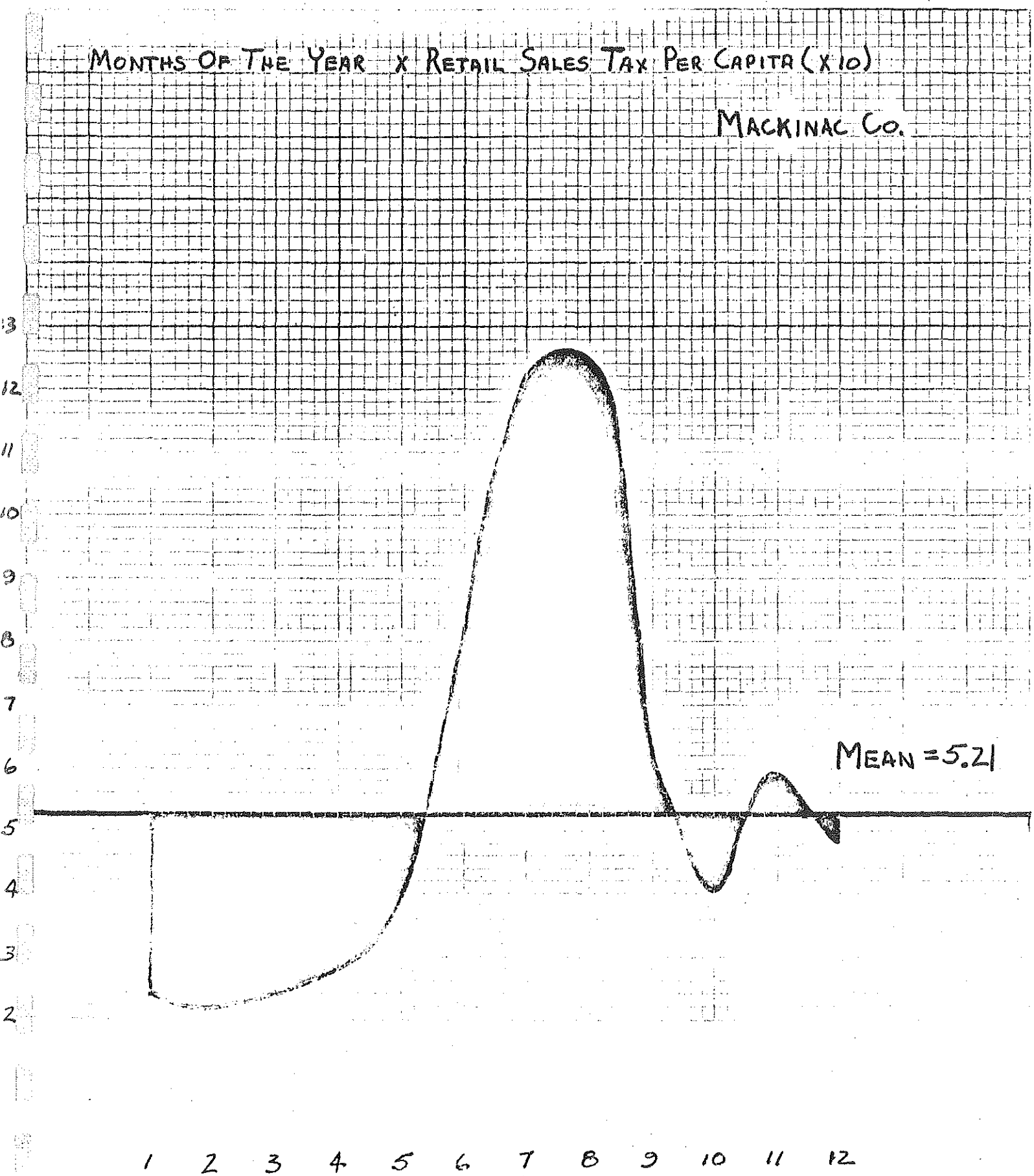
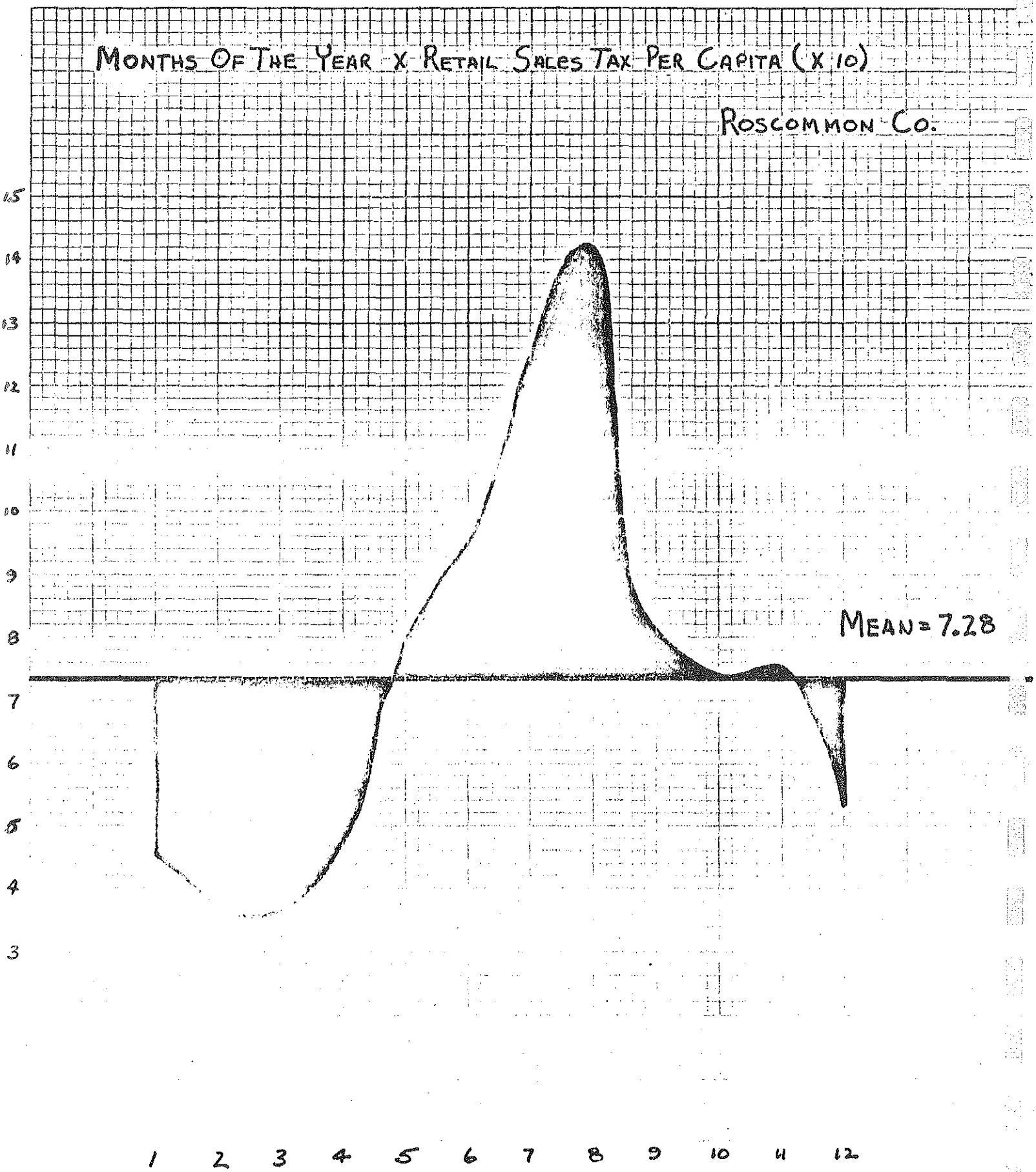

MONTHS OF THE YEAR x RETAIL SALES TAX PER CAPITA (X 10)
MACKINAC CO.
13
12
11
10
9
8
7
6
5
4
3
2
MEAN = 5.21
1 2 3 4 5 6 7 8 9 10 11 12

FIGURE 15d

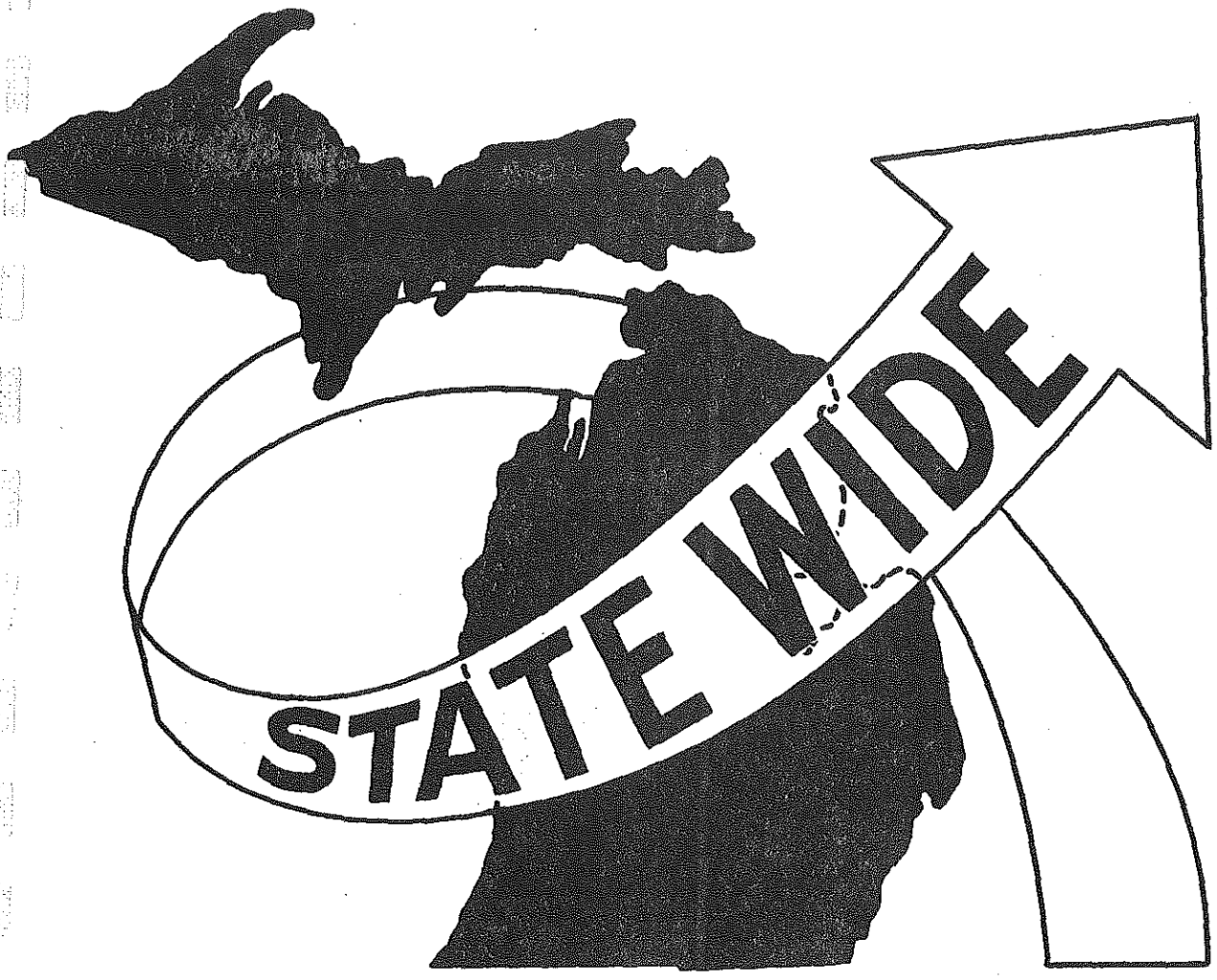

MONTHS OF THE YEAR X RETAIL SALES TAX PER CAPITA (X 10)
ROSCOMMON CO.
MEAN = 7.28
15
14
13
12
11
10
9
8
7
6
5
4
3
1 2 3 4 5 6 7 8 9 10 11 12

Briefly, this act states that the Highway Department must account for the social, economic, and environmental impacts of any future highway projects. This file consists of a list of the number of hospitals in each zone, and will be used to measure these effects on each hospital based on the existing highway network or any alternative plans.

State Educational Institutions

By adding data of this nature to the Socio-Economic Data Bank, it was the idea of the Statewide Studies Unit to be able to monitor what effect any alternate routes have on the colleges and universities throughout the state in terms of college age residents and their travel time to these institutions. Combining this section of the file with the census data file (which gives a breakdown of age by zone) a comparison of driving times to these institutions between alternative routes can be made. Thus, possible future building sites of new colleges could be chosen if an optimal location is desired.

GRAPHICAL PRESENTATION TECHNIQUES



GRAPHICAL PRESENTATION

Presently, there are two programs used in the statewide model analysis process that employ the use of graphical representation. The first and most widely used is a routine called SYMAP. This program produces output in the form of a map with up to ten levels of shading used to distinquish the variances for each area. The working version of SYMAP produces output at the 547 statewide zone level. Input may be any numerical data that the user wishes. Scaling, i.e., the level of shading representing each range of data, may also be specified by the user. Two options exist within this program, those being the ability to create a "flat tone" (Figure 16a) or a "contour" (Figure 16b) map. These two illustrations show the distribution of retail sales tax for each county for the month of June, 1965. This data was taken directly from the Socio-Economic file.

The second program, SYMVU, presents output in the form of a three-dimensional map. The magnetic computer tape created by running SYMAP is used as a basis for SYMVU. Because of the limitations of the working version at the present time, SYMVU is not used as extensively as it will be after modifications are made. Figure 17a is a sample of SYMVU run for retail sales tax by county. This map was produced from the magnetic tape created by the "flat tone" version of a SYMAP run. Figure 17b is an illustration of a SYMVU plot showing the percentage of population change

FIGURE 16a

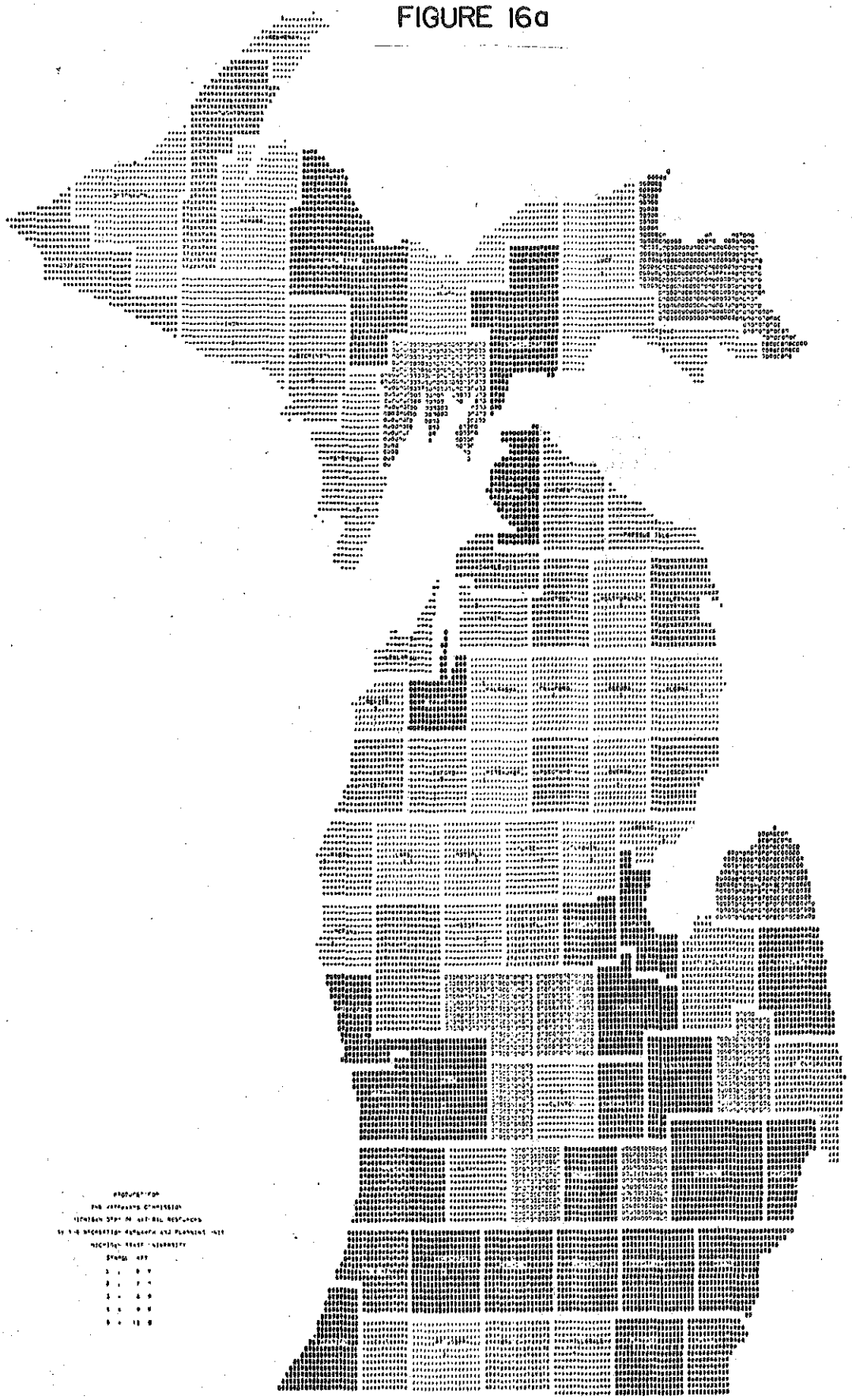
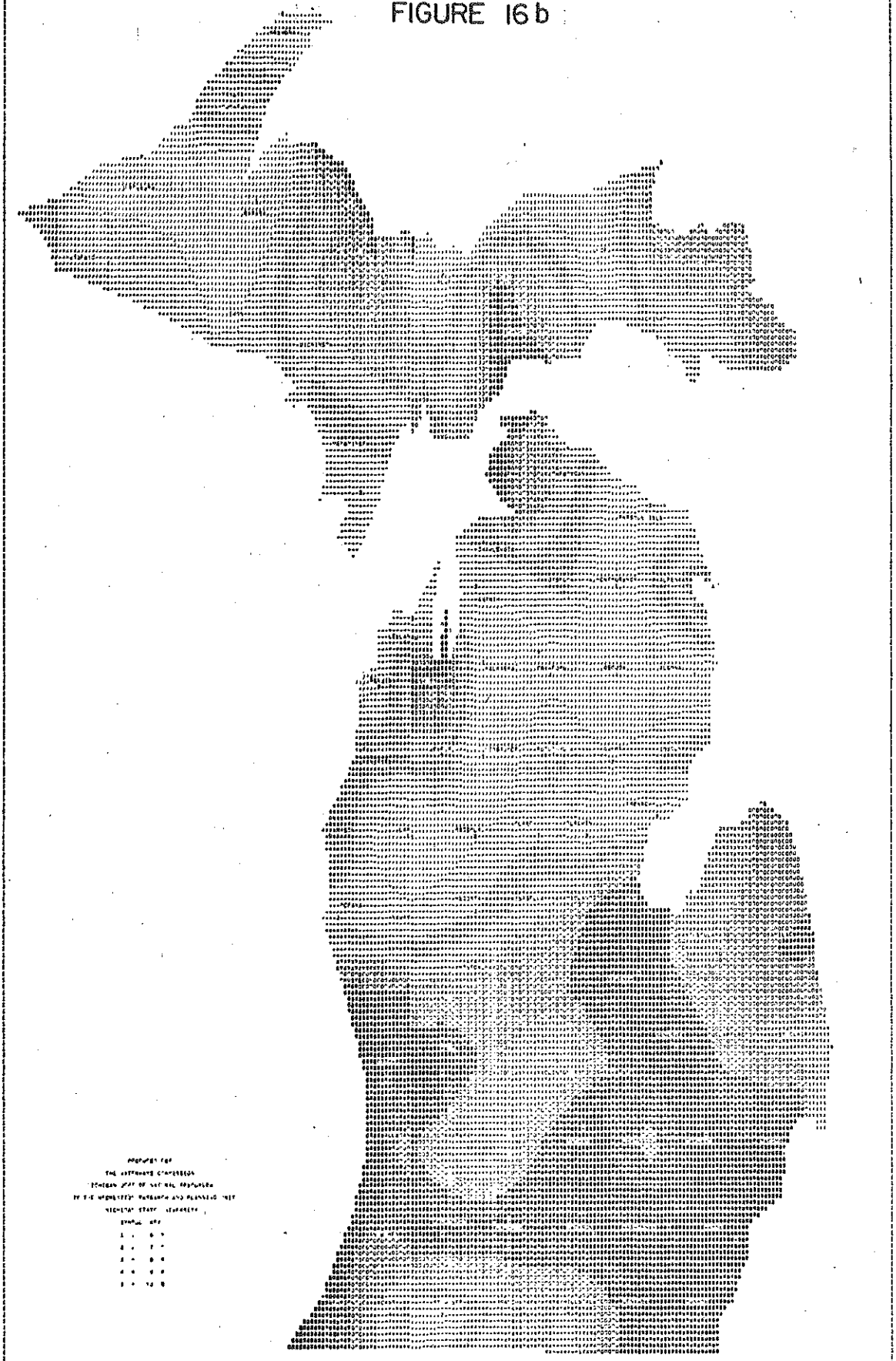
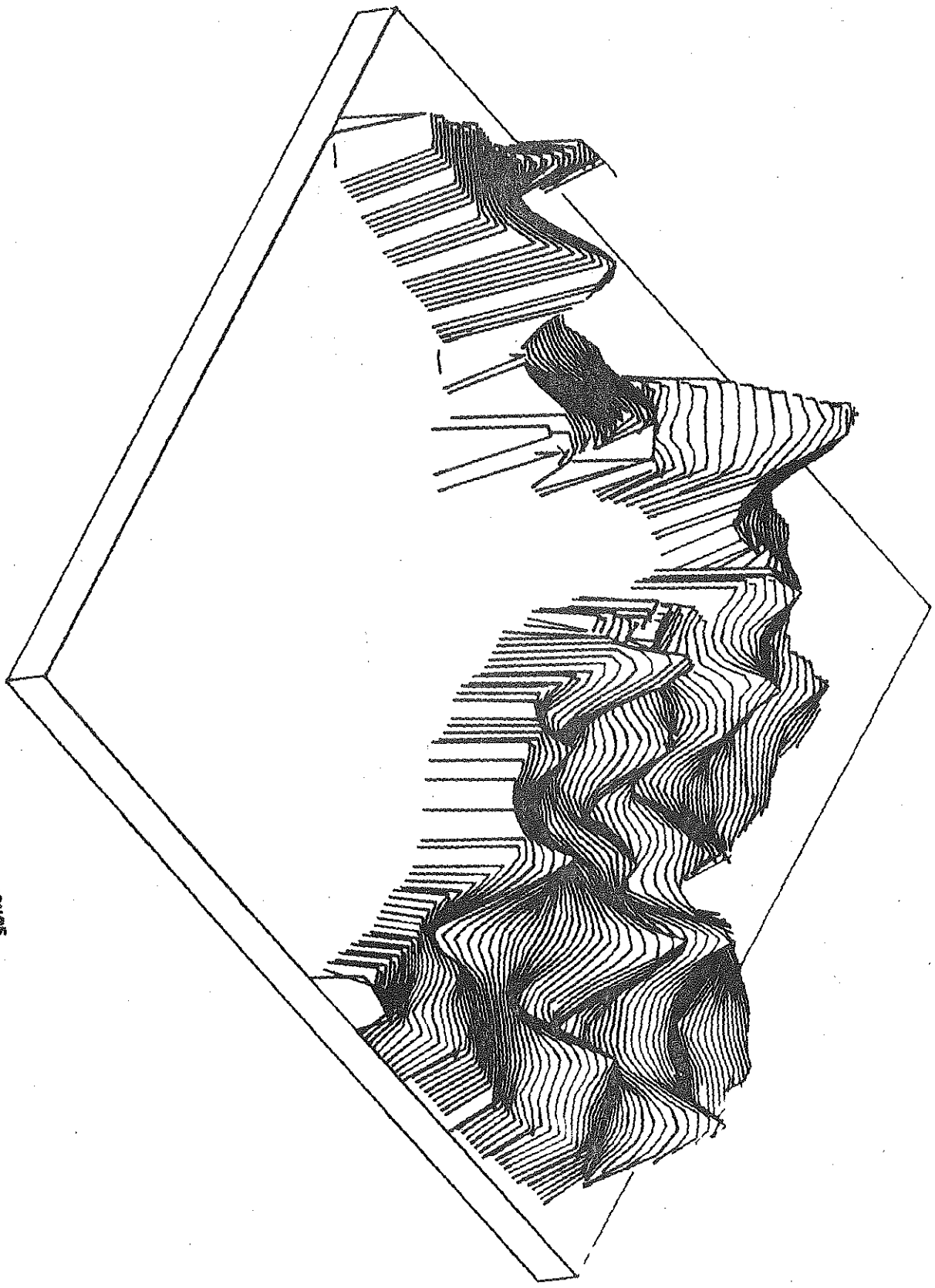


FIGURE 16 b

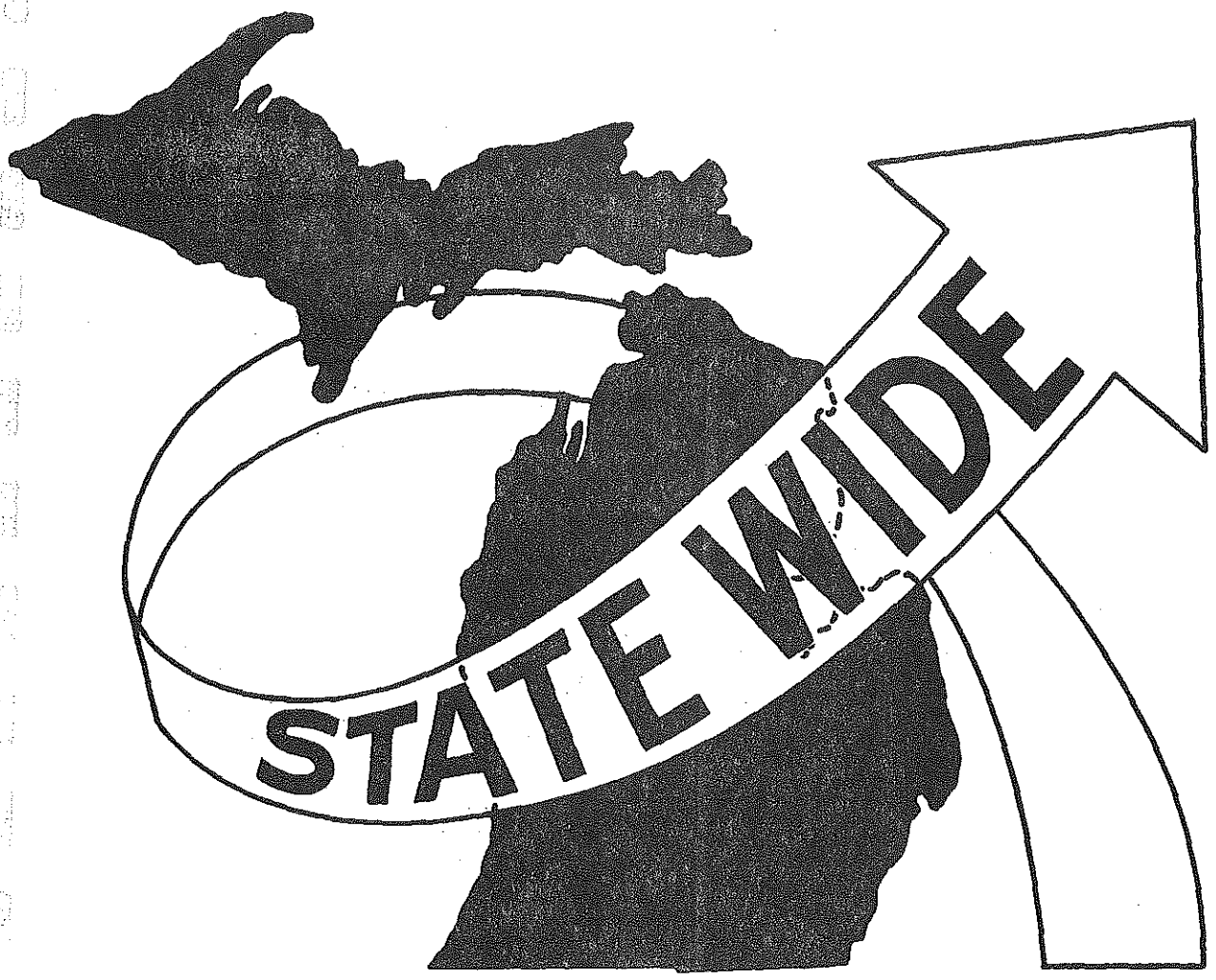


from 1960 to 1970. This is the SYMVU version of a "contour" plot.

FIGURE 17b


1960-1970 PERCENT POPULATION CHANGE
0.00
0.50
1.00
1.50
1.77
5.00
20.00
37.75
54.25
54.20

FUTURE DATA BANK MODIFICATIONS



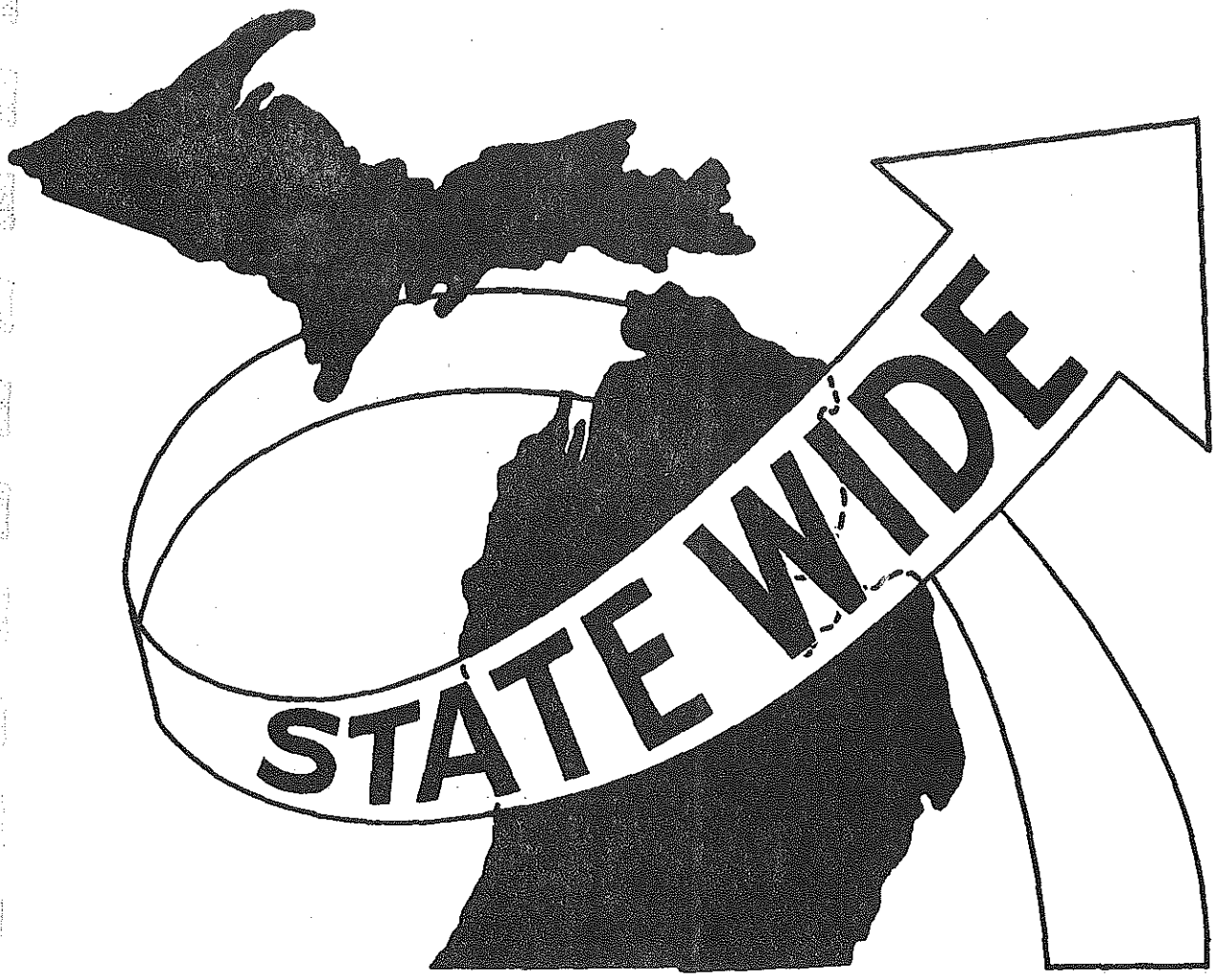
FUTURE DATA BANK MODIFICATIONS

The Socio-Economic data file as described in this report is by no means sophisticated. The procedures used to collect the various data entries have many times been long, involved, manual processes requiring many man-months of work. Other data was obtained by combining pieces of already existing information. This is not to say, however, that the simplicity of this file lends itself to less accurate results than could be obtained by a more sophisticated file. It is our intention to expand upon our current file by adding new information using more computer oriented techniques so that the user's time may be spent applying the output of the file rather than supplying its input.

We now have a copy of the Michigan 1970 census computer tape and hope to use much of this data in the future. We are in the process of equivalating this information to our zone system through programs written for our specific use. Along with this information we are presently acquiring "land use" data in the form of forests and rivers and their relationship to our traffic forecasting process. Soil types and their percentages in each zone is being collected in a further attempt at land use models.

The idea behind our future data file is not entirely the quantity of data, but also the quality of detail and the relation to the foreseeable needs of the Highway Department.

APPENDIX A



BPR 6/24/65
RECORD LAYOUT OF CENSUS POPULATION AND HOUSING DATA 1960

REC.	POSITIONS		DESCRIPTION
1		1	RECORD NUMBER
1	2-	6	IGNORES
1	7	12	DIGITS 1-6 OF STANDARD LOCATION AREA SERIAL NUMBER
1	13-	14	DIGITS 7-8 OF STANDARD LOCATION AREA SERIAL NUMBER
1		15	ZERO
1	16-	18	IGNORES OR BLANK
1			HOUSEHOLD RELATIONSHIP
1			MARRIED COUPLES
1	19-	24	TOTAL
1	25-	30	WITH OWN HOUSEHOLD
1	31-	36	WITH OWN CHILDREN UNDER 6
1	37-	42	WITH OWN CHILDREN UNDER 18
1	43-	48	WITH HUSBAND UNDER 45
1	49-	54	HUSBAND UNDER 45 - CHILDREN UNDER 18
1	55-	60	UNRELATED INDIVIDUALS
1	61-	66	PERSONS UNDER 18
1	67-	72	PERSONS UNDER 18 LIVING WITH BOTH PARENTS
1			SCHOOL ENROLLMENT AGES 5-34
1	73-	78	TOTAL KINDERGARTEN
1	79-	84	PUBLIC KINDERGARTEN
1	85-	90	TOTAL ELEMENTARY
1	91-	96	PUBLIC ELEMENTARY
1	97-	102	TOTAL HIGH SCHOOL
1	103-	108	PUBLIC HIGH SCHOOL
1	109-	114	COLLEGE
1			YEARS OF SCHOOL COMPLETED 25 YEARS OLD PLUS
1	115-	120	NO SCHOOL YEARS COMPLETED
1	121-	126	ELEMENTARY 1-4
1	127-	132	ELEMENTARY 5-7
1	133-	138	ELEMENTARY 8
1	139-	144	HIGH SCHOOL 1-3
1	145-	150	HIGH SCHOOL 4
1	151-	156	COLLEGE 1-3
1	157-	162	COLLEGE 4 PLUS
1			TOTAL RESIDENCE IN 1955
1	163-	168	SAME HOUSE AS IN 1960
1	169-	174	ZERO
1			DIFFERENT HOUSE IN U. S.
1	175-	180	CENTRAL CITY THIS SMSA
1	181-	186	OTHER PART THIS SMSA
1	187-	192	ZERO
1	193-	198	OUTSIDE THIS SMSA, NORTH AND WEST
1	199-	204	OUTSIDE THIS SMSA, SOUTH
1	205-	210	ABROAD
1	211-	216	MOVED, RESIDENCE IN 1955 NOT REPORTED
1	217-	222	DIFFERENT HOUSE, SAME COUNTY
1	223-	228	DIFFERENT COUNTY, SAME STATE
1	229-	234	DIFFERENT STATE

BPR 6/24/65
RECORD LAYOUT OF CENSUS POPULATION AND HOUSING DATA 1960

REC.	POSITIONS	DESCRIPTION
1		FAMILY INCOME FOR FAMILIES IN 1959
1	235- 240	UNDER $1,000
1	241- 246	$1,000-$1,999
1	247- 252	$2,000-$2,999
1	253- 258	$3,000-$3,999
1	259- 264	$4,000-$4,999
1	265- 270	$5,000-$5,999
1	271- 276	$6,000-$6,999
1	277- 282	$7,000-$7,999
1	283- 288	$8,000-$8,999
1	289- 294	$9,000-$9,999
1	295- 300	$10,000-$14,999
1	301- 306	$15,000-$24,999
1	307- 312	$25,000 PLUS
1		INCOME FOR UNRELATED INDIVIDUALS IN 1959
1	313- 318	UNDER $1,000
1	319-324	$1,000-$1,999
1	325- 330	$2,000-$2,999
1	331- 336	$3,000-$3,999
1	337- 342	$4,000-$4,999
1	343- 348	$5,000-$5,999
1	349- 354	$6,000-$6,999
1	355- 360	$7,000-$7,999
1	361- 366	$8,000-$8,999
1	367- 372	$9,000-$9,999
1	373- 378	$10,000-$14,999
1	379- 384	$15,000-$24,999
1	385- 390	$25,000 PLUS
1		MALE, EMPLOYMENT STATUS
1	391- 396	EMPLOYED
1	397- 402	UNEMPLOYED
1	403- 408	ARMED FORCES
1	409- 414	NOT IN LABOR FORCE
1		FEMALE, EMPLOYMENT STATUS
1	415- 420	EMPLOYED
1	421- 426	UNEMPLOYED
1	427- 432	ARMED FORCES
1	433- 438	NOT IN LABOR FORCE
1		MARRIED WOMEN IN LABOR FORCE
1	439- 444	HUSBAND PRESENT
1	445- 450	HUSBAND PRESENT, CHILDREN UNDER 6
1		MALES, EMPLOYED BY OCCUPATION
1	451- 456	PROFESSIONAL, TECHNICAL AND KINDRED WORKERS
1	457- 462	FARMERS AND FARM MANAGERS
1	463- 468	MANAGERS, OFFICIALS AND PROPRIETORS
1	469- 474	CLERICAL AND KINDRED
1	475- 480	SALES
1	481- 486	CRAFTSMEN, FOREMEN AND KINDRED

BPR 6/24/65
RECORD LAYOUT OF CENSUS POPULATION AND HOUSING DATA 1960

REC.	POSITIONS	DESCRIPTION
1		MALES, EMPLOYED BY OCCUPATION, CONTINUED
1	487- 492	OPERATIVES AND KINDRED
1	493- 498	PRIVATE HOUSEHOLD
1	499- 504	SERVICE EXCEPT HOUSEHOLD
1	505- 510	FARM LABORERS AND FOREMEN
1	511- 516	LABORERS EXCEPT FARM AND MINE
1	517- 522	NOT REPORTED
1		FEMALES, EMPLOYED BY OCCUPATION
1	523- 528	PROFESSIONAL, TECHNICAL AND KINDRED
1	529- 534	FARMERS AND FARM MANAGERS
1	535- 540	MANAGERS, OFFICIALS AND PROPRIETORS
1	541- 546	CLERICAL AND KINDRED
1	547- 552	SALES
1	553- 558	CRAFTSMEN, FOREMEN AND KINDRED
1	559- 564	OPERATIVES AND KINDRED
1	565- 570	PRIVATE HOUSEHOLD
1	571- 576	SERVICE EXCEPT HOUSEHOLD
1	577- 582	FARM LABORERS AND FOREMEN
1	583- 588	LABORERS EXCEPT FARM AND MINE
1	589- 594	NOT REPORTED
1		CLASS OF WORKERS
1	595- 600	PRIVATE WAGE AND SALARY
1	601- 606	GOVERNMENT
1	607- 612	SELF-EMPLOYED
1	613- 618	UNPAID FAMILY WORKER
1		TOTAL EMPLOYED BY INDUSTRY
1	619- 624	MINING
1	625- 630	CONSTRUCTION
1	631- 636	FURNITURE LUMBER AND WOOD
1	637- 642	METAL INDUSTRIES
1	643- 648	MACHINERY
1	649- 654	TRANSPORTATION EQUIPMENT
1	655- 660	OTHER DURABLE GOODS
1	661- 666	FOOD AND KINDRED
1	667- 672	TEXTILE AND APPAREL
1	673- 678	PRINTING, PUBLISHING AND ALLIED
1	679- 684	OTHER NONDURABLE
1	685- 690	RAILROAD AND RAILWAY EXPRESS
1	691- 696	OTHER TRANSPORTATION
1	697- 702	COMMUNICATIONS, UTILITIES, SANITARY SERVICE
1	703- 708	WHOLESALE TRADE
1	709- 714	EATING AND DRINKING PLACES
1	715- 720	OTHER RETAIL
1	721- 726	BUSINESS AND REPAIR SERVICE
1	727- 732	PRIVATE HOUSEHOLD
1	733- 738	OTHER PERSONAL SERVICE
1	739- 744	HOSPITALS
1	745- 750	EDUCATION SERVICE

BPR 6/24/65
RECORD LAYOUT OF CENSUS POPULATION AND HOUSING DATA 1960

REC.	POSITIONS	DESCRIPTION
1		TOTAL EMPLOYED BY INDUSTRY, CONTINUED
1	751- 756	OTHER PROFESSIONAL SERVICE
1	757- 762	PUBLIC ADMINISTRATION
1	763- 768	OTHER, INCLUDING NOT REPORTED
1		MEANS OF TRANSPORTATION TO WORK
1	769- 774	RAILROAD
1	775- 780	SUBWAY OR ELEVATED
1	781- 786	BUS OR STREETCAR
1	787- 792	OTHER MEANS
1	793- 798	PRIVATE AUTO OR CARPOOL
1	799- 804	WALKED
1	805- 810	WORKED AT HOME
1	811- 816	NOT REPORTED
1	817- 822	ZERO
1		PLACE OF WORK
1	823- 828	AREA A
1	829- 834	B
1	835- 840	C
1	841- 846	D
1	847- 852	E
1	853- 858	F
1	859- 864	G
1	865- 870	H
1	871- 876	I
1	877- 882	J
1	883- 888	K
1	889- 894	L
1	895- 900	M
1	901- 906	ELSEWHERE
1	907- 912	NOT REPORTED
1		TOTAL POPULATION, URBAN AND RURAL
1	913- 918	URBAN
1	919- 924	ZERO
1	925- 930	RURAL NONFARM
1	931- 936	RURAL FARM
1		MALES, 14 PLUS, NOT IN LABOR FORCE
1	937- 942	INMATE OF INSTITUTION
1	943- 948	ENROLLED IN SCHOOL
1	949- 954	OTHER UNDER 65
1	955- 960	OTHER 65 PLUS
1		FEMALES, 14 PLUS, NOT IN LABOR FORCE
1	961- 966	INMATE OF INSTITUTION
1	967- 972	ENROLLED IN SCHOOL
1	973- 978	OTHER UNDER 65
1	979- 984	OTHER 65 PLUS

BPR 6/24/65
RECORD LAYOUT OF CENSUS POPULATION AND HOUSING DATA 1960

REC.	POSITIONS	DESCRIPTION
1	985- 990	TOTAL EMPLOYED IN AGRICULTURE, INCLUDED AS
1		PART OF TALLY IN RECORD 1,POSITIONS 763-768
1	991- 996	FARMERS, MALE
1	997-1002	FARM LABORERS, MALE
1	1003-1008	FARMERS, FEMALE
1	1009-1014	FARM LABORERS, FEMALE
1		TENURE AND VACANCY STATUS OF HOUSING UNIT
1	1015-1020	OWNER OCCUPIED, TOTAL
1	1021-1026	RENTER OCCUPIED TOTAL
1		VACANT
1	1027-1032	FOR SALE ONLY
1	1033-1038	FOR RENT
1	1039-1044	OTHER VACANT
1		CONDITION AND PLUMBING, ALL UNITS
1		SOUND
1	1045-1050	WITH ALL FACILITIES
1	1051-1056	LACKING ONLY HOT WATER
1	1057-1062	LACKING PRIVATE TOILET, BATH, RUNNING WATER
1		DETERIORATING
1	1063-1068	WITH ALL FACILITIES
1	1069-1074	LACKING ONLY HOT WATER
1	1075-1080	LACKING PRIVATE BATH, TOILET RUNNING WATER
1	1081-1086	DILAPIDATED
1		NUMBER OF BATHROOMS
1	1087-1092	1.
1	1093-1098	1 PLUS
1	1099-1104	SHARED OR NONE
1		ROOMS DISTRIBUTION FOR TOTAL UNITS
1	1105-1110	1
1	1111-1116	2
1	1117-1122	3
1	1123-1128	4
1	1129-1134	5
1	1135-1140	6
1	1141-1146	7
1	1147-1152	8 PLUS
1		TOTAL NUMBER OF UNITS IN STRUCTURE
1	1153-1158	1
1	1159-1164	2
1	1165-1170	3-4
1	1171-1176	5-9
1	1177-1182	10 PLUS

BPR 6/24/65
RECORD LAYOUT OF CENSUS POPULATION AND HOUSING DATA 1960

REC.	POSITIONS	DESCRIPTION
1		YEAR STRUCTURE BUILT TOTAL
1	1183-1188	1950-1960
1	1189-1194	1940-1949
1	1195-1200	BEFORE 1940
1		OWNER OCCUPIED
1	1201-1206	1950-1960
1	1207-1212	BEFORE 1950
1		
1		BASEMENTS
1	1213-1218	BASEMENT
1	1219-1224	CONCRETE SLAB
1	1225-1230	OTHER
1		HEATING EQUIPMENT
1	1231-1236	STEAM OR HOT WATER
1	1237-1242	WARM AIR FURNACE
1	1243-1248	BUILT-IN ROOM UNITS
1	1249-1254	OTHER, WITH FLUE
1	1255-1260	OTHER, WITHOUT FLUE
1	1261-1266	NONE
1		NUMBER PERSONS IN HOUSEHOLD
1		OWNER OCCUPIED
1	1267-1272	1
1	1273-1278	2
1	1279-1284	3
1	1285-1290	4
1	1291-1296	5
1	1297-1302	6
1	1303-1308	7
1	1309-1314	8 PLUS
1		RENTER OCCUPIED
1	1315-1320	1
1	1321-1326	2
1	1327-1332	3
1	1333-1338	4
1	1339-1344	5
1	1345-1350	6
1	1351-1356	7
1	1357-1362	8 PLUS
1		PERSONS PER ROOM TOTAL
1	1363-1368	UNDER 0.51
1	1369-1374	0.51-0.75
1	1375-1380	0.76-1
1	1381-1386	1.01 PLUS

BPR 6/24/65
RECORD LAYOUT OF CENSUS POPULATION AND HOUSING DATA 1960

REC.	POSITIONS	DESCRIPTION
1		YEAR MOVED INTO UNIT-TOTAL
1	1387-1392	1958-1960
1	1393-1398	1954-1957
1	1399-1410	ZERO OR ITEM NUMBER
1	1411-1422	ZERO OR SUM CHECK
2	1- 18	SAME AS RECORD 1, POSITIONS 1-18
2		YEAR MOVED INTO UNIT TOTAL, CONTINUED
2	19- 24	1940-1953
2	25- 30	BEFORE 1940
2		YEAR MOVED INTO UNIT-OWNER OCCUPIED
2	31- 36	1958-1960
2	37- 42	1954-1957
2	43- 48	BEFORE 1954
2		AUTOMOBILES AVAILABLE, OCCUPIED UNITS ONLY
2	49- 54	NONE
2	55- 60	1
2	61- 66	2
2	67- 72	3 PLUS
2		VALUE OF PROPERTY TOTAL
2	73- 78	UNDER $5,000
2	79- 84	$5,000-$7,400
2	85- 90	$7,500-$9,900
2	91- 96	$10,000-$12,400
2	97- 102	$12,500-$14,900
2	103- 108	$15,000-$17,400
2	109- 114	$17,500-$19,900
2	115- 120	$20,000-$24,900
2	121- 126	$25,000-$34,900
2	127- 132	$35,000 PLUS
2		GROSS RENT TOTAL
2	133- 138	UNDER $20
2	139- 144	$20-$29
2	145- 150	$30-$39
2	151- 156	$40-$49
2	157- 162	$50-$59
2	163- 168	$60-$69
2	169- 174	$70-$79
2	175- 180	$80-$89
2	181- 186	$90-$99
2	187- 192	$100-$119
2	193- 198	$120-$149
2	199- 204	$150-$199
2	205- 210	$200 PLUS

BPR 6/24/65
RECORD LAYOUT OF CENSUS POPULATION AND HOUSING DATA 1960

REC.	POSITIONS	DESCRIPTION
2		CONTRACT RENT
2	211- 216	UNDER $20
2	217- 222	$20-$29
2	223- 228	$30-$39
2	229- 234	$40-$49
2	235- 240	$50-$59
2	241- 246	$60-$69
2	247- 252	$70-$79
2	253- 258	$80-$89
2	259- 264	$90-$99
2	265- 270	$100-$119
2	271- 276	$120-$149
2	277- 282	$150 PLUS
2	283- 288	NO CASH RENT
2		STORIES AND ELEVATORS
2	289- 294	3 STORIES OR LESS
2	295- 300	4 PLUS WITH ELEVATOR
2	301- 306	4 PLUS WITHOUT ELEVATOR
2		TRAILERS
2	307- 312	MOBILE
2	313- 318	PERMANENT FOUNDATIONS
2		SOURCE OF WATER
2	319- 324	PUBLIC SYSTEM OR PRIVATE COMPANY
2	325- 330	CONNECTED TO PUBLIC SEWER
2	331- 336	INDIVIDUAL WELL
2	337- 342	OTHER
2		SEWAGE DISPOSAL
2	343- 348	PUBLIC SEWER
2	349- 354	SEPTIC TANK OR CESSPOOL
2	335- 360	OTHER OR NONE
2		HOUSING UNITS TOTAL
2	361- 366	URBAN
2	367- 372	RURAL
2	373- 378	OCCUPIED FARM
2	379- 384	NONFARM
2		OWNER OCCUPIED TOTAL
2	385- 390	URBAN
2	391- 396	FARM
2	397- 402	NONFARM
2		RENTER OCCUPIED TOTAL
2	403- 408	URBAN
2	409- 414	FARM

BPR 6/24/65
RECORD LAYOUT OF CENSUS POPULATION AND HOUSING DATA 1960

REC.	POSITIONS	DESCRIPTION
2		HOUSING UNITS - RENTER OCCUPIED, CONTINUED
2	415- 420	NONFARM
2	421- 426	EXCESS HOUSING CAPACITY
2		HEATING FUELS USED BY OCCUPIED UNITS
2	427- 432	COAL OR COKE
2	433- 438	WOOD
2	439- 444	UTILITY GAS
2	445- 450	BOTTLED, TANK OR LP GAS
2	451- 456	ELECTRICITY
2	457- 462	FUEL OIL, KEROSENE
2	463- 468	OTHER
2	469- 474	NO FUEL
2		EXPERIENCED CIVILIAN LABOR FORCE
2	475- 480	TOTAL
2		PROFESSIONAL, TECHNICAL AND KINDRED WORKERS
2	481- 486	ACCOUNTANTS AND AUDITORS
2	487- 492	ACTORS, DANCERS, AND ENTERTAINERS
2	493- 498	AIRPLANE PILOTS AND NAVIGATORS
2	499- 504	ARCHITECTS
2	505- 510	ARTISTS AND ART TEACHERS
2	511- 516	AUTHORS
2	517- 522	CHEMISTS
2	523- 528	CHIROPRACTORS
2	529- 534	CLERGYMEN
2		COLLEGE PRESIDENTS, PROFS, AND INSTRUCTORS
2	535- 540	AGRICULTURAL SCIENTISTS
2	541- 546	BIOLOGICAL SCIENTISTS
2	547- 552	CHEMISTRY
2	553- 558	ECONOMICS
2	559- 564	ENGINEERING
2	565- 570	GEOLOGISTS AND GEOPHYSICISTS
2	571- 576	MATHEMATICS
2	577- 582	MEDICAL SCIENTISTS
2	583- 588	PHYSICS
2	589- 594	PSYCHOLOGY
2	595- 600	STATISTICS
2	601- 606	NATURAL SCIENTISTS
2	607- 612	SOCIAL SCIENTISTS
2	613- 618	OTHER SUBJECTS AND UNSPECIFIED
2	619- 624	DENTISTS
2	625- 630	DESIGNERS
2	631- 636	DIETICIANS AND NUTRITIONISTS
2	637- 642	DRAFTSMEN
2	643- 648	EDITORS AND REPORTERS
2		ENGINEERS - TECHNICAL
2	649- 654	AERONAUTICAL ENGINEERS
2	655- 660	CHEMICAL ENGINEERS

REC.	POSITIONS	DESCRIPTION
2		EXPERIENCED CIVILIAN LABOR FORCE, CONTINUED
2		PROFESSIONAL, TECHNICAL AND KINDRED WORKERS, CONTINUED
2		ENGINEERS - TECHNICAL CONTINUED
2	661- 666	CIVIL ENGINEERS
2	667- 672	ELECTRICAL ENGINEERS
2	673- 678	INDUSTRIAL ENGINEERS
2	679- 684	MECHANICAL ENGINEERS
2	685- 690	METALLURGICAL ENGINEERS AND METALLURGISTS
2	691- 696	MINING ENGINEERS
2	697- 702	SALES ENGINEERS
2	703- 708	ENGINEERS NOT ELSEWHERE CLASSIFIED
2	709- 714	FARM AND HOME MANAGEMENT ADVISORS
2	715- 720	FORESTERS AND CONSERVATIONISTS
2	721- 726	FUNERAL DIRECTORS AND EMBALMERS
2	727- 732	LAWYERS AND JUDGES
2	733- 738	LIBRARIANS
2	739- 744	MUSICIANS AND MUSIC TEACHERS
2		NATURAL SCIENTISTS, N.E.C.
2	745- 750	AGRICULTURAL SCIENTISTS
2	751- 756	BIOLOGICAL SCIENTISTS
2	757- 762	GEOLOGISTS AND GEOPHYSICISTS
2	763- 768	MATHEMATICIANS
2	769- 774	PHYSICISTS
2	775- 780	MISCELLANEOUS NATURAL SCIENTISTS
2	781- 786	NURSES - PROFESSIONAL
2	787- 792	NURSES - STUDENT PROFESSIONAL
2	793- 798	OPTOMETRISTS
2	799- 804	OSTEOPATHS
2	805- 810	PERSONNEL AND LABOR RELATIONS WORKERS
2	811- 816	PHARMACISTS
2	817- 822	PHOTOGRAPHERS
2	823- 828	PHYSICIANS AND SURGEONS
2	829- 834	RADIO OPERATORS
2	835- 840	RECREATION AND GROUP WORKERS
2	841- 846	RELIGIOUS WORKERS
2	847- 852	SOCIAL AND WELFARE WORKERS EXCEPT GROUP
2		SOCIAL SCIENTISTS
2	853- 858	ECONOMISTS
2	859- 864	PSYCHOLOGISTS
2	865- 870	STATISTICIANS AND ACTUARIES
2	871- 876	MISCELLANEOUS SOCIAL SCIENTISTS
2	877- 882	SURVEYORS
2	883- 888	TEACHERS, ELEMENTARY
2	889- 894	TEACHERS, SECONDARY SCHOOLS
2	895- 900	TEACHERS, N.E.C.
2	901- 906	TECHNICIANS, MEDICAL AND DENTAL
2	907- 912	TECHNICIANS, ELECTRICAL AND ELECTRONIC
2	913- 918	TECHNICIANS, OTHER ENGINEERING AND PHYSICAL
2	919- 924	TECHNICIANS, N.E.C.
2	925- 930	THERAPISTS AND HEALERS

RECORD LAYOUT OF CENSUS POPULATION AND HOUSING DATA 1960

REC.	POSITIONS	DESCRIPTION
2		EXPERIENCED CIVILIAN LABOR FORCE, CONTINUED
2		PROFESSIONAL, TECHNICAL AND KINDRED WORKERS, CONTINUED
2	931- 936	VETERINARIANS
2	937- 942	OTHER PROFESSIONAL, TECHNICAL AND KINDRED WORKERS, N.E.C.
2	943- 948	FARMERS AND FARM MANAGERS
2		MANAGERS, OFFICIALS AND PROPRIETORS, EXCEPT FARM
2	949- 954	BUYERS AND DEPARTMENT HEADS, STORE
2	955- 960	CONDUCTORS, RAILROAD
2	961- 966	OFFICERS, PILOTS, PURSERS, ENGINEERS, SHIP
2	967- 972	OFFICIALS AND INSPECTORS, STATE AND LOCAL
2	973- 978	PURCHASING AGENTS AND BUYERS, N.E.C.
2	979- 984	OTHER MANAGERS, OFFICIALS, PROP. EXCEPT FARM
2		MANAGERS, OFFICIALS AND PROPRIETORS, N.E.C., SALARIED
2	985- 990	EATING AND DRINKING PLACES
2	991- 996	OTHER INDUSTRIES
2		MANAGERS, OFFICIALS AND PROPRIETORS, N.E.C., SELF EMPLOYED
2	997-1002	EATING AND DRINKING PLACES
2	1003-1008	OTHER INDUSTRIES
2		CLERICAL AND KINDRED WORKERS
2	1009-1014	ATTENDANTS, PHYSICIANS AND DENTAL OFFICE
2	1015-1020	BOOKKEEPERS
2	1021-1026	CASHIERS
2	1027-1032	DISPATCHERS AND STARTERS, VEHICLE
2	1033-1038	MAIL CARRIERS
2	1039-1044	OFFICE MACHINE OPERATORS
2	1045-1050	PAYROLL AND TIMEKEEPING CLERKS
2	1051-1056	SECRETARIES
2	1057-1062	SHIPPING AND RECEIVING CLERKS
2	1063-1068	STENOGRAPHERS
2	1069-1074	STOCK CLERKS AND STOREKEEPERS
2	1075-1080	TELEGRAPH OPERATORS
2	1081-1086	TELEPHONE OPERATORS
2	1087-1092	TYPISTS
2	1093-1098	OTHER CLERICAL AND KINDRED WORKERS, N.E.C.
2		SALES WORKERS
2	1099-1104	INSURANCE AGENTS, BROKERS AND UNDERWRITERS
2	1105-1110	REAL ESTATE AGENTS AND BROKERS
2	1111-1116	SALES - RETAIL TRADE
2	1117-1122	SALES OTHER THAN RETAIL
2		CRAFTSMEN, FOREMEN AND KINDRED WORKERS
2	1123-1128	BAKERS
2	1129-1134	BLACKSMITHS
2	1135-1140	BOILER MAKERS
2	1141-1146	BRICKMASONS, STONE MASONS AND TILE SETTERS
2	1147-1152	CABINET MAKERS
2	1153-1158	CARPENTERS
2	1159-1164	CEMENT AND CONCRETE FINISHERS
2	1165-1170	COMPOSITERS AND TYPESETTERS
2	1171-1176	CRANEMEN, DERRICKMEN AND HOISTMEN
2	1177-1182	ELECTRICIANS

RECORD LAYOUT OF CENSUS POPULATION AND HOUSING DATA 1960

REC.	POSITIONS	DESCRIPTION
2		EXPERIENCED CIVILIAN LABOR FORCE, CONTINUED
2		CRAFTSMEN, FOREMEN AND KINDRED WORKERS, CONTINUED
2	1183-1188	ELECTROTYPERS AND STEREOTYPERS
2	1189-1194	ENGRAVERS EXCEPT PHOTO
2	1195-1200	EXCAVATNG, GRADING, AND ROAD MACHINE OPERATOR
2	1201-1206	FOREMEN NOT ELSEWHERE CLASSIFIED
2	1207-1212	FORGEMEN AND HAMMERMEN
2	1213-1218	FURRIERS
2	1219-1224	GLAZIERS
2	1225-1230	HEAT TREATERS, ANNEALERS AND TEMPERERS
2	1231-1236	JEWELERS, WATCHMAKERS, GOLD/SILVERSMITHS
2	1237-1242	JOB SETTERS, METAL-CIVILIAN LABOR FORCE
2	1243-1248	LINEMEN AND SERVICE MEN, TELEPHONE, TELEGRAPH,POWER
2	1249-1254	LOCOMOTIVE ENGINEER
2	1255-1260	LOCOMOTIVE FIREMEN
2	1261-1266	LOOM FIXERS
2	1267-1272	MACHINISTS
2		MECHANICS AND REPAIRMEN
2	1273-1278	AIR CONDITIONNG,HEATNG AND REFRIGERATION
2	1279-1284	AIRPLANE
2	1285-1290	AUTOMOBILE
2	1291-1296	OFFICE MACHINE
2	1297-1302	RADIO AND TELEVISION
2	1303-1308	RAILROAD AND CAR SHOP
2	1309-1314	MECHANICS, N.E.C.
2	1315-1320	MILLERS,GRAIN,FLOUR,FEED, ETC.
2	1321-1326	MILLWRIGHTS
2	1327-1332	MOLDERS,METAL
2	1333-1338	OPTICIANS,LENS GRINDERS AND POLISHERS
2	1339-1344	PAINTERS,CONSTRUCTION AND MAINTENANCE
2	1345-1350	PAPERHANGERS
2	1351-1356	PATTERN AND MODEL MAKERS EXCEPT PAPER
2	1357-1362	PHOTOENGRAVERS AND LITHOGRAPHERS
2	1363-1368	PLASTERERS
2	1369-1374	PLUMBERS AND PIPE FITTERS
2	1375-1380	PRESSMEN,PLATE-PRINTERS, PRINTING
2	1381-1386	ROLLERS AND ROLL HANDS METAL
2	1387-1392	ROOFERS AND SLATERS
2	1393-1398	SHOEMAKERS AND REPAIRERS EXCEPT FACTORY
2	1399-1422	SAME AS RECORD ONE
3	1- 18	SAME AS RECORD ONE
3		EXPERIENCED CIVILIAN LABOR FORCE, CONTINUED
3		CRAFTSMEN, FOREMEN AND KINDRED WORKERS, CONTINUED
3	19- 24	STATIONARY ENGINEERS
3	25- 30	STONE CUTTERS AND CARVERS
3	31- 36	STRUCTURAL METAL WORKERS
3	37- 42	TAILOR AND TAILORESSES
3	43- 48	TINSMITHS, COOPERSMITHS AND SHEET METAL WORKERS
3	49- 54	TOOL AND DIE MAKERS AND SETTERS
3	55- 60	UPHOLSTERERS

REC.	POSITIONS	DESCRIPTION
3		EXPERIENCED CIVILIAN LABOR FORCE, CONTINUED
3		CRAFTSMEN, FOREMEN AND KINDRED WORKERS, CONTINUED
3	61- 66	CRAFTSMEN AND KINDRED, N.E.C.
3	67- 72	OTHER CRAFTSMEN AND KINDRED WORKERS
3		OPERATIVES AND KINDRED WORKERS
3	73- 78	APPRENTICES
3	79- 84	ASBESTOS AND INSULATION WORKERS
3	85- 90	ASSEMBLERS
3	91- 96	ATTENDANTS,AUTO SERVICE AND PARKING
3	97- 102	BLASTERS AND POWDERMEN
3	103- 108	BRAKEMEN, RAILROAD
3	109- 114	BUS DRIVERS
3	115- 120	CHAINMEN,RODMEN,AXMEN,SURVEYING
3	121- 126	CHECKERS, EXAMINERS,INSPECTORS,MFG.
3	127- 132	DELIVERY MEN,ROUTEMEN
3	133- 138	DRESSMAKERS,SEAMSTRESSES,EXCEPT FACTORY
3	139- 144	DYERS
3	145- 150	FILLERS,GRINDERS AND POLISHERS,METAL
3	151- 156	FURNACEMEN,SMELTERMEN AND POURERS
3	157- 162	HEATERS,METAL
3	163- 168	KNITTERS,LOOPERS AND TOPPERS,TEXTILE
3	169- 174	LAUNDRY AND DRY CLEANING
3	175- 180	MEAT CUTTERS EXCEPT SLAUGHTER AND PACKING HOUSE
3	181- 186	MINE OPERATIVES AND LABORERS, N.E.C.
3	187- 192	MOTORMEN,MINE,FACTORY,LOGGING,ETC.
3	193- 198	MOTORMEN,STREET,SUBWAY AND ELEVATED
3	199- 204	OILERS,GREASERS EXCEPT AUTO
3	205- 210	PACKERS AND WRAPPERS
3	211- 216	PAINTERS EXCEPT CONSTRUCTION AND MAINTENANCE
3	217- 222	PHOTOGRAPHIC PROCESS WORKERS
3	223- 228	POWER STATION OPERATORS
3	229- 234	SAILORS AND DECK HANDS
3	235- 240	SAWYERS
3	241- 246	SEWERS AND STITCHERS MFG.
3	247- 252	SPINNERS,TEXTILE
3	253- 258	STATIONARY FIREMEN
3	259- 264	SWITCHMEN, RAILROAD
3	265- 270	TAXICAB DRIVERS AND CHAUFFEURS
3	271- 276	TRUCK AND TRACTOR DRIVERS
3	277- 282	WEAVERS,TEXTILE
3	283- 288	WELDERS AND FLAME CUTTERS
3	289- 294	OTHER SPEC. OPERATIVES AND KINDRED
3		OPERATIVES AND KINDRED WORKERS, N.E.C.
3	295- 300	MANUFACTURING - DURABLE GOODS
3	301- 306	MANUFACTURING - NONDURABLE GOODS
3	307- 312	NONMANUFACTURING INDUSTRY, INCLUDING NOT REPORTED
3		PRIVATE HOUSEHOLD WORKERS
3	313- 318	LIVING IN
3	319- 324	LIVING OUT

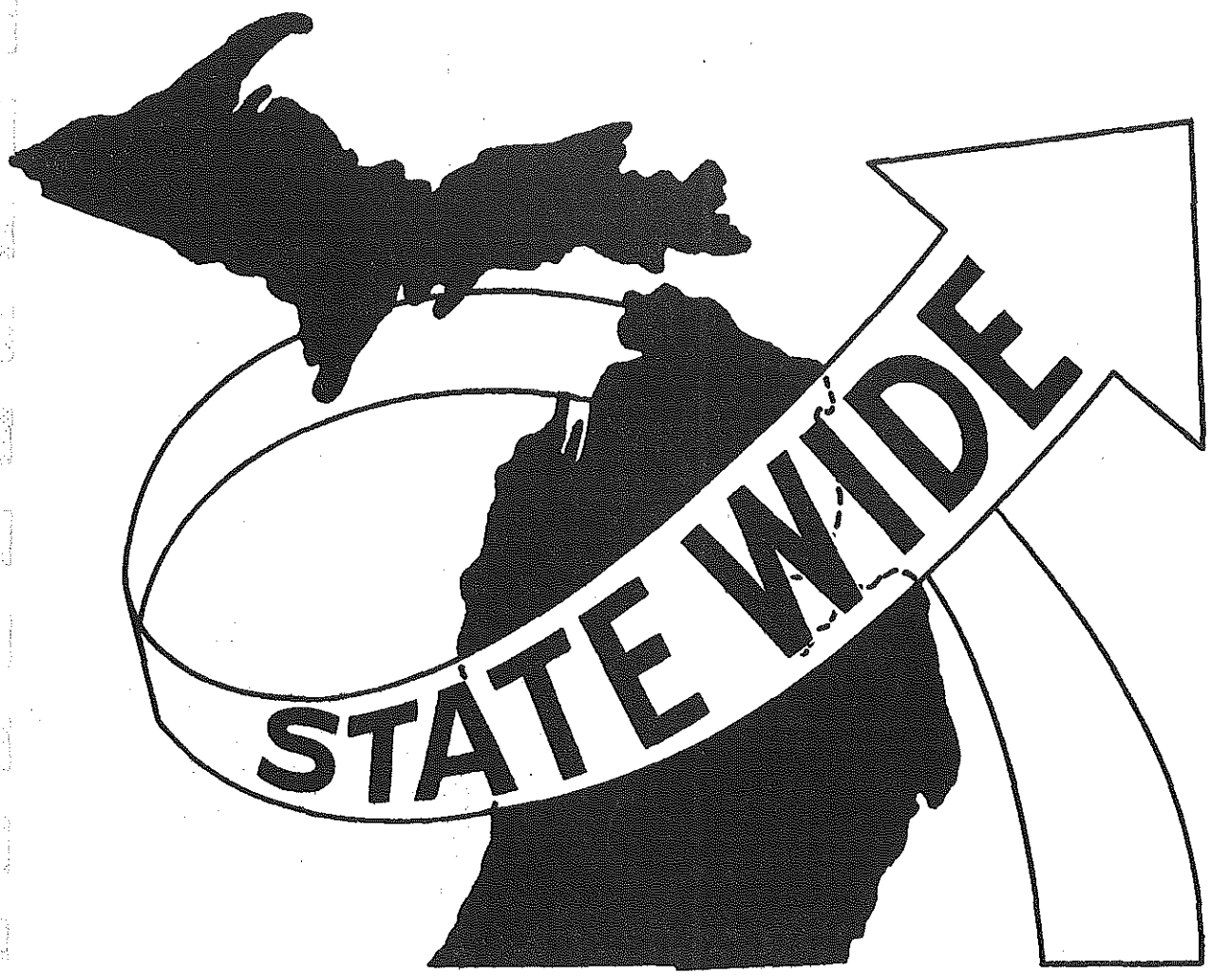
BPR 6/24/65
RECORD LAYOUT OF CENSUS POPULATION AND HOUSING DATA 1960

REC.	POSITIONS	DESCRIPTION
3		EXPERIENCED CIVILIAN LABOR FORCE, CONTINUED
3		SERVICE WORKERS,EXCEPT PRIVATE HOUSEHOLD, CONTINUED
3	325- 330	ATTENDANTS,HOSPITAL AND OTHER INSTITUTIONAL
3	331- 336	BARBERS
3	337- 342	CHARWOMEN,JANITORS,PORTERS
3	343- 348	COOKS, EXCEPT PRIVATE HOUSEHOLD
3	349- 354	ELEVATOR OPERATORS
3	355- 360	HAIRDRESSERS AND COSMETOLOGISTS
3	361- 366	HOUSEKEEPERS AND STEWARDS EXCEPT PRIVATE HOUSEHOLD
3	367- 372	MIDWIVES
3	373- 378	PRACTICAL NURSES
3		PROTECTIVE SERVICE WORKERS
3	379- 384	FIREMEN,FIREPPROTECTORS
3	385- 390	GUARDS,WATCHMEN,DOORKEEPERS
3	391- 396	POLICEMEN AND DETECTIVES
3	397- 402	SHERIFFS,CONSTABLES AND MARSHALLS
3	403- 408	WAITERS,BARTENDERS AND COUNTER WORKERS
3	409- 414	WATCHMEN,CROSSING, AND BRIDGE TENDERS
3	415- 420	OTHER SERVICE WORKERS, N.E.C.
3		FARM LABORERS AND FOREMEN
3	421- 426	FARM LABORERS, UNPAID FAMILY WORKERS
3	427- 432	FARM LABORERS EXCL. UNPAID WORKERS
3		LABORERS, EXCEPT FARM AND MINE
3	433- 438	CARPENTERS AND HELPERS EXCEPT LOGGING AND MINE
3	439- 444	FISHERMEN AND OYSTERMEN
3	445- 450	LONGSHOREMEN AND STEVEDORES
3	451- 456	LUMBERMEN,RAFTSMEN,WOODCHOPPERS
3	457- 462	WAREHOUSEMEN, N.E.C.
3	463- 468	OTHER SPECIFIED LABORERS
3		LABORERS, N.E.C. - MANUFACTURING
3	469- 474	DURABLE GOODS
3	475- 480	NONDURABLE GOODS
3	481- 486	NONMANUFACTURING INDUSTRY, INCLUDING NOT REPORTED
3	487- 492	TOTAL EMPLOYMENT OCCUPATION NOT REPORTED.
3	493- 498	ZERO
3	499- 504	IGNORE
3	505- 510	URBANIZED AREA CODE
3	511- 702	ZERO OR IGNORE
3	703- 708	BLANK
3	709- 714	NAME - FOUR WORDS MAX.
3	715- 720	BLANK
3	721- 726	NAME CONTINUED
3	727- 732	BLANK
3	733- 738	NAME CONTINUED
3	739- 744	BLANK
3	745- 750	NAME CONTINUED
3	751- 756	BLANK
3	757- 761	NAME CONTINUED
3	762	0-URBAN...1-RURAL
3	763- 768	BLANK
3	769- 771	BUREAU OF CENSUS COUNTY NUMBER
3	772- 774	CONGRESSIONAL DISTRICT

RECORD LAYOUT OF CENSUS POPULATION AND HOUSING DATA 1980

REC.	POSITIONS	DESCRIPTION
3	775- 780	BLANK
3	781- 782	LONGITUDE, DEGREES
3	783- 784	LONGITUDE, MINUTES
3	785- 786	LONGITUDE, SECONDS
3	787- 792	BLANK
3	793- 794	LATITUDE DEGREES
3	795- 796	LATITUDE MINUTES
3	797- 798	LATITUDE SECONDS
3	799- 804	BLANK
3	805- 810	DIGITS 1-6 OF STANDARD LOCATION AREA SERIAL NUMBER
3	811- 816	BLANK
3	817- 818	DIGITS 7-8 OF STANDARD LOCATION AREA SERIAL NUMBER
3	819- 822	SMSA CODE
3	823- 828	ZERO
3	829- 834	HOUSES-SOUND
3	835- 840	ZERO
3	841- 846	HOUSES-DETERIORATED
3	847- 852	ZERO
3	853- 858	HOUSES-DILAPIDATED
3	859- 864	ZERO
3	865- 870	TOTAL HOUSE UNITS
3	871- 876	ZERO
3	877- 882	TOTAL NUMBER OF ROOMS
3	883- 888	ZERO
3	889- 894	MALES UNDER FIVE YEARS OLD
3	895- 900	ZERO
3	901- 906	MALES 5-14
3	907- 912	ZERO
3	913- 918	MALES 15-19
3	919- 924	ZERO
3	925- 930	MALES 20-64
3	931- 936	ZERO
3	937- 942	MALES 65 PLUS
3	943- 948	ZERO
3	949- 954	FEMALES UNDER 5 YEARS OLD
3	955- 960	ZERO
3	961- 966	FEMALES 5-14
3	967- 972	ZERO
3	973- 978	FEMALES 15-19
3	979- 984	ZERO
3	985- 990	FEMALES 20-64
3	991- 996	ZERO
3	997-1002	FEMALES 65 PLUS
3	1002-1008	ZERO
3	1009-1014	TOTAL MALE
3	1015-1020	ZERO
3	1021-1026	TOTAL FEMALE
3	1026-1032	ZERO
3	1033-1038	TOTAL POPULATION
3	1039-1044	ZERO
3	1045-1050	ZERO OR ITEM NUMBER
3	1051-1056	ZERO OR SUM CHECK
3	1057-1062	ZERO OR SUM CHECK
3	1063-1404	ZERO
3	1405-1410	ZERO OR ITEM NUMBER
3	1411-1416	ZERO OR SUM CHECK
3	1417-1422	ZERO OR SUM CHECK

APPENDIX B



1970 Fourth Count Summary Tape (Population)

Table of Contents

Table of Contents (Continued)

Table of Contents (Continued)

Table of Contents (Continued)

*All tabulations not otherwise indicated represent 20% Sample. Those indicated as 20% tabulations for Spanish Americans are tabulated on a 15% basis.