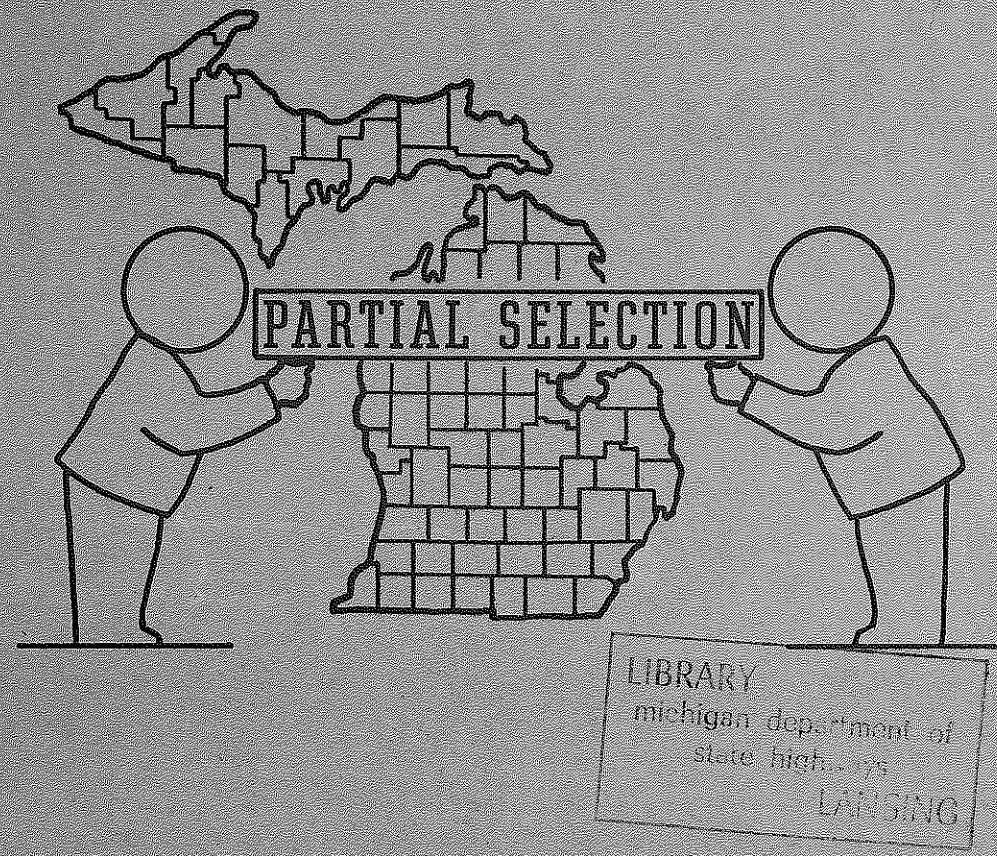


65-4045

FEDERAL AID SECONDARY HIGHWAYS IN MICHIGAN • 1945



MICHIGAN STATE HIGHWAY DEPARTMENT
CHARLES M. ZIEGLER, STATE HIGHWAY COMMISSIONER

65-4045

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STATE HIGHWAY DEPARTMENT
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FEDERAL AID
SECONDARY HIGHWAYS
IN MICHIGAN

PARTIAL SELECTION

NOVEMBER, 1945

PARTIAL SELECTION OF FEDERAL-AID SECONDARY HIGHWAYS
IN MICHIGAN

The Federal-Aid Highway Act of 1944 authorizes funds for projects on the principal secondary and feeder roads. The act provides that the funds shall be expended on a system of roads selected by the State highway departments in cooperation with the county road commissioners and the Commissioner of Public Roads.

The regulations for the act and General Administrative Memorandum No. 277 furnish the interpretations and procedures for carrying out the provisions. They interpret the intent of the act to be the establishment of administrative cooperation between local, state, and federal highway agencies for the development of a long-range program of highway improvements to serve the several classes of highway traffic, one of which is broadly defined as rural secondary or farm-to-market traffic. They indicate the need for review and modification of the Federal-aid highway system in conjunction with a total selection of secondary routes, but they caution that the process will require considerably more time than is available for getting the first year's program under way. They suggest that the Federal-aid secondary system be selected and submitted for approval in progressive stages.

The regulations suggest that the Federal-aid secondary routes be selected by the counties cooperatively with the State. They require that the Federal-aid secondary system in each county be approved by the county officials before the system is submitted to the Public Roads Administration for their consideration.

Experience with the counties in the administration of the Federal-aid secondary system established the belief that highway systems should be selected by officials of the agency responsible for their construction and operation. The State believed that it could so organize the Federal and State procedures that they could be placed before a group of county engineers and superintendents, representing all types of counties, for their consideration, modification and approval. There was confidence that the process of working together, each one contributing from his particular knowledge and experience, would produce policies and procedures that would expedite the selection of highways best adapted for inclusion in an integrated system of transportation highways.

In April, 1945, the State Highway Commissioner designated to his Special Assignment Engineer the responsibility for carrying out the Federal-aid secondary provisions of the Federal-Aid Highway Act of 1944. The facilities of the department were placed at his disposal to perform the various phases of the work. The Planning and Traffic Division suggested criteria, procedures and methods for use by the counties and it was assigned the task of preparing the material for review by the various cooperating individuals, approval by the counties, and submission to the District Engineer of the Public Roads Administration.

Criteria, procedures and methods were worked out with and adopted by the counties. Each county selected their Federal-aid secondary routes and arranged for connections with adjoining counties.

The Federal-aid secondary routes on State trunklines were selected by the State with concurrence by the counties.

THE SELECTED FEDERAL-AID SECONDARY SYSTEM

The general location of the routes that comprise the selected Federal-aid secondary system are shown on the eight-sheet State map which is in the back of this report. The Federal-aid secondary routes are shown as State trunklines and county roads. They connect with the regular Federal-aid system and are otherwise integrated. The selected system is composed of the former Federal-aid secondary routes with some modifications, a majority of the State trunklines that are not on the Federal-aid system, and the principal county roads where the counties are programming Federal-aid secondary construction projects for a three-year period.

The selected Federal-aid secondary system amounts to 11,258 miles of which 3,268 miles are State trunklines and 7,990 miles are county roads. The total Federal-aid secondary mileage is 12.4 percent of all the eligible roads and streets in Michigan. The rural county roads in the system amount to 7,758 miles. This mileage is 9.3 percent of the total mileage of rural county roads that are under the jurisdiction of the 83 boards of county road commissioners. These and other mileage characteristics of the system are presented graphically in the table on page 4. Similar mileage data for each county is contained in the table with the maps included in this report.






COUNTY APPROVAL

The highway officials in each county have approved their Federal-aid secondary system, their approval being signified by the signature of the chairman of the board of county road commission. Plate 1 is an example of the 83 county maps evidencing their approval.




FEDERAL AID SECONDARY HIGHWAYS IN MICHIGAN - 1945

PARTIAL SELECTION

MILEAGE

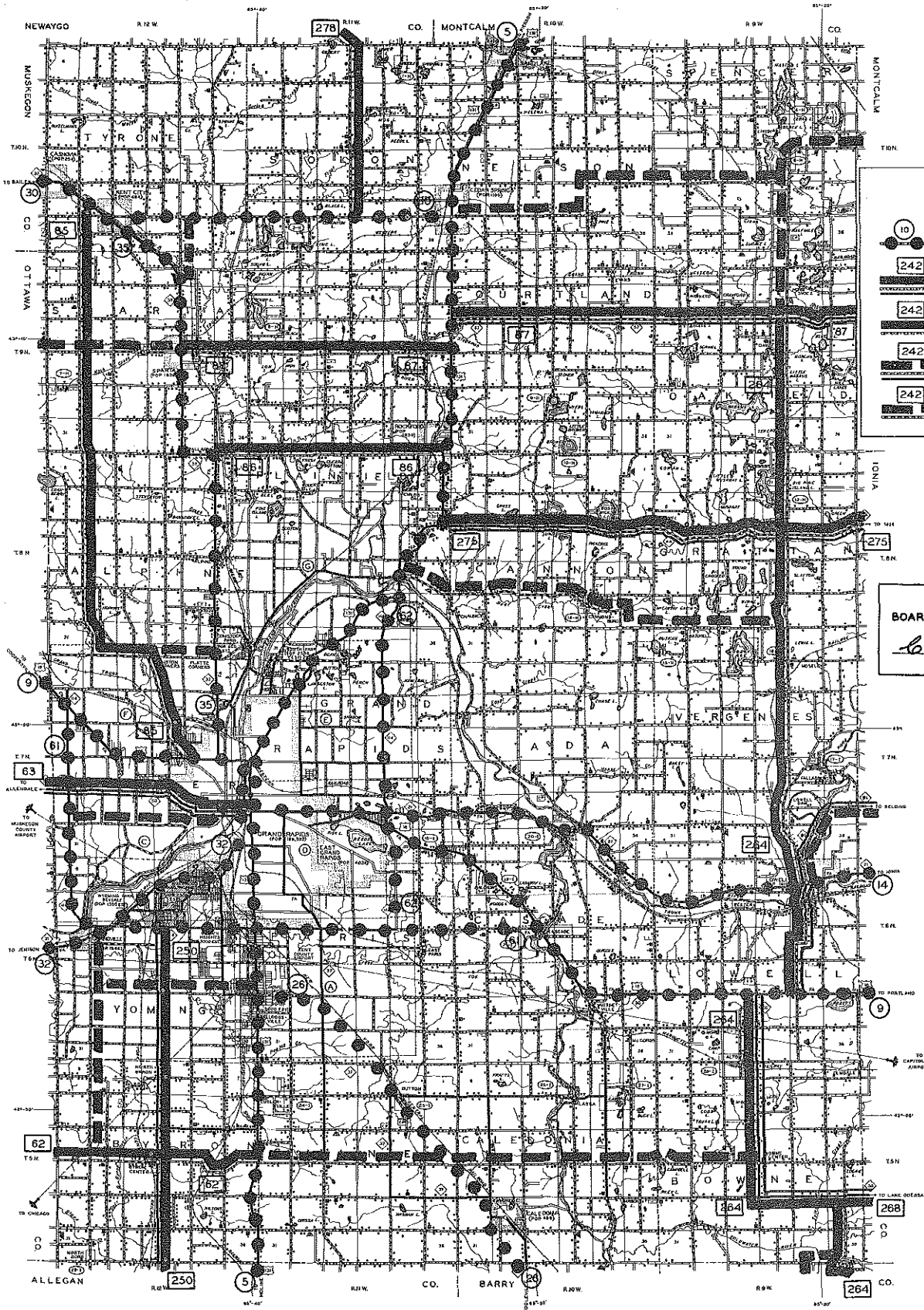
	 STATE TRUNKLINES	 COUNTY ROADS	TOTAL
 RURAL	3,068.7	7,758.0	10,826.7
 RURAL INCORPORATED	199.5	231.5	431.0
TOTAL RURAL	3,268.2	7,989.5	11,257.7
 URBAN EXTENSIONS	54.4	92.8	147.2
TOTAL	3,322.6	8,082.3	11,404.9

MILES OF ROADS IN MICHIGAN ELIGIBLE FOR FEDERAL AID SECONDARY SYSTEM






 STATE TRUNKLINES	 COUNTY ROADS	 OTHER LOCAL STREETS	TOTAL
3,815	83,372	3,680	90,867

THE SELECTED MILEAGE AS A PERCENTAGE OF THE ELIGIBLE MILEAGE

STATE TRUNKLINES	COUNTY ROADS	OTHER LOCAL STREETS	TOTAL
85.7 %	9.3 %	6.3 %	12.4 %



LEGEND
ROUTE CLASSIFICATION

-  FEDERAL-AID TRUNKLINE ROUTES (1)
-  APPROVED FEDERAL-AID SECONDARY ROUTES (2) ON STATE TRUNKLINE
-  APPROVED FEDERAL-AID SECONDARY ROUTES (3) ON COUNTY ROADS
-  SELECTED FEDERAL-AID SECONDARY ROUTES (4) ON STATE TRUNKLINE
-  SELECTED FEDERAL-AID SECONDARY ROUTES (5) ON COUNTY ROADS

APPROVED
BOARD OF COUNTY ROAD COMMISSIONERS

C. Mason 9-25-45
CHAIRMAN DATE



**FEDERAL AID
SECONDARY SYSTEM
KENT COUNTY**

MICHIGAN
STATE HIGHWAY DEPARTMENT
CHARLES H. ZIEGLER
STATE HIGHWAY COMMISSIONER
DATA OBTAINED FROM
HIGHWAY PLANNING SURVEY
CONDUCTED IN COOPERATION WITH
FEDERAL WORKS AGENCY
PUBLIC ROADS ADMINISTRATION

SCALE  MILES
1940
POLARIC PROJECTION

SEE SUPPLEMENTAL SHEETS A TO 3 FOR ENLARGED AREAS

THE SITUATION

This report is an explanation of the manner in which the cooperation of the county highway officials was developed and their approval of the partial system secured. It explains the principles and criteria employed in the selection of the routes by the counties. It presents an over-all view of the use made of the rural lands of Michigan for agriculture, forests and outdoor recreation.

The Michigan State Highway Department is not ready to revise and modify the Federal-aid highway system so that a total Federal-aid secondary system could be selected jointly with the counties. There are contained in the Federal-aid system several routes which perform secondary highway services. These routes would be adequately provided for in the Federal-aid secondary system and transferral of the routes will be effected upon subsequent review of the entire transportation system. The studies in highway classification, based on the functional usage of the roads of this State, have not been developed to the stage where the Federal-aid systems can be segregated and fully established.

The State Legislature provided State funds to be matched by counties to prepare surveys and plans for postwar highway construction projects on county roads. This legislation encouraged and speeded the preparation of postwar construction programs in the counties. The counties were developing their construction programs to use the funds when the selection of a Federal-aid secondary system was initiated.

These construction programs, as presented by the counties, in general consisted of roads that qualify for the system and that could be constructed with the funds authorized by Congress. The routes selected, comprising the

partial system, are on the principal secondary roads that can best be incorporated in the long-range planning of the entire system. These roads are not necessarily the most important or the most heavily traveled highways. In general, the counties believe that the whole system of principal roads should be improved to a high minimum standard before the more important and heavily used roads are reconstructed to make them more efficient for traffic service and maintenance.

COUNTY COOPERATION

Prior to the convention of the American Road Builders Association held in Chicago last January, county road officials showed little interest in the Federal-Aid Highway Act of 1944. The majority of the officials believed that the regulations pertaining to the act would discourage their participation in the Federal-aid secondary program. The speeches delivered at the convention, conversations with the speakers and other national highway authorities changed their viewpoint. They came back to Michigan convinced that the program had merit and that it could be made to produce satisfactory results for all the counties.

As a first step, the Engineering Committee of the County Road Association of Michigan met on February 9, 1945, and discussed the program. At that time, they prepared a number of suggestions and recommendations for consideration by the State Highway Commissioner. Most of the suggestions and recommendations were relative to geometric design standards, character of plans, and apportionment of the funds.

As a result of the meeting the counties initiated their own program for a study of the county roads to identify the principal secondary

and feeder roads. Each county was furnished with the following information:

1. A county map of the existing Federal-aid and Federal-aid secondary systems with mileage data with regard to approved routes.
2. The report of the Engineering Committee.
3. A copy of the Public Roads Administration's General Administrative Memorandum No. 269.

They were asked to expand their Federal-aid secondary system to a suggested maximum of forty percent by increments of ten percent based on need, use, and importance. Explanations of need were requested for each ten percent increment. They were told that changes and abandonment of existing Federal-aid secondary routes would be permitted if good reasons were furnished. They were told that the Planning and Traffic Division, State Highway Department, would cooperate with them and discuss their programs.

As a result, 76 of the 83 counties prepared and submitted the material requested by their Engineering Committee. Upon examination it was found that the Federal-aid secondary systems suggested by the 76 counties represented a variety of interpretations and viewpoints. The percentage ratio of Federal-aid secondary mileage to total county road mileage varied from five to forty percent with an average of 19 percent. In general they had selected principal secondary roads. It appeared that the principal secondary roads could be included in three increments of ten percent.

Representatives of 26 counties came to Lansing and discussed the problem with the department. These meetings served to clarify the purpose of the study and the procedures to be followed. They created a clearer understanding by the counties of the purposes of the Act and the activities of

the Planning and Traffic Division. They suggested the idea that group discussions would be the better way to carry out--in the initial stages--the Federal-aid secondary provisions of the Act. They served to confirm the belief that the county road commissioners, engineers, and superintendents should select their principal roads, subject to the guidance of the procedures suggested by the State and considered and adopted by their own committees.

On May 23, 1945, their Engineering Committee again met in Lansing to consider the results of their study and to formulate definite recommendations of administrative procedure and design for the State Highway Commissioner to consider and present to the Public Roads Administration. The District Engineer for the Public Roads Administration and the State Highway Commissioner and his staff reviewed the regulations and elements of the problem and made suggestions for procedure. This meeting produced the policy and accepted the criteria with which the counties were able to select the Federal-aid secondary routes for a three-year construction program.

Arrangements were then made for group meetings and later for meetings with the individual boards of county road commissioners where the principles, procedure and previous selection were reviewed in detail. Most of the meetings were arranged by the Engineer-Director of the County Road Association of Michigan. He organized and attended the group meetings and usually accompanied the State Highway Department Engineer on trips to individual counties. He entered the discussions and otherwise represented the Engineering Committee in carrying out their over-all State policy.

At these meetings the previously selected road systems and the post-war highway construction program in the county were studied. The criteria and guidance furnished by the State Highway Department Engineer enabled the county road officials to identify their principal secondary roads using their experience and knowledge of local conditions. The problem was studied, discussed, and clarified around the table until a mutually satisfactory group of principal secondary roads in need of immediate improvement had been selected. These roads were then connected with the Federal-aid routes and across county lines to secure a connected network.

In the few instances where there was some difference of opinion about the eligibility of a particular road, every effort was made to reach agreement. The county road officials were asked to amplify and support their recommendations and this usually resulted in concurrence. The supporting data, advanced by the county road officials is part of the record file in Lansing.

It was the policy to encourage the counties to re-examine the eligibility for the Federal-aid secondary system of roads considered as borderline cases. But when this procedure was exhausted and the county highway officials still believed that their road was eligible, their opinion was allowed to prevail. These instances were rare indeed.

The principles and criteria employed in the selection of principal secondary roads are still in process of formulation. They need to be better established before they should be permitted to prevail over the experience and opinion of the local highway officials.

It was agreed that the meetings with the board of road commissioners, the subsequent follow-up procedures, and the cooperation secured

thereby, are major elements essential to the success of the Federal-aid secondary program.

The results indicate the advantages to be obtained by county, state and federal highway cooperation in dealing with other fundamental problems of highway administration. In the county field, they have shown the mutual benefits resulting from working together through an active agency, as the County Road Association of Michigan. Finally, in becoming conversant with, and in planning according to the provisions of the Federal-Aid Highway Act of 1944, all parties have learned the benefits to be had from working with a long-range program.

The meetings have established a sound foundation for working out functional highway classification and for selecting the total Federal-aid secondary system of principal county roads contemplated in the Federal-Aid Highway Act of 1944.

PRINCIPLES FOR THE SELECTION

Traffic on the highways is the accumulation of the movements of people and goods for various purposes. For that reason the usage of land and the location of populated places form the basic highway traffic pattern.

Studies of automobile usage by people living in rural areas reveal that the frequency of their trips is in inverse ratio to their length. The same characteristic is found in the travel of people in small communities and villages to the centers that provide more extensive shopping and service facilities.

1. Trips are made most frequently to the nearest place where daily requirements may be had. This place may

be a neighborhood center, a village, a small town, or a city. The frequency of trips for this purpose depends upon the distance to the place. Usually, this service can be had within a six-mile radius. In this case, the driver habitually seeks the shortest road distance.

2. Trips are made frequently to urban places that furnish all the essential shopping and service facilities needed by people living in the rural areas. The frequency of these trips depends upon the distance to the urban place. In this case, drivers will travel a little further to use better highways.
3. Trips are made habitually but less frequently to the nearest city where superior shopping service and recreational facilities are available. On the average, the frequency of these trips depends upon the distance traveled. In this case, drivers will go out of their way to use the best highways.
4. In many instances, trips are also made to metropolitan centers like Detroit. These trips do not appear necessary and are not made by a majority of the rural residents; however, the composite indicates that the frequency of these trips, likewise, depends upon the distance. The driver will seek, by the shortest distance, the State trunkline that leads to the metropolitan center.

There are other places which are origins and destinations of traffic in varying degrees; such as institutions, consolidated schools, churches, inland lakes, large rural industries, parks, picnic grounds, etc.

Trips are also made to more distant places of traffic interest and to visit among rural residents. These trips are much less frequent. They do not aggregate much traffic and are not major factors in comparison with the uses of the passenger car and the truck that are listed above.

The most efficient roads are those that extend outward north, south, east, and west from the main four corners of the smaller places and from the central business districts of the larger places and which serve to connect these places with other places and points of traffic interest. These roads, extended rectilinearly along section lines, produce a connected network. About midway between places of similar importance, these roads can be planned to lead directly into the place of traffic interest in one of the four cardinal directions.

The studies have revealed the following conditions for consideration in identifying the principal secondary and feeder roads:

1. Three or four-mile spacing is the most desirable; three-mile spacing in the better agricultural areas and four-mile spacing in the sparsely populated agricultural areas.
2. The most desirable arrangement in purely agricultural areas is a three-mile by four-mile rectangular area bordered by principal highways.
3. On the fringe of the larger cities where urban developments are taking place, a spacing of one mile appears reasonable.

4. There are instances of natural barriers and irregular location of places that prevent the formulation of the ideal connected network of principal highways. Here spacings of one and two miles for principal secondary roads appear justified.
5. The existence of large lakes and wide rivers will increase the mileage of principal secondary roads. A large lake will usually require a principal road around its shores and a wide river will usually require a principal road on each side. Naturally, the points of travel interest are located on the rivers and on the shores of large lakes.
6. Diagonal roads should be given consideration in designating routes in any system of highways. Where they serve a considerable volume of travel, they will have to be designated in the system. In general, they constitute an addition to the roads radiating in the four cardinal directions and, therefore, tend to increase the mileage of the principal roads that will have to be constructed and maintained with higher standards and greater expense.
7. Spurs to principal secondary routes may be necessary to reach consolidated schools, institutions, parks, developed lakes, etc.

These principles, along with traffic flow and the general land-use characteristics displayed on the general highway county maps, were used by

the State Highway Department Engineer as criteria to guide the selection of Federal-aid secondary routes by county highway officials. He was furnished with a map for each county on which were displayed the points of traffic interest as determined by studies in functional highway classification. Plate 2 is an example of the county map used by engineers during their meetings with the counties. The relative classifications of places displayed on the map are for utility in judging the principal roads in groups of decreasing importance. This device permits a progressive examination of a road system from the most important to the least important. The classifications used in the legend are general and are not intended to measure the real importance of any particular place. In each instance, where this method was understood and used it was accepted with favorable comment by the local highway officials. There is increasing confidence that when the current studies are complete and the method perfected, it will serve to segregate the highways in levels for administrative responsibility.

RURAL LAND USE

Practically speaking, all land in Michigan is used. It is true that extensive acreages are improperly used: the soil is being mined and erosion is on the increase. The greatest agricultural need is soil conservation.

A greater need for the proper use of the land is good roads for highway transportation, the only mode of transportation for most of the land. Good roads are required for a prosperous agriculture, for successful forest industry, to develop mineral resources, and to reach and enjoy the extensive outdoor recreational resources. They are needed for hunting, fishing, touring and vacationing. They are required for the use, protection and administration of the lands in public ownership.

AGRICULTURE

Among the 48 states Michigan ranks 21st in farm population--860,000; and 15th in value of farm products--\$340,000,000. This differential in rank signified a comparatively prosperous agriculture founded in good soils and nearby consuming markets. Plate 3 illustrates this point. The high values of agricultural production per acre are close to the industrial cities. Improved principal secondary and farm-to-market roads are essential elements for Michigan agriculture to maintain this position.

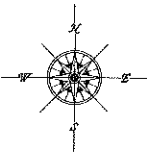
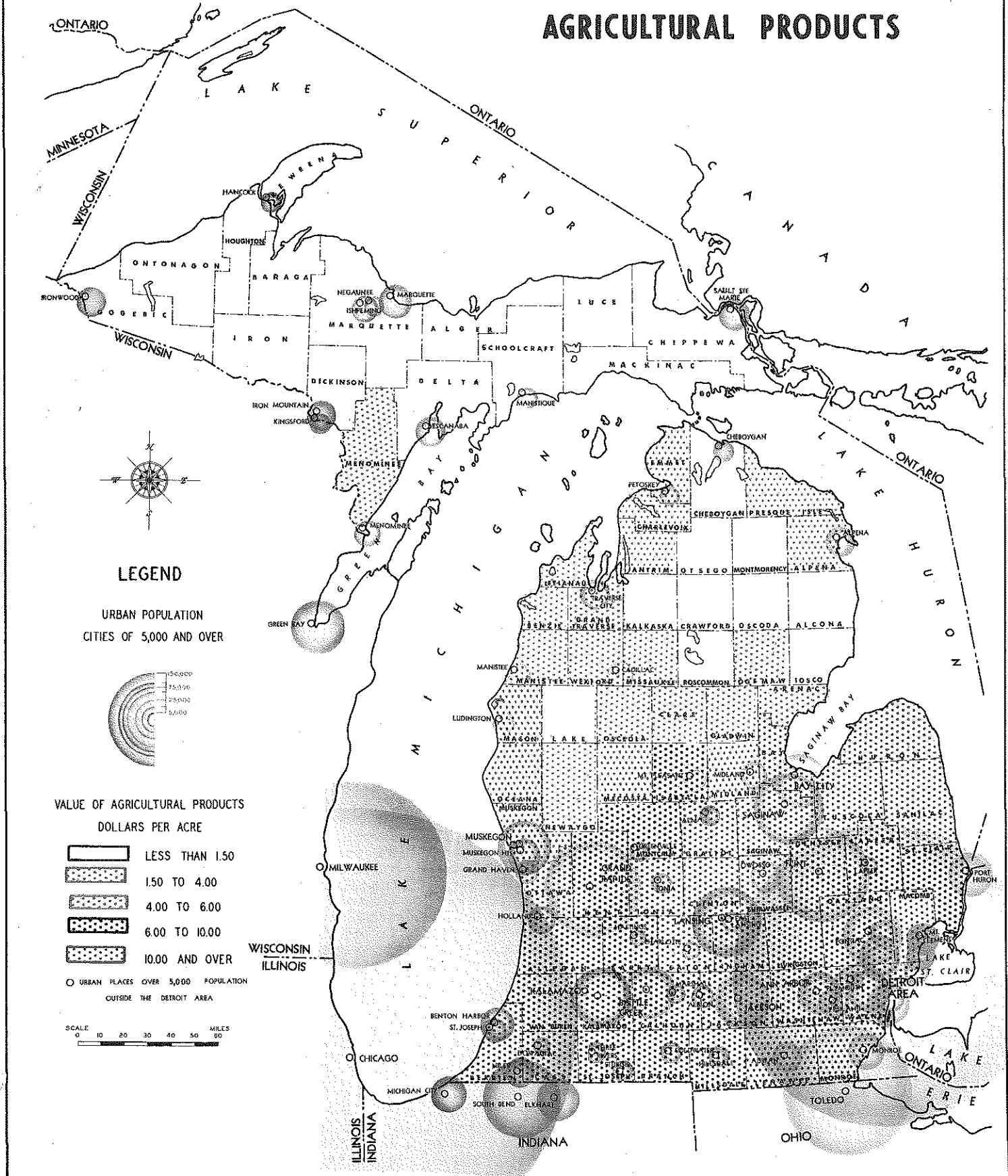
There are some good agricultural soils in northern Michigan where a good living can be had by farming. There are immediate consuming markets catering to the extensive recreational and tourist industry. This idea is suggested by the comparison in plate 4.

The rural non-farm population-940,000--in Michigan is greater than the farm population--860,000. The non-farm population live in the fringes of the industrial cities and are scattered in the farm and forest areas. This group is comprised of industrial and service workers, and those employed in the rural, farm, forest and recreational industries. The daily requirements of working and living necessitate their travel of the principal secondary and feeder roads. In plate 5 the principal mineral resources are compared with the intensity of rural population by counties.

RECREATIONAL RESOURCES

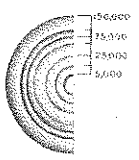
Michigan people and the people living in the adjoining states are increasingly using the healthful outdoor recreational resources of southern and northern Michigan. These resources in the form of inland lakes, game areas, hunting grounds, streams, views and the beaches on the Great Lakes,

CENTERS OF URBAN POPULATION AND VALUE OF AGRICULTURAL PRODUCTS

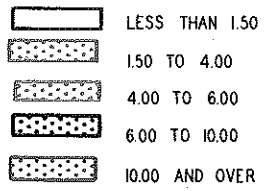


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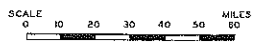
URBAN POPULATION
CITIES OF 5,000 AND OVER



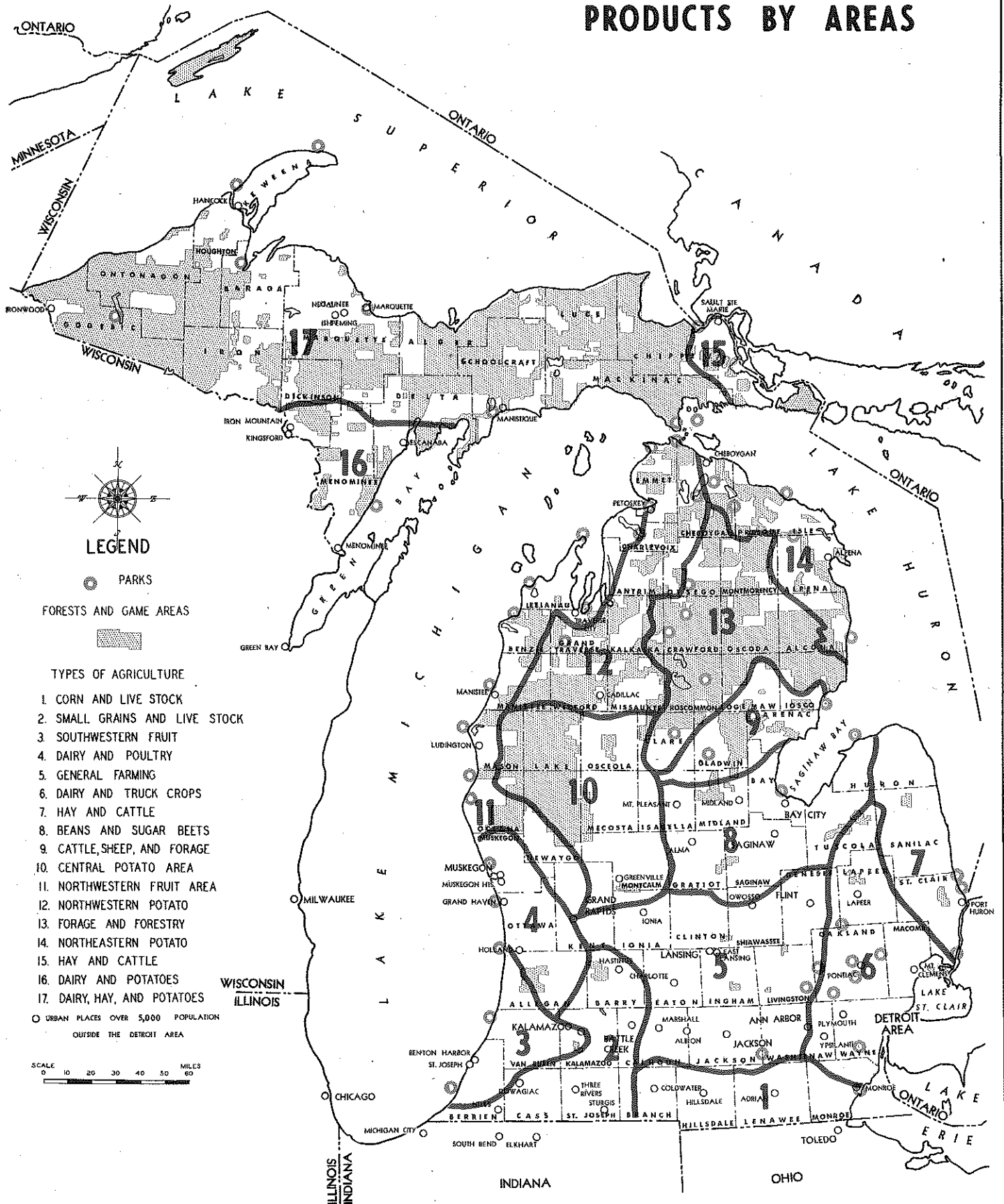
VALUE OF AGRICULTURAL PRODUCTS
DOLLARS PER ACRE



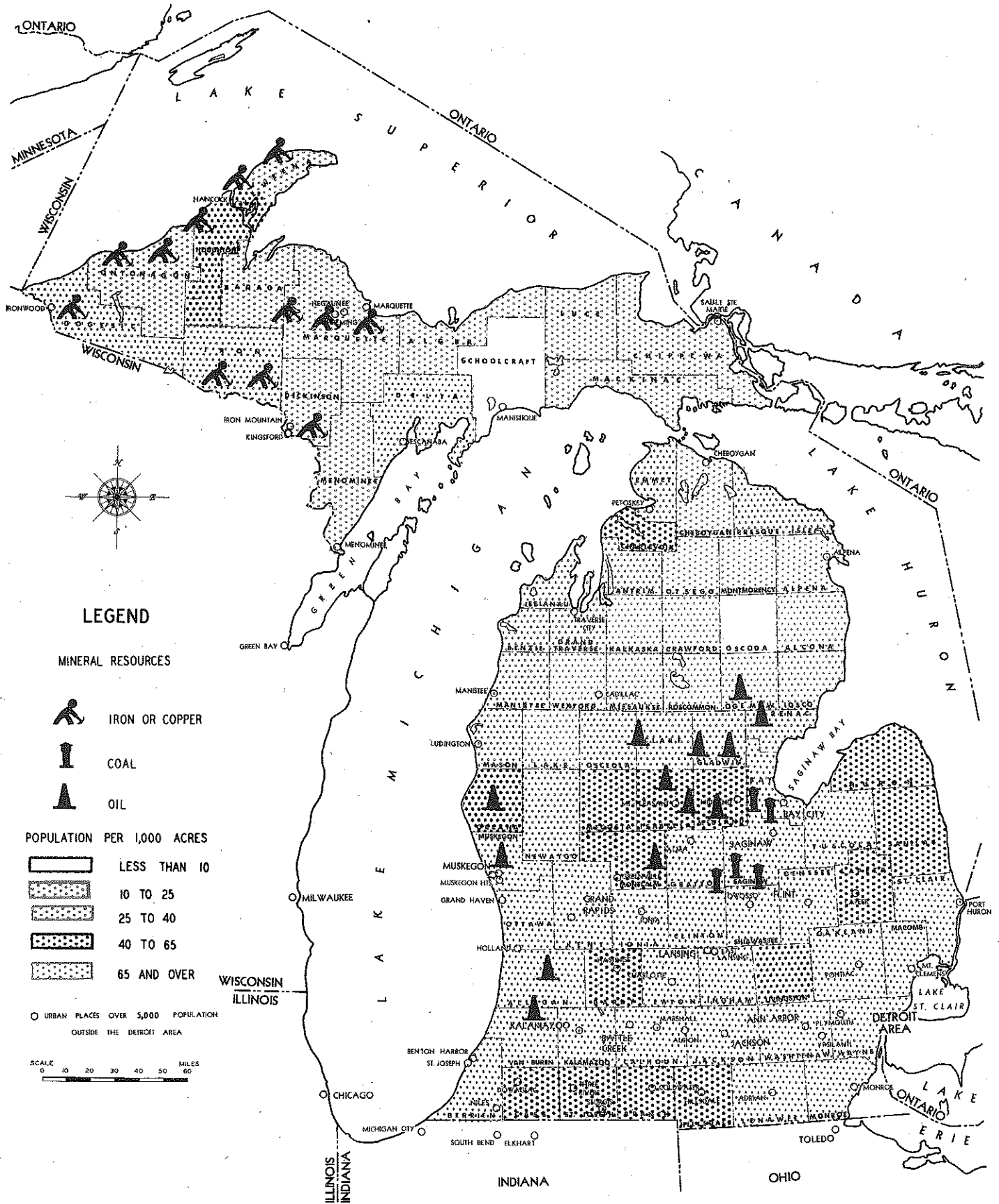
○ URBAN PLACES OVER 5,000 POPULATION
OUTSIDE THE DETROIT AREA



RECREATIONAL RESOURCES AND TYPES OF AGRICULTURAL PRODUCTS BY AREAS



MINERAL RESOURCES AND RURAL POPULATION



are mostly accessible via the principal secondary roads that are eligible for the Federal-aid secondary system. These roads are used extensively by recreational patrons who are seasonal residents of the areas.

In Southern Michigan the principal secondary roads serve both agriculture and outdoor recreation. In Northern Michigan the principal secondary roads serve the tourist and recreational industry and they often pass through and reach the small areas of good agricultural soils. They are essential elements for prosperous tourist enterprises and the healthful enjoyment of the natural resources. Lands and parks, forests, game areas, public grounds and the shores of the Great Lakes display the extent of the tourist and recreational industry in Michigan. This is shown in plates 4 and 6.

HUNTING

In 1943 the State Department of Conservation made an estimate of the number of deer hunters in each of the counties based on the return of cards from the deer hunting licenses issued. Plate 6 displays the distribution of nearly 214,000 deer hunters by counties in 1943.

The importance of this form of recreation in the life of the people is evidenced by the great number of hunters who managed one way or another to accumulate enough ammunition and gasoline to enjoy this outdoor recreation during the restrictive war years.

The season of 1941 produced the greatest number of deer and small game hunters in the history of the State. There were slight decreases in the number of deer hunters during 1942 and 1943, due primarily to the remoteness of the deer hunting areas from the centers of population. However, the average

number of small game hunters in each of the three war years was greater than in 1940. The proximity of small game hunting, available in each county of the State, made this possible.

FEDERAL AID SECONDARY HIGHWAYS IN MICHIGAN - 1945

PARTIAL SELECTION

MILEAGE TABULATION BY COUNTIES

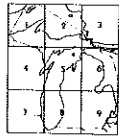
	MILEAGE ELIGIBLE FOR F.A.S.	ROUTES IN RURAL AREAS					TOTAL MILES	% OF ELIGIBLE MILEAGE	URBAN EXTENSIONS	TOTAL MILEAGE
		STATE TRUNKLINES	COUNTY ROADS			TOTAL				
			RURAL	*RURAL INC.	TOTAL					
ALCONA	687.0	72.2	94.0	0.5	94.5	166.7	24.3		166.7	
ALGER	520.9	68.5	31.1	1.3	32.4	100.9	19.4		100.9	
ALLEGAN	1944.1	40.5	142.8	5.8	148.6	189.1	9.7		189.1	
ALPENA	638.4	26.4	76.2		76.2	102.6	16.1	1.0	103.6	
ANTRIM	898.8	52.4	87.5	3.5	91.0	143.4	16.0		143.4	
ARENAC	684.1	27.3	54.5	1.6	56.1	83.4	12.2		83.4	
BARAGA	422.2	9.5	61.5	1.3	62.8	72.3	17.1		72.3	
BARRY	1147.4	76.0	105.1	2.8	107.9	183.9	16.0	4.3	188.2	
BAY	1011.8	20.0	84.4	1.3	85.7	106.7	10.4		106.7	
BENZIE	692.4	27.3	53.0	1.0	54.0	81.3	11.7		81.3	
BERRIEN	1387.4	35.3	121.1	7.7	128.8	164.1	11.8	2.4	166.5	
BRANCH	1017.0	21.4	123.9	3.9	127.8	149.2	14.7		149.2	
CALHOUN	1366.4	11.6	73.0	0.9	73.9	85.5	6.3	5.4	90.9	
CASS	1033.4	55.9	126.7	3.1	129.8	185.7	18.0	3.3	189.0	
CHARLEVOIX	841.0	35.4	58.1	6.4	64.5	99.9	11.9		99.9	
CHEBOYGAN	909.6	15.4	48.3	0.6	48.9	64.3	7.1	2.8	67.1	
CHIPPEWA	1329.8	122.7	197.3	2.0	199.3	322.0	24.2	4.8	326.8	
CLARE	895.4	27.2	67.8	0.9	68.7	95.9	10.7		95.9	
CLINTON	1185.5	1.8	112.4	8.1	120.5	122.3	10.3		122.3	
CRAWFORD	800.4	28.0	67.5		67.5	95.5	11.9		95.5	
DELTA	845.7	32.6	154.6	1.9	156.5	189.1	22.4	1.3	190.4	
DICKINSON	588.5	25.1	71.5		71.5	97.6	16.6	3.2	100.8	
EATON	1184.9	54.9	74.9	4.3	79.2	134.1	11.3	0.9	135.0	
EMMET	871.6	25.5	57.7	1.1	58.8	84.3	9.7	0.8	85.1	
GENESE	1421.9	25.2	121.5	5.6	127.1	152.3	10.7	3.1	155.4	
GLADWIN	781.6	50.3	61.7	1.4	63.1	113.4	14.5		113.4	
GOGEBIC	516.5	25.1	101.7	2.1	103.8	128.9	25.0	3.0	131.9	
GRAND TRAVERSE	877.1	37.7	70.6	1.8	72.4	110.1	12.6	4.0	114.1	
GRATIOT	1263.8	26.5	123.7	2.3	126.0	152.5	12.1	4.1	156.6	
HILLSDALE	1219.5	73.3	117.1	4.8	121.9	195.2	16.0	2.8	198.0	
HOUGHTON	1045.6	44.3	149.0	0.5	149.5	193.8	18.5		193.8	
HURON	1746.5	55.5	103.7	5.6	109.3	164.6	9.4		164.6	
INGHAM	1216.3	39.4	139.6	4.6	144.2	183.6	15.1	4.8	188.4	
IONIA	1263.9	74.7	89.9	6.6	96.5	170.2	13.5	1.7	171.9	
IOSCO	847.4	38.7	59.9	1.1	61.0	99.7	11.8		99.7	
IRON	687.6	16.0	83.6	6.5	90.1	106.1	15.4		106.1	
ISABELLA	1155.1		135.3	1.0	136.3	136.3	11.8		136.3	
JACKSON	1414.1	67.5	71.1	1.4	72.5	140.0	9.9	5.3	145.3	
KALAMAZOO	1240.1	22.8	90.9	3.9	94.8	117.6	9.5	4.7	122.3	
KALKASKA	957.4	14.1	94.4		94.4	108.5	11.3		108.5	
KENT	2058.4	43.8	142.0	3.7	145.7	189.5	9.2	4.1	193.6	
KEWEENAW	166.7	22.3	58.7		58.7	81.0	48.6		81.0	
LAKE	790.4	16.6	48.3	1.0	49.3	65.9	8.3		65.9	
LAPEER	1328.7	24.7	125.0	5.0	130.0	154.7	11.6		154.7	
LEELANAU	755.7	94.5	54.1	1.8	55.9	150.4	19.9		150.4	
LENA WEE	1608.8	44.7	98.8	4.4	103.2	147.9	9.2	2.1	150.0	
LIVINGSTON	1129.2	23.8	129.9	4.1	134.0	157.8	14.0		157.8	
LUCE	376.6	51.7	59.4		59.4	111.1	29.5		111.1	
MACKINAC	664.1	82.8	75.7	0.7	76.4	159.2	24.0		159.2	
MACOMB	1166.1	16.9	109.0	3.4	112.4	129.3	11.1	11.8	141.1	
MANISTEE	1053.2	19.8	108.5	3.9	112.4	132.2	12.6	1.0	133.2	
MARQUETTE	1282.2	38.6	93.2		93.2	131.8	10.3	7.8	139.6	
MASON	877.4		74.8	1.9	76.7	76.7	8.7		76.7	
MECOSTA	1236.9	43.3	111.6	0.6	112.2	155.5	12.6		155.5	
MENOMINEE	1239.5	17.9	132.1	0.7	132.8	150.7	12.2	1.6	152.3	
MIDLAND	925.6	28.7	71.7	0.8	72.5	101.2	10.9	2.5	103.7	
MISSAUREE	1012.7	46.0	48.5	0.5	49.0	94.0	9.3		94.0	
MONROE	1273.2	44.5	93.7	1.8	95.5	140.0	11.0	2.6	142.6	
MONTCALM	1630.5	74.3	92.6	4.5	97.1	171.4	10.5	1.8	173.2	
MONTMORENCY	702.6	24.0	48.0	0.8	48.8	72.8	10.4		72.8	
MUSKOGON	1228.1	9.3	84.0	4.0	88.0	97.3	7.9		97.3	
NEWAYGO	1674.0	34.6	142.1	3.1	145.2	179.8	10.7		179.8	
OAKLAND	2488.4	38.8	128.1	12.7	140.8	179.6	7.2	5.3	184.9	
OCEANA	1173.3	35.6	93.4	2.5	95.9	131.5	11.2		131.5	
OGEMAW	823.6	42.5	85.8	0.8	86.6	129.1	15.7		129.1	
ONTONAGON	577.7	53.7	63.8		63.8	117.5	20.3		117.5	
OSCEOLA	966.5	46.1	52.7	2.1	54.8	100.9	10.4		100.9	
OSCODA	603.8	53.2	54.6		54.6	107.8	17.9		107.8	
OTSEGO	749.4		53.2	0.5	53.7	53.7	7.2		53.7	
OTTAWA	1414.1	20.1	71.6	3.6	75.2	95.3	6.7		95.3	
PRESQUE ISLE	654.2	26.5	74.4	2.5	76.9	103.4	15.8		103.4	
ROSCOMMON	844.1	12.6	51.5	0.3	51.8	64.4	7.6		64.4	
SAGINAW	1680.7	71.6	100.4	1.8	102.2	173.8	10.3	0.9	174.7	
ST. CLAIR	1622.6		81.3	3.1	84.4	159.9	9.9		159.9	
ST. JOSEPH	1055.7	31.1	100.9	4.0	104.9	136.0	12.9	1.6	137.6	
SANILAC	1967.2	130.6	128.2	6.9	135.1	265.7	13.5		265.7	
SCHOOLCRAFT	452.3	60.3	89.3		89.3	149.6	33.1	2.1	151.7	
SHIAWASSEE	1143.6	33.4	121.7	8.9	130.6	164.0	14.3	3.2	167.2	
TUSCOLA	1797.1	63.8	143.2	5.0	148.2	212.0	11.8		212.0	
VAN BUREN	1456.2	75.8	136.7	6.6	143.3	219.1	15.0		219.1	
WASHTENAW	1493.6	31.1	117.6	3.5	121.1	152.2	10.2	4.1	156.3	
WAYNE	2189.3	19.2	169.9	9.3	179.2	198.4	9.1	29.7	228.1	
WEXFORD	968.5	19.9	79.4	2.5	81.9	101.8	10.5	1.3	103.1	
TOTAL	90,867.0	3,268.2	7,758.0	231.5	7,989.5	11,257.7	12.4	147.2	11,404.9	

* MILEAGE IN INCORPORATED PLACES OF LESS THAN 5,000 POPULATION



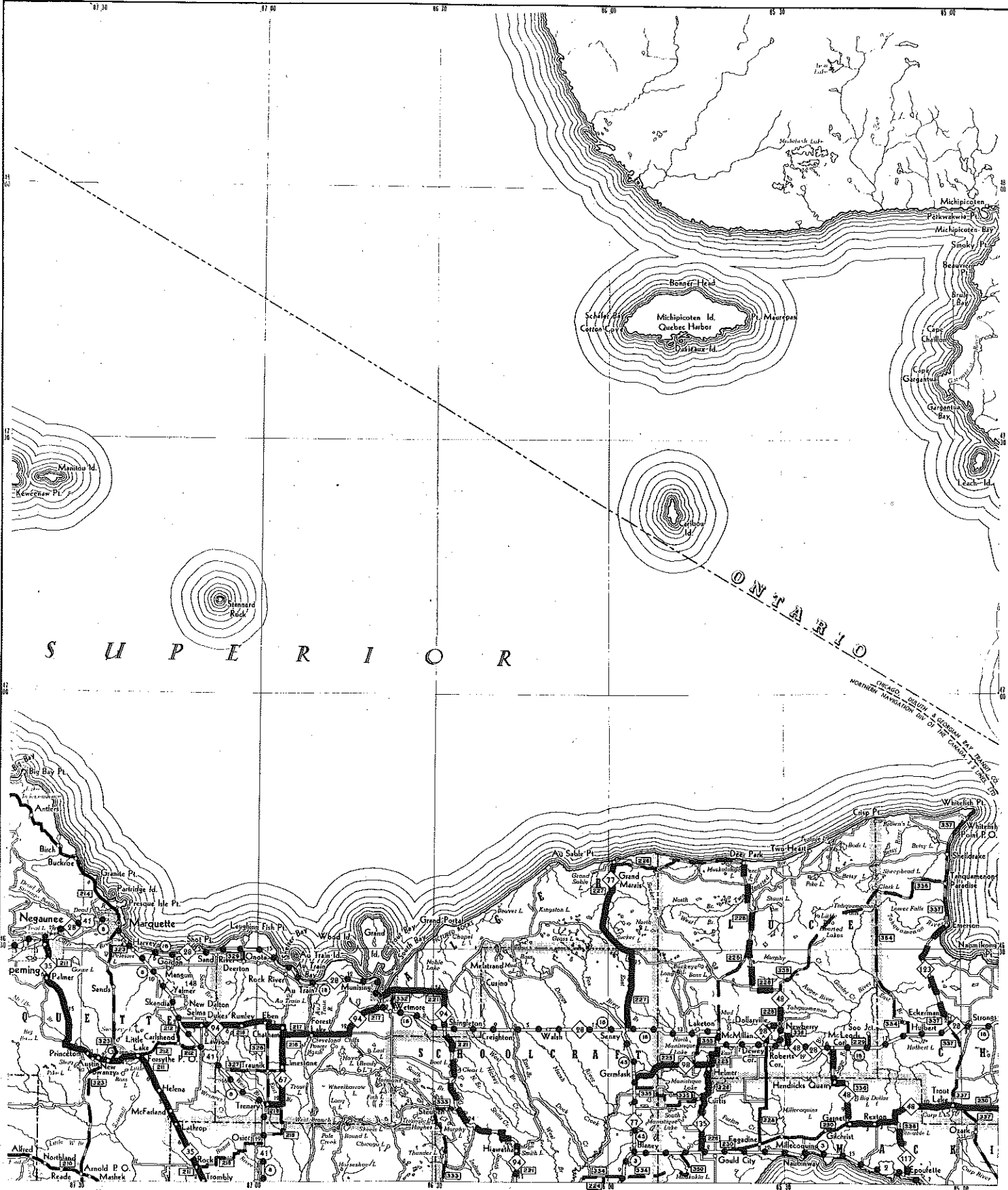
SHEET 1 OF 9 MAPS

MICHIGAN



GENERAL HIGHWAY MAP
 STATE OF
MICHIGAN
 MICHIGAN STATE HIGHWAY DEPARTMENT
 CHARLES M. ZIGLER, STATE HIGHWAY COMMISSIONER
 DATA OBTAINED FROM
 HIGHWAY PLANNING SURVEY
 CONDUCTED BY GEORGE W. KEMP
 PUBLIC ROADS ADMINISTRATION
 FEDERAL WORKS AGENCY
 1945

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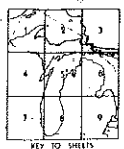


S U P E R I O R

ONTARIO

CINCINNATI, CLEVELAND & DETROIT RAILROAD CO.
NORTHWESTERN NAVIGATION CO. OF THE CANTON, N.Y. PORT

SHEET 8 OF 9 MAP SHEETS MICHIGAN



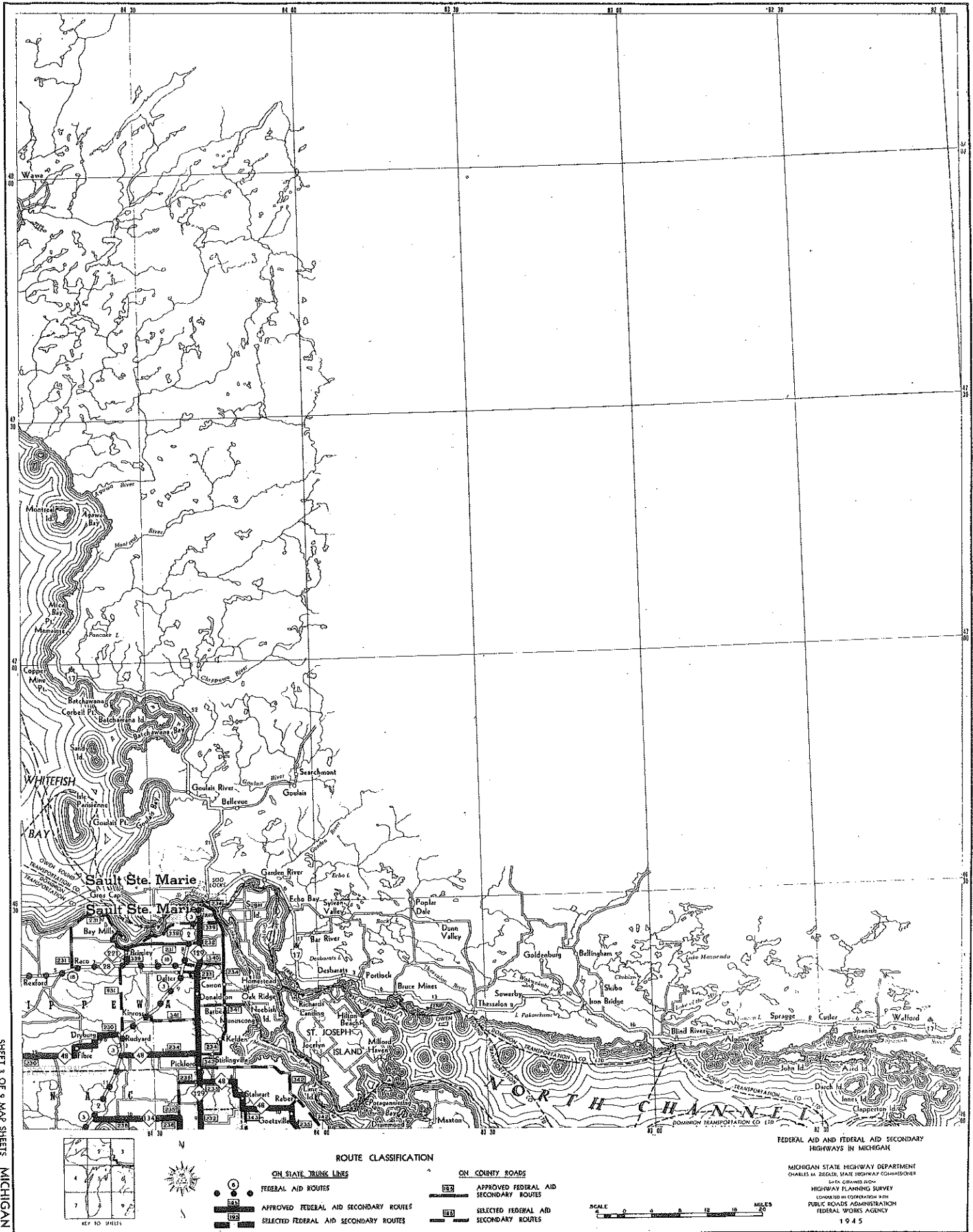
ROUTE CLASSIFICATION

ON STATE TRUNK LINES		ON COUNTY ROADS	
	FEDERAL AID ROUTES		APPROVED FEDERAL AID SECONDARY ROUTES
	APPROVED FEDERAL AID SECONDARY ROUTES		SELECTED FEDERAL AID SECONDARY ROUTES

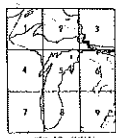


FEDERAL AID AND FEDERAL AID SECONDARY HIGHWAYS IN MICHIGAN

MICHIGAN STATE HIGHWAY DEPARTMENT
 CHARLES W. ZIEGLER, STATE HIGHWAY COMMISSIONER
 DATA OBTAINED FROM
 HIGHWAY PLANNING SURVEY
 CONDUCTED IN COOPERATION WITH
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 FEDERAL WORKS AGENCY



SHEET 3 OF 9 MAP SHEETS MICHIGAN



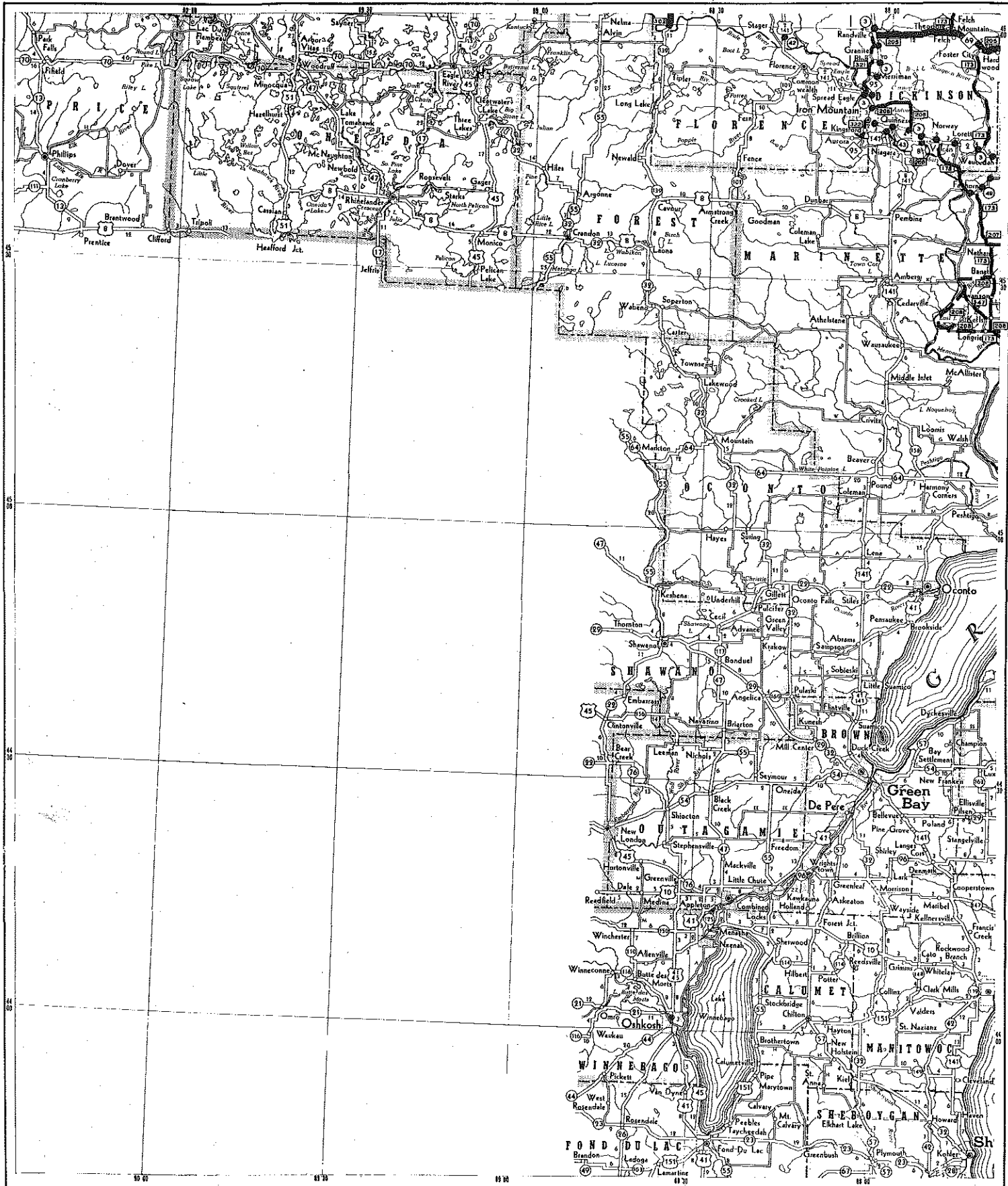
ROUTE CLASSIFICATION

- | | | | |
|-----------------------------|---------------------------------------|------------------------|---------------------------------------|
| ON STATE TRUNK LINES | | ON COUNTY ROADS | |
| | FEDERAL AID ROUTES | | APPROVED FEDERAL AID SECONDARY ROUTES |
| | APPROVED FEDERAL AID SECONDARY ROUTES | | SELECTED FEDERAL AID SECONDARY ROUTES |
| | SELECTED FEDERAL AID SECONDARY ROUTES | | |

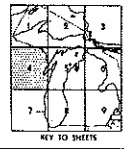


FEDERAL AID AND FEDERAL AID SECONDARY HIGHWAYS IN MICHIGAN

MICHIGAN STATE HIGHWAY DEPARTMENT
 CHARLES H. BEGGS, STATE HIGHWAY COMMISSIONER
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 1945



SHEET 4 OF 9 MAP SHEETS MICHIGAN



ROUTE CLASSIFICATION

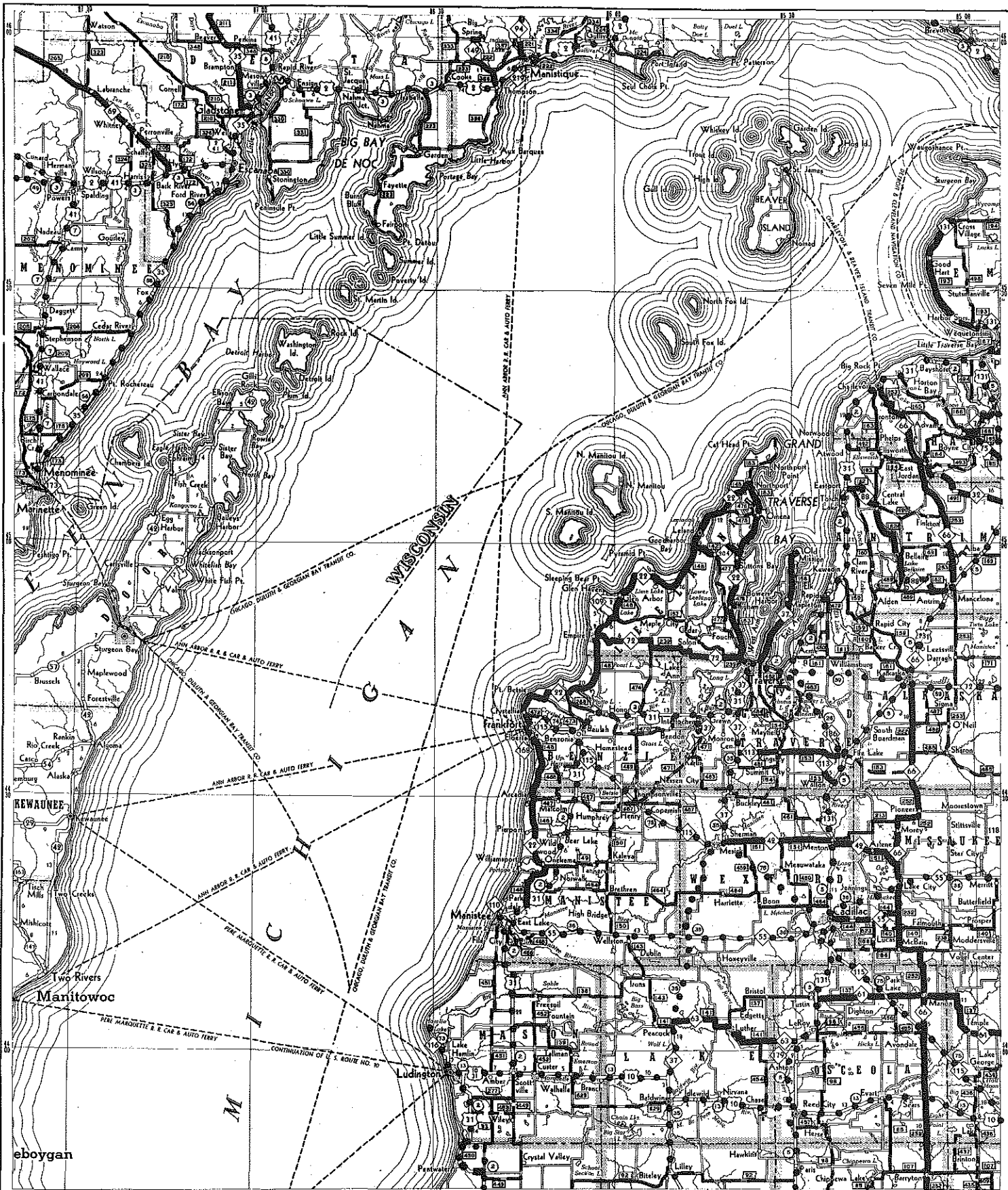
 ON STATE TRUNK LINES	 ON COUNTY ROADS
 FEDERAL AID ROUTES	 APPROVED FEDERAL AID SECONDARY ROUTES
 APPROVED FEDERAL AID SECONDARY ROUTES	 SELECTED FEDERAL AID SECONDARY ROUTES
 SELECTED FEDERAL AID SECONDARY ROUTES	 SELECTED FEDERAL AID SECONDARY ROUTES



FEDERAL AID AND FEDERAL AID SECONDARY HIGHWAYS IN MICHIGAN

MICHIGAN STATE HIGHWAY DEPARTMENT
 CHARLES H. ZICKLER, STATE HIGHWAY COMMISSIONER
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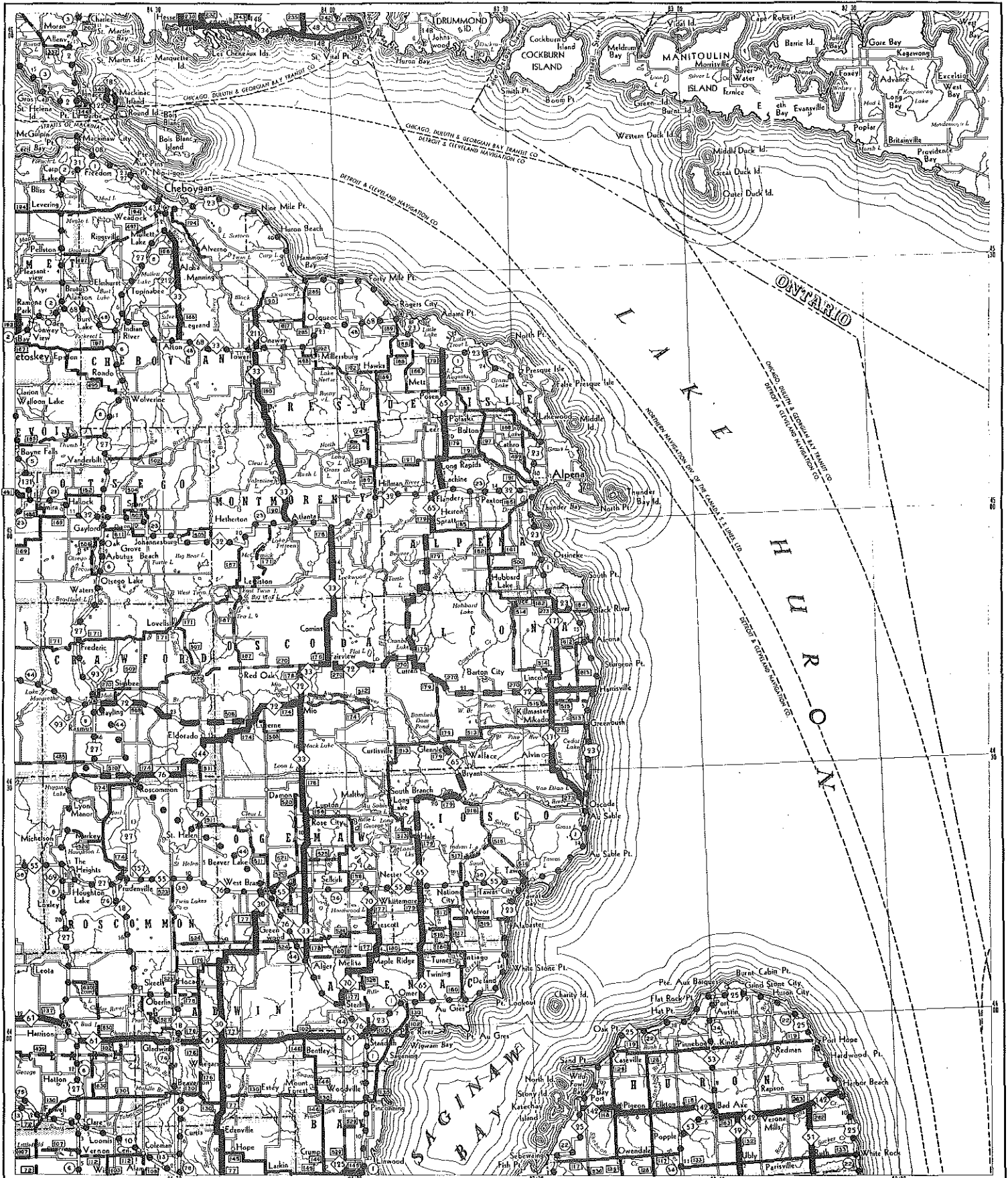
ROUTE CLASSIFICATION

- | | | | |
|--|--|--|--|
| | OH STATE TRUNK LINES | | ON COUNTY ROADS |
| | FEDERAL AID ROUTES | | APPROVED FEDERAL AID SECONDARY ROUTES |
| | APPROVED FEDERAL AID SECONDARY ROUTES | | SELECTED FEDERAL AID SECONDARY ROUTES |

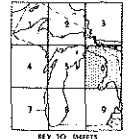


FEDERAL AID AND FEDERAL AID SECONDARY HIGHWAYS IN MICHIGAN

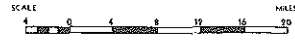
MICHIGAN STATE HIGHWAY DEPARTMENT
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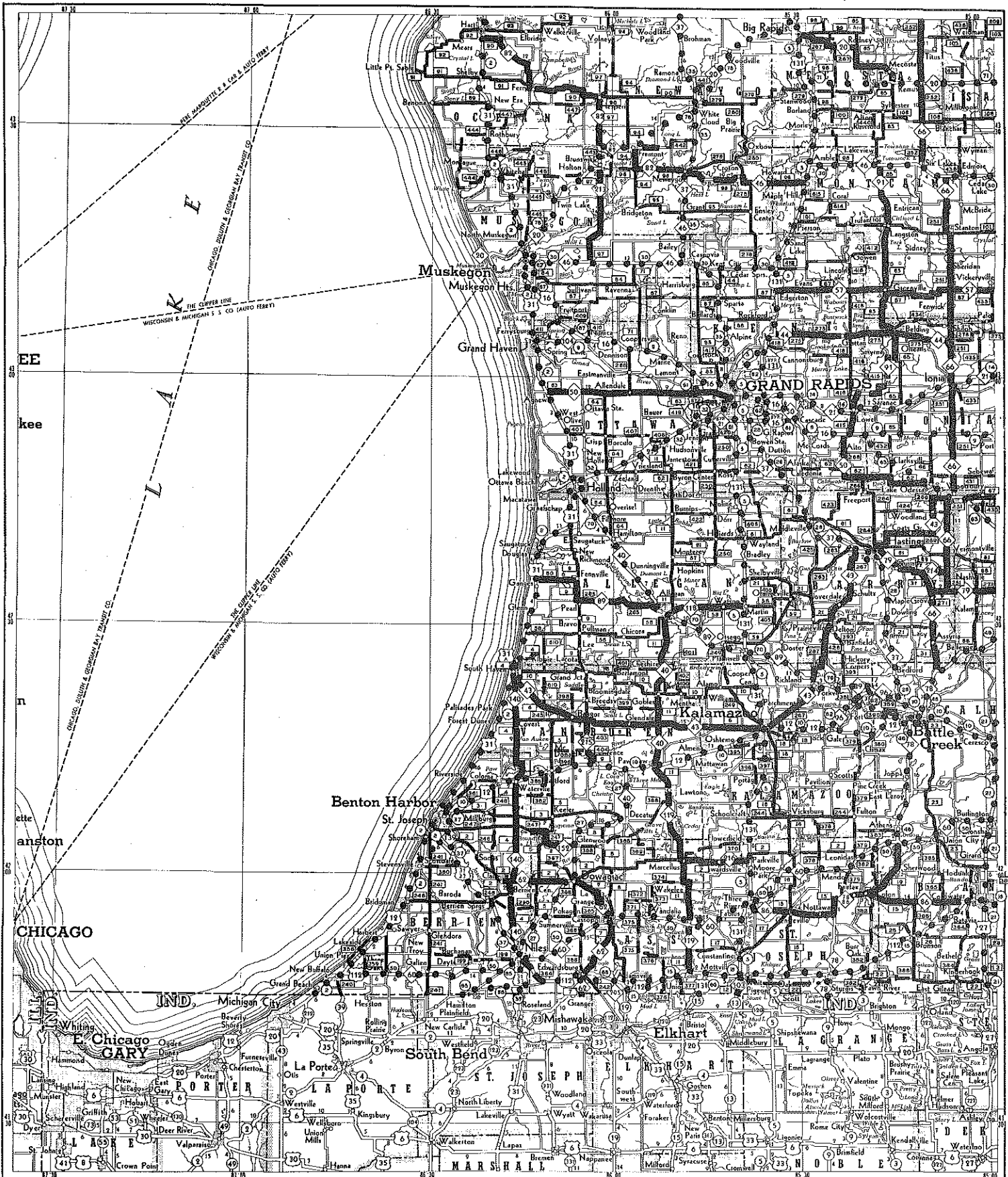
SHEET 6 OF 9 MAP S-1



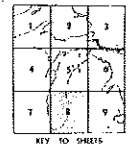
SEE SUPPLEMENTAL SHEETS FOR ENLARGED AREAS



GENERAL HIGHWAY MAP
STATE OF
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MICHIGAN STATE HIGHWAY DEPARTMENT
CHARLES H. ZIEGLER, STATE HIGHWAY COMMISSIONER
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PUBLIC ROADS ADMINISTRATION
FEDERAL WORKS AGENCY
1945



SHEET 8 OF 9 MAP SHEETS MICHIGAN



ROUTE CLASSIFICATION

- | | |
|---------------------------------------|---------------------------------------|
| ON STATE TRUNK LINES | ON COUNTY ROADS |
| FEDERAL AID ROUTES | APPROVED FEDERAL AID SECONDARY ROUTES |
| APPROVED FEDERAL AID SECONDARY ROUTES | SELECTED FEDERAL AID SECONDARY ROUTES |
| SELECTED FEDERAL AID SECONDARY ROUTES | |



FEDERAL AID AND FEDERAL AID SECONDARY HIGHWAYS IN MICHIGAN

MICHIGAN STATE HIGHWAY DEPARTMENT
 CHARLES H. ZIEGLER, STATE HIGHWAY COMMISSIONER

HIGHWAY PLANNING SURVEY
 CONDUCTED BY GEORGE A. HARRIS
 PUBLIC ROADS ADMINISTRATION
 FEDERAL WORKS AGENCY

1945



SHEET 9 OF 9 MA



SEE SUPPLEMENTAL SHEETS FOR ENLARGED AREAS



GENERAL HIGHWAY MAP
 STATE OF
MICHIGAN
 MICHIGAN STATE HIGHWAY DEPARTMENT
 CHARLES W. ZIEGLER, STATE HIGHWAY COMMISSIONER
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