

E7401

THE ANATOMY OF  
SELECTED MINNESOTA  
ENVIRONMENTAL SYSTEMS

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THE ANATOMY  
OF  
SELECTED  
MINNESOTA ENVIRONMENTAL SYSTEMS

A Selection of Background Maps for the  
Industry-Education Conference

Onamia, Minnesota

May 12-14, 1974

Compiled by the

Center for Urban and Regional Affairs (CURA)  
University of Minnesota  
Minneapolis, Minnesota 55455

Note to the Reader

This selection of maps is grouped under five headings which conform to five of the six environmental components, or systems, around which the Industry-Education Conference is organized. Time prohibited our including maps for the Energy System. Those included are listed in the Table of Contents, below.

<u>System</u>	<u>Map Numbers</u>	<u>Pages</u>
Education/Communication	1-17	1-10
Government	18-27	11-18
Industrial	28-45	19-33
Natural	46-54	34-42
Transportation	55-62	43-50

Maps of agriculture and manufacturing employment were compiled from the most recent census data. Others are taken from the following sources.

Atlas of Minnesota Resources and Settlement, J. R. Borchert and D. P. Yaeger, St. Paul: Minnesota State Planning Agency, 1968-69.

Minnesota Land Use and Settlement 1985, J. R. Borchert and D. D. Carroll, Minneapolis: U. of M.--CURA for Minnesota State Planning Agency, 1971.

Public College Enrollments in Minnesota's Changing Population Pattern 1970-1985, Thomas Mortenson, et al., Minneapolis: U. of M.--CURA, 1973.

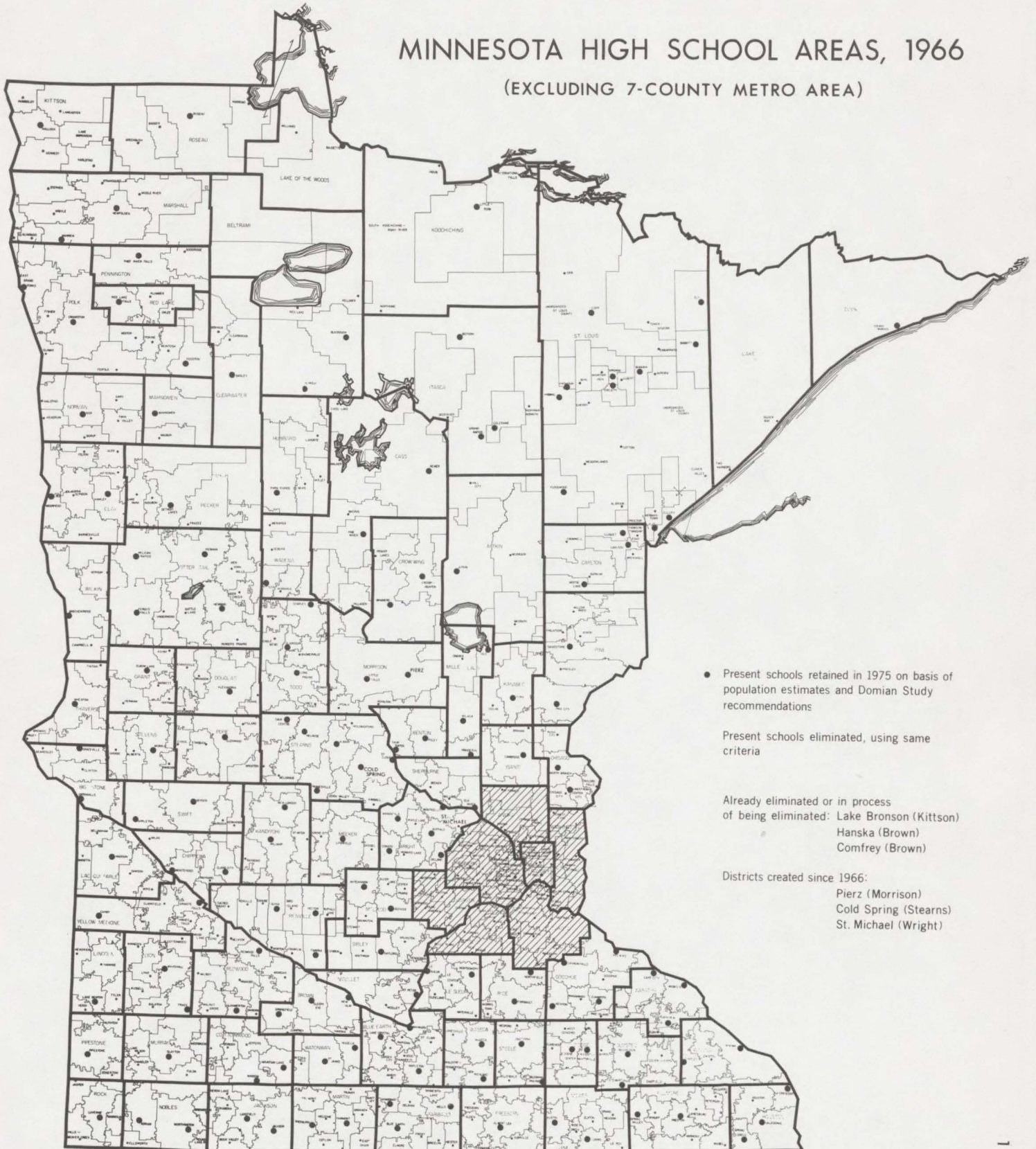
Minnesota Population and State Planning, Report of a Seminar in the Department of Geography, U. of M., St. Paul: Minnesota State Planning Agency, 1968.

EDUCATION/COMMUNICATION SYSTEMS



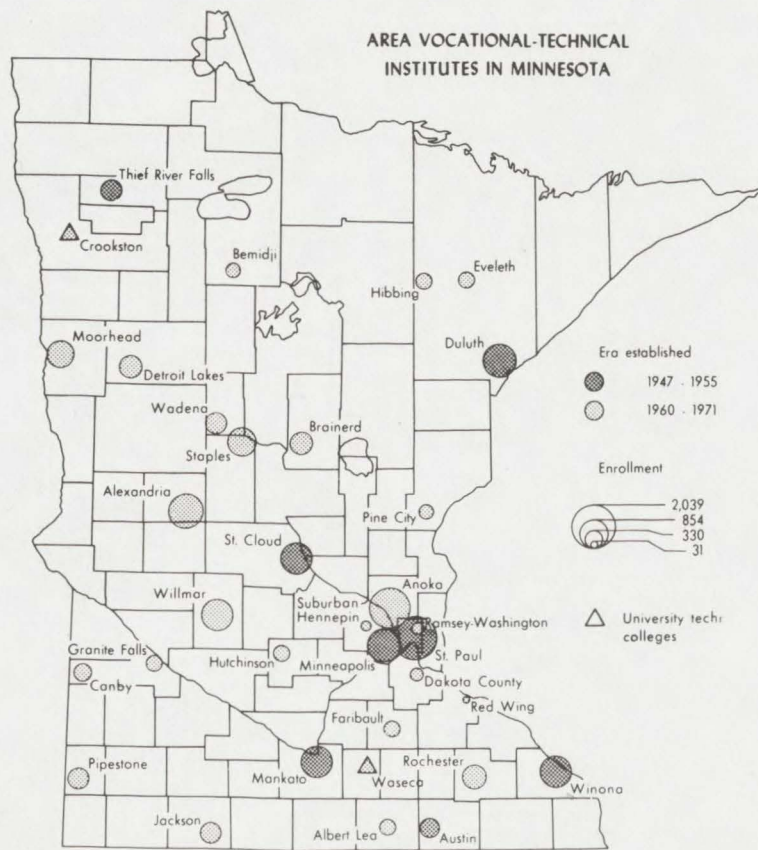
# MINNESOTA HIGH SCHOOL AREAS, 1966

(EXCLUDING 7-COUNTY METRO AREA)

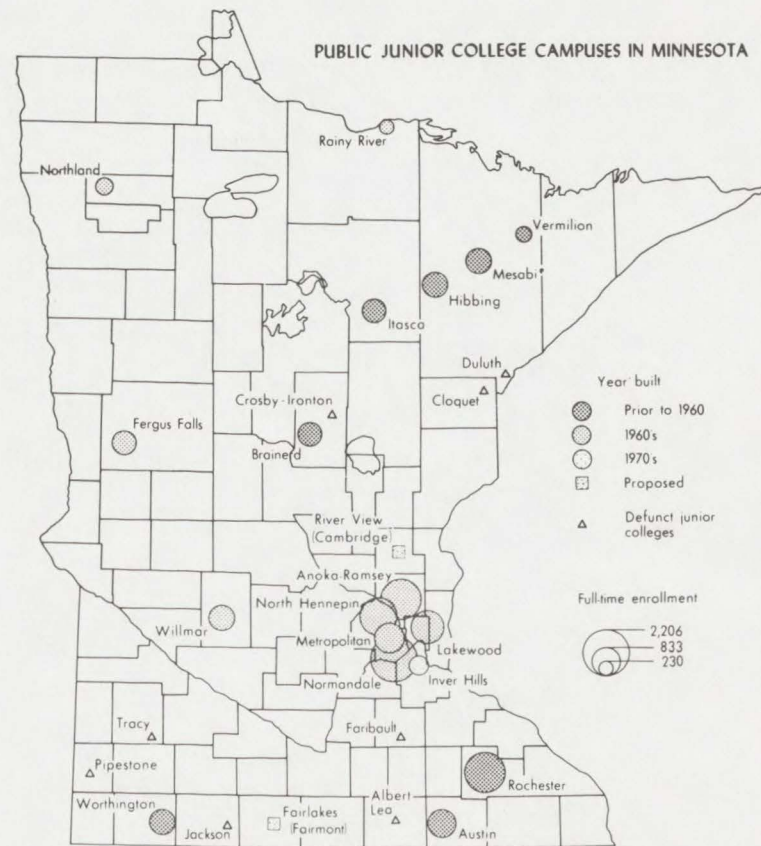


- Present schools retained in 1975 on basis of population estimates and Domian Study recommendations
- Present schools eliminated, using same criteria
- ▨ Already eliminated or in process of being eliminated: Lake Bronson (Kittson)  
Hanska (Brown)  
Comfrey (Brown)
- Districts created since 1966:  
Pierz (Morrison)  
Cold Spring (Stearns)  
St. Michael (Wright)

Data from Bureau of Field Studies and Surveys, College of Education, University of Minnesota



Data from HECC



\* Eveleth and Virginia Junior Colleges merged to form Mesabi State Junior College in 1967.

Data from HECC



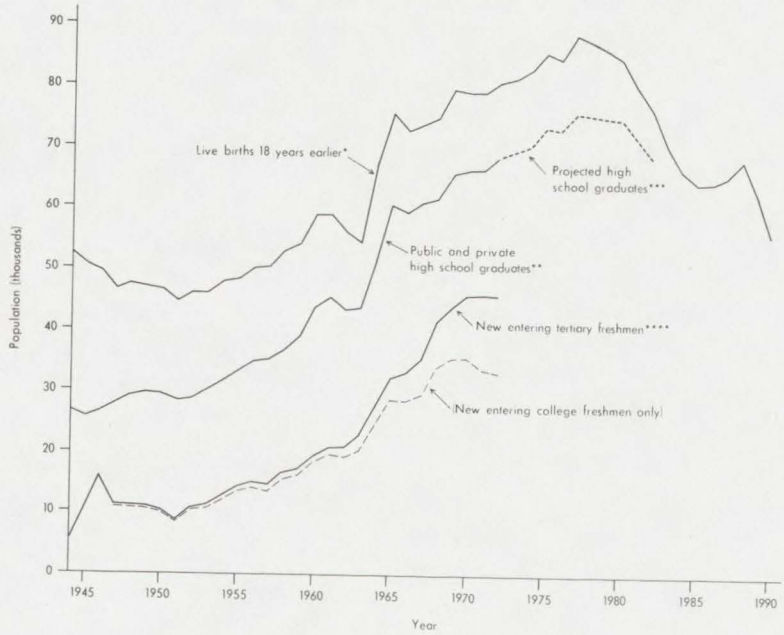


## NUMBER OF MINNESOTA FULL-TIME STUDENTS MIGRATING TO STATE FOUR-YEAR COLLEGES IN 1970

Campus Destination	From Natural Service Area		Beyond Natural Service Area		Full-time Minnesota Total	
	From Local Commuter Counties	Remainder of Nat. Serv. Area	From Twin Cities Commuter Counties	From Rest of State		
UM-Duluth	N	2,198	859	788	915	4,760
	%	46%	18%	17%	19%	100%
Bemidji	N	647	767	925	1,667	4,006
	%	16%	19%	23%	42%	100%
Moorhead	N	1,107	1,010	346	1,599	4,062
	%	27%	25%	9%	39%	100%
UM-Morris	N	153	361	330	788	1,632
	%	9%	22%	20%	48%	100%
St. Cloud	N	1,452	1,251	2,998	2,155	7,856
	%	18%	16%	38%	27%	100%
Southwest	N	510	832	479	921	2,742
	%	19%	30%	17%	34%	100%
Mankato	N	1,852	2,232	2,521	1,594	8,199
	%	23%	27%	31%	19%	100%
Winona	N	779	736	884	568	2,967
	%	26%	25%	30%	19%	100%
Sub-Total		8,698	8,048	9,271	10,207	36,224
		24%	22%	26%	28%	100%
UM-TCC	N	18,037	417		4,321	22,775
Collegiate	%	79%	2%		19%	100%
Professional	N	2,691	1,992			4,683
	%	57%	43%			100%
Total	N	29,426	10,457	9,271	14,528	63,682
	%	46%	16%	15%	23%	100%

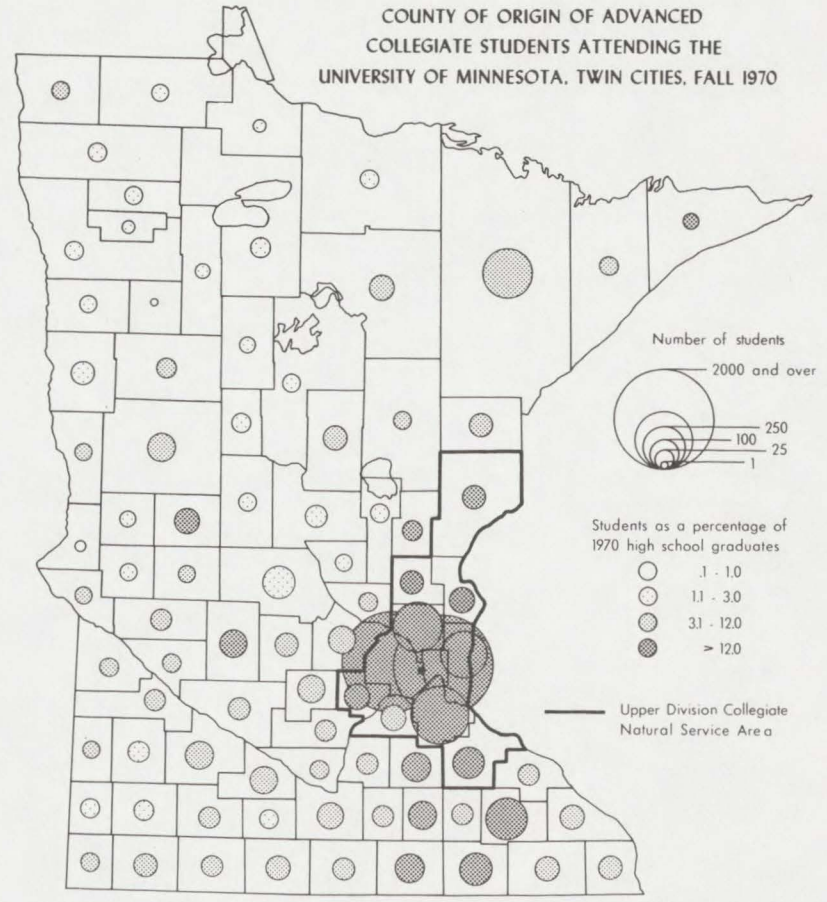


AGE STRUCTURE OF MINNESOTA POPULATION, HIGH SCHOOL GRADUATES, AND NEW ENTERING TERTIARY FRESHMEN, 1944 - 1990

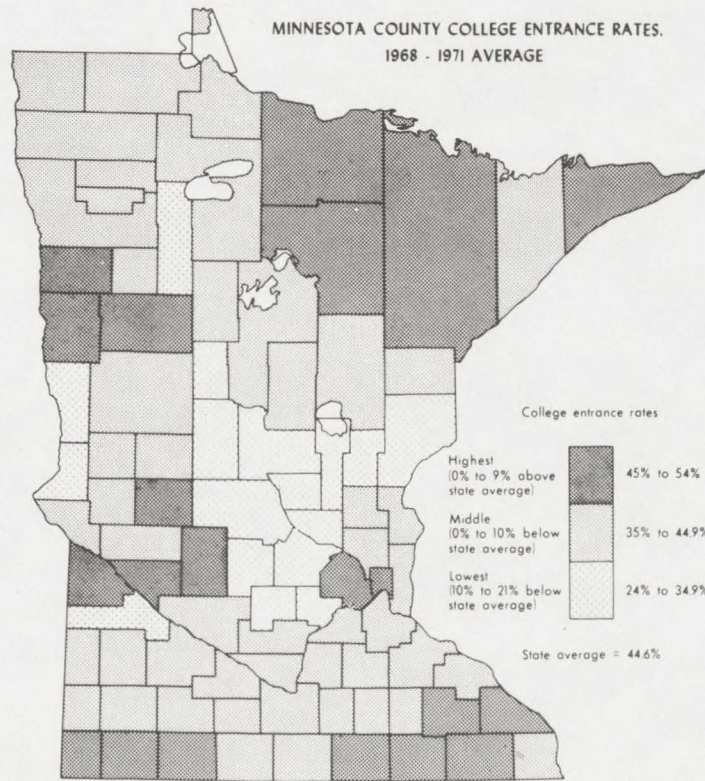


Sources:  
 \* Live births: Minnesota Department of Health, Section of Vital Statistics  
 \*\* High school graduates: Minnesota Department of Education, Statistics and Research Section  
 \*\*\* Projected high school graduates: Robert Rustad, University of Minnesota  
 \*\*\*\* New entering tertiary freshmen: 1944-1955 college data from Upper Midwest Regional Association of Collegiate Registrars; 1956-1967 college data from Bureau of Institutional Research, University of Minnesota; 1968-1972 data from HECC; Area vocational-technical institute data prior to 1965 supplied by each institution

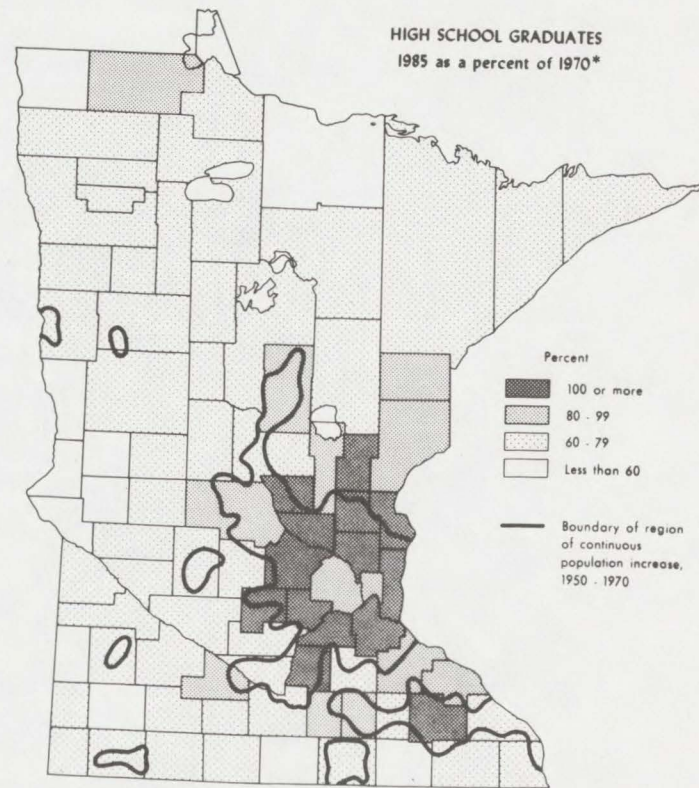
COUNTY OF ORIGIN OF ADVANCED COLLEGIATE STUDENTS ATTENDING THE UNIVERSITY OF MINNESOTA, TWIN CITIES, FALL 1970



Data from HECC and University of Minnesota President's Biennial Report, 1969-1971

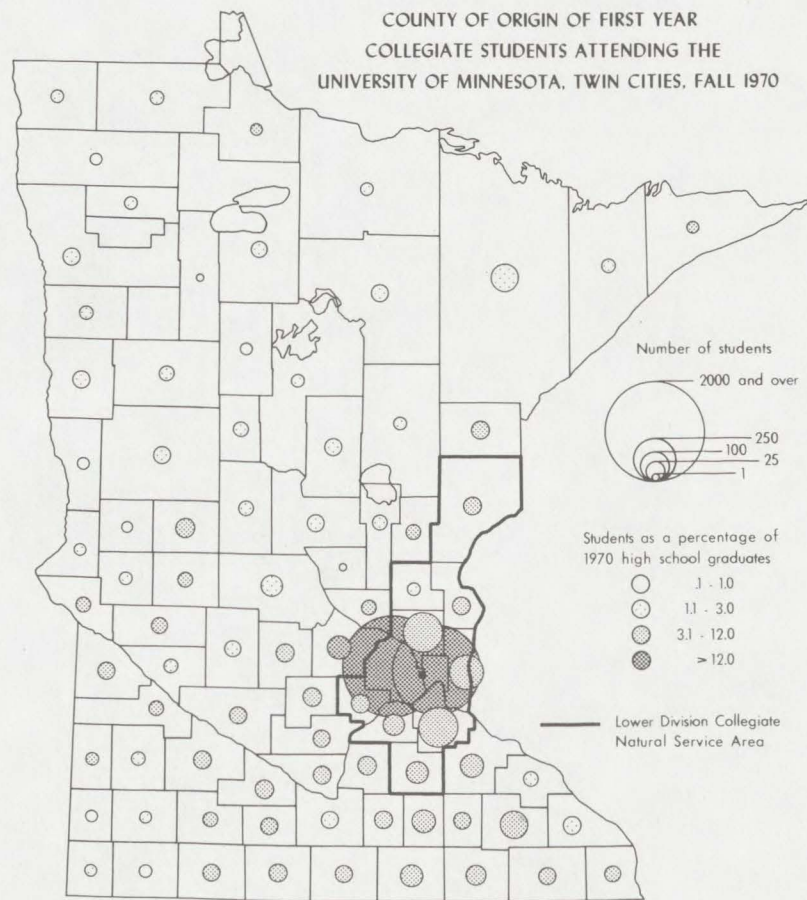


Source: HECC and C.E.R. to adjacent non-Minnesota institutions from college registrars and student directories.

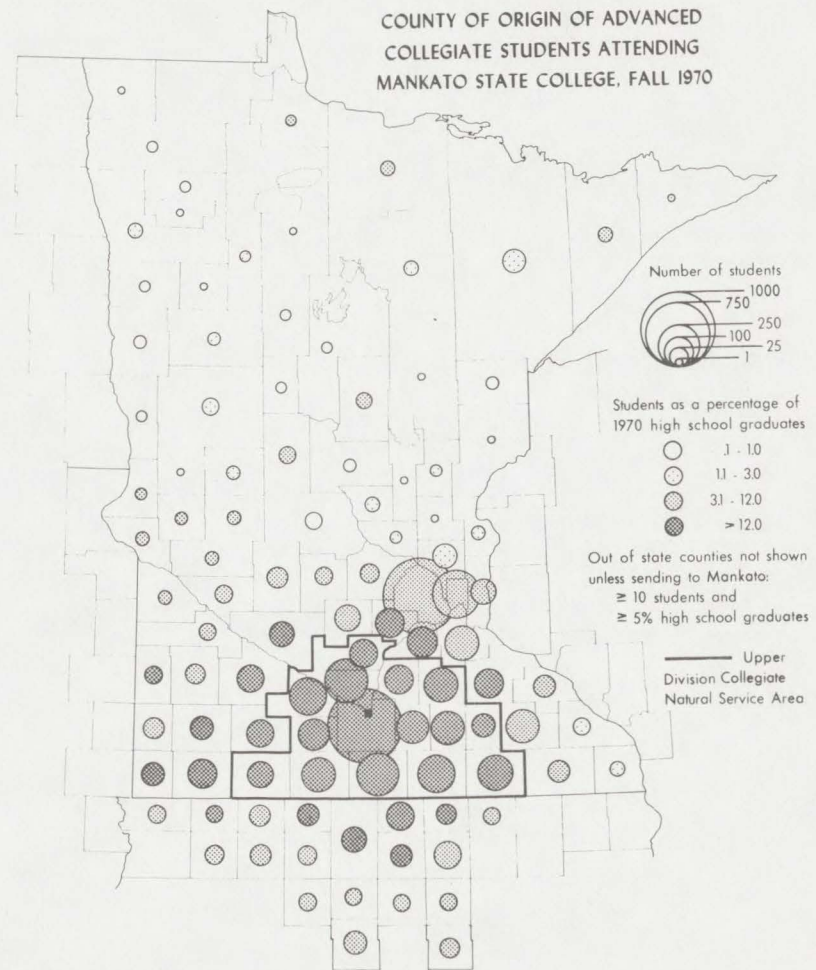


\*Based on population projections of Minnesota Department of Health, 1972  
Data from J. R. Borchert and D. D. Carroll, *Minnesota Land Use and Settlement 1985*, University of Minnesota and Minnesota State Planning Agency, 1970

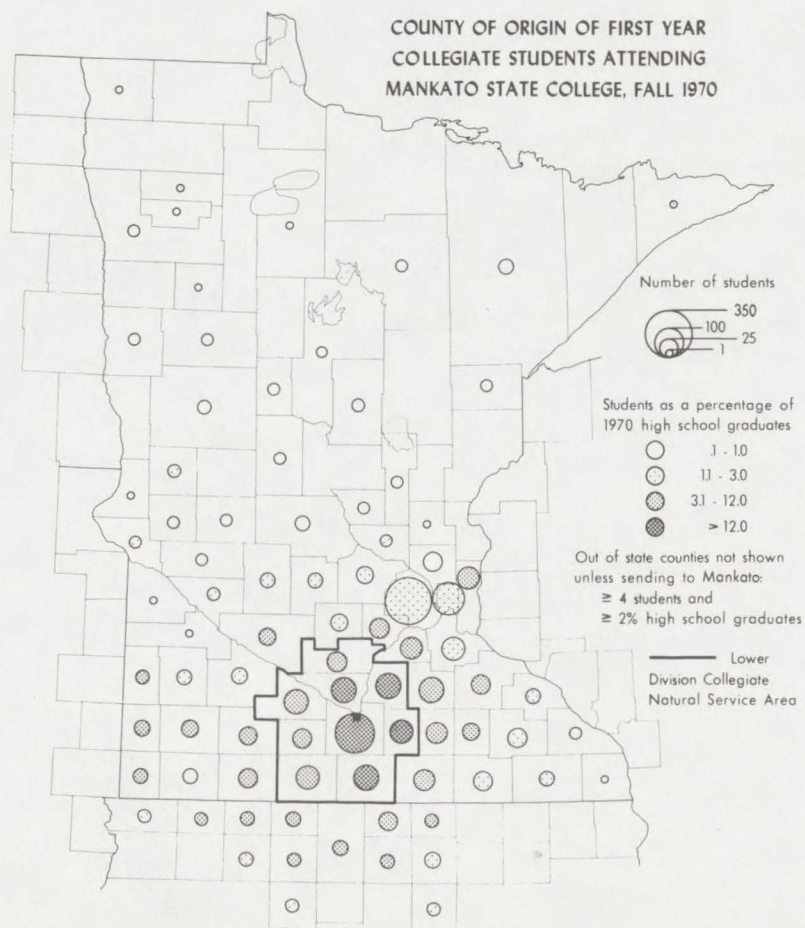




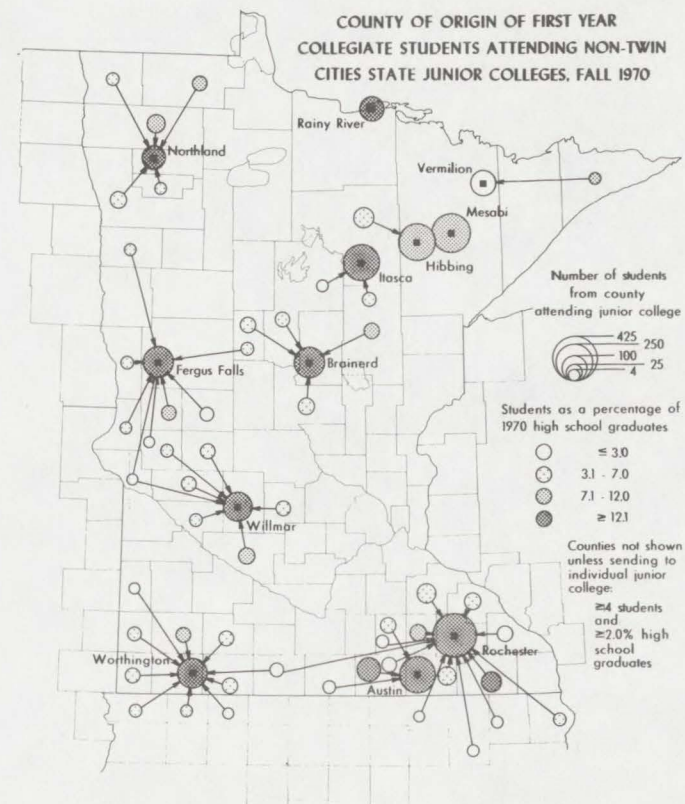
Data from HECC and University of Minnesota President's Biennial Report, 1969-1971



Data from HECC, Mankato State College Directory; and Iowa Department of Public Instruction

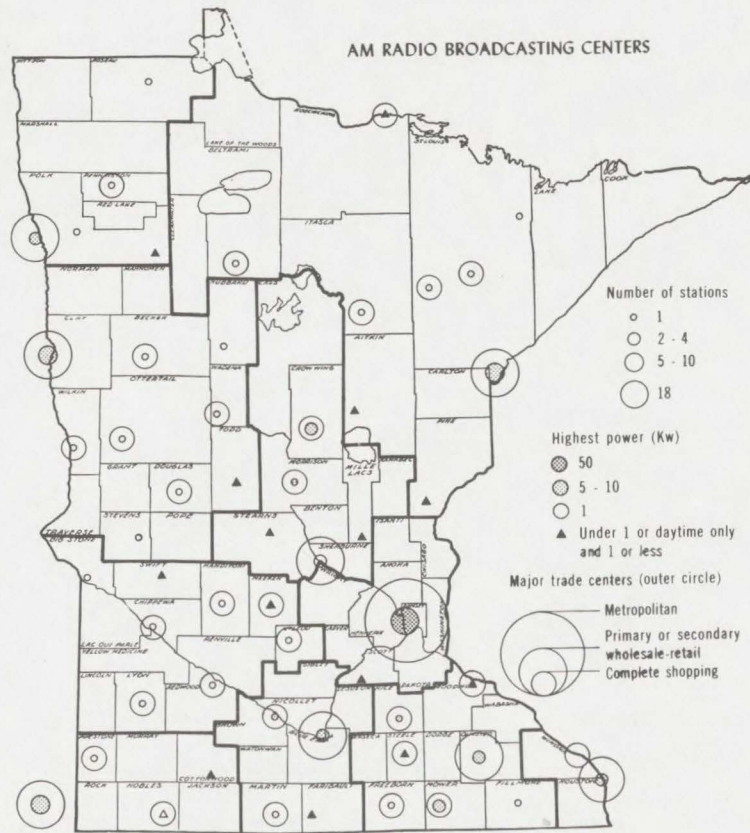


Data from HECC; Mankato State College Directory; and Iowa Department of Public Instruction

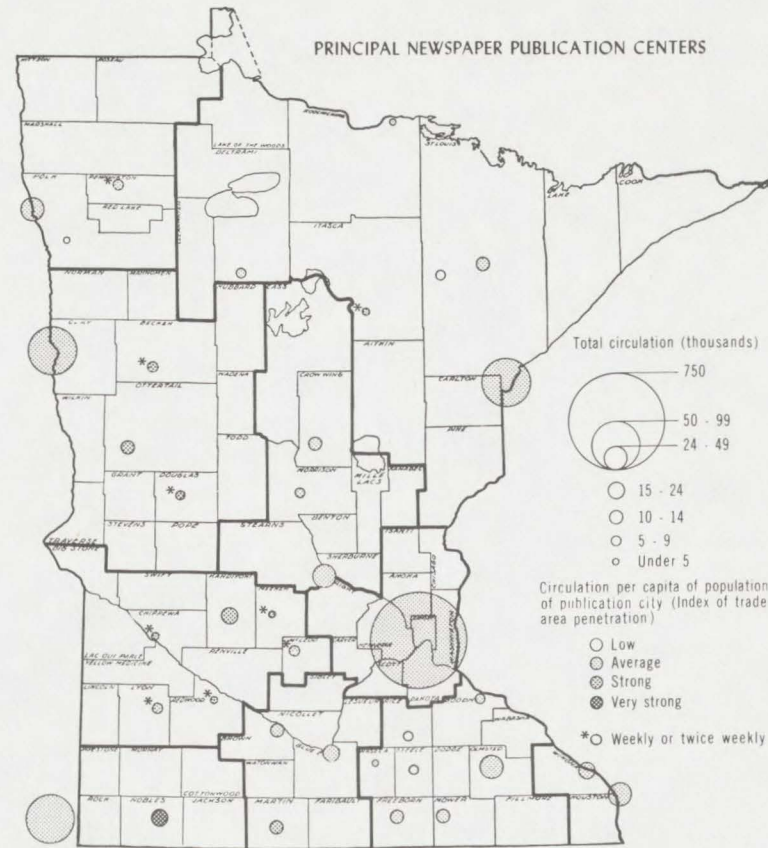


Data from HECC, Worthington and Rochester State Junior College Recorders, and Iowa Department of Public Instruction





Source: Broadcasting 1970 Yearbook, Washington: Broadcasting Publications, Inc., 1970.

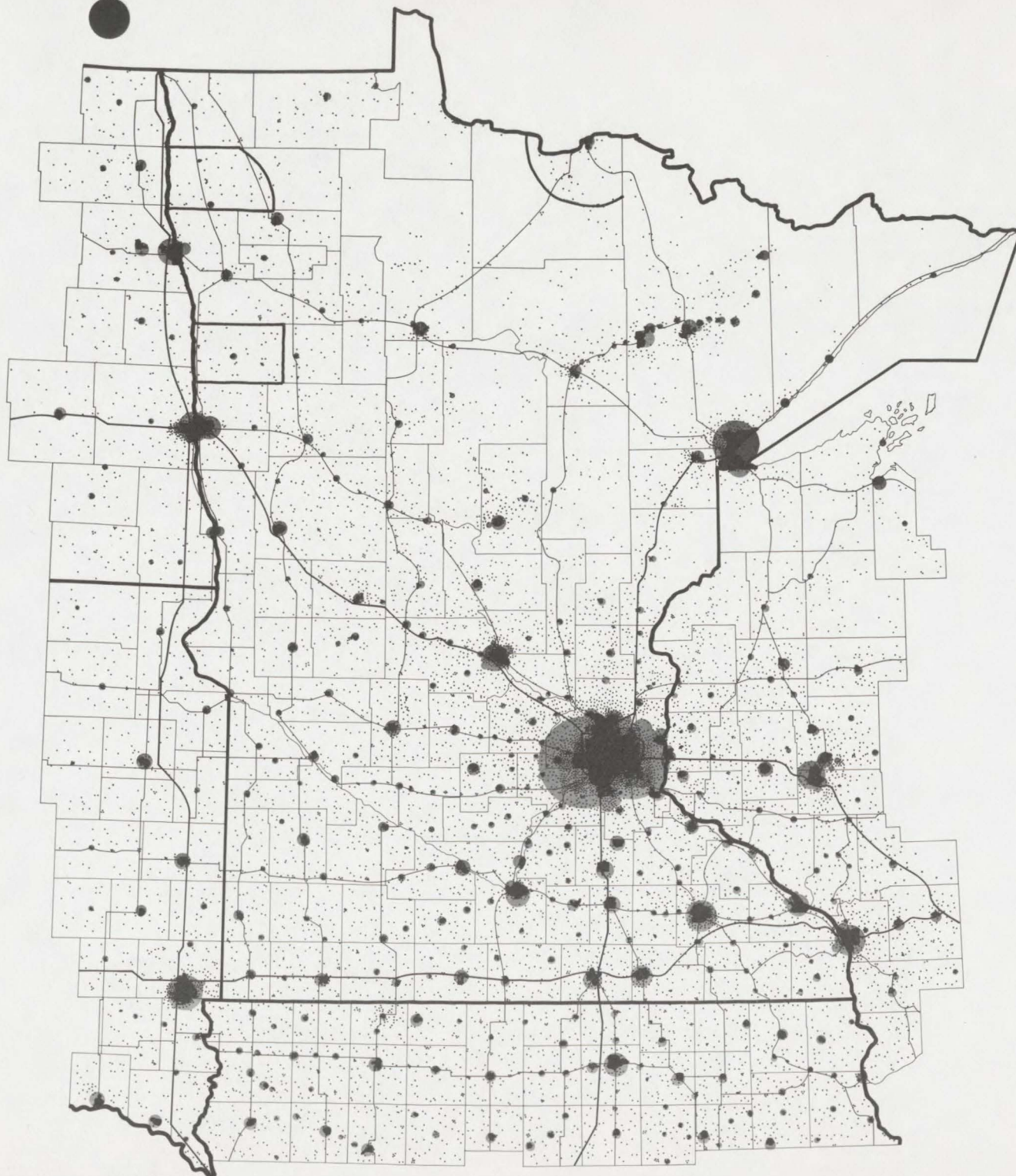


Daily newspapers except where otherwise designated. Source of data: Ayer Directory of Newspapers, Management, and Trade Publications, Philadelphia: Ayer Press, 1970.



GOVERNMENT SYSTEMS

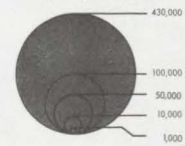




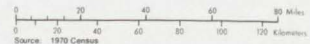
### POPULATION DISTRIBUTION, 1970

One dot represents 200 persons

Incorporated places over 1000 persons

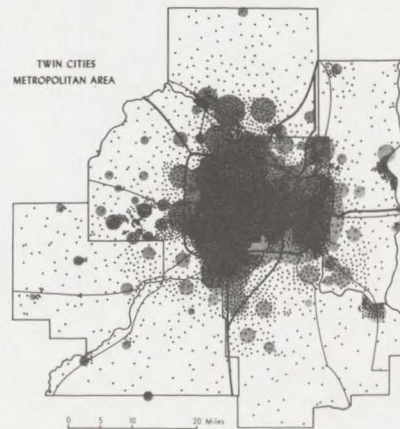


U. S. highways  
Existing and proposed interstate highways

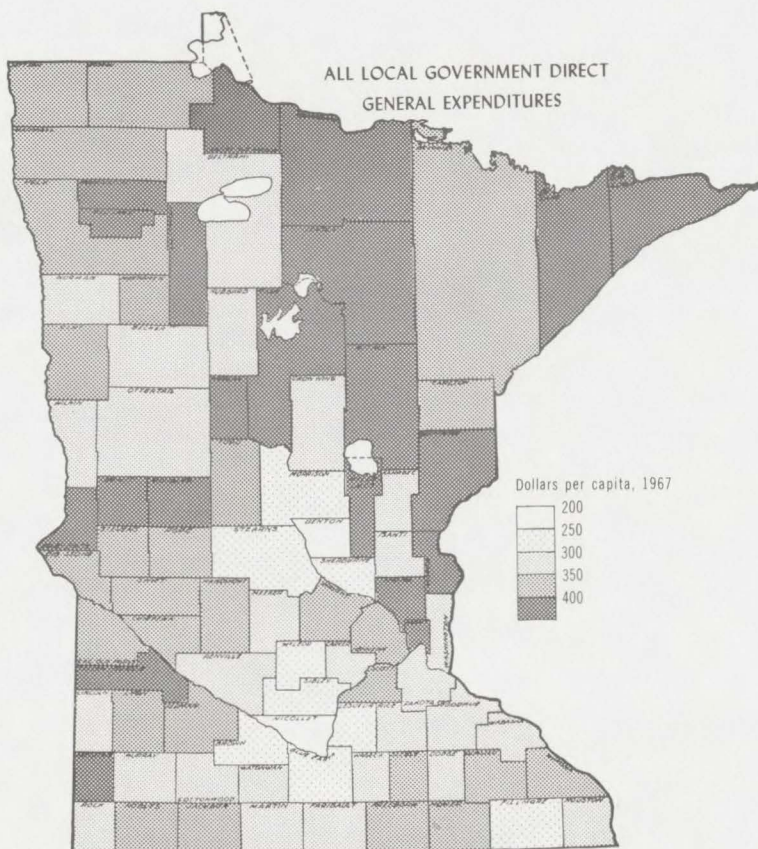


Source: 1970 Census

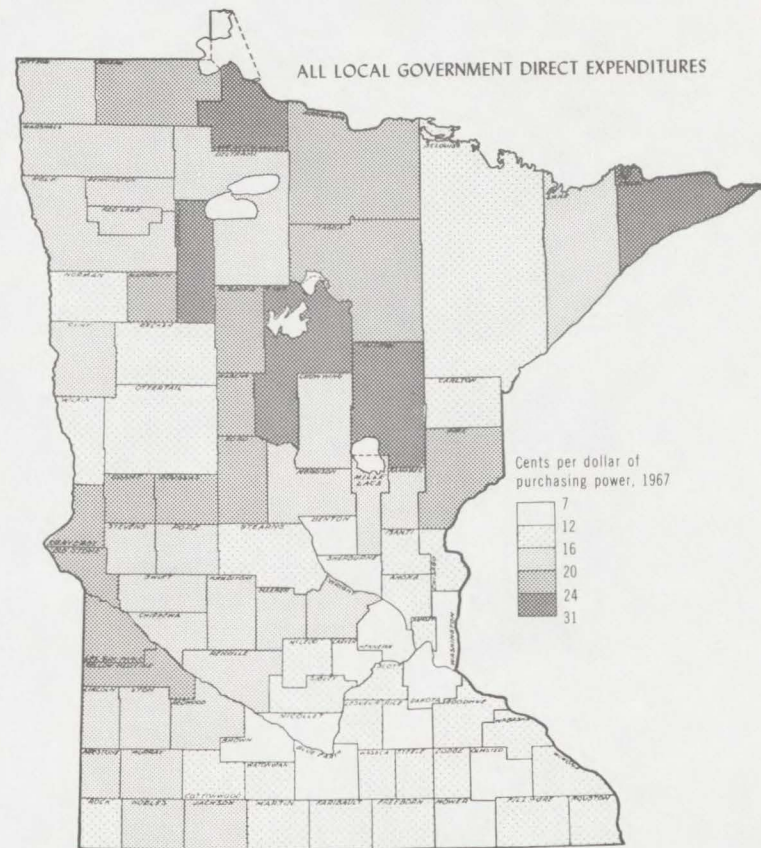
Prepared by the Center for Urban and Regional Affairs, University of Minnesota for the Minnesota State Planning Agency.



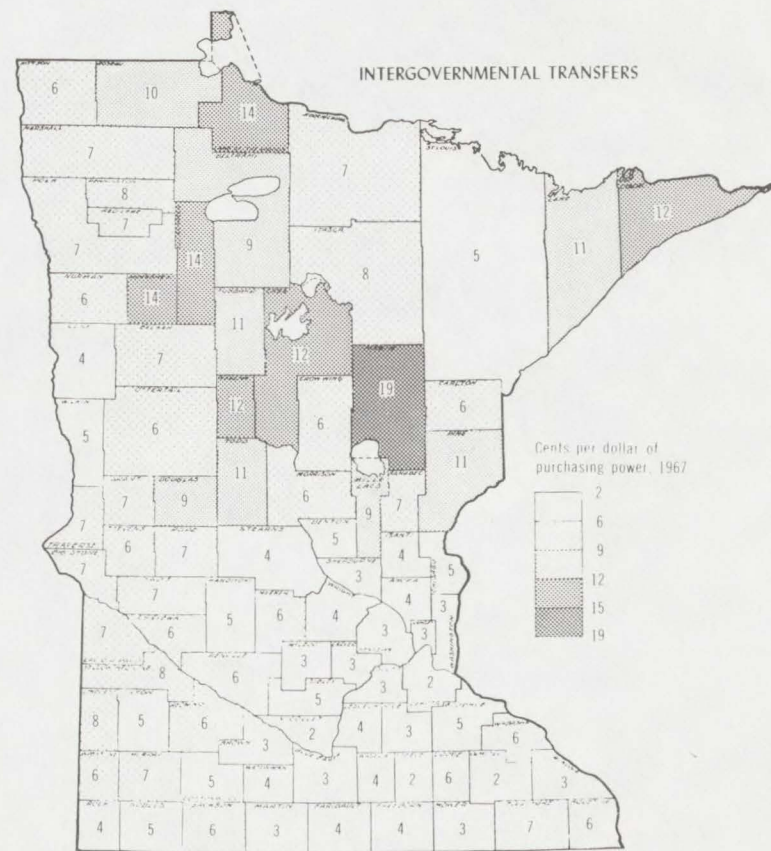
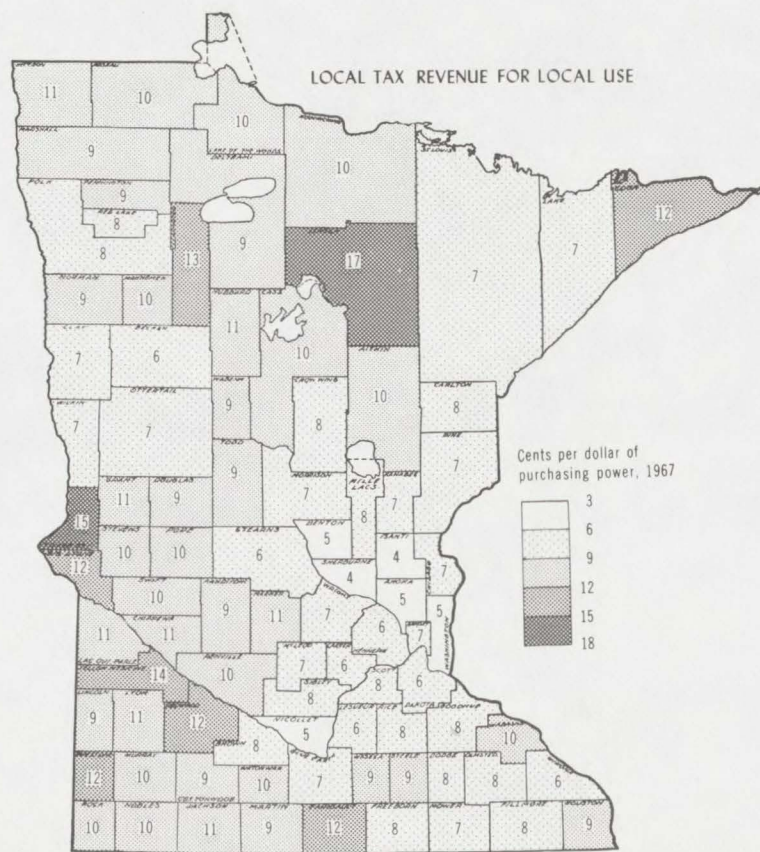




Data from U.S. Census of Governments, 1967.



Data computed from U.S. Census of Governments and Sales Management, 1967.



Total state and federal payments to local governments, by county, per doilar of purchasing power in each county. Approximately 95 percent of the total came from state sources. Data from same sources as Figure 33.



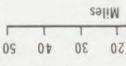
COMPLETE SHOPPING TRADE AREAS

COMPARED WITH COUNTY BOUNDARIES

(Contrast between governmental and trade regions)



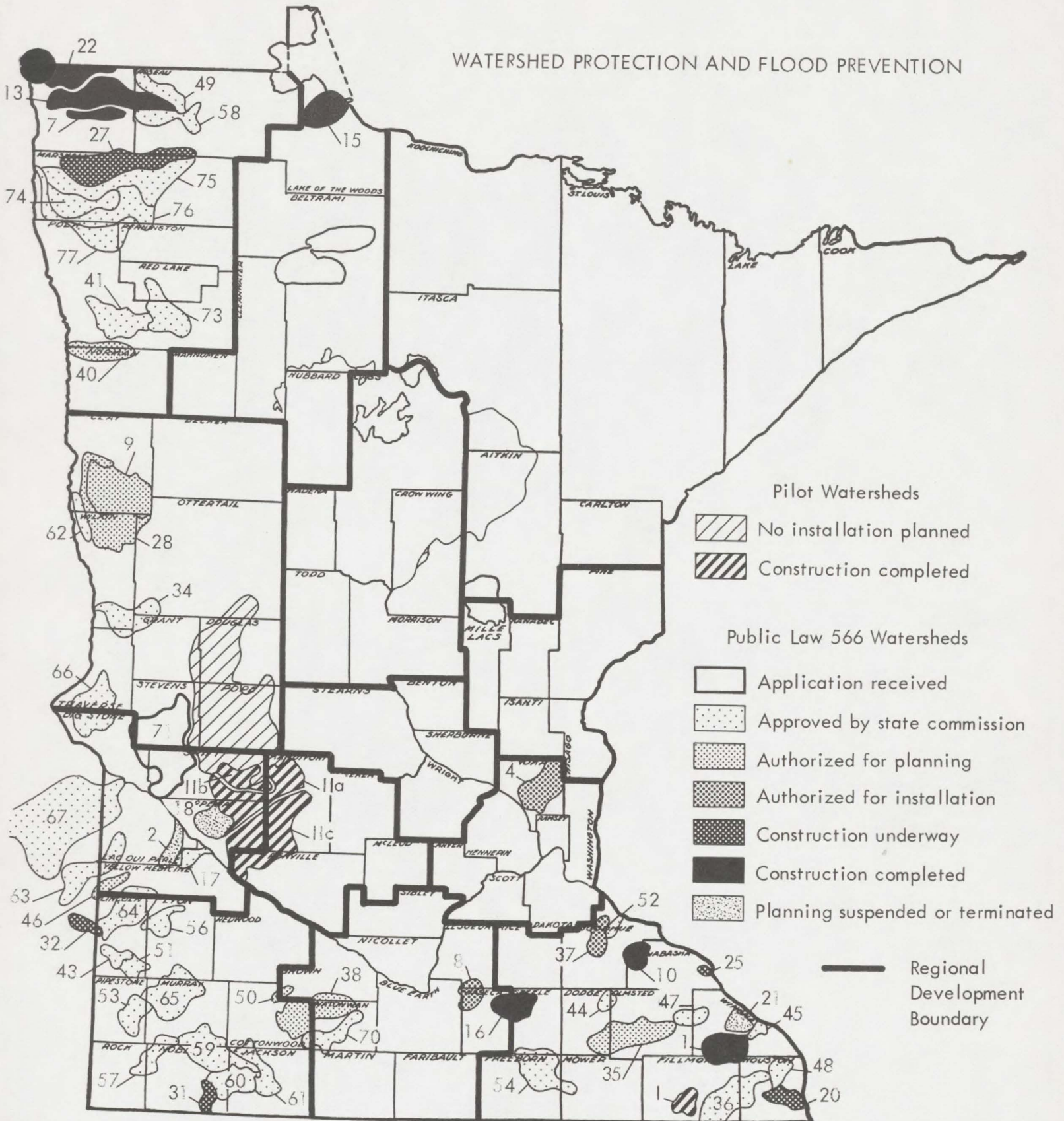
Data from Borchert, 1968







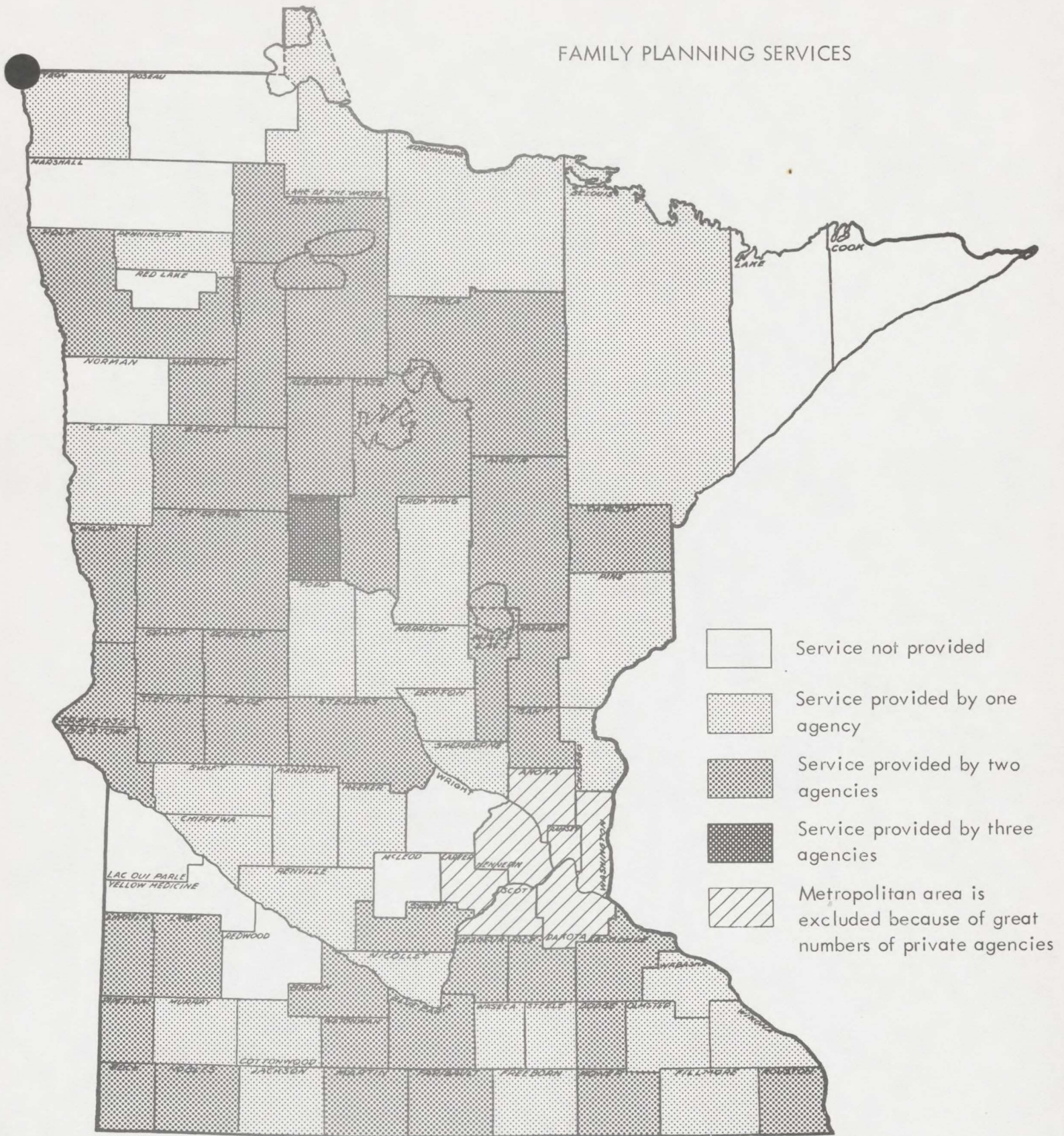
# WATERSHED PROTECTION AND FLOOD PREVENTION







Source: SOIL CONSERVATION SERVICE IN MINNESOTA, 1973, USDA - Soil Conservation Service, 200 Federal Building, 316 North Robert Street, St. Paul, Minnesota 55101



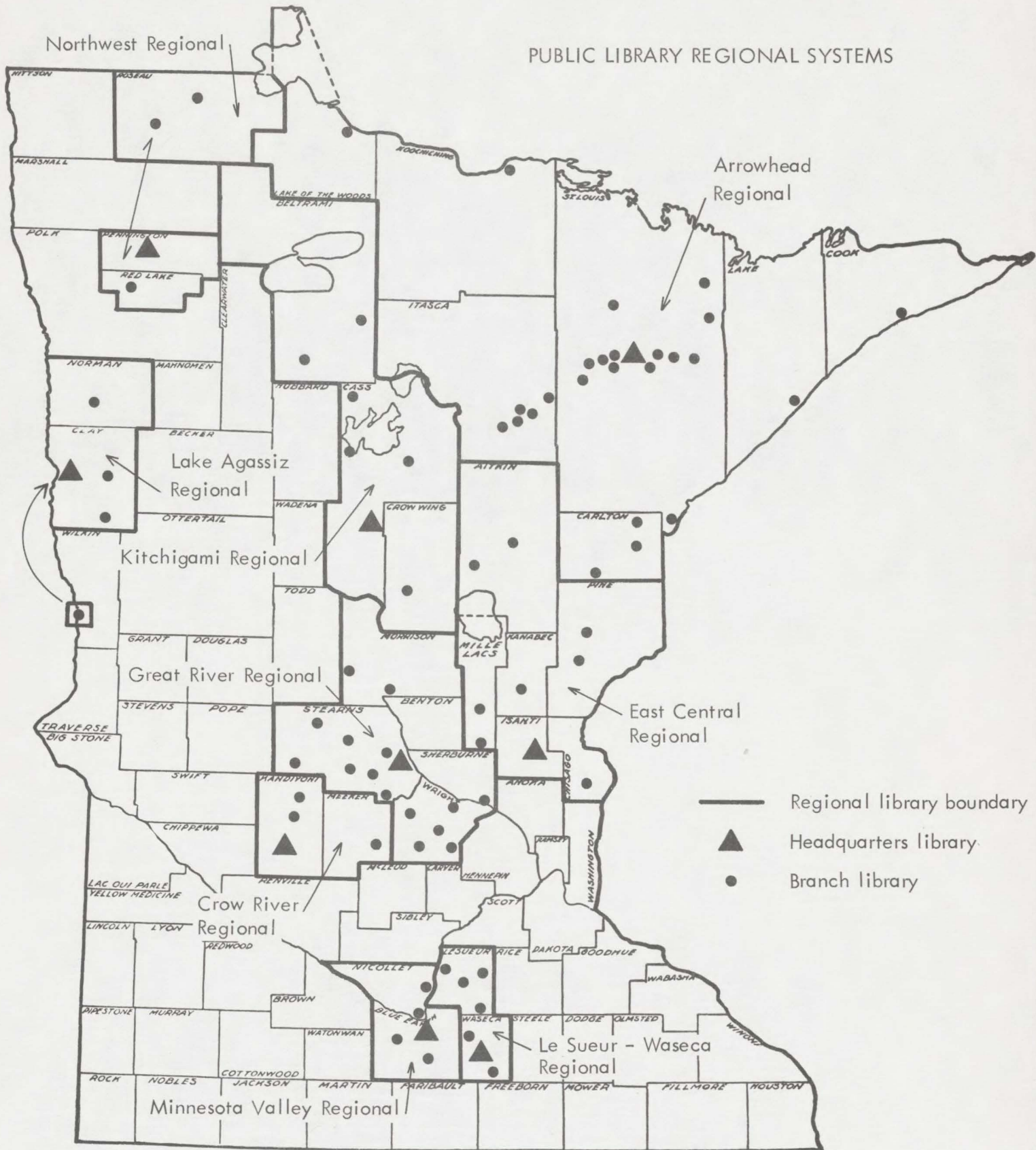
# FAMILY PLANNING SERVICES



-  Service not provided
-  Service provided by one agency
-  Service provided by two agencies
-  Service provided by three agencies
-  Metropolitan area is excluded because of great numbers of private agencies



PUBLIC LIBRARY REGIONAL SYSTEMS



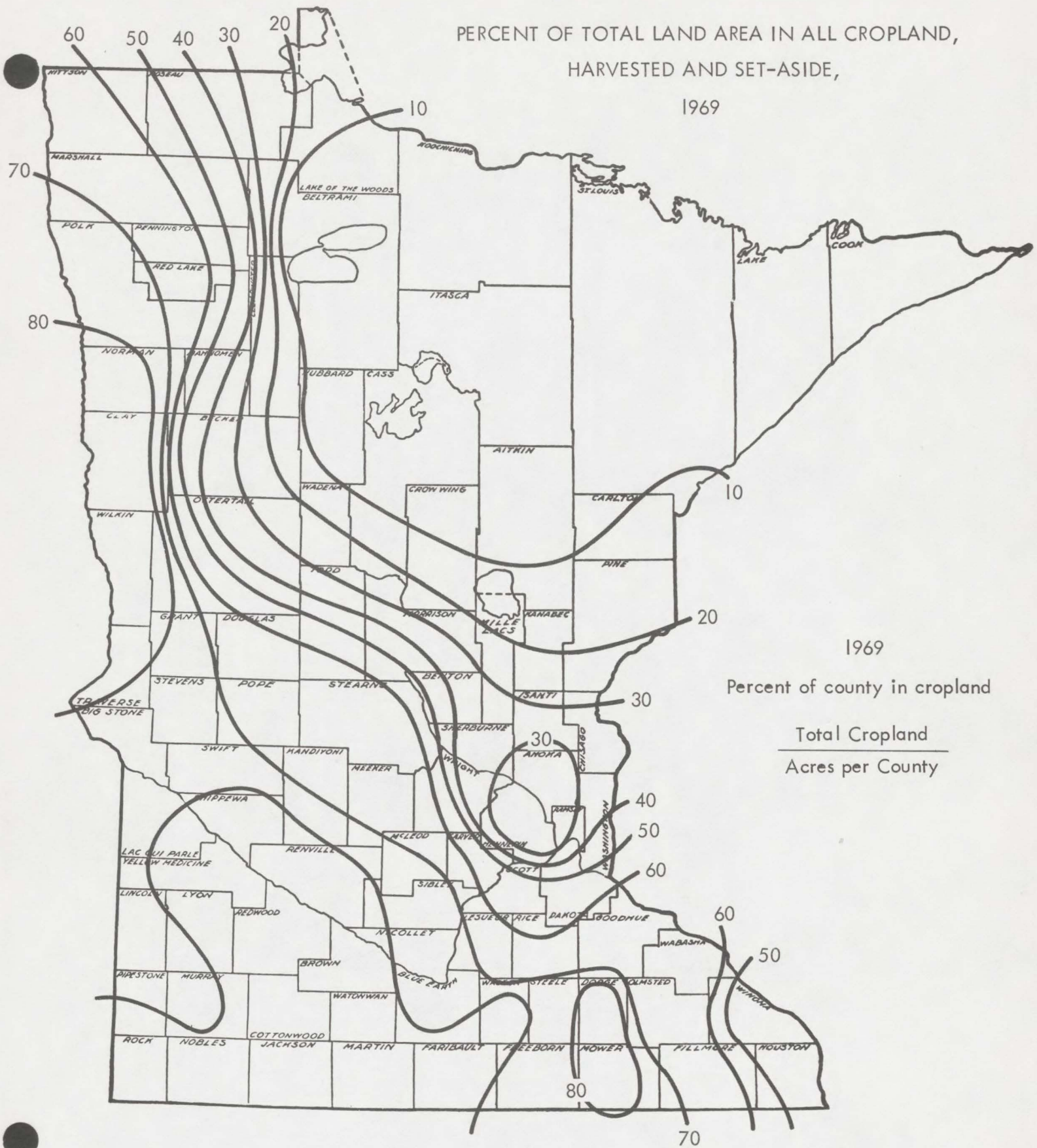
Source: DEPARTMENT OF EDUCATION, PUBLIC LIBRARIES SECTION



INDUSTRIAL SYSTEMS

PERCENT OF TOTAL LAND AREA IN ALL CROPLAND,  
HARVESTED AND SET-ASIDE,

1969



1969

Percent of county in cropland

$$\frac{\text{Total Cropland}}{\text{Acres per County}}$$



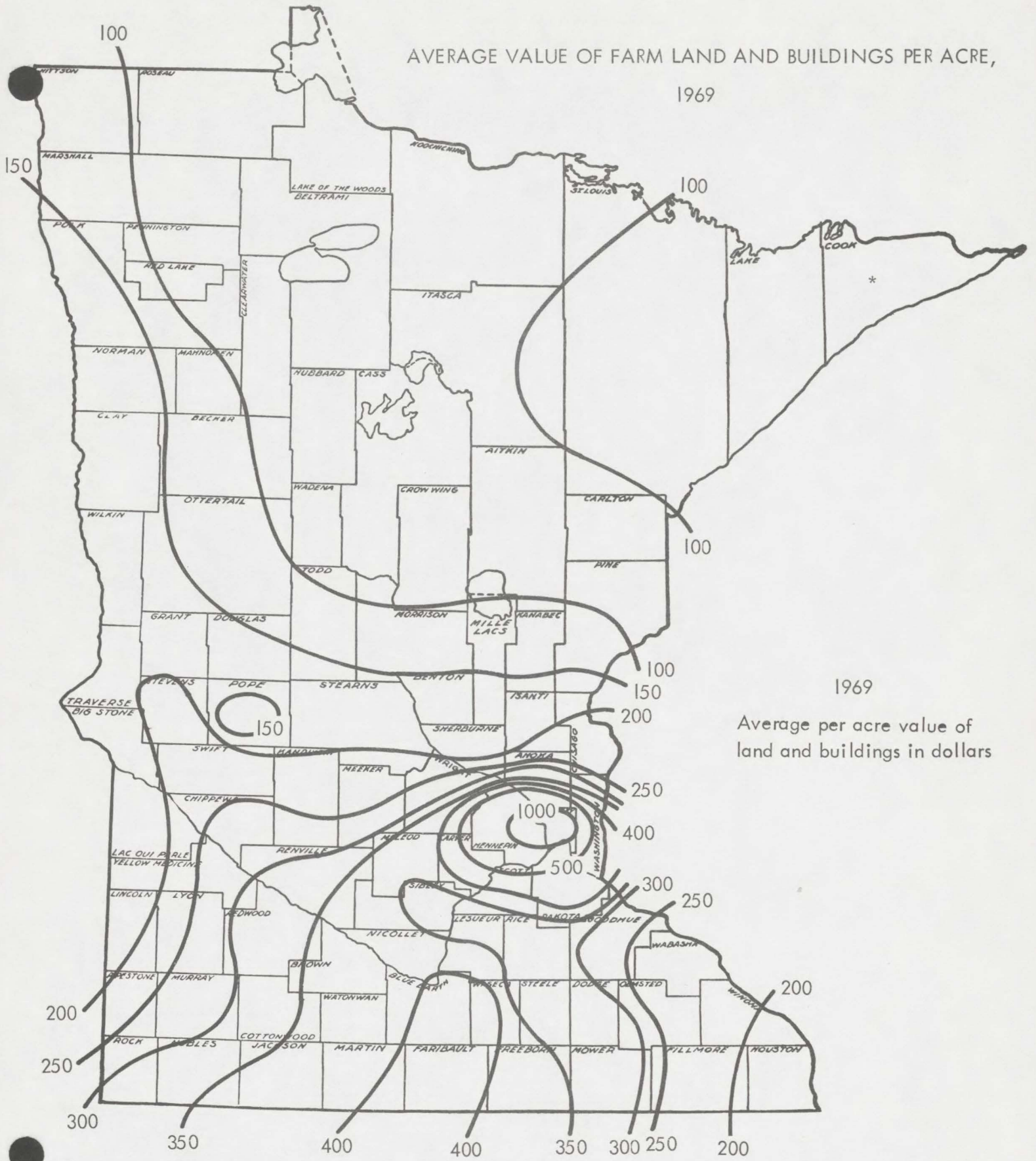








AVERAGE VALUE OF FARM LAND AND BUILDINGS PER ACRE,  
1969



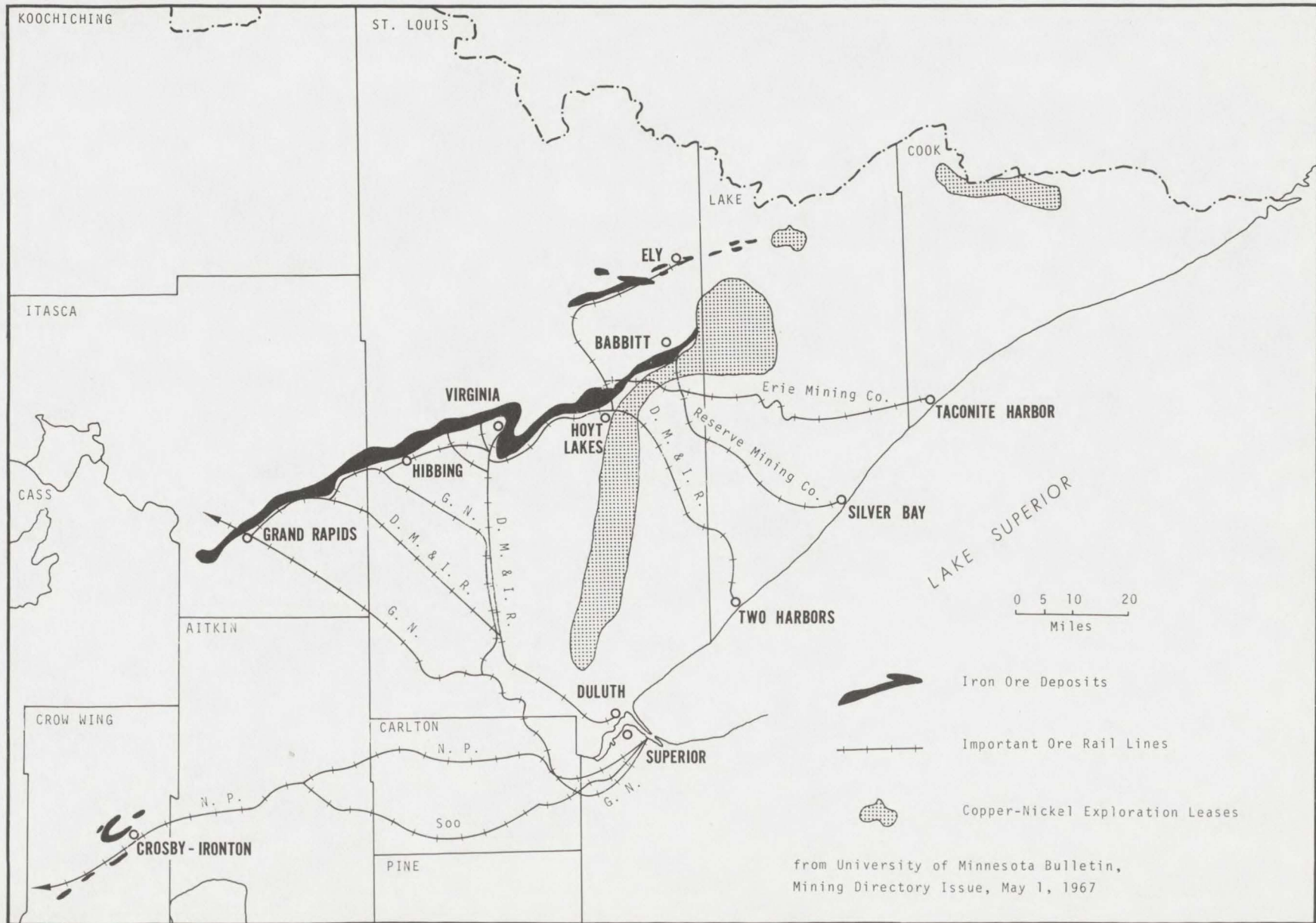
1969  
Average per acre value of  
land and buildings in dollars

\*1969 data not available for Cook County





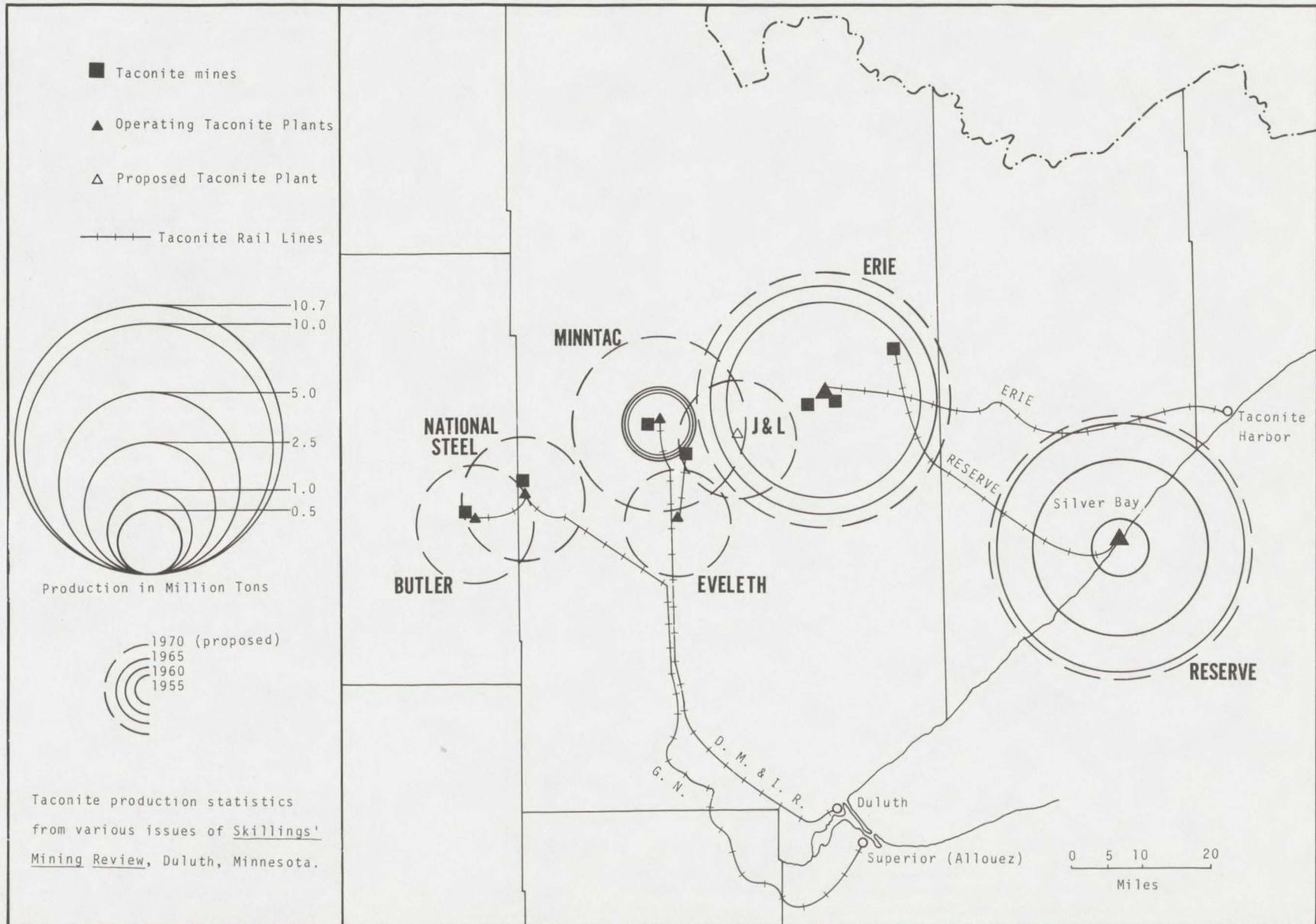
ORE DEPOSITS AND RAIL LINES



from University of Minnesota Bulletin,  
Mining Directory Issue, May 1, 1967



# TACONITE PRODUCTION



NOTE: All plants shown as proposed are now in production. Minntac plant ships pellets through Two Harbors.



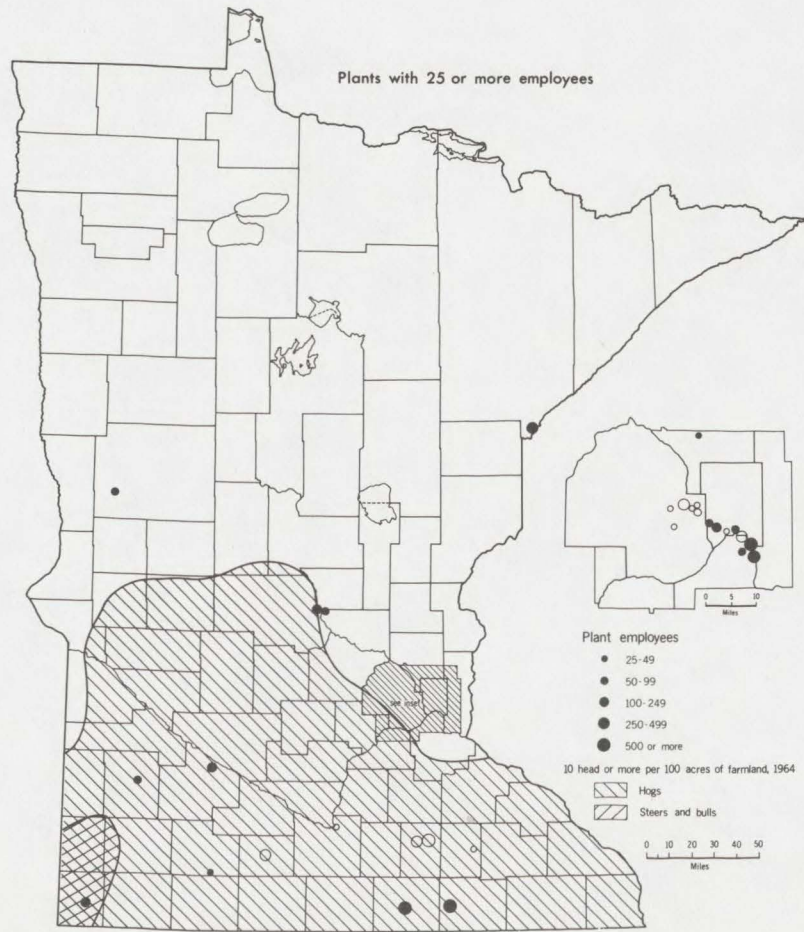






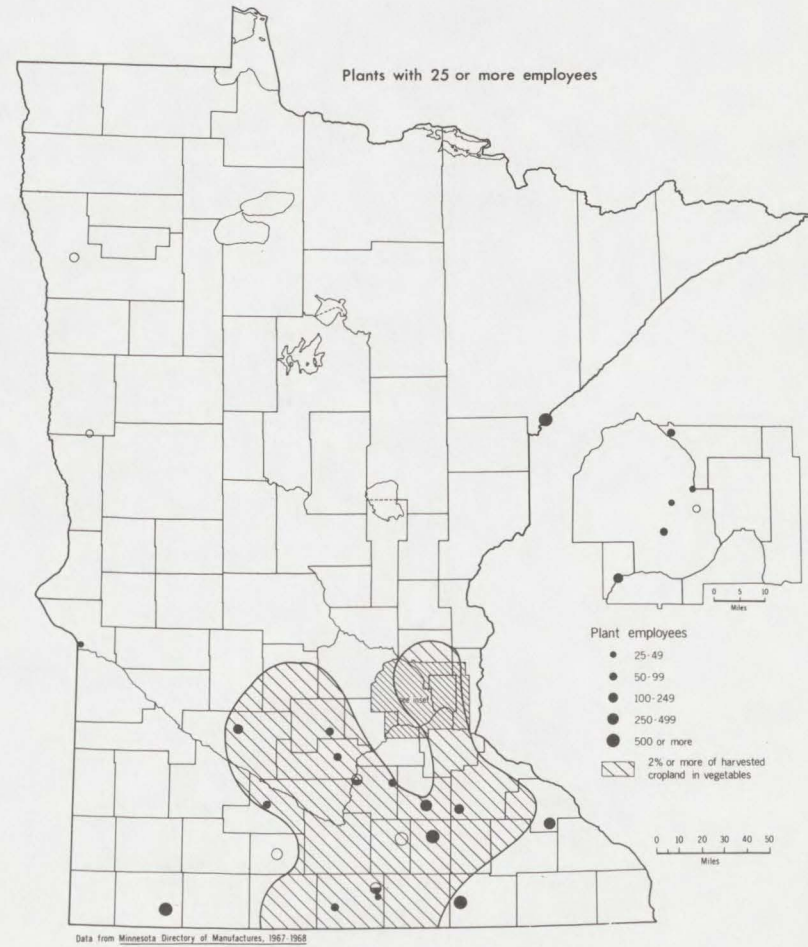
### MEAT PRODUCTS

- Meat packing plants
- Sausages and other meat products



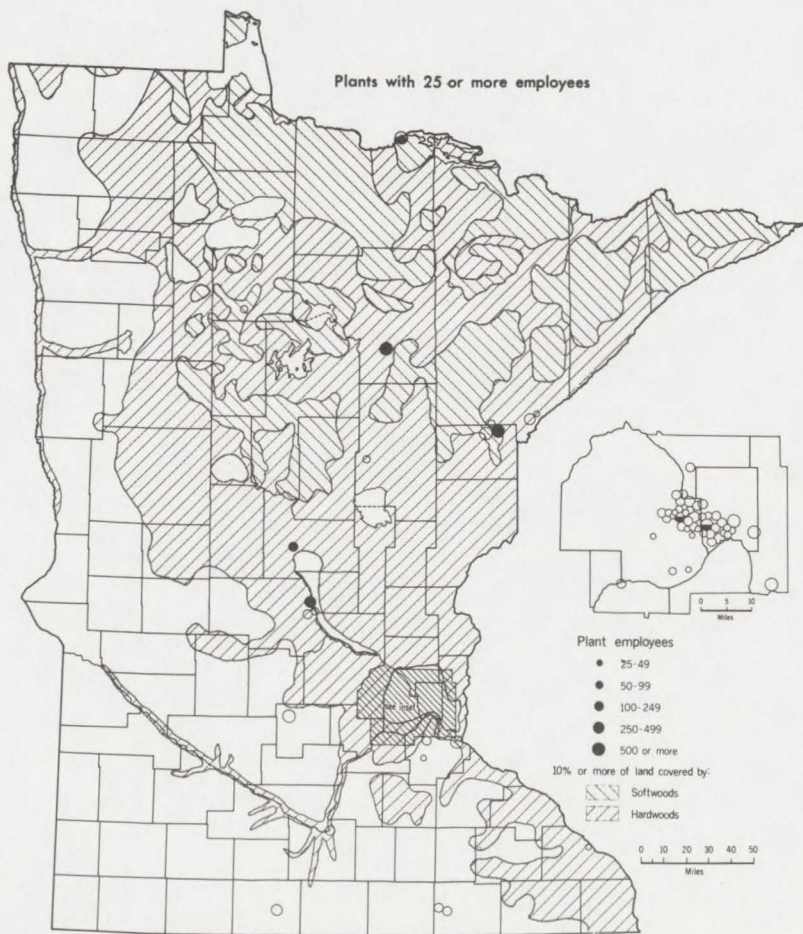
### CANNED AND FROZEN FOOD PRODUCTS

- Canned food products
- Frozen food products
- Both



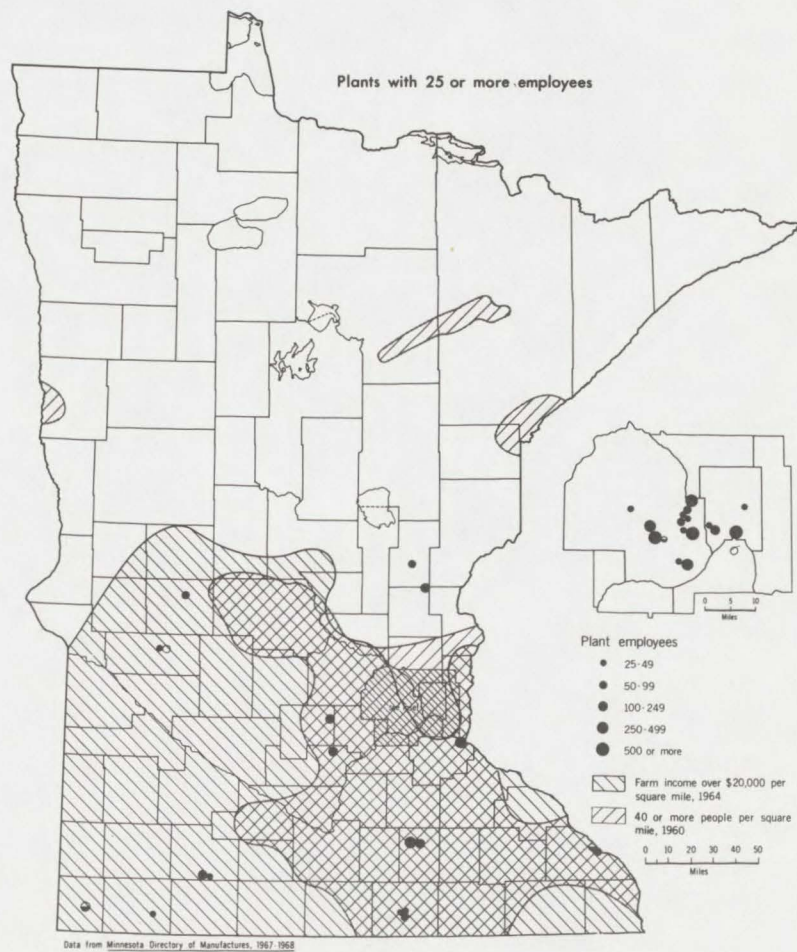
### PAPER AND ALLIED PRODUCTS

- Paper mills
- Paperboard
- All other paper and allied products
- Both



### FARM MACHINERY

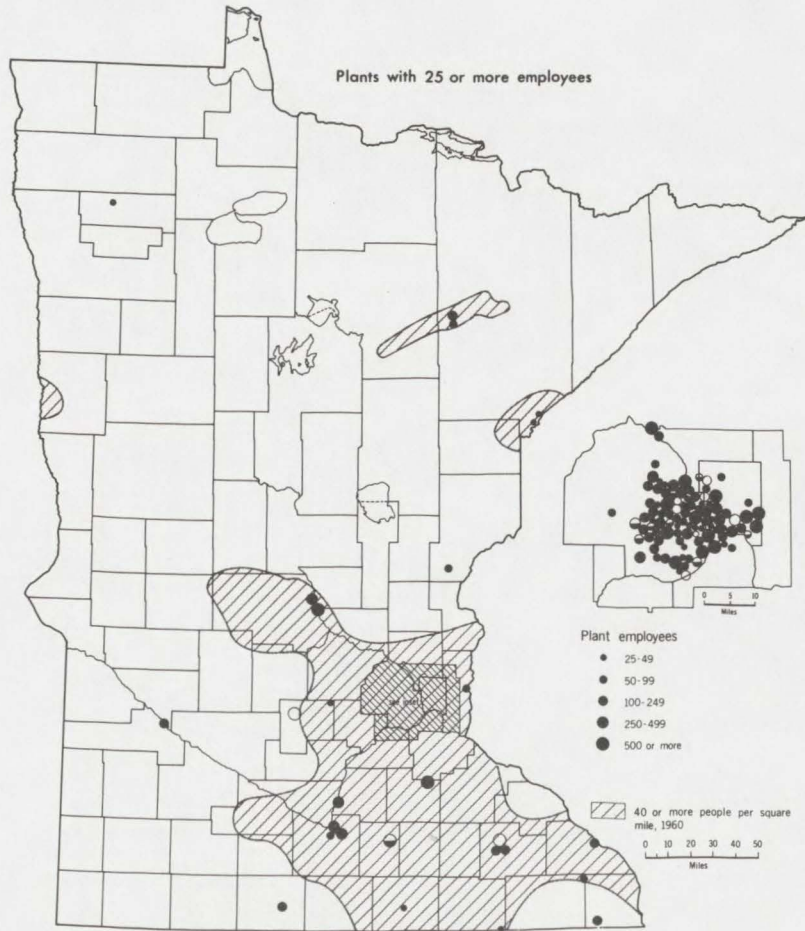
- Farm machinery and equipment
- Poultry equipment
- Both





### ELECTRICAL MACHINERY, EQUIPMENT, AND SUPPLIES

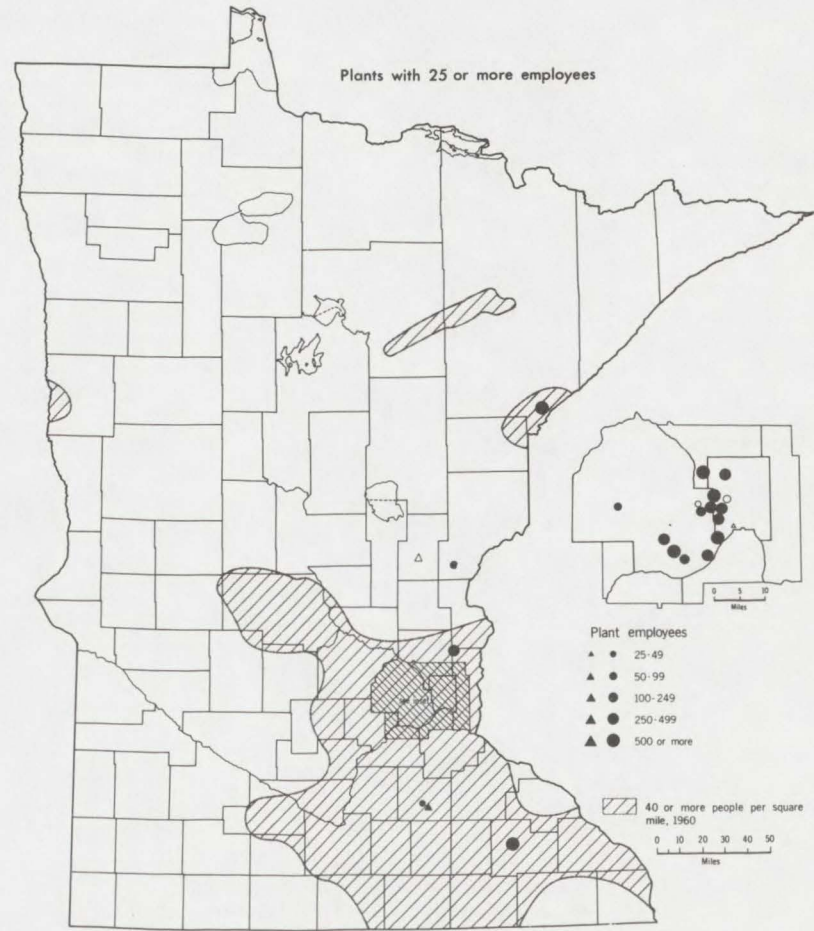
- All electrical machinery, except communications
- Radio and television receiving sets
- Radio and television transmitting equipment
- Telephone and telegraph apparatus
- Both



Data from Minnesota Directory of Manufactures, 1967-1968

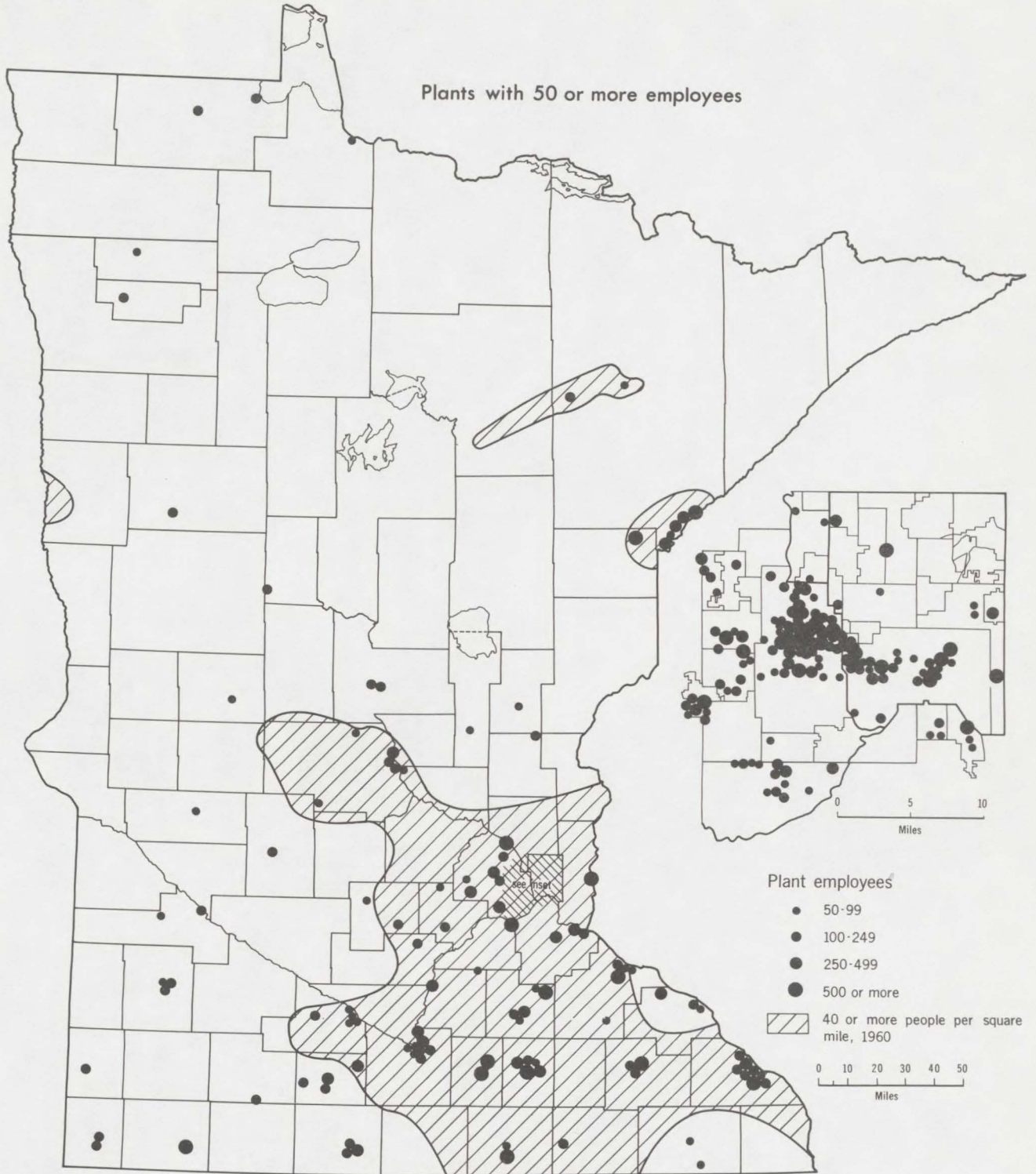
### OFFICE MACHINERY

- Computing and accounting machines
- Scales and balances
- ▲ Office machines
- △ Vending machines



Data from Minnesota Directory of Manufactures, 1967-1968

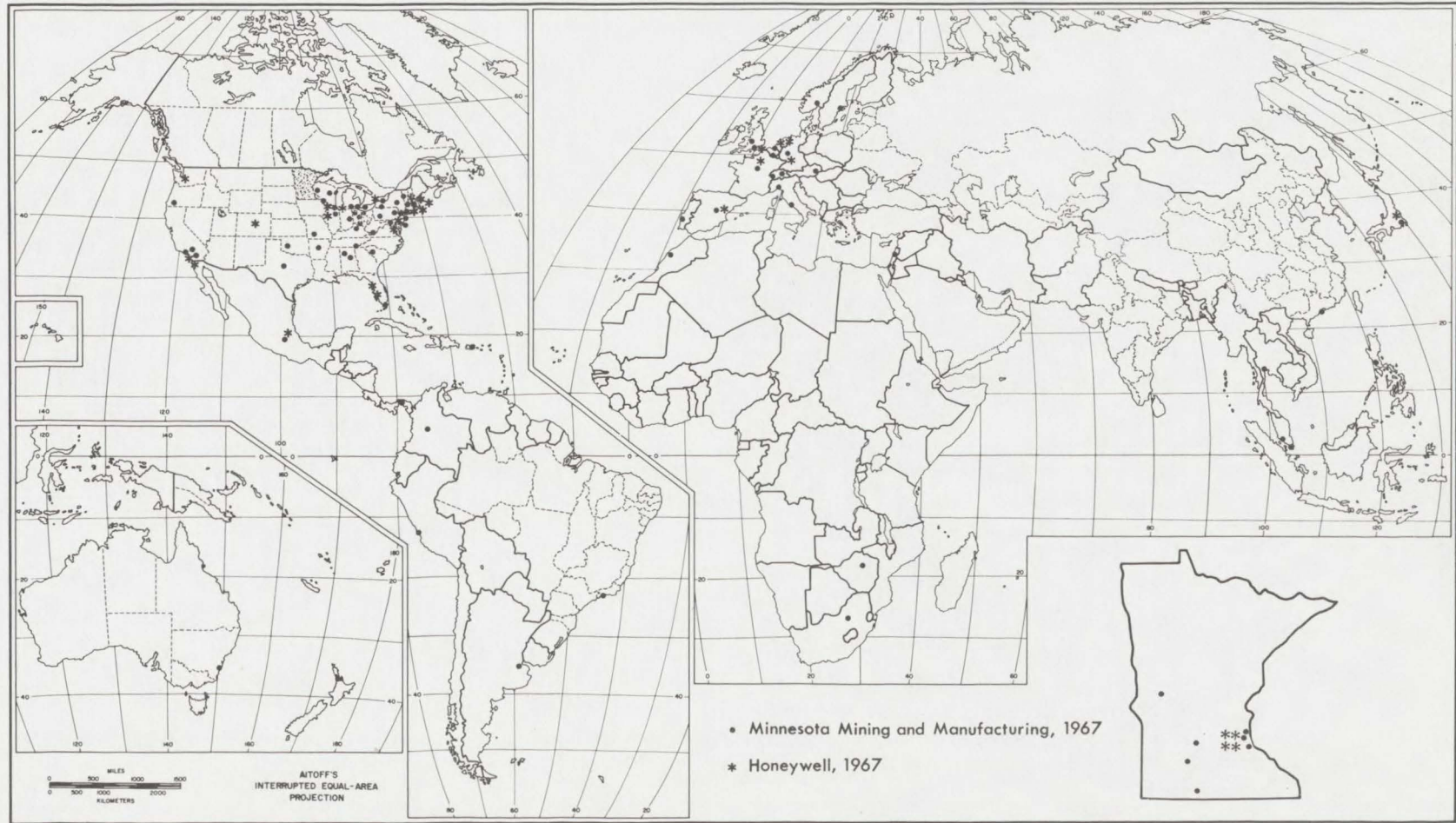
# MINNESOTA EXPORTERS



Data from Minnesota Directory of Manufactures, 1967-1968



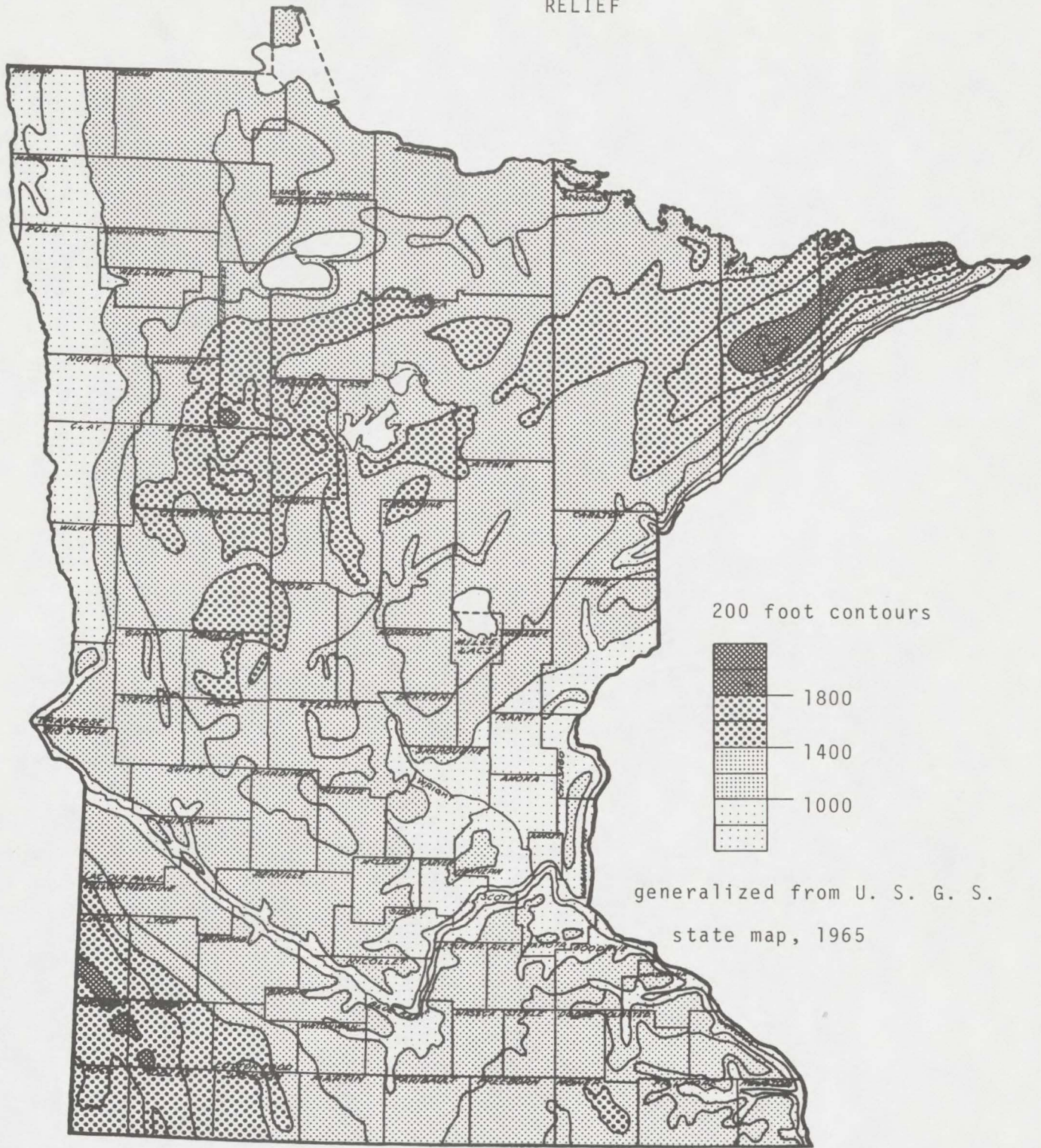
# INTERNATIONAL AND NATIONAL PLANTS OF MAJOR TWIN CITY BASED FIRMS



NATURAL SYSTEMS



RELIEF





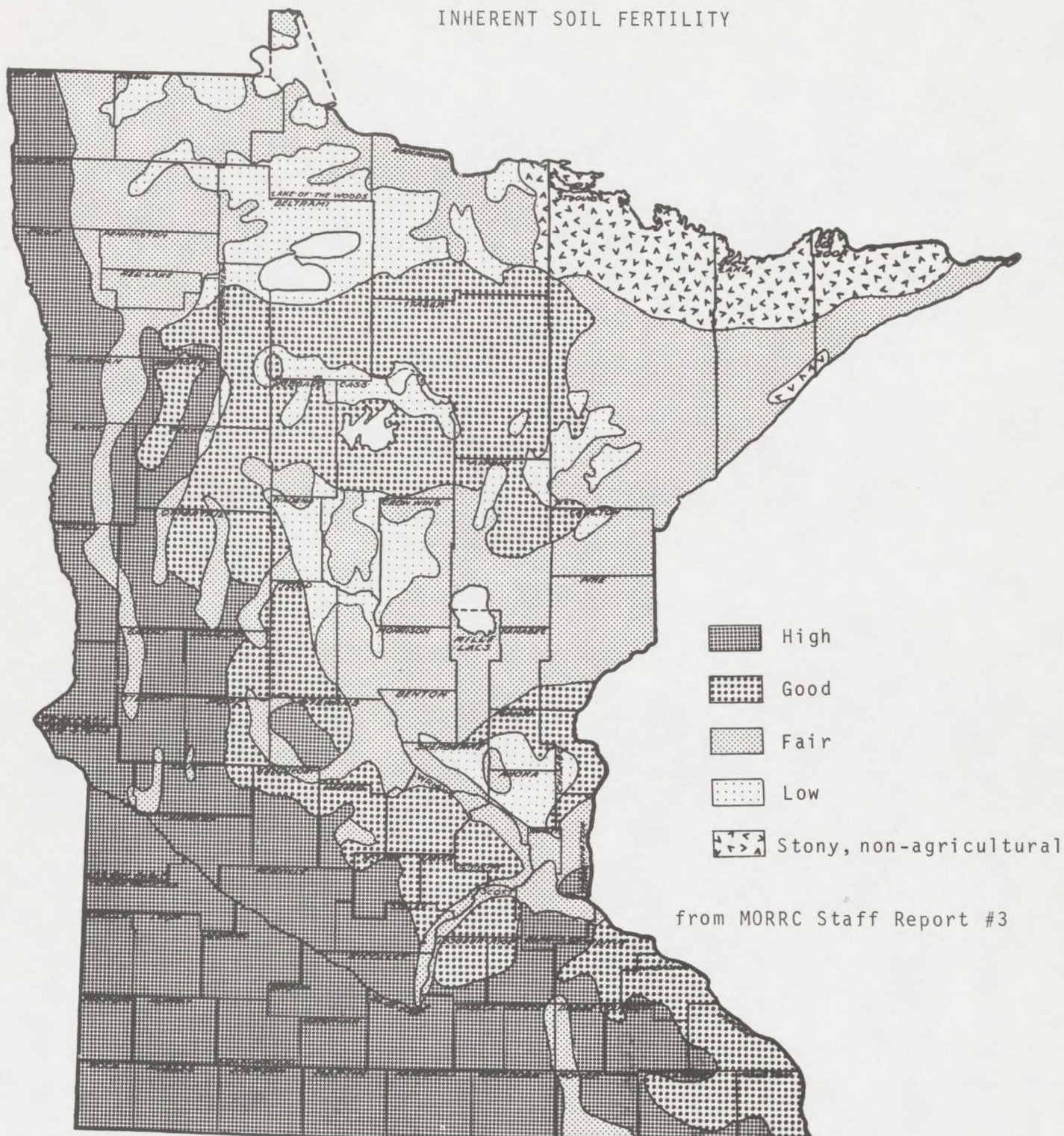








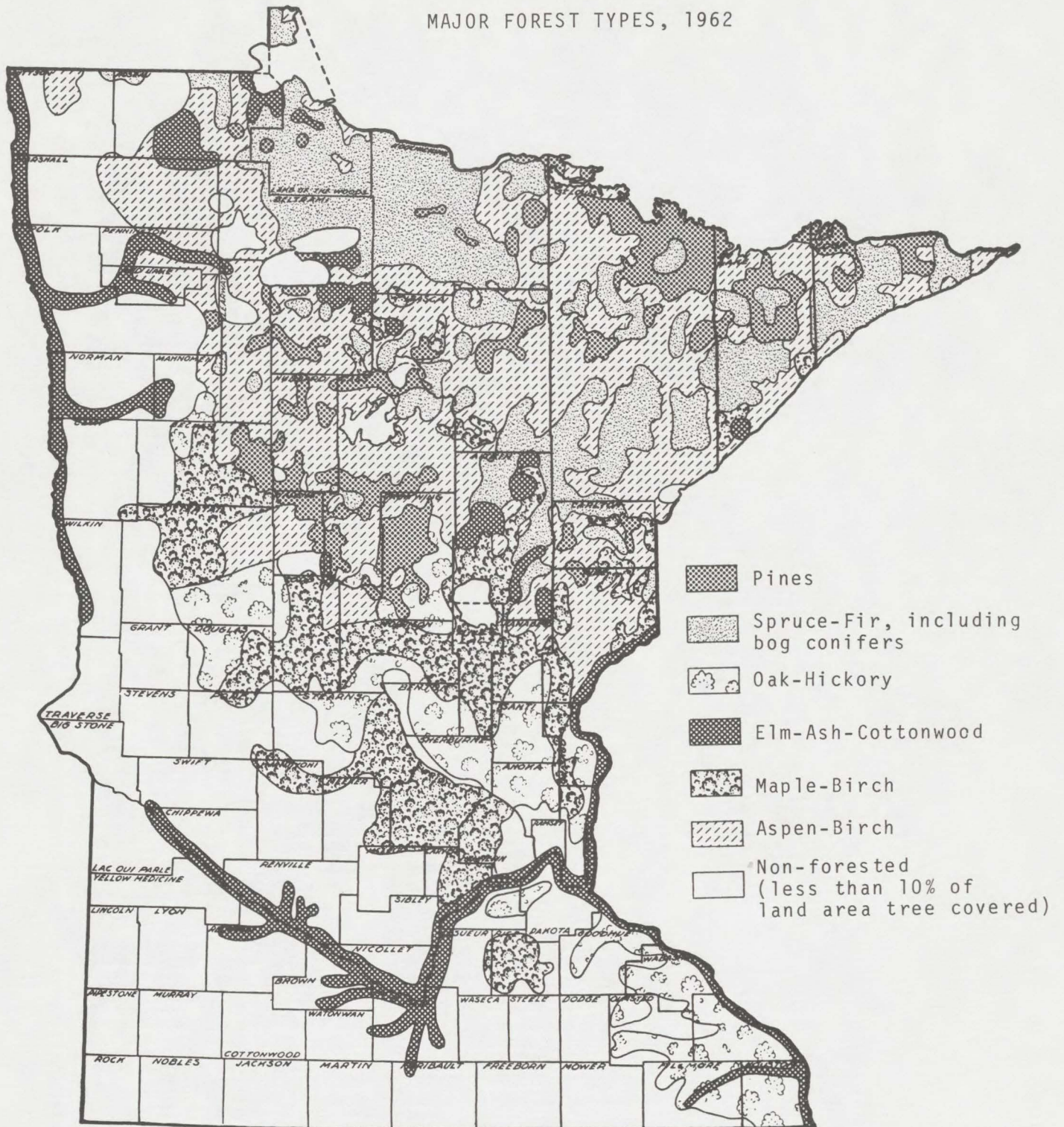
# INHERENT SOIL FERTILITY



from MORRC Staff Report #3



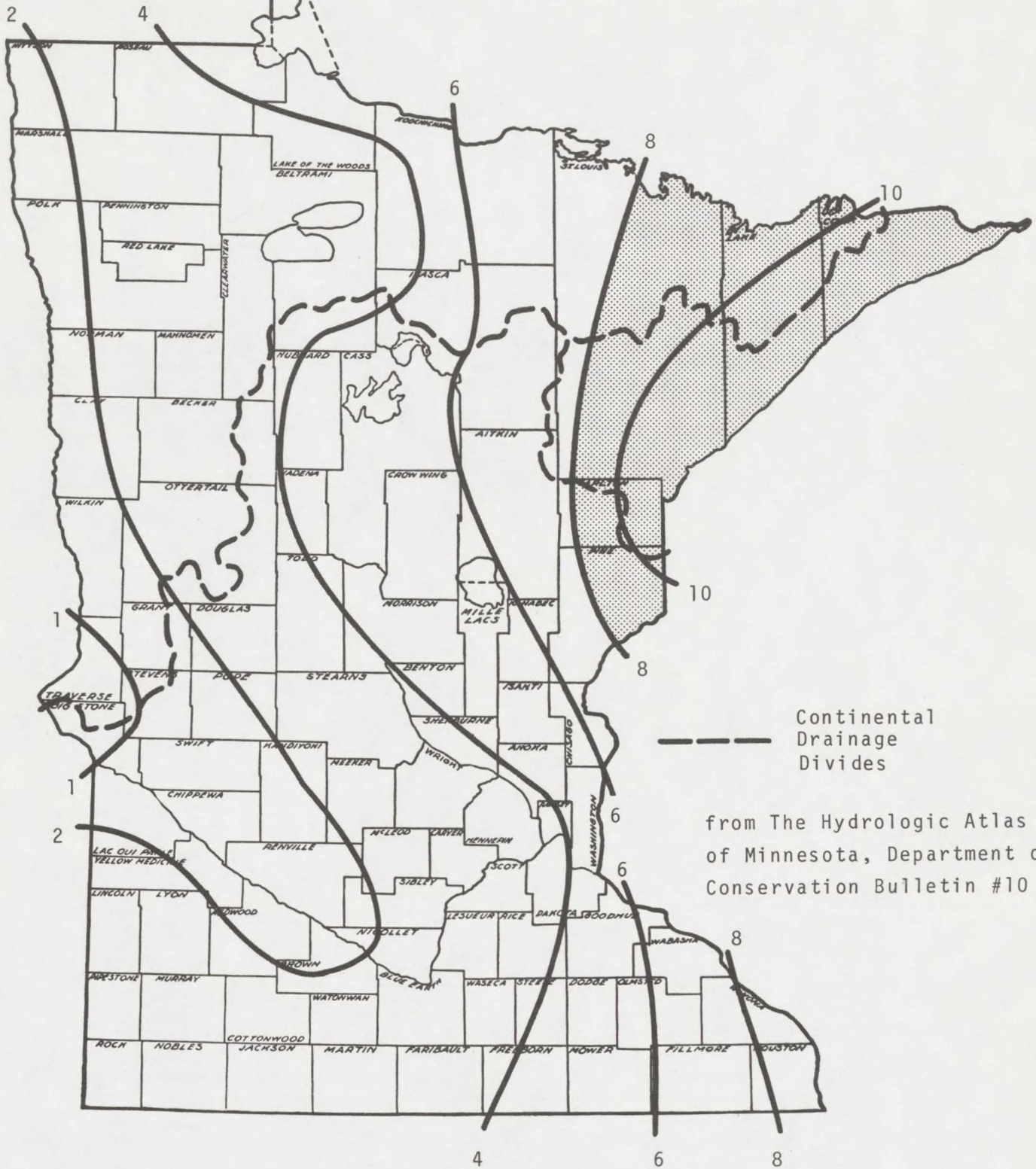
MAJOR FOREST TYPES, 1962



from A Third Look At Minnesota's Timber by Robert N. Stone, USFS, 1966



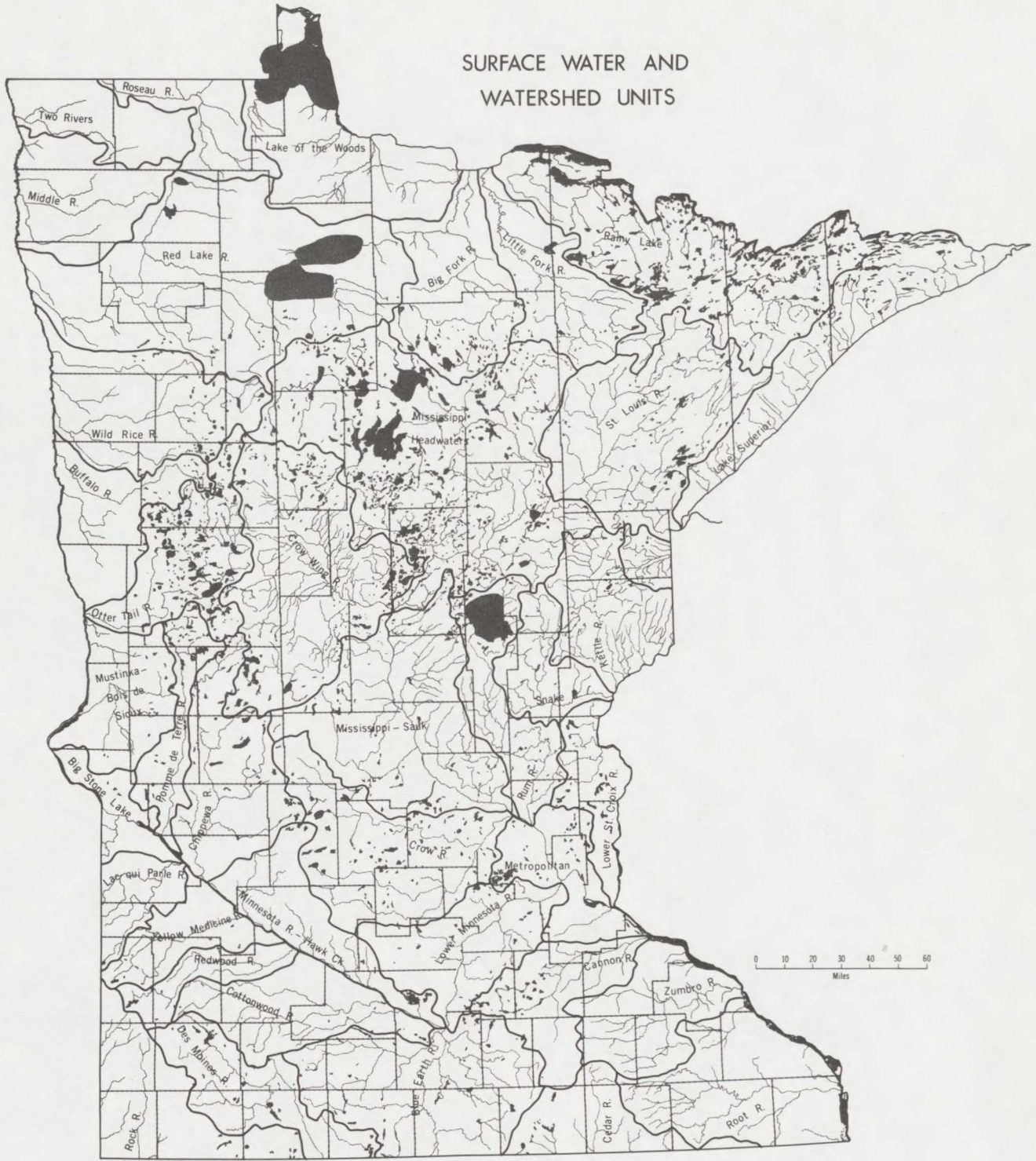
AVERAGE ANNUAL RUNOFF (in inches)



from The Hydrologic Atlas of Minnesota, Department of Conservation Bulletin #10



# SURFACE WATER AND WATERSHED UNITS



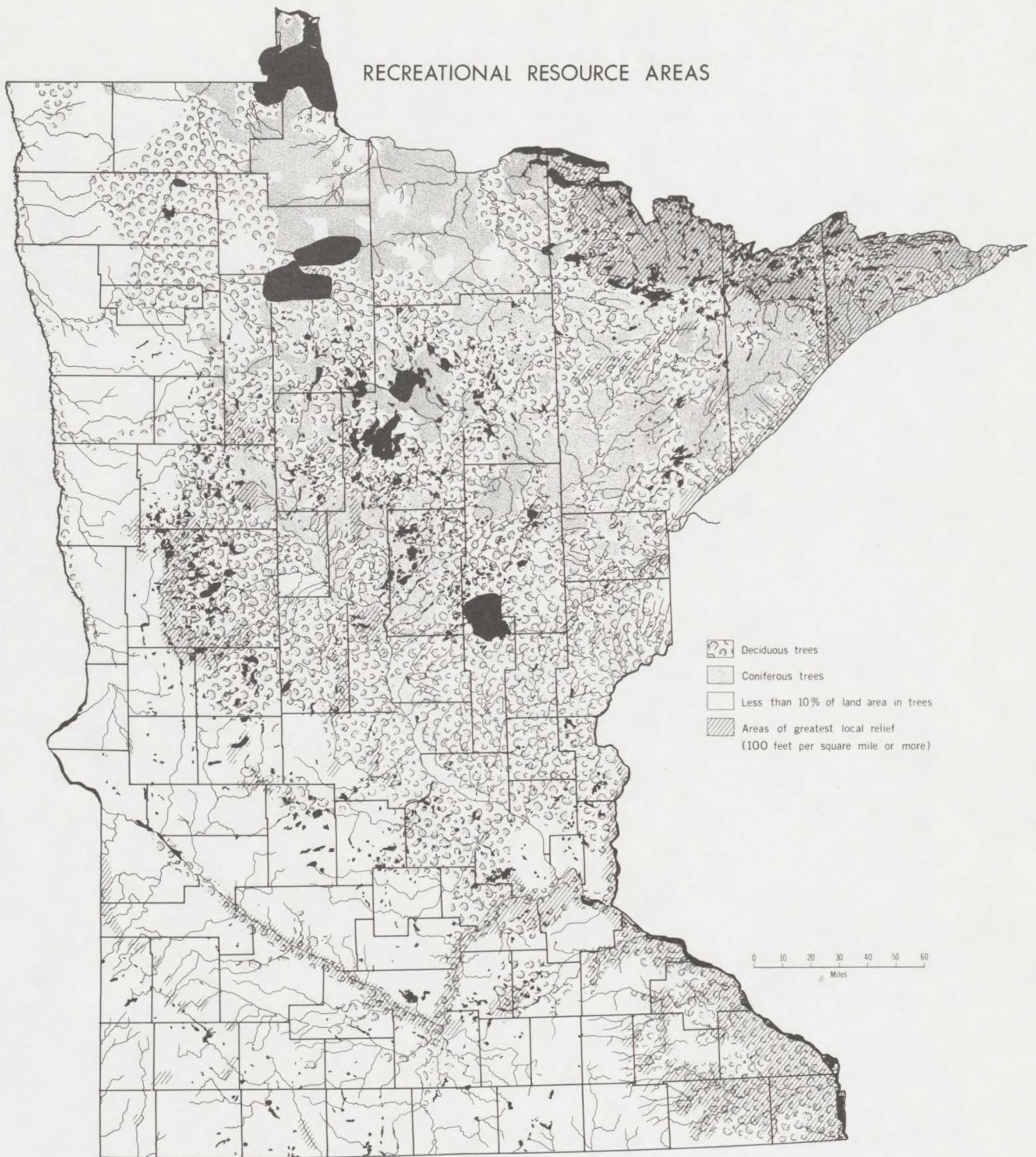
Data from Minnesota Department of Conservation, 1962







# RECREATIONAL RESOURCE AREAS

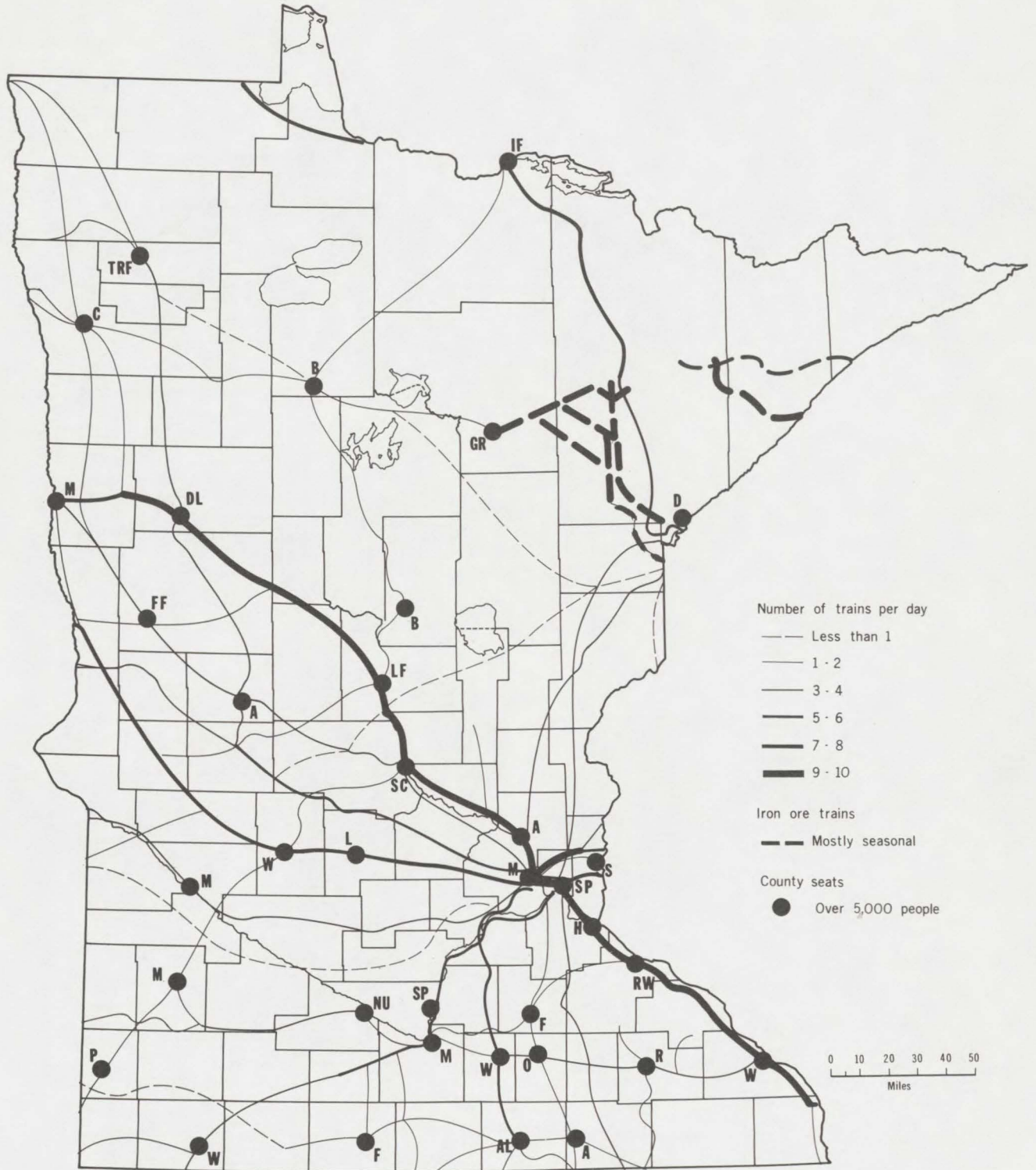


Data from Stone, 1966, and U.S.G.S. topographic maps

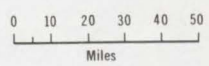
TRANSPORTATION SYSTEMS



# SCHEDULED FREIGHT TRAINS, 1968

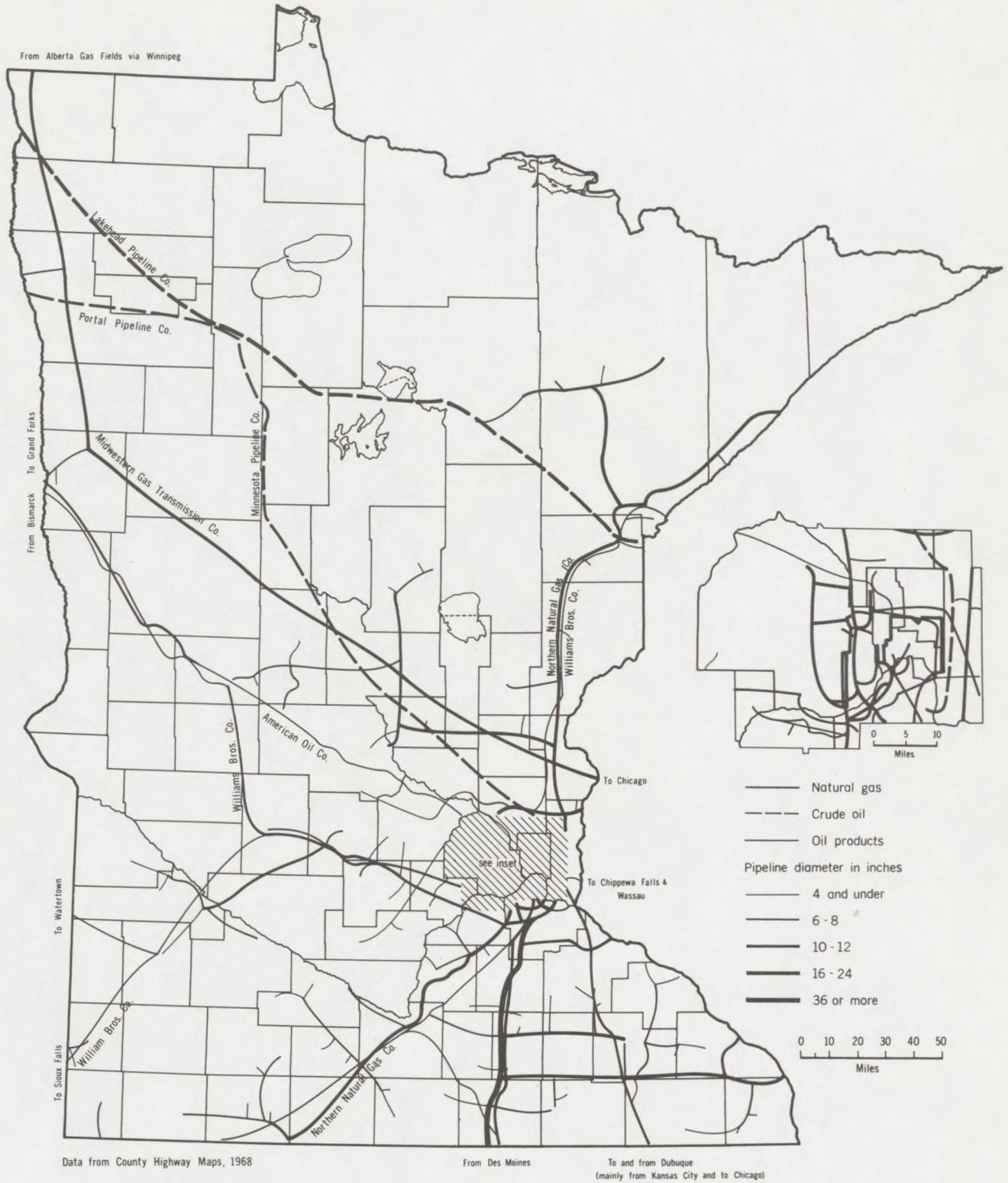


- Number of trains per day
- Less than 1
  - 1 - 2
  - 3 - 4
  - 5 - 6
  - 7 - 8
  - 9 - 10
- Iron ore trains
- - - Mostly seasonal
- County seats
- Over 5,000 people



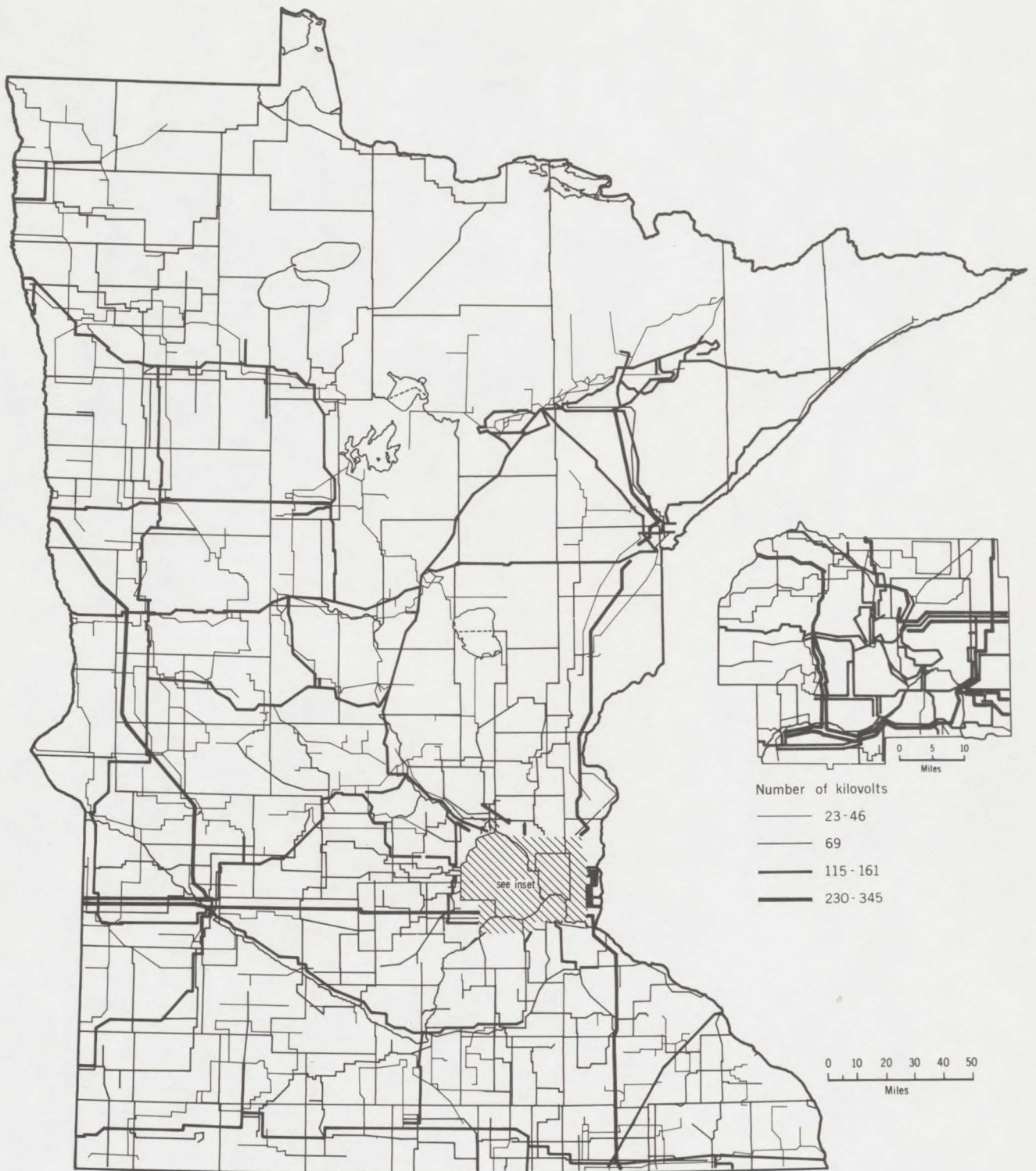
Data from Railroad Companies, 1968

# PIPELINES, 1968



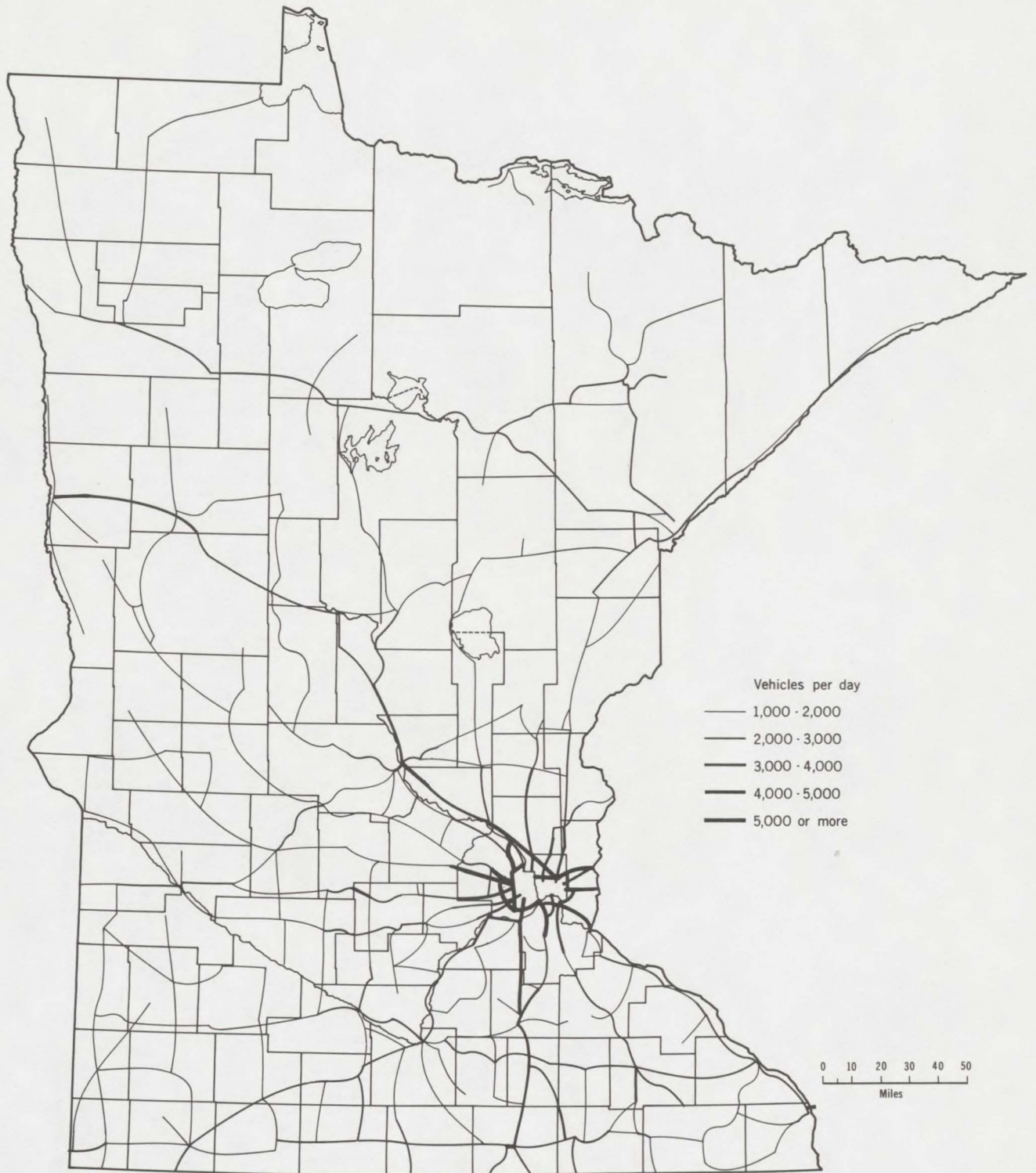


# HIGH VOLTAGE TRANSMISSION LINES, 1968



Data from Northern States Power Company and County Highway Maps, 1968

# NON-COMMERCIAL TRAFFIC VOLUME, 1966



Data from Highway Department Traffic Flow Map, 1966







# COMMERCIAL TRAFFIC VOLUME, 1966



Data from Highway Department Traffic Flow Map, 1966

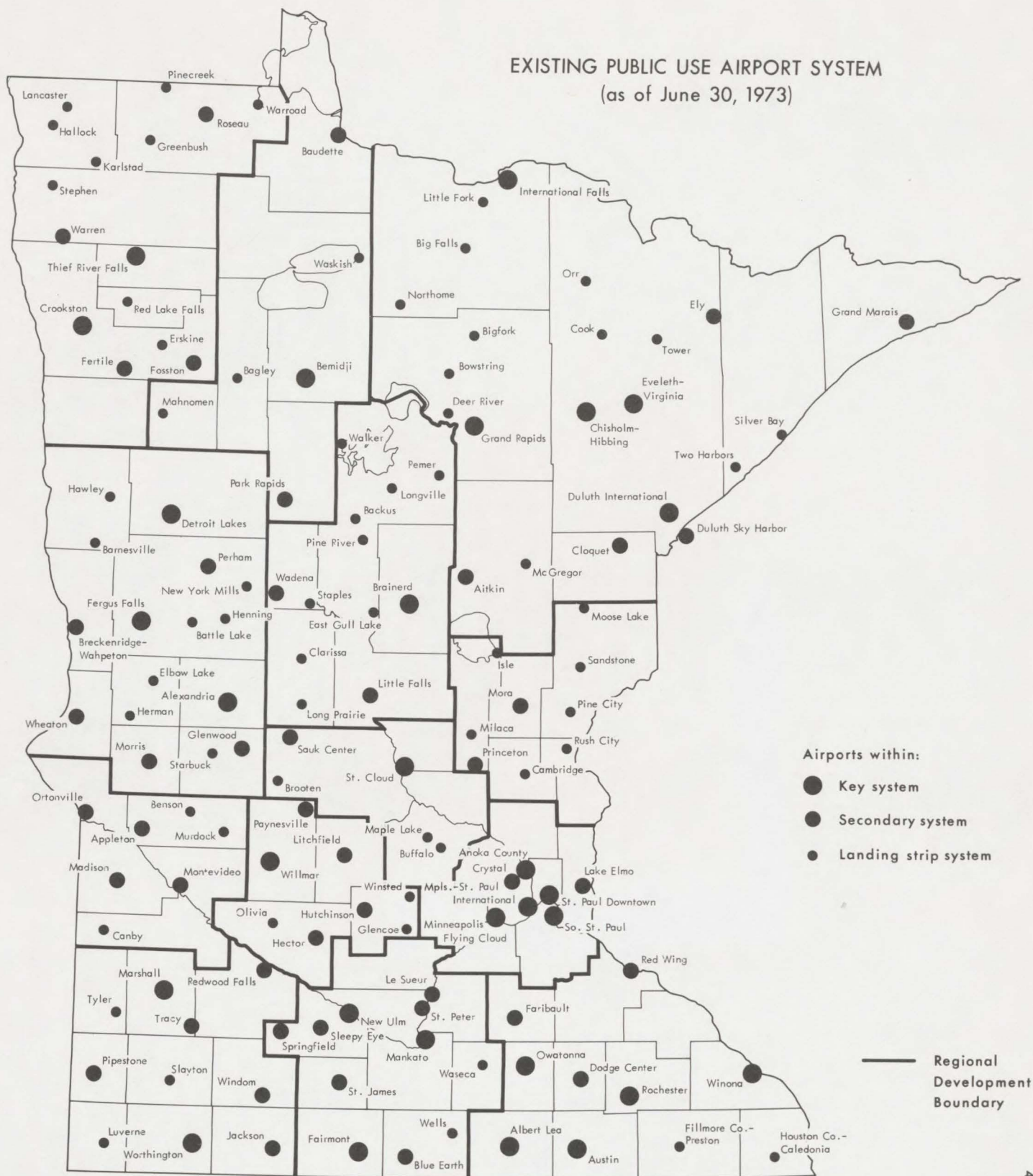
METRO INTERSTATE FREEWAYS  
AND BUILT-UP AREA,  
1970

-  High
-  Medium
-  Low
-  Very Low





EXISTING PUBLIC USE AIRPORT SYSTEM  
(as of June 30, 1973)



- Airports within:
- Key system
  - Secondary system
  - Landing strip system
- Regional Development Boundary

Source: DEPARTMENT OF AERONAUTICS, Administration Building, Downtown Airport, St. Paul, Minnesota 55107



The Anatomy of Selected  
Minnesota Environmental  
Systems.

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BY-EXPERIMENTAL