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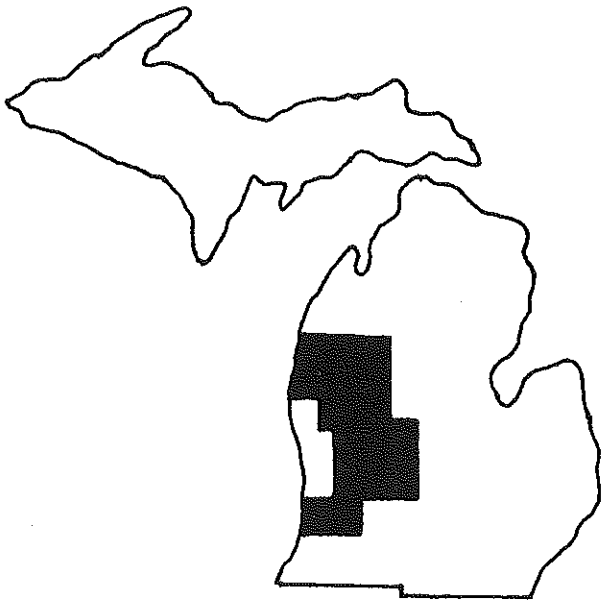

REGIONAL TRANSPORTATION SYSTEMS STUDY

REGION 8 PLAN REPORT 1983

PREPARED BY THE

MICHIGAN DEPARTMENT OF TRANSPORTATION

J. P. PITZ, DIRECTOR

IN COOPERATION WITH THE

WEST MICHIGAN REGIONAL PLANNING COMMISSION

MICHIGAN DEPARTMENT OF TRANSPORTATION

WEST MICHIGAN TRANSPORTATION STUDY

1983

This report represents the findings and/or professional opinions of the Michigan Department of Transportation staff and is not an official opinion of the Michigan State Transportation Commission.

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SUMMARY

The Region 8 Regional Transportation Study was initiated for the purpose of fulfilling the Department's responsibility for planning, building, and maintaining an adequate transportation system within the Region. The traditional system and project planning processes will guide the state and its governmental units in analyzing the existing transportation systems and in preparing plans for future systems and facilities.

The study area considered in this transportation study coincides with the nine county jurisdiction of the West Michigan Regional Planning Commission. It involves Allegan, Ionia, Kent, Lake, Mason, Mecosta, Montcalm, Newaygo, and Osceola Counties.

By studying current and future transportation deficiencies, this study will recommend sub-area, corridor, and project studies for specific improvements in all modes of transportation operating in the Region.

A multi-disciplinary team called a "study team" is conducting this study. Representatives from Multi-Regional Planning, Aviation, Highways, Public Transportation, Railroads, and Non-Motorized Transportation are involved, plus environmentalists and social-economists. The West Michigan Regional Planning Commission is a member of the study team.

Population in the Region is projected to increase 36 percent between 1970 and the year 2000. Energy for transportation, on the other hand, is expected to become less available in future years, and current conditions reinforce this expectation.

In order to insure a level of mobility for citizens, visitors, and commerce in the Region that is reasonable in terms of social, economic, and environmental values, issues and problems must be resolved. This resolution must take place within parameters set by the needs occurring through development patterns and activities in the Region.

Numerous factors influence the region's future transportation systems needs. Many factors were considered, such as economic conditions, governmental influence, desirable lifestyles, etc., but two factors were selected as dominant in developing descriptions of various growth "futures": (1) Energy and (2) Population. Future energy supplies were identified as "restricted," "conserved," and "abundant." The future population growth options were identified as "low," "medium," and "high." Combining these factors yielded nine possible situations or "futures." Each future is assumed to represent a potential travel condition in the year 2000. By reviewing each of the travel demands by mode and the related population and energy impacts in the matrix of futures, determination of future problems are simplified. By concentrating transportation dollars on those areas which appear deficient under all futures, safety of investment can be reasonably assured.

The Plan Report describes in detail how the existing transportation network, population, and energy fit into this matrix. Analysis of the deficiencies evident in the futures and study of related issues acquired through public input provided the basis for preliminary recommendations.

Following is a brief overview of the modes in the Region: Included are recommendations developed through the study for problems identified in each mode.

Aviation

There are currently 17 airports serving Region 8. There are three types of airports; air carrier, utility, and transport airports. Air carrier airports are those which offer regularly scheduled airline service. Utility airports are general aviation airports with runways of 2,000 to 4,700 feet. Transport airports are also general aviation airports, but with a minimum runway length of 4,700 feet.

The Kent Count International Airport in Grand Rapids is the only air carrier airport in Region 8. There are two transport airports in Region 8. These are located at Fremont and Ludington. There are 14 utility airports located in Region 8. The utility airports at Big Rapids, Greenville, Holland, and Ionia are recommended to be upgraded to transport airports. New utility airports are recommended for western Ionia County, southern Kent County, southeastern Montcalm County, and western Montcalm County.

Water Transportation

Port development in the State of Michigan is associated with two types of waterborne activity-recreation and commerce. The responsibility within state government for recreational harbors is vested primarily in the Michigan Waterways Commission of the Department of Natural Resources. Planning responsibility for commercial harbors lies with the Department of Transportation.

The Ludington harbor is located in Mason County. This is the only commercial harbor within Region 8. Commercial activity at the Ludington harbor is dominated by the carferry operations of the Chessie System

railroad. During recent years, service has been provided with three ferries between Ludington and the Wisconsin ports of Milwaukee, Manitowoc, and Kewaunee.

The most significant issue facing Ludington is the status of the car-ferry operation. Service was discontinued to Milwaukee in 1980 and to Manitowoc in 1982. Additional cutbacks are anticipated and future service could be radically different from the past. The rail section of this report further identifies the problems associated with the railroad carferries.

Maintenance of the navigation channels is another issue at Ludington. The channels must be periodically dredged in order to permit commercial traffic in the harbor. Potential problems concerning channel maintenance include continued economic justification for dredging and environmental consequences of dredged material disposal.

Highways

Region 8 has 931 miles of state trunkline. Reconstruction and rehabilitation of existing highways is the prime concern of the Department of Transportation. However, where monitoring of the highway system clearly indicates a need, and where a detailed planning process defines that need, relocation of existing highways or addition of new highways may be undertaken.

All highways were carefully analyzed using the Sufficiency Rating System. Every section of trunkline was "rated" in Capacity, Safety, Surface Condition, and Base Condition. Congestion levels, based on the capacity of a section of road related to the volume of traffic it carries, were also considered.

Projected traffic volumes, based on energy availability and population growth for future years were used to identify future problem areas. This information, together with highway transportation issues acquired through public input has enabled the Department to compile a list of deficient highway segments and recommendations for solutions to these problem areas.

Corridor studies are recommended. These are South Beltline (M-10) from I-96 to I-196 in Kent County, M-20 from Remus to White Cloud in Mecosta and Newaygo Counties, and M-40, M-89, and M-118 in the City of Allegan.

There are several project studies recommended. These are M-37 from 10 Mile Road in Kent County to M-82 north of Newaygo in Newaygo County, M-44 from I-96 to Plainfield Avenue in Kent County, and M-37 from Caledonia to M-11 in Kent County.

Non-Motorized

The primary network for non-motorized transportation (biking, walking, etc.) is the existing street system. Many urban and rural streets have adequate widths and low traffic volumes, and are considered safe for these activities without further improvements.

In many areas, higher motor vehicle speeds and volumes pose problems for non-motorized activities. Therefore, the concept of additional road width will form a base for the bicycle facility planning process.

The state non-motorized program requires that at least one percent of Michigan Transportation Funds received by each agency be used for non-motorized facilities. Construction of new non-motorized facilities is recommended for areas that demonstrate a need in Region 8. These

would be areas where a new link is needed to supplement a non-motorized system or a local plan. It is recommended that non-motorized projects be constructed in conjunction with highway projects or independently as funds are available.

Public Transportation

There are ten transportation agencies providing service to the general public in Region 8. Two of these are rural systems. One is the county-wide Mecosta system and the other is the Yates Township service located in Lake County.

There are seven small community systems in the region. These predominantly demand-response systems operate in the cities of Belding, Big Rapids, Greenville, Ionia, Ludington, Reed City, and Saugatuck.

The largest transit system in Region 8 is the 107 vehicle fixed route system operated by the Grand Rapids Area Transit Authority (GRATA). This is the second largest system in Michigan as it carries almost 5 million passengers annually. Service is provided to the communities of Comstock Park, Grand Rapids, Grandville, Kentwood, Wyoming, and to Grand Valley State College. Demand-response service supplements the fixed-route service providing transportation to elderly and handicappers.

There is a need for new or improved demand response type transit service for special individuals in the rural portions of each county (except Mecosta County and Yates Township in Lake County in Region 8). The transit system in Grand Rapids (GRATA) should be expanded. Intercity bus service should be provided for Allegan, Fremont, Otsego, and Sparta. Additional east-west intercity bus service would be desirable

to connect Big Rapids and Reed City with Mount Pleasant and Clare. More north-south service is needed between Ludington and Muskegon/Grand Rapids.

Coordination should be developed between intercity and local public transportation schedules and terminal facilities. Intercity bus service should be coordinated with rail passenger service. Local intercity bus service should be provided along rail corridors to communities not served by rail, and supplement rail service during low demand periods. Grand Rapids should have direct rail passenger service consisting of about three daily round trips.

Rail Freight

Competing transportation modes have caused a steady decline in rail transportation and many carriers have gone bankrupt. These bankruptcies represent a possible loss of 2,000 miles of trackage in Michigan's lower peninsula.

The passage of the State Transportation Preservation Act of 1975 represents the State's initial commitment to maintain a statewide rail network through subsidization and other planning features. Further funds are provided by the Federal Rail Reorganization (3R Act) and the Rail Revitalization and Regulatory Act (4R Act).

The subsidized operations should be monitored of the Ann Arbor Railroad System, Michigan Northern Railway, and the Kent-Barry-Eaton Connecting Railway. Changes should be instituted as required.

The pending or potential abandonment should be monitored of the Grand Trunk Western (Greenville-Carson City-Ashley), Conrail (Grand Rapids CBD), and Chesapeake & Ohio (Ionia-Portland-Grand Ledge).

Restore the service, if required, on the Fuller-Kinney (Conrail) segment.

The possible abandonment of the Lake Michigan carferry service between Ludington and Kewaunee, Wisconsin by the Chesapeake & Ohio should be monitored.

The need to continue and promote rail operations in the Region has been addressed by this study, and issues relating to rail transportation are receiving study. The state will monitor the operations of the above rail systems, and changes will be instituted as required.

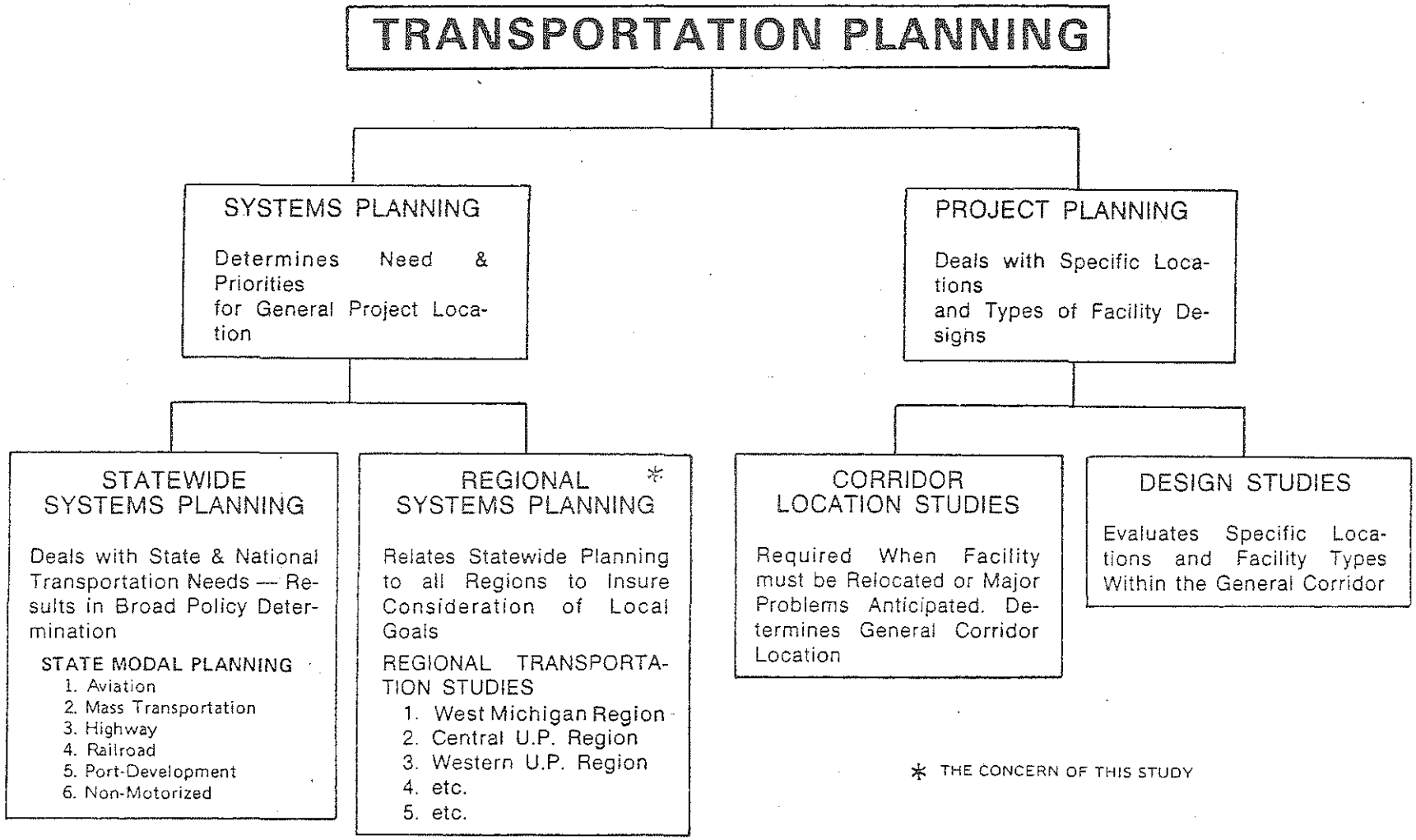
A. INTRODUCTION

The Constitution and Statutes of the State of Michigan establishes the Michigan Transportation Commission's responsibility for planning, building and maintaining a transportation system for our State. To fulfill these responsibilities the Michigan Department of Transportation has developed a process to guide the State and its governmental units in analyzing the adequacy of existing transportation systems and preparing plans for future systems and facilities.

Traditionally, the planning process has been divided into two phases; systems planning and project planning (see diagram). Systems planning consists of analyzing transportation system needs and developing alternative proposals designed to satisfy those needs. The process begins with the analysis of existing systems and facilities and their relationship to goals and objectives of the State and local governmental units of the State. It extends through the identification of deficiencies and recommendations for action. Systems planning studies provide a general overview of how all modes of transportation interact in a given area. They address the physical and functional components of the various transportation systems and consider the impacts to its users and non-users. The contents of this report represent a systems planning study as it relates to the West Michigan Region (Region 8).

Project planning is the process of analyzing all practical alternatives to improve specific transportation facilities. Analysis is continued until all but one alternative is eliminated. Because project planning

EXHIBIT A-1



* THE CONCERN OF THIS STUDY

deals with specific facility location and design, an Environmental Impact Statement (EIS) may be required, depending on the extent of improvements and the intensity of impacts.

STUDY AREA

The geographic area considered in this transportation study coincides with the nine county jurisdiction (Exhibit A-2) of the West Michigan Regional Planning Commission. This agency has been designated by the Governor as the multicounty regional planning agency for this area. The overall objective of this designation is to better coordinate state programs with one another along with federal, regional, local and private sector programs. The West Michigan Regional Transportation Study represents the Department of Transportation's efforts towards meeting this objective.

PURPOSE OF THE STUDY

The West Michigan Regional Transportation Study was initiated in 1975. The purpose of the study is to identify current and future deficiencies in the transportation system. This study will recommend sub-area, corridor and project studies that will result in recommendations for improving various transportation modes operating in the nine county West Michigan Region.

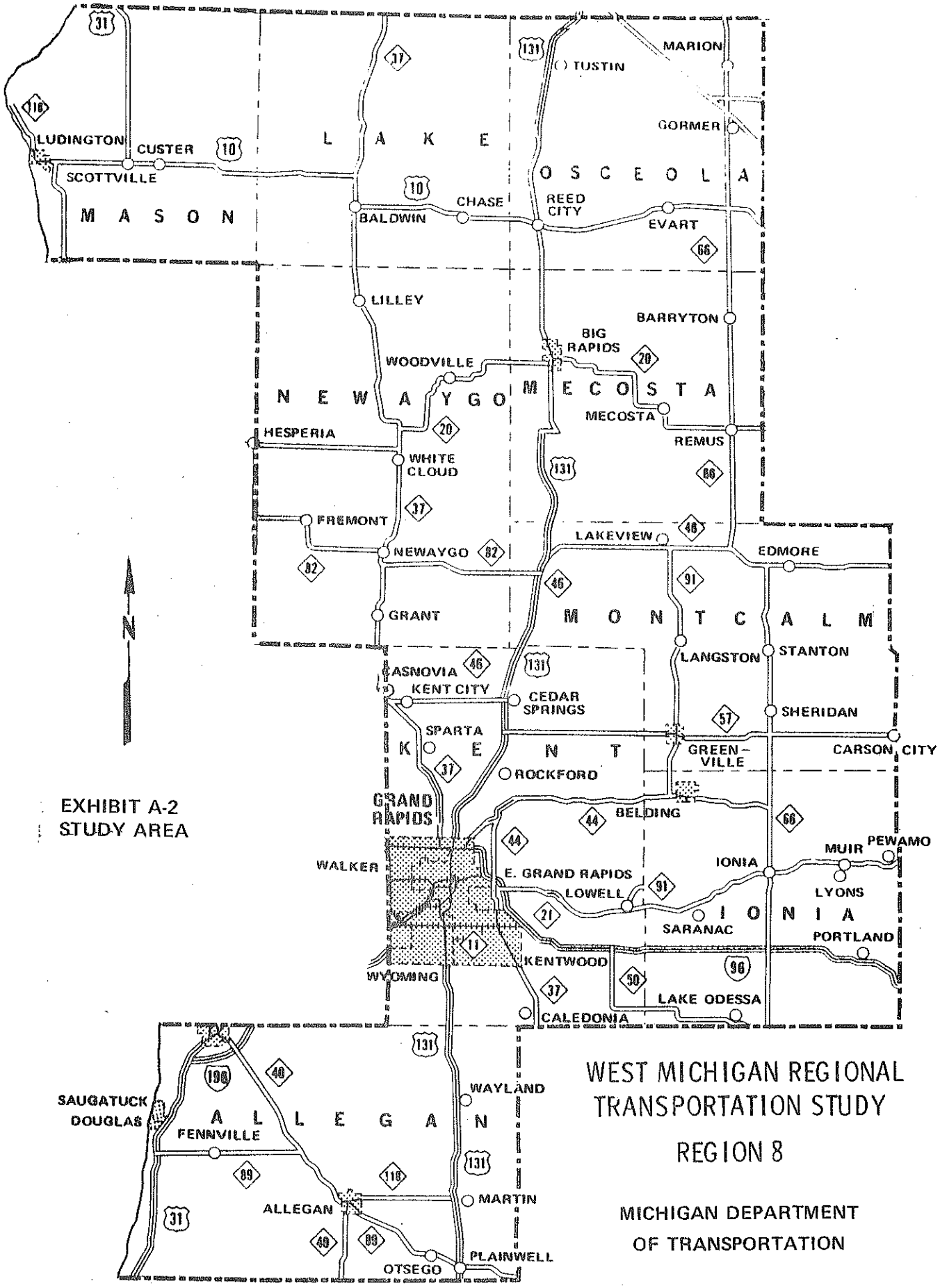


EXHIBIT A-2
STUDY AREA

WEST MICHIGAN REGIONAL TRANSPORTATION STUDY

REGION 8

MICHIGAN DEPARTMENT
OF TRANSPORTATION

PLANNING METHODOLOGY

Conducting this study is a multi-disciplinary planning team made up of professionals who have diverse educational backgrounds with different perspectives. Typical membership of this study team includes planners, engineers, social scientists, economists and ecologists. The study team has members representing the West Michigan Regional Planning Commission (Region 8) and the Federal Highway Administration.

A key element of this document is the requirement to encourage public involvement in the early planning stages for major transportation facilities. To accomplish this, a 3-step meeting process has been established, consisting of: 1) PreStudy Public Meetings, 2) Public Hearings and, 3) Post Decision Meetings. These meetings are generally conducted for both the systems and project level planning steps. Thus, the general public will have opportunities to become involved in the planning process and to review and comment on transportation proposals affecting their area. The contents of this report were assembled in preparation for the second meeting, a Public Hearing on the Transportation Study for the West Michigan Region.

In addition to the prescribed public meetings, the study team utilizes many other sources to obtain public input into the planning process. These sources include, questionnaires, travel surveys, correspondence, newspaper articles, interviews with local officials, public information meetings, and the involvement of special interest groups, citizen

advisory groups and local planning organizations. Information gathered from these sources has assisted in identifying many important transportation needs. The current planning efforts illustrate how various future growth projections and energy situations could affect the existing and future travel demands by mode of travel. By analyzing these future conditions, the study team will be in a better position to continue planning efforts on those projects which show the greatest need and are common to: 1) existing deficiencies, 2) expected future deficiencies without new improvements, and 3) diversion to other modes of travel in future years.

In the travel analysis distribution phase, energy availability and growth trends are factored into trips by different transportation modes by trip length and trip purpose for each future period.

Travel projections are first made on the existing highway network using low, medium, and high population projections to the year 2000. Projected traffic volumes for each future year are then compared with the existing facilities and deficiencies are identified. After this evaluation, a diversion of trips from the highway system is made to other modes of transportation based upon population levels and energy availability. Highways which continue to be deficient from a capacity standpoint are included as projects to be studied in greater detail. These are the highways which cannot be relieved with a diversion of trips to other modes of transportation as the cost would be prohibitive or because continuity of through trips on the system would be broken.

The matrix, Exhibit A-3, will be used to summarize the affects on various transportation modes and their related population and energy impacts. The squares are numbered one through nine. One represents the most conservative highway oriented future and nine represents the most liberal highway oriented future. Any deficiency which is significantly represented in all nine can be considered as a safe investment for expenditure when programming highway funds. Problems which only occur in three, six, and nine require high population growth to become a safe investment. If we do not expect energy supplies to become more restricted, problems occuring only in seven, eight, and nine are safe investments. Number seven is the future which most closely resumbles present conditions.

By reviewing each of the travel demands by mode, and the related population and energy impacts using this matrix, the task of determining future problems is simplified.

ANALYSIS TECHNIQUES

The Regional Study Team evaluated nine future conditions that could affect travel in the year 2000. An analysis was made to determine what would happen if each of the energy futures generated different diversion patterns by mode. The impact population had on trip volumes was also analyzed.

EXHIBIT A-3

	2000 Population Low Growth	2000 Population Medium Growth	2000 Population High Growth
Restricted Future Energy Supply	Most Conservative Future Projection 1	2	Public Transit Most Successful In This Future 3
Conserved Future Energy Supply	4	5	6
Abundant Future Energy Supply	This Future Most Closely Resembles Present Conditions 7	8	Most Liberal Future Projection 9 Highway Improvements Needed Here

Exhibit A-4 summarizes the mode split percentages and the travel reductions made under three energy futures. The travel was diverted from the highway mode based on trip length and trip purpose. The process is shown in Exhibit A-5.

Three energy futures were used in conjunction with three population futures to develop nine future conditions. It is assumed that each one of these nine futures closely represents a potential travel condition in the year 2000. All population projections were obtained from the Michigan Department of Management and Budget (MDMB). Projected figures for 1980 were assumed to represent a low growth future. Projections for 1990 were assumed to represent a moderate growth future and population projections for 2000 were assumed to represent the high growth future for 2000.

RELATIONSHIP BETWEEN THE REGIONAL AND URBANIZED AREA TRANSPORTATION PLANNING PROCESS

The 1962 Federal Aid Highway Act requires continuing, comprehensive, and cooperative (3-C) transportation planning in urbanized areas with central cities of over 50,000 population. This requirement applies to the City of Grand Rapids and the urbanized area surrounding it.

As part of the on-going Grand Rapids urbanized area planning process, long and short range transportation plans are developed and updated periodically. These plans are comprehensive and multi-modal in nature. Since the Grand Rapids area is a focal point for much social and economic activity in the region, it is important that plans and proposals for the urbanized area be integrated with the Region 8 plan. This has been done where appropriate.

EXHIBIT A-4

ESTIMATED MODE SPLIT BY TRIP LENGTH, TRIP PURPOSE AND ENERGY FUTURE

MODE SPLIT PERCENTAGES

ABUNDANT ENERGY SUPPLY

TRIP* PURPOSE	TRAVEL REDUCTION	MODE	TRIP LENGTH (MIN) 3/ 0-30	31-60	61-90	91-121	121-300	300+
WORK	0%	Auto	99.9	99.6	98.6	97.0	94.6	88.8
		Bus	0.1	0.2	0.6	1.0	2.0	2.0
		Rail	0.0	0.2	0.8	2.0	2.0	2.0
		Air	0.0	0.0	0.0	0.0	1.4	7.2
VACATION	0%	Auto	99.9	99.6	98.6	97.0	96.2	90.1
		Bus	0.1	0.2	0.6	1.0	2.0	2.0
		Rail	0.0	0.2	0.8	2.0	1.0	1.5
		Air	0.0	0.0	0.0	0.0	0.8	6.4
OTHER	0%	Auto	99.9	99.6	98.6	97.0	96.7	88.7
		Bus	0.1	0.2	0.6	1.0	2.0	2.0
		Rail	0.0	0.2	0.8	2.0	2.5	2.5
		Air	0.0	0.0	0.0	0.0	0.8	6.8

CONSERVED ENERGY SUPPLY

TRIP PURPOSE	TRAVEL REDUCTION	MODE	TRIP LENGTH (MIN) 0-30	31-60	61-90	91-120	121-300	300+
WORK	0%	Auto	93 1/	93 2/	97	94	91	84
		Bus	5	2	1	2	4	4
		Rail	0	0	2	4	4	4
		Air	0	0	0	0	1	8
VACATION	-5%	Auto	100	99	97	96	93	87
		Bus	0	1	1	2	4	4
		Rail	0	0	2	2	2	2
		Air	0	0	0	0	1	7
OTHER	-5%	Auto	95	99	97	93	90	84
		Bus	5	1	1	3	4	4
		Rail	0	0	2	4	5	5
		Air	0	0	0	0	1	7

RESTRICTED ENERGY SUPPLY

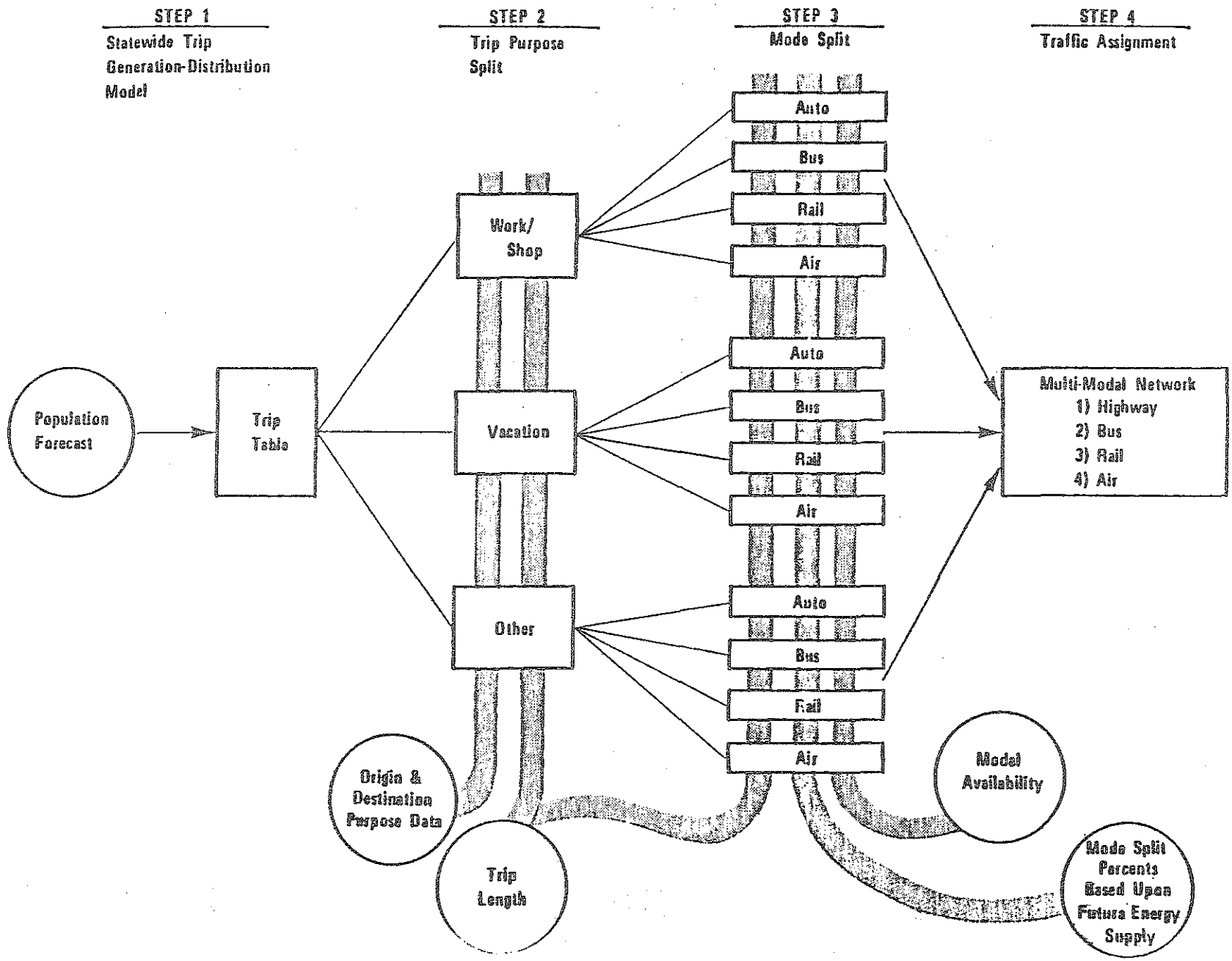
TRIP PURPOSE	TRAVEL REDUCTION	MODE	TRIP LENGTH (MIN) 0-30	31-60	61-90	91-120	121-300	300+
WORK	0%	Auto	85 1/	84 4/	97	93	87	81
		Bus	10	5	1	3	5	5
		Rail	0	1	2	4	7	7
		Air	0	0	0	0	1	7
VACATION	-20%	Auto	100	98	97	94	90	84
		Bus	0	1	1	3	4	4
		Rail	0	1	2	3	5	6
		Air	0	0	0	0	1	6
OTHER	-20%	Auto	90	95	97	91	85	78
		Bus	10	4	1	4	6	6
		Rail	0	1	2	5	8	10
		Air	0	0	0	0	1	6

* Work Trips Include: Work, Shopping, Personal Business
Vacation Trips Include: Vacation
Other Trips Include: Social, Recreation, and all others

1/ Reflects 2% Car Pools for 0-30 min "Work" Trips
2/ Reflects 5% Car Pools for 31-60 min "Work" Trips
3/ Reflects 5% Car Pools for 0-30 min "Work" Trips
4/ Reflects 10% Car Pools for 31-60 min "Work" Trips
5/ Based on Approximate Auto Driving Time (Minutes)

EXHIBIT A-5

MULTI-MODAL TRAFFIC ASSIGNMENT PROCESS



Specific questions regarding products, proposals, and other activities may be directed to the Grand Rapids and Environs Transportation Study (GRETS), located within the West Michigan Regional Planning Commission office.

REGIONAL STUDIES AND THE STATE TRANSPORTATION PLAN

Recommendations from regional studies were and will be used as input into the State Transportation Planning Process. The State Transportation Plan will incorporate the Needs Study, regional study recommendations, modal plans and other information to form the framework for developing future regional or sub-state project priorities. The State Transportation Plan will consider varying levels of transportation service under varying levels or senarios of proposed financing.

This study, therefore, is not a comprehensive plan in itself to measure all intra-modal relationships within the region. It is basically an inventory of existing systems and an attempt to define deficiencies within each mode and offer corrective recommendatfons.

B. SOCIAL AND ECONOMIC CHARACTERISTICS

Population Trends and Projections

According to the 1980 Census, Region 8 contains 750,400 people. The nine county region, with 10.5% of Michigan's land area, comprised 8.1% of the state's population. There is a wide variation in population among the nine counties. Population totals (1980) range from a low of 7,700 in Lake County to a high of 444,500 in Kent County.

Population changes, at least in terms of migration, are primarily associated with the relative availability of social and economic opportunities present in different areas. The rate of population growth in Region 8 between 1970-1980 was higher than the state as a whole. All nine counties have shown increases since 1970, but the rate and amount of growth have varied widely. The largest percentage gains have occurred in Lake (35.1%) and Mecosta (32.1%) Counties.

The projections shown in Exhibit B-1 were prepared by the Department of Management and Budget, and are generally considered quite reliable for areas the size of counties.

These projections show that all counties in the region are expected to continue to increase in population. By the year 2000, the region as a whole is expected to increase by 19.6% over 1980 levels. In general, the largest percentage increases are expected to occur in the region's northern tier of counties, while in terms of absolute

EXHIBIT B-1

Population, 1970-2000

Area	1970[1]	1980[2]	1980[3]	1990[3]	2000[3]	Change 1970[1]-1980[2] Number	%	Change 1980[2]-2000[3] Number	%
Allegan	66,600	81,600	77,200	90,900	102,500	15,000	22.5	20,900	25.6
Ionia	45,800	51,800	50,000	55,700	60,700	6,000	13.1	8,900	17.2
Kent	411,000	444,500	436,700	469,700	492,000	33,500	8.2	47,500	10.7
Lake	5,700	7,700	7,600	11,100	14,900	2,000	35.1	7,200	93.5
Mason	22,600	26,400	25,800	30,700	34,700	3,800	16.8	8,300	31.4
Mecosta	28,000	37,000	38,000	49,800	58,400	9,000	32.1	21,400	57.8
Montcalm	39,700	47,600	47,500	55,500	63,700	7,900	19.9	16,100	33.8
Newaygo	28,000	34,900	34,200	41,000	45,900	6,900	24.6	11,000	31.5
Osceola	14,800	18,900	18,900	23,000	24,800	14,100	27.7	5,900	31.2
Region 8	662,000	750,400	736,000	827,000	898,000	88,400	13.4	147,200	19.6
Michigan	8,875,000	9,258,300	9,358,000	10,046,000	10,505,000	383,000	4.3	1,246,700	13.5

[1] U.S. Census of Population 1970

[2] 1980 Census of Population P.L. 94-171 Population Counts

[3] Michigan Department of Management and Budget, Population Projections for Michigan to the Year 2000, Lansing, 1978

numbers the largest increases are expected in the already densely populated Kent County.

The regions major concentration of population is in Kent County. In 1980, Kent County contained 444,500 people or 68% of the regions total population. The second largest concentration of population is in Allegan County. Outside of the two counties other concentrations of population are in the cities of Big Rapids, Ludington, Greenville, and Ionia. When the population of these cities is added to that of Kent and Allegan Counties, 86% of the regions total population is accounted for.

Age Factors

For 1970, the age distribution of the region's population is very similar, in all age categories, to that of the state as a whole. The number of children under 5 years has declined since 1960. The rate of decline has paralleled the statewide decline in this age group, reflecting declining birth rates which are a current national trend. The regional average of persons 65 years or older (9.8%) is higher than the statewide average (8.5%), but there is a wide variation among counties. The percentage of persons 65 years or older ranges from 8.6% in Mecosta County to 20.6% in Lake County. Mecosta County, influenced by Ferris State College students, had the lowest median age (22.7 years) in 1970. Lake County had the highest median age (38.3 years). The 1970 median age for the state as a whole was 26.3 years. Median age is defined as the age at which one-half of the population is older and one-half is younger.

Persons in the 65 years of age or older group have different travel needs than persons in younger age brackets. There tend to be more trips to doctors or hospitals with elderly persons than younger people. Also, the elderly people tend to be located in the rural areas while the health services are in the urban areas.

Health Care and Educational Facilities

On a regional level, two of the more important socio-economic considerations in terms of providing efficient transportation facilities are access to health care facilities and to institutions of higher education. There are twenty-four hospitals within Region 8. See Exhibit B-2. Among counties, the number of hospitals range from none in Lake County to eight hospitals (with a total bed capacity of 2,304) in Kent County.

There are eleven major institutions of higher education within the region (Exhibit B-3). The largest college in the region is Ferris State College in Big Rapids. The greatest concentration of educational facilities is in the immediate area of Grand Rapids.

Transportation Disadvantaged

Persons living in rural areas are generally required to travel to more densely populated areas of the region to shop, work, or to take advantage of health care and educational facilities, cultural activities, and other services. This places a special burden on portions of the population which, because of a handicap, poverty or old age, find it difficult to make the necessary trip without burden or hardship. When the expense of an automobile is too great,

EXHIBIT B-2

HOSPITAL FACILITIES

County	Facility Name	City	Licensed Bed Capacity
Allegan	Allegan General Hosp.	Allegan	80
	Community Hosp.	Douglas	31
	Pipp Community Hosp.	Plainwell	45
			156
Ionia	Belding Comm. Osteo. Hosp.	Belding	56
	Ionia County Mem. Hosp.	Ionia	77
			133
Kent	Blodgett Memorial Hosp.	E. Grand Rapids	410
	Butterworth Hosp.	Grand Rapids	554
	Ferguson Droste Ferg. Hosp.	Grand Rapids	105
	Grand Rapids Osteo. Hosp.	Grand Rapids	265
	Kent Community Hosp.	Grand Rapids	520
	Kent Oaks Hospital	Grand Rapids	0
	Mary Free Bed Guild	Grand Rapids	80
	St. Mary	Grand Rapids	370
			2,304
Lake	None		
Mason	Memorial Hosp.-Mason Co.	Ludington	99
Mecosta	Community Hospital	Big Rapids	74
	Mecosta Memorial Hosp.	Stanwood	36
			110
Montcalm	Carson City Osteopathic	Carson City	114
	Kelsey Memorial Hosp.	Lakeview	94
	Sheridan Community Hosp.	Sheridan	42
	Tri County Community Hosp.	Edmore	40
	United Memorial Hosp.	Greenville	106
			396
Newaygo	Gerber Memorial Hosp.	Fremont	87
	Grant Community Hosp.	Grant	32
			119
Osceola	Reed City Hospital	Reed City	100

SOURCE: Michigan Department of Public Health, Bureau of Health Facilities. Directory of Hospitals, Nursing Care Facilities and Homes for the Aged. Lansing, 1980

EXHIBIT B-3

OPENING FALL ENROLLMENT IN INSTITUTIONS
OF HIGHER EDUCATION (1981)

College/Location	Full Time	Part Time	Total*
PUBLIC BACCALAUREATE INSTITUTIONS			
Ferris State College, Big Rapids	10,944	317	11,261
PUBLIC COMMUNITY AND JUNIOR COLLEGES			
Grand Rapids Junior College, Grand Rapids	5,022	3,887	8,909
Montcalm Community College, Sidney	756	467	1,223
West Shore Community College, Scottville	450	482	933
PRIVATE INSTITUTIONS			
Aquinas College, Grand Rapids	1,835	918	2,753
Calvin College, Grand Rapids	3,674	245	3,919
Calvin Theological Seminary, Grand Rapids	159	26	185
Davenport College of Business, Grand Rapids	2,725	1,540	4,265
Grace Bible College, Grand Rapids	195	46	241
Grand Rapids Baptist College and Seminary, Grand Rapids	912	220	1,132
Reformed Bible College, Grand Rapids	184	22	206

SOURCE: Michigan Statistical Abstract
*Sixteenth Edition 1981

public transportation is not available, or when physical limitations preclude the use of an automobile or other means of transportation to make these necessary trips, access to facilities and services may be very difficult and expensive. The objective is to provide basic service to the disadvantaged; it must, however, be determined at what cost.

The transportation disadvantaged as defined in the Interim Findings and Recommendations of the Governor's Interagency Transportation Coordinating Council, January, 1976, are those persons who are poor, young, old, handicapped, carless families, or a second wage-earner in a single-car family. Data on the transportation disadvantaged for all counties in Michigan were compiled for this report. The percent of transportation disadvantaged within the region ranged from a low of 22.4% in Kent County to a high of 51.6% in Lake County. In general, the higher percentages are found in the more rural, less densely populated areas of the region. The percentage of transportation disadvantage in the region (23.7%) is slightly higher than the comparable figure for the state (22.5%).

Economic Characteristics

In order to have a strong regional economy, an efficient transportation system should be developed which promotes the movement of materials, goods and people while avoiding the unnecessary disruption of social and eocnomic activity.

The economy of Region 8 is characterized by manufacturing and wholesale and retail trade. The primary source of employment in six of the nine counties is the manufacturing of durable goods. Wholesale and retail trade is the primary or secondary source of employment in seven of the nine counties. The dominance of a few manufacturing firms has proven to be a problem in some counties in recent years.

Tourism and recreation related services are important industries for the more rural, less densely populated counties of the region. Employment and travel for these industries are seasonal.

Commuting Patterns

An important socio-economic consideration in terms of providing efficient transportation facilities is the trip to work. Exhibit B-5 shows, for each county of the region, the number and percentage of the total number of working residents who worked outside the county in 1970. It also shows the number and percentage of people employed in the county, but residing in neighboring counties.

Kent County has the largest percentage (92.20%) of its work force working in the same county. Allegan County has the largest percentage (35.13%) of its employed residents commuting outside the county; most of whom travel to Ottawa or Kent County and, secondarily, to Kalamazoo County. As might be expected, the most densely populated county (Kent) has the lowest percentage (3.26%) of its residents commuting outside the county to work.

EXHIBIT B-4

NUMBER EMPLOYED IN SELECTED ACTIVITIES,
BY COUNTY/AREA, AS A PERCENTAGE OF TOTAL
COUNTY/AREA EMPLOYMENT IN THAT ACTIVITY

	Manufacturing				Selected Services		
County/Area	Durable Goods	Non-Durable Goods	Wholesale & Retail Trade	Finance, Insurance & Real Estate	Business & Repair	Personal	Professional & Related
Allegan	27.7%	13.9%	17.7%	2.0%	1.9%	3.3%	12.9%
Ionia	32.9	7.4	15.4	2.3	1.9	3.8	14.3
Kent	23.9	7.9	24.0	4.8	3.3	3.7	17.3
Lake	15.6	6.0	18.3	4.0	1.8	6.2	15.1
Mason	22.3	10.9	16.8	2.6	1.3	4.0	15.3
Mecosta	11.3	9.4	19.9	2.4	1.4	3.6	32.6
Montcalm	32.5	8.7	17.3	2.0	1.2	3.6	14.9
Newaygo	19.0	16.4	16.4	2.8	1.7	3.5	16.2
Osceola	20.3	18.5	16.3	2.7	1.2	3.6	15.7
Michigan	29.3	6.6	19.5	4.0	2.6	3.6	17.7

SOURCE: U.S. Department of Commerce. Bureau of the Census. 1970. 1980 Census material not available at this time.

EXHIBIT B-5

COMMUTING PATTERNS (1970)

COUNTY	NUMBER OF EMPLOYED COUNTY RESIDENTS	% WORKING IN COUNTY OF RESIDENCE	% WORKING OUTSIDE COUNTY OF RESIDENCE	NOT REPORTED	NUMBER OF EMPLOYED PERSONS WORKING IN COUNTY	% OF EMPLOYED PERSONS WORKING IN COUNTY BUT RESIDING OUTSIDE COUNTY
Allegan	23,224	50.75	35.13	14.12	14,126	16.56
Ionia	14,719	60.86	26.35	12.79	10,658	15.95
Kent	152,952	92.20	3.26	4.54	159,483	11.57
Lake	1,694	60.80	27.57	11.63	1,192	13.59
Mason	8,001	82.35	5.64	12.01	6,979	5.58
Mecosta	9,075	73.62	18.84	7.54	7,566	11.70
Montcalm	13,540	70.05	22.24	7.71	11,519	17.66
Newaygo	8,771	62.38	30.04	7.58	6,002	8.85
Osceola	4,875	75.98	18.71	5.31	4,566	18.88
Region 8	236,851	82.21	11.07	6.72	222,091	12.32

SOURCE: U.S. Department of Commerce, Bureau of the Census, 1970.

C. Environmental Features

The West Michigan Regional Planning Region is noted for its environmental diversity. Large tracts of forest land, abundant lakes and streams, sandy beaches and dunes, and highly productive orchard land are a few of the resources found thorughout the region. These resources have been a major factor in the social and economic development of the region.

This nine county region significantly contributes to Michigan's agricultural productivity. Due to Lake Michigan's modifying effect on weather and the varied soils, these counties are able to produce many fruit and vegetable crops that cannot be grown as successfuly elsewhere in the state. Allegan and Kent counties are particularly noteworthy due to the variety of specialty crops produced. This region is also active in livestock production and dairy products. These high-value intensive operations make a significant contributions to the state's economy as well.

Recreational boating harbors are at Ludington in Mason County and Saugatuck in Allegan County. These harbors attract people from all over the state who use the marinas and many other recreational facilities in the area, including the sand beaches and dunes. Ludington is also a commerical harbor and has car-ferry service to Manitowoc, Wisconsin. Hamlin Lake, a dune-impounded lake, is also a popular recreational area, although it does not have access to Lake Michigan.

Geologic features of environmental importance in the region include the sand dunes along Lake Michigan, morainic highlands, outwash plains and level lake bed formations. Some of the most unique resources of the region are related to the coastal zone.

Region 8 contains several watersheds and many rivers and streams. The White River, which originates in Newaygo County and the Rouge River which originates in Kent County have been designated as natural rivers under the Michigan Natural Rivers Program. Numerous species of fish and wildlife can be found in abundance in the habitat provided the region's many lakes and streams and their associated floodplains. Many wildlife species are also abundant in the region's many forest and wetlands. The Baldwin-Luther deeryard is a significant habitat area for the white-tailed deer. Region 8 also includes some wild turkey management areas.

There are remnants of native prairie vegetation that remain today primarily in Newaygo and Allegan Counties. There are three designated prairie preserves in this region while several others have been recommended for preservation. Other natural communities in Region 8 include wetlands, sand dunes, bogs, moist southern and northern forests and dry southern forests.

Each county in Region 8 has records of occurrences for threatened or endangered species within its boundaries. Allegan and Kent Counties currently have the highest number (50-99) of occurrences of threatened, endangered, or rare species and other natural features as determined from the Michigan Natural Features Inventory data base (1983). Ionia and Newaygo Counties have 20-49 occurrence records. While the remaining counties have between 1 and 19 occurrence records.

There are no federally listed plant species in Region 8. However, there are two species in Region 8 that are under review for federal listing with threatened status. They are Besseya bullii (Kitten Tails) and Cirsium Pitcheri (Pitcher's Thistle). Kitten Tails is a small herb in the snapdragon family that inhabits sandy prairies in Kent and Ionia Counties. Pitcher's Thistle is a thistle that is endemic to Michigan and grows only along the great lakes shoreline which in Region 8 is in Mason and Allegan Counties. This plant is threatened by increased shoreline development. Each county has between two and thirty-one special plant species of statewide significance. These numbers are not static and current county lists may be obtained from the DNR.

Several threatened and endangered animal species occur in this region. Of note are the following birds.

The Peregrine falcon, Falco peregrinus, is listed as endangered on the Federal list and could be found in the coastal zone areas of the state during migration.

The Kirtland's warbler, Dendroica kirtlandii, is listed as endangered on the Federal and State lists. Kirtland's warblers typically inhabit jack pine areas in the northern lower peninsula. This bird could also occur in the region during migration.

The Bald eagle, Haliaeetus leucocephalus, is considered threatened in Michigan on both State and Federal lists. Eagle nests are recorded in Newaygo and Mason Counties.

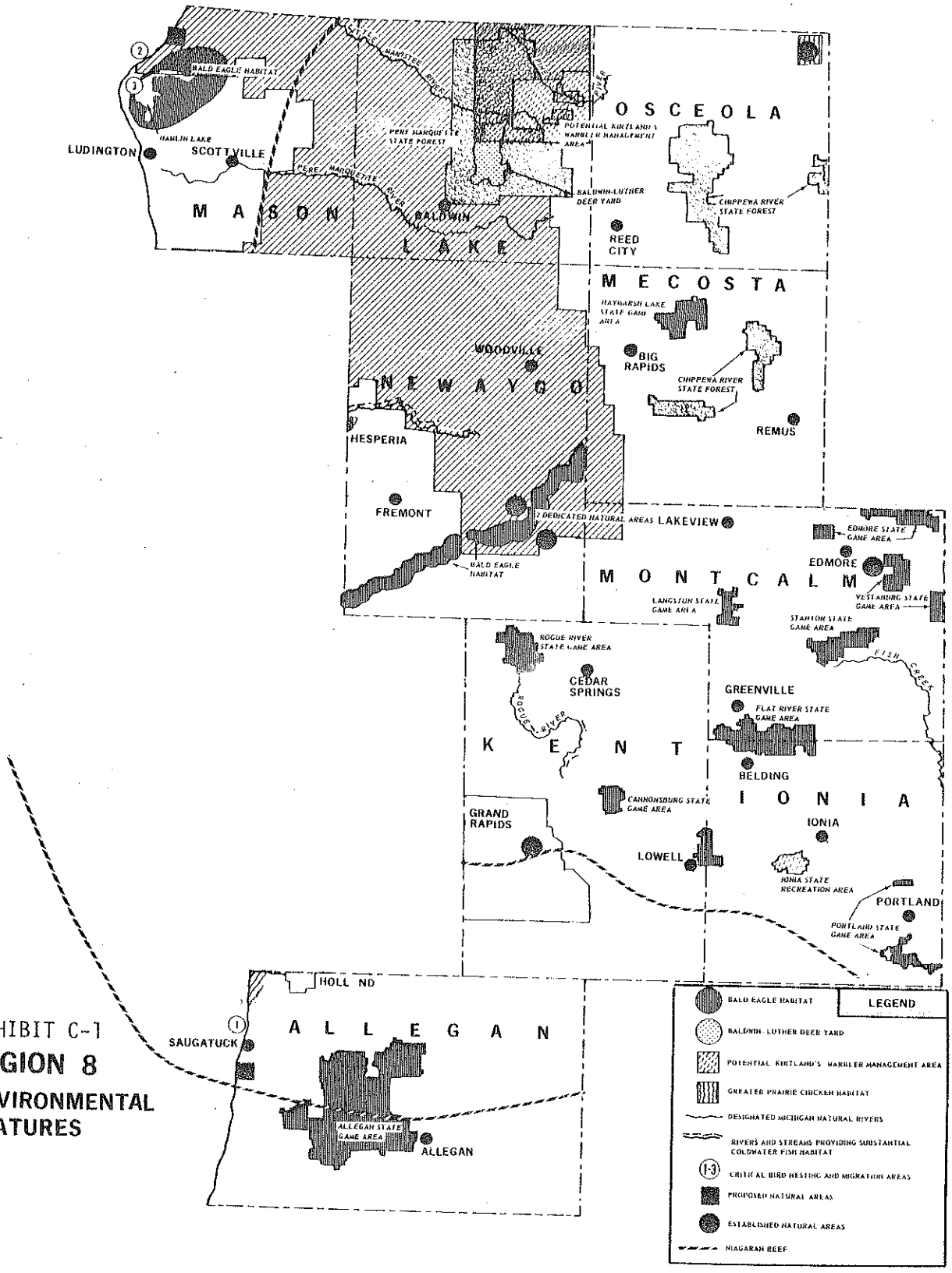


EXHIBIT C-1

REGION 8

ENVIRONMENTAL FEATURES

The Greater prairie chicken, Tympanuchus cupido, is considered threatened in Michigan. Prairie chickens maintain a precarious hold in a few isolated colonies in the northern lower peninsula. The Department of Natural Resources maintains a prairie chicken management area in Osceola County adjacent to the Michigan Nature Association's Prairie Chicken Nature Sanctuary. There are also eleven other animal species that are of statewide concern that occur in this region.

The forests, water, and wildlife resources of the region, combined with the large areas of public land in the northern portion, provide varied recreational opportunities. In addition to State and National forests, 4 State parks, numerous private and public campgrounds, State game areas and recreation areas are available for recreational use. Marinas and mooring facilities are available in the harbors of Allegan and Mason Counties for recreational boating. The beaches, dunes, and harbors attract people from all over the state to the region.

Environmental Impact Statements

Federal and State legislation require detailed environmental impact studies be prepared on many transportation projects. Because of the site-specific nature of highways and airports, meaningful assessment of the relationship between a transportation improvement and a region's natural and human environment can only be conducted at the project planning level, rather than the systems planning stage. Project alignments are generally chosen from a number of alternatives after serious comparison of the relative advantages of each alternate.

Among the important components of the environment which are given in-depth analysis at the project stage are wetlands, water quality, agriculture, aesthetics, vegetation, wildlife, noise impacts, and air quality. Another federal rule prohibits construction of any transportation project through a local, state, or regional park or recreation area unless no other prudent and feasible alternative exists. The State Game Areas, community parks, and public access sites to lakes and streams, fall into this category of protection.

The Department's process for conducting environmental studies encourage citizen input at key points. Local input has been extremely useful in the identification of impacts, and analysis of alternatives.

D. TRANSPORTATION GOALS AND OBJECTIVES

Goals and objectives reflect a variety of social values related to transportation system development and maintenance in the Region 8 area. Current and emerging federal and state policies assist in providing direction to local planning efforts by providing a general statement of positions for the nation and the state respectively. There are numerous policies affecting the Region 8 area which are derived from federal and state agencies. These policy statements affect the development of local policies, goals, and objectives. They are modified, where necessary, to meet and be consistent with local community desires, needs, values, issues, capacties, and constraints.

Local policies, goals, and objectives reflect the generally accepted thoughts and ideas of the community, with consideration of federal and state policy perspectives. However, they are more finely tuned to the needs and desires of the community and are, therefore, more specific and action oriented.

State of Michigan Goals

The State of Michigan has adopted general goals and objectives for aid to local communities, and for directing their actions in the provision of transportation services statewide. A major purpose of these goals and objectives is to ensure a level of mobility for Michigan citizens, visitors, and commerce that is reasonable in terms of the social, economic, and environmental values of the State.

These goals, by mode, are as follows:

Aviation Goals

1. Provide a reasonable level of aviation service to all Michigan citizens, visitors, and commerce.

2. Reduce the number and severity of accidents and promote the personal safety of air travelers.

3. Maximize economic benefits through aviation program investments.

4. Minimize environmental impacts in the planning, development, and operation of airport facilities.

Highway Goals

1. Develop a highway transportation system which will provide accessibility to existing and anticipated patterns of development throughout the state and effectively serve existing and projected travel demands.

2. Develop a functional statewide highway transportation system which will provide for appropriate types and levels of highway service commensurate with the needs of the various areas and activities in the state.

3. Alleviate traffic congestion and reduce travel time.

4. Provide for increased travel safety.

5. Provide a system which is both economical and efficient, satisfying all other objectives at the lowest possible cost.

6. Coordinate highway planning with land use planning for the development and preservation of resources.

7. Develop a system which is compatible with the aesthetic qualities of the landscape.

8. Develop a system which is integrated with other modes of transportation. Attention should be given to existing and planned terminal locations and their expected levels of activity.

Non-Motorized Goals:

1. Make bicycling safer through the provision of bicycle facilities and improvements to appropriate street and roads.

2. Promote the use of bicycle transportation for utilitarian purposes by improving bicycle accessibility and mobility.

3. Encourage the use of bicycle transportation for recreational purposes by developing long distance touring routes and shorter duration to and through aesthetically pleasing areas.

4. Provide recreational horseback riding opportunities in co-operation with other state and local agencies.

Port and Harbor Goals

1. Provide and maintain an efficient commercial harbor system to meet the needs of Michigan's economic structure.

2. Promote fiscal integrity, stability, and efficiency within the commercial harbor system.

3. Minimize environmental and social impacts resulting from port improvements or expansion.

4. Improve safety and pollution controls in harbor areas.

Public Transportation Goals:

1. Provide a reasonable level of public transportation investments.

2. Maximize economic benefits through public transportation investments.

3. Maximize positive environmental impacts achievable through the provision of public transportation services.

Railroad Goals:

1. Provide and maintain an adequate efficient railroad network within Michigan and maintain links to the regional and national networks.

2. Promote present and future financial viability, stability, and efficiency within the Michigan railroad system.

3. Minimize adverse social and economic impacts of changes in railroad service.

4. Promote and maintain safe railroad freight operations consistent with public need and carrier capability.

Transportation Planning
Goals and Policies
for Region 8

GOAL

To accommodate the demand for travel when and where it occurs.

POLICIES

1. Provide transportation capacity that is compatible with the distribution of population and activity centers.

2. Achieve a balance between available capacity and travel needs along routes experiencing peak traffic problems.

3. Maximize traffic flow along major travel corridors.

GOAL

To develop a transportation system that offers a range of services, and which is compatible with the social and economic needs of local residents.

POLICIES

1. Provide adequate east-west connectors between major activity centers.

2. Insure that both necessary and reasonable levels of transportation service are available to all user groups.

3. Seek solutions to the severe problems of deteriorated county bridges.

GOAL

To serve the needs of social and economic growth through a diverse, yet economically competitive system of transportation services.

POLICIES

1. Provide essential flexibility in commercial product movement.
2. Achieve scale economies and service maximizations wherever possible.
3. Take advantage of cost-effective intermodal potentials.
4. Make more effective use of port, ferry, and related facilities.

GOAL

To coordinate the development of transportation services with environmental requirements and responsible resource use.

POLICIES

1. Minimize encroachment on the Region's valuable environmental resources.
2. Utilize energy conservation as a major factor affecting transportation development decisions.
3. Implement measures which will reduce transportation emissions and noise pollution problems.

GOAL

To provide safe conditions for travel between population and activity centers via every feasible mode.

POLICIES

1. Provide a transportation system which meets modern day standards.

2. Improve the condition of modal interfaces.

3. Protect the functional integrity of transportation facilities.

Summarized on the following pages are the concerns expressed by the citizens and public agencies in Region 8. When meetings were scheduled, the Department asked for input from the general public concerning the direction transportation planning should take in Region 8.

TRANSPORTATION ISSUES OF REGION 8

1983

HIGHWAYS:

* Financing improvements for deteriorated conditions on roads and bridges.
* The Southbelt Corridor (M-10) near Grand Rapids.
* US-131 improvements north of Grand Rapids.
* US-31/US-10 near Scottville.
* M-20 alignment from Remus to White Cloud.
* Tourist travel on M-37.
* Penoyer Creek M-37/82 bridge replacement in Newaygo County.
* Lack of adequate east/west facilities across Allegan County.

PUBLIC TRANSPORTATION:

* Rural transit service to transportation disadvantaged.
* Essential transit service to elderly and handicapped.
* Deregulation of intercity bus carriers.

AVIATION:

* Essential passenger service to low demand airports.
* Instrument landing capability at airports.
* Use of Miller Airport in Reed City.

RAILROADS:

* Long term commitments to carriers operating region-wide.
* Continuation of subsidized rail service from Comstock Park to the Straits of Mackinaw.
* "Market swap" of rail service to Ionia and Greenville.
* The long term viability of Conrail.
* Amtrak service to Grand Rapids.

WATER TRANSPORTATION:

* Adequate facilities for water borne freight and passenger service across Lake Michigan.

* Long term cross-lake ferry service from Ludington.

NON-MOTORIZED:

* Adequate trails and right-of-ways for all modes of non-motorized travel.

E. EXISTING TRANSPORTATION SERVICES

The following sections discuss the various transportation modes. These modes include:

Aviation

Commercial Water Transportation

Highways

Non-Motorized Transportation

Public Transportation

Railroads

In these sections the discussion centers around the general condition of each system and how it complements other systems.

Discussion of problems expected in the future for each mode of transportation will be highlighted in the conclusion of this report.

F. AVIATION

The Department's role in air transportation is to help insure an orderly and timely development of the State's aviation system. The State of Michigan, however, does not own or operate airports; private interests or local (cities and counties) governments do. The State can only make recommendations based on a logical, systematic process. To facilitate the recommendation process, the Department of Transportation, in 1974, adopted a Michigan Airport System Plan (MASP). A complete update of this plan or MASP with the addition of a detailed analysis of regularly scheduled air service is currently being considered.

A major purpose of the plan or MASP is to show various communities their projected level of aviation demand for future time periods. This helps them to assess their needs associated with airport development. Potential community and environmental impacts are then addressed in more detail as individual airport master plans are prepared or updated.

The MASP includes the 17 existing airports and recommends the development of an additional four new airports in Region 8. In general, the basic measures used to determine the need for these airports were:

1. To provide aviation capacity sufficient to accommodate forecasted levels of aviation activity in a given geographical area; and,
2. To provide a reasonable geographic distribution of airports throughout the State.

Exhibits F-1 and F-2 show the recommended airport system for Region 8 as contained in the MASP. Air carrier airports are those which offer regularly scheduled airline service. For purposes of simplification in this report, the remaining airports are classified into two general categories based upon runway length. Utility Airports are general aviation airports with runways of 2000 to 4700 feet. Transport Airports are also general aviation airports, but with a minimum runway length of 4700 feet.

AIR CARRIER SYSTEM

At present, Kent County International Airport in Grand Rapids is the only air carrier airport in Region 8. It is served by United, Republic, Freedom, US Air, and Simmons. Two additonal carriers, Piedmont and Air Lincoln, have announced plans to begin service during 1982.

As of April 1982,the five current carriers furnished 30 daily departures, with approximately 3100 available seats to 12 different cities nonstop. Of the 12 cities served non-stop, six are classified as "large" hubs or gateways. These are Chicago, Cleveland, Denver, Detroit, Pittsburgh,and Tampa. From these points, connections can be made to anywhere in the international air transportation network. The current changing air service environment has been influenced by the energy situation and the Airline Deregulation Act of 1978. Skyrocketing fuel costs have caused steep fare increases, which in turn have discouraged discretionary travel. However, deregulation has allowed airlines more freedom to adjust their route structures for better fuel efficiency.

Examples of this phenomenon are United Airlines non-stop flights to Denver and Tampa, and cessation of any non-stop flights to Chicago. While some have viewed the cessation of United's non-stop flights to Chicago with mixed emotions, Republic Airlines has increased their Chicago service from Kent County International and mitigated this problem.

Kent County International Airport's relative immunity to decreasing air travel demand stems from two basic reasons. First, Grand Rapids' diverse economic base is not as heavily dominated by the depressed automotive industry as other parts of the State (Detroit and Flint for example). Second, Kent County International is rapidly becoming a "regional" airport.

This relative immunity to the decreasing demand facing the airline industry is demonstrated with passenger statistics. (See Exhibit F-3). Between fiscal years 1979 and 1980, total passenger counts (statewide) decreased marginally (1.4%) while those at Kent County increased 8.6%. Over this same period, Kent County's percentage of Michigan's state wide total air passengers increased from 6.4 to 7.1 percent. Of the 22 air carrier airports in the State, Kent County is second only to Detroit Metro, with more than twice the passengers as the next busiest facility.

Kent County International Airport possesses excellent facilities to handle the larger commercial aircraft. The primary runway is 10,000 feet long, with crosswind runways of 3900 and 3400 feet. The airport is capable of servicing the 727, 737, and DC-9 jets currently operated by United and Republic. In addition, the jumbo jets (747, DC-10, and L-1011) could land at Kent County.

The two crosswind runways help serve the many smaller general aviation type aircraft, including business jets and single and twin engined propeller craft. The instrument approach system and radio facilities allow all weather operations by both commercial and general aviation aircraft.

The steadily increasing level of passengers at Kent County and the forecasts of ever increasing passenger loads in the future, necessitate planning for future expansion and improvement of existing facilities. Additionally, the trend of the commercial aviation industry toward the use of larger jet aircraft will add to the need for improved ground facilities. In preparation for the future, Kent County International has begun updating their Airport Master Plan, including forecasts of future activity, needed facilities, and methods of financing, all subject to cost benefit analysis.

GENERAL AVIATION SYSTEM

General aviation airports provide a basic level of air service for local communities. These airports provide access to the entire air transportation system. In Region 8 these airports are accommodating approximately 644 locally registered aircraft (see Exhibits F-3 and F-4). Typical primary runway lengths vary from 2200 feet (turf) at Wayland Municipal, to the 5800 foot paved runway at Fremont Municipal. Business jets and air cargo aircraft are able to use the airports with the longer runways, thereby encouraging economic development.

FUNDING SOURCES

Although the MASP is a product of local, state, and federal planning efforts, it is the decision of the local community or airport authority to initiate airport development projects. The present financial sources available include:

- Federal funds, through the Airport Development Aid Program (ADAP) and FAA Facility and Equipment Funds.
- State Funds, through Michigan Aeronautics Commission revenues from a tax imposed upon the sale of aviation fuel.
- Local funds, available primarily through long-term borrowing.

Exhibit F-5 shows some of the airport development projects that have been requested and/or programmed for Region 8.

BENEFITS OF THE AVIATION SYSTEM

The airport improvement projects plus other MASP recommendations produce a wide range of benefits to a broad spectrum of Michigan residents and visitors. Benefits that can accrue are summarized as follows:

USERS:
- Reduced travel time and costs for air travelers and shippers;
- Expanded recreational opportunities due to increased accessibility of recreational areas and wider opportunities for pleasure flying;

AIRLINES AND AIRPORT AUTHORITIES:
- Improved safety and convenience of aircraft operations;

COMMUNITIES:
- Enhanced business and industrial growth in areas served both by air carrier and general aviation airports;
- Increased employment opportunities and tax base (from business and industrial growth); and
- Improved emergency access to communities for medical supply and evacuation.

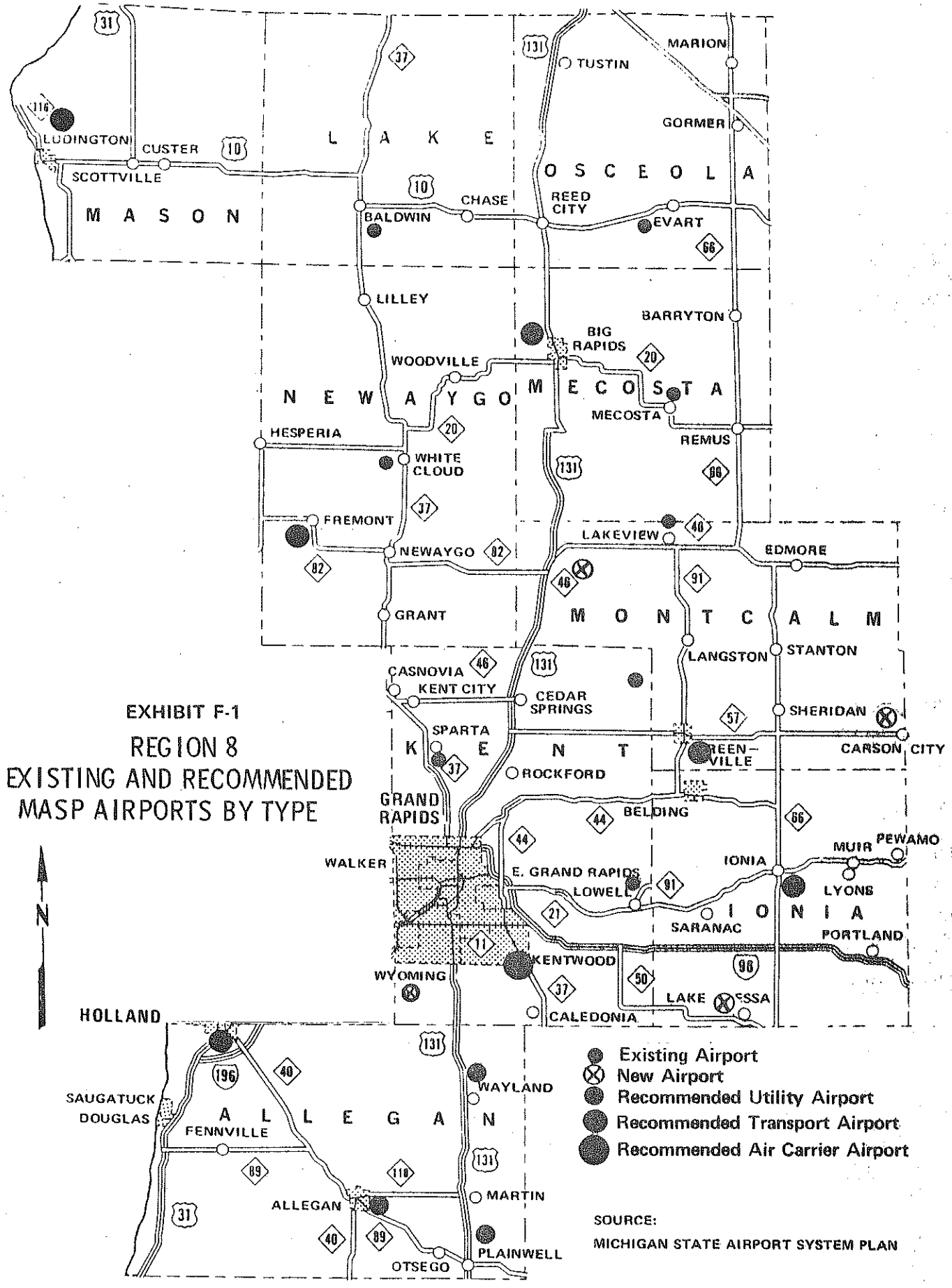


EXHIBIT F-1

REGION 8
EXISTING AND RECOMMENDED MASP AIRPORTS BY TYPE

SOURCE:
MICHIGAN STATE AIRPORT SYSTEM PLAN

EXHIBIT F-2

AIRPORT CLASSIFICATION

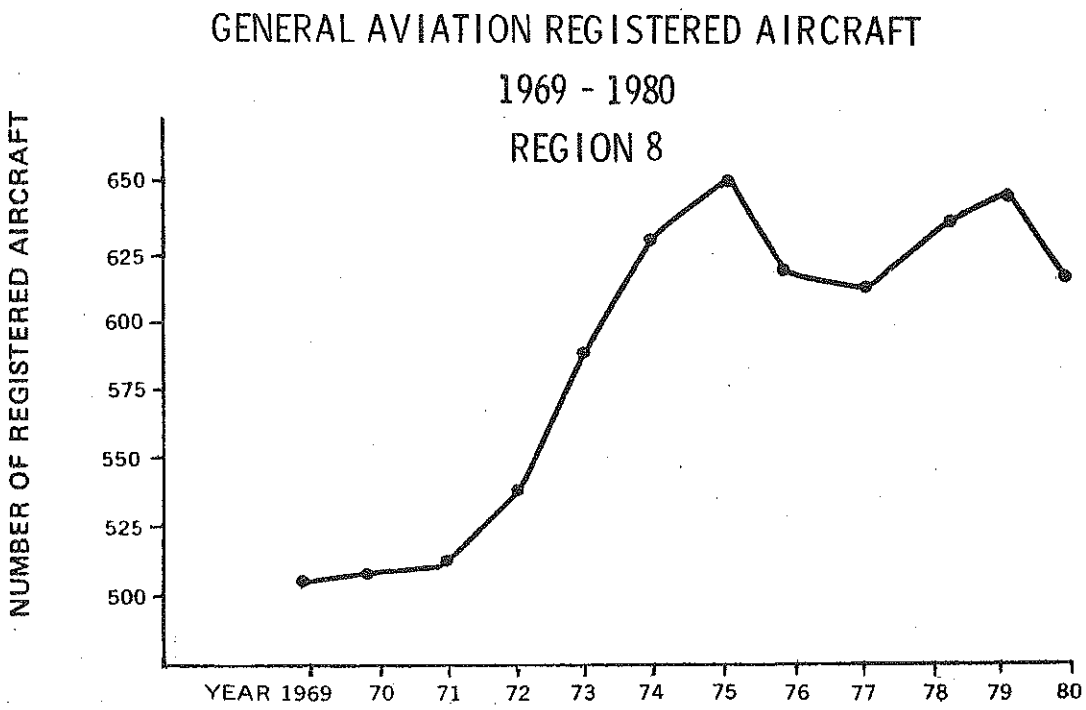
REGION 8

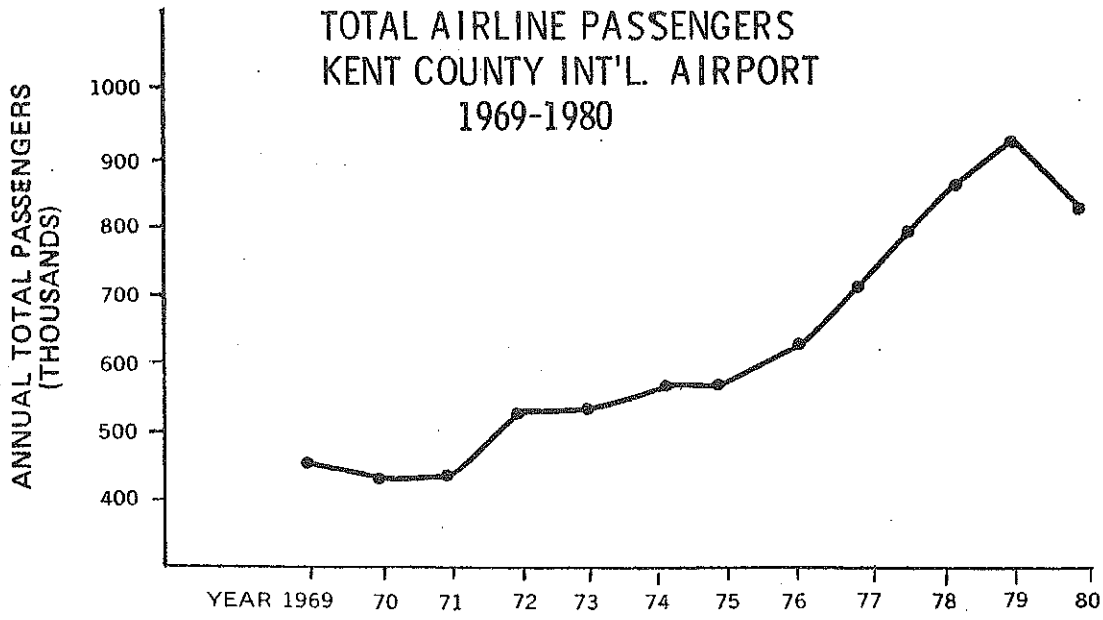
Associated City	Name	Present Classification	Recommended Classification
Allegan	Padgham Field	Utility	Utility[1/]
Baldwin	Municipal	Utility	Utility
Big Rapids	Roben Hood	Utility	Transport
Evart	Municipal	Utility	Utility
Fremont	Municipal	Transport	Transport
Grand Rapids	Kent Co. Int'l	Air Carrier	Air Carrier[2/]
Greenville	Municipal	Utility	Transport
Holland	Tulip City	Utility	Transport[1/]
Ionia	Ionia County	Utility	Transport
Lakeview	Lakeview	Utility	Utility
Lowell	Lowell City	Utility	Utility
Ludington	Mason County	Transport	Transport
Plainwell	Otsego-Plainwell	Utility	Utilityy
Sparta	Sparta	Utility	Utility[1/]
Wayland	Municipal	Utility	Utility
White Cloud	White Cloud	Utility	Utility
Ionia Co.-West	New	--	Utility
Kent Co.-South	New	--	Utility
Mecosta	Morton Township	Utility	Utility
Montcalm Co.-Southeast	New	--	Utility
Montcalm Co.-West	New	--	Utility

Notes: 1) Master Plan Study in progress.
2) Master Plan Update completed.

Sources: 1) Michigan Airport System Plan (MASP)
2) National Airport System Plan (NASP)
3) Michigan Airport Directory

EXHIBIT F-3





SOURCE: MDOT, BTP, MPD, APS

EXHIBIT F-4

GENERAL AVIATION

AIRCRAFT REGISTRATIONS

REGION 8 1969-1980

County	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	% Change 1969-80
Allegan	85	79	77	94	110	110	100	92	96	98	95	99	+16.5%
Ionia	29	34	44	42	42	40	47	41	47	44	50	50	+72.4%
Kent	236	241	233	242	252	292	297	289	290	316	324	257	+ 8.9%
Lake	0	0	0	1	1	0	0	0	3	2	2	0	-
Mason	20	23	24	25	30	27	29	28	23	22	25	24	+20.0%
Mecosta	17	16	15	15	21	24	23	20	22	21	22	27	+58.8%
Montcalm	69	69	80	80	77	87	93	83	74	69	75	78	+13.0%
Newaygo	25	29	28	29	47	44	50	52	49	55	45	50	+100.0%
Osceola	22	16	8	7	6	5	7	10	7	5	6	6	-72.7%
Region 8 TOTALS	503	507	509	535	586	629	656	615	611	632	644	591	+17.5%
Michigan TOTALS	5333	5504	5682	5831	6074	6276	6275	6274	6361	6513	6600	6770	+26.9%

Source: MDOT, BTP, Aviation Planning Section

EXHIBIT F-5

PROPOSED 5 - YEAR DEVELOPMENT PROGRAM

MICHIGAN AIRPORT PROGRAM

Airport	Project	Federal Funds*	State Funds*	Local Funds*	Total Funds*
Kent County International	Expand Auto Parking, Modify Terminal and Entrance Road	$4.00	$0.25	$0.75	$5.00
	Construct General Aviation Taxiway and Taxi Streets.	$1.60	$0.20	$0.20	$2.00
Ionia	Rehabilitate Taxiways	$0.11	$0.01	$0.01	$0.13
Sparta	Extend and Rehabilitate Primary Runway to 3900' x 75', Construct Administration building.	----	$0.25	$0.25	$0.50

Note: All funding figures are estimates and in millions of 1980 dollars.

Source: MDOT, Bureau of Aeronautics

G. WATER TRANSPORTATION

Background

Port development in the State of Michigan is associated with two types of waterborne activity - recreation and commerce. The responsibility within state government for recreational harbors is vested primarily in the Michigan Waterways Commission of the Department of Natural Resources. Planning responsibility for commercial harbors lies with the Department of Transportation.

Two counties in Region 8, Allegan and Mason, are located along the shore of Lake Michigan. The cities of Saugatuck and Douglas are located near the mouth of the Kalamazoo River in Allegan County and their harbor facilities are recreational. The Ludington harbor is located in Mason County and serves both recreational and commercial traffic. A new marina was constructed during 1980 which will probably result in an increased level of recreational activity.

Commercial activity at the Ludington harbor is dominated by the carferry operations of the Chessie System railroad. During recent years, service has been provided with three ferries carrying rail cars, highway vehicles, and passengers between Ludington and the Wisconsin ports of Milwaukee, Manitowoc, and Kewaunee. Additional commerce has included primarily nonmetallic minerals such as limestone, clay, and coal. Exhibit G-1 identifies the commodities and tonnages handled by the port during 1979. The figures include cargoes carried in rail cars on the ferries.

Major Issues

The most significant issue facing Ludington is the status of the car-ferry operation. Service was discontinued to Milwaukee in 1980 and to Manitowoc in 1982. Additional cutbacks are anticipated and future service could be radically different from the past. The rail section of this report further identifies the problems associated with the railroad carferries.

Exhibit G-2 presents the historical levels of waterborne commerce at Ludington during the past 20 years. During the last decade, total tonnage declined from approximately 4 million tons annually to about 2 1/2 million tons. The volume will probably continue to decline unless major changes in the carferry system are implemented.

Maintenance of the navigation channels is another issue at Ludington. The channels must be periodically dredged in order to permit commercial traffic in the harbor. Potential problems concerning channel maintenance include continued economic justification for dredging and environmental consequences of dredged material disposal.

With the exception of the uncertain future for carferry operations, the port is expected to continue handling bulk material at or near present levels in the near future. Long range changes may occur, either postively or negatively, based upon changing economic conditions and vessel technologies.

EXHIBIT G-1

WATERBORNE COMMERCE AT LUDINGTON

1979

Commodity Type	Tonnage
Farm Products	12,426
Metallic Ores	2,241
Coal	48,367
Non-metallic Minerals	1,473,074
Food and Kindred Products	177,855
Lumber and Wood Products	97,622
Furniture and Fixtures	298
Pulp, Paper, and Allied Products	255,572
Chemicals and Allied Products	440,234
Rubber and Misc. Plastic Products	22,952
Leather and Leather Products	2,543
Stone, Clay, Glass, and Concrete Products	13,025
Primary Metal Products	52,026
Fabricated Metal Products	1,919
Machinery, Except Electrical	17,147
Transportation Equipment	27,299
Miscellaneous Manufactured Products	104,698
Waste and Scrap Materials	18,590
Total	2,764,888

EXHIBIT G-2

Historical Patterns of Waterborne Commerce

At Ludington 1959-1979

Year	Tonnage
1959	3,838,473
1960	3,892,308
1961	3,588,858
1962	3,686,435
1963	3,843,407
1964	3,904,089
1965	3,978,708
1966	3,969,311
1967	3,836,254
1968	3,639,093
1969	3,664,748
1970	4,643,609
1971	4,258,442
1972	3,368,015
1973	2,557,086
1974	2,178,835
1975	2,123,507
1976	2,338,774
1977	2,448,983
1978	2,397,920
1979	2,764,888
Mean Annual	3,377,225

H. HIGHWAYS

Department's Function

The Department of Transportation's foremost function is to provide a reasonable level of mobility for people and goods through the provision of adequate transportation services. A significant part of these services is the State Trunkline System.

The Constitution and Statutes of the State of Michigan charge the Department with the responsibility for planning, designing and maintaining highway facilities. Construction, although supervised by the Department, is carried out by private contractors. This system of state highways now totals 9,476 miles of which 931 miles are located in Region 8.

The Purpose of Highways

Public highways in Michigan have two basic service functions:

1. Accommodate the movement of through traffic.
2. Provide access to property.

Freeways and major highways serve the first function and local rural roads and city streets primarily serve the latter. Between these two extremes are a substantial number of highways, roads, and streets that serve a dual function.

A major highway whose primary function is to accommodate long distance traffic will often be designed with a limited number of access opportunities and with safety features commensurate with higher traveling speeds. Local residential streets and county roads, on the other

hand, are designed with numerous access points for adjacent properties and often incorporate numerous curves and stops to discourage high speeds and through traffic.

Department's Approach

On November 16, 1977, Michigan's State Highway Commission revised its approach to highway development. The significance of this revision was to shift emphasis from new highway route development to management of the existing system. Reconstruction and rehabilitation of existing highways has become the top priority. This does not mean, however, that expansion or relocation of existing highways will not be purused. Where monitoring of the highway system clearly indicated a need, and where a detailed planning process defines that need, relocations of existing highways or addition of new highways may be undertaken.

Highway Classification

In order to properly plan and develop a state highway system, the Department has established a functional classification system. Under this system, the primary function of the state's highways are identified by their grouping into four classifications: interstate arterials, other statewide arterials, regional arterials, and local arterials.

One of the aids to highway classification is a system of ranking cities or places which these highways connect. The socio-economic data evaluated for all places produces an ascending scale of classes representing marked differences in importance of attractors of traffic.

In addition to the identification of population centers, there are other factors considered, such as areas of major trip attraction or generation, travel desires, trip length and traffic volumes which together define a hierarchy of facilities which reflects their importance in handling of statewide, regional, and local traffic.

HIGHWAY DEFICIENCIES

It is imperative that problem areas be carefully defined and analyzed to determine the degree of improvement necessary. Many miles of the State's system are considered deficient for various reasons. Some of these deficient sections can be remedied with minimal improvements involving only the existing roadway. But a few areas exist where the problems go beyond the remedial benefits of minor reconstruction and will require additional laneage. Whether these new lanes should be added to the existing facility or built on a new location is the concern of more detailed, project level, studies. The first step, and the concern of this study, is to determine where the major problem areas are located, and the magnitude they represent.

The method currently used by the Department to identify highway deficiencies is a sufficiency rating system. These ratings are used to evaluate individual segments of the entire highway system. This information indicates which sections will require attention within a given time period and their relative urgency.

The sufficieny rating (evaluation score) is comprised of four categories: surface, base, safety, and capacity. Each secton of highway is evaluated in terms of these categories and given a score, or rating, based upon its adequacy, or sufficiency. If a highway segment is rated

below a predetermined level, it is considered critically deficient in that category. A segment of roadway can be rated critically deficient in one or more of the four categories.

The surface rating represents the adequacy of the surface and shoulders or curbs. This category is perhaps the most noticeable to the motorists because of its visibility. The year of construction or improvement, width and surface type, along with the condition and estimated surface life are also included in this category.

The base rating represents the adequacy of everything under the surface to support the surface. It considers the average base and soil conditions, taking into account the average drainage conditions.

The safety rating calls attention to excessive or extraordinary conditions creating potential hazards. Existence of fixed objects (trees, utility poles, sign posts, abutments, etc.) in proximity to the pavement edge constitutes such a condition. Accident frequency, type, and severity are also considered in this evaluation.

The capacity rating represents the ability of a section of roadway to carry existing volumes of traffic. Several factors used to determine this rating include: pratical hourly capacity, sight restriction, lane width, amount of commercial traffic, and peak hour volumes.

The accompanying exhibits indicate the sufficiency evaluation of the highways in the region. These evaluations are based upon existing conditions. It is intended that these exhibits will help to determine

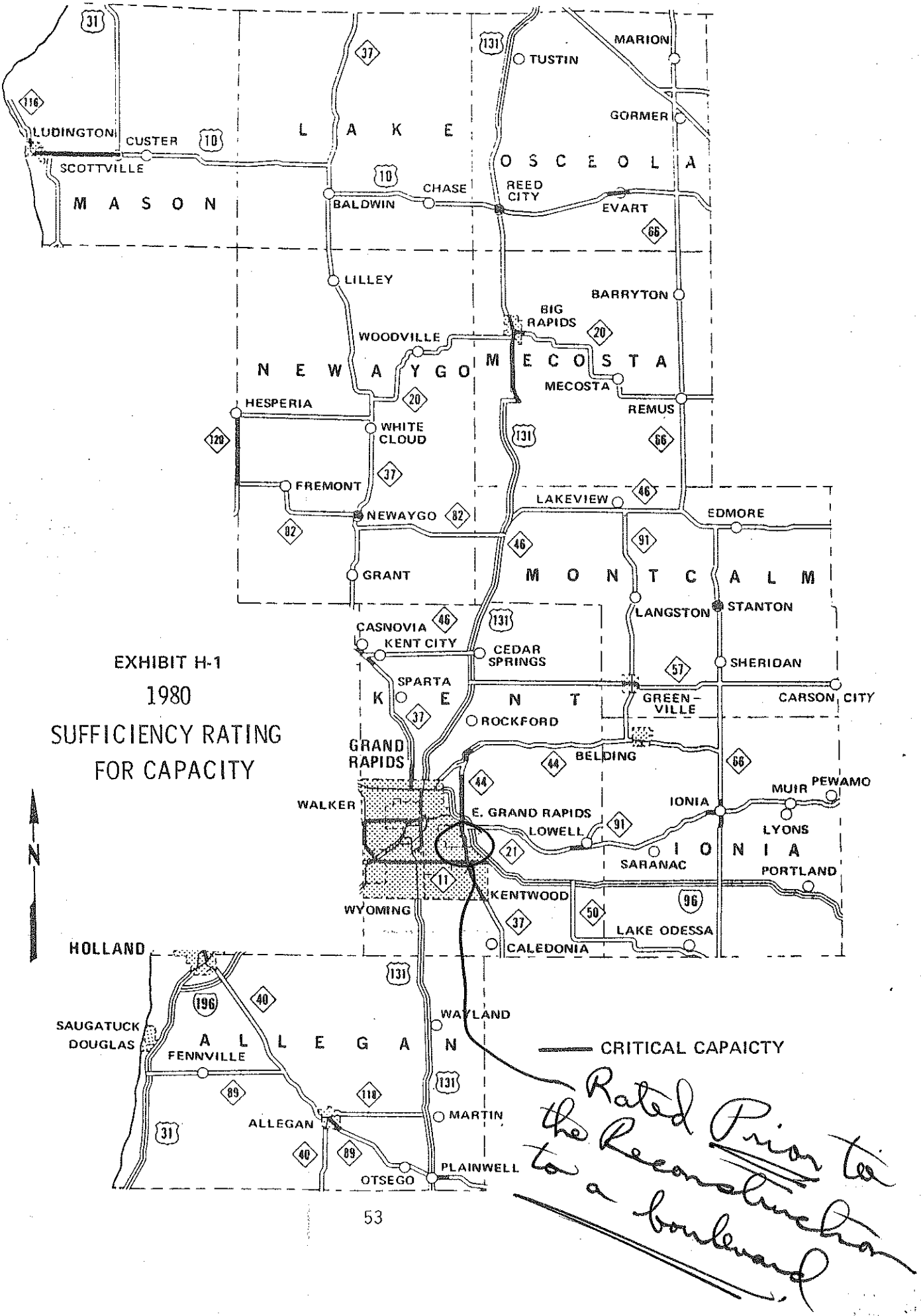


EXHIBIT H-1
1980
SUFFICIENCY RATING
FOR CAPACITY
N
CRITICAL CAPAICTY
Rated Prior to the Reconstruction to a boulevard
MASON
LAKE
OSCEOLA
NEWAYGO
MECOSTA
MONTCALM
KENT
IONIA
ALLEGAN
LUDINGTON
SCOTTVILLE
CUSTER
BALDWIN
CHASE
TUSTIN
MARION
REED CITY
GORMER
EVART
LILLEY
BARRYTON
BIG RAPIDS
WOODVILLE
MECOSTA
REMUS
HESPERIA
WHITE CLOUD
FREMONT
NEWAYGO
LAKEVIEW
EDMORE
GRANT
LANGSTON
STANTON
CASNOVIA
KENT CITY
CEDAR SPRINGS
SHERIDAN
SPARTA
GREEN-VILLE
CARSON CITY
ROCKFORD
GRAND RAPIDS
BELDING
WALKER
E. GRAND RAPIDS
LOWELL
IONIA
MUIR
PEWAMO
LYONS
SARANAC
PORTLAND
KENTWOOD
WYOMING
LAKE ODESSA
CALEDONIA
HOLLAND
SAUGATUCK
DOUGLAS
FENNVILLE
WAYLAND
ALLEGAN
MARTIN
OTSEGO
PLAINWELL

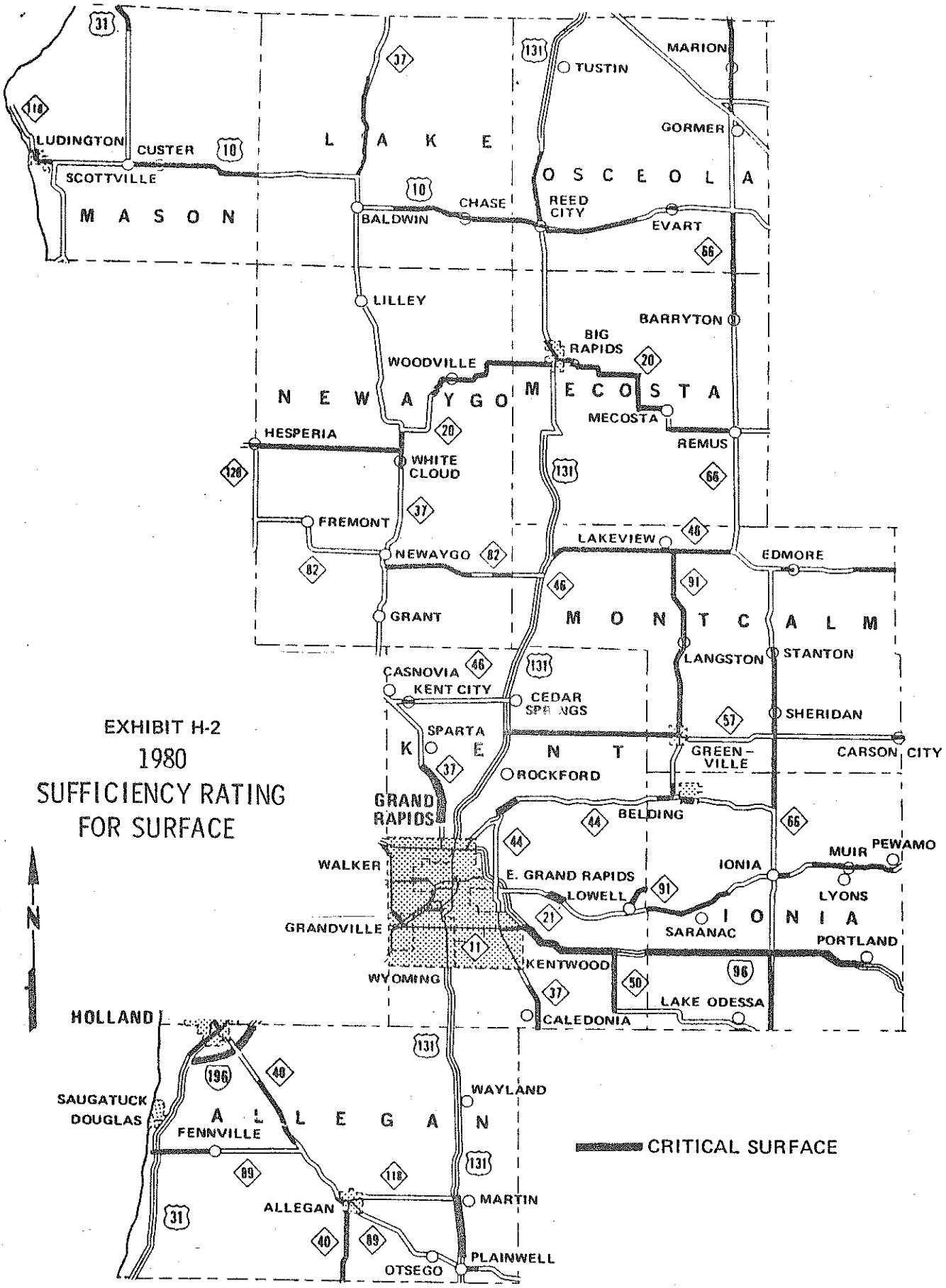


EXHIBIT H-2
1980
SUFFICIENCY RATING
FOR SURFACE
N
CRITICAL SURFACE
LUDINGTON
CUSTER
SCOTTVILLE
MASON
LAKE
BALDWIN
CHASE
TUSTIN
MARION
GORMER
OSCEOLA
REED CITY
EVART
LILLEY
BARRYTON
BIG RAPIDS
WOODVILLE
NEWAYGO
MECOSTA
HESPERIA
WHITE CLOUD
REMUS
FREMONT
LAKEVIEW
EDMORE
GRANT
MONTCALM
LANGSTON
STANTON
CASNOVIA
KENT CITY
CEDAR SPRINGS
SHERIDAN
SPARTA
KENT
GREEN-VILLE
CARSON CITY
ROCKFORD
GRAND RAPIDS
BELDING
WALKER
E. GRAND RAPIDS
IONIA
MUIR
PEWAMO
LOWELL
LYONS
GRANDVILLE
SARANAC
PORTLAND
KENTWOOD
WYOMING
LAKE ODESSA
CALEDONIA
HOLLAND
SAUGATUCK
DOUGLAS
ALLEGAN
FENNVILLE
WAYLAND
MARTIN
PLAINWELL
OTSEGO

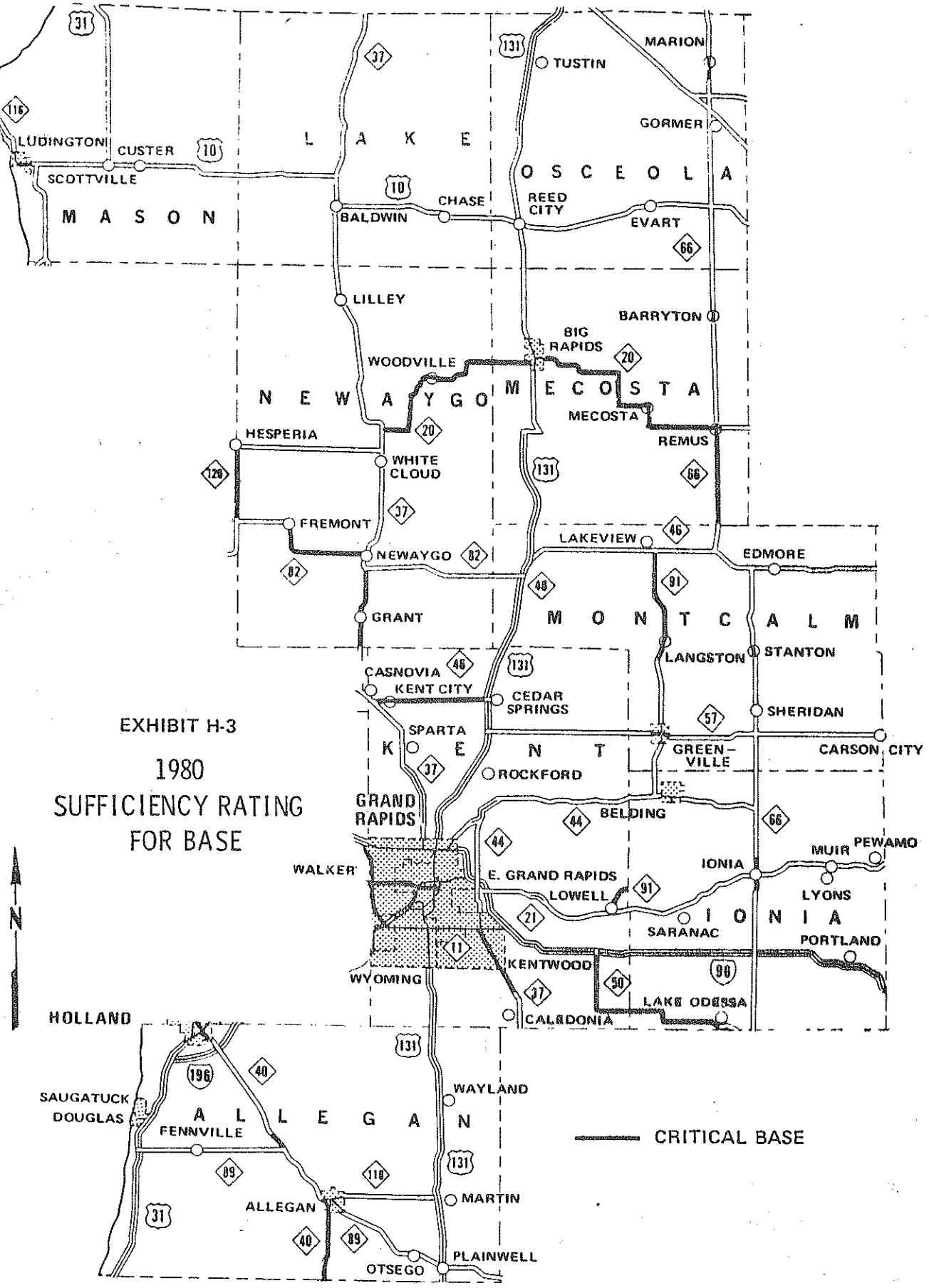


EXHIBIT H-3
1980
SUFFICIENCY RATING
FOR BASE
N
CRITICAL BASE
LUDINGTON
CUSTER
SCOTTVILLE
MASON
LAKE
TUSTIN
MARION
GORMER
OSCEOLA
BALDWIN
CHASE
REED CITY
EVART
LILLEY
BARRYTON
BIG RAPIDS
WOODVILLE
NEWAYGO
MECOSTA
HESPERIA
WHITE CLOUD
REMUS
FREMONT
LAKEVIEW
EDMORE
GRANT
MONTCALM
LANGSTON
STANTON
CASNOVIA
KENT CITY
CEDAR SPRINGS
SHERIDAN
SPARTA
KENT
GREEN-VILLE
CARSON CITY
ROCKFORD
GRAND RAPIDS
BELDING
MUIR
PEWAMO
IONIA
WALKER
E. GRAND RAPIDS
LOWELL
LYONS
SARANAC
PORTLAND
KENTWOOD
WYOMING
LAKE ODESSA
CALEDONIA
HOLLAND
SAUGATUCK
DOUGLAS
FENNVILLE
ALLEGAN
WAYLAND
MARTIN
PLAINWELL
OTSEGO

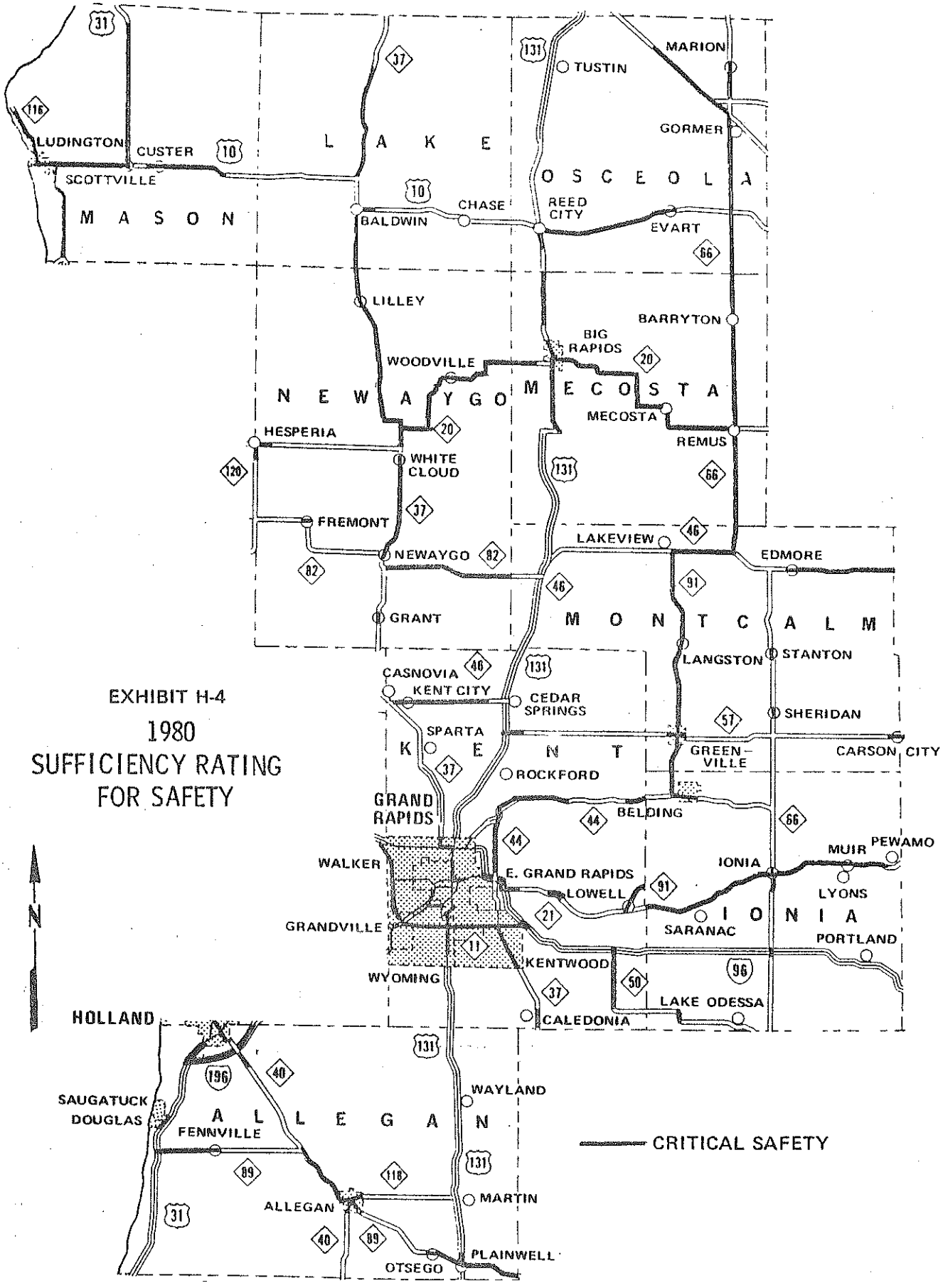


EXHIBIT H-4
1980
SUFFICIENCY RATING
FOR SAFETY
N
CRITICAL SAFETY
MASON
LAKE
OSCEOLA
NEWAYGO
MECOSTA
MONTCALM
KENT
IONIA
ALLEGAN
LUDINGTON
CUSTER
SCOTTVILLE
BALDWIN
CHASE
TUSTIN
REED CITY
MARION
GORMER
EVART
LILLEY
BARRYTON
BIG RAPIDS
WOODVILLE
MECOSTA
REMUS
HESPERIA
WHITE CLOUD
FREMONT
NEWAYGO
LAKEVIEW
EDMORE
GRANT
LANGSTON
STANTON
CASNOVIA
KENT CITY
CEDAR SPRINGS
SHERIDAN
SPARTA
ROCKFORD
GREEN-VILLE
CARSON CITY
GRAND RAPIDS
BELDING
WALKER
E. GRAND RAPIDS
LOWELL
IONIA
MUIR
PEWAMO
LYONS
GRANDVILLE
SARANAC
PORTLAND
KENTWOOD
WYOMING
LAKE ODESSA
CALEDONIA
HOLLAND
SAUGATUCK
DOUGLAS
FENNVILLE
WAYLAND
ALLEGAN
MARTIN
PLAINWELL
OTSEGO

where problems exist; where minor improvements are needed; and where more extensive improvements are required to eliminate critical deficiencies.

To accomplish this separation of major and minor improvement types, an attempt has been made to separate capacity deficient segments from all others. The main reason for this distinction is that capacity deficient highways sometimes require a major transportation improvement. Major improvements usually become controversial issues when the anticipated benefits and impacts are evaluated. Thus, it becomes important to identify these areas early in the planning process so that these issues can be resolved.

Commuter Parking Program

The concept of a rural carpool parking lot program came under consideration late in 1973 when the oil embargo caused increasing concern with energy conservation. The onset of the energy crisis led to the development of a number of ride sharing programs such as "park and ride" which provides for automobile parking at commuter transit stops, and the State Employees Ride Sharing Program. The main thrust behind creation of the program was fuel conservation. Fulfillment of this single purpose would largely justify the program. However, reduced vehicle usage, in addition to fuel conservation, produces a broad range of benefits, most of which are extremely difficult to measure. These benefits include, but are not limited to, reduced air and noise pollution, less congested highways and reduced parking needs in urban areas.

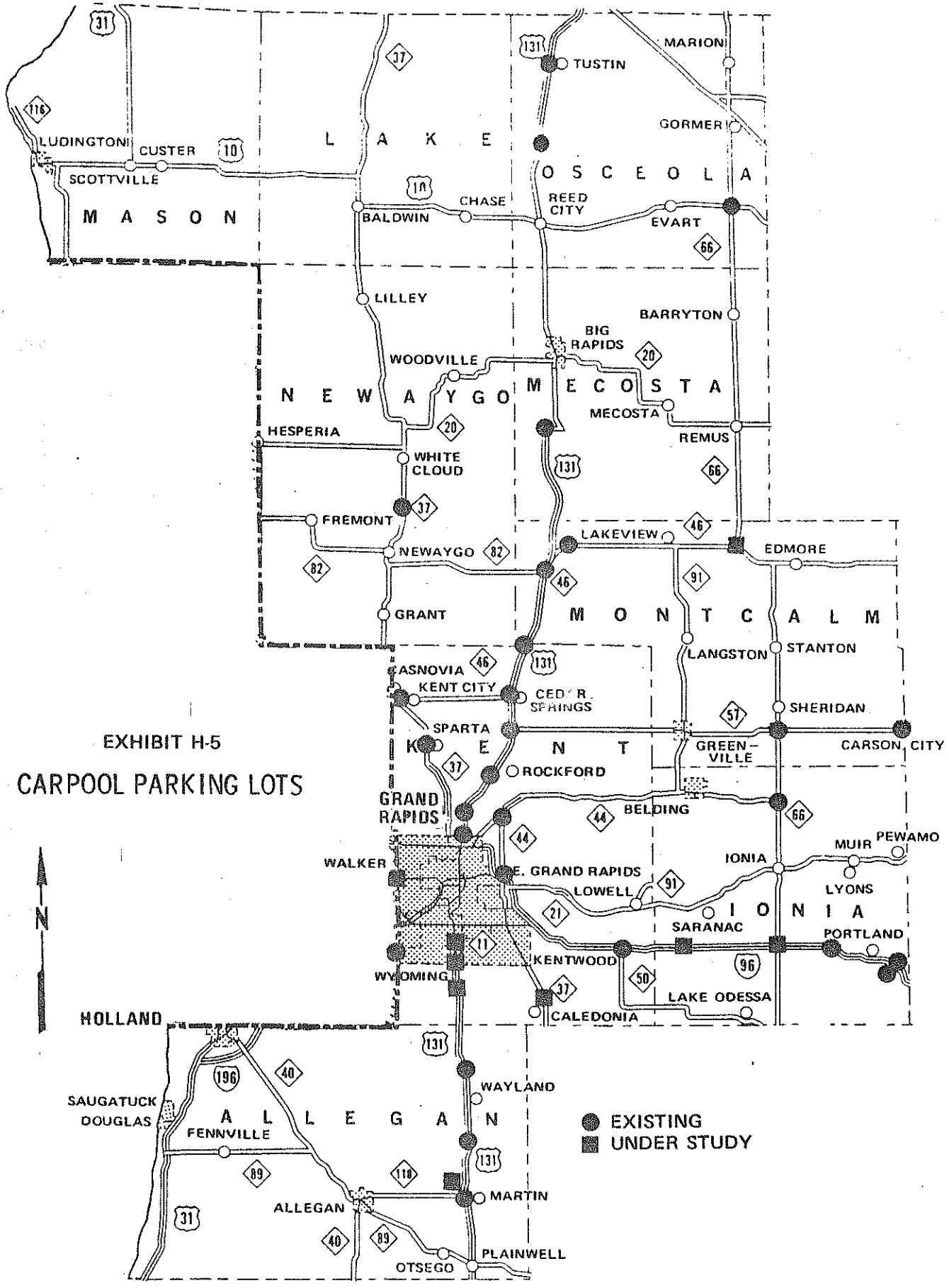


EXHIBIT H-5

CARPOOL PARKING LOTS

Informal carpools had been formed which used roadway shoulders, clear vision areas and other such areas for parking. Safer carpool parking locations for these ridesharers, as well as those in more formally organized pools, are one result of the program.

The planning process for new ride sharing lots begins with a request from the Department's District Offices, public agencies, Legislators, and individual citizens. These requests are reviewed by the Planning staff in accordance with established site selection criteria. If the request is justified, then funds are provided for construction. Exhibit H-5 and identifies the existing commuter carpool lots in Region 8.

Highway Issues

Completion of US-131 Freeway to the existing freeway facility north of Ashton in Osceola County.

Completion of US-31 north of US-10.

Reconstruction of M-66 from Six Lakes to Remus in Montcalm and Mecosta Counties.

Complete the M-37/US-131 connector study and make a recommendation of the alternative to implement, Kent County.

Turnback of M-91 in Kent County and (0.5 miles in Belding) Ionia County.

Highway Recommendations

Corridor Studies

South Beltline (M-10): I-96 to I-196, Kent County.

M-20: Renus to White Cloud, Mecosta and Newaygo Counties.

M-40, M-89 and M-118: City of Allegan, Allegan County.

Project Studies

M-37: 10 Mile Road in Kent County to M-82 north of Newaygo in Newaygo County.

M-44: I-96 to Plainfield Avenue, Kent County.

M-37: Caledonia to M-11, Kent County.

I. NON-MOTORIZED

The bicycle provides an inexpensive, energy-efficient mode of transportation which can supplement or serve as an alternative to motorized methods of travel. The existing road system serves the cyclist as well as the motorist. However, improvements can be made to the system so that it is safer for the cyclist and better accommodates the mix of motorized and non-motorized vehicles. The safety measures utilized can take a variety of forms, including: separate bicycle paths, bicycle lanes, paved shoulders, sidewalks designated for bicycle use, special bridges or bridge widenings, sewer grate replacements, and special signing and striping. In addition, abandoned railroad lines and utility corridors can be converted into recreational trails which incorporate bicycling, horseback riding, and hiking.

The state transportation law requires that each road agency receiving Michigan Transportation Funds (from gasoline, weight and license plate taxes) spend at least one percent of these funds each year for non-motorized services and facilities. Facilities for non-motorized transportation may be established in conjunction with or separate from already existing highways, roads, and streets and shall be established when a highway, road or street is being constructed, reconstructed, or relocated, unless:

1. The cost of establishing the facilities would be disproportionate to the need or probable use.
2. The establishment of the facilities would be contrary to public safety.

3. Adequate facilities for non-motorized transportation already exist in the area.

4. Matching funds are not available through the Department of Natural Resources or other state, local, or federal government sources.

5. The previous expenditures and projected expenditures for non-motorized transportation facilities for the fiscal year exceed one percent of that unit's share of the Michigan Transportation Fund in which case additional expenditures shall be discretionary.

The law also requires that each administering road agency prepare a five year program for the expenditure of available funds. Local input from bicyclists and other interested citizens is important to the development of these programs.

Some improvements have already been made in Region 8 to accommodate bicycle travel. The types of improvements include: special lanes, paved shoulders, signed routes, and sidewalk routes. A recently completed inventory of facilities in the Region show 130 miles of existing facilities and 5 miles of proposed facilities (Exhibit I-1).

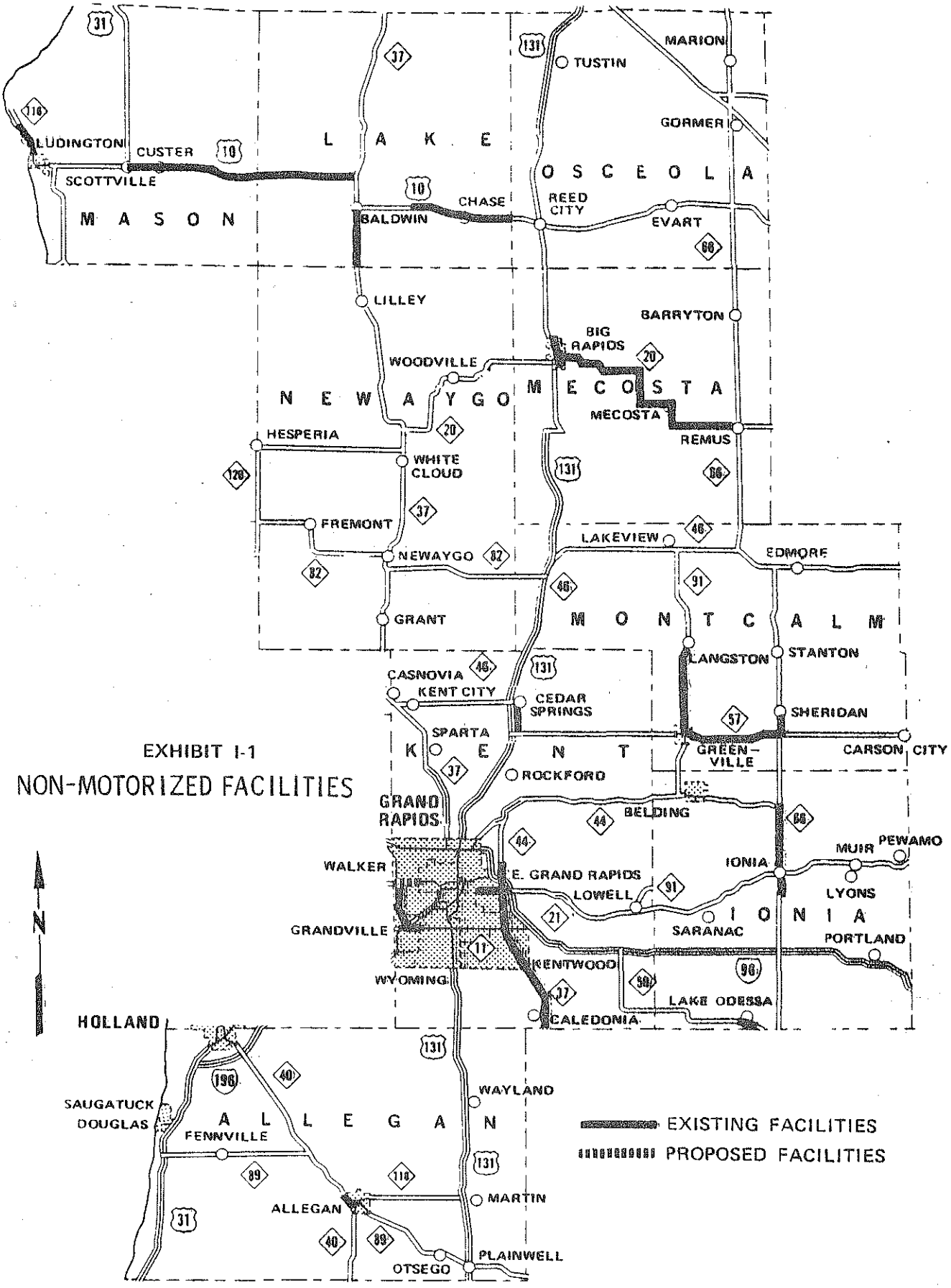


EXHIBIT I-1

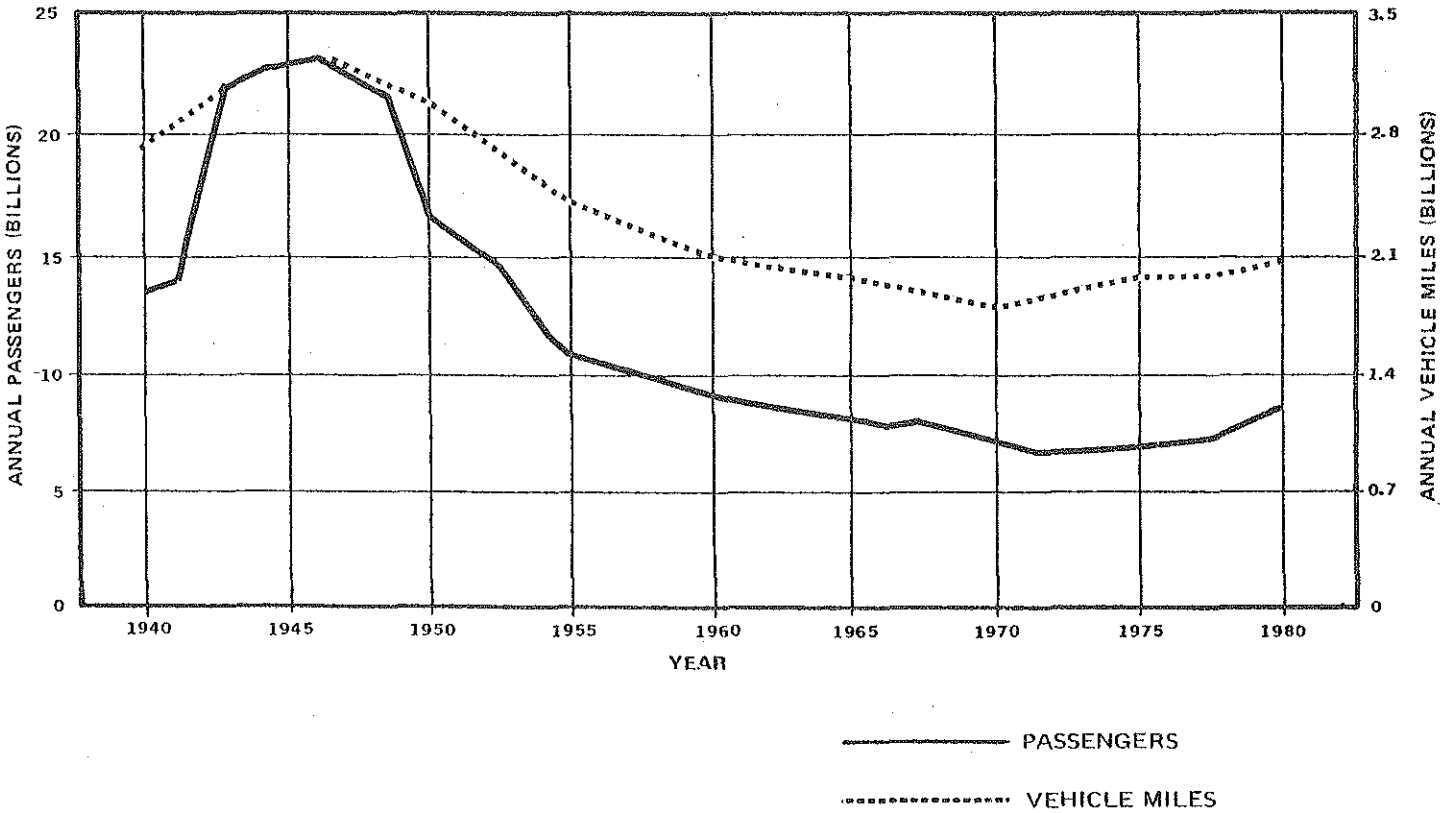
NON-MOTORIZED FACILITIES

J. PUBLIC TRANSPORTATION

Public transportation in Michigan and the United States, until recent years, experienced a long period of steady decline. From a World War II annual figure of 23.3 billion, public transportation ridership steadily decreased to the 1972 low of 6.6 billion (See Exhibit J-1). This decrease has been attributed mainly to increased use of the automobile and changing land development patterns. As transit ridership decreased, the corresponding loss in revenues forced many private and public transit operators to either reduce service or cease transit operations entirely. The number of annual passenger miles operated decreased in a manner similar to ridership from a 1945 high of 3.3 billion to the 1972 low of 1.8 billion.

EXHIBIT J-1

TRANSIT RIDERSHIP AND SERVICE IN THE UNITED STATES
1940 - 1980



The recovery of public transportation, commencing in the mid-seventies, was evidenced by increased ridership brought about by higher levels of service and modern well-equipped buses. Since 1972, annual ridership has increased by 1.6 billion to 8.2 billion, a level approaching that of 1965 and one-third of the 1945 figure. The level of service has also improved since 1972 by some 300 million annual vehicle miles. In Michigan, since 1972, transit ridership has increased by nearly 5 percent from approximately 92 million to over 96 million. During this same period, the number of public transit systems increased five-fold from 12 to 58.

Several factors influenced this rejuvenation. These include: (1) federal and state financial assistance to transit systems, (2) more favorable public attitudes regarding services which transit could provide, and (3) the higher price and reduced availability of automobile fuel. Landmark transit legislation leading to this recovery were the National Mass Transportation Assistance Act of 1974, which authorized federal operating assistance funds to transit systems for the first time, and Michigan Act 327, Public Acts of 1972, which earmarked a portion of the State's gas and weight tax revenues to help meet transit system capital and operating costs.

Michigan's future public transportation outlook has been predicated on the results of the Michigan's Transportation Needs Study conducted in 1976-77. The needs determination process included: (1) stratifying Michigan into five planning area types, (2) determining service standards for each planning area type, and (3) applying these standards to Michigan's future population to obtain public transportation needs.

PLANNING AREA TYPES

The need for transit service varies from area to area. Transit service appropriate for a rural area or a community of 5,000 persons is significantly different from that needed in a metropolitan area like Grand Rapids. There are five geographically distinct planning area types used for state public transportation planning. These consist of rural, small urban, urban, small metropolitan and metropolitan. Each of these is characterized by a unique population range, population density, and blend of transit services (see Exhibit J-2). The Detroit urbanized area represents the only metropolitan community in the state. The small metropolitan category consists of the Ann Arbor, Battle Creek, Bay City, Flint, Grand Rapids, Jackson, Kalamazoo, Lansing, Muskegon, and Saginaw urbanized area. There are 191 urban and small urban communities and 83 rural areas consisting of the rural portion of each of Michigan's counties.

Existing Service

There are ten transportation agencies providing service to the general public in Region 8. Two of these are rural systems. One is the county-wide Mecosta systems and the other is the Yates Township service located in Lake County. The size, level of service, and use of the Mecosta County system has increased markedly during the past 5 years (see Exhibit J-3), while the Yates Township system has evolved from what was originally the Lake County system.

EXHIBIT J-2
PLANNING AREA TYPES AND DEFINITION COMPONENTS

Area Type	Population Range	Population Per Square Mile	Transit Service Characteristics
Metropolitan	Over 1 million	Over 6,000	Bus rapid transit (and possibly rail rapid transit); high level of fixed-route service and commuter service (commuter bus and rail); supplemental service such as demand-responsive and downtown circulation.
Small Metropolitan	50,000 to 1 million	3,000 to 6,000	Moderate to high level of fixed-route service and commuter service (generally commuter bus only); supplemental service such as demand-responsive and downtown circulation may exist.
Urban	5,000 to 50,000	1,500 to 3,000	Low to moderate level of fixed-route service; high level of demand-responsive service.
Small Urban	2,000 to 5,500	100 to 1,500	No fixed-route service; moderate level of demand-responsive service (sometimes provided for portions of the day only).
Rural	Communities under 2,000 and all unincorporated areas.	Less than 100	Low level of fixed-route service and commuter service; low to moderate level of demand-responsive service.

There are seven small community systems in the region. These predominantly demand-response systems operate in the cities of Belding, Big Rapids, Greenville, Ionia, Ludington, Reed City, and Saugatuck. Size, level of service, and use of these systems have increased signficantly during the past 5 years (see Exhibit J-3). Of particular note, the vehicle productivities of these systems have leveled off at approximate 9 passengers/vehicle hour.

The largest transit system in Region 8 is the 107 vehicle fixed- route system operated by the Grand Rapids Area Transit Authority (GRATA). This is the second largest system in Michigan as it carries almost 5 million passengers annually. Service is provided to the communities of Comstock Park, Grand Rapids, Grandville, Kentwood, Wyoming, and to Grand Valley State College. Demand-response service supplements the fixed-route service providing transportation to elderly and handicappers. Level of service and system use have doubled in the last six years (see Exhibit J-3).

In addition to the ten systems already discussed, there are a number of specialized transportation services being provided in Region 8. Those receiving Department of Transportation financial assistance consist of Allegan County (1 vehicle), Kent County (2 vehicles), Mason County (2 vehicles), Montcalm County (1 vehicle), and Newaygo County (2 vehicles). These services are usually provided by human service agencies who transport their own clientele; usually elderly or handicapped.

EXHIBIT J-3

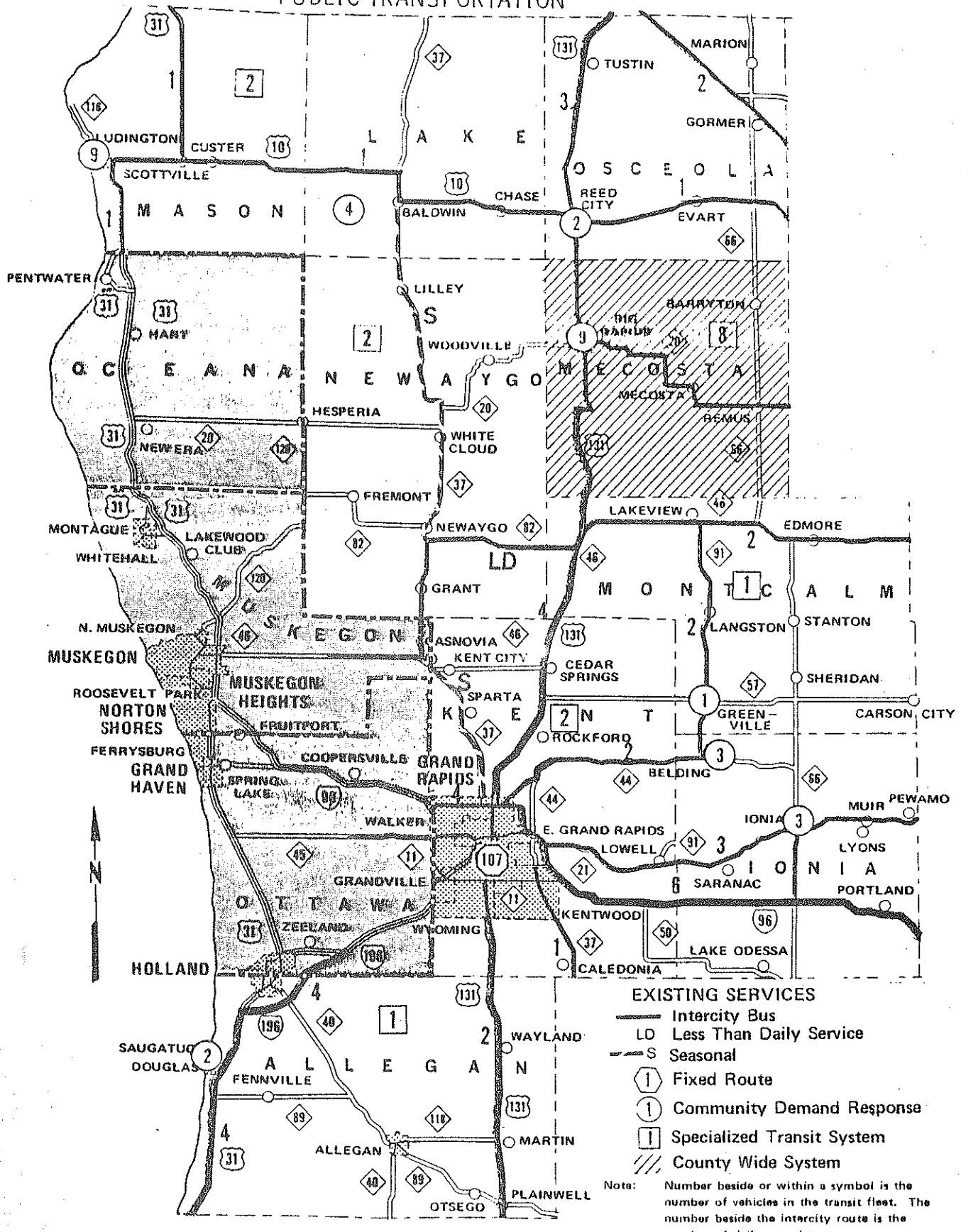
Selected Characteristics of Region 8 Public Transportation Systems, 1976-81

Transit System	Year	Vehicles	Annual Vehicle Hours	Annual Passengers	Passengers/ Vehicle Hour
GRATA	1981	107	205,184	5,087,678	24.8
	1980	100	199,021	4,705,985	23.6
	1979	94	153,652	4,053,807	26.4
	1978	94	170,107	3,465,883	20.4
	1977	80	146,194	2,782,491	19.0
	1976	63	101,056	2,193,888	21.7
1976-81% Chg.		69.8%	103.0%	131.9%	
Belding	1981	3	4,391	42,633	9.7
	1980	3	4,759	42,081	8.8
	1979	2	4,060	37,756	9.3
	1978	2	3,800	31,000	8.2
	1977	2	3,977	29,178	7.3
	1976	2	4,081	26,275	6.4
1976-81% Chg.		50.0%	7.6%	62.3%	
Big Rapids	1981	9	18,574	155,336	8.4
	1980	9	18,019	153,467	8.5
	1979	5	15,884	140,104	8.8
	1978	5	13,268	119,188	9.0
	1977	5	12,627	102,670	8.1
	1976	5	11,101	77,650	7.0
1976-81% Chg.		80.0%	67.3%	100.0%	
Greenville	1981	Start-up date December 14, 1981			
Ionia	1981	3	6,192	46,632	7.5
	1980	3	3,781	24,663	6.5
		Start-up June, 1980			
Ludington	1981	9	10,017	102,976	10.3
	1980	9	12,096	109,884	9.1
	1979	7	11,478	98,448	8.6
	1978	5	8,875	81,120	9.1
	1977	5	8,076	72,128	8.9
	1976	5	7,500	63,700	8.5
1976-81% Chg.		80.0%	33.6%	61.7%	
Reed City	1981	2	4,526	23,209	5.1
	1980	2	3,099	11,997	3.9
		Start-up May, 1980			
Saugatuck	1981	2	5,085	33,807	6.6
	1980	2	3,630	19,140	5.3
		Start-up May, 1980			
Mecosta County	1981	8	15,815	66,674	4.2
	1980	8	15,251	62,735	4.1
	1979	5	8,931	37,981	4.3
	1978	5	2,275	5,456	2.4
1979-81% Chg.		60.0%	77.1%	75.5%	
Yates Township	1981	4	6,155	18,578	3.0
	1980	4	5,970	15,008	2.5
	1979	3	2,980	6,477	2.2
1980-81% Chg.		0%	3.1%	23.8%	

The Yates Township system was initially a countywide Lake County service which commenced on August 9, 1976. In 1979, the countywide service discontinued, but the Yates Township (includes Baldwin) portion of the service continued operation.

EXHIBIT J-4

PUBLIC TRANSPORTATION



EXISTING SERVICES

- Intercity Bus
- LD Less Than Daily Service
- S Seasonal
- (1) Fixed Route
- (1) Community Demand Response
- [1] Specialized Transit System
- /// County Wide System

Note: Number beside or within a symbol is the number of vehicles in the transit fleet. The number beside the intercity route is the number of daily round trips.

Issues

Several issues confront the provision of local public transportation to Region 8 residents.

Level of Service. What level of service is necessary to meet the basic transportation needs of each community? Is this a service level that should be preserved regardless of costs and other extenuating effects? In rural areas, for example, vehicle productivities are low and costs per trip are high due to long trip lengths and low densities. On the other hand, should a level of service be maintained that will be readily available for use in an energy-constrained situation?

Funding. Rising labor costs and fuel prices coupled with declining State and Federal transit dollars contribute to a critical financial crisis. The result may be reduced transit service, substantially higher fares, new funding sources and mechanisms, or a combination of these. In the past, the State has customarily assumed all capital and up to 1/3 of total operating costs on a continuing basis. At the same time, local governmental units have had success receiving voter approval of millage proposals and governing body support through appropriating general funds.

Service Area. Can transit systems continue to expand their service areas to serve new developments, more of a county, and outlying communities? Especially as long trip lengths, considerable "deadheading," and high cost per trip is often the result.

Vehicle Replacement. Some systems have experienced unusually high "down time" percentages due to keeping vehicles in service far beyond their useful lives. This results in reduced service and lower ridership yields.

Coordination/Consolidation of Services. There is a need for coordinating, and sometimes consolidating, the transit service afforded by two or more carriers within a county and between counties. This is particularly true of the small metropolitan systems and those providing service to the remainder of their respective counties.

Policies

Individual public transportation operating agencies may serve a variety of planning area types. A regional transportation authority, for example, may serve both rural and urban areas. The Department of Transportation is strongly encouraging areawide operating agencies because of the efficiencies and economics involved. This is a departure from earlier approaches which allowed individual cities to establish transit systems.

In addition, policies to encourage the coordination and consolidation of public transportation and human service transportation have been adopted. Both the Department of Transportation and other state and local agencies have agreed to the concept of a reduced number of transportation providers. Whenever possible the provider should be the local public transportation agency.

Service Improvements

Improvements needed during the 1980's regarding local public transportation systems in Region 8 were determined by applying service standards (see Exhibit J-5) to future populations. The key standard is daily vehicle hours per 1000 population, developed for each planning area type as were the other service standards, by observing existing service levels in Michigan communities. The level of service and fleet size needed for each county in Region 8 to meet these standards are presented in Exhibit J-6. Needs by planning area type are discussed below.

Fleet size and level of service (daily vehicle hours/1000 population) already meet or exceed service standards indicated by the Needs Study for both existing rural systems (Mecosta County and Yates Township). The remainder of Lake County and the other 7 counties in Region 8 show a need for a level of service equal to 2.5 vehicle hours per 1000 population. Part of this service is already afforded by human service agencies to their own clientele.

Most smaller communities with transit service such as Belding, Big Rapids, and Ludington meet or exceed the needed fleet size and level of service indicated in the Needs Study. Communities of Reed City, Ionia, Greenville, and Saugatuck have just started service within the past 18 months. The level of service which is indicated by the Needs Study for these communities is 3.0 to 3.5 daily vehicle hours/1000 population.

EXHIBIT J-5

LOCAL PUBLIC TRANSPORTATION SERVICE STANDARDS SUMMARY

Service Standard	Rural	Small Urban	Urban	Small Metropolitan	Metropolitan
Daily Vehicle Hours Per 1,000 Population 3/	2.5 (1.8)	3.0 (2.9)	3.5 (2.9)	4.0 (2.0)	4.0 (2.3)
Average Response Time	24 Hours	25 Min.	20 Min.	10 2/	10 2/
Daily Service Hours	10	12	15	16 2/	16 2/
Passengers Per Vehicle Hour	5.0	8.0	8.0	30.0	35.0
Percent of Population within 1/4 Mile	100	100	100	80	80
Percent of Elderly and Handicapped Served	100	100	100	100	100
Maximum Cost Per Passenger 1/	$3.00	$2.00	$2.00	$1.00	$0.75
Minimum Passenger Miles Per Gallon	10	10	10	25	40

Notes: 1/ In 1977 dollars

2/ Major Corridor Service

3/ Daily vehicle hours per 1,000 population for 1979 noted in parentheses.

Source: Michigan Department of Transportation, Mass Transportation Planning Section and the Michigan Transportation Needs Study, January 1980.

EXHIBIT J-6

Local Public Transportation Needs in Region 8, 1990

County		Population	Daily Vehicle Hours	Number of Vehicles	Daily Ridership	Passengers/ Vehicle Hour
Allegan	1990	87,900	246	33	1719	7.0
	Existing	81,318	--	--	--	--
Ionia	1990	46,131	132	18	1071	8.1
	Existing	51,670	17	3	148	8.8
Kent	1990	460,600	1750	221	58,299	33.3
	Existing	444,030	701	94	16,570	23.6
Lake	1990	8,900	41	6	129	5.9
	Existing	7,801	21	4	53	2.5
Mason	1990	28,900	86	12	649	7.5
	Existing	26,343	39	9	387	10.0
Mecosta	1990	50,600	151	19	1155	7.6
	Existing	36,925	117	17	762	6.5
Montcalm	1990	55,000	153	20	1018	6.7
	Existing	47,532	--	--	--	--
Newaygo	1990	40,900	123	17	767	6.2
	Existing	34,864	--	--	--	--
Osceola	1990	22,400	69	9	416	6.0
	Existing	18,879	--	--	--	--

Note: 1/ Existing values are transit systems serving the general public and operating in any of the nine counties. Some service is being provided to special groups by human service agencies and others. Such services are not included in the existing figures.

Source: Michigan Department of Transportation, Mass Transportation Planning Section.

The system operated by the Grand Rapids Area Transit Authority would need to double (approximately) its fleet size and level of service (daily vehicle hours) between 1981 and 1990 to meet Needs Study standards.

INTERCITY BUS

Intercity bus systems connect major urban areas with the remainder of the state and nation. In addition to passenger service, these buses offer package shipment service. Although intercity bus companies are privately-owned, their operations are regulated by the Michigan Public Service Commission and the Interstate Commerce Commission. They are required to operate over specified highway routes and abide by published time schedules. Recently, changes in the federal law have resulted in those routes under the control of the ICC being deregulated.

Existing Service

Intercity bus transportation in Region 8 provides service to all communities over 5000 population and most over 2000. The number of daily round trips varies from a high of six between Grand Rapids and Lansing to one between Reed City and Ludington. These services are provided by six carriers: G&M Coaches, Greyhound Lines, Indian Trails, Michigan Trailways, and North Star Lines. The use of intercity bus service declined in the early and mid-seventies. During the latter years of the 1970's, ridership began to increase.

Issues

Several issues confront intercity bus service in Michigan and Region 8. These include:

1. Lack of public awareness of the service available and the advantages afforded.

2. Lack of revenues to justify continued service to small communities. Over 2,000 communities, nationwide, have been abandoned in the last decade. Further elimination of service may occur with the advent of deregulation.

3. Lack of capital resources to purchase new buses.

4. Uncertainty regarding the impact of deregulation on service to rural areas.

Service Improvemments

Based on the Michigan Transportation Needs Study several improvements to the present intercity bus system are suggested. These improvements are described in relation to the service standards determined in the Needs Study.

1. Service should be provided to all communities of 2,000 or more population. At this time, Allegan, Fremont, Otsego, and Sparta are without intercity bus service.

2. Service should be provided to all counties in Region 8. All counties in Region 8 except Mecosta are served to some degree with intercity bus service.

3. Service frequency should be consistent with the intercity bus service corridor classifications established in the Michigan Transportation Needs Study. Additional east-west service would be desirable to connect Big Rapids and Reed City with Mount Pleasant and Clare. More north-south service is needed between Ludington and Muskegon/Grand Rapids.

4. Coordination should be developed between intercity and local public transportation schedules and terminal facilities. Schedules are being coordinated but joint intercity bus/local public transportation terminals should be considered for several Region 8 communities.

5. Coordinate intercity bus with rail passenger service.

   a. Feed the rail passenger service from areas not served. This is being accomplished from Muskegon and Grand Rapids to the Kalamazoo rail passenger station.

   b. Provide local service along rail corridors to communities not served by rail and supplement rail service during low demand periods.

INTERCITY RAIL PASSENGER

Intercity rail passenger service can enhance mobility within travel corridors connecting the major urban and metropolitan areas of the state and nation. The National Railroad Passenger Corporation, better known as Amtrak, was created in May, 1971 to revitalize the nation's rail passenger network. Amtrak rail passenger service in Michigan consists

of three daily round trips between Detroit and Chicago, one daily round trip between Port Huron and Chicago, one daily round trip between Jackson, Ann Arbor and Detroit, and one daily round trip between Detroit and Toledo. A total of 16 Michigan communities have direct rail passenger service.

Existing Service

Intercity rail passenger transportation has not been directly available to communities in Region 8 for many years. The closest rail passenger station is Kalamazoo, 50 miles away, which has eight daily trains. Intercity bus service to Region 8 communities is coordinated with these trains. Service between Grand Rapids and Chicago is recognized as a desirable component of the State's total transportation program. The realization of this service will be contingent upon the availability of future revenues.

Issues

Several issues are critical to the success of rail passenger service in Michigan and Region 8.

- Designation of the Detroit-Chicago corridor as an emerging corridor - This is one of the highest population corridors in the nation and has a comparatively high ridership level. National and state commitment to a high level of service in this corridor is warranted. Such service will benefit Region 8 particularly with the provision of service between Grand Rapids and Kalamazoo.

- Difficulty in selecting good Michigan corridors for rail passenger service - By carefully selecting rail corridors, investments in track upgrading and terminal improvements will result in improved cost effectiveness and energy efficient public transportation service realizing the high ridership potential characteristic of such corridors.

- High operating costs - The cost of operating a rail passenger service is approximately 10 times higher than that incurred operating an intercity bus passenger service.

- Coordinating other modes with rail passenger service - This includes "feeding" rail passenger stations by automobile and bus, providing intercity bus service to communities in a rail corridor which have no rail passenger station, and using intercity bus service to supplement the rail passenger schedule to afford convenient service.

Service Improvements

The Michigan Transportation Needs Study suggested several improvements for rail passenger service in Michigan. Two of these are located in or affect Region 8. These improvements are noted under the following rail passenger standards developed as part of the Needs Study determination process. These are:

- Rail passenger service should be provided to all metropolitan areas in Michigan with a higher level of service being provided to

those over 200,000. Such service could be defined as having a 30-45 minute service area radius from any given station. This means Grand Rapids should have direct rail passenger service consisting of about 3 daily round trips.

- All rail passenger trackage between metropolitan areas should accommodate speeds of 79 mph, except in unusual circumstances. From Grand Rapids to Kalamazoo, it needs to be upgraded from about 30 mph to 79 mph.

- Intercity rail passenger terminals should be jointly used by intercity bus and local public transportation services. A Grand Rapids terminal should be developed for joint use by the intercity bus lines serving Grand Rapids, the Grand Rapids Area Transit Authority, and the intercity rail passenger service.

RIDESHARING

Ridesharing may be defined as any vehicle containing two or more persons. As such, it includes caprools, vanpools and public transportation service. Ridesharing programs are usually associated with the work trip, they are increasing in importance as a means of providing energy efficient, cost effective transportation serivce. Carpools and vanpools begin at the origin of the trip with no "deadheading" which is often characteristic of transit service. Automobiles and vans are relatively inexpensive to operate compared to other forms of public transportation due to lower labor, maintenance, and fuel costs. Similarly they are relatively energy efficient due to the lower fuel consumption rates. Finally, there is a vast fleet of automobiles in

place which can be called upon on short notice to move people in an energy constrained situation.

Ridesharing activity in Michigan includes employer-sponsored vanpool programs, the MichiVan program, local ridesharing office coordinated carpools, and self-initiated carpools. The local ridesharing office, Commuter Connecting, can be contacted by calling 616-458-7283. Two employer-sponsored vanpool programs are in operation in Region 8, both in the Grand Rapids area. One is a 21 van program sponsored by Steelcase Company and the other is the Amway Corporation 13 van program.

Local ridesharing offices offer a variety of vanpool and carpool-related services, such as:

1. Promotion and Marketing - Work with employers and employees, conduct workshops, provide resource materials, and conduct media campaigns.

2. Ridesharing Match Program - Develop and implement appropriate manual and computer matching systems to assist in the formation of carpools, vanpools, and buspools.

3. Statewide Vanpool Program - Coordinate the statewide third party vanpool program which includes assuming responsibility for the organization of vanpools.

4. Coordination - Coordinate ridesharing programs with other related programs, including public transportation and carpool parking lot programs.

K. RAILROADS

The financial condition of the railroad industry in the Northeastern and Midwestern regions of the United States has been cause for serious national concern. In Michigan and Region 8 specifically, deteriorating service, rising operating costs and the prospects of abandonment have put the future of rail service in doubt for some communities. At the same time, the demand for reliable rail freight service has increased in certain other industrial and agricultural centers.

The regional rail system as of May 1, 1983 consists of approximately 590 route miles and is served by seven carriers:

Chesapeake and Ohio	343 route miles (Class I carrier)
Grand Trunk Western	76 route miles (Class I carrier)
Conrail	62 route miles (Class I carrier)
Ludington & Northern	6 route miles (Class III carrier)
Ann Arbor	10 route miles (Designated Operator)
Michigan Northern	84 route miles (Designated Operator)
Kent-Barry-Eaton Connecting	9 route miles (Designated Operator)

The attached map indicates the major routes of these railroads within Region 8. No rail passenger service currently exists in the area but restoration of service is contemplated jointly by the State and Amtrak for the Grand Rapids-Chicago and Grand Rapids - Detroit corridors.

Most of the region's rail carloadings are generated in the Grand Rapids metropolitan area and at Ludington. Accordingly, the region's heavy

density routes include the C&O's Plymouth - Grand Rapids (24 million annual gross tons/mile) and Chicago - Grand Rapids (27 million annual gross tons/mile) lines, Conrail's Elkhart - Grand Rapids route (4 million annual gross tons/mile), and C&O's Saginaw - Ludington line (6 million annual gross tons/ mile). These lines handle chiefly automotive products, chemicals, paper and pulp products, primary metal products, and coal. While lower densities exist along rural lines, these lines are vital for Michigan's agriculture as they permit the importation of fertilizers and building supplies and the exportation of grains in economical bulk quantities.

Of particular concern are the 103 miles of regional lines operated by designated operators and requiring public operating subsidies for continued existence. This trackage involved the following stations and carloadings in 1981:

System	Station	Carloads
Ann Arbor	Marion	9
Michigan Northern	Rockford	124
	Cedar Springs	18
	Howard City	138
	Big Rapids	29
	Reed City	20
Kent-Barry-Eaton Connecting	Caledonia	80
	Dutton	85

An additional 67 route-miles involving Region 8 are subject to either pending or potential abandonment:

Grand Trunk Western	Greenville - Carson City - Ashley
Conrail	At Grand Rapids (Central Business District)
Chesapeake & Ohio	Ionia - Portland - Grand Ledge

The Chesapeake and Ohio is permitted to file an application with the Interstate Commerce Commission in 1983 to abandon its Lake Michigan carferry service between Ludington and Kewaunee, Wisconsin.

This is a continuation of a long term trend of railroad abandonments in Michigan and the nation as a whole. Since 1960, Region 8 and adjoining areas have lost 150 land route miles, primarily in rural areas or as a result of the Penn Central bankruptcy in 1970 and the subsequent federally mandated reorganization in 1976, which created Conrail. These abandonments included:

Chesapeake and Ohio	Fremont-White Cloud	9.0 miles (1961)
	Ionia - Prison Spur	1.14 miles (1971)
	Hamilton - Allegan	14.00 miles (1972)
	Edmore - Lakeview	12.46 miles (1974)
	Edmore - Remus	15.98 miles (1981)
Conrail	Doster - Richland Jct.	4.8 miles (1977)
	Fuller - Kinney	4.8 miles (1982)
New York Central	Doster - Hooper	4.5 miles (1961)

Penn Central	Grand Rapids Belt Line	1.5	miles (1972)
	Plainwell - Parchment	7.26	miles (1972)
	Otsego - Lamar	38.8	miles (1976)
Penn Central (KBEC)	Caledonia - Vermontville	33.0	miles (1982)
Pennsylvania	Kinney - Walker	2.55	miles (1961)
C&O Carferries	Ludington - Milwaukee	98	water miles (1980)
	Ludington - Manitowoc	60	water miles (1982)

In the decade of the 1980's, several issues will confront the railroad mode and its continued operations in Region 8. The Staggers Rail Act of 1980 substantially deregulated the mode and permitted less stringent criteria for Interstate Commerce Commission approval of abandonment applications. In the face of deregulation, stabilization of the region's rural light-density lines may be hampered as private sector rail carriers seek to shed themselves of marginally profitable operations. Similarly, traditional Lake Michigan carferry service may not survive the decade as vessels reach replacement age and deregulated pricing policies for rail freight discourage cross-lake routings. The State's commitment to develop an integrated tug-barge fleet for the Great Lakes does present hope in an otherwise gloomy forecast.

EXHIBIT K-1

EXISTING RAILROAD SYSTEM

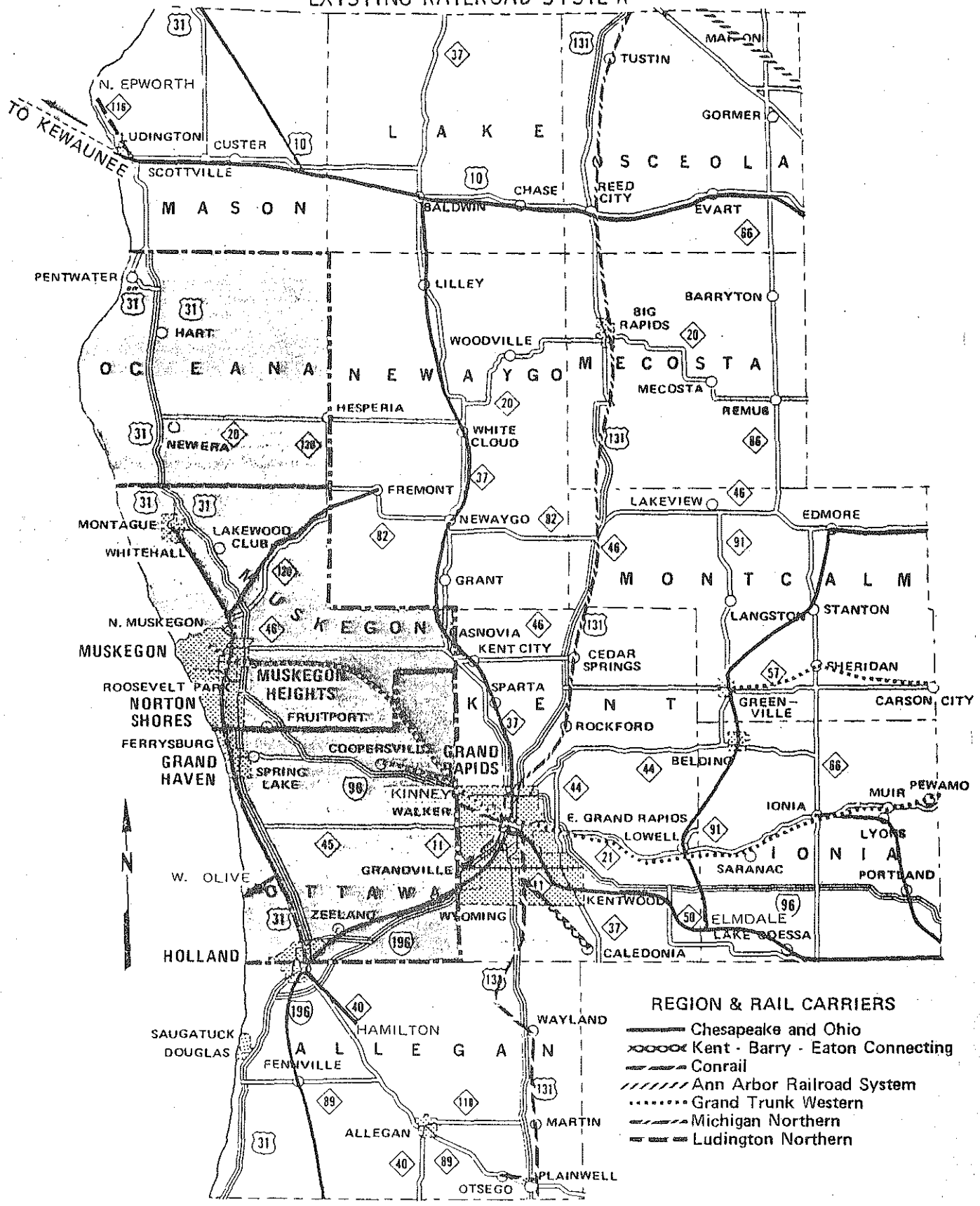
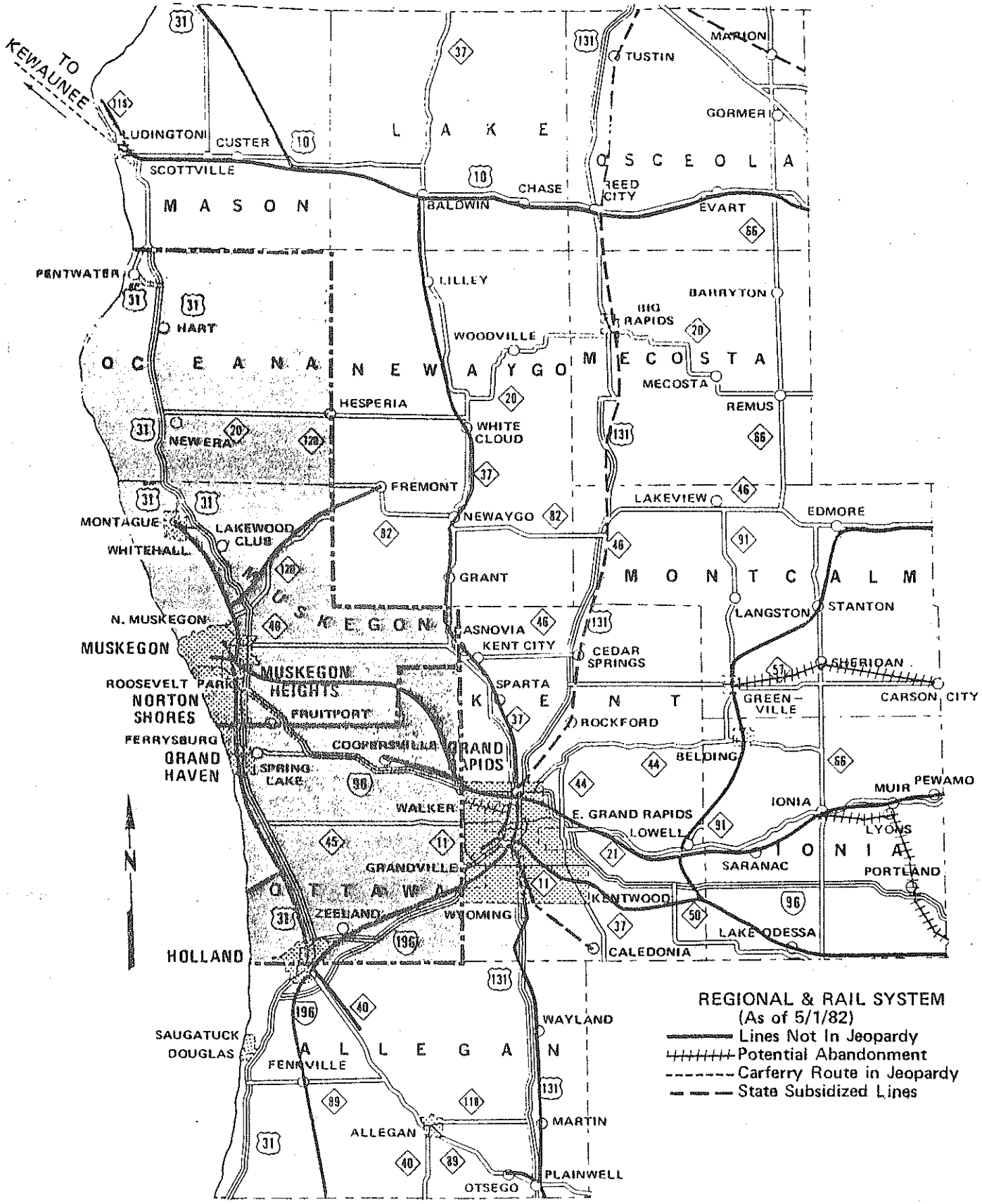


EXHIBIT K-2

EXISTING RAILROAD SYSTEM



REGIONAL & RAIL SYSTEM
(As of 5/1/82)

- Lines Not In Jeopardy
- Potential Abandonment
- Carferry Route in Jeopardy
- State Subsidized Lines

L. DISCUSSION OF ALTERNATIVE FUTURES (POPULATION VS. ENERGY)

A major objective of this study is to identify a regional transportation system that is adequate to meet current and future needs of Region 8. To assist in accomplishing this objective, the study team has recognized two principal factors that will significnatly affect the character of future transportation systems. They are:

1. The availability of gasoline, and
2. The continuing changes in population.

Future Transportation Development Strategy

Numerous factors, other than energy availability and population change, will influence the region's future transportation system needs. Economic conditions, governmental influence, incentive programs, available leisure time, and desirable lifestyles will all play an important part. Energy and population, however, were selected as the dominant factors in forecasting the future as they are more easily quantified on a regional basis.

Energy Availability

The availability of fuels will define the costs and much of the character of future transportation services and raises many questions. Should we continue expanding the highway system? Should we be considering more transit options? Are we going to need additional airports or will existing facilities be adequate? Should the railroads be permitted to abandon their service? Will the region's ports be

involved in transporting western coal into the Midwest? It is because of these and other questions that the study team has identified the "energy" issue as a central concern of future planning efforts.

Growth Futures

The study team has developed a planning strategy based on two dominant factors. It considered the possible occurrence of several future conditions based upon variations of energy supply and population growth.

The alternative energy supply futures are identified as "Abundant", "Conserved" and "Restricted". The population growth futures are described as "Low", "Medium", and "High". Combinations of these factors yield nine possible situations, or futures, which are conceptually illustrated on the matrix of sample futures.

Following is a brief explanation of the variations within the energy and growth futures.

Transportation facility development is directly related to the expected mobility requirements of current and future population levels. The 1970 Census established the region's year round resident population at 662,000 persons. Forecasts for the year 2000 were developed by the Michigan Department of Management and Budget (MDMB). The study team has established three possible growth levels as discussed in the Planning Techniques Section. These projections were used as a base for the various futures. The High Growth Future reflects the MDMB projection for the year 2000 A.D.:

High Growth - This future assumes that the region's year 2000 population will reach approximately 898,000 persons, a 36% increase since 1970.

Medium Growth - This future assumes that the region's year 2000 population will reach approximately 827,000 persons, a 25% increase since 1970.

Low Growth - This future assumes that the region's year 2000 population will reach approximaty 736,000 persons, a 11% inccrease since 1970.

Energy Futures

The study team found that defining three energy futures was a more difficult task. While fuel availability was considered the determining factor, both the fuel cost per gallon and cost per vehicle mile of travel will also certainly affect its future use. The three possible energy futures are described as follows:

Abundant Energy - This future assumes that there is no energy shortage. Adequate fuels are available for transportation either through the discovery of new resources or through the development of synthetic fuels. The single family vehicle (automobile) remains the dominant mode of transportation, reinforcing urban expansion. This future is most typical of recent past conditions reflecting today's relatively affluent suburban lifestyle.

Conseved Energy - This future assumes that energy shortages are a long term reality. Fuel conservation is stressed but still based on voluntary efforts. The price of fuel has risen significantly enough so that

it begins to make a real impact on everyday driving habits. The automobile is still the dominant mode but certain trip purposes, like work trips, are shifting to carpools or public transit.

Restricted Energy - This future assumes that energy for transportation purposes is in very critical supply. Gasoline rationing would be in effect. Strong government programs would be implemented to insure proper utilization of the various modal transportation systems. Public transit development would be very extensive.

M. Future Transportation Networks

Nine regional transportation networks were evaluated. These networks were developed by the study team and are based on the previously described energy and growth futures. In addition, these networks were derived from the premise that:

1. The availability of future "energy supplies" determines the distribution of trips to the highway, air, rail, and transit mode.

2. The amount and location of future "growth" derermined the extent of transportation system development.

In reviewing these different transportation networks, the team noted several key items that are worthy of special atttention. These are:

1. All future networks show a potential need for some major highway improvements.

2. All futures have a potential for some transit improvements.

3. All futures propose rural bus service in every county of the region as a result of legislative mandates and departmental programs.

4. All future networks retain the existing rail freight service to major communities, while recognizing that unprofitable lines may be dropped.

5. All future networks retain the existing system of commercial ports.

6. All future networks retain the existing system of air carrier airports.

7. The most extensive highway improvements are needed for the high growth-abundant energy future.

8. The least amount of highway improvements are needed for the low growth-restricted energy future.

9. The most extensive amount of transit development is needed for the high growth-restricted energy future.

10. The least amount of transit development is needed for the low growth abundant-energy future.

Modal Improvement Options

Exhibit M-1 indicates three categories of transportation improvements. These are:

1. Do Nothing
2. Minor System Improvements
3. Major System Improvements

A few examples are listed beneath each heading. These in no way represent the entire array of options available but should be helpful in associating a category with familiar improvement types.

It should be understood that these three categories of transportation improvements should not be considered interchangeable. Each is intended to satisfy a transportation problem of a certain magnitude except the maintenance or do-nothing alternative. Minor problems should be resolved with minor system improvements. Major problems should be resolved with improvement alternatives of greater proportions that will solve the problem.

EXHIBIT M-1

MODAL IMPROVEMENT OPTIONS

TRANSPORTATION MODE	DO NOTHING	MINOR SYSTEM IMPROVEMENTS	MAJOR SYSTEM IMPROVEMENTS
Aviation	Maintain Existing Airport Facilities	Resurface Runways Construct New Taxiways, Utility Buildings and Emergency Equipment Install Landing Systems	New Airports Runway Extensions Additional Runways Implement Scheduled Passenger Service
Commercial Harbors	No Maintenance	Continue Maintenance to Authorized Depth	Increase Harbor and Channel Depths Improve Cargo Transfer Facilities
Highways	Maintain Existing Facilities	Resurfacing Passing Lanes Intersection Improvements Minor Realignments Traffic Control Devices	Widening Existing 2-Lane to 4 or 5 Lanes Construct 4-Lanes Divided on Existing Location Construct 2-Lanes on New Location Construct 4-Lanes on New Location - Free Access - Partial Access Control - Limited Access (Freeway)
Non-Mororized	Maintain Existing Facilities	Pave Shoulders Pavement Markings Install Signs Curb Cuts	Construct Separate Path or Bikeway
Public Transportation	Service and Equipment Maintained by Private or Local Agencies	Continue Current Level of Bus Subsidy Programs Provide Low Interest Loans for Vehicle Purchases	Expansion of Subsidy Programs for: Intercity Carriers Regional Carriers Rural Systems Local Systems Construct New Terminal Facilities
Railroads	Service and Equipment Maintained by Current Owner	Continue Current Level of Rail Subsidy Programs Track Rehabilitation	Institute State Ownership of Subsidized Rail Lines Institute Rail Passenger Service

NOTE: Examples of improvement options were arbitrarily selected.

The option of doing nothing always exists. This alternative would indicate that people have decided to accept or tolerate the impacts associated with this option. This option would be the proper recommendation for those areas not presently experiencing or anticipating existing or future transportation problems.

As an example, assume a highway transportation problem where the capacity of the existing right-of-way is clearly inadequate to meet existing and future traffic demands. No amount of work of the type under the category of "Minor System Imrpovements" will solve the problem because additional capacity is required. Therefore, those options should be ruled out as alternatives for further consideration. But, each of the highway options identified as "Major System Improvements" would become logical candidates for serious consideration.

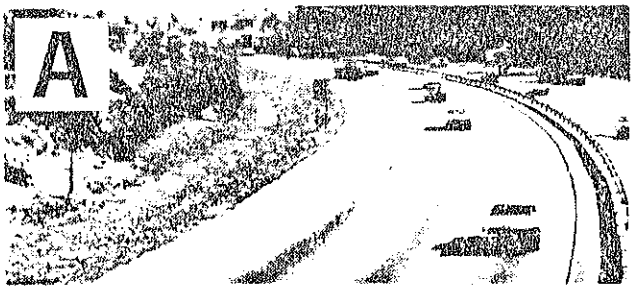
Likewise, situations may exist where a minor highway capacity deficiency could be resolved by an "up-to-standard" two-lane roadway. Only improvement types, such as those listed under the "Minor System Improvements" category, should then be considered as alternatives to solve the problem.

The point is this-transportation problems should first be identified according to their magnitude. Then, only those options which could solve that particular problem should be considered as realistic alternatives. To seriously consider alternatives which involve either more or less than is conceivably needed would be impractial.

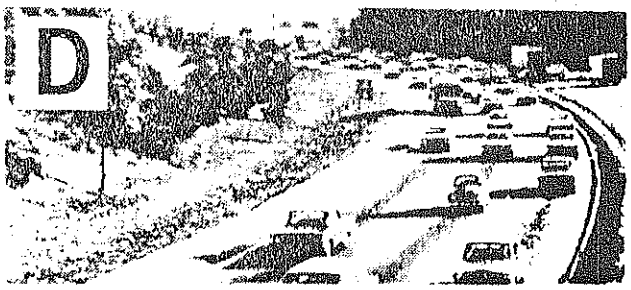
The following level of service matrix (Exhibits M-2 and M-3) reflects the various levels of congestion that are expected during the design hour volume period for each highway link in Region 8. The number of bands indicates the average two way congestion level for each link.

Exhibit M-2

LEVELS OF SERVICE

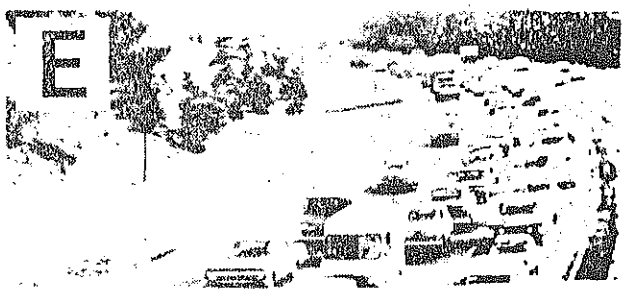


NO RESTRICTION ON OPERATING SPEED



APPROACHING UNSTABLE FLOW-
LITTLE FREEDOM TO MANEUVER

STABLE FLOW - FEW SPEED RESTRICTIONS



UNSTABLE FLOW - LOWER SPEED -
SOME STOPS

STABLE FLOW - HIGHER VOLUMES -
RESTRICTED SPEED AND LANE CHANGING

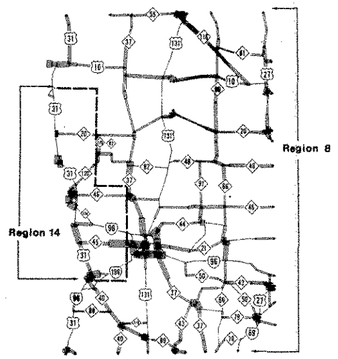
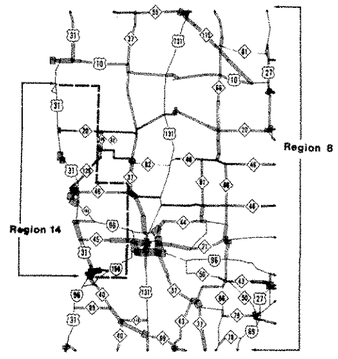
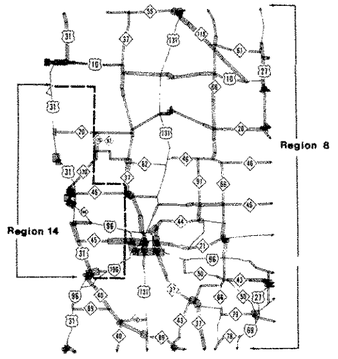
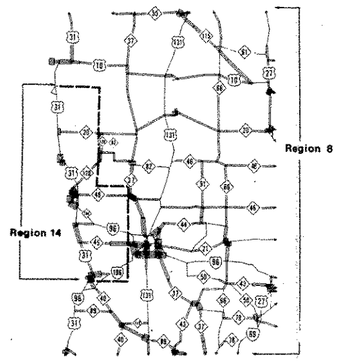
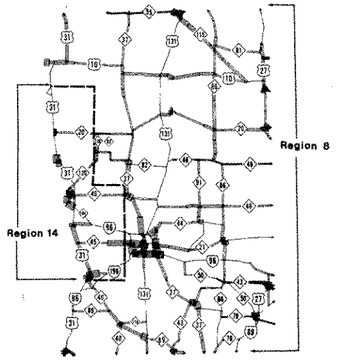
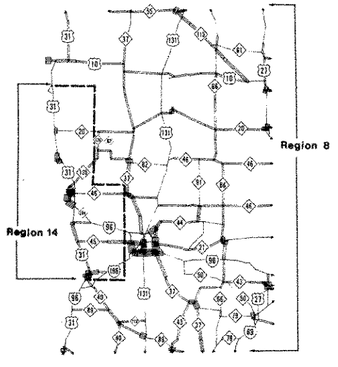
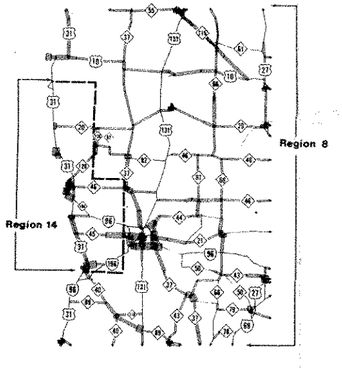
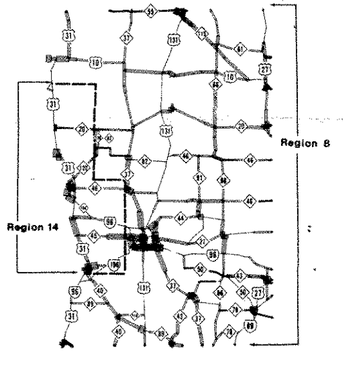
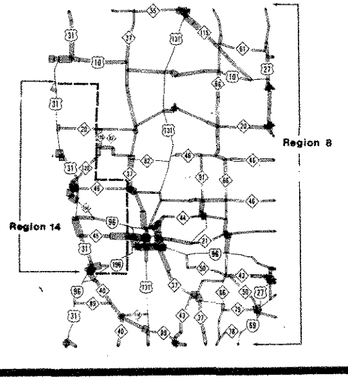
FORCED FLOW OPERATION AT LOW SPEEDS -
MANY STOPS

PHOTOGRAPHS - TRANSPORTATION RESEARCH BOARD

REGION 8 and 14

LEVELS OF SERVICE

LEGEND	
1, 2 And 3 Lines	Good Travel Conditions
4 And 5 Lines	Crowded Travel Conditions
6 Or More Lines	Unacceptable Travel Conditions

	2000 POPULATION LOW GROWTH	2000 POPULATION MEDIUM GROWTH	2000 POPULATION HIGH GROWTH
RESTRICTED FUTURE ENERGY SUPPLY			
CONSERVED FUTURE ENERGY SUPPLY			
ABUNDANT FUTURE ENERGY SUPPLY			

NOTE: 1 THESE SERVICE LEVELS REFLECT DESIGN HOUR VOLUMES AND DESIGN HOUR VOLUME CAPABILITIES

N. STUDY FINDINGS

Numerous conclusions have been reached during the course of this study. Obviously, they vary considerably in the degree to which they could affect transportation related decisions. While many of these findings are stated previously, others are less obvious. Therefore, the study team has attempted to objectively state some of those findings which are felt to be most pertinent. It is hoped that they will serve to highlight the major phases of the study and focus attention on the decisions that must be made.

The study findings include:

Aviation

Development of new utility type airport at Ionia County (west), Kent County (south), Montcalm County (southeast) and Montcalm County (west).

Upgrade the airports from utility to transport type at Big Rapids (Roben Hood), Greenville (Municipal), Holland (Tulip City), and Ionia (Ionia County).

Complete the Master Plan Study for improvements at Allegan (Padgham Field), Holland (Tulip City), and Sparta (Sparta).

Complete the Master Plan Update improvements at Grand Rapids (Kent County International).

Water Transportation Continue to monitor the carferry operation at Ludington. Maintain the navigation channels for the carferry service at Ludington.

Highway

Corridor Studies

South Beltline (M-10): I-96 to I-196, Kent County.

M-20: Remus to White Cloud, Mecosta and Newaygo Counties.

M-40, M-89, and M-118: City of Allegan, Allegan County.

Project Studies

M-37: 10 Mile Road in Kent County to M-82 north of Newaygo in Newaygo County.

M-44: I-96 to Plainfield Avenue, Kent County.

M-37: Caledonia to M-11, Kent County.

Non-Motorized

Projects should be constructed in conjunction with highway projects or independently as funds are available.

Public Transportation

There is a need for new or improved demand response type transit service for special individuals in the rural portions of each county (except Mecosta County and Yates Township in Lake County) in Region 8.

The transit system in Grand Rapids (GRATA) should be expanded. Intercity bus service should be provided for Allegan, Fremont, Otsego, and Sparta.

Additional east-west intercity bus service would be desirable to connect Big Rapids and Reed City with Mount Pleasant and Clare. More north-south service is needed between Ludington and Muskegon/Grand Rapids.

Coordination should be developed between intercity and local public transportation schedules and terminal facilities.

Coordinate intercity bus with rail passenger service.

Provide local intercity bus service along rail corridors to communities not served by rail, and supplement rail passenger service during low demand periods.

Grand Rapids should have direct rail passenger service consisting of about 3 daily round trips.

Rail Freight

Continue to monitor the subsidized operations of the Ann Arbor Railroad System, Michigan Northern Railway, and the Kent-Barry-Eaton Connecting Railway. Institute changes as required.

Monitor the pending or potential abandonment of Grand Trunk Western (Greenville-Carson City-Ashley), Conrail (Grand Rapids CBD), and Chesapeake & Ohio (Ionia-Portland-Grand Ledge).

Restore service on Fuller-Kinney (Conrail) segment if required. Monitor the possible abandonment of the Lake Michigan carferry service between Ludington and Kewaunee, Wisconsin by the Chesapeake & Ohio.

O. FUTURE PLANNING ACTIVITIES

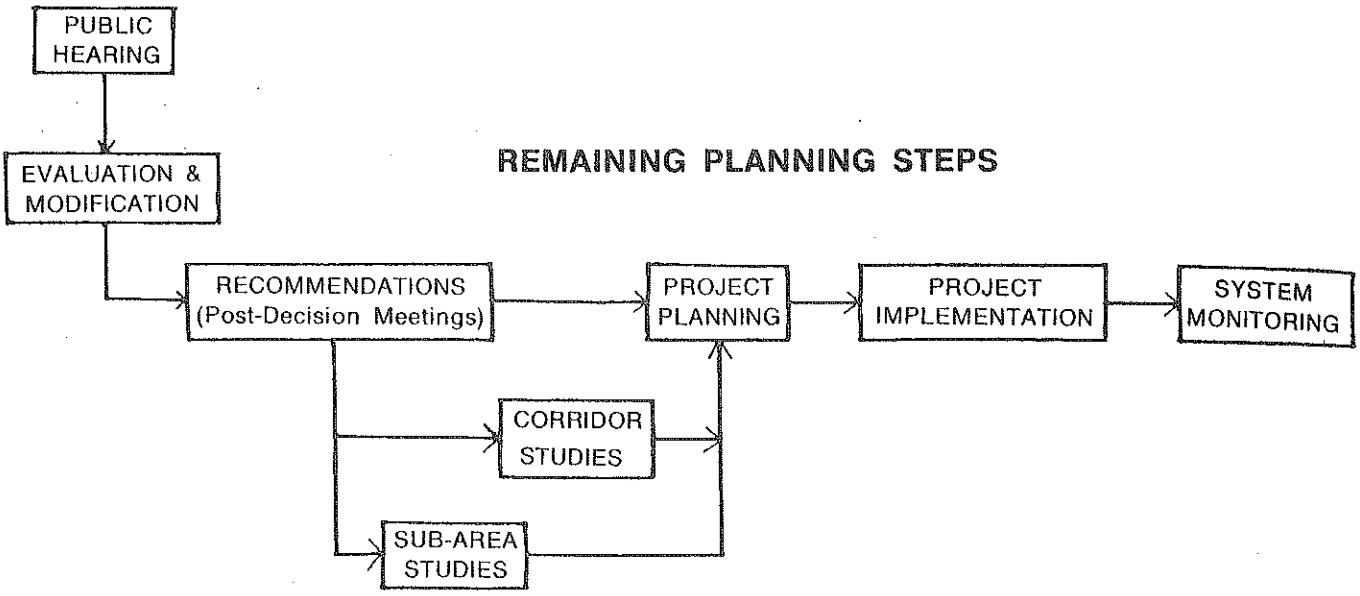
An objective of the Region 8 Transportation Study is to identify deficiencies and recommend necessary changes to the region's various transportation systems. However, in order for this objective to be fully realized, some additional planning steps are required. These planning steps are illustrated in the accompanying diagram (Exhibit O-1) and discussed below.

PUBLIC HEARINGS

Purpose

The Region 8 Transportation Study has completed the public hearing stage. The formal public hearing represents a critical phase in the study since it occurs prior to a decision-making point in the planning process. It is conducted at this time because flexibility still exists to make alterations, adopt new proposals, or proceed towards plan implementation. The public hearings ensure that all interested agencies, political jurisdictions, groups, and individuals have the opportunity to make or submit public statements, ask questions, voice disagreement, offer support, or make suggestions concerning the Regional Study. Questions and statements are answered or discussed and a public record made of these proceedings. In order to permit greater public understanding of the issues considered, this report was made available for public review before the hearing.

EXHIBIT O-1


PUBLIC HEARING
EVALUATION & MODIFICATION
REMAINING PLANNING STEPS
RECOMMENDATIONS (Post-Decision Meetings)
PROJECT PLANNING
PROJECT IMPLEMENTATION
SYSTEM MONITORING
CORRIDOR STUDIES
SUB-AREA STUDIES

The previous section of this report presented the primary findings of the study. This brings us to a major decision point. Before any further action can be taken, the options available to us must be thoroughly discussed with federal, state, and local public and private interests. A public hearing offers this opportunity.

After the public hearings were conducted, the study team evaluated the public comments received. Upon completion of this review, necessary process modifications were made to ensure that proper considerations will be given to all pertinent issues before making recommendations.

RECOMMENDATIONS

Post-decision meetings will be held in the region to present the final recommendations derived from the Regional Transportation Study. These meetings are important to the public involvement process since they provide an opportunity to view and understand exactly what has been recommended. They also illustrate the logical sequence of the planning process, making key decisions only after extensive studies have been completed. Because of the general nature of the Regional Study, these recommendations will be geared toward intensifying planning activities in areas having identified transportation problems. As illustrated in the preceeding diagram, recommendations can be made to initiate a Sub-Area Study or begin more detailed Project Planning. This decision is dictated by the degree of complexity of the problems identified in the Regional Study. These two planning phases are further explained in the following sections.

SUB-AREA STUDIES

One possible recommendation of the Regional Study is to concentrate planning efforts in one or more urban areas of the region. These Sub-Area Studies are necessary when an urban area contains several potential modal projects that may influence one another or when there are a significant number of alternative solutions. In these instances, a sub-area analysis is performed to test alternative solutions and identify specific parts of each modal network which will require project initiation.

Sub-Area Studies interrelate with regional studies but usually emphasize the special transportation needs of a particular community. Therefore, a stronger community involvement is reflected in the multi-modal transportation plans developed for the area.

These studies also include a refinement of various social, economic, and environmental impacts associated with various transportation alternatives and lay the groundwork for subsequent project planning steps.

PROJECT PLANNING

As shown in the diagram, project planning can be recommended from either the Sub-Area Study or directly from the Regional Study. The first situation was discussed under Sub-Area Studies. The latter situation would normally occur in rural portions of the region when project needs are identified which would not likely involve another mode or another facility of the same mode and no practical alternate exists other than the improvement of a particular facility, either on the existing or relocated alignment.

Project planning consists of performing detailed studies on a speific part of a transportation system. Realistic location alternatives for solving an identified problem are analyzed, with the most appropriate alternative being recommended for implementation.

Highway projects represent the most complex form of project planning, especially where new locations are being considered. As a result, additional highway corridor, alignment and design studies are required as a logical sequence in the project planning stage.

Project planning efforts for other transportation modes are usually not as involved since they have fewer alternatives to consider. At the present time, several modal projects in the region are being planned. The Regional Study will lend support to these projects since they conform with identified transportation problem areas.

P. Public Hearing Results

In July 1983, a total of 22 persons attended two public hearings conducted in the West Michigan Regional Planning Region in the communities of Big Rapids and Ionia. These hearings provided interested citizens an opportunity to participate in the planning decisions that may lead to the location, design, implementation, and construction of transportation facilities and services by this Department for Region 8.

Each hearing was held in two parts. The first half consisted of a Department presentation summarizing the data contained in the West Michigan Regional Transportation Study draft report, along with a discussion of the major study findings. After a brief intermission, the second part of the hearing provided an opportunity for persons to make comments, statements, offer suggestions, express opinions or ask questions regarding transportation related issues for Region 8.

During these hearings, five speakers took advantage of this opportunity. Some written comments were also sent to the Department. All testimony was recorded and an official public transcript was prepared. Copies of this transcript are available for review at the West Michigan Regional Planning Commission office in Grand Rapids and the Department's main office in Lansing. Examples of comments received at the hearings are paraphrased as follows:

Big Rapids

Why isn't the meeting held in the Grand Rapids area? The Southbelt highway is one of the hotest contested deficiencies.

It isn't necessary to apply federal standards in less populated areas and still make highway improvements.

Region 8 and 10 are medium to high growth areas.

Need railroad and airport capability.

Need solid waste movement in the railroad area.

Proposal to upgrade several airports, including Big Rapids, is sensible.

Endorse study of carferry operations at Ludington.

Corridor study of M-20 between Remus and White Cloud is appropriate.

Non-motorized transportation be constructed in conjunction with highway projects or independently as funds are available.

Look at additional east-west intercity bus service between Big Rapids and Reed City with Mt. Pleasant and Clare.

Continue to monitor the subsidized operations of the Ann Arbor Railroad System and Michigan Northern.

Ionia

Lack of foresight for year 2500.

Land, particularly agricultural land, will become increasingly important.

Lack of attention to maintenance of existing highways.

Studies have not predicated the future with any certainty.

Any study involving traffic patterns in southeastern Kent County have to be considered invalid.

Interchange at Whitneyville Road and I-96 has not been built.

Who makes and sets priorities?

Don't see where you are getting the input for the area that you are after.

Trying to cover such a vast area for the average person.

Need better system in notifying public of meetings.

Q. Recommendations

After the public hearings, the study team reviewed comments with Department and Regional personnel. Based on this review, the study team agrees that the West Michigan Regional Transportation Systems Study had adequately identified the major transportation system deficiencies and related issues and concerns for Region 8.

In order to move closer toward correcting these deficiencies, it is recommended that the accompanying list of modal improvements be advanced to the final transportation planning phase--Project Planning. Project planning consists of performing detailed studies on a specific part of a transportation system. Realistic alternatives for solving an identified problem are analyzed, with the most appropriate alternative being recommended for implementation. In regard to more complex projects, an Environmental Impact Statement is prepared to assist in a project's final determination. Project planning recommendations may include the specific design of a highway widening or relocation, an airport runway extension, type of bikeway, depth of harbor, local bus system, amount of rail subsidy, etc. Highway projects normally represent the most complex form of project planning, because a number of alternatives usually need to be considered. Project planning activities for other transportation modes are usually not as extensive since fewer alternatives are available for consideration.

Because the Department is primarily responsible for the planning, programming, design, construction, and operation of the state highway system, it will continue to assume the lead role in such activities. The process provides

the framework from which the Department, the West Michigan Regional Planning Commission, local units of government and special interest groups can more fully explore the specific needs and impacts associated with possible solutions. These may range from simple maintenance, to widening, to constructing a major new transportation facility.

The responsibility for project development for most of the other transportation modes rests primarily with either a local public agency, non-profit organization or private enterprise. Therefore, the Departmental role will be to provide technical assistance for their project planning efforts. Representatives of the Department and the Region will continue working with local officials as these projects progress.

Following is a brief overview of the modes in the Region: Included are recommendations developed through the study for problems identified in each mode.

Aviation

There are currently 17 airports serving Region 8. There are three types of airports; air carrier, utility, and transport airports. Air carrier airports are those which offer regularly scheduled airline service. Utility airports are general aviation airports with runways of 2,000 to 4,700 feet. Transport airports are also general aviation airports, but with a minimum runway length of 4,700 feet.

The Kent County International Airport in Grand Rapids is the only air carrier airport in Region 8. There are two transport airports in Region 8. These are located at Fremont and Ludington. There are 14 utility airports located in Region 8.

Recommendations

Development of new utility type airport at Ionia County (west), Kent County (south), Montcalm County (southeast) and Montcalm County (west).

Upgrade the airports from utility to transport type at Big Rapids (Roben Hood), Greenville (Municipal), Holland (Tulip City), and Ionia (Ionia County).

Complete the Master Plan Study for improvements at Allegan (Padgham Field), Holland (Tulip City), and Sparta (Sparta).

Complete the Master Plan Update improvements at Grand Rapids (Kent County International).

Water Transportation

Port development in the State of Michigan is associated with two types of waterborne activity-recreation and commerce. The responsibility within state government for recreational harbors is vested primarily in the Michigan Waterways Commission of the Department of Natural Resources. Planning responsibility for commercial harbors lies with the Department of Transportation.

The Ludington harbor is located in Mason County. This is the only commercial harbor within Region 8. Commercial activity at the Ludington harbor is dominated by the carferry operations of the Chessie System railroad. During recent years, service has been provided with three ferries between Ludington and the Wisconsin ports of Milwaukee, Manitowoc, and Kewaunee.

The most significant issue facing Ludington is the status of the carferry operation. Service was discontinued to Milwaukee in 1980 and to Manitowoc in 1982. Additional cutbacks are anticipated and future service could be radically different from the past. The rail section of this report further identifies the problems associated with the railroad carferries.

Maintenance of the navigation channels is another issue at Ludington. The channels must be periodically dredged in order to permit commercial traffic in the harbor. Potential problems concerning channel maintenance include continued economic justification for dredging and environmental consequences of dredged material disposal.

Recommendations

Continue to monitor the carferry operation at Ludington. Maintain the navigation channels for the carferry service at Ludington.

Highways

Region 8 has 931 miles of state trunkline. Reconstruction and rehabilitation of existing highways is the prime concern of the Department of Transportation. However, where monitoring of the highway system clearly indicates a need, and where a detailed planning process defines that need, relocation of existing highways or addition of new highways may be undertaken.

All highways were carefully analyzed using the Sufficiency Rating System. Every section of trunkline was "rated" in Capacity, Safety, Surface Condition, and Base Condition. Congestion levels, based on the capacity of a section of road related to the volume of traffic it carries, were also considered.

Projected traffic volumes, based on energy availability and population growth for future years were used to identify future problem areas. This information, together with highway transportation issues acquired through public input has enabled the Department to compile a list of deficient highway segments and recommendations for solutions to these problem areas.

Recommendations

Corridor Studies

South Beltline (M-10): I-96 to I-196, Kent County.

M-20: Remus to White Cloud, Mecosta and Newaygo Counties.

M-40, M-89, and M-118: City of Allegan, Allegan County.

Project Studies

M-37: 10 Mile Road in Kent County to M-82 north of Newaygo in Newaygo County.

M-44: I-96 to Plainfield Avenue, Kent County.

M-37: Caledonia to M-11, Kent County.

Non-Motorized

The primary network for non-motorized transportation (biking, walking, etc.) is the existing street system. Many urban and rural streets have adequate widths and low traffic volumes, and are considered safe for these activities without further improvements.

In many areas, higher motor vehicle speeds and volumes pose problems for non-motorized activities. Therefore, the concept of additional road width will form a base for the bicycle facility planning process.

The state non-motorized program requires that at least one percent of Michigan Transportation Funds received by each agency be used for non-

motorized facilities. Construction of new non-motorized facilities is recommended for areas that demonstrate a need in Region 8. These would be areas where a new link is needed to supplement a non-motorized system or a local plan.

Recommendations

Projects should be constructed in conjunction with highway projects or independently as funds are available.

Public Transportation

There are ten transportation agencies providing service to the general public in Region 8. Two of these are rural systems. One is the countywide Mecosta system and the other is the Yates Township service located in Lake County.

There are seven small community systems in the region. These predominantly demand-response system operate in the cities of Belding, Big Rapids, Greenville, Ionia, Ludington, Reed City, and Saugatuck.

The largest transit system in Region 8 is the 107 vehicle fixed route system operated by the Grand Rapids Area Transit Authority (GRATA). This is the second largest system in Michigan as it carries almost 5 million passengers annually. Service is provided to the communities of Comstock Park, Grand Rapids, Grandville, Kentwood, Wyoming, and to Grand Valley State College. Demand-response service supplements the fixed-route service providing transportation to elderly and handicappers.

Recommendations

There is a need for new or improved demand response type transit service for special individuals in the rural portions of each county (except Mecosta County and Yates Township in Lake County) in Region 8.

The transit system in Grand Rapids (GRATA) should be expanded. Intercity bus service should be provided for Allegan, Fremont, Otsego, and Sparta.

Additional east-west intercity bus service would be desirable to connect Big Rapids and Reed City with Mount Pleasant and Clare. More north-south service is needed between Ludington and Muskegon/Grand Rapids.

Coordination should be developed between intercity and local public transportation schedules and terminal facilities.

Coordinate intercity bus with rail passenger service.

Provide local intercity bus service along rail corridors to communities not served by rail, and supplement rail passenger service during low demand periods.

Grand Rapids should have direct rail passenger service consisting of about 3 daily round trips.

Rail Freight

Competing transportation modes have caused a steady decline in rail transportation and many carriers have gone bankrupt. These bankruptcies represent a possible loss of 2,000 miles of trackage in Michigan's lower peninsula.

The passage of the State Transportation Preservation Act of 1975 represents the State's initial commitment to maintain a statewide rail network through subsidization and other planning features. Further funds are provided by the Federal Rail Reorganization (3R Act) and the Rail Revitalization and Regulatory Act (4R Act).

Recommendations

Continue to monitor the subsidized operations of the Ann Arbor Railroad System, Michigan Northern Railway, and the Kent-Barry-Eaton Connecting Railway. Institute changes as required.

Monitor the pending or potential abandonment of Grand Trunk Western (Greenville-Carson-Ashley), Conrail (Grand Rapids CBD), and Chesapeake & Ohio (Ionia-Portland-Grand Ledge).

Restore service on Fuller-Kinney (Conrail) segment if required. Monitor the possible abandonment of the Lake Michigan carferry service between Ludington and Kewaunee, Wisconsin by the Chesapeake & Ohio.