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# REGIONAL TRANSPORTATION STUDY

REGION 14  
PLAN REPORT  
1984



PREPARED BY THE  
MICHIGAN DEPARTMENT OF TRANSPORTATION  
J. P. PITZ, DIRECTOR  
  
IN COOPERATION WITH  
WEST MICHIGAN SHORELINE  
REGIONAL DEVELOPMENT COMMISSION

MICHIGAN DEPARTMENT OF TRANSPORTATION  
WEST MICHIGAN SHORELINE REGIONAL TRANSPORTATION STUDY

1984

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.

MICHIGAN STATE TRANSPORTATION COMMISSION

William C. Marshall, Chairman  
Weston E. Vivian  
Hannes Meyers, Jr.

Carl V. Pellonpaa  
Lawrence C. Patrick, Jr.  
Rodger D. Young

Director  
James P. Pitz

Comments should be addressed to:

Josh Austin  
Director of Transportation Planning  
West Michigan Shoreline Regional Development  
Commission  
137 Muskegon Mall  
Muskegon, Michigan 49440  
Phone: (616) 722-7878

or forwarded directly to:

Phillip Lamb, Team Leader  
West Michigan Shoreline Regional Transportation  
Study  
Bureau of Transportation Planning  
Michigan Department of Transportation  
P.O. Box 30050  
Lansing, Michigan 48909  
Phone: (517) 373-9355

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## SUMMARY

The Region 14 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 three county jurisdiction of the West Michigan Shoreline Regional Development Commission. It involves Muskegon, Oceana, and Ottawa 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 Shoreline Regional Development Commission is a member of the study team.

Population in the Region is projected to increase 13.6 percent between 1980 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 four airports serving Region 14. 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.

Muskegon County International Airport is the only air carrier airport in Region 14. There are no transport airports in Region 14. There are three utility airports located at Hart/Shelby, Grand Haven, and Holland.

The Muskegon County International Airport will not need any major expansion, but will need continual improvement and modernization. Two new utility airports are recommended to serve the Coopersville and Whitehall/Montague areas. The Hart/Shelby Airport should receive improvements to bring it up to standards as a county airport for Oceana 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.

There are three commercial harbors within Region 14. These are located at Muskegon, Grand Haven, and Holland. It is recommended to maintain the navigation channels in all the harbors within the region and to promote the commercial harbors within the region. It is recommended to monitor the efforts by port interests in Region 14 to re-establish the cross-lake ferry services.

### Highways

Region 14 has 273 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.



There are several project studies recommended. These are M-45 from Allendale easterly to 24th Avenue in Ottawa County, M-120 from US-31 to the east county line of Muskegon County, M-104 through Spring Lake in Ottawa County, and US-31 from the City of Holland to the City of Ferrysburg in Ottawa 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 local road agency be used for non-motorized facilities. Construction of new non-motorized facilities is recommended for areas that demonstrate a need in Region 14. 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 three transportation agencies providing service to the general public in Region 14. One is the fixed-route, line haul system in

Muskegon. The other two are primarily demand-response systems in Grand Haven and Holland. The Muskegon Area Transit System (MATS) provides service to the residents of Muskegon and the surrounding communities of Muskegon Heights, Norton Shores, and Roosevelt Park. The Harbor Transit Dial-A-Ride provides demand-response service to the residents of Grand Haven, Spring Lake, and Ferrysburg. In addition, a limited fixed route service is provided during the summer months. The third system in Region 14 is a demand-response system operated by the City of Holland. This system was the first one started in the State of Michigan under Act 327. It began operating in February of 1974.

In addition to these three publicly-owned transit systems, Department of Transportation assisted specialized transportation is provided in Muskegon and Oceana Counties. This type of service is generally provided by human service agencies to their own clientele which are usually elderly and/or handicapped.

There will be a need for countywide demand response service in all three counties by the year 2000. The Muskegon area will need to expand service and improve service levels by the year 2000. The Holland area will need to expand their system to include the Zeeland area by the year 2000. Intercity bus service should be extended to the City of Coopersville. Additional intercity bus service should be provided along US-31, north of the Muskegon area.

#### Rail Freight

Competing transportation modes have caused a steady decline in rail transportation and many carriers have gone bankrupt. Competition and bankruptcies have jeopardized or caused the loss of trackage in Michigan's lower peninsula.

The passage of the State Transportation Preservation Act of 1975 represented the State's initial commitment to maintain a statewide rail network through subsidization and other assistance. Further funds were provided by the federal legislation and appropriations.

For Region 14, there are no specific recommendations for line changes. No improvements are currently recommended other than regular line maintenance and elimination of significant highway-grade crossing conflicts. It is recommended to continue monitoring of the system in order to determine if private sector lines authorized for abandonment should be operated and/or rehabilitated in a cooperative effort by all affected parties.

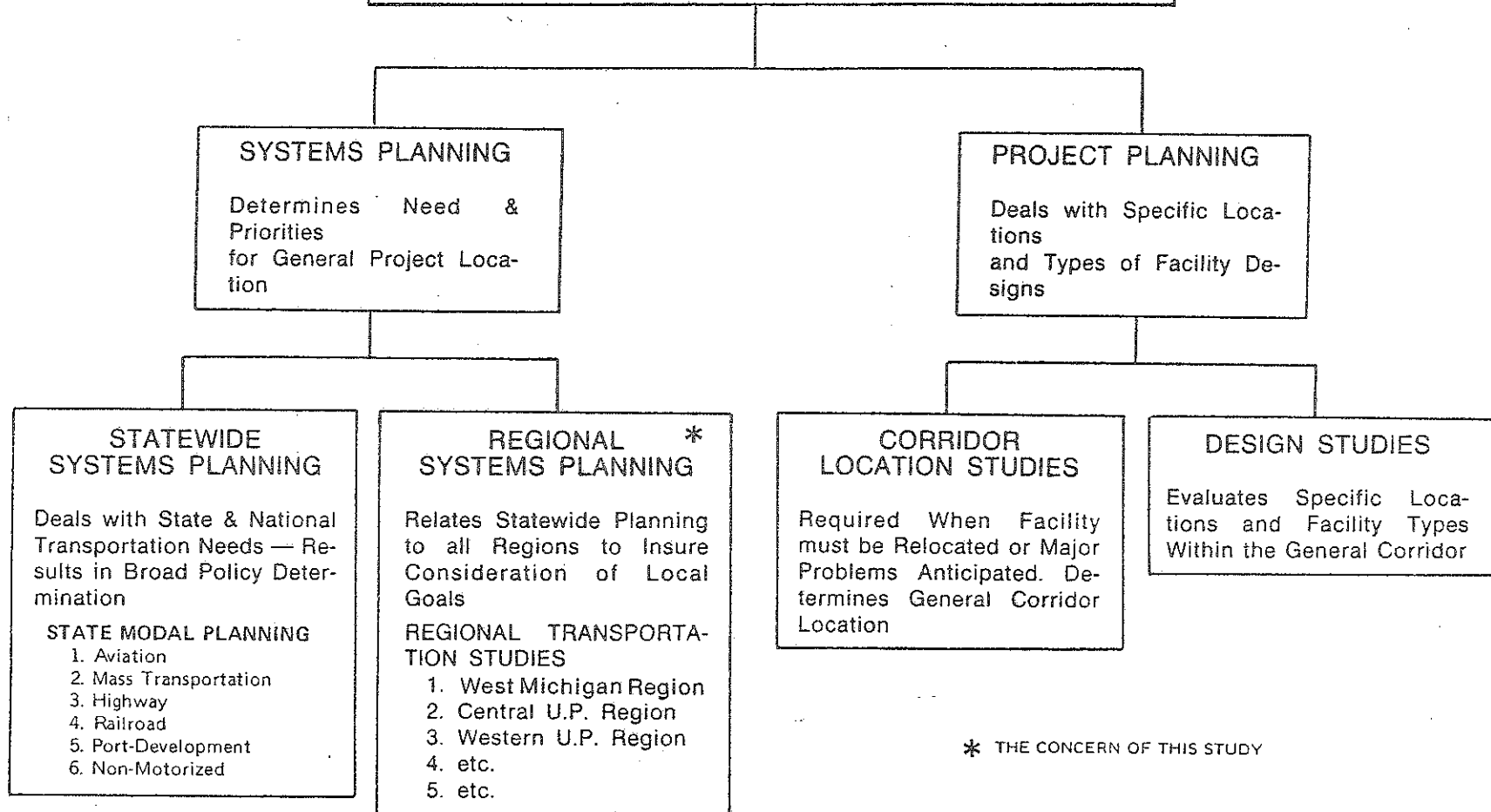
## A. INTRODUCTION

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 Shoreline Region (Region 14).

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

# TRANSPORTATION PLANNING



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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 three county jurisdiction (Exhibit A-2) of the West Michigan Shoreline Regional Development Commission. This agency has been designated by the Governor as the multi-county 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 Shoreline Regional Transportation Study represents the Department of Transportation's efforts towards meeting this objective.

#### PURPOSE OF THE STUDY

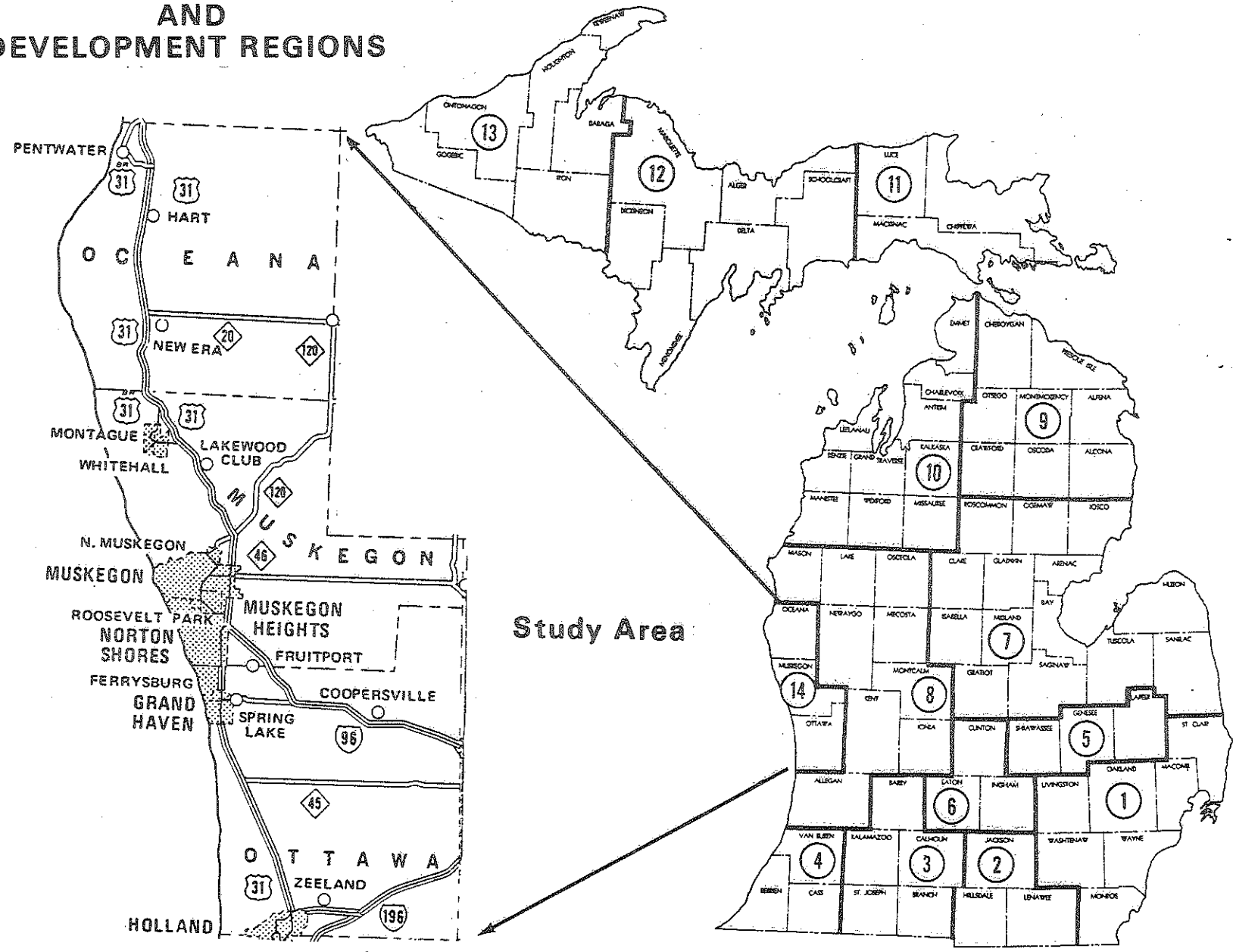
The West Michigan Shoreline Regional Transportation Study was initiated in 1975. The purpose of the study is to identify current and future deficiencies in the transportation system. This study will recommend sub-area, corridor and project studies that will result in recommendations for improving various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

#### 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

# STATE PLANNING AND DEVELOPMENT REGIONS

EXHIBIT A-2



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representing the West Michigan Shoreline Regional Development Commission (Region 14) 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) Pre-Study 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 Shoreline 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 occurring only in seven, eight, and nine are safe investments. Number seven is the future which most closely resembles present conditions.

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

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-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). Actual 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 Muskegon and the urbanized area surrounding it.

## 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) <sup>2/</sup>					
			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	94.7	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 <sup>1/</sup>	93 <sup>2/</sup>	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

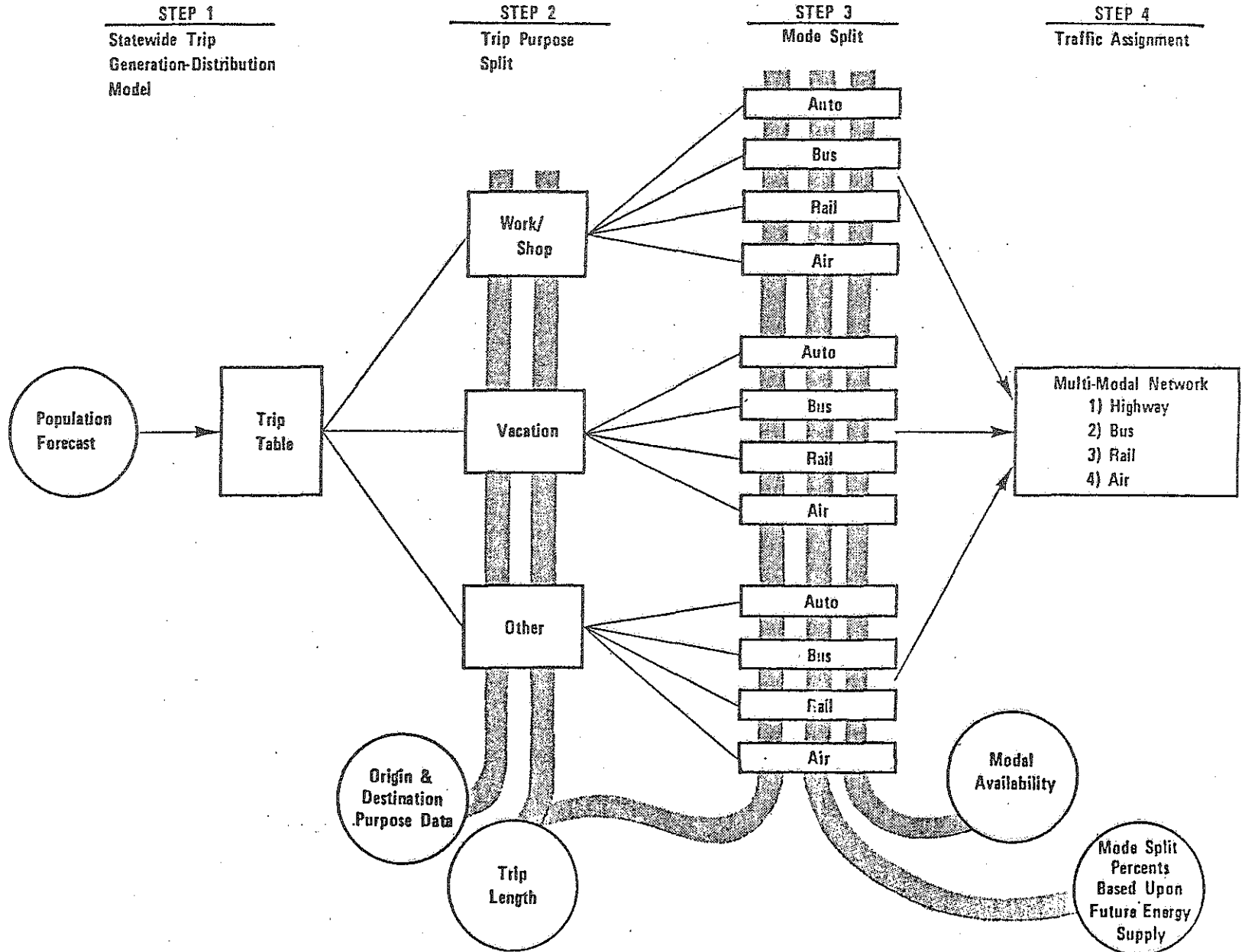
RESTRICTED  
ENERGY  
SUPPLY

TRIP PURPOSE	TRAVEL REDUCTION	MODE	TRIP LENGTH (MIN)					
			0-30	31-60	61-90	91-120	121-300	300+
WORK	0%	Auto	85 <sup>3/</sup>	84 <sup>4/</sup>	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



As part of the on-going Muskegon 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 Muskegon 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 14 plan. This has been done where appropriate.

Specific questions regarding products, proposals, and other activities may be directed to the Muskegon Area Transportation Planning Program, located within the West Michigan Shoreline Regional Development 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 scenarios 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 recommendations.

## B. SOCIAL AND ECONOMIC CHARACTERISTICS

### Population Trends and Projections

The total population of the West Michigan Shoreline Region for 1980 was 336,800, representing an 11 percent increase over 1970 and comprising 3.6 percent of the state population. The state population increased 4.3 percent between 1970 and 1980 (Exhibit B-1).

Muskegon County's population (157,600) accounts for 46.8 percent of the regional total, Ottawa County (157,200) accounts for 46.7 percent, while Oceana County (22,000) accounts for 6.5 percent. Muskegon County's population is concentrated around the City of Muskegon; Ottawa County's population is focused in three areas: the City of Holland, the City of Grand Haven, and Georgetown Township; Oceana County's population is dispersed throughout the county.

Population projections shown in Exhibit B-1 were prepared by the Department of Management and Budget (DMB) and were adjusted by DMB to reflect the 1980 population totals. These population projections indicate that by the year 2000 Oceana and Ottawa Counties are expected to increase 35 and 32 percent, respectively; Muskegon County is expected to decrease by 7.3 percent, while the region is expected to increase by approximately 45,800 people or 13.6 percent. The largest numerical increase is expected to occur in Ottawa County. This concentration of growth is an indicator that future transportation needs for the region may be located in Ottawa County.

## EXHIBIT B-1

## POPULATION, 1970 - 2000

<u>Area</u>	<u>1970<sup>1</sup></u>	<u>1980<sup>2</sup></u>	<u>Change</u> <u>1970 - 1980</u>		<u>1990<sup>3</sup></u>	<u>2000<sup>3</sup></u>	<u>Change</u> <u>1980 - 2000</u>	
			<u>Number</u>	<u>%</u>			<u>Number</u>	<u>%</u>
Muskegon	157,400	157,600	200	0.1	152,300	146,100	-11,500	-7.3
Oceana	18,000	22,000	4,000	22.2	26,000	29,700	7,700	35.0
Ottawa	128,200	157,200	29,000	22.6	182,400	206,800	49,600	31.6
Region 14	303,600	336,800	33,200	10.9	360,700	382,600	45,800	13.6
Michigan	8,881,800	9,262,100	380,300	4.3	9,644,800	10,085,500	823,400	8.9

<sup>1</sup> U.S. Census of Population, 1970.

<sup>2</sup> U.S. Census of Population, 1980.

<sup>3</sup> Michigan Department of Management and Budget. Population Projections for Michigan to the Year 2000, Lansing, 1982.



### Age Factors

According to the 1980 Census, the age distribution of the region's population is very similar to that of the state. The number of children in the region under five years of age has declined by 2.3 percent since 1970. This rate of decline has paralleled the statewide decline in this age group, reflecting declining birth rates which is a current national trend. The regional average of persons 65 years or older (9.9%) is slightly higher than the statewide average (9.8%). The percentage of persons 65 years or older was 10.7% in Muskegon County, 8.7% in Ottawa County, and 12.4% in Oceana County. Age distribution is not only a factor in estimating future population growth, but also in transportation needs for the young and elderly. These needs are usually in the area of public transportation.

### Health Care and Educational Facilities

Access to health care facilities and to institutions of higher education is an important element in transportation system development. There are five hospitals within the West Michigan Shoreline Region with a licensed bed capacity of 100 or more. Of these, three are located in Muskegon County, two in Ottawa County, and none in Oceana County.

Major institutions of higher education within the region are Grand Valley State College, Muskegon Community College, Hope College, Muskegon Business College, and Ottawa Area Vocational Center.

Public transportation service to these facilities needs to be evaluated. In addition, ridesharing activities associated with institutions of higher education should also be reviewed.

## Economic Characteristics

Muskegon and Ottawa Counties, containing the cities of Muskegon and Holland, respectively, comprise the economic heart of the West Michigan Shoreline Region. Major economic activities are chemical and automobile-related manufacturing. Oceana County depends primarily on agriculture and tourism for its economic base.

Significant changes in major employment categories occurred in the region between 1960 and 1970. Workers involved in the agriculture, forestry, and fisheries sector dropped from 4.7% to 2.8% of the total employed. Those employed in mining also decreased slightly. The number of persons working in all other industries increased.

Manufacturing accounts for the largest employment category in the region. Some 41% of the total number of employed persons were involved in manufacturing in 1970. The services category was the next largest, employing approximately 21.9%. Trade accounted for 15% of the total employment, while construction activities employed 5%.

The overriding problem in the region, despite the strong industrial base and an abundance of jobs for skilled workers, is the 15%\* unemployment rate. Seasonal fluctuations in agricultural and tourism-related employment make it difficult to find year-round work for those living in outlying areas. These workers migrate to the industrialized urban areas and increase the pool of unskilled labor already present there.

\*Based on April 1982, estimate from the West Michigan Regional Development Commission.

## Commuting Patterns

An important socio-economic consideration in terms of providing efficient transportation facilities is the trip to work. A majority (87.6 percent) of the employed regional residents worked within the region, however, a substantial number (5,249) of region residents worked in a county other than where they reside. The 1970 census revealed that 6.0, 31.3, and 38.0 percent of the total employed persons residing in Muskegon, Ottawa, and Oceana Counties, respectively, worked outside the county. Roughly a third (1,684) of Oceana County's employed residents worked in Muskegon County. The Whitehall/Montague Area was especially important as an employment center for those Oceana to Muskegon commuters. Approximately 3,565 persons commuted between Muskegon and Ottawa Counties with the worker exchange being essentially equal. The bulk of the commuting activity occurred between the Muskegon metropolitan area and Ferrysburg, Grand Haven, and Spring Lake.

The remainder of those regional residents which worked outside their county of residence (13,568), worked outside the region altogether. Over 80 percent (11,419) of the above residents were Ottawa County residents working in Kent County. Nine hundred and forty-six Holland Area residents work in Allegan County.

As for the non-regional residents working in Region 14, this group totaled 5,491 persons. The largest portion (2,869) of those commuters were residents of Allegan County working in the City of Holland/Zeeland area.

This interchange of commuters within the region has a definite impact on the transportation system which may need further examination as to possible carpool or vanpool potential.

### C. ENVIRONMENTAL FEATURES

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

This three county region significantly contributes to Michigan's agricultural productivity. Due to Lake Michigan's modifying effect and the variable soils, these counties are able to produce many fruit and vegetable crops that cannot be grown as successfully elsewhere in the state. Ottawa County is also noted for its poultry production. These high value crops make a significant contribution to the state's economy.

Some of the most unique resources of the region include long expanses of sand beaches, high sand dunes, bluffs, and dune-impounded lakes. The sand dunes in the vicinity of Grand Haven, Holland, Muskegon, and Little Sable Point have been designated for protection under the Sand Dune Act (Act 222, P.A. 1976). This act places certain restrictions on mining and development activities in these areas. The dunes and beaches provide a unique opportunity for recreational and educational activities and provide habitat for many coastal plant and animal species. The coastal lakes (Muskegon, Macatawa, White, and Pentwater) and the Grand River are heavily used for recreational boating and are recreational boat harbors. Grand Haven, Holland, and Muskegon also have commercial harbors. Silver Lake, a dune-impounded lake, is also a popular recreational lake, although it does not have access to Lake Michigan.

A number of critical nesting and migration areas have been identified in the West Michigan Shoreline Region. Some of the areas provide stopover points for migrating waterfowl, shorebirds, perching birds and hawks. Others provide nesting sites for a variety of waterfowl, gulls, herons, and terns. These include the Windmill Park Marsh in Holland, Port Sheldon Harbor, Pigeon Lake, and Muskegon State Park.

Region 14 is made up of several major river basins. These include the Black River which drains into Lake Michigan at Holland; the Grand River which drains at Grand Haven; the Muskegon River which drains at Muskegon; the White River which drains at Whitehall/Montague; and the Pentwater River which drains at Pentwater. The Grand and Muskegon Rivers have the largest drainage basins in the region. Several large lakes, many small lakes, rivers and streams, and wetland areas are generally associated with the rivers.

The water quality of rivers and streams in the region is generally good; however, some substandard areas occur particularly in the southern part of the region. Among the environmentally important rivers in the region are those being studied for inclusion in State or National River Programs. The Michigan Natural Rivers Act (Act 231, P.A. 1970) provides a system for preserving or enhancing values of Michigan streams including fisheries and recreation resources, floodplain preservation, and ecologic, historic, and scenic values. The Natural Resources Commission designates recreational, scenic, or wild rivers. The White River has been designated as a natural river under the Michigan Natural Rivers program. Several others have been proposed for study.

The forests, lakes, streams, and wetlands of the interior portions of the region also provide habitat for numerous wildlife species. The wetlands associated with the Grand, Muskegon, and White Rivers provide extensive waterfowl habitat. Many of the streams of the region have high quality coldwater fisheries. The streams are also used for spawning by several salmon species. These fish mature in Lake Michigan and return to the streams to spawn. Whitetail deer and small game are also major wildlife attractions in the region. Whitetail deer are found throughout the region but have greater numbers in the northern areas.

Oceana, Ottawa, and Muskegon Counties have 73 occurrence records of threatened and endangered plants and animals (Michigan Natural Features Inventory data base, 1983). Ten records represent six animal species all with threatened status under the Michigan Endangered Species Act. Only the Bald Eagle also has threatened status under the Federal Endangered Species Act. All six animals live in or are associated with rivers and/or wetlands.

Two birds, the Peregrine Falcon and Kirtland's Warbler, have endangered status under the Federal Endangered Species Act. Neither bird is known to breed in Region 14. However, they could be found in the area during migration.

The remaining 63 occurrence records represent 23 plant species. One species, Pitcher's Thistle, is currently under review for threatened status under the Federal Endangered Species Act. Two species, Eleocharis atropurpurea and Scirpus hallii have endangered status under the Michigan Endangered Species Act. The remaining species are

threatened in Michigan. Most of the plants are associated with sand dunes, interdunal wetlands, or inland lakeshores and pond margins. A minority of the species occur in prairie-like habitats or in northern mesic woods.

It should be noted that the high number of threatened or endangered plants are due to the influence of Lake Michigan. The Pitcher's Thistle is endemic to Michigan and only found along the shores of Lakes Michigan and Huron. Also, several of the listed species are known only from the Lake Michigan Coastal Plain and are a disjunct from the same species on the Atlantic Coastal Plain. Additionally, the Muskegon River marks the northern most range for many southern plant species.

Plant and Animal Preserves in Region 14

<u>Preserve</u>	<u>County</u>
Hoffmaster Natural Area	Muskegon, Ottawa
Kasey Hartz Natural Area	Muskegon
Kitchel Dunes	Ottawa
Five Lakes Muskegon Plant Preserve	Muskegon

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, six State parks, numerous private and public campgrounds, State game areas and recreation areas are available for recreational use. The beaches, dunes, and harbors attract people from all over the state to the region.

Besides its natural environmental values, the West Michigan Shoreline Development Region has substantial cultural resources of a historic and archaeological nature. A number of sites that are listed on or eligible for the National Register of Historic Places are found in the region, as are many other sites of State and local significance.

#### Environmental Impact Statements


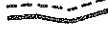





Federal and State legislation require detailed environmental impact studies be prepared on many transportation projects. Because of the site-specific nature of highways and airports, meaningful assessment of the relationship between a transportation improvement and a region's natural and human environment 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.

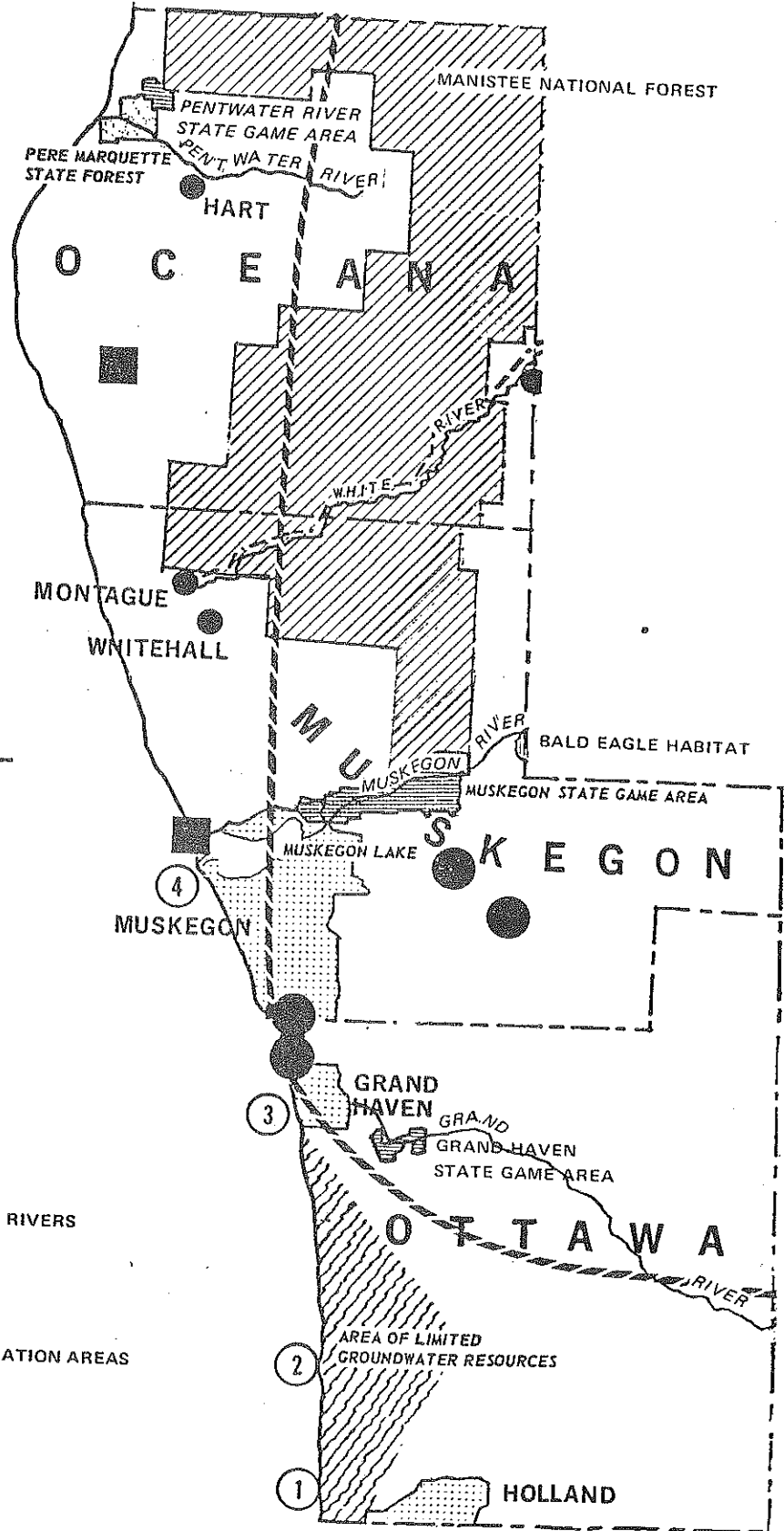
Among the important components of the environment which are given in-depth analysis at the project stage are wetlands, water quality, agriculture, aesthetics, vegetation, wildlife, noise impacts, and air quality. Another federal rule prohibits construction of any transportation project through a local, 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.



ENVIRONMENTAL  
FEATURES  
REGION 14

-  URBAN DEVELOPMENT
-  DESIGNATED MICHIGAN NATURAL RIVERS
-  MAJOR RIVER
-  CRITICAL BIRD NESTING AND MIGRATION AREAS
-  PROPOSED NATURAL AREAS
-  ESTABLISHED NATURAL AREAS
-  NIAGARAN REEF



#### D. TRANSPORTATION GOALS AND OBJECTIVES

Goals and objectives reflect a variety of social values related to transportation system development and maintenance in the Region 14 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 14 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, capacities, 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 cooperation 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 financial viability, stability, and efficiency within the Michigan railroad system.
3. Minimize adverse social and economic impacts resulting from changes in railroad service.
4. Promote and maintain safe railroad operations consistent with public need and carrier capability.

## ISSUES WITHIN THE REGION

There are numerous transportation issues which will influence the way the transportation system will develop and operate. Some of these issues are of local importance while others are of state and national significance.

Below is a list of general issues which have been identified through various sources. Some of these issues will be reviewed in this study, while others require either a statewide perspective, or relates to a specific project or program situation.

### Highways

- o Maintenance of the existing system versus improvement and/or expansion.
- o Weight and size restrictions for tractor-trailer trucks.
- o Upgrading US-31 to freeway standards throughout the region.
- o Improved access to central and east-central Michigan.

### Air Transportation

- o Level of service in the region.
- o Centralized service between the region and the Grand Rapids metropolitan area.
- o Commuter air service.

### Rail Freight

- o Reduction of rail freight service resulting from abandonment of lines.

- o Safe movement of hazardous rail commodities through the region.

#### Ports

- o Reinstatement of the Lake Michigan cross-lake auto/passenger ferry service at Muskegon.
- o Maintain the region's ports so they can accommodate more Great Lakes shipping.
- o Maintain capabilities to provide a means for winter shipping on the Great Lakes.

#### Non-Motorized

- o Extend facilities throughout the region.
- o Promote non-motorized travel to work.

## 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

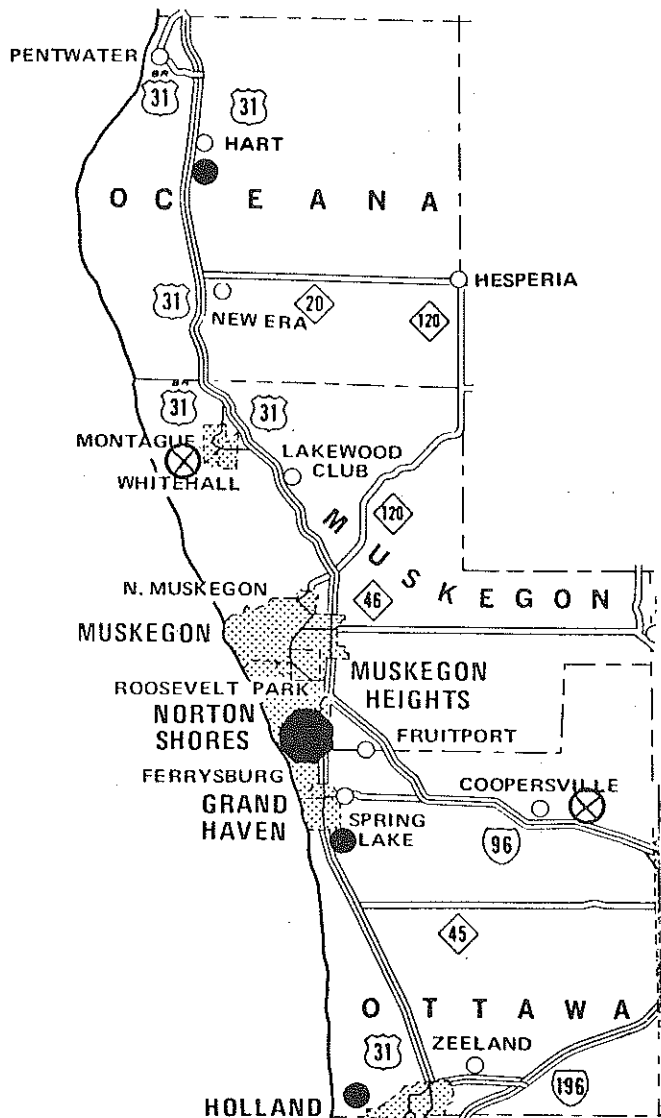
The Department's role in air transportation is to insure an orderly and timely development of the State's Aviation System. The State of Michigan, however, does not own or operate airports - - private interests or local/county governments do. The state can only make recommendations based on a logical, systematic process. To facilitate this process the Michigan Department of Transportation, in 1974, adopted a Michigan State Airport System Plan (MSASP) for the years 1975, 1980, and 1990. The Department is currently updating this plan with additional analysis of scheduled air service.

The purpose of the MSASP is to show projected level of aviation demand. This will enable communities to assess the potential community and environmental impacts associated with airport development. Depending upon the extent of these improvements, these considerations are addressed in more detail as local airport master plans are prepared or updated.

Exhibit F-1 illustrates the 1990 recommended airport system for the West Michigan Shoreline Region as contained in the MSASP. In addition to the four existing and recommended two additional airports contained in the plan, there are five small landing strips located in the region that are listed in the Michigan Airport Directory.

Airports are classified into two basic service-related categories:  
Air Carrier Airports and General Aviation Airports.

# EXISTING AND RECOMMENDED AIRPORTS



### LEGEND

- EXISTING UTILITY AIRPORT
- ⊗ NEW UTILITY AIRPORT (Not Site Specific)\*
- EXISTING TRANSPORT AIRPORT
- EXISTING AIR CARRIER AIRPORT

\*NOTE: AN EXISTING AIRPORT MIGHT BE SUITABLE FOR PUBLIC PURCHASE AND EXPANSION

## Air Carrier System

An Air Carrier Airport is an airport which offers regularly scheduled airline service. For the first half of 1984, Air Wisconsin and Midstate were the certified carriers providing passenger service to the Muskegon County International Airport, the sole Air Carrier Airport in the region. Air Wisconsin provided Muskegon County with nine flights a day, while Midstate offered eight daily flights.

These 17 flights provided 602 available seats (420 in 1982) from four cities non-stop. These cities are Chicago and Traverse City (Midstate) and Chicago, Battle Creek, and Elkhart, Indiana (Air Wisconsin). Midstate is flying 19-seat Swearingen Metroliners and Air Wisconsin flies a 50-seat DeHavilland (Dash 7).

During the summer of 1984, Simmons Airline began operating at the Muskegon International Airport. Simmons Airline operated nine daily flights, non-stop, to four cities using Short Brothers SH6's (36 seater) and Embraer Bandeirantes (18 seater) for a total of 270 seats available per day.

The Muskegon County International Airport has excellent facilities for handling larger commercial aircraft. The main northeast-southwest runway is 6,500 feet long and can serve all general aviation aircraft and smaller commercial jets. The crosswind runways are 5,000 and 3,461 feet long. The airport is capable of serving the 727 and DC-9 jets. In addition, many smaller general aviation type aircraft are served at the Muskegon facility, including business jets and propeller craft. The instrument landing system allows all-weather operations by both commercial and general aviation aircraft.

For the West Michigan Shoreline Region the recommended air carrier system of airports for 2000 will remain about the same. With a forecast of gradually increasing passenger demand, necessitate planning for future expansion and improvement of existing facilities. The trend of the commercial aviation industry toward the use of smaller fuel efficient aircraft will add to the need for improved ground facilities.

No new air carrier airports are currently planned for the West Michigan Shoreline Region, but continual improvement, modernization, and expansion of the present Muskegon facilities will likely be required.

In 1977, a study of Michigan's Air Carrier Airports was conducted by the Department of Transportation. Results from that study indicate that passenger service to and from the West Shoreline Region was generally perceived to be satisfactory by residents of the area. Chicago was the predominant final destination for air travelers from the region.

#### General Aviation System

General Aviation Airports provide a basic level of air service for local communities. These airports offer such communities, and businesses, the ability to access the vast market area provided by the entire air transportation system. In the West Michigan Shoreline

Region, these airports are accommodating about 240 locally registered general aviation aircraft (see Exhibit F-2). Typical main runway lengths vary from 2020 feet at the Oceana County Airport at Hart-Shelby to a 3750 foot runway at the Grand Haven Memorial Airport. Business jets and cargo aircraft are able to use the airports with the longer runways thereby encouraging economic development.

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 general aviation activity in a given geographical area.
2. To provide a reasonable geographic distribution of airports throughout the State.

The Michigan State Airport System Plan (MSASP) lists 162 general aviation airports, of which 56 are recommended as new airports. Four of the existing airports in the MASP are in Region 14, as are two of the recommended new airport sites. The two new general aviation airports recommended for the region are to serve the areas of Coopersville and Whitehall/Montague. Planning activities, however, have been suspended for the time being because MDOT is in the process of updating the 1974 MSASP.

The Hart/Shelby Airport is recommended to receive improvements to bring it up to standards in order to serve as the county airport of Oceana County.

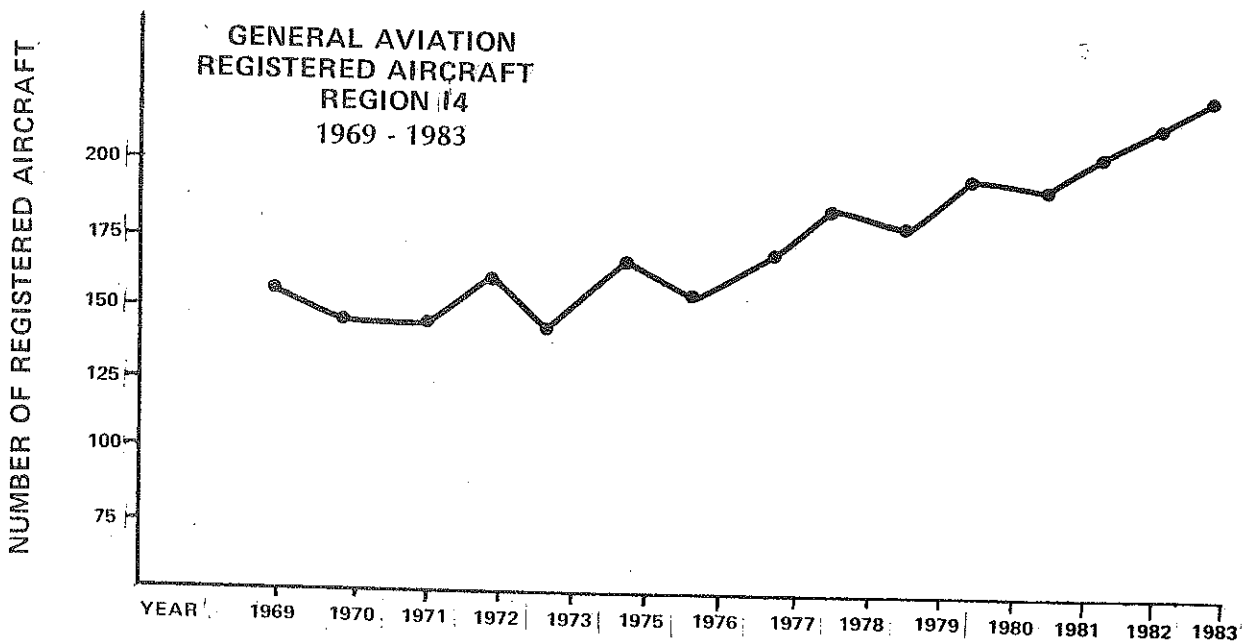
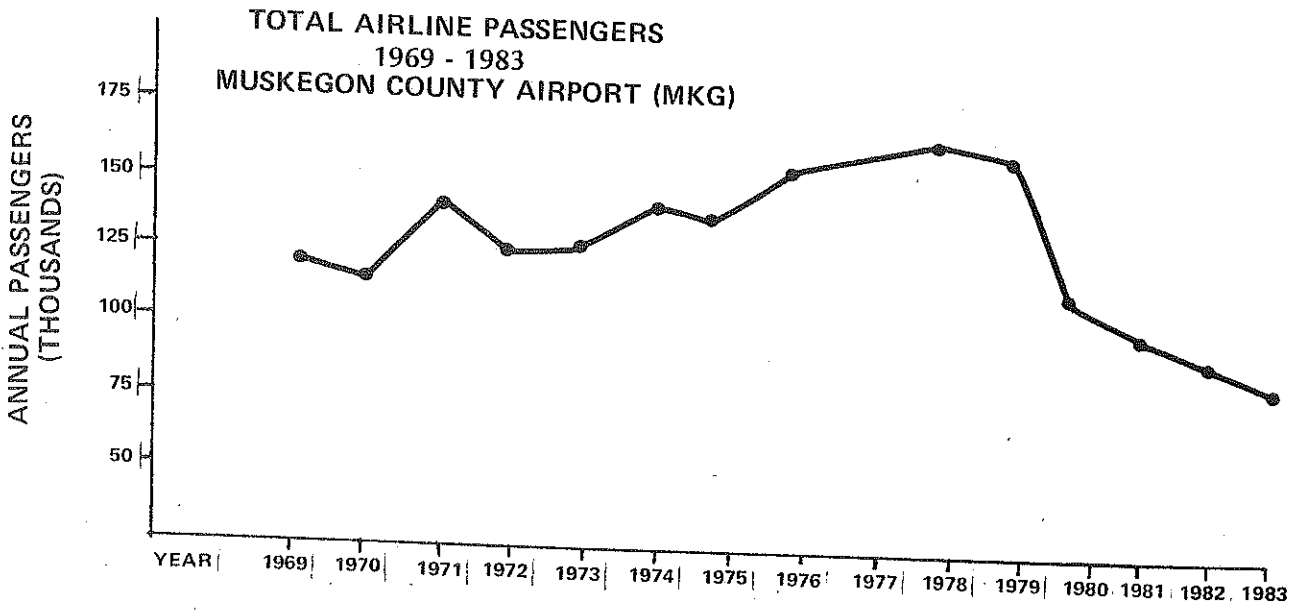
EXHIBIT F-2

GENERAL AVIATION  
AIRCRAFT REGISTRATIONS  
REGION 14  
1973-1983

<u>County</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1973-83 % Change</u>
Muskegon	68	73	73	70	83	78	86	79	74	75	79	+16.2%
Oceana	12	8	11	12	11	11	14	11	15	19	18	+50.0%
Ottawa	67	88	76	90	97	96	102	109	120	131	139	+107.5%
Region 14 TOTALS	147	169	160	172	191	185	202	199	209	225	236	+60.5%
Michigan TOTALS	6074	6276	6275	6274	6361	6513	6600	6770	6674	6680	6770	+11.5%

Source: MDOI, Aircraft Registration Records

EXHIBIT F-3



SOURCE: MDOT, BTP, AVIATION PLANNING SECTION

## G. WATER TRANSPORTATION

Port development in the State of Michigan is associated with two specific types of activity: (1) recreational harbors and (2) commercial harbors. The responsibility within state government for recreational harbors and harbors of refuge is with the Michigan Waterways Commission of the Department of Natural Resources. The planning responsibility for commercial harbors lies within the Michigan Department of Transportation. Region 14 ports are depicted on Exhibit G-1.

### Commercial and Recreational Harbors

Region 14 is situated along the eastern shore of Lake Michigan and has approximately 78 miles of coastline. The most prominent water feature in the Region is the Muskegon Harbor which extends to the very center of the City of Muskegon. These geographical characteristics make water transportation of great importance to the Region. Commercial harbors within the Region - Muskegon, Grand Haven, and Holland have facilities capable of serving large commercial ships. It is anticipated that by the year 2000, no additional harbors will be used for commercial shipping, with the exception of occasional commercial fishing with shallow draft vessels operating from recreational harbors.

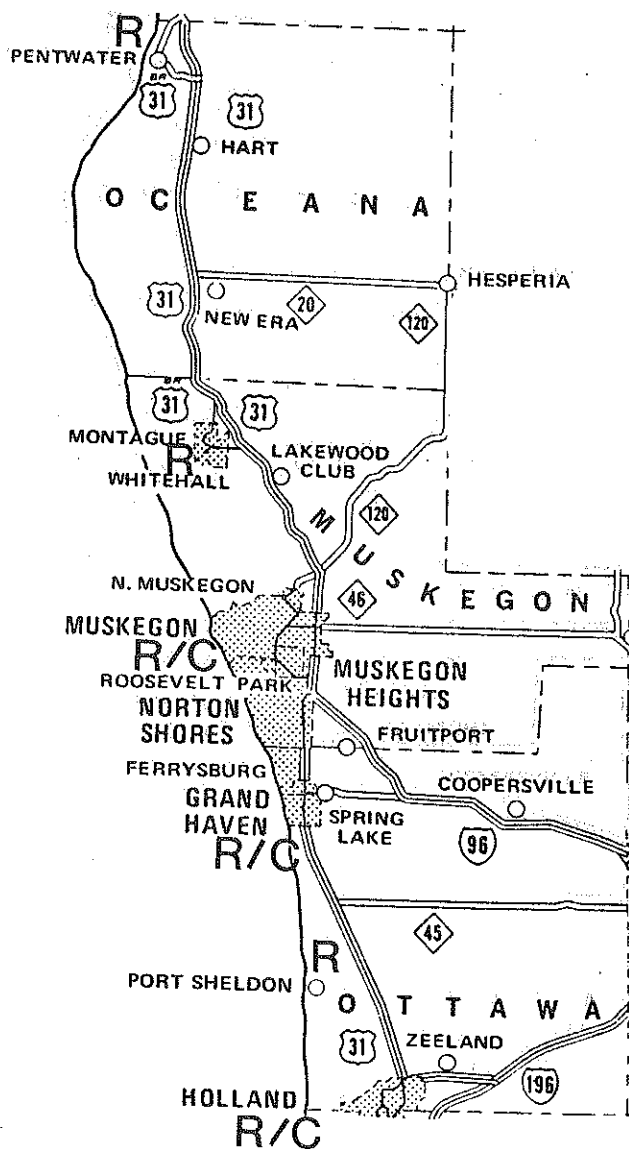
### Port Of Muskegon

The Port of Muskegon is located in Muskegon County and is used for the receipt of several diverse cargoes, particularly large receipts of coal and cement. A commercial dock also provides cranes and other general



EXHIBIT G-1

COMMERCIAL AND RECREATIONAL HARBORS



LEGEND

- C-Commercial Harbor
- R-Recreational Harbor

cargo capabilities, although this type of traffic has diminished. A channel has been dredged from the deeper water of Lake Michigan to Muskegon Lake and slips have been dredged at various locations on the shore. The port is served by large Great Lakes vessels and ocean freighters.

Exhibit G-2 identifies tonnages shipped from the Port of Muskegon by the number of vessels during the period 1968-1981. Traffic ranged from a low of 1,158,499 tons in 1981 to a high of 3,765,652 tons in 1965. During that period, a trend of decreasing shipments is evident. Decreases are due to elimination of cross lake service and a general decline in international shipments.

#### Grand Haven

Grand Haven is located in Ottawa County at the mouth of the Grand River and is used primarily for the shipment of sand, receipt of limestone, slag, coal, and for storage of recreational craft. Five docks are located along the main channel and are clustered between one and two miles from the river mouth. The channel is dredged to 21 feet and is further limited by a 700 foot turning basin which restricts the size of vessels using this port.

Exhibit G-2 identifies tonnages shipped from Grand Haven and the number of vessels during the period 1968-81. Traffic ranged from a low of 430,087 tons in 1981 to a high of 3,693,175 tons in 1969. During the last few years, shipments have varied significantly.

## Holland

Holland Harbor is located in Ottawa County. The docks are located at the extreme east end of Lake Macatawa within Holland. Its harbor provides safe refuge for large vessels between Benton Harbor/St. Joseph and Grand Haven, a distance of about 80 miles. Commercial traffic consists of coal, slag, fertilizers, and limestone. Exhibit G-2 identifies tonnages received at Holland during the period 1968-81. Traffic ranged from a low of 232,302 tons in 1970 to a high of 491,916 tons in 1978.

EXHIBIT G-2  
COMMERCIAL WATERBORNE TRAFFIC AT MUSKEGON, GRAND HAVEN,  
AND HOLLAND, FOR 1968-1980  
Total Tonnage

Year	Muskegon	Grand Haven	Holland
1968	3,765,652	3,436,572	284,035
1969	3,402,747	3,693,175	263,308
1970	3,554,628	3,328,447	232,302
1971	3,541,910	3,134,058	276,872
1972	2,835,823	2,977,109	261,738
1973	2,922,730	2,504,551	448,314
1974	2,508,138	2,215,873	368,891
1975	1,945,311	1,138,133	338,089
1976	2,270,826	830,858	338,735
1977	1,912,425	499,510	377,122
1978	1,952,476	701,711	491,916
1979	1,906,688	1,009,966	451,492
1980	1,235,315	585,202	263,177
1981	1,158,499	430,087	263,974

Waterborne Commerce of the U.S., 1981, Part III, Army Corp. of Engineers.

EXHIBIT G-2

WATERBORNE COMMERCE AT  
MUSKEGON HARBOR, 1981

<u>Commodity Group</u>	<u>Tonnage</u>
Coal	1,030,877
Chemicals	20,651
Cement	73,223
Primary Metal Products	6,205
Nonmetallic Minerals	27,535
Other	8
TOTAL	1,158,499

WATERBORNE COMMERCE AT  
GRAND HAVEN HARBOR, 1981

<u>Commodity Group</u>	<u>Tonnage</u>
Coal	95,423
Nonmetallic Minerals	229,308
Chemicals	14,391
Primary Metal Products	90,889
Other	76
Total	430,087

WATERBORNE COMMERCE AT  
HOLLAND HARBOR, 1981

<u>Commodity Group</u>	<u>Tonnage</u>
Coal	129,730
Nonmetallic Minerals	77,794
Chemicals	14,627
Primary Metal Products	41,823
TOTAL	263,974

## 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 273 miles are located in Region 14.

### 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 pursued. 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 sufficiency rating (evaluation score) is comprised of four categories: surface, base, safety, and capacity. Each section 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.

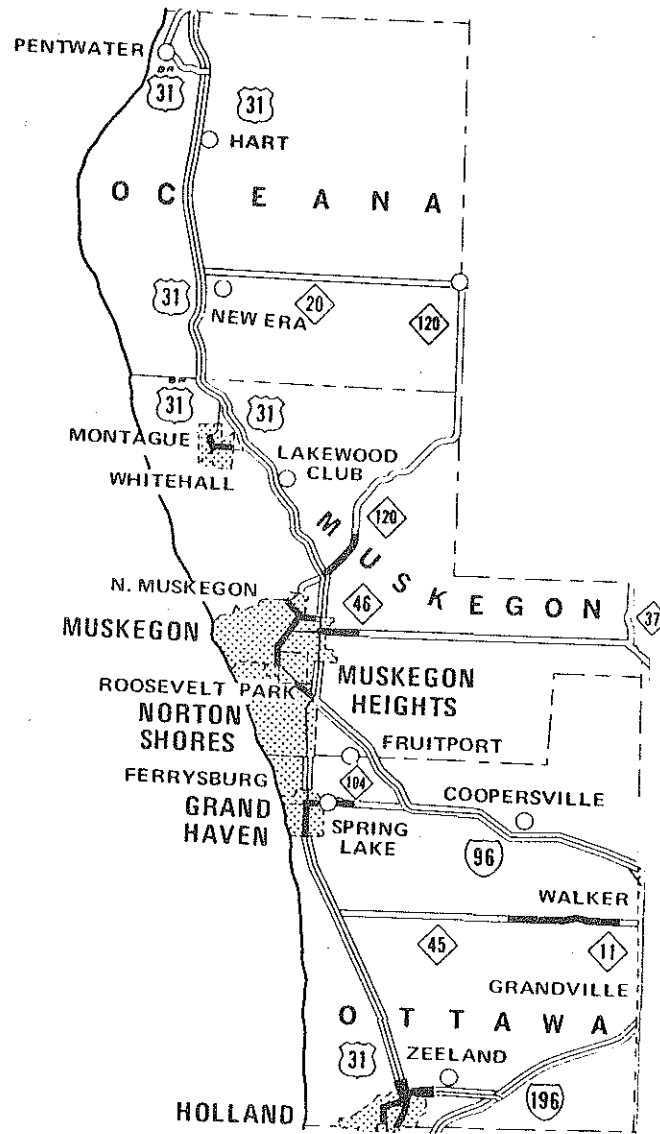
The safety rating calls attention to excessive or extraordinary conditions creating potential hazards. Existence of fixed objects (trees, utility poles, sign posts, abutments, etc.) in proximity to the pavement edge constitutes such a condition. Accident frequency, type, and severity are also considered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

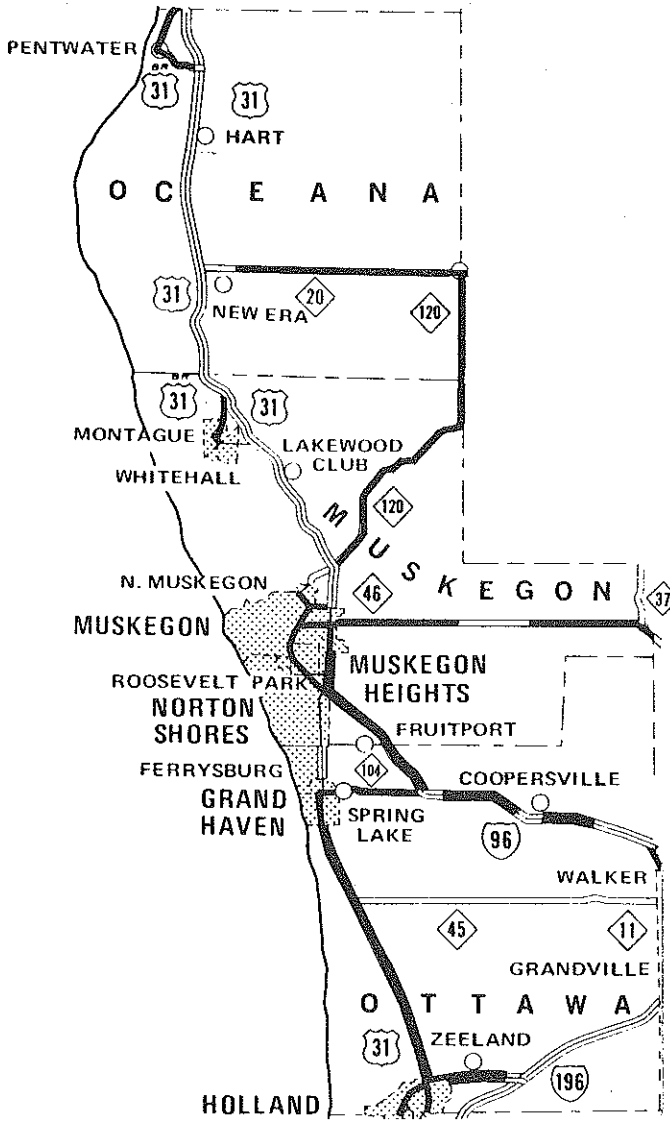


# 1982 SUFFICIENCY RATING FOR CAPACITY

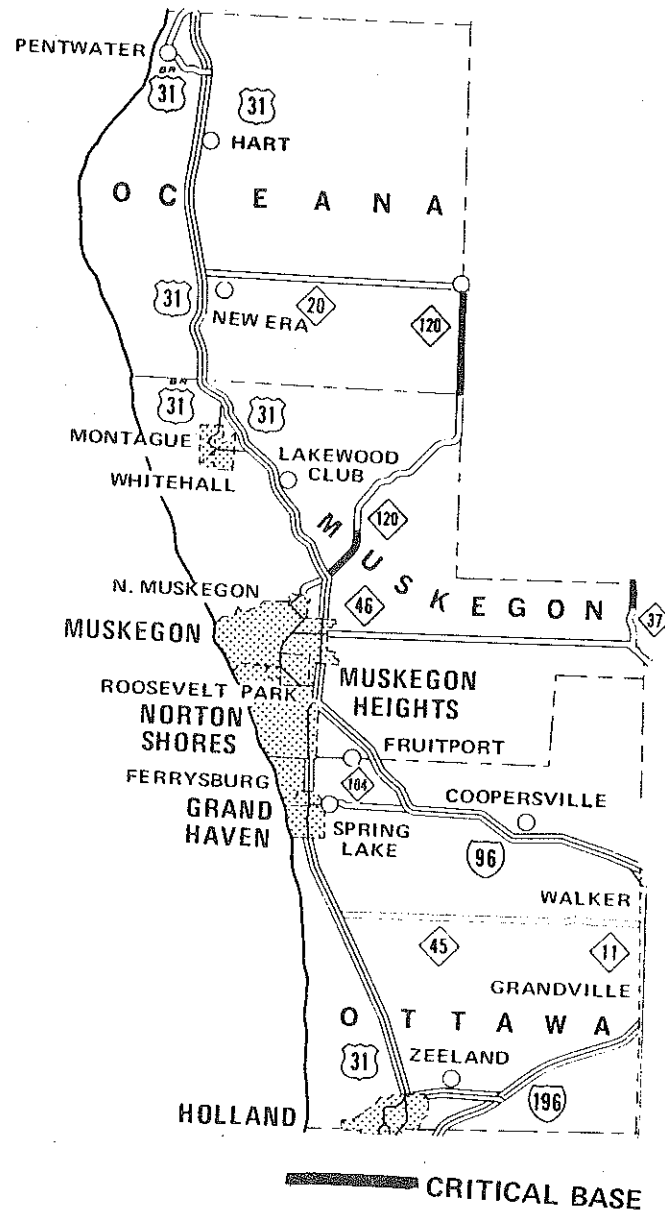


**CRITICAL CAPACITY**

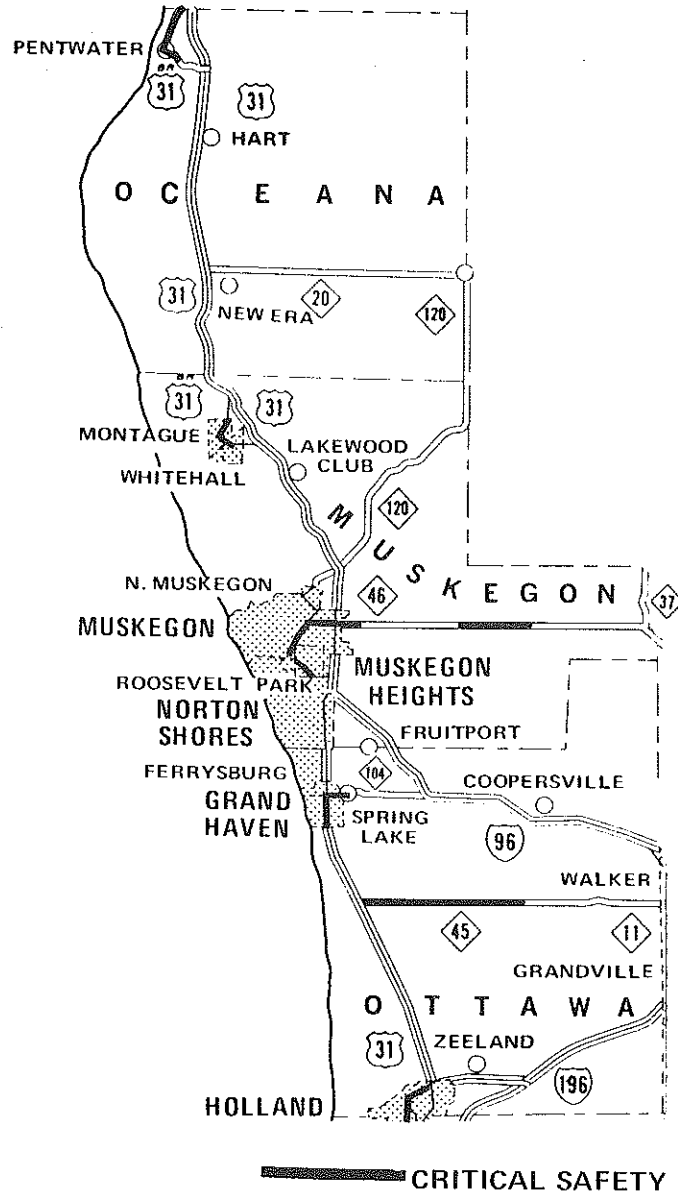
# 1982 SUFFICIENCY RATING FOR SURFACE



# 1982 SUFFICIENCY RATING FOR BASE



# 1982 SUFFICIENCY RATING FOR SAFETY



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

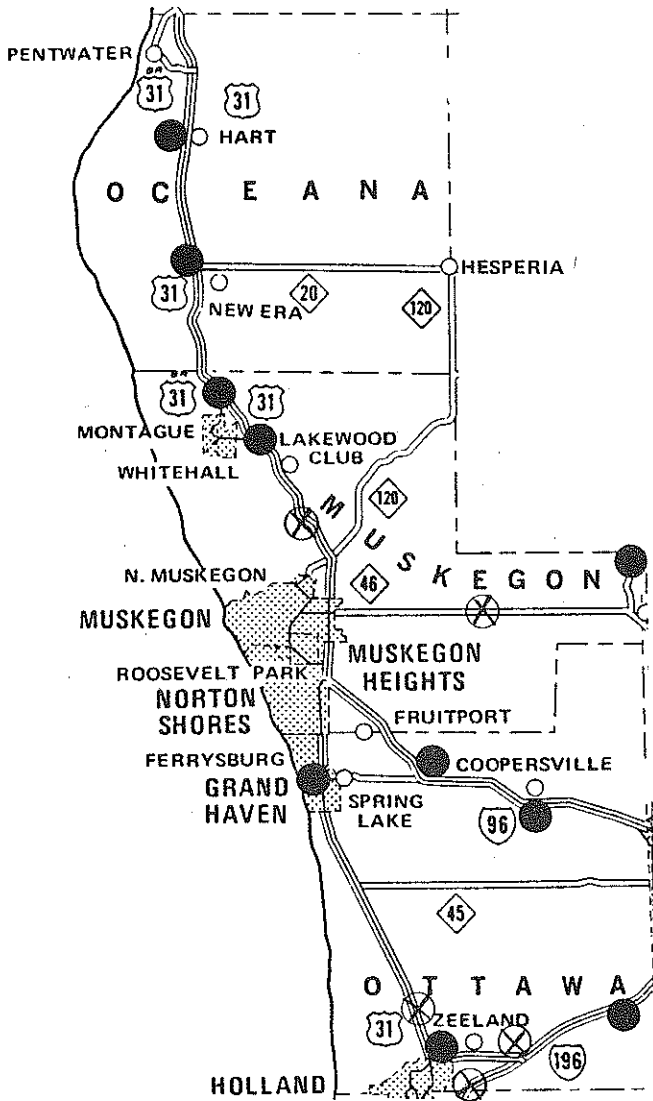
To accomplish this separation of major and minor improvement types, an attempt has been made to separate capacity deficient segments from all others. The main reason for this distinction is that capacity deficient highways sometimes require a major transportation improvement. Major improvements usually 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

STATE CARPOOL PARKING LOTS



- LEGEND
- EXISTING LOT
  - ⊗ AREA UNDER STUDY

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 identifies the existing commuter carpool lots in Region 14.

#### Highway Issues

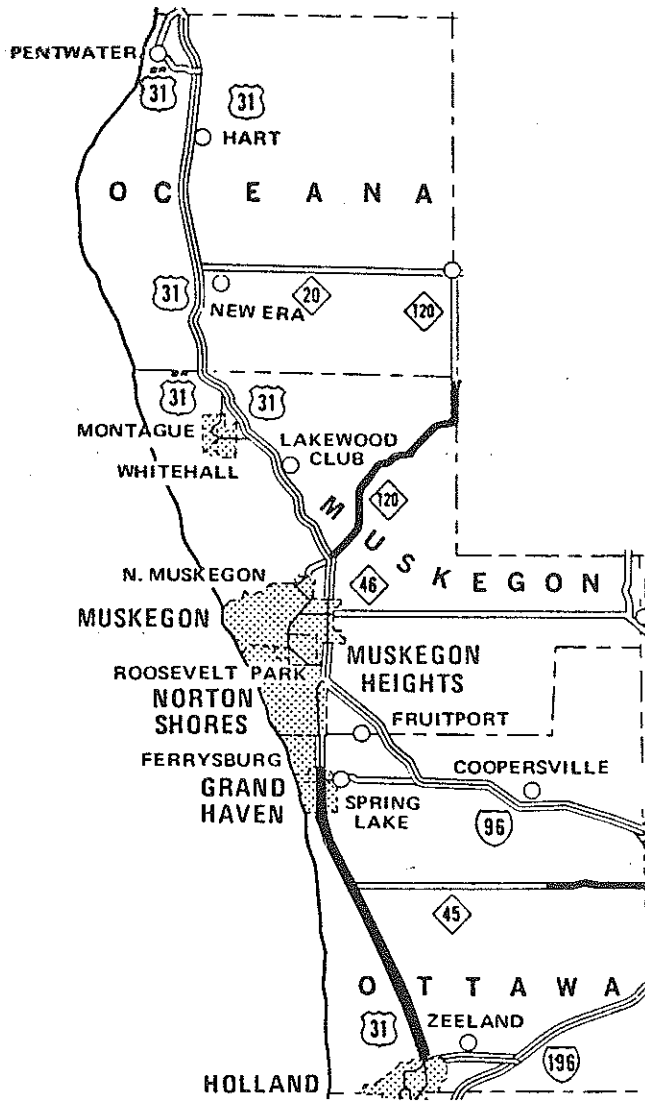
- o Maintenance of the existing system versus improvement and/or expansion.
- o Weight and size restrictions for tractor-trailer trucks.
- o Upgrading US-31 to freeway standards throughout the region.
- o Improved access to central and east-central Michigan.

#### Highway Recommendations

##### Project Studies:

- M-45: Allendale easterly to 24th Avenue, Ottawa County
- M-120: US-31 to the east county line of Muskegon County
- US-31: City of Holland to the City of Ferrysburg
- M-104: Through Spring Lake in Ottawa County

EXHIBIT H-6  
HIGHWAYS



Legend

———— PROJECT STUDIES



## I. NON-MOTORIZED TRANSPORTATION

### Background

The bicycle provides an inexpensive, energy efficient mode of transportation. The bicycle supplements the motorized methods of travel and also provides a means of recreation.

The existing road system serves the cyclist as well as the motorist. Improvements to the system can accommodate a mix of the motorized and non-motorized modes and improve safety. Non-motorized improvements can take a variety of forms including; separate bicycle paths, bicycle lanes, paved shoulders, special bridges or bridge widenings, sewer grate replacement, and special signing and striping. In addition, recreational riding can be provided for by developing abandoned railroad lines and utility corridors as multi-use recreational trails incorporating bicycling, horseback riding, and hiking.

State transportation law requires that each local road agency receiving Michigan Transportation Funds (from gasoline and vehicle weight taxes) spend an average of at least one percent of these funds each year during a ten-year period for non-motorized facilities. The law also requires that each administering local road agency annually prepare and submit to the MDOT a 5-year program for the expenditure of available funds.

At this point in the study process it is too early to discuss specific programs or project locations. However, existing facilities, anticipated non-motorized demands, and the impacts of the availability of energy and changes in population growth will be addressed.

### Existing Facilities

The primary network for bicycle transportation is the existing street system. Many streets are considered safe for bicycling without any special improvements. This includes streets with low traffic volumes and adequate lane widths. Many urban and suburban residential streets fall in this category.

In rural areas, the higher speeds of motor vehicles pose additional problems for the bicyclist. Some rural roads are suitable for bicycling because of low traffic volumes. Of the 273 miles of state trunkline in the region, over 93 have traffic volumes low enough to permit safe riding without the addition of paved shoulders.

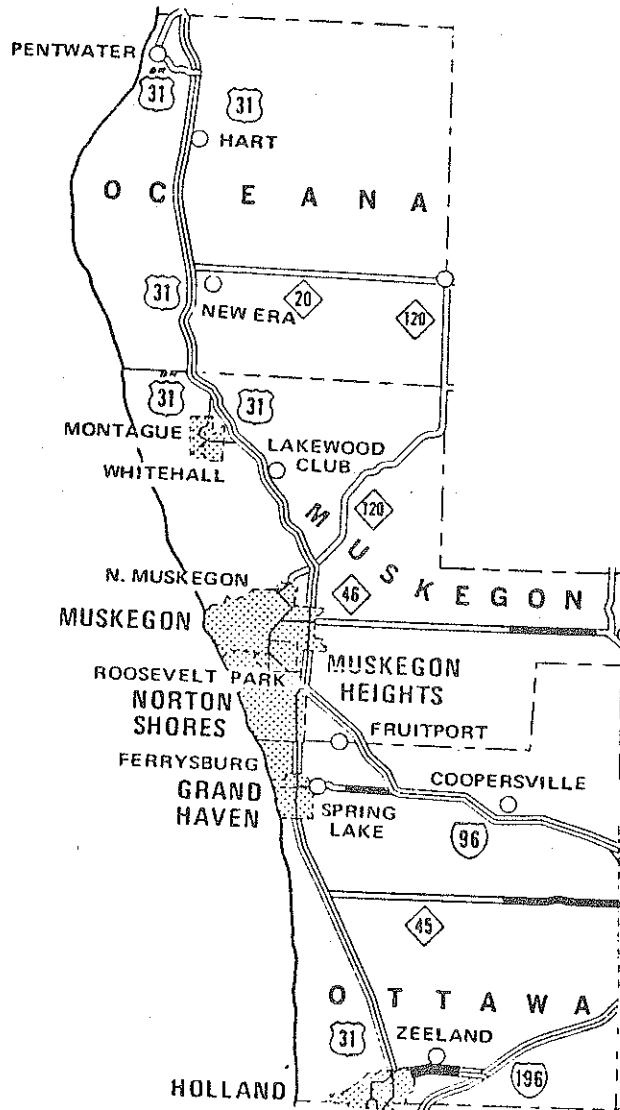
### The Effects of Population Growth and Energy Availability

It is difficult to assess the effects of population and energy on the non-motorized transportation mode. Little data is available on current bicycle use or the actual number of bicycles, since they do not have to be registered.

Nationally, bicycle sales peaked in 1972-73 and, following a slight decline, have remained relatively constant. Bicycle manufacturers predict a steady growth in the industry with sales almost doubling by the end of the study period. Thus, it seems reasonable to assume that a moderate increase in bicycle use will occur as the population increases.

A restricted energy supply might also result in an increase in bicycle use for transportation. Survey data indicate most bicycle trips in the United States are under five miles in length. Many urban trips could be

EXHIBIT I-1  
NON-MOTORIZED FACILITIES



LEGEND

Existing Facilities

made by bicycle. In rural areas the potential for substitution for automobile trips is much less since most rural bicycle trips are recreational in purpose.

#### Anticipated Non-Motorized Demand

It seems reasonable to predict that during the study period there will be moderate increases in bicycle use particularly in urban areas. This trend will be accentuated by any significant population increase or restriction on fuel availability. The state non-motorized program should lead to an increase in the number of special facilities built to accommodate bicycle travel. The location and types of facilities constructed must be based on sound planning and engineering principles and should be influenced by those segments of the public interested in bicycle transportation and in the overall regional transportation system.

## J. PUBLIC TRANSPORTATION

### Background

The resurgence of public transportation in the mid-seventies as an alternative to the automobile was evidenced by increased ridership resulting from higher levels of service and modern well-equipped buses. Since 1972, annual ridership nationwide 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 92 million to 96 million annual passengers. During this same period, the number of public transit systems increased fivefold from 12 to 61. This increase would have been even more dramatic if not for the continuing decline in ridership in the Detroit metropolitan area.

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 can 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 cost.

### 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 an area like Muskegon. There are four geographically distinct planning area types used for state public transportation planning. These consist of rural, small community, small metropolitan, and metropolitan. These areas are characterized by a population range, population density, and blend of transit service as outlined in Exhibit J-1.

The Detroit urbanized area represents the only metropolitan community in the state. There are 10 small metropolitan areas including the Muskegon urbanized area. There are 191 small community areas and 83 rural areas consisting of the rural portion of each of Michigan's counties.

### LOCAL PUBLIC TRANSPORTATION

Local public transportation consists of general or special transit service available to the public at the local governmental unit level.

### Existing Service

There are three transportation agencies providing service to the general public in Region 14 (Exhibit J-2). One is the fixed-route, line haul system in Muskegon. The other two are primarily demand-response systems in Grand Haven and Holland.

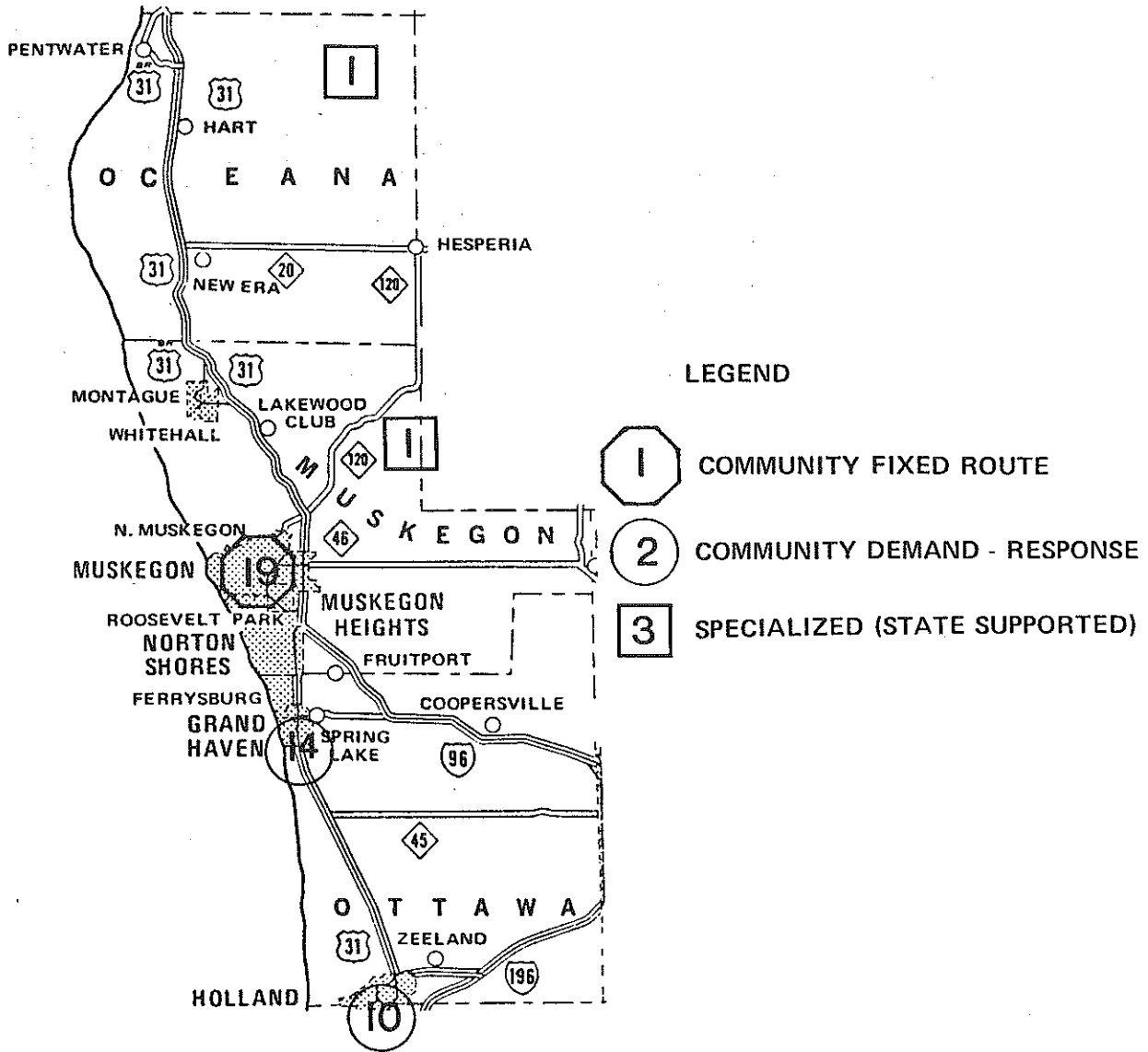
The Muskegon Area Transit Systems (MATS) provides service to the residents of Muskegon and surrounding communities of Muskegon Heights, Norton Shores, and Roosevelt Park. Operational statistics for the years 1976-1981 are contained in Exhibit J-3.

EXHIBIT J-1

PLANNING AREA TYPES AND DEFINITION COMPONENTS

<u>Area Type</u>	<u>Population Range</u>	<u>Population Per Square Mile</u>	<u>Transit Service Characteristics</u>
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.
Small Community	2,000 to 50,000	100 to 3,000	Low to moderate level of fixed-route service; moderate to high level of demand-responsive service (sometimes provided for portions of the day only).
Rural	Communities under 2,000 and all unincorporated	Less than 100	Low level of fixed-route service and commuter service; low to moderate level of demand-responsive service.

# LOCAL PUBLIC TRANSPORTATION 1981





The Harbor Transit Dial-A-Ride provides demand-response service to the residents of Grand Haven, Spring Lake, and Ferrysburg. In addition, a limited fixed route service is provided during the summer months. Historical operational data are provided in Exhibit J-3.

The third and final system in Region 14 is a demand-response system operated by the City of Holland. This system was the first one started in the State of Michigan under Act 327. It began operation in February 1974. Operational characteristics are shown in Exhibit J-3.

In addition to these three publicly-owned transit systems, Department of Transportation assisted specialized transportation is provided in Muskegon and Oceana Counties. This type of service is generally provided by human service agencies to their own clientele which are usually elderly and/or handicapped.

#### Service Improvements

The Michigan Transportation Needs Study identified improvements needed during the 1980's regarding local public transportation systems in Region 14. They were determined by applying service standards and objectives (see Exhibit J-4) to future populations. The key standard is daily vehicle hours per 1,000 population which was developed for each planning area type by observing existing service levels in Michigan communities. The level of service and fleet size needed to meet these standards for each county in Region 14 are presented in Exhibit J-4 which is followed by a list of the needs for Region 14 in Exhibit J-5.

EXHIBIT J-3

OPERATIONAL CHARACTERISTICS OF REGION 14 PUBLIC TRANSPORTATION SYSTEMS

1976-81

<u>Transit System</u>	<u>Year</u>	<u>Vehicles</u>	<u>Annual Vehicle Hours</u>	<u>Annual Passengers</u>	<u>Passengers/ Vehicle Hours</u>
Muskegon	1981	19	36,773	569,234	15.5
	1980	15	31,340	457,319	14.6
	1979	15	32,616	404,043	12.4
	1978	15	31,609	367,460	11.6
	1977	15	12,747	329,618	25.9
	1976	14	29,442	278,289	9.5
	1976-81 % Change			24.9%	104.6%
Grand Haven (Harbor Transit)	1981	14	22,482	156,120	6.9
	1980	14	1,909	163,764	7.5
	1979	8	18,363	132,205	7.2
	1978	8	15,447	112,811	7.3
	1977	7	15,119	108,043	7.1
	1976	6	12,792	89,473	7.0
	1976-81 % Change			75.8%	74.5%
Holland	1981	10	17,563	226,311	6.6
	1980	11	15,341	100,386	6.5
	1979	7	14,168	88,053	6.2
	1978	6	12,823	89,720	7.0
	1977	6	12,544	79,181	6.3
	1976	6	10,778	69,621	6.5
	1976-81 % Change			63.0%	67.1%

Source: MDOT/Mass Transportation Planning Section

EXHIBIT J-4

LOCAL PUBLIC TRANSPORTATION SERVICE STANDARDS

SERVICE STANDARDS	RURAL	SMALL URBAN	URBAN	SMALL METROPOLITAN	METROPOLITAN
Daily Vehicle Hours Per 1,000 Population	<sup>3/</sup> 2.5 (2.3)	2.0 (3.4)	3.5 (3.4)	4.0 (1.9)	4.0 (2.5)
Average Response Time	24 Hours	25 Minutes	20 Minutes	10 <sup>2/</sup>	10 <sup>2/</sup>
Daily Service Hours	10	12	15	16 <sup>2/</sup>	16 <sup>2/</sup>
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	<sup>1/</sup> \$3.00	\$2.00	\$2.00	\$1.00	\$ .75
Minimum Passenger Miles Per Gallon	10	10	10	25	40

NOTES: <sup>1/</sup> In 1977 dollars

<sup>2/</sup> Major Corridor Service

<sup>3/</sup> Daily vehicles hours per 1,000 population for 1981 presented in parentheses.

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

EXHIBIT J-5

LOCAL PUBLIC TRANSPORTATION NEEDS IN REGION 14, 1990

		Population	Daily Vehicle Hours	# of Vehicles	Daily Ridership	Passengers per Vehicle Hour
Muskegon County	1990	157,100	516	62	6,319	57
	1981	157,589	-	-	-	-
City of Muskegon <sup>1</sup>	1990	97,364	389	46	5,723	31
	1981	99,713	128	19	1,977	15.5
Oceana County	1990	28,300	70	9	364	26
	1981	22,002	-	-	-	-
Ottawa County	1990	185,300	503	63	2,696	77
	1981	157,174	-	-	-	-
City of Grand Haven <sup>2</sup>	1990	21,382	71	9	516	7.3
	1981	16,934	80	14	556	6.9
City of Holland	1990	32,254	112	14	720	9
	1981	26,281	63	10	414	6.6

1. Figures for the City of Muskegon include Muskegon Township, Muskegon Heights, North Muskegon, Norton Shores, and Roosevelt Park.

2. Figures for Grand Haven include Ferrysburg and Spring Lake.

Source: MDOT/Mass Transportation Planning Section.

There is a need for new or improved demand-response service for certain areas within Region 14. All three counties need countywide service. Oceana County has no public transportation service, nor do the residents of rural Ottawa County. Ottawa County is currently conducting a study to provide countywide service. The cities of Holland (urban) and Muskegon (small metropolitan) would need to expand service by 1990 to meet Needs Study Standards, while the City of Grand Haven (urban) is currently operating at their projected 1990 needs. By 1990, Zeeland would warrant demand-response service at the small urban standard level. Improvements to any of these areas are contingent on the availability of Federal, State, and local funds and the support of the local governmental units being served.

#### Intercity Bus

Intercity bus systems connect major urban areas with the remainder of the state and nation. The intercity bus, which is designed for intermediate and longer distance travel, can comfortably seat 47 people. 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. They are required to operate over specified highway routes and abide by published time schedules. Should intercity bus service deregulation become a reality, the carriers would have more flexibility in determining markets, routes, and services.

### Existing Service

Intercity bus transportation in Region 14 provides service to all communities over 5000 population. Currently, there are three bus companies operating in Region 14. They are Greyhound, North Star, and G&M Coaches. The number of daily round trips varies from a high of four between Holland and Grand Rapids, and Muskegon and Grand Rapids (Greyhound) to one between Muskegon and Holland (North Star) (See Exhibit J-6). The use of intercity bus service declined in the early and mid-seventies. During the late 1970's ridership began to increase; however, passenger levels have recently decreased probably due to the severe economic problems in the state.

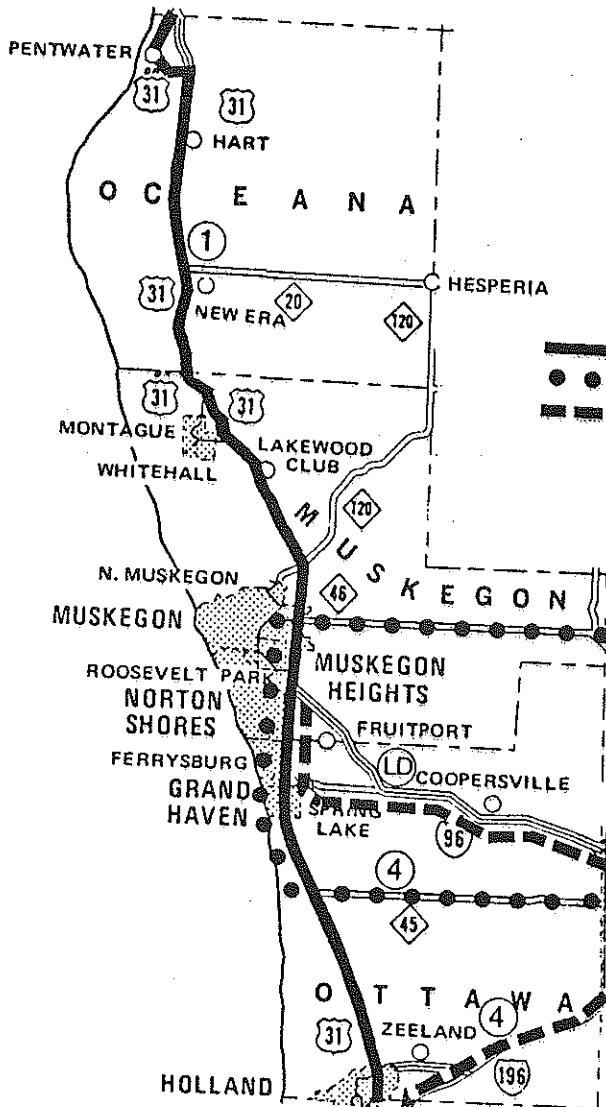
### Service Improvements

Intercity bus service in Region 14 is generally adequate when compared to the service standards developed in the Needs Study. Only US-31 north of Muskegon needs major improvement in service. There is now only one round trip daily. The Needs Study indicated an adequate level of service would be four round trips daily.

The service standards developed in the Needs Study include:

1. Provide daily service to all communities with 2,000 or more population. Only Coopersville is without service at this time in Region 14.
2. Provide daily service to all counties in Region 14. All three counties in the region are currently being served.
3. Service frequency should be consistent with the intercity bus service corridor classifications established in the Michigan

# INTERCITY PUBLIC TRANSPORTATION



### LEGEND

- SHORTWAY, INC.
- ● ● G AND M COACHES
- - - GREYHOUND

NOTE: NUMBER INSIDE SYMBOL INDICATES DAILY ROUND TRIPS

LD - LESS THAN DAILY SERVICE

Transportation Needs Study. Increase in service is warranted along US-31, particularly north of the City of Muskegon.

4. Coordination should be developed between intercity and local public transportation schedules and terminal facilities. Joint intercity bus/local public transportation terminals should be considered for communities that have or warrant demand response type service.
5. Coordinate intercity bus with rail passenger service. This is being accomplished by a "feeder" system from Muskegon to the rail passenger station in Kalamazoo.

#### INTERCITY RAIL PASSENGER

Intercity rail passenger service contributes to 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 save and 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

Currently, there is no rail passenger service directly available to the citizens of Region 14, but "bus Trak I" provides connecting service from Muskegon to Kalamazoo. This service is provided daily by Greyhound. In Kalamazoo, passengers can make connections with Amtrak's Port Huron/Detroit and Detroit/Chicago trains.



### Service Improvements

The following service standards were designated in the State Transportation Plan and the Needs Study. They were designed to provide a level of service consistent with meeting state public transportation goals.

1. 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.
2. All rail passenger trackage between metropolitan areas should accommodate speeds of 79 mph, except in unusual circumstances.
3. Intercity rail passenger terminals should be jointly used by intercity bus and local public transportation services.

### RIDESHARING

Ridesharing may be defined as any vehicle containing two or more persons. As such, it includes carpools, 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 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 comparatively energy efficient due to higher rate of miles per gallon per passenger. Finally, there is a vast fleet of automobiles in place which can be called upon, on short notice, to move people in any energy-constrained situation.

The Department of Transportation has established a statewide program to promote ridesharing. This program includes a statewide vanpool program (MichiVan) as well as the establishment of local ride-sharing offices throughout the state. The MichiVan Program is designed to provide vans to groups of nine or more people anywhere in Michigan. Local ridesharing offices offer a variety of vanpool and carpool-related services.

Promotion and Marketing. Assist employers and employees, conduct workshops, provide resource materials, and conduct media campaigns.

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

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

Coordination. Coordinate ridesharing programs with other related programs including public transportation.

## K. RAIL FREIGHT TRANSPORTATION

The deteriorating condition of the railroad industry in recent years has been cause for serious national concern. In Michigan and Region 14 specifically, reduced 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 freight system consists of approximately 131 route miles and is served by two carriers:

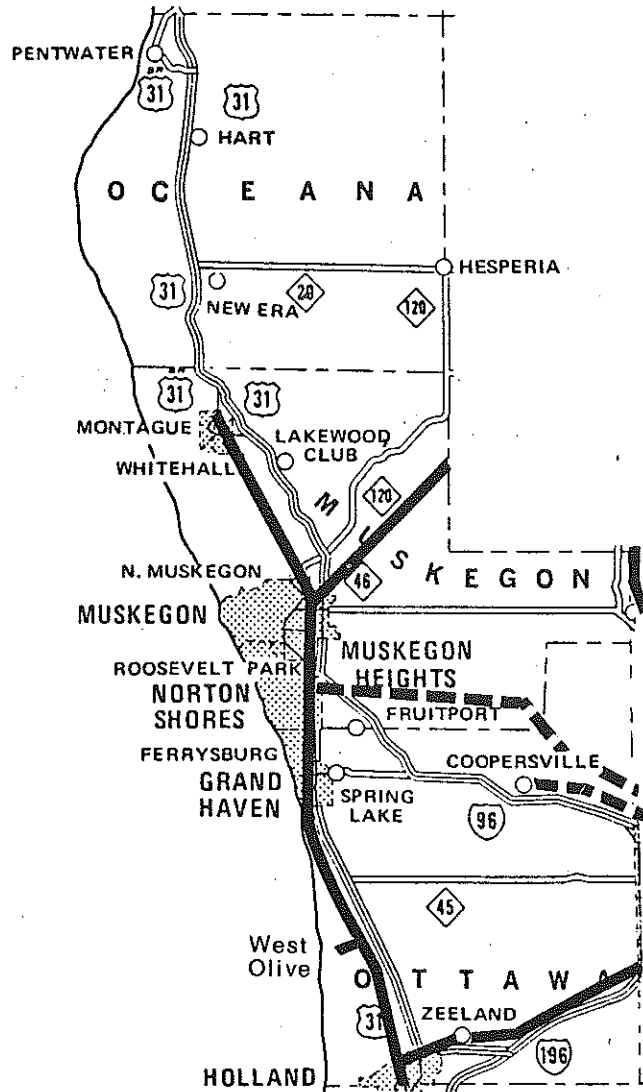
Chesapeake and Ohio (CSX System)	89 route miles (Class I carrier)
Grand Trunk Western	42 route miles (Class I carrier)

Exhibit K-1 illustrates the major routes of these railroads within Region 14. The region as a whole generates a moderate level of rail carloadings with most rail shippers concentrated in the Muskegon metropolitan area, West Olive, and Holland. The only heavy density route is the C&O's Grand Rapids - Chicago main line, via Holland, with an annual volume of 27 million gross tons/mile. Its traffic mainly consists of automotive products, chemicals, and coal.

Secondary lines include the C&O's Holland-Muskegon line (3.2 million annual gross tons/mile), Grand Trunk's Durand-Muskegon line (1.5 million annual gross tons/miles), and the C&O's Grand Rapids - Baldwin line which traverses the extreme eastern portion of Muskegon County (3.3 million

EXHIBIT K-1

EXISTING RAILROAD FREIGHT SERVICE



LEGEND

- CHESAPEAKE AND OHIO R.R.
- - - - GRAND TRUNK WESTERN R.R.

annual gross tons/mile). These regional routes handle chemicals, salt, sand, paper and pulp products, and primary metal products. Additionally, significant tonnage is hauled by unit coal trains from the Appalachian coal fields via Grand Rapids and Holland to electric power generating facilities at West Olive. While lower densities exist along rural lines, these lines are vital to agriculture as they permit the importation of fertilizers and building supplies and the exportation of grains in economical bulk quantities.

At the present time, none of the Region's rail network is operated by utilizing public operating subsidies. Some of the region's lines are marginal; however, 24 route miles were recently abandoned. They were:

Chesapeake & Ohio:	Montague-Hart	23 miles
Chesapeake & Ohio:	North Horn Spur at North Muskegon	1 mile

With the abandonment of the Montague-Hart line in December, 1981, Oceana County lost its only rail service.

The C&O also filed an application with the Interstate Commerce Commission to abandon its Berry-Fremont branch line but withdrew its request in late 1980, following a negotiated settlement with the line's principal shippers.

Also, as a result of the Penn Central bankruptcy in 1970 and the subsequent federally - mandated reorganization in 1976, which created Conrail, 27 miles of Penn Central trackage between Walker and Shaw (Muskegon) was transferred to the Grand Trunk Western. This line has subsequently been identified as a candidate for future abandonment.

This is a continuation of a long-term trend of railroad abandonments in Michigan and the nation as a whole. Since 1960, Region 14 has lost 107 route miles:

Pennsylvania Railroad: Kinney-Walker 2.55 miles (1961)  
Grand Trunk Western: Coopersville-Grand Haven 15.65 miles (1977)  
Grand Trunk Western: Lake Michigan Carferry 88.8 water miles (1978)  
between Muskegon & Milwaukee

In the decade of the 1980's several issues will confront the railroad mode and its continued operations in Region 14. 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 marginal operations. Similarly, traditional Lake Michigan carferry service may not survive the decade as vessels need replacement and deregulated pricing policies for rail freight discourage cross-lake routings.

The need for rail service could increase in the region's urbanized areas, and concern must be focused upon the maintenance of adequate railroad capacity to serve such industrial growth. The 1980 Staggers Rail Act is designed to guarantee sufficient revenues for capital investment and rehabilitation. If this goal is not attained, then the potential role of the public sector in financing private sector improvements must be evaluated.

Additionally, railroad safety will remain an important State and regional concern with greater public awareness anticipated. A major objective will be the reduction of railroad-highway conflicts in urbanized areas, which could involve elimination of unnecessary trackage in central business districts or grade separation projects. Continued state involvement in highway grade crossing improvements can be expected with a coordinated and comprehensive program based upon priority needs developed. In addition, state-financed railroad track and equipment safety programs will seek to minimize the risk of hazardous commodity transit through populated areas.

Deregulation, branch line abandonments, adequate capital generation for future equipment and track betterments, and increased public sector involvement in a previously private sector enterprise are therefore significant modal issues which will certainly impact upon Region 14 in the coming decade. Public awareness by regional shippers and community leaders of these issues is essential if a rational, effective regional rail network is to emerge.

## 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 14.

To assist in accomplishing this objective, the study team has recognized two principal factors that will significantly 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.

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

A key indicator of the region's growth potential is often expressed in its forecasted population levels. From 1970 to 1980, the region's population increased 10.9 percent, from 303,600 to 336,800 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. These projections were used as a base for the various futures. The High Growth Future reflects the MDMB projection for the year 2000.

High Growth - This future assumes that the region's year 2000 population will reach approximately 382,600 persons, a 13.6 percent increase since 1980.

Medium Growth - This future assumes that the region's year 2000 population will reach approximately 360,700 persons, a 7.1 percent increase since 1980.

Low Growth - This future assumes that the region's year 2000 population will be approximately the same as the 1980 population of 336,800 persons.

### 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.

Conserved 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 energy and growth futures. In addition, these networks were derived from the premises that:

1. The availability of future "energy supplies" determines the distribution of trips to the highway, air, rail, and transit modes.
2. The amount and location of future "growth" determines the extent of transportation system development.

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

1. All future networks show a potential need for highway improvements.
2. All futures have a potential for transit improvements.
3. All futures propose rural bus service in every county of the region as a result of legislative mandates and department programs.
4. All futures retain the existing rail freight service to major communities, while recognizing that unprofitable lines may be dropped.
5. All futures retain the existing system of commercial ports.
6. All futures retain the existing air carrier airport in the Muskegon area.

### Modal Improvement Options

There are three categories of transportation improvements.

These are:

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

Exhibit M-1 provides some examples of each improvement, but these examples do not represent the entire array of options available.

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.

The option of doing nothing always exists. Selection of 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.

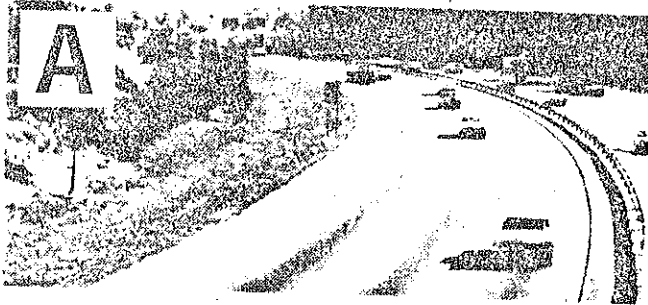
## EXHIBIT M-1

## MODAL IMPROVEMENT OPTIONS

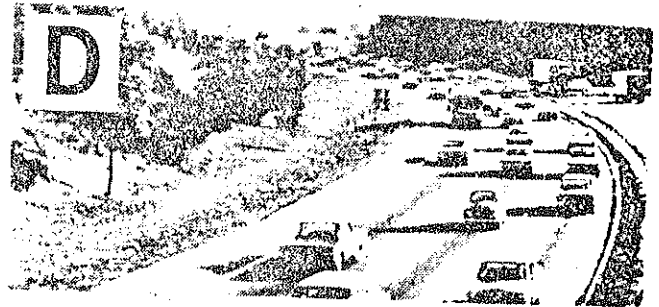
<u>TRANSPORTATION MODE</u>	<u>DO NOTHING</u>	<u>MINOR SYSTEM IMPROVEMENTS</u>	<u>MAJOR SYSTEM IMPROVEMENTS</u>
Aviation	Maintain Existing Airport Facilities	Resurface Runways Construct New Taxiways, Utility Buildings and Emergency Equipment Install Landing Systems	New Airports Runway Extensions Additional 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-Motorized	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 Intercity Carriers Regional Carriers Rural Systems Local Systems Construct New Terminal Facilities
Railroads	Service and Equipment Maintained by Current Owner	Consider Rail Subsidy and Track Rehabilitation	Institute State Ownership of Subsidized Rail Lines Institute Rail Passenger Service

NOTE: Examples of improvement options were arbitrarily selected.

# 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

Conclusions have been reached during the course of this study. While some of these findings were 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.

The study findings include:

### Aviation

Muskegon County International Airport will not need any major expansion but will need continual improvement and modernization.

Two new general aviation airports are recommended for the region to serve the Coopersville and Whitehall/Montague areas.

The Hart/Shelby Airport should receive improvements to bring it up to standards as a county airport for Oceana County.

### Highway

Project Studies:

M-45: Allendale easterly to 24th Avenue, Ottawa County.

M-120: US-31 to the east county line of Muskegon County.

US-31: City of Holland to the City of Ferrysburg.

M-104: Through Spring Lake in Ottawa County.

### Public Transportation

By year 2000 all three counties will have a need for countywide demand response service.

The Muskegon area will need to expand service and improve service levels by year 2000.

The Holland area will need to expand their system to include the Zeeland area by the year 2000.

Intercity bus service should be extended to the City of Coopersville. Additional intercity bus service should be provided along US-31, north of the Muskegon area.

#### Non-Motorized

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

#### Rail Freight

No specific recommendations for line changes or improvements are recommended other than regular line maintenance and elimination of significant highway-grade crossing conflicts.

Monitoring of the system will be continuing in order to determine if private sector lines authorized for abandonment should be operated and/or rehabilitated in cooperation with all affected parties.

#### Water Transportation and Ports

Maintain the navigation channels in all harbors within the region with an effort to promote the commercial harbors within the region.

Monitor efforts by port interests in Region 14 to re-establish cross-lake ferry services.

## O. FUTURE PLANNING ACTIVITIES

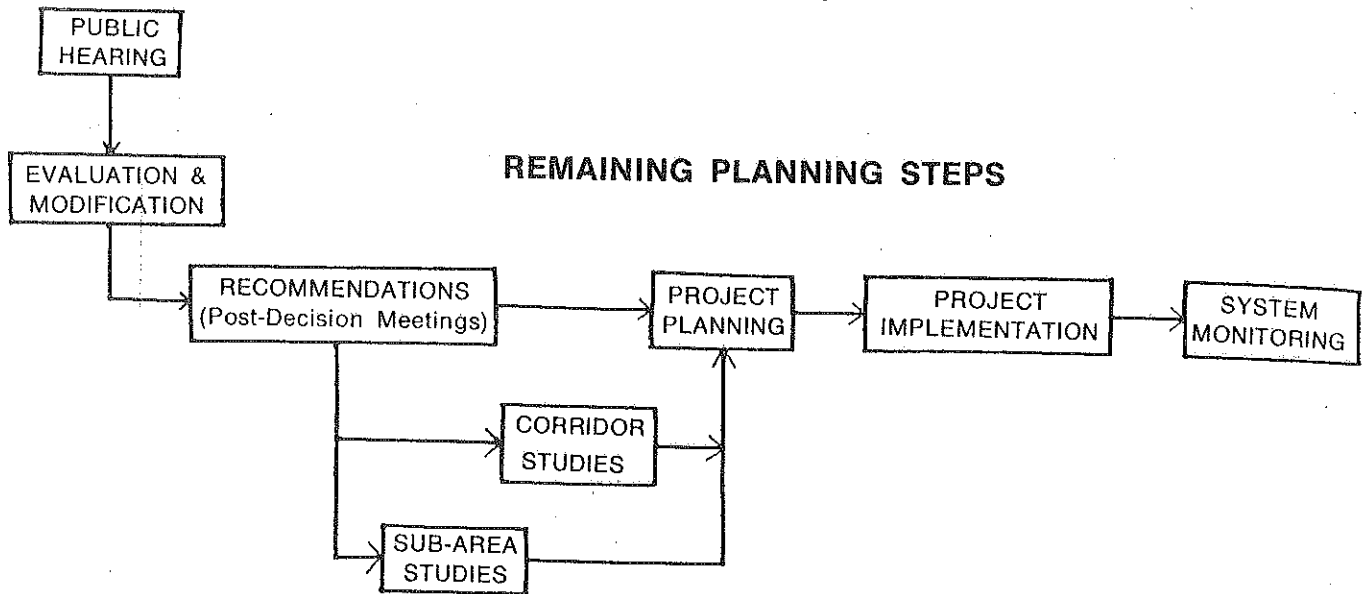
An objective of the Region 14 Transportation Study is to identify deficiencies and recommend necessary changes in the region's various transportation systems. However, in order for this objective to be fully realized, some additional planning steps may be required. These remaining planning steps are illustrated in the accompanying diagram (Exhibit O-1) and discussed below.

### PUBLIC HEARINGS

#### Purpose

The Region 14 Transportation Study has now reached 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 toward plan implementation. The public hearings will ensure that all interested agencies, political jurisdictions, groups, and individuals will have the opportunity to make or submit statements, ask questions, voice disagreement, offer support, or make suggestions concerning the Regional Study. Questions and statements will be answered or discussed and a public record made of these proceedings. In order to permit greater understanding of the issues considered, this report is being made available for review before the hearing.

EXHIBIT O-1



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 have been conducted, the study team will evaluate the comments received. After this review, necessary process modifications will be 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. 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 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

Project planning can be recommended from either a 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 alternative 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 specific 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 when 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 there are fewer alternatives to consider.

## P. Public Hearing Results

In July 1984, a total of 12 persons attended the public hearing conducted in the West Michigan Shoreline Regional Development Region in Muskegon. This hearing 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 14.

The hearing was held in two parts. The first half consisted of a Department presentation summarizing the data contained in the West Michigan Shoreline 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 14.

During these hearings, four 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 Shoreline Regional Development Commission office in Muskegon and the Department's main office in Lansing. Examples of comments received at the hearing are paraphrased as follows:

### Muskegon

Use of public funds to support the cross-lake ferry service in the Muskegon area or implement this service to the detriment of the service to Ludington should be avoided.



Should evaluate need for two services across the lake.

Should evaluate cross-lake ferry service impact on Ludington.

Most desirable would be two cross-lake ferry services operating profitably.

The worst would be two cross-lake ferry services both subsidized.

Region 8 Planning Commission offers assistance in studying cross-lake ferry system.

Study should be done on M-104 through Spring Lake along with US-31 in Ottawa County.

Dial-A-Ride is now Harbor Transit. It provides a fixed route.

Promote commercial harbors in the region - continue dredging and encourage commercial harbor activity.

Simmons Airline is now flying out of Muskegon airport.

A new race track is being proposed near US-31. There is a need to study traffic flow, congestion, and safety.

In process of developing a maritime park in Muskegon. There is need to study traffic in the area.

The cross-lake ferry service has been over studied. Regret the delay. Muskegon is ready to operate the cross-lake ferry. It will not compete with or take away from Ludington.

There is need now for public transportation for the poor and elderly in outlying areas of Ottawa County.

## Q. Recommendations

After the public hearing, the study team reviewed comments with Department and Regional personnel. Based on this review, the study team agrees that the West Michigan Shoreline Regional Transportation Systems Study had adequately identified the major transportation system deficiencies and related issues and concerns for Region 14.

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 Shoreline

Regional Development 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 four airports serving Region 14. 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.

Muskegon County International Airport is the only air carrier airport in Region 14. There are no transport airports in Region 14. There are three utility airports located at Hart/Shelby, Grand Haven, and Holland.

### Recommendations

The Muskegon County International Airport will not need any major expansion, but will need continual improvement and modernization. Two new utility airports are recommended to serve the Coopersville and Whitehall/Montague areas. The Hart/Shelby Airport should receive improvements to bring it up standards as a county airport for Oceana 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.

There are three commercial harbors within Region 14. These are located at Muskegon, Grand Haven, and Holland.

### Recommendations

It is recommended to maintain the navigation channels in all the harbors within the region and to promote the commercial harbors within the region. It is recommended to monitor the efforts by port interests in Region 14 to re-establish the cross-lake ferry services.

## Highways

Region 14 has 273 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

There are several project studies recommended. These are M-45 from Allendale easterly to 24th Avenue in Ottawa County, M-120 from US-31 to the east county line of Muskegon County, M-104 through Spring Lake in Ottawa County, and US-31 from the City of Holland to the City of Ferrysburg in Ottawa 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 local road agency be used for non-motorized facilities. Construction of new non-motorized facilities is recommended for areas that demonstrate a need in Region 14. These would be areas where a new link is needed to supplement a non-motorized system or a local plan.

### Recommendations

It is recommended that non-motorized projects be constructed in conjunction with highway projects or independently as funds are available.

## Public Transportation

There are three transportation agencies providing service to the general public in Region 14. One is the fixed-route, line haul system in Muskegon. The other two are primarily demand-response systems in Grand Haven and

Holland. The Muskegon Area Transit System (MATS) provides service to the residents of Muskegon and the surrounding communities of Muskegon Heights, Norton Shores, and Roosevelt Park. The Harbor Transit Dial-A-Ride provides demand-response service to the residents of Grand Haven, Spring Lake, and Ferrysburg. In addition, a limited fixed route service is provided during the summer months. The third system in Region 14 is a demand-response system operated by the City of Holland. This system was the first one started in the State of Michigan under Act 327. It began operating in February of 1974.

In addition to these three publicly-owned transit systems, Department of Transportation assisted specialized transportation is provided in Muskegon and Oceana Counties. This type of service is generally provided by human service agencies to their own clientele which are usually elderly and/or handicapped.

### Recommendations

There will be a need for countywide demand response service in all three counties by the year 2000. The Muskegon area will need to expand service and improve service levels by the year 2000. The Holland area will need to expand their system to include the Zeeland area by the year 2000. Intercity bus service would be extended to the City of Coopersville. Additional intercity bus service should be provided along US-31, north of the Muskegon area.

### Rail Freight

Competing transportation modes have caused a steady decline in rail transportation and many carriers have gone bankrupt. Competition and bankruptcies have jeopardized or caused the loss of trackage in Michigan's lower peninsula.

The passage of the State Transportation Preservation Act of 1975 represented the State's initial commitment to maintain a statewide rail network through subsidization and other assistance. Further funds were provided by the federal legislation and appropriations.

#### Recommendations

For Region 14, there are no specific recommendations for line changes. No improvements are currently recommended other than regular line maintenance and elimination of significant highway-grade crossing conflicts. It is recommended to continue monitoring of the system in order to determine if private sector lines authorized for abandonment should be operated and/or rehabilitated in a cooperative effort by all affected parties.