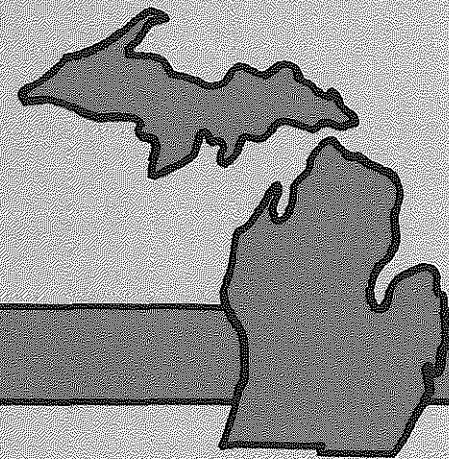


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MICHIGAN DEPARTMENT OF TRANSPORTATION

LAKE MICHIGAN
CROSS-LAKE CAR FERRY
PASSENGER DEMAND MARKET
STUDY
PRELIMINARY REPORT

June 1984



BUREAU OF TRANSPORTATION PLANNING

MICHIGAN DEPARTMENT
OF
TRANSPORTATION

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STUDY
PRELIMINARY REPORT

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

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Purpose of Study

The Michigan Department of Transportation initiated this study of Lake Michigan cross-lake ferry service to provide a basis for department policy regarding assistance in support of service expansion.

Although there appears to be many development ideas which would integrate well with additional ferry operations, the Administration of the Michigan Department of Transportation realizes the car ferry operation in Ludington, Michigan had been purchased by the Michigan-Wisconsin Transportation Company (MWTC) and is trying to establish itself as a profitable operation.

In order to clarify all the issues which are related to any expansion of service, MDOT conducted public meetings on March 28 and 29, 1984 in the Cities of Ludington and Muskegon, respectively.

The major issues presented at those meetings were as follows:

Issues presented in opposition to state assisted service expansion:

1. The MWTC is a private operation established without the assistance of state or federal funds. Any new car ferry operation should be established under the same provision;
2. The passenger market is limited and another car ferry operation could cause the demise of all car ferry operations on Lake Michigan; and,
3. The MWTC is a major employer and finance resource in the Ludington area. If they were forced out of business due to state assisted competition, then the areas unemployment would increase substantially.

Issues presented in favor of state assisted service expansion:

1. There are two apparent basic markets of cross-lake passengers; those who go to the northern portion of the state (Traverse City, Mackinac Island, etc.) and those who go to the southern portion of the state;
2. When car ferry operations ceased at the Port of Muskegon, ridership did not increase in Ludington and Frankfort, thereby indicating multiple markets exist; and
3. A request for state assistance does not prohibit other port cities from pursuing similar arrangements.

From these issues three basic questions exist which the Department wishes to answer as a result of this study. These questions are:

1. Are there distinct markets of auto-passenger riders who would utilize a northern and southern Lake Michigan operation?
2. Is the demand large enough to operate services out of at least two ports in the State of Michigan?
3. What role, if any, should the State assume in the car ferry operations between Michigan and Wisconsin?

Introduction

Lake Michigan cross-lake car ferry service has been in existence since the early 1900's. During that time many people utilized the service as a rapid mode of travel between Michigan and Wisconsin or as opportunity for leisure travel across one of the largest inland lakes in the United States. As many as five car ferry operations were in service until the late 1940's.

Today there is only one car ferry operation on Lake Michigan and that is provided by the Michigan-Wisconsin Transportation Company (MWTC), of Ludington, Michigan. It provides automobile, passenger, and railroad car service between the ports of Ludington, Michigan; and Kewaunee, Wisconsin and automobile-passenger service to Milwaukee, Wisconsin.

There have been numerous supporters of car ferry service who maintain that service can be improved and enlarged. Some of these supporters feel that if service is initiated from other Lake Michigan ports, the market demand is large enough to sustain the current operations in Ludington while supporting service to new and/or different customers elsewhere. The purpose of this study is to examine the size of the car ferry passenger market and determine if a multiple port market exists.

This study does not intend to evaluate the vessels that are available or are being developed, the impact of variable fare structures, or the marketing options which might induce and increase passenger ridership. Several assumptions were developed which are felt to be elements which are beyond the purpose of the study. These assumptions are:

1. Car ferry operations, in the immediate future, are restricted to existing marine or vessel design and that passenger ridership is restricted to the capacities of those vessels.
2. Existing and new car ferry operations could create an atmosphere which might stimulate competition which, in turn, could cause;
 - a. Development of regular schedules that are met;
 - b. The establishment of amenities and service at ports and on the vessels which would improve the passenger's experience; and,
 - c. The creation of promotional campaigns which would make the public more aware of the car ferry service, fares, and amenities.
3. Fares will remain near the existing levels.

History of Travel

Travel is directly proportional to population size and indirectly proportional to the travel time between population centers. This means that population centers like Chicago and Milwaukee should have a considerable interchange of travel while the cities of Chicago and Detroit might have a smaller interchange of travel.

This basic principle of travel flow has a direct effect on the probability of travel between the States of Michigan and Wisconsin via a Lake Michigan car ferry. The question confronting such a proposal, however, is whether there is enough demand to sustain more than one operation.

A means of evaluating the potential demand is by examining the immediate area of service and the travel trends in that area. The East North Central States, of the United States, comprise the area around Lake Michigan. The states included in this area are Illinois, Indiana, Ohio, Michigan, and Wisconsin. Ohio is the only state of these five states which does not border on Lake Michigan.

The five East North Central States had a 1980 population of 41,682,000, to which comprises 18.4 percent of the U.S. population. Between 1950 and 1980, population growth in the East North Central States has been at a rate of 37.1 percent while the U.S. growth rate was 49.7 percent, (See Table 1).

These figures serve as a general reference and provide a base of evaluation. In and of themselves, the population figures indicate that one out of every five persons living in the United States is within a radius of 630 miles of a port which has Lake Michigan car ferry service. This distance is only about 30 miles further than a trip from Ironwood, Michigan to Detroit, Michigan.

TABLE 1

Population Growth Trends
(1,000's)

	<u>1950</u>	<u>1960</u>	<u>1970</u>	<u>1980</u>	<u>1950-80</u>
United States	151,326	179,323	203,302	226,505	49.7%
East North Central States	30,399	36,225	40,262	41,670	37.1%
East North Central States % of U.S.	20.1%	20.2%	19.8%	18.4%	
Michigan	6,372	7,823	8,882	9,258	45.3%
Michigan - % of East North Central States	21.0%	21.6%	22.1%	22.2%	
Wisconsin	3,435	3,952	4,418	4,705	37.0%
Wisconsin - % of East North Central States	11.3%	10.9%	11.0%	11.3%	

Source: U.S. Bureau of Census, 1980 Census of Population, Characteristics of the Population, Part 1 - United States Summary.

The immediate states of Michigan and Wisconsin have a combined population of 13,963,000, and jointly experienced a 42.4 percent increase in population between 1950 and 1980, which nearly parallels the growth in the United States at 49.7 percent.

The significance of these two states is, obviously, that they currently have active ports which are served by the cross-lake car ferry operation. In the theory of proximity and travel time, Michigan and Wisconsin provide the main resource for passengers. If these two states were to supply the car ferry system with 250,000 passengers per year, then 1.8 percent of their combined population would have to make a one way trip across Lake Michigan. Under this same concept, only 0.6 percent of the population in the East North Central States would be required to make a one-way trip.

Potential for travel on the cross-lake ferry routes may be better reflected by the proximity of specific population centers, in the North Central States, to the existing ports along Lake Michigan. Table 2 lists the top 25 cities in the East North Central States, the population of those cities, and the driving distance to the ports nearest them which have cross-lake car ferry service. There are 15 cities, of over 100,000 population, that are within 390 miles of the City of Ludington, Michigan. The combined population of these 15 cities is 4,381,000. Milwaukee, Wisconsin, on the other hand, has 10 cities within 440 miles that have a combined population of 5,648,000. Therefore, a Lake Michigan car ferry port is within one day driving time for 10,029,000 persons who live in major cities in the North Central United States.

TABLE 2

CITIES OF 100,000 OR MORE POPULATION
IN THE EAST NORTH CENTRAL UNITED STATES
1980

<u>City</u>	<u>Population (1,000's)</u>	<u>Nearest Operating Car Ferry Port</u>	<u>Distance Approx. Miles</u>
Akron, OH	237	Ludington, MI	390
Ann Arbor, MI	107	Ludington, MI	220
Chicago, IL	3,005	Milwaukee, WI	90
Cincinnati, OH	385	Milwaukee, WI	390
Cleveland, OH	574	Ludington, MI	390
Columbus, OH	565	Ludington, MI	390
Dayton, OH	204	Milwaukee, WI	440
Detroit, MI	1,203	Ludington, MI	240
Evansville, IN	130	Milwaukee, WI	370
Flint, MI	160	Ludington, MI	180
Ft. Wayne, IN	172	Ludington, MI	230
Gary, IN	152	Milwaukee, WI	120
Grand Rapids, MI	182	Ludington, MI	90
Indianapolis, IN	701	Milwaukee, WI	270
Lansing, MI	130	Ludington, MI	160
Livonia, MI	105	Ludington, MI	240
Madison, WI	171	Milwaukee, WI	80
Milwaukee, WI	636	Milwaukee, WI	0
Peoria, IL	124	Milwaukee, WI	240
Rockford, IL	140	Milwaukee, WI	90
South Bend, IN	206	Ludington, MI	160
Sterling Heights, MI	109	Ludington, MI	240
Toledo, OH	355	Ludington, MI	260
Warren, MI	161	Ludington, MI	240
Youngstown, OH	115	Ludington, MI	430

Source: U.S. Bureau of the Census, 1980, Characteristics of the Population, Part 1, United States Summary and the Rand McNally Atlas, 1982.

Resident population provides one perspective of the market potential for cross-lake ferry service, however, another basis of evaluation is travel trends on the highway system. Table 3 lists the vehicle miles of travel along East North Central U.S., Michigan and Wisconsin highways, between the years of 1966 and 1980. Travel during this time period was greatly influenced by the availability of domestic oil. In 1966 regular leaded gasoline was selling for about 27¢ per gallon while in 1980 prices were about \$1.25 per gallon. Reliance on foreign oil and the sharp price increases that occurred in the mid-1970's greatly influenced our desire and ability to travel. Travel behavior was modified effecting all trips.

Travel in the East North Central States, during this 15 year period, increased 42.4 percent while it increased 41.2 and 51.8 percent in Michigan and Wisconsin, respectively. These two states experienced 93.3 billion vehicle miles of travel during 1980. This represents nearly 6,681 miles of travel per person in those respective states. Travel growth, when compared to population growth, is increasing at a more rapid rate, indicating that more trips are being made per household.

Table 4 lists the car ferry passenger ridership for the operations in existence between 1965 and 1980. Ridership, unlike vehicle miles of travel, did not follow a steady trend upward, but fluctuated year to year. The best year for ridership, during this time period, was in 1966 when over 321,000 passengers rode on one of six routes between six ports located in Michigan and Wisconsin.

A significant drop in total ridership occurred when the Muskegon-Milwaukee route was eliminated. Ridership dropped nearly 76,000 passengers in the first year and another 37,000 in the second year. It is also interesting

TABLE 3

VEHICLE MILES OF TRAVEL
1966 TO 1980
(1,000,000's)

<u>Year</u>	<u>East North Central States</u>	<u>% Change</u>	<u>Michigan</u>	<u>% Change</u>	<u>Wisconsin</u>	<u>% Change</u>	<u>Mich. as % of N.C.S.</u>	<u>Wisc. as % of N.C.S.</u>
1966	187,811		43,940		20,574		23.4	11.0
1967	192,964	+2.7	45,054	+2.5	20,931	+1.7	23.3	10.8
1968	204,759	+6.1	48,047	+6.6	22,189	+6.0	23.5	10.8
1969	215,101	+5.1	50,905	+5.9	23,885	+7.6	23.7	11.1
1970	221,696	+3.1	53,148	+4.4	24,563	+2.8	24.0	11.1
1971	234,146	+5.6	55,557	+4.5	28,856	+17.5	23.7	12.3
1972	245,056	+4.7	57,817	+4.1	27,566	-4.5	23.6	11.2
1973	251,847	+2.8	58,478	+1.1	28,699	+4.1	23.2	11.4
1974	243,001	-3.5	55,749	-4.7	27,965	-2.6	22.9	11.5
1975	249,193	+2.5	58,173	+4.3	28,584	+2.2	23.3	11.5
1976	263,352	+5.7	61,817	+6.3	30,221	+5.7	23.5	11.5
1977	273,284	+3.8	63,361	+2.5	31,572	+4.5	23.2	11.6
1978	281,558	+3.0	65,827	+3.9	33,864	+7.3	23.4	12.0
1979	276,256	-1.9	64,900	-1.6	32,974	-2.6	23.5	11.9
1980	267,488	-3.2	62,059	-4.4	31,233	-5.3	23.2	11.7
1966-80		42.4		41.2		51.8		

Source: Highway Statistics, U.S. Department of Transportation, Federal Highway Administration; 1966-1980.

TABLE 4

PASSENGER RIDERSHIP TRENDS
LAKE MICHIGAN CAR FERRY OPERATIONS

	MUSKEGON		LUDINGTON		FRANKFORT		TOTAL		MUSKEGON	LUDINGTON	FRANKFORT
	<u>No. of</u> <u>Passengers</u>	<u>%</u> <u>Change</u>	<u>No. of</u> <u>Passengers</u>	<u>%</u> <u>Change</u>	<u>No. of</u> <u>Passengers</u>	<u>%</u> <u>Change</u>	<u>No. of</u> <u>Passengers</u>	<u>%</u> <u>Change</u>	<u>% of</u> <u>Total</u>	<u>% of</u> <u>Total</u>	<u>% of</u> <u>Total</u>
1965	98,556		166,651		22,943		288,151		34.2	57.8	8.0
1966	107,035	+ 8.6	190,113	+14.0	24,216	+ 5.5	321,364	+11.5	33.3	59.2	7.5
1967	95,415	-10.9	170,083	-10.5	27,537	+13.7	293,035	- 8.9	32.6	58.0	9.4
1968	101,034	+ 5.9	182,228	+ 6.5	26,107	- 5.1	309,369	+ 5.6	32.7	58.9	8.4
1969	101,096	+ 0.1	174,224	- 4.3	25,225	- 3.3	300,545	- 2.9	33.6	58.0	8.4
1970	111,594	+10.4	177,353	+ 1.7	22,577	-10.4	311,524	+ 3.7	35.8	56.9	7.3
1971	742		205,389	+15.8	29,666	+31.3	235,797	-24.3	0.3	87.1	12.6
1972			176,598	-14.0	21,614	-27.1	198,388	-15.9		89.0	11.0
1973			179,855	+ 1.8	15,076	-30.2	194,931	- 1.8		92.3	7.7
1974			188,426	+ 4.8	13,021	-13.6	201,447	+ 3.3		93.5	6.5
1975			149,251	-20.8	14,077	+ 8.1	163,328	-18.9		91.4	8.6
1976			156,218	+ 4.7	13,410	- 4.7	169,628	+ 3.9		92.1	7.9
1977			169,871	+ 8.7	17,499	+30.1	187,320	+10.4		90.7	9.3
1978			110,006	-35.2	28,451	+63.1	138,457	-26.1		79.5	20.5
1979			133,765	+21.6	16,105	-43.4	149,870	+ 8.2		89.3	10.7
1980			136,272	+ 1.9	24,391	+51.4	160,663	+ 7.2		84.8	15.2

SOURCE: Waterborne Commerce of the United States, U.S. Army Corp of Engineers, Part 3; 1965-1980.

to see how ridership was effected by the 1974 OPEC oil embargo and the 1979 gas price increase. In 1974 total ridership increased nearly 7,000 passengers to 201,447 and then dropped the following year to 163,328. In 1979 ridership increased 10,000 passengers, to 149,870, then in 1980 ridership also increased by almost 11,000 passengers, to 160,663. These increases meant an 8.2 and 7.2 percent growth in ridership.

Ridership since 1980 has declined and is nearly one-half the total that was experienced in 1980. Regardless of the reduction which has occurred between 1980 and 1983, it is more important to note that ridership between 1965 and 1980 dropped 44 percent from 297,002 to 160,663. Therefore, while population and vehicle miles of travel were increasing in Michigan and Wisconsin, ridership on the Lake Michigan car ferry system was decreasing by nearly an equal percentage.

Most of this decline appears to be the result of the reduction in service which occurred when the Milwaukee Clipper was retired from operation. Ridership declined about 100,000 passengers when that vessel was removed from service. This loss of passengers could indicate that ridership is either sensitive to the availability of cross-lake service, or that two cross-lake markets exist, or both.

The Clipper carried over 30 percent of the cross-lake passenger travel, therefore, it was not a declining ridership which caused the retirement of this vessel, but Coast Guard renovation requirements. Apparently the capital expenditure facing the owner of the Milwaukee Clipper was much larger than was affordable for the age of the vessel.

Travel Variations and Trip Purposes

Michigan ports are serviced by many highway routes and the travel along those routes provide an indicator as to the magnitude of seasonal markets. There are four routes, listed in Table 5, which provide a access to Michigan port communities and which are monitored daily. The routes are: 1) I-94 near New Buffalo, 2) I-96 east of Grand Rapids, 3) US-31 north of Pentwater, and 4) US-10 east of Evart.

I-94 near New Buffalo is a heavily traveled route which had a 1980 annual volume of 6,595,113 vehicles, however, 52.5 percent of that volume was recorded during the 5-month period of May through September. I-96 east of Grand Rapids has little seasonal fluctuations in volume and its 1980 annual volume was 5,123,682 vehicles. The May through September volume was 45.9 percent of the annual volume. US-31, on the other hand, is a highly seasonal road with a low average daily traffic, (ADT). The 1980 annual volume was 1,434,648 with 58.4 percent being recorded between May and September. Finally, US-10 east of Evart, also is a low volume highway but experiences a seasonal fluctuation pattern similar to I-94 near New Buffalo. The five month, May-September volume was 50.2 percent of the 962,687 annual vehicle recording.

From this traffic information, it is apparent that the high seasonal volumes occur between May and September. What this indicates is that over 50% of the vehicle travel occurs during 41.6% of the year. US-10 is the only route where high volumes extend into October.

Car ferry ridership follows a similar but more dramatic pattern to automobile travel. Table 6 gives a monthly account of 1978-80 ridership on the C&O Railroad car ferry in Ludington and the Ann Arbor Railroad car ferry in Frankfort.

TABLE 5
1980 SEASONAL TRAFFIC VOLUMES
ON MICHIGAN ROUTES PROVIDING ACCESS
TO MICHIGAN PORTS

<u>Traffic Data</u>	<u>I-94 At New Buffalo</u>	<u>I-96 At Grand Rapids</u>	<u>US-31 At Pentwater</u>	<u>US-10 At Sears</u>
Annual Volume	6,595,113	5,123,682	1,434,648	962,687
June Through August % of Annual Vol.	2,258,045 34.2%	1,453,969 28.4%	552,479 38.5%	310,066 32.2%
May Through September % of Annual Vol.	3,459,314 52.5%	2,353,675 45.9%	838,471 58.4%	482,994 50.2%
Average Daily Traffic	18,024	13,999	3,921	2,631
30th Highest Hour Volume	2,767	1,676	734	405
Date	Sunday, August 10; Friday, May 16;		Sunday, August 24; Saturday, August 2	

Source: Michigan Department of Transportation, Automatic Traffic Recorder Report, 1980.

TABLE 6

SEASONAL DEMAND FOR CAR FERRY SERVICE

	<u>June Through August</u>			<u>May Through September</u>		
	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>
Ludington Passenger Ridership	114,267	109,260	107,629	133,086	125,647	126,766
Frankfort Passenger Ridership	17,495	9,594	15,149	22,159	13,601	18,200
Ludington % of Annual Ridership	78.7%	80.2%	79.3%	91.7%	92.2%	93.4%
Frankfort % of Annual Ridership	65.3%	51.2%	66.2%	82.7%	72.6%	79.6%

Source: Chessie System and Ann Arbor Car Ferry Ridership records.

The C&O received from 78.7 to 80.2 percent of its annual passenger ridership during the months of June, July, and August. When May and September figures are included, these five months account for 91.7 to 93.4 percent of the ridership.

The Ann Arbor car ferry passenger volume was similar to the C&O, except the percentage of summer month passengers is lower. The June through August ridership was 65.3, 51.2, and 66.2 percent, respectively, for 1978 through 1980. The addition of May and September increases these percentages to 82.7, 72.6, and 79.6.

Table 6, when compared with Table 5, indicates that both passenger ridership on Lake Michigan car ferries and seasonal traffic volumes in Michigan follow similar patterns; however, annual traffic volumes are increasing while annual passenger ridership is decreasing. Travelers for one reason or another have chosen not to use the cross-lake car ferry system.

To further refine the market that might use the cross-lake car ferry system, it is important to examine the type of trip that uses the system. Surveys were taken on the Ann Arbor Car Ferry in Frankfort and the C&O Car Ferry in Ludington during 1976, and also on the Milwaukee Clipper during 1965.

The predominant trip purpose is the pleasure trip, which includes the vacation trip (see Table 7). Between the three systems, pleasure trips ranged from 82.8 percent to 93.6 percent of the trips. Business trips comprised 12.2 percent down to 3.3 percent while miscellaneous type trips ranged from 6.9 percent to 3.1 percent. The vacation trip or pleasure trip is the primary market.

TABLE 7
TRIP PURPOSE OF LAKE MICHIGAN
CROSS-LAKE CAR FERRY PASSENGERS

<u>Trip Purpose</u>	<u>Ann Arbor at Frankfort 1/</u>	<u>C & O at Ludington 1/</u>	<u>Milwaukee Clipper Muskegon 2/</u>	<u>All Routes 3/</u>
Pleasure <u>4/</u>	82.8%	85.2%	93.6%	86.2
Business <u>5/</u>	12.2%	7.9%	3.3%	7.6
Other or Unknown	5.0%	6.9%	3.1%	6.2
Total Responses	282	2,830	519	3,631

1/ Interstate Commerce Commission Passenger Ridership Survey, 1976.

2/ Muskegon Area Origin-Destination Survey, Michigan Department of Transportation, 1965.

3/ Combination of ICC and MDOT surveys.

4/ Pleasure trips from the Muskegon Origin-Destination Survey is a combination of Vacation and Social/Recreational trips.

5/ Business trips from the Muskegon Origin-Destination Survey is a combination of Work and Personal Business trips.

The magnitude of that market can be estimated based on the responses to the 1977 Bureau of the Census - Nationwide Personal Transportation Survey (NPTS), and the 1977 National Travel Survey (NTS). The NPTS survey inventoried all household trips as part of a nationwide household sample (see Table 8). About 19.3 percent of all household trips are made for social and recreational purposes and constitute 24.0 percent of the annual miles traveled by each family. Within the social and recreational classification is the vacation trip. Vacation trips are only 0.1 percent of all household trips and comprise 0.6 percent of the total annual miles of travel by a family.

If the above data applies to the vacation trips which utilize the cross-lake car ferry system, then many of these trips are between the States of Michigan and Wisconsin. The surveys that were taken on the cross-lake ferry routes indicate the percentage of travel that occurs between Michigan and Wisconsin. From 56.3 to 67.2 percent of the cross-lake ferry trips originated in either Michigan or Wisconsin and 50.9 to 85.2 percent of those trips were destined for locations in Michigan or Wisconsin (see Table 9). The route which had the lowest percentage of trips originating or destined in Michigan or Wisconsin was the Muskegon-Milwaukee route. There were many trips that originated or were destined for Illinois, New York and Minnesota. Of the total trips using this route 17.6, 12.0 and 8.5 percent were coming from or going to these three states, respectively. These figures seem to indicate that the primary market for cross-lake car ferry passengers are the States of Illinois, Michigan, and Wisconsin.

TABLE 8

1977 PERCENT OF VEHICLE TRIPS, VEHICLE TRAVEL,
AVERAGE TRIP LENGTH BY PURPOSE AND PLACE OF RESIDENCE

<u>Trip Purpose</u>	<u>Percent</u>		<u>Trip</u>	<u>Trip Length/Residence</u>	
	<u>Trips</u>	<u>Travel</u>	<u>Length (MI)</u>	<u>Non-SMSA</u>	<u>SMSA</u>
Earning a Living	32.9	37.7	9.6	9.4	9.6
Family & Personal Business	32.3	22.9	5.9	6.6	5.4
Civic, Educational & Religious	6.4	4.7	6.1	6.1	5.9
Social & Recreational	19.3	24.0	10.2	10.2	10.3
*Visiting Friends	8.4	11.3	11.2	11.6	10.9
*Pleasure Driving	0.4	0.8	15.7	14.4	16.6
*Vacations	0.1	0.6	95.4	39.9	103.5
*Other	10.4	11.3	9.1	8.7	9.2
Other & Unknown	9.1	10.7	9.8	9.8	9.4
Total	100.0	100.0	8.3	8.5	8.2

Source: 1977 Nationwide Personal Transportation Study, Purposes of Vehicle Trips and Travel, Highway Statistics Division, Federal Highway Administration.

TABLE 9

ORIGIN AND DESTINATION OF LAKE MICHIGAN
CROSS-LAKE CAR FERRY PASSENGERS

<u>Trip Origin</u>	<u>Ann Arbor at Frankfort 1/</u>	<u>C&O at Ludington 1/</u>	<u>Milwaukee Clipper Muskegon 2/</u>	<u>All Routes</u>
Michigan or Wisconsin	65.6%	67.2%	56.3%	65.4%
Other Locations	34.4%	32.8%	43.7%	34.6%
Responses	270	2,689	519	3,478

<u>Trip Destination</u>	<u>Ann Arbor at Frankfort</u>	<u>C&O at Ludington</u>	<u>GTW at Muskegon</u>	<u>All Routes</u>
Michigan or Wisconsin	85.2%	77.1%	50.9%	73.8%
Other Locations	14.8%	22.9%	49.1%	26.2%

1/ Interstate Commerce Commission Passenger Ridership Survey, 1976.

2/ Muskegon Area Origin-Destination Survey, Michigan Department of Transportation, 1965.

Although the above figures indicate the percentage distribution of car ferry passenger trips, it still does not indicate the complete market for the car ferry system. The U.S. Bureau of Census in the 1977 National Travel Survey (NTS), inventoried trips of 100 miles, or more, in length. One major tripmaking category which was inventoried was the vacation trip. Subsequent to the survey, the Better Homes and Gardens Publications developed a report on, the Family Vacation Travel Market. This report indicated that Michigan ranked 10th and Wisconsin ranked 14th in the number of family vacation trips recorded and they ranked 5th and 11th, respectively, in the number of travel dollars spent by vacation travelers. The largest origin of vacation trips in the United States were recorded in the East North Central States at 18.3 percent.

Table 10 indicates there were 1,827,000 vacation trips to or within Michigan involving 5,517,000 persons. Another 229,000 vacation trips were taken by families driving through Michigan to another state of destination. Those "through trips" involved 768,000 persons. Wisconsin received 1,535,000 vacation trips to or within the state while recording 356,00 through trips. These trips involved 4,789,000 and 1,048,000 persons respectively.

Vacation trips which are likely to take the Lake Michigan cross-lake car ferry are those which originate in or are destined for the states in the northern third of the United States. Table 10 lists the primary states with vacation travel destinations which might take the car ferry in traveling to or through Michigan or Wisconsin. There are approximately 197,000 persons traveling through and another 589,000 persons traveling to Michigan from west of Lake Michigan. Wisconsin, on the otherhand, had 357,000 persons traveling through and 626,000 persons

TABLE 10

1977 VACATION TRIPS TO/THROUGH MICHIGAN AND WISCONSIN
PERSON TRIPS (1,000's)

State of ^{1/} Origin	MICHIGAN				WISCONSIN				TOTAL	
	To	%	Through	%	To	%	Through	%	Mich.	Wisc.
Michigan					334	7.0	109	10.4	-	443
Wisconsin	349	6.3	109	14.2	-	-	-	-	458	-
Minnesota	97	1.8	32	4.2	-	-	-	-	129	-
Iowa	21	0.4	32	4.2	-	-	-	-	53	-
Oregon	26	0.5	-	-	-	-	-	-	26	-
Nebraska	9	0.2	15	2.0	-	-	-	-	24	-
WY, MT, ND & SD	87	1.6	9	1.2	-	-	-	-	96	-
Ohio	-	-	-	-	245	5.1	61	5.8	-	306
New York	-	-	-	-	-	-	94	9.0	-	94
Pennsylvania	-	-	-	-	-	-	48	4.6	-	48
New Jersey	-	-	-	-	17	0.4	11	1.0	-	28
Maryland	-	-	-	-	-	-	15	1.4	-	15
Connecticut	-	-	-	-	7	0.1	5	0.5	-	12
Massachusetts	-	-	-	-	23	0.5	24	2.3	-	47
Others	4928	89.2	573	74.2	4163	86.9	681	65.0	5501	4844
TOTAL	5517		768		4789		1048		6285	5837

Source: The Family Vacation Travel Market, Better Homes and Gardens Publications;
Based on 1977 National Travel Survey, U.S. Bureau of the Census.

^{1/} Primary states with vacation destinations which would permit car ferry useage.

traveling to the state from states east of Lake Michigan. This means that 1,769,000 persons are traveling to locations where a car ferry trip could be considered a natural route for the trip. To obtain 250,000 passengers from this group of vacation trips would mean that 14.1 percent of those persons need to plan a car ferry trip in their vacation travel.

One question that is difficult to answer is, "what percent of all the vacation trips to and through the States of Michigan and Wisconsin can be attracted to a car ferry system?" If all 12,122,000 persons on vacation trips within, to or through Michigan and Wisconsin are considered, then 2.1 percent of all vacation trips would need to ride the car ferry system in order to generate 250,000 passengers.

Table 11 indicates the impact that vacation travel has on the States of Michigan and Wisconsin along with the family profile of those vacationers. Nearly \$2 billion are spent in Michigan and Wisconsin for vacation travel. Household income and household size are factors that influence the car ferry market potential. The percentages of vacationers who come from households with an income of \$20,000 or greater is 40.7 percent for Michigan and 46.7 percent for Wisconsin. Seventy-six percent of the vacationers traveling to, within or through Michigan had four or less persons residing in the household. Wisconsin, on the other hand, had 80.6 percent of its vacationers that were from households with four or less persons.

Although vacation travel is the main trip purpose of the passengers riding the cross-lake car ferry system, other trips utilize the system for interstate travel. The 1977 National Travel Survey (see Table 12)

TABLE 11
 FAMILY PROFILE - VACATION TRIPS
 TO/THROUGH MICHIGAN AND WISCONSIN

<u>Family Size</u>	<u>MICHIGAN</u>	<u>WISCONSIN</u>
Two	23.1%	37.0%
Three	17.0%	17.8%
Four	25.2%	25.8%
Five or More	23.7%	19.4%
 <u>Household Income</u>		
Less than \$5,000	4.2%	1.1%
\$5,000-\$9,999	10.2%	10.2%
\$10,000-\$14,999	21.2%	24.3%
\$15,000-\$19,999	23.7%	17.7%
\$20,000-\$24,999	16.2%	14.0%
\$25,000-\$34,999	16.5%	20.8%
\$35,000+	8.0%	11.9%
 Average People on Trip	 3.1	 3.7
Average Adults on Trip	2.3	2.3
Average Nights Spent	5.5	4.5
Weekend Trips	32.7%	37.2%
Average Family Expenditure/Trip	\$330.00	\$318.00

Source: The Family Vacation Travel Market, Better Homes and Gardens Publications; Based on 1977 National Travel Survey, S. Bureau of the Census.

TABLE 12

1977 PERSON TRIPS TO AND THROUGH MICHIGAN AND WISCONSIN
(1000's)

TRIP PURPOSE	MICHIGAN			WISCONSIN			Total Both States
	Trips To Michigan	Trips Thru Michigan	Total	Trips To Wisconsin	Trips Thru Wisconsin	Total	
Visit Relatives or Friends	6,767	4,010	10,777	6,280	3,171	9,451	20,228
Business	2,671	655	3,326	1,991	1,452	3,443	5,769
Convention	187	229	416	294	161	455	871
Outdoor Recreation	4,926	1,122	6,048	5,137	852	5,989	12,037
Entertainment	712	874	1,586	837	657	1,494	3,080
Sightseeing	852	1,146	1,998	534	874	1,408	3,406
Personal/Family/Medical	2,700	1,342	4,042	2,126	808	2,934	6,976
Shopping	58	166	224	238	22	260	484
Other	926	710	1,636	788	242	1,030	2,666
TOTAL	19,800	10,253	30,052	18,225	8,240	26,465	56,517

Source: U.S. Bureau of Census, 1977 Census of Transportation, 1977 National Travel Survey.

indicated that 32.9 percent of Michigan travel and 47.2 percent of Wisconsin travel is comprised of interstate vacation person trips of 100 miles in length or more. In addition to interstate vacation travel, there are 34,137,00 person trips which are entering or passing through either Michigan or Wisconsin for various travel purposes. If 0.1 percent of the non-vacation travel would use the car ferry system, then an additional 50,000 passengers would be realized.

In summary, there were 56,517,000 person trips which entered or traveled through the States of Michigan and Wisconsin during 1977. The 187,000 passengers riding the car ferry system during that same year represents 0.3 percent of those trips. If car ferry travel was to reach 250,000 passengers, then an additional 0.1 percent of those person trips would have to be induced to cross Lake Michigan.

Market Areas and Travel Forecasts

The above figures reveal that there is sufficient travel to and through the States of Michigan and Wisconsin that the potential for several car ferry operations exists, under the correct conditions. Of concern is whether the distribution of trips to and from the various ports will be equal or whether a new port operation might have a negative effect on the car ferry operation in Ludington.

Table 13 indicates the population accessible to the Ports of Ludington and Muskegon under a restrained and unrestrained travel condition. The restrained condition is simply a provision which limits population to only one port. With a restrained condition, the Muskegon

TABLE 13

1980 MICHIGAN MARKET AREAS FOR LAKE MICHIGAN
CROSS-LAKE FERRY PORTS - POPULATION PROXIMITY

Travel Time (minutes)	LUDINGTON		MUSKEGON	
	Population Unrestrained By Adjacent Ports	Population Restrained By Proximity To Adj. Ports	Population Unrestrained By Adjacent Ports	Population Restrained By Proximity To Adj. Ports
0- 30	29,147	40,352	183,030	183,030
30- 60	63,980	133,159	723,427	716,122
60- 90	299,172	218,945	960,027	921,378
90-120	733,936	276,443	1,734,907	1,644,468
120-150	1,225,495	381,336	2,334,937	2,202,181
150-180	1,856,910	527,388	3,233,065	2,951,355
180-210	2,938,034	683,980	5,803,554	5,310,586
210-240	3,818,675	770,737	8,505,783	7,947,772
240-270	5,083,115	811,660	8,767,851	8,125,617
270-300	8,688,875	836,920	8,861,102	8,151,267

(1) Population accumulates by travel times.

Source: MDOT, Statewide Procedures Section, Statewide Travel Model

Port has a favorable position over the Port of Ludington by 7,314,347 persons; however, under the unrestrained condition, the difference in the population accessible to Muskegon and Ludington, within five hours travel time, is only 172,227 persons. Therefore, from the Michigan perspective, the Ports of Ludington and Muskegon have nearly an equal market.

Table 14 lists the major vacation areas and festivals in Michigan and Wisconsin that attract many of the interstate vacation trips. Exhibits 1 & 2 illustrate those areas in Michigan and Wisconsin which are major attractors for east-west travel and which would be the most probable source of cross-lake car ferry travel. This information indicates that Mackinac Island and the Soo Locks are major attractors in northern lower Michigan and in Upper Michigan.

In Wisconsin, the Green Bay-northeast Wisconsin area and the Duluth/Superior-Northwest Wisconsin areas are the predominant areas in Wisconsin for vacation trips.

This information would indicate that northern Michigan and northern Wisconsin have certain vacation attraction features, such as lakes, fishing, and seclusion, which many vacationers are seeking. The demand for access to these locations means that a northern cross-lake ferry market exists, however, the size of that market is not easily determined.

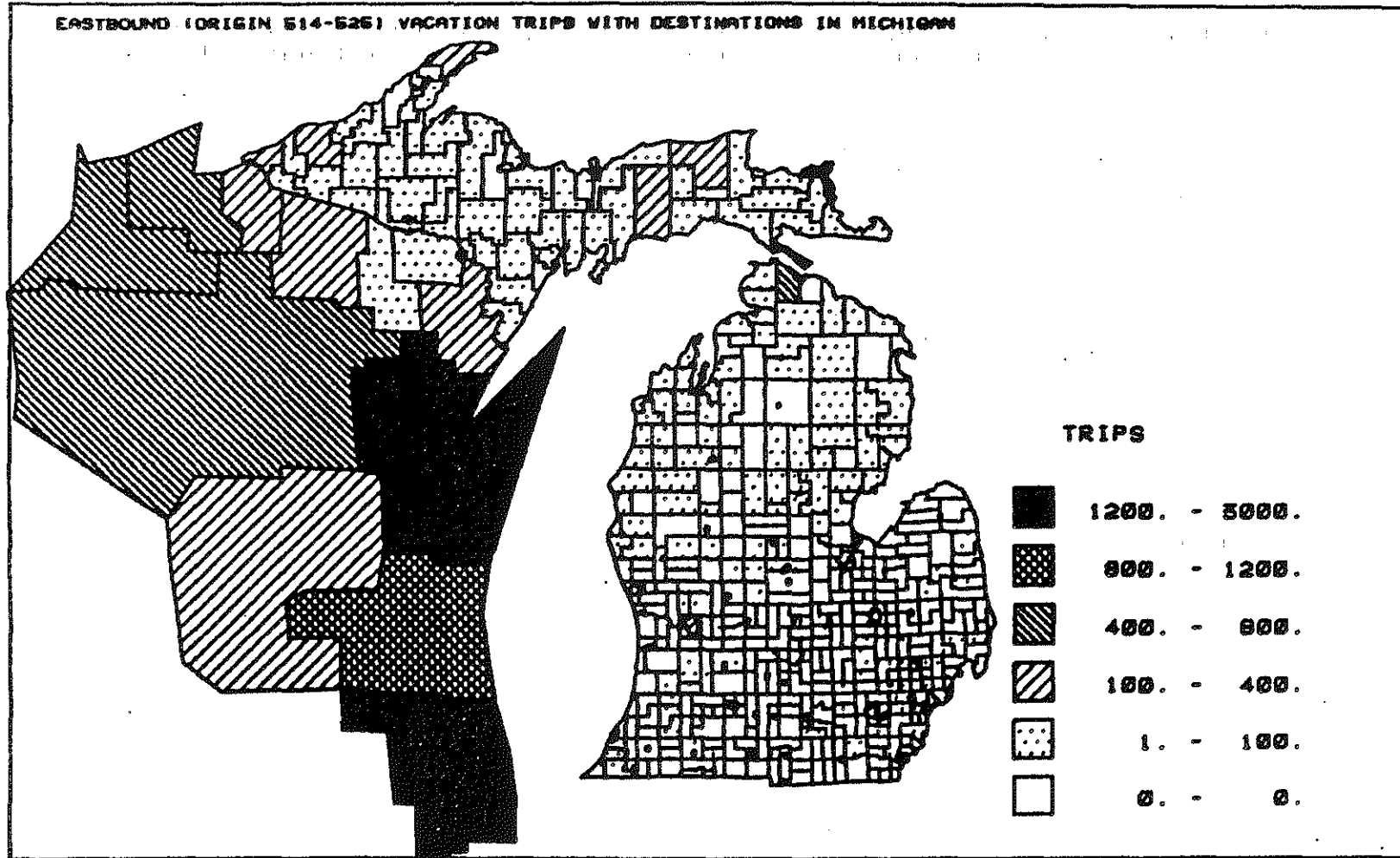
Several passenger ridership projections have been made in other car ferry studies. The Analysis of Lake Michigan Car Ferry Service, prepared by the Wisconsin Department of Transportation (1975), analyzed passenger ridership along with freight movement. This analysis examined the various vessel options including the three vessels used by the Ann Arbor

TABLE 14

MAJOR TOURIST ATTRACTIONS AND SUMMER EVENTS
IN MICHIGAN AND WISCONSIN

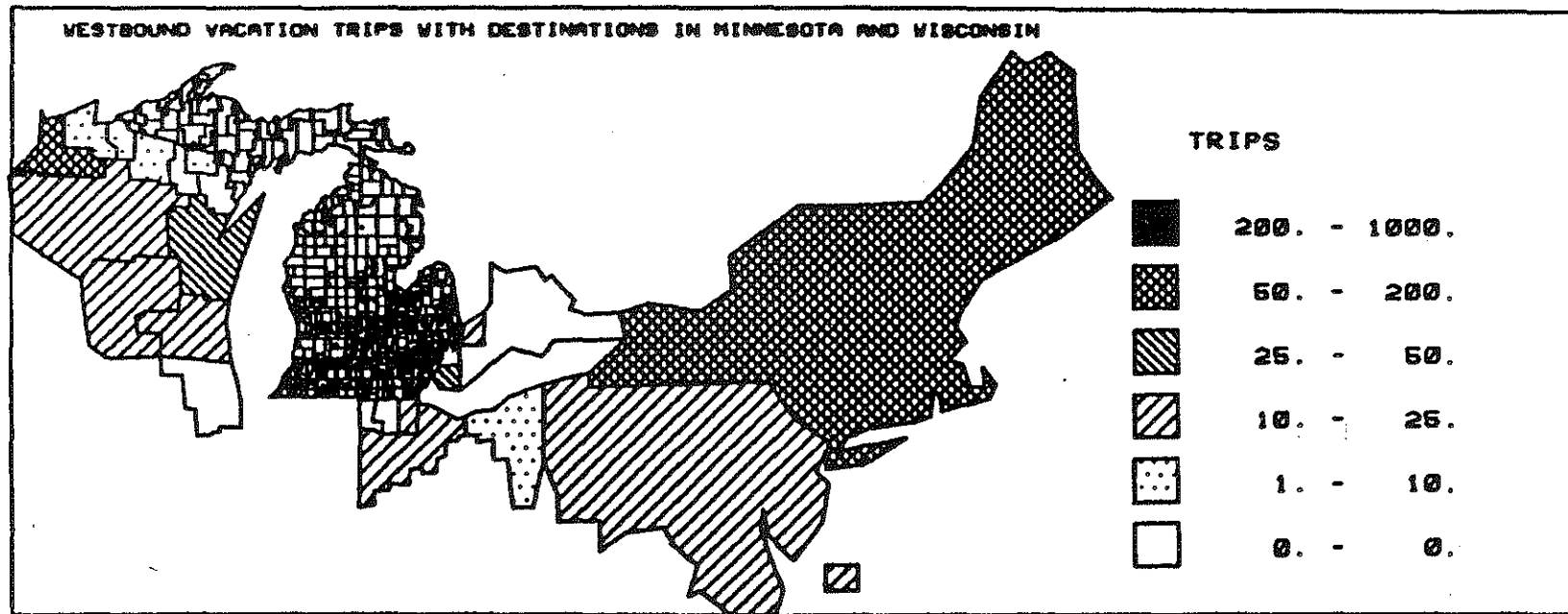
<u>PLACES</u>	MICHIGAN	<u>EVENTS</u>	<u>PLACES</u>	WISCONSIN	<u>EVENTS</u>
Mackinac Island and Bridge		Holland Tulip Festival	Wisconsin Dells		Lumber Jack Contest, Hayward
Soo Locks		Detroit Grand Prix	New Glarus		Air Show, Oshkosh
Greenfield Village		Bavarian Fest, Frankenmuth	Door County		Volkfest/Heide Fest, New Glarus
Michigan Int'l Speedway		Nat'l Cherry Festival, Traverse City	Baraboo Circus Museum		Dells Hot Air Balloon Rally, Wisc. Dells
Detroit Zoo		Hot Air Balloon Festival, Battle Creek	Milwaukee County Stadium		Milwaukee Summerfest
Boblo Island		International Freedom Festival, Detroit	Milwaukee Brewery Tours		
Frankenmuth			Elkhart Lake - Road America		
Tiger Stadium					
Pontiac Silverdome					

EASTBOUND VACATION TRIPS FROM WISCONSIN TO MICHIGAN



Source: Michigan Department of Transportation, Statewide Procedures Section - Traffic Model Vacation Trip Table based on Aggregated Origin-Destination Data.

WESTBOUND VACATION TRIPS, FROM STATES
EAST OF MICHIGAN, INTO WISCONSIN



Source: Michigan Department of Transportation, Statewide Procedures Section - Traffic Model
Vacation Trip Table based on Aggregated Origin-Destination Data.

Carferry operation, the three vessels used by the C&O Carferry operation, and the remodeling of a vessel for expanded trucks and automobile storage. Passenger ridership was estimated to range from 207,536 passengers up to 483,120 passengers, depending on the number of routes and vessels used.

The Board of Harbor Commissioners for the Port of Milwaukee, hired the firm of Transportation and Economic Research Associates (TERA), to perform a feasibility study for an air cushion ferry service between the Ports of Milwaukee and Muskegon. Table 15 indicates the projected ridership for this service only, based upon various fare structures. The estimate for use of an air cushion vessel based upon a \$26 vehicle \$14 passenger fare, ranged from 365,000 passengers in 1980 to 468,000 in the year 2000.

According to an origin-destination survey, conducted by TERA, ridership figures would be only 30 percent of these projections if a conventional car ferry vessel is used. Under this situation, car ferry passenger ridership between Milwaukee and Muskegon would range from 120,000 in 1980 to 156,000 by year 2000..

The car ferry market appears to be substantial, however, factors like scheduling, fare structure, passenger amenities and promotion or marketing are the elements which have direct impact upon how much of the market is captured. Thus far, the figures that have been examined reveal the past and current status of the probable Lake Michigan Car Ferry market. The future market is also important.

Estimating total car ferry passenger ridership involves many variables and assumptions. Previous figures would indicate that current ridership could be from 250,000 to 300,000 passengers; however, the decline in

TABLE 15

ESTIMATED DEMAND IN HOUSEHOLDS AND PASSENGER TRIPS
(Total)

FARE * \$	1977 **		1980		1990		2000	
	Estimated Household Trips (000)	Estimated Passenger Trips (000) ***	Estimated Household Trips (000)	Estimated Passenger Trips (000)	Estimated Household Trips (000)	Estimated Passenger Trips (000)	Estimated Household Trips (000)	Estimated Passenger Trips (000)
25/14	206	353	212	365	241	415	268	468
24/13	272	467	281	482	319	548	355	609
22/12	365	626	377	647	428	736	476	817
20/11	438	751	452	776	514	883	571	980
18/10	464	797	480	824	545	936	605	1040
16/9	464	797	480	824	545	936	605	1040
14/8	464	797	480	824	545	936	605	1040

* The numbers before and after the slash (/) represent the fare per car and fare per person, respectively

** Base Year

*** Estimated Passenger Trips are equal to 1.717 Household trips

Source: Feasibility Study of a Cross Lake Passenger Auto Air Cushion Ferry Service, Phase I Report,
Transportation and Economic Research Associates (TERA), Inc. August, 1980.

service has definitely had an effect. Since 1965 car ferry ridership has declined nearly 44 percent while vehicle miles of travel increased 44 percent. Table 16 lists the vehicle miles of travel projections for Michigan highways. A conservative estimate indicates that an additional 22.7 billion vehicle miles of travel will occur in Michigan by the year 2000. This added VMT represents a 36.6 percent increase in the VMT from the 1980 volume. An optimistic projection has the VMT increasing 52.4 percent or 32.5 billion vehicle miles of travel. Using the 1977 NPTS percentage of 0.6 percent of all travel is for vacations, then Michigan would experience 136.4 million vehicle miles of vacation travel under the conservative estimate and 195.0 million VMT of vacation travel under the optimistic estimate. At the Michigan-Wisconsin average of nearly 1,000 round-trip miles per vacation trip, this means an additional 136,400 to 195,000 vacation trips are expected by year 2000, in Michigan.

Wisconsin has had a history of VMT which is nearly 50 percent of the Michigan VMT. If this relationship holds true until the year 2000, then Wisconsin will experience another 68,200 to 97,500 vacation trips by the year 2000. Combined, these two states are estimated to receive an additional 204,600 to 292,500 vacation trips. At an average of 3.5 persons per trip, there could be 716,100 to 1,023,750 additional persons vacationing in these two states.

TABLE 16

MICHIGAN VEHICLE MILES OF TRAVEL
 1985 - 1990 - 1995 - 2000 PROJECTIONS
 (1,000,000's VMT)

1980 VMT = 62,059

<u>YEAR</u>	<u>CONSERVATIVE PROJECTION</u>	<u>% INCREASE</u>	<u>OPTIMISTIC PROJECTION</u>	<u>INCREASE</u>
1985	68,900	11.0	70,299	13.3
1990	75,900	10.2	77,500	10.2
1995	80,200	5.7	85,600	10.5
2000	84,800	5.7	94,560	10.5
190-2000		36.6		52.4

Source: MDOT, Statewide Procedures Section, Statewide Travel Model

Summary of Findings

The data on the previous pages present various facts regarding Lake Michigan cross-lake car ferry travel and travel trends in general. From this information several summary statements can be made about these subject areas.

I. Lake Michigan Car Ferry Travel:

1. Between 1965 and 1980, the year 1966 recorded the highest passenger ridership total of 321,364 passengers.
2. Passenger surveys indicate that from 82.8 to 93.6 percent of all cross-lake passenger trips are pleasure trips.
3. Ridership data indicates that from 72.6 to 93.4 percent of the ridership occurs during the months of May through September.
4. Passenger surveys indicate that an average of 65.4 percent of the passengers originate and 73.8 percent of the passengers are destined for the States of Michigan or Wisconsin.
5. Between the years 1965 and 1980, car ferry passenger ridership declined 44 percent, with much of this decline due to the reduction in service.
6. The largest decline occurred when the Milwaukee Clipper ceased operations in 1970. There was a drop of over 100,000 passengers during the following two years.

II. Cross-Lake Market Indicators:

1. Population in the East North Central United States increased 37.1 percent between 1950 and 1980, with Michigan and Wisconsin maintaining their proportional share of the population.

2. The States of Michigan and Wisconsin had a combined 1980 population of 13,963,000.
3. Vehicle miles of travel in the East North Central United States increased 42.4 percent between the years of 1966 and 1980.
4. Michigan ranks 10th and Wisconsin 14th in the number of family vacation trips and 5th and 11th in receipts of travel dollars, respectively.
5. The 1977 National Travel Survey (NTS) indicated that 12,122,000 persons made vacation trips within, into, or through the States of Michigan and Wisconsin.
6. The 1977 NTS indicated that a total of 56,517,00 persons travel to or through the States of Michigan and Wisconsin, for various travel purposes, including vacations.
7. The 1977 NTS indicated that 1,779,000 person vacation trips were made to or through Michigan and Wisconsin from origins which would make a cross-lake ferry trip a natural part of the route.
8. Vehicle miles of travel (VMT) are projected to increase from 36.6 percent to 52.4 percent by the year 2000.
9. The projected VMT translates into an additional 716,000 to 1,023,750 person vacation trips into or through the States of Michigan and Wisconsin.

Conclusion

There is insufficient data to arrive at conclusions which are irrefutable; however, the data which is available does have some definite indicators.

These indicators are:

1. The subsequent drop in the total Lake Michigan cross-lake car ferry ridership, when the Milwaukee Clipper ceased operations, indicates that ridership is either sensitive to the number of opportunities or options to travel across Lake Michigan or there exists two markets of cross-lake travelers (see Exhibit 3).
2. Vacation travelers are the primary market of cross-lake passengers. Vacation travel, as well as all travel, has been increasing which would indicate the market possibilities are also increasing.
3. The expenditure of \$2 billion for vacations in Michigan and Wisconsin is substantial, which would indicate that travelers would favorably consider a cross-lake ferry experience if fares and amenities seem reasonable.

Although there has been substantial data which has been examined, some of the data is dated. Before any final recommendations and/or decisions are made, it would be appropriate to perform an origin-destination survey on the current cross-lake operations. In addition to the basic origin and destination information, it would be appropriate that various social and economic information be gathered from the travelers along with their impression about the existing service.

LAKE MICHIGAN CROSS-LAKE FERRY TRAVEL CORRIDORS

