Dial-A-Ride Transportation

MICHIGAN DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION

BUREAU OF URBAN
AND PUBLIC TRANSPORTATION

MICHIGAN DEPARTMENT
OF
STATE HIGHWAYS AND TRANSPORTATION

MICHIGAN DART PROGRAM

STATUS REPORT

Revised February, 1976

By

Bureau of Urban and Public Transportation

Bus Transport Division

Bus Development Section

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I. Introduction

The Michigan Department of State Highways and Transportation has actively been exploring the feasibility of improving public transportation in Michigan's small/medium-sized communities and rural areas. Michigan DART or Dial-A-Ride Transportation is the program concept designed to provide basic transportation service throughout the state. The Michigan DART program is based on concepts developed in Ann Arbor which began Dial-A-Ride service in September, 1971.

The first Michigan DART system started in Holland in February, 1974, and twenty-eight systems have now been implemented statewide (Exhibit A), providing total public transportation services to half-a-million Michigan residents. By August of 1976, it is expected that 38 to 40 systems will be operating. The trend is now towards more rural county and regional systems.

Basically, a dial-a-ride transportation system in cities involves the potential customer contacting the transit service by telephone to make arrangements for pickup and delivery to a destination. DART is a flexible system which operates on a demand-responsive basis (Exhibit B). DART does not operate like a taxi, picking up and delivering fares one at a time, but on tours. A tour consists of the bus picking up passengers at five or six locations and delivering them to different destinations throughout the city. All of the DART vehicles are radio dispatched. When a tour is finished, the dispatcher uses the radio system to relay a new list of pickups. Pickups after

EXHIBIT A

OPERATING SYSTEMS

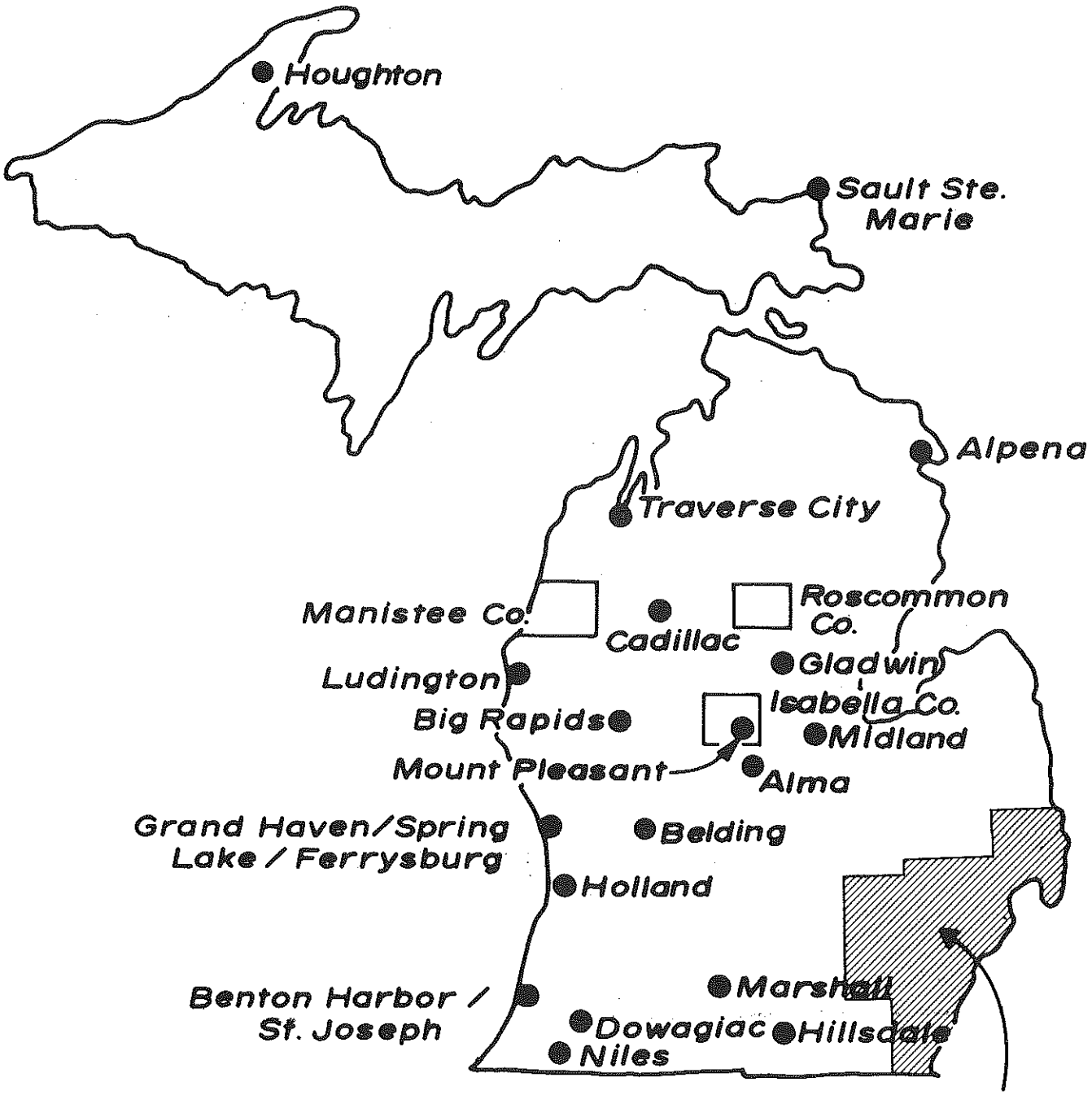
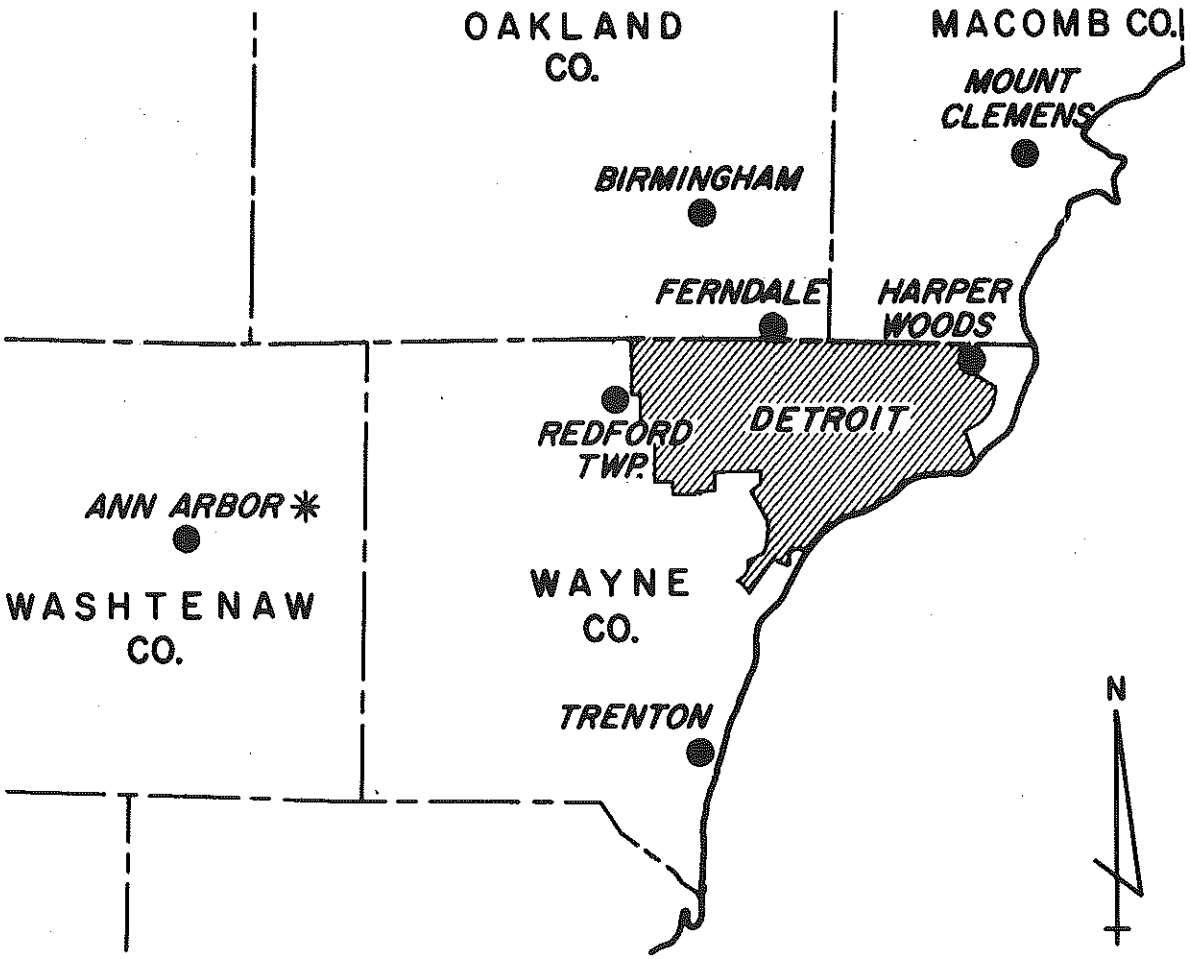


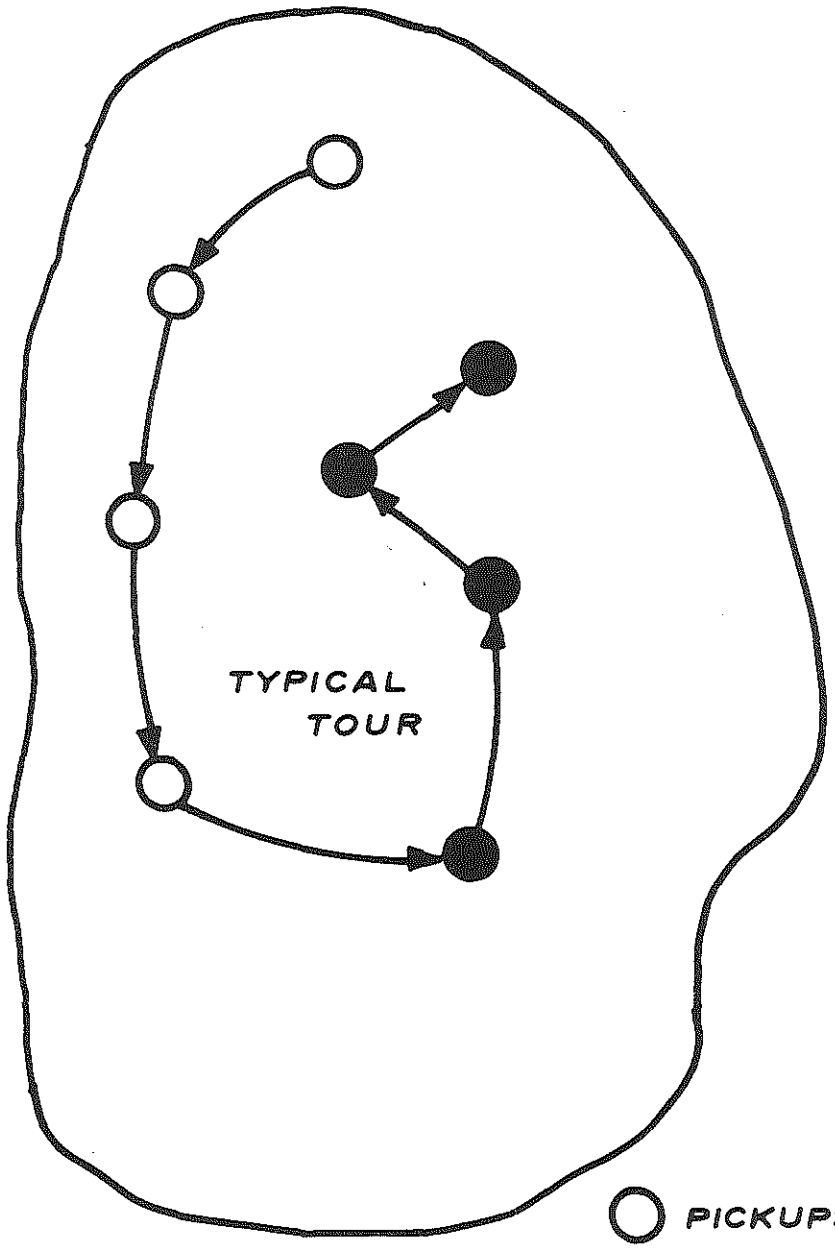
EXHIBIT A

OPERATING SYSTEMS



* Authority separate from SEMTA

DEMAND-RESPONSIVE SERVICE



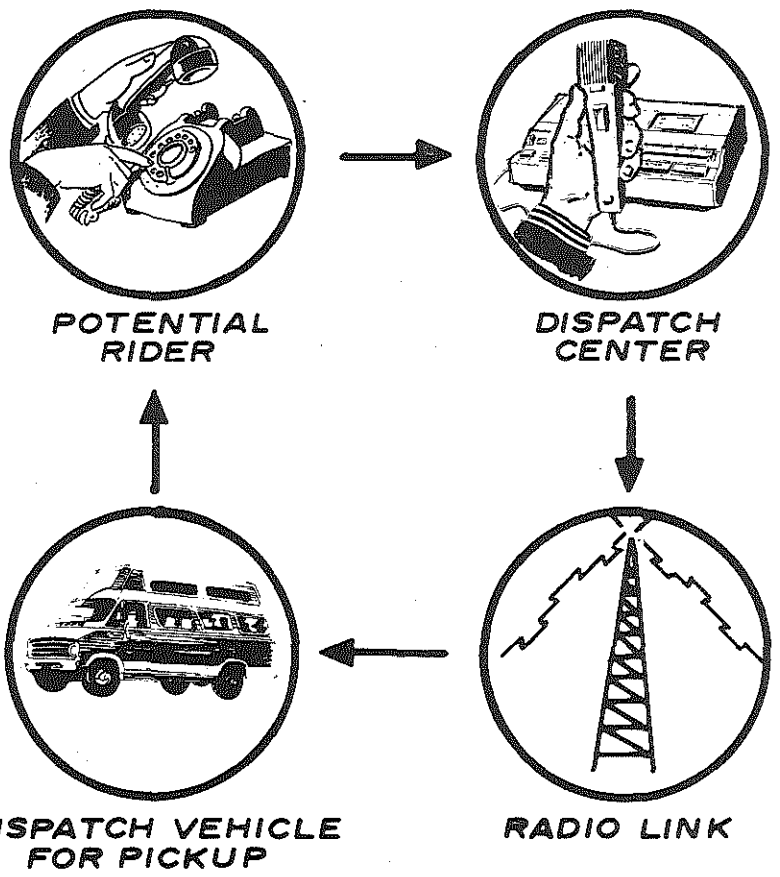


EXHIBIT B

call-in are generally within 20 minutes and trip time averages 15 minutes. The larger systems include some loop service in conjunction with the demand-responsive service.

In rural areas, DART takes on many different forms. The towns over 3,000 are served with Dial-A-Ride; however, it is operationally impossible to provide this quality of service to all residents in a typical county covering 500 square miles and keep the cost per passenger under a reasonable amount, such as $2.50.

The options available are planned/demand service (advance sign-up), shuttles connecting population areas, route deviation service, local coordinators to arrange transportation for low population areas, contracts with community action and social service agencies, etc.

This report does not attempt to cover the community impact as it relates to the individuals using the system and to the community as a whole. As part of its contract with the state, the Huron River Group has completed a report entitled "Michigan DART: Executive Summary of Performance and Impacts." This report provides an overview of the program covering such areas as:

Why DART Anyway?
Characteristics of Passengers
Community Penetration
Subsidy Requirements
Private Operator Contracts and Legal Issues
Economic, Traffic, and Energy Impacts
Alternatives to DART
Etc.

II. Background

A. Legislation and Financing

Act 327 of the Public Acts of 1972 provided for the implementation of Dial-A-Ride Transportation systems in Michigan's small/medium-sized cities and rural counties. In Fiscal Year 1974, funds from the General Transportation Fund, which are derived from one-half cent of the nine cent state gas tax, were utilized to implement nine systems on a demonstration basis. The program for Fiscal Year 1975 provided funding for an additional nineteen communities. This program will continue in Fiscal Year 1976 with capital and operating funds to implement twelve new systems.

The first year operating cost is funded 100 percent from the state, less $1,000 as the local contribution. The covered costs include:

1. Capital Costs

    a. Vehicles
    b. Radio System
    c. Dispatch Center Renovation

2. Monthly Operating Costs

    a. Management
    b. Insurance
    c. Marketing
    d. Office Supplies
    e. Rent and Utilities
    f. Telephone
    g. Dispatch Labor
    h. Driver Labor
    i. Vehicle Operations and Maintenance
    j. Radio Maintenance
    k. Training and Travel

For the first year, the state contracts with the city, county, or authority. If a subcontractor is used, such as a cab company, the local unit of government must execute a contract with the third party to provide operating services.

At the end of the first year, if the system is continued, the equipment is sold to the community for one dollar per vehicle. The state will continue after the first year to provide operating subsidies up to a maximum of 33 percent of the total operating costs, as well as providing 100 percent state funding or matching funds for capital grants.

B. Population Characteristics

Exhibit C indicates pertinent demographic data for each system. It is readily apparent that a wide range of Michigan communities now have DART service. Gladwin is the smallest with a population of 3,025 and Benton Harbor/St. Joseph is the largest with a population of 56,828. Percent of households with no cars, percent of senior citizens, and percent of families below poverty level are indicators of the relative need for public transportation.

C. System Characteristics

Exhibit D describes the basic system characteristics. Of the twenty-eight systems operating, the Huron River Group implemented Holland, Ludington, Mt. Pleasant, Sault Ste. Marie, Traverse City, Midland, Houghton, and Benton Harbor/St. Joseph. State forces have implemented Alpena, Niles, Marshall, Cadillac, Hillsdale, Manistee County, Big Rapids, Isabella County, Belding, Roscommon County, Bladwin, Dowagiac, Alma, and Grand Haven to date. The Southeastern Michigan Transportation Authority (SEMTA) systems were implemented with a combination of Huron River Group and SEMTA personnel. The basic fare structure is 50 cents with senior citizens and handicapped riding for half fare. It should be noted

1970 GENERAL POPULATION CHARACTERISTICS - OUTSTATE SYSTEMS

EXHIBIT C

	Holland	Ludington	Mt. Pleasant	Sault Ste. Marie	Traverse City	Isabella County	Midland	Houghton	Alpena
Population of City/Co.	26,337	9,021	20,504	15,136	18,048	44,594	35,176	6,067	13,805
Population Served	27,137	9,521	20,504	15,136	26,321	24,090	35,176	12,287	19,805
City/County Area (Sq. Miles)	13.8	3.2	5.1	15.7	7.8	572	24.9	2.2	7.4
Service Area (Sq. Miles)	14.2	4.3	5.1	15.7	17.8	568	24.9	4.1	10.4
City/County Population Per Sq. Mile (Average)	1,908	2,819	4,020	964	2,314	78	1,413	2,758	1,866
Service Area Population per Square Mile (average)	1,911	2,214	4,020	964	1,479	42	1,413	2,997	1,904
Median Family Income	$10,135	$8,811	$ 9,213	$8,033	$10,143	$9,207	$ 13,428	$ 7,743	$ 9,039
% Households with no car	10%	15%	9%	21%	13%	7%	5%	11%	11%
% Senior Citizens	11%	15%	5%	11%	14%	7%	5%	7%	10%
% Families Below Poverty Level	5%	9%	7%	14%	7%	10%	4%	15%	9%

1970 GENERAL POPULATION CHARACTERISTICS - OUTSTATE SYSTEMS

EXHIBIT C

	Benton Harbor/St. Joseph	Niles	Marshall	Cadillac	Hillsdale	Manistee County	Big Rapids	Belding	Roscommon County
Population of City/Co.	27,523	12,988	7,253	9,990	7,728	20,094	11,995	5,121	9,892
Population Served	56,828	12,988	7,253	10,490	7,728	18,404	11,995	5,321	9,892
City/County Area (Sq. Miles)	6.8	5.2	4.6	5.8	4.3	533	5.1	4.2	521.
Service Area (Sq. Miles)	51.6	5.2	4.6	6.1	4.3	408	5.1	4.7	521
City/County Population Per Sq. Mile (Average)	4,048	2,498	1,577	1,722	1,797	36	2,352	1,219	19
Service Area Population per Square Mile (average)	1,101	2,498	1,577	1,720	1,797	45	2,352	1,132	19
Median Family Income	$10,322	$10,621	$11,304	$8,474	$9,791	$8,365	$8,140	$9,486	$6,895
% Households with no car	11%	17%	14%	16%	14%	12%	13%	9%	8%
% Senior Citizens	4%	12%	12%	13%	12%	14%	6%	12%	17%
% Families Below Poverty Level	10%	9%	4%	9%	6%	12%	11%	6%	15%

1970 GENERAL POPULATION CHARACTERISTICS - OUTSTATE SYSTEMS

EXHIBIT C

October-December, 1975	Gladwin	Dowagiac	Alma	Grand Haven					Averages
Population of City/Co.	2,071	6,583	9,790	17,074					12,153/city 24,860/co.
Population Served	3,025	7,883	9,790	17,074					16,645/city 17,462/co.
City/County Area (Sq. Miles)	1.6	2.6	4.6	7.5					7.0/city 549/co.
Service Area (Sq. Miles)	2.4	4.1	4.6	7.5					10.4/city 499/co.
City/County Population Per Sq. Mile (Average)	1,294	1,923	2,128	2,277					1,736/city 45/co.
Service Area Population per Sq. Mile (Average)	1,260	1,923	2,128	2,277					1,930/city 35/co.
Median Family Income		$ 9,668	$ 9,352	$10,610					$9,035
% Households with no car	10%	16%	11%	9%					12%
% Senior Citizens	13%	10%	11%	10%					11%
% Families Below Poverty Level	5%	9%	9%	4%					9%

1970 GENERAL POPULATION CHARACTERISTICS - URBAN SYSTEMS

EXHIBIT C

	Ann Arbor	Trenton	Mt. Clemens	Ferndale	Harper Woods	Birmingham	Redford Township		
Population Served	100,035	24,127	20,476	30,850	21,455	26,170	71,901		
Service Area (Square Miles)	13.6	7.2	3.8	3.9	2.6	4.6	15.8		
Population per Square Mile (Average)	460	3,351	5,388	7,910	8,252	5,689	4,551		
Median Family Income	$12,294	$14,581	$11,210	$ 11,525	$13,534	$17,292	$15,216		
% Households with no car	8.5%	3.2%	6.1%	6.4%	5.4%	2.6%	4.0%		
% Senior Citizens	5.6%	4.3%	9.6%	11.5%	10.9%	10.1%			
% Families Below Poverty Level	5.1%	3.3%	5.0%	3.6%	2.1%	1.8%	2.4%		

SYSTEM CHARACTERISTICS - OUTSTATE SYSTEMS

EXHIBIT D

	Holland	Ludington	Mt. Pleasant	Sault Ste. Marie	Traverse City	Isabella County	Midland	Houghton	Alpena
Start of Service	2/4/74	2/19/74	3/18/74	4/29/74	5/20/74	6/10/74	6/25/74	7/22/74	7/29/74
Regular Vehicles	5	3	4	5	5	3	9	4	4
Lift Vehicles	1	1	1	1	1		1		1
Fare Structure Adult	50-75	50-75	50	50	50-1.00	50-1.00	50	50-70	50-75
Children	Free 50-75	Free 25-35	Free	Free	25-50	Free-25-50	Free 25-50	Free-25-35	25-40
Sen. Cit.	25-25	25-35	25	25	25-50	25-50	25	25-35	25-40
System Hours Mon.-Thurs.	6:00-6:00	6:00-6:00	7:00-7:00	7:30-10:00	6:00-6:00	M-F	6:15-11:00	6:00-6:00	6:30-8:30
Fri.	6:00-6:00	6:00-7:00	7:00-9:00	7:30-11:00	6:00-9:30	7:00-5:30	6:15-11:00	6:00-10:00	6:30-10:30
Sat.	----	8:00-6:00	8:00-7:00	8:00-6:00	9:00-5:00		8:00-6:00	6:00-6:00	8:00-6:00
Sun.	----	9:00-1:00	9:00-1:00	8:00-6:00	----		9:00-5:00	---	9:00-5:00
Number of Employees Full	3	3	1	8	7	0	16	9	9
Part	9	7	17	8	1	5	7	1	1
Operator	Warm Friend Inc.	City	City	Comm. Action Agency	Number 1 Cab Co.	Isabella Co. Comm. on Aging	City	Portage Lake Trans. Authority	City Cab
Capital First Year Cost	$67,200	$43,200	$55,200	$68,200	$67,200	$20,910	$98,529	$57,200	$49,000
Oper. First Year Cost	$131,780	$105,910	$116,750	$131,265	$107,800	$35,221	$213,804	$110,620	$115,290
Special Services and Features	Sen. Cit. Charter	Shut-in Tour-Hand.	Charter for mental	Comm. Programs Free	Sen. Cit. Center - pick up 2 Wed. nights per month.	Headstart Charter	$9/hour Charter Loop-Line haul Service		

SYSTEM CHARACTERISTICS - OUTSTATE SYSTEMS

EXHIBIT D

		Benton Harbor/St. Joseph	Niles	Marshall	Cadillac	Hillsdale	Manistee County	Big Rapids	Belding	Roscommon County
Start of Service		9/30/74	11/4/74	11/21/74	12/9/74	2/10/75	3/3/75	3/31/75	4/14/75	5/1/75
Regular Vehicles		14	4	2	3	2	4	4	2	2
Lift Vehicles		1	1	1	1	1	1			1
Fare Structure	Adult	60	50-75	50-75	50	50	50	50	50	50-75-1.00
	Children	25-Free	25-35	25-35	Free - 25	25	25	Free-25-50	Free-25	50-75-1.00
	Sen.Cit.	30	25-35	25-35	25	25	25	25	25	25-35-50
System Hours	Mon.-Thurs.	6:30-6:30	6:00-6:00	6:00-6:00	6:00-6:00	6:30-6:30	6:30-6:30	6:30-6:30	6:30-9:30	6:00-6:00
	Fri.	6:30-6:30	6:00-9:00	6:00-6:00	6:00-9:00	6:30-9:30	6:30-6:00	6:30-10:00	6:30-9:30	6:00-6:00
	Sat.	9:00-6:00	9:00-6:00	8:00-6:00	8:00-6:00	8:00-6:00	8:00-6:00	9:00-6:30	----	----
	Sun.	----	----	----			----	----	----	----
Number of Employees	Full	26	8	4	6	4	2	0	2	4
	Part	3	6	3	2	4	10	10	4	4
Operator		Twin City Area Trans. Auth.	Waltman Enterprises	City	Cadillac Cab	City	Man. Co. Council on Aging.	City	City	County
Capital first year cost		$153,200	$ 46,900	$ 33,000	$35,000	$34,500	$41,900	$44,000	$24,954	$32,540
Oper. first year cost		$278,446	$ 97,512	$ 70,546	$88,690	$64,662	$93,260	$112,960	$43,528	$44,075
Special Services and Features		1 trip/hr. M-F to Lake Mich. College	Meets AMTRAK Trains Handicap Charter			4 trip/wk. to Oak Haven Resort	Tickets 10 for $4.50 Fixed Rt. for Co. Nursing Home serv. once/week.		10 tickets for $3.50	

SYSTEM CHARACTERISTICS - OUTSTATE SYSTEMS

EXHIBIT D

		Gladwin	Dowagiac	Alma	Grand Haven Spring Lake Ferrysburg				
Start of Service		5/12/75	6/16/75	6/30/75	8/18/75				
Regular Vehicles		1	2	3	4				
Lift Vehicles		1							
Fare Structure	Adult	50	50	50	50				
	Children	Free-10-25	Free-25-50	Free-25-50	Free-25-50				
	Sen. Cit.	25	25	25	25				
System Hours	Mon.-Thurs.	8:00-4:00	8:00-6:00	6:30-10:00	6:00-6:00				
	Fri.	8:00-4:00	8:00-6:00	6:30-10:00	6:00-9:00				
	Sat.	----	----	8:00-6:00	8:00-5:00				
	Sun.	----	----						
Number of Employees	Full	1	2	8	3				
	Part	0	1	1	8				
Operator		Gladwin City Housing Comm.	City	City	Tri-Cities Trans.				
Capital first year cost		$23,500	$24,500	$35,000	$46,100				
Oper. first year cost		$43,080	$31,775	$110,350	$130,452				
Special Services and Features		Weekly Craft Class for Senior Citizens		Alma Day Care Center Twice/week	Charter $5/hour plus 30¢/mile				

SYSTEM CHARACTERISTICS - URBAN SYSTEMS

EXHIBIT D

		Ann Arbor	Trenton	Mt. Clemens	Ferndale	Harper Woods	Birmingham	Redford Township		
Start of Service		9-71	8-19-75	3-31-75	4-14-75	5-5-75	7-7-75	7-10-75		
Regular Vehicles		20	6	4	2	4	3	4		
Lift Vehicles		2					1			
Fare Structure	Adult	25¢	60¢	50¢	50¢	50¢	50¢	60¢		
	Children	25¢	30¢	25¢	25¢	free	25¢	30¢		
	Sen. Cit.	10¢	30¢	25¢	25¢	25¢	25¢	30¢		
System Hours	Mon.-Thurs.	6:30-1:00	6:00-6:00	7:00-6:00	6:30-6:30	9:00-5:00	6:30-6:30	6:30-6:30		
	Fri.	6:30-1:00	6:00-6:00	7:00-6:00	6:30-6:30	9:00-5:00	6:30-9:30	6:30-6:30		
	Sat.	8:00-6:00	none	none	10:00-4:00	none	10:00-6:00	none		
	Sun.	8:00-6:00	none	none	none	none	10:00-2:00	none		
Number of Employees	Full Time		0	1	0	0	5	1		
	Part Time		27	10	8	6	0	7		
Operator		Ann Arbor Trans. Auth.	City	City	City	City	Birmingham Taxi	N.W. Transport		
Total First Year Cost	Capital		$94,931	$49,000	$37,500	$18,427	$55,210	$54,416		
	Operating		$ 0	$42,270	$46,370	$ 8,870	$72,600	$88,364		
Special Services and Features		Subscription service Meet train handicap	None	None	None	None.	Handicap	Shopping Centers		

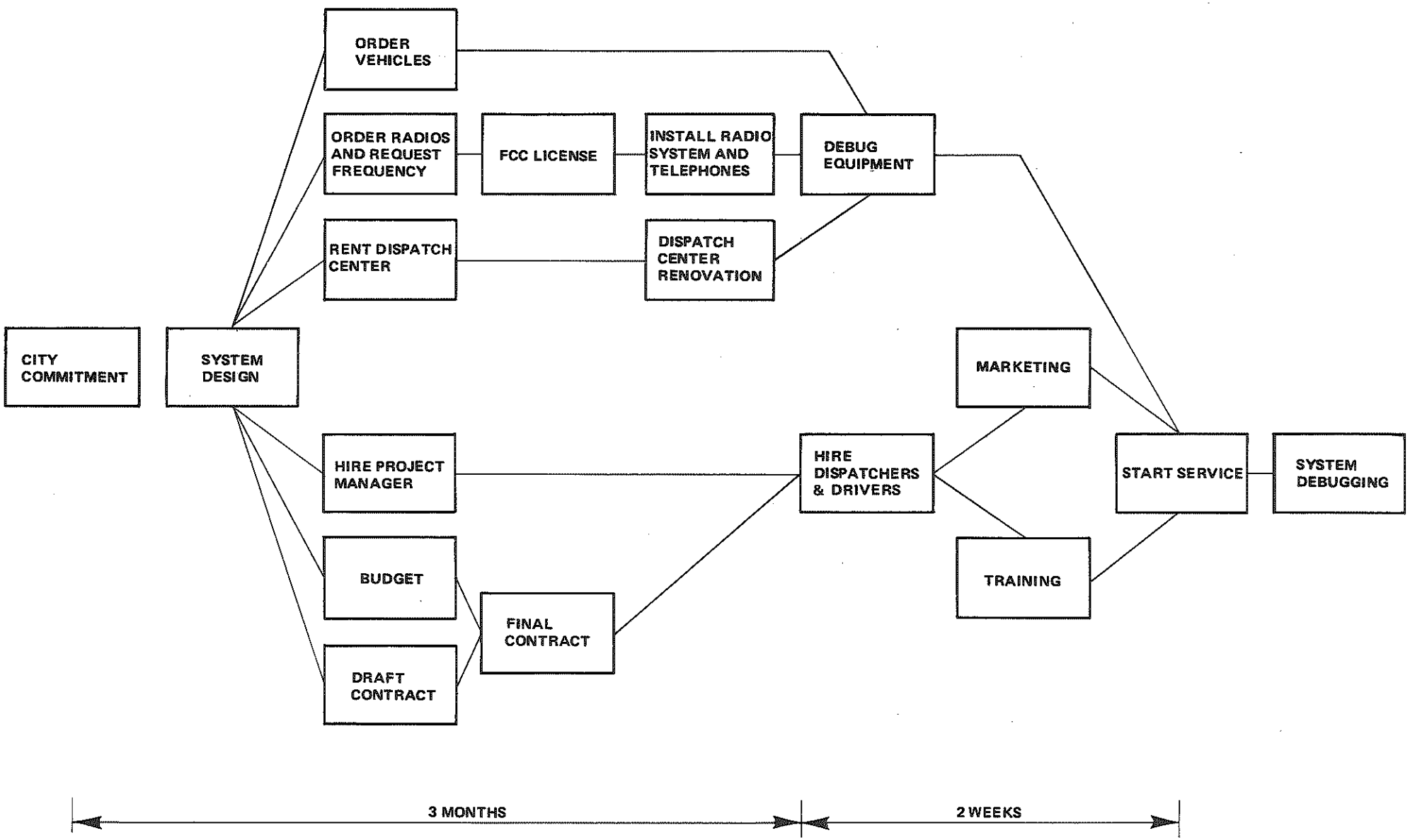
that a number of the systems are being operated by the local cab company under subcontract to the city.

Most of the systems have experimented with special service to both increase ridership and meet community needs. Mt. Pleasant experimented with a 25 cent full fare for a month. Their ridership increased substantially during the month, then dropped back practically to previous levels. It did serve to introduce many new people to the system. Ludington has provided one-hour tours for shut-ins, with the cost covered by a local merchant or individuals. Twelve of the systems have vehicles equipped with a wheelchair lift. In the near future, all of the DART systems will have this capability. Passengers requiring the use of the lift must call in well in advance. The systems do not have a driver available to operate the lift vehicles at all times during operating hours, since in most cases, the demand for the lift is too low. Service for customers using the lift is limited generally to curb-to-curb service to avoid liability problems. If required, the passengers must provide an attendant. Operating hours are generally 12 hours per day with the actual number of vehicles on the road at any one time varied according to demand.

D. Flow Chart

A number of basic steps must be taken in order to implement a DART system as shown in simplified form in Exhibit E. Obviously, all of these steps must be coordinated to insure that everything is set to go at the projected start-up date.

EXHIBIT E


ORDER VEHICLES
ORDER RADIOS AND REQUEST FREQUENCY
FCC LICENSE
INSTALL RADIO SYSTEM AND TELEPHONES
DEBUG EQUIPMENT
RENT DISPATCH CENTER
DISPATCH CENTER RENOVATION
CITY COMMITMENT
SYSTEM DESIGN
MARKETING
HIRE PROJECT MANAGER
HIRE DISPATCHERS & DRIVERS
START SERVICE
SYSTEM DEBUGGING
BUDGET
TRAINING
FINAL CONTRACT
DRAFT CONTRACT
3 MONTHS
2 WEEKS

All equipment is purchased by the state. Vehicles, in general, are taking 90 to 120 days for delivery and are generally the biggest holdup in starting the system. Training is also handled by state staff and covers such things as rules of the road, emergency procedures, proper radio procedures, use of the equipment, especially the safe operation of the wheelchair lift, customer relations, dispatcher and driving techniques, etc.

In addition, state staff and the local project manager develop a low-key marketing program initially including an information brochure, opening ceremony, talks to local groups and as much free radio, TV, and newspaper coverage as possible prior to and during the start-up period. An excessively large marketing campaign at the outset could overload the system at the beginning causing long waits and ride times which will in turn drive customers away. The marketing should, therefore, be geared to create a gradual but continual increase in ridership over the first year, allowing the project manager to efficiently adjust the system to meet the increasing demand, thus maintaining a consistent quality of service.

III. Ridership Data

Of course, the measure of success in any transportation system is found in the ridership statistics. Exhibit F indicates the average ridership for the quarter ending December, 1975. As of this writing, over 145,000 passengers per month are riding Dial-A-Ride.

As might be expected, senior citizens have used Dial-A-Ride in large numbers, generally ranging from 30 to 50 percent of the total ridership.

Passengers/vehicle hour is an indication of system efficiency. We generally believe that DART systems should be averaging six to eight passengers per vehicle hour by the end of the first year. Passengers per 1,000 population are an indicator of system usage and provide a basis for comparing systems.

A recent one-week survey in Alma provides some insight into ridership demands during a typical day. Exhibit G illustrates the "peaks" and "valleys" experienced in every Dial-A-Ride system. The manager's dilemma is, of course, how to keep productivity up by adjusting vehicle hours to fit demand, while still attempting to provide reasonable shifts for the drivers. Perhaps the manager's most important task is to develop ridership for those portions of the day with low productivity and demand for service. Excessive ridership increases developed during the peaks will only necessitate an increase in vehicle hours resulting in higher subsidy levels which may be unaffordable.

RIDERSHIP DATA - OUTSTATE SYSTEMS

EXHIBIT F

October - December, 1975	Holland	Ludington	Mount Pleasant	Sault Ste. Marie	Traverse City	Isabella County	Midland	Houghton	Alpena
Average Monthly Ridership	5,678	5,562	5,440	8,901	5,321	1,263	10,951	6,563	7,950
Average Weekday Ridership	266	236	227	341	222	56	464	270	314
Average Saturday Ridership	---	121	123	267	133	21	220	188	179
Average Sunday Ridership	---	---	15	106	---	---	21	---	86
% Full Fare	41%	30%	37%	30%	34%	57%	68%	21%	30%
% Half Fare	50%	56%	26%	33%	53%	20%	21%	34%	46%
% Free Fare	9%	--	6%	9%	--	6%	11%	3%	--
% Special Fare	0	14%	31%	28%	13%	17%	--	42%	24%
% Senior Citizens	50%	56%	26%	42%	56%	37%	12%	54%	32%
% Handicapped	0.0%	2.9%	1.7%	0.4%	0.8%	0	0.8%	0	3.1%
Passengers Per Vehicle Hour	6.5	7.8	5.9	6.2	6.4	1.6	5.4	7.4	6.2
Passengers per 1,000 Population per month	209	584	265	588	202	52	311	534	401

EXHIBIT F

RIDERSHIP DATA - OUTSTATE SYSTEMS

October - December, 1975	Benton Harbor/St. Joseph	Niles	Marshall	Cadillac	Hillsdale	Manistee County	Big Rapids	Belding	Roscommon
Average Monthly Ridership	15,864	6,022	3,542	6,747	3,530	5,993	5,387	2,258	1,340
Average Weekday Ridership	679	260	150	277	148	251	224	95	63
Average Saturday Ridership	318	109	99	194	88	148	141	56	--
Average Sunday Ridership	----	---	---	---	---	---	----	---	----
% Full Fare	48%	31%	36%	35%	23%	44%	39%	26%	77%
% Half Fare	33%	52%	61%	54%	76%	56%	55%	69%	14%
% Free Fare	2%	---	---	11%	1%	---	6%	5%	9%
% Special Fare	17%	17%	3%	---	---	---	---	---	---
% Senior Citizens	33%	32%	32%	34%	45%	44%	36%	28%	17%
% Handicapped	0	1.7%	0	0.2%	0.2%	3.5%	0	0	0.8%
Passengers Per Vehicle Hour	6.6	5.9	6.3	6.9	6.5	6.9	6.9	5.9	1.9
Passengers Per 1,000 Population Per Month	279	464	488	643	457	298	449	424	135

RIDERSHIP DATA - OUTSTATE SYSTEMS

EXHIBIT F

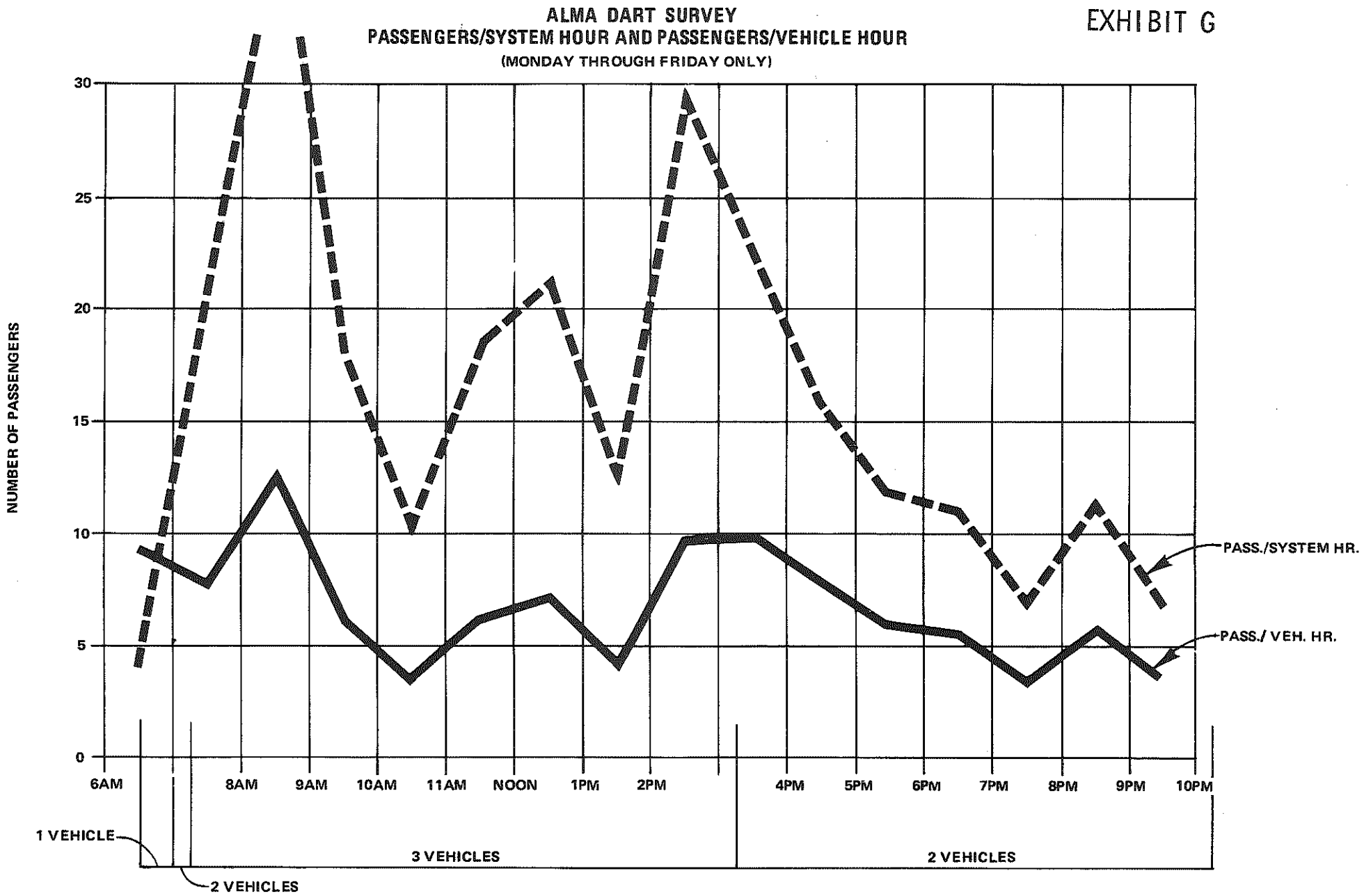
October - December, 1975	Gladwin	Dowagiac	Alma	Grand Haven					Averages
Average Monthly Ridership	1,657	1,409	4,615	5,721					5,532
Average Weekday Ridership	83	67	201	245					234
Average Saturday Ridership	---	---	78	150					146
Average Sunday Ridership	---	---	---	---					57
% Full Fare	7%	34%	32%	47%					38%
% Half Fare	30%	62%	46%	45%					45%
% Free Fare	21%	4%	4%	8%					5%
% Special Fare	42%	---	18%	---					12%
% Senior Citizens	22%	38%	18%	22%					35%
% Handicapped	4.3%	0	0	0					0.9%
Passengers Per Vehicle Hour	9.8	5.7	5.4	6.8					5.9
Passengers Per 1,000 Population Per Month	548	214	471	335					330

RIDERSHIP DATA - URBAN SYSTEMS

EXHIBIT F

October - December, 1975	Ann Arbor	Trenton	Mt. Clemens	Ferndale	Harper Woods	Birmingham	Redford Township		Averages without Ann Arbor
Average Monthly Ridership	184,026	4,031	6,835	5,868	2,462	4,648	4,437		4,713
Average Weekday Ridership	2,718		307	249	117	186	208		213
Average Saturday Ridership	735		94	126	none	133	none		71
Average Sunday Ridership	642		none	none	none	26	none		5
% Full Fare	95%		54%	27%	35%	41%	31%		38%
% Half Fare	5%		35%	68%	58%	57%	60%		55%
% Free	0		10%	5%	7%	none	9%		6%
% Special Fare	0		1%	none	none	2%	none		1%
% Senior Citizens	3%		36%	N.A.	56%	31%	N.A.		41%
% Handicapped	0.6%		N.A.	N.A.	N.A.	N.A.	N.A.		N.A.
Passengers Per Vehicle Hour	5.6		9.1	7.7	9.6	6.6	4.8		7.1%
Passengers Per 1,000 Population Per Month	613		334	190	122	178	62		142

EXHIBIT G


ALMA DART SURVEY
PASSENGERS/SYSTEM HOUR AND PASSENGERS/VEHICLE HOUR
(MONDAY THROUGH FRIDAY ONLY)
NUMBER OF PASSENGERS
30
25
20
15
10
5
0
6AM
8AM
9AM
10AM
11AM
NOON
1PM
2PM
4PM
5PM
6PM
7PM
8PM
9PM
10PM
PASS./SYSTEM HR.
PASS./ VEH. HR.
1 VEHICLE
2 VEHICLES
3 VEHICLES
2 VEHICLES

Wait and ride times were also measured during the Alma survey. The results are shown in Exhibits H and I. Wait and ride times are one of the best measures of quality of service provided to the riding public. The wait times graph indicates a few long wait times during certain periods. In most cases, these are customers who have used the system and are giving the dispatcher extra time to insure on-time pick ups. Ride time tends to vary according to demand and again points up the need for system management to avoid excessive ride time. Inaccurate estimated arrival times by the dispatcher and excessive ride times will more than any other factors drive customers away.

The average daily ridership trends shown in Exhibit J indicates the trends of the three cities of different populations. There is a seasonal pattern to ridership based on our limited data; however, each system reacts differently to weather variations, tourist traffic, economic conditions and seasonal variations. Winter weather does bring about some dramtic increases in ridership. A great deal more research is needed in this area.

EXHIBIT H

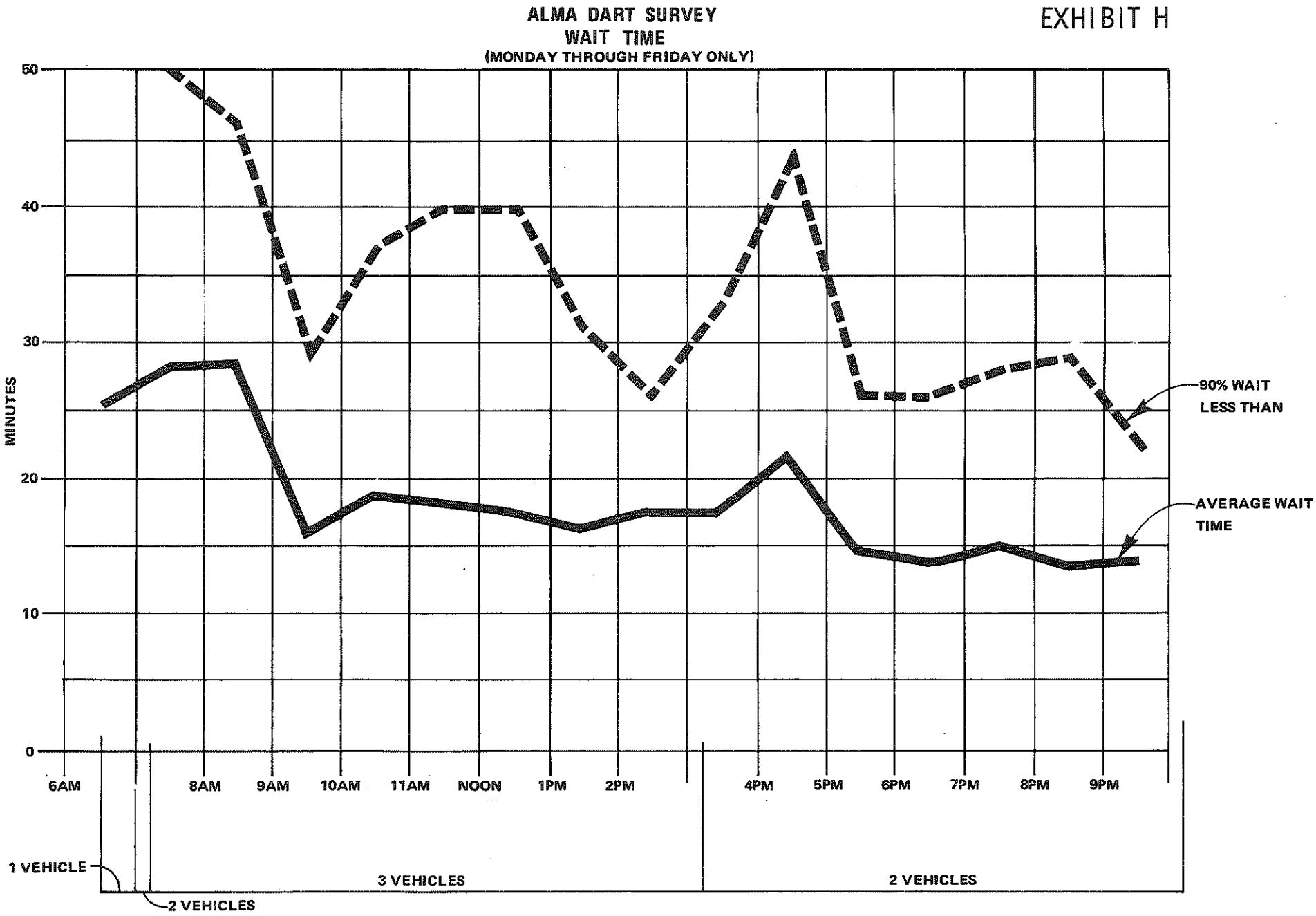
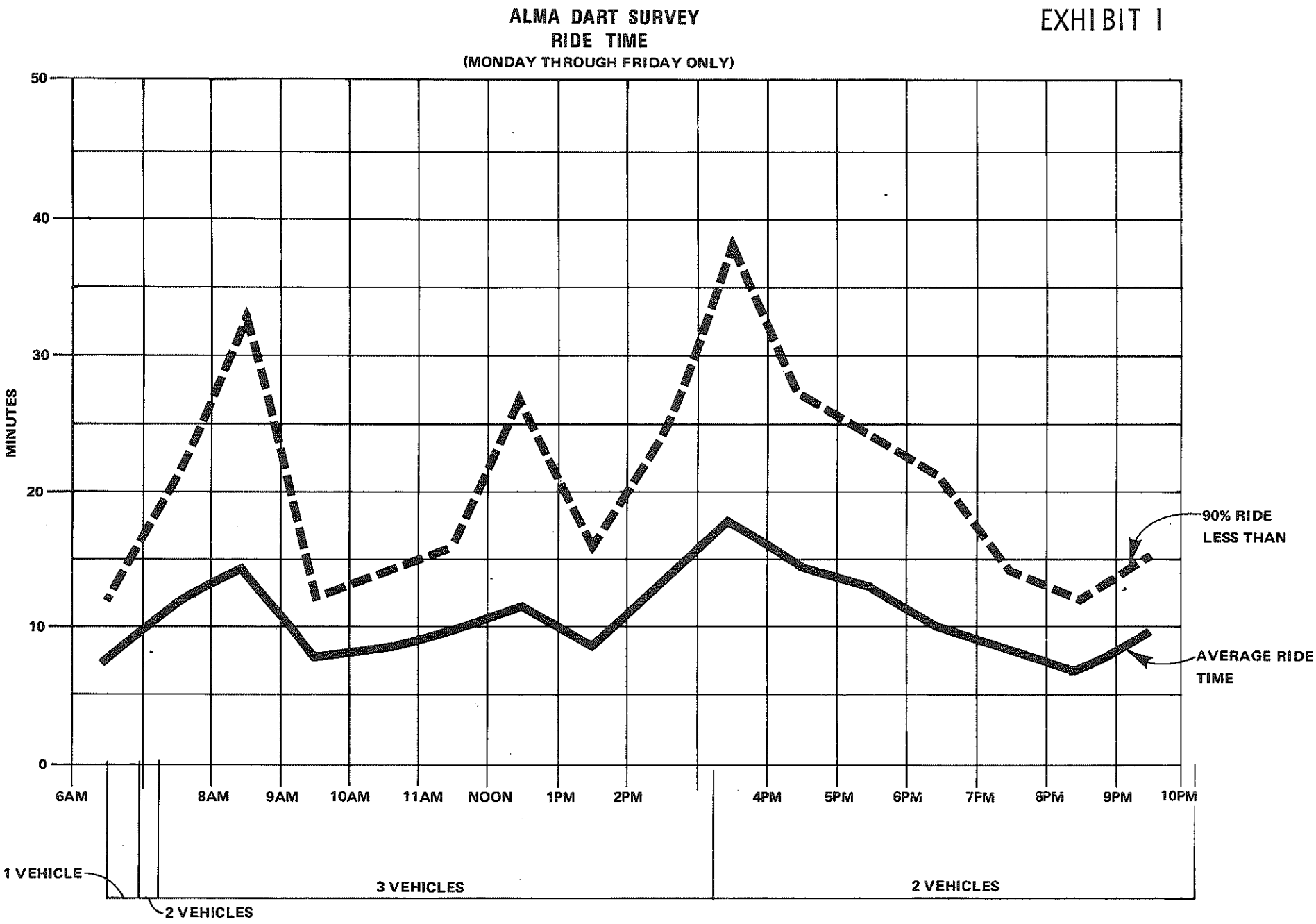
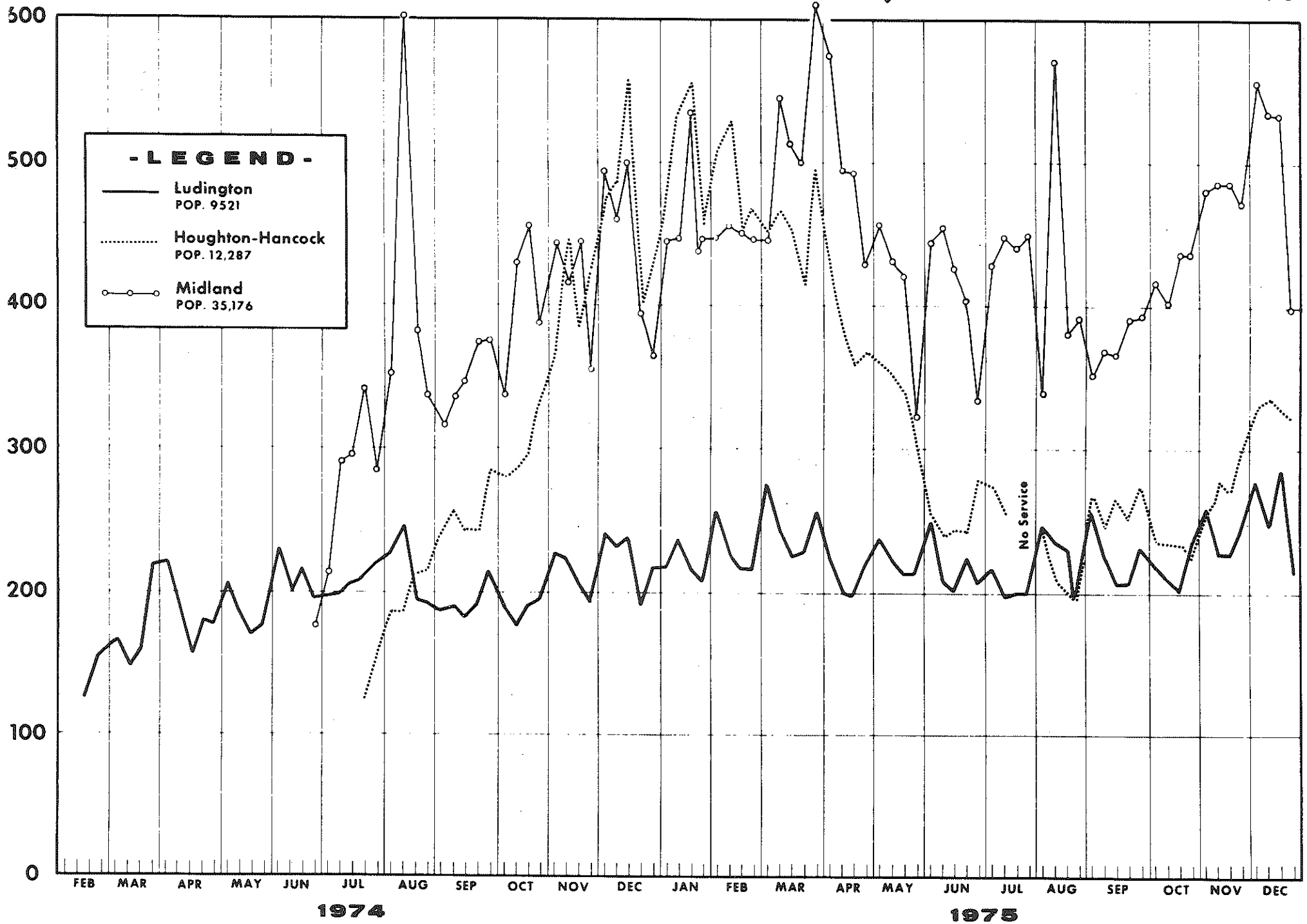

ALMA DART SURVEY
WAIT TIME
(MONDAY THROUGH FRIDAY ONLY)
MINUTES
50
40
30
20
10
0
6AM
8AM
9AM
10AM
11AM
NOON
1PM
2PM
4PM
5PM
6PM
7PM
8PM
9PM
90% WAIT LESS THAN
AVERAGE WAIT TIME
1 VEHICLE
2 VEHICLES
3 VEHICLES
2 VEHICLES

EXHIBIT I


ALMA DART SURVEY
RIDE TIME
(MONDAY THROUGH FRIDAY ONLY)
MINUTES
50
40
30
20
10
0
6AM
8AM
9AM
10AM
11AM
NOON
1PM
2PM
4PM
5PM
6PM
7PM
8PM
9PM
10PM
90% RIDE LESS THAN
AVERAGE RIDE TIME
1 VEHICLE
2 VEHICLES
3 VEHICLES
2 VEHICLES

AVERAGE DAILY RIDERSHIP/WEEK

EXHIBIT J



IV. Cost/Revenue Data

Another measure of the relative success of the DART program is the actual cost per passenger, as well as the subsidy per passenger as shown in Exhibit K. The average cost per passenger is $1.47 for the outstate systems and $1.22 for urban systems. Average revenue is 35 cents, leaving a required subsidy of $1.12 for the outstate systems. By way of comparison, the average cost per passenger for the metropolitan fixed route bus systems was 92 cents with revenues averaging 22 cents, leaving a required subsidy of 70 cents. For the urban DART systems, average revenue is 35 cents per passenger leaving a required subsidy of 87 cents. As one would expect with demand-responsive service, labor amounts to 63 percent of the total cost.

It should be noted that after the first year the state covers one third of the total operating cost. Revenues will cover 20 to 35 percent, leaving the balance to be provided from local funds.

An interesting experiment was conducted in Mt. Pleasant this past summer. The system was altered from providing full demand-responsive service to a combination fixed-route loop service for three of the buses with one bus remaining on the demand-responsive mode. The fare for the loop buses was 50¢/25¢, while on the demand-responsive bus, it was $1.00/50¢. This experiment was conducted to see if system-wide

COST/REVENUE DATA - OUTSTATE SYSTEMS

EXHIBIT K

October - December, 1975	Holland	Ludington	Mt. Pleasant	Sault Ste. Marie	Traverse City	Isabella County	Midland	Houghton	Alpena
Total Operating Cost per month	$8,551.72	$6,791.73	$10,412.47	$6,691.07	$8,053.50	$5,919.95	$18,562.54	$7,421.61	$11,779.05
% Administration & Fixed Overhead	21%	31%	32%	50%	14%	27%	15%	19%	12%
% Labor	68%	59%	58%	14%	65%	48%	70%	68%	71%
% Vehicle Operation	11%	10%	10%	36%	21%	25%	15%	13%	17%
Cost Per Vehicle Hour	$ 9.77	$ 9.56	$ 11.37	$ 4.67	$ 7.62	$ 7.31	$ 9.17	$ 8.41	$ 9.15
Cost Per Passenger	$ 1.51	$ 1.22	$ 1.91	$ .75	$ 1.51	$ 4.69	$ 1.70	$ 1.13	$ 1.48
Cost Per Mile	$ .82	$ .84	$ 1.11	$ .39	$ .69	$ .38	$ .60	$ .77	$ .66
Fares Per Month	$1,899.68	$2,071.80	$1,649.09	$2,811.18	$2,005.97	$ 630.78	$3,984.17	$2,401.60	$3,239.86
% of Fares to Total Cost	22%	31%	16%	42%	25%	11%	21%	32%	28%
Fares Per Vehicle Hour	$ 2.17	$ 2.92	$ 1.80	$ 1.96	$ 1.90	$ .78	$ 1.97	$ 2.72	$ 2.52
Fares Per Passenger	$ .33	$ .37	$ .30	$ .32	$ .38	$ .50	$ .36	$ .37	$ .41
Fares Per Mile	$ .18	$ .26	$ .18	$ .16	$ .17	$ .04	$ .13	$ .25	$ .18
% of Subsidy	78%	69%	84%	58%	75%	89%	79%	68%	72%

COST/REVENUE DATA - OUTSTATE SYSTEMS

EXHIBIT K

October - December, 1975	Benton Harbor/St. Joseph	Niles	Marshall	Cadillac	Hillsdale	Manistee County	Big Rapids	Belding	Roscommon County
Total Operating Cost per month	$29,919.83	$9,636.96	$5,503.14	$8,106.99	$5,705.35	$8,483.15	$6,249.13	$1,483.39	$4,926.34
% Administration & Fixed Overhead	26%	29%	17%	20%	27%	23%	18%	1%	25%
% Labor	60%	49%	71%	67%	64%	59%	71%	82%	56%
% Vehicle Operation	14%	22%	12%	13%	9%	18%	11%	17%	19%
Cost Per Vehicle Hour	$ 12.49	$ 9.40	$ 9.76	$ 8.32	$ 10.49	$ 8.34	$ 7.96	$ 3.86	$ 6.90
Cost Per Passenger	$ 1.89	$ 1.60	$ 1.55	$ 1.20	$ 1.62	$ 1.42	$ 1.16	$ .66	$ 3.68
Cost Per Mile	$ .65	$ .94	$ .83	$ .73	$ .96	$ .52	$ .70	$ .40	$ .35
Fares Per Month	$ 6,534.59	$2,280.42	$1,197.27	$2,117.69	$1,077.90	$2,159.50	$1,849.41	$ 514.13	$ 639.65
% of Fares to Total Cost	22%	24%	22%	26%	19%	25%	30%	12%	13%
Fares Per Vehicle Hour	$ 2.73	$ 2.22	$ 2.12	$ 2.17	$ 1.98	$ 2.12	$ 2.36	$ 1.34	$ .90
Fares Per Passenger	$ .41	$ .38	$ .34	$ .31	$ .31	$ .36	$ .34	$ .23	$ .48
Fares Per Mile	$ .14	$ .22	$ .18	$ .19	$ .18	$ .13	$ .21	$ .14	$ .05
% of Subsidy	78%	76%	78%	74%	81%	75%	70%	88%	87%

COST/REVENUE DATA - OUTSTATE SYSTEMS

EXHIBIT K

October - December, 1975	Gladwin	Dowagiac	Alma	Grand Haven					Averages
Total Operating Cost per month	$1,436.77	$1,600.02	$7,465.15	$5,088.10					$8,172.18
% Administration & Fixed Overhead	32%	9%	16%	22%					22%
% Labor	59%	83%	73%	68%					63%
% Vehicle Operation	9%	8%	11%	10%					15%
Cost Per Vehicle Hour	$ 8.53	$ 6.42	$ 8.78	$ 6.07					$ 8.77
Cost Per Passenger	$ .87	$ 1.14	$ 1.62	$ .89					$ 1.48
Cost Per Mile	$ .61	$ 1.07	$ 1.07	$ .46					$ .65
Fares Per Month	$ 236.77	$ 455.33	$1,335.88	$1,978.86					$1,957.80
% of Fares to Total Cost	16%	28%	18%	39%					24%
Fares Per Vehicle Hour	$ 1.41	$ 1.83	$ 1.57	$ 2.36					$ 2.10
Fares Per Passenger	$ .14	$ .32	$ .29	$ .35					$ .35
Fares Per Mile	$ .10	$ .31	$ .19	$ .18					$ .16
% of Subsidy	84%	72%	82%	61%					76%

COST/REVENUE DATA - URBAN SYSTEMS

EXHIBIT K

October-December, 1975	Ann Arbor	Trenton	Mt. Clemens	Ferndale	Harper Woods	Birmingham	Redford Township		Averages
Total Operating Costs per month	N.A	N.A.	$6,676.10	$5,080.57	$2,122.10	$7,016.50	$8,386.88		$5,856.43
% Administration and Fixed Overhead			35%	6%	7%	31%	25%		21%
% Labor			52%	81%	76%	52%	50%		62%
% Vehicle Operation			13%	13%	17%	17%	25%		17%
Cost Per Vehicle Hour			$ 8.85	$ 6.65	$ 7.73	$ 10.03	$ 9.06		$ 8.46
Cost Per Passenger			$ .98	$ .87	$ .86	$ 1.51	$ 1.89		$ 1.22
Cost Per Mile			$ .69	$ .58	$ .55	$ .75	$ .64		$ .64
Total Fares per Month			$2,452.89	$1,808.11	$ 794.01	$1,542.61	$1,837.25		$1,686.97
% of Fares to Total Cost			37%	36%	37%	22%	22%		31%
Fares Per Vehicle Hour			$ 3.25	$ 2.37	$ 2.89	$ 2.20	$ 1.99		$ 2.54
Fares Per Passenger			$ .36	$ .31	$ .32	$ .33	$ .41		$ .35
Fares Per Mile			$ .25	$ .21	$ .20	$ .17	$ .14		$ .19
% of Subsidy			63%	64%	63%	78%	78%		69%

cost savings would result by altering the service. During the July through September experiment, average daily ridership dropped to 74 passengers/day compared to an average of 210 passengers/day the previous summer. The cost/passenger jumped to $5.14.

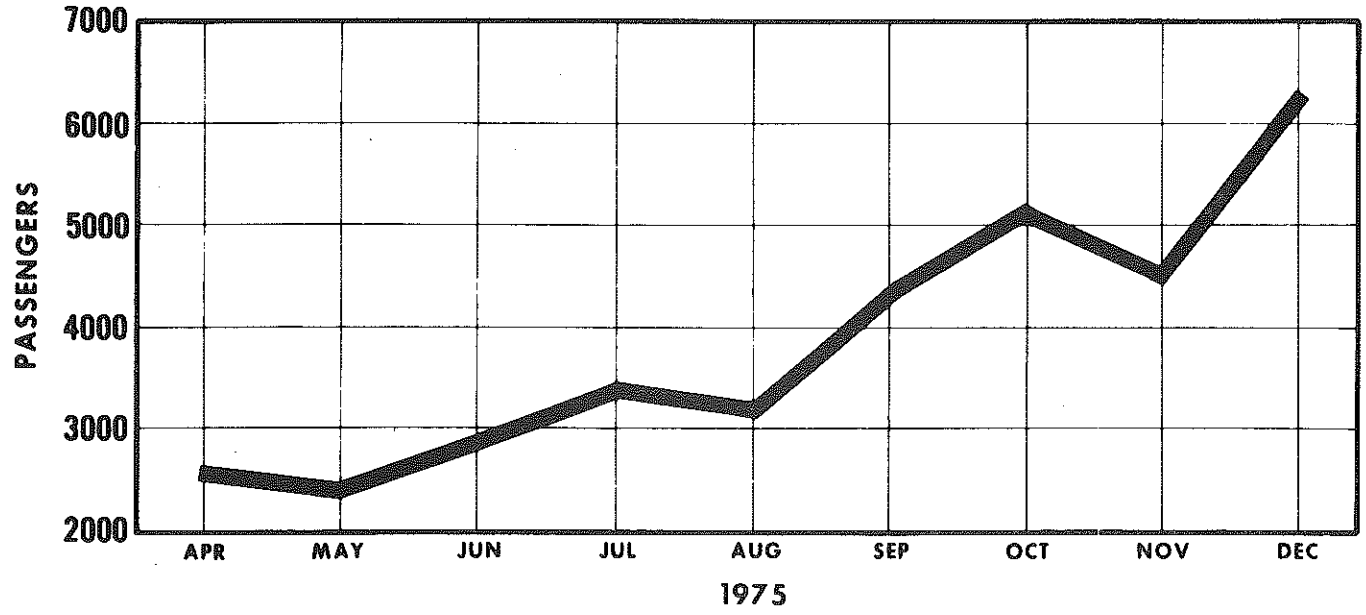
The system has subsequently returned to full demand-responsive service resulting in ridership increasing to over 300 passengers/day and cost/passenger dropping to $1.91. This experiment graphically pointed out the need for high quality of service in low density, medium-sized communities.

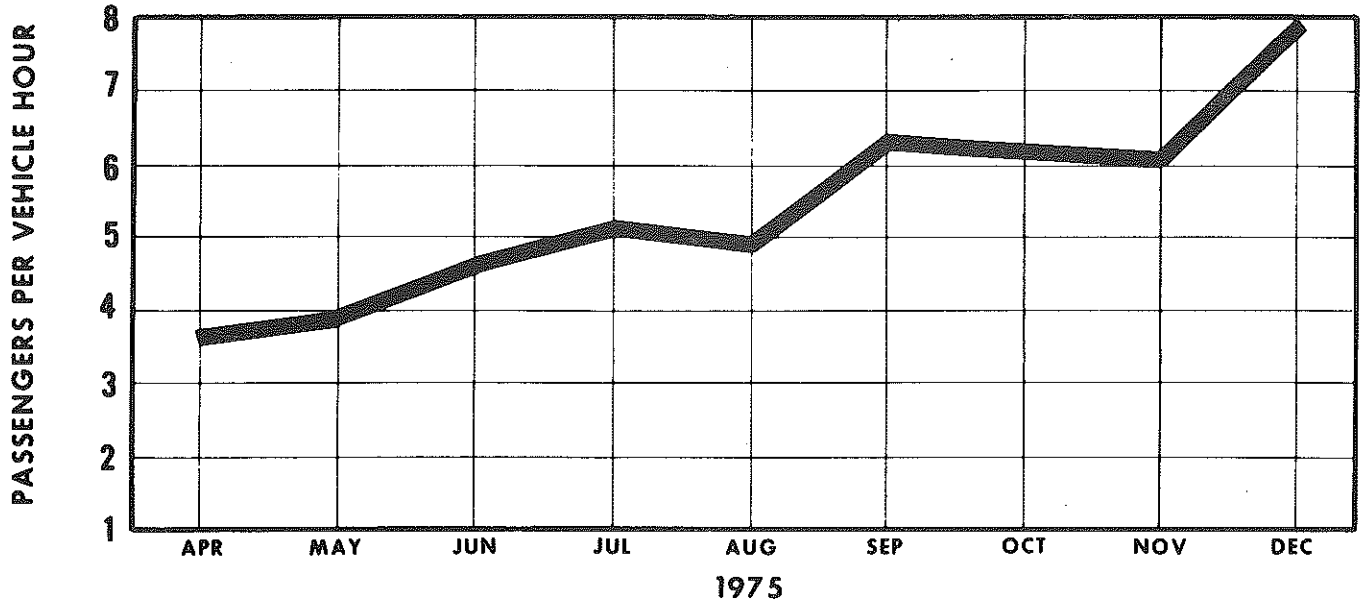
The nature of demand-responsive service, being door-to-door, economical, comfortable, and convenient to the passenger, requires a tradeoff in higher operating costs. We do feel, however, that an overall average of $1.47/passenger is not excessive in relation to the high quality of service being provided.

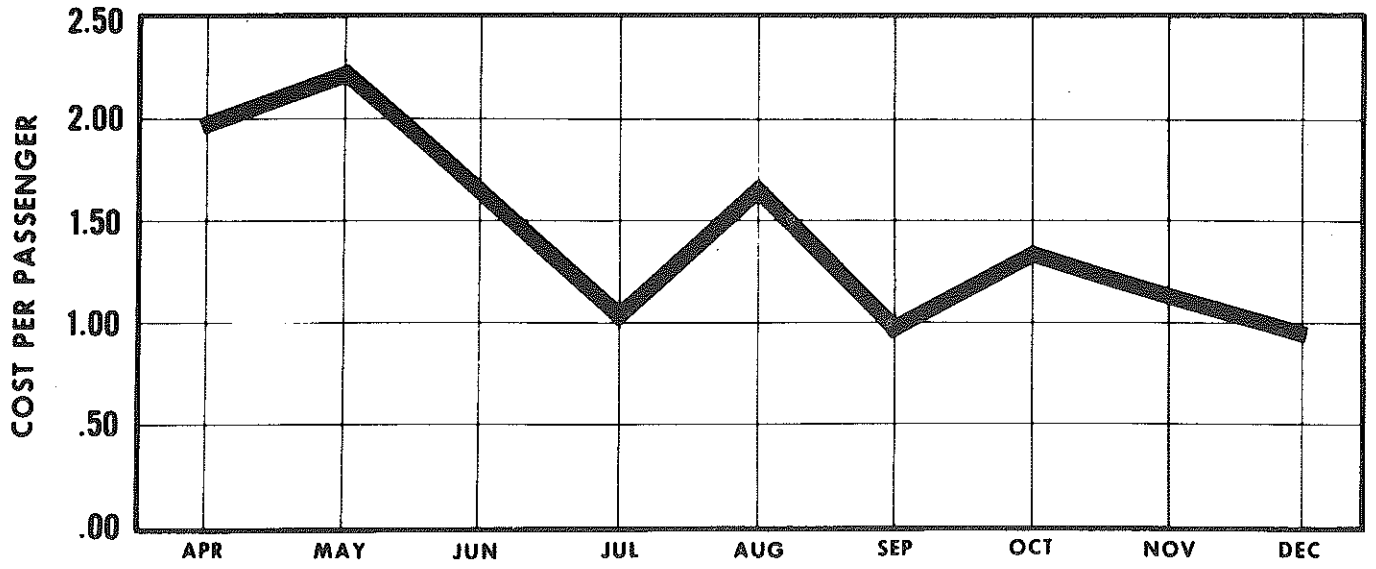
Exhibit L indicates the relationship between productivity and operating costs/passenger. The Big Rapids system data provides a classic example of what is hoped will happen after a system is implemented. During the first eight months of operation, ridership has steadily increased, while cost/passenger has steadily decreased. The system has been managed effectively resulting in a December productivity of 8.0 and cost per passenger of $1.00.

Big Rapids DART

EXHIBIT L







V. Quality of Service Versus Cost/Passenger

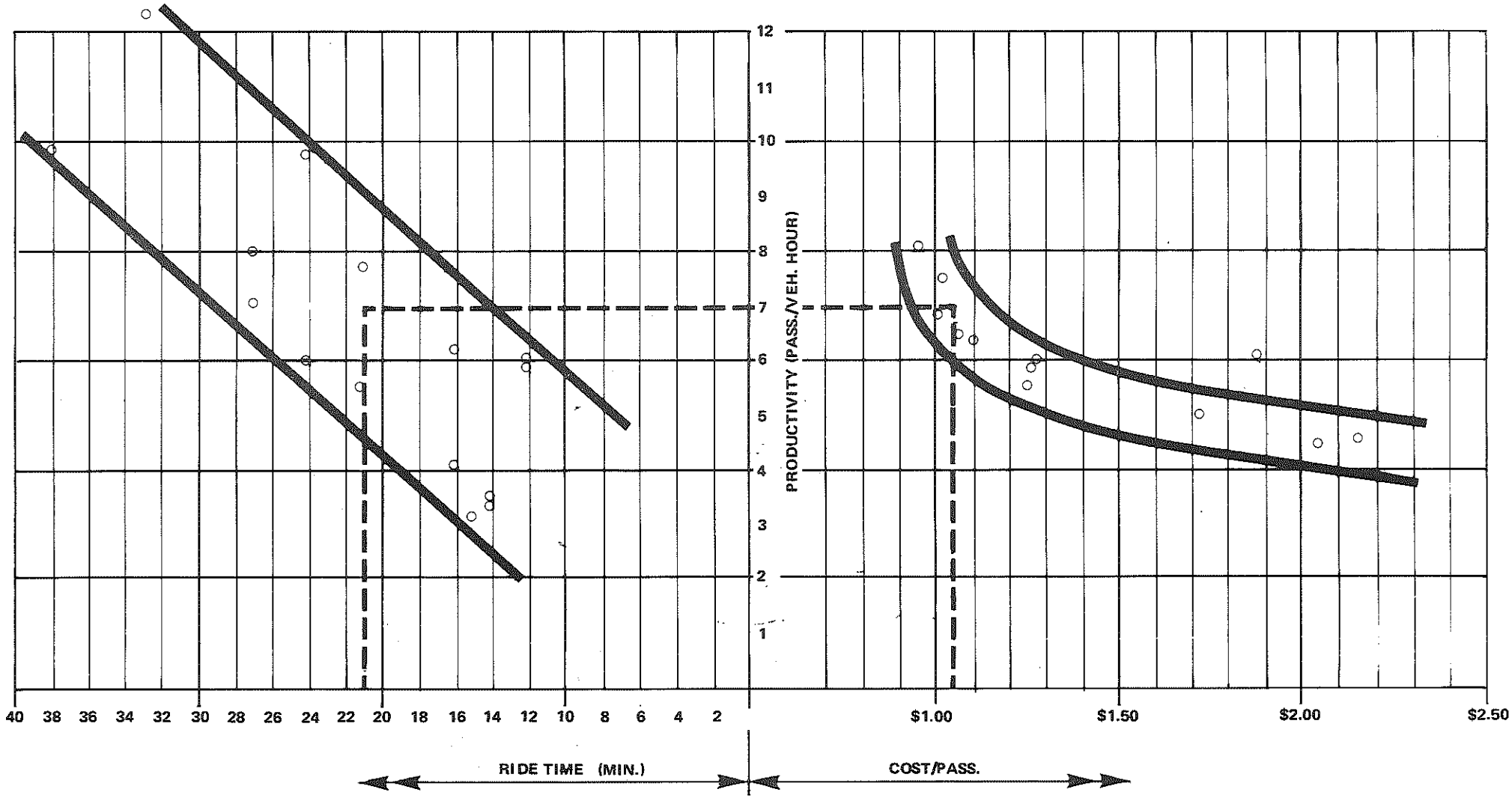
After the system is underway and the interest in this "new" business in town have leveled off, the system settles into a routine. Now starts the manager's sometime routine day-after-day task of running a business that cannot make money but must be as cost effective as possible and still provide a high quality of service. In order to accomplish this effectively, the manager must constantly be monitoring the system for its weaknesses and strengths using the operational and financial data collected daily. Exhibit M provides a basis for making system-wide comparisons. Care should be taken in using this graph, as it is based on limited data. Using ride time as a measure of quality of service provided to the public and cost/passenger as a measure of system cost to the taxpayer, the exhibit graphically shows the manager's dilemma, namely the tradeoff between service and cost.

QUALITY OF SERVICE VS. COST/PASSENGER

EXHIBIT M

*ALMA SURVEY DATA

* JAN.–MARCH, 1975 QUARTERLY OPERATING DATA
(13 SYSTEMS)



VI. Vehicle Operating Data

The backbone of the DART system is, of course, the equipment used to carry passengers. There are presently many vehicles on the market (approximately 30) which are purported by each company to be the ideal Dial-A-Ride vehicle. Some are van conversions, mobile home conversions, electrics, diesels, school bus conversions, etc.

In the Michigan DART program, we have generally settled on the high-roof van conversion as the vehicle best suited for service in medium- to small-sized towns (Exhibit N). It is unobtrusive, comfortable, and very maneuverable on residential streets. We are presently purchasing this type of vehicle for approximately $10,000 per unit.

The major drawback to this vehicle is maintenance and limited vehicle life. The van chassis is a factory production model and is not built for the daily stop and go operations of a bus system. We expect that each vehicle will put on approximately 35,000 miles per year. The rural DART systems are using a combination of van conversions and larger buses (15 to 21 passenger). A separate report entitled "Small Bus Program - Vehicle Operation Efficiency Report" discusses in detail the various types of vehicles being used in Michigan DART.

The vehicle operating cost averages 23 cents per passenger which is only sixteen percent of the total operating cost per passenger, indicating the labor intensiveness of DART service. Average vehicle operating cost is 10 cents per mile. Exhibit O indicates our operating experience for the last quarter.

Exhibit N

VEHICLE OPERATING DATA - OUTSTATE SYSTEMS

EXHIBIT O

October-December, 1975	Holland	Ludington	Mt. Pleasant	Sault Ste. Marie	Traverse City	Isabella County	Midland	Houghton	Alpena
Average Vehicle Hours Per Month	875	710	916	1,434	1,058	810	2,024	883	1,288
Average Vehicle Miles Per Month	10,377	8,119	9,405	17,316	11,615	15,624	31,019	9,686	17,738
Cost Per Hour	$ 1.06	$ .97	$ 1.09	$ 1.69	$ 1.00	$ 1.82	$ 1.38	$ 1.06	$ 1.60
Cost Per Passenger	$ .16	$ .12	$ .18	$ .27	$ .19	$ 1.17	$ .26	$ .20	$ .26
Cost Per Mile	$ .09	$ .08	$ .11	$ .14	$ .09	$ .09	$ .09	$ .13	$ .12

VEHICLE OPERATING DATA - OUTSTATE SYSTEMS

EXHIBIT O

October-December, 1975	Benton Harbor/St. Joseph	Niles	Marshall	Cadillac	Hillsdale	Manistee County	Big Rapids	Belding	Roscommon County
Average Vehicle Hours Per Month	2,396	1,026	564	974	544	1,017	785	385	714
Average Vehicle Miles Per Month	45,710	10,274	6,652	11,085	5,928	16,321	8,954	3,709	14,117
Cost Per Hour	$ 1.80	$ 2.03	$ 1.13	$ 1.12	$ .95	$ 1.48	$ .84	$ .67	$ 1.33
Cost Per Passenger	$ .27	$ .35	$ .18	$ .16	$ .15	$ .25	$ .12	$. .11	$ .70
Cost Per Mile	$ .09	$ .20	$ .10	$ .10	$ .09	$ .09	$ .07	$ .07	$ .06

VEHICLE OPERATING DATA - OUTSTATE SYSTEMS

EXHIBIT O

October-December, 1975	Gladwin	Dowagiac	Alma	Grand Haven					Averages
Average Vehicle Hours Per Month	169	249	850	838					932
Average Vehicle Miles Per Month	2,344	1,491	6,955	11,162					12,527
Cost Per Hour	$ .76	$ .53	$ .98	$ .59					$ 1.18
Cost Per Passenger	$ .06	$ .09	$ .18	$ .09					$ .25
Cost Per Mile	$ .03	$ .09	$ .12	$ .05					$ .10

VEHICLE OPERATING DATA - URBAN SYSTEMS

EXHIBIT O

October-December, 1975	Ann Arbor	Trenton	Mt. Clemens	Ferndale	Harper Woods	Birmingham	Redford Township		Averages
Average Vehicle Hours per Month	10,873	N.A.	754	764	275	700	925		684
Average Vehicle Miles per Month			9,705	8,725	3,881	9,377	13,116		8,961
Cost Per Hour			$1.15	$ .84	$ 1.32	$ 1.70	$ 2.25		$ 1.45
Cost Per Passenger			$ .13	$ .11	$ .15	$ .26	$ .47		$ .22
Cost Per Mile			$ .09	$ .07	$ .09	$ .13	$ .16		$ .11

As mentioned previously, the department is providing each DART system with a wheelchair lift equipped vehicle, thus insuring service to 100 percent of the citizens in the service area. Exhibit P typifies the type of equipment now in service. Each of these vehicles are equipped with two wheelchair tie-downs leaving seating for six walk-on passengers.

As more and more transit systems get into higher quality, door-to-door service, especially for elderly and handicapped, we expect the demand for small- to medium-sized buses will exceed 100,000 units by 1980. It is hoped that automobile, school bus, and transit bus manufacturers will develop small- to medium-sized vehicles capable of withstanding the rigors of transit use, as well as provide bus life expectancy comparable to the large diesel buses (8 to 10 years).

Exhibit P

VII. Community Impact

To date, the DART systems have had a favorable impact on the community as a whole as reflected in millage elections in eleven communities. The following is the second-year funding status of those systems having completed their first year:

Holland - Millage vote - 1/2 mill - passed by 73% - 6,566 to 2,283

Ludington - Millage vote - 1 mill - passed by 58%

Mt. Pleasant - Advisory vote - passed by 73% - 3,500 to 1,327 Mt. Pleasant voters voted again on November 4, 1975, - 1 mill - passed by 65% - 1,402 to 746

Isabella County - County Commission recommended continuation of the Van-Tran system using $48,000 from available funds. The Isabella County Board also approved $40,000 for the Mt. Pleasant DART system since city residents pay county taxes. UPTRAN staff is working closely with the city and county officials to develop a single operating agency for public transportation in Isabella County.

Sault Ste. Marie - Money will come from general funds

Traverse City - Millage vote - 3/4 mill - passed by 58%

Midland - Money will come from general funds

Houghton/Hancock - Millage vote - defeated - both communities had to approve.

First Election

Houghton	Hancock
Yes - 522	Yes - 616
No - 183	No - 632 - Defeated by 16 votes

Houghton has revoted on 1-1/2 mills for DART. This vote passed with a 72% majority. Hancock is being served by DART at a fare differential of 70¢ regular fare, 35¢ for senior citizens. Houghton fare is 50¢, 25¢, respectively.

Alpena - Money came from revenue funds until issue was put on ballot on November 4, 1975. Millage vote - 1/2 mill - passed by 65% - 2,064 to 1,134

Benton Harbor -	Communities will be using own funds (Community Development funds) - Benton Harbor, St. Joseph, Benton and St. Joseph Townships - Lincoln Township has dropped out of the authority
Niles -	Eligible for federal funds - local share will come from general funds
Marshall -	Millage vote - 1 mill - election held August 5, 1975 - passed by 74%
Cadillac -	Millage vote - November 4, 1975 - 1 mill - passed by 55% - 942 to 759
Hillsdale -	Millage vote - November 4, 1975 - 1 mill - passed by 60% - 599 to 415
Big Rapids -	Millage vote - 1 mill - election held February 3, 1976 - passed by 80% - 877 to 213
Gladwin -	Money will come from general fund
Dowagiac -	Millage vote - November 4, 1975 - 1 mill - passed by 61% - 515 to 324
Grand Haven -	Millage vote - 1 mill (all 3 cities) - election dates have not been set
Alma -	Millage vote - 1 mill - election is tentatively scheduled for May, 1976
Manistee County -	County Board approved $32,400 in funds to operate the Manistee County Dial-A-Ride
Belding -	Millage vote (?)
Roscommon County -	Dial-A-Ride staff has been working with County Board on second-year funding. County Board will be making a determination on this matter shortly.

The fact that none of the original start ups have shut down indicates that the first year impact has been sufficient to convince the voting public, as well as local elected officials, of the need to provide local support funds to insure continuation of the service.

VIII. Summary

The Michigan DART program has been running since February, 1974, when the first system started in Holland, Michigan. The twenty-eight operating systems are carrying the equivalent of half-a-million passengers per year. None of these citizens have previously had the availability of public transportation which is low cost, convenient, comfortable, safe, and most of all provides the freedom of movement when the need arises, not when it is convenient for someone else to provide the transportation.