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MICHIGAN
SCHEDULED AIR SERVICE STUDY
SUMMARY REPORT

MAY 1978

MICHIGAN DEPARTMENT OF STATE
HIGHWAYS AND TRANSPORTATION

STATE OF MICHIGAN
DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION

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**MICHIGAN
SCHEDULED AIR SERVICE STUDY
SUMMARY REPORT**

Prepared for

Michigan Department of State Highways
and Transportation
P.O. Box 30050
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by

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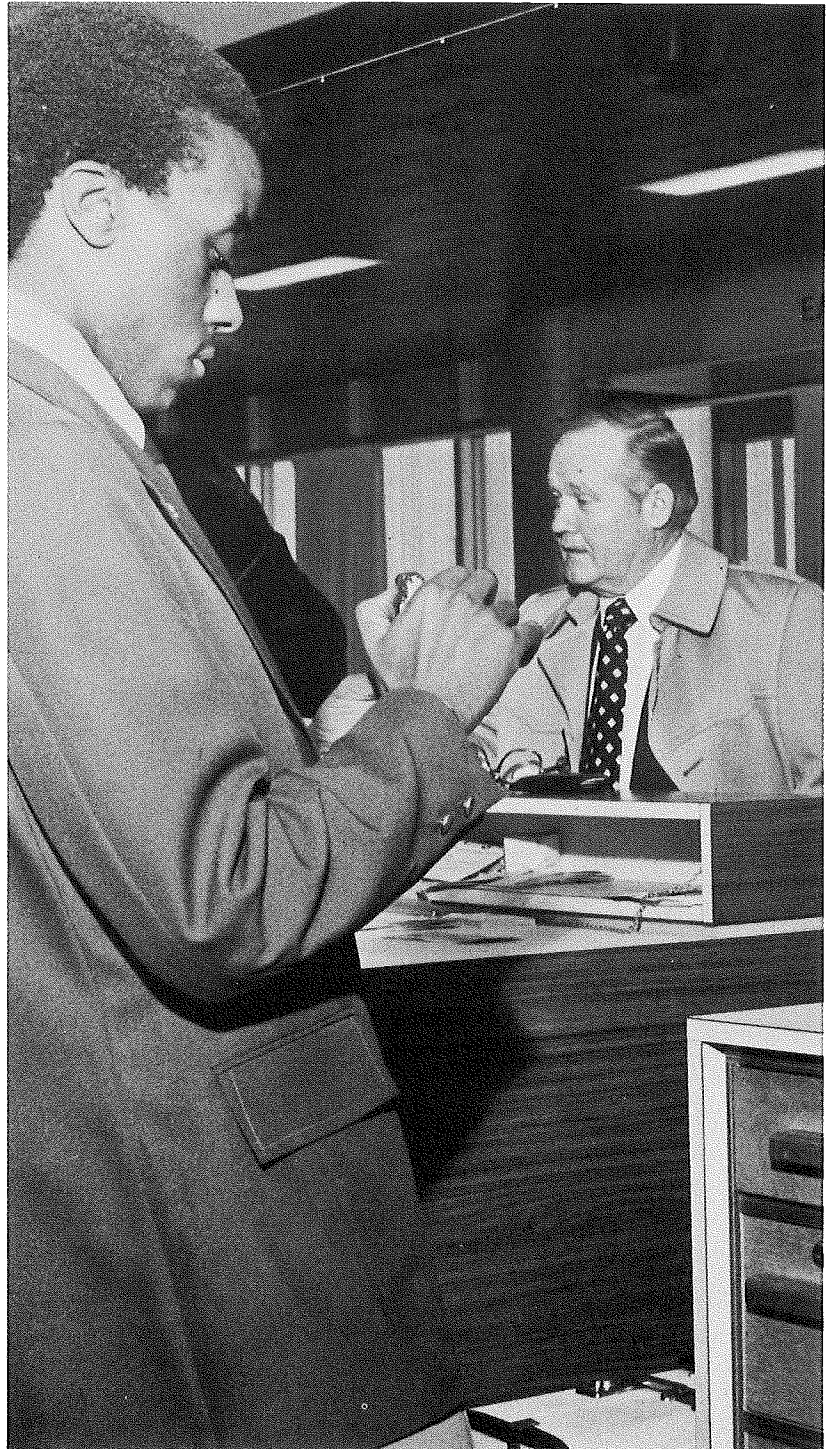
November 3, 1977

Tables

1 — Changes in Certificated and Third-Level Commuter Carrier Service: 1966-1976	6
2 — Productivity of Air Carrier Airports in Michigan	10
3 — Markets Analyzed and Deficiencies Found for 1980	11
4 — Number of Deficient Markets	13
5 — Severity of Deficient Markets	13
6 — Number of 1975 O-D Passengers in Deficient Markets	14
7 — Summary of 1980 Certificated Carrier Route Proposals	26
8 — Summary of 1980 Commuter Carrier Route Proposals	27

Figures

1 — Scheduled Non-stop Service by Certificated Carriers	4
2 — Scheduled Non-stop Service by Third-Level Commuter Carriers	5
3 — Airport Enplanements	7
4 — Perceived Need for New Air Service	9
5 — Air Service Scoring System Example	12
6 — 1980 Air Service Deficiencies: 60 Deficiency Points or Greater	15
7 — 1980 Air Service Deficiency: 30-59 Deficiency Points	16
8 — 1980 Air Service Deficiencies: 20-29 Deficiency Points	17
9 — 1980 Air Service Deficiencies: 10-19 Deficiency Points	18
10 — 1980 Air Service Deficiencies: 9 Deficiency Points or Less	19
11 — Final Route Proposals	25
12 — Actions Leading to Improved Air Service	30



Passengers check in at their local airport and through connections can reach destinations throughout the world.

Roger Creighton Associates

INCORPORATED

Mr. Sam F. Cryderman, Deputy Director
Bureau of Transportation Planning
Michigan Department of State Highways and Transportation
Lansing, MI 48904

Dear Mr. Cryderman:

We are pleased to forward to you the Summary Report of the Michigan Scheduled Air Service Study. This study was conducted for the Michigan Department of State Highways and Transportation by Roger CREIGHTON ASSOCIATES Incorporated (prime contractor) and Diemler and Diekemper Incorporated (subcontractor).

The objectives of the study were to first assess the adequacy of existing scheduled air service and the need for new service between 22 Michigan air carrier and six gateway airports, and then to develop a series of options to resolve the needs identified.

During the study a number of air deficiencies were found to exist. There are several ways in which these service deficiencies could be corrected. Existing carriers could agree to improve service through schedule adjustments, thus resolving the deficiencies and eliminating any need by Michigan to seek other solutions. However, should these carriers be unwilling or economically unable to improve service, the state then has the option of turning to other certificated carriers or commuter operators to provide the supplemental or replacement services needed. Anticipating this ambiguity, the route and service proposals that were developed during the study considered many aircraft type, frequency, intermediate stop/connection, route structure, and carrier type possibilities thereby providing several options to resolve each deficiency. The ultimate composition of the future air service system in Michigan will depend to a large extent on how each of the existing carriers reacts to these options.

We don't know what the ultimate outcome will be since the carriers haven't yet studied the results of this study and indicated which deficiencies they can resolve through schedule changes or by adding flights. Given this situation, the study results are really "process" rather than "product" oriented. The study is different from most in that it focuses on services to be provided by the private sector, rather than reasonably specific facilities to be constructed or services to be provided by governmental agencies. Consequently, further refinement and development of this plan must continue during implementation as carriers make their operational intentions known. A great deal depends upon how vigorous an effort is made by the state and affected communities to obtain better air service through persuasion, the regulatory process, and by a willingness to bring in other carriers, if necessary. Thus, attention should now be focused on implementing the results of this study. Otherwise, the work done to date will be for naught.

During the course of the study, a number of policy issues arose which will ultimately require Commission consideration. These include:

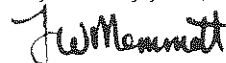
1. Establishing an appropriate partnership or working relationship with local governments in promoting improved air service.
2. Identifying the conditions under which other certificated carriers or commuter operators will be brought in to supplement or even replace present carrier service.
3. When and where to use regulatory means to obtain service improvements (versus continued reliance on persuasion).
4. Obtaining authority to control and regulate intrastate air service.

Immediate work by MDSH&T staff should include:

1. Through research of existing legislation in other states and discussion with Federal officials and certificated and commuter airline representatives, prepare legislation for licensing intrastate air carriers and providing, where necessary, start-up economic assistance.
2. Continuing coordination/liaison with communities and airlines in (a) explaining the technical procedures used in this study and the recommendations made by RCAI, (b) establishing the interest and commitment on the part of communities in seeking improved air service, (c) seeking commitments from existing carriers to improve service to eliminate deficiencies, and (d) evaluating certificated carrier and commuter operator proposals to improve or initiate new services.
3. Administrative preparations for soliciting proposals from carriers and in evaluating proposals to be received.

We encourage the MDSH&T to go forward. While this represents a new activity and responsibility for the Department, the benefits to be obtained from better air service are substantial.

Very sincerely yours,



Frederick W. Memmott, Vice-President

INTRODUCTION

Passengers on scheduled airlines in Michigan numbered over 10 million in 1977 (boardings and deplanements). Since 1967, this figure has increased 45.2 percent.



This document is the Summary Report of the Michigan Scheduled Air Service Study. The study was conducted for the Michigan Department of State Highways and Transportation (MDSH&T) by Roger CREIGHTON ASSOCIATES Incorporated (prime contractor) and Diemler and Diekemper Incorporated (subcontractor). Study procedures and findings are described more fully in the Final Technical Report dated September 23, 1977.

A. Air Service in Michigan

Air service is the "end product" of three separate, but highly interrelated components:

- **Supply/Demand.** Passenger services offered by carriers (flights, seats) in response to travel demand (patronage).
- **Aircraft.** Physical, operational, and performance characteristics of the vehicle used to provide service.
- **Airport.** Physical features of airports that act as constraints on the level of service or type of aircraft that can be accommodated.

Before presenting the results of this study, a brief review is given of air service in Michigan over the past ten years. During this time, governmental attention has largely focused on physical improvements to air carrier and general aviation airports. Such capital investments as runway extensions and strengthening, taxiway and apron improvements, and navigational aids have been made through federal and state funding administered by the Michigan Aeronautics Commission. These investments often were made with the expectation that, by accommodating larger and heavier jet-powered aircraft, service improvements would in turn be made by

the certificated carriers serving these airports. This cause/effect relationship has not always occurred.

In November, 1976, scheduled service was provided by seven carriers---three certificated and four commuter---at 22 Michigan air carrier airports. Historically, service by the certificated carriers (United, North Central) has been quite stable. Except for Battle Creek, no change has been made in airports served during the past ten years. Scheduled, certificated non-stop service for October 1976 is shown in Figure 1 (Page 4). While the state appears to be well-covered by such air service, over 38 percent of the routes shown operate at a frequency of one round trip per day and only 37 percent with a frequency greater than two round trips daily. Little direct service exists between the upper and lower peninsulas.

Since 1966, the total number of flights has increased moderately, although this growth is solely attributable to commuter flights (see Table 1 Page 6). Excluding interstate flights from Detroit Metropolitan, certificated carriers operated 207 flights per day in 1966 and 195 in 1976, a decrease of 8.5 percent. Rather than adding flights, the change was substituting jet and turboprop equipment for smaller piston-engined aircraft. These aircraft do provide higher quality service and have a greater seating capacity.

Commuter operations have, through the years, demonstrated far less stability. Since 1968, no less than 20 commuter airlines have provided scheduled service to various points in Michigan. The number of operators has ranged from nine in 1969 to three in 1974 and 1975. Most commuter operators have stayed in business only for a year or two. Scheduled commuter non-stop service for October 1976 is shown in Figure 2 (Page 5).

The growth in Michigan enplanements has approximated that occurring nationally. Growth has been somewhat greater at non-Detroit airports where enplanements increased 215 percent from 1965 to 1975. At individual airports, growth varied considerably ranging from an increase of 590 percent at Alpena to a decrease of 50 percent at Detroit City (see Figure 3 Page 7). Patronage-wise, Detroit Metropolitan is by far the most important airport and accounted for over three-quarters of total enplanements in 1976.

Supply and demand are closely interrelated; changes in supply do affect the resulting demand, and vice versa. The variation shown in Figure 3 (Page 7) stems from this principle. Some airports are served better than others. In the latter case, unmet service needs could well have dampened the growth in patronage that would have otherwise occurred had the service been better.

B. Statement of the Problem

In Michigan, as in many other parts of the country, many small and intermediate size cities have not received adequate air service due to:

- The certificated local service carriers, originally conceived to serve smaller markets, have grown to become "junior trunk" carriers. This growth has occurred both in the size of the markets served by these carriers and in the type and size of the aircraft making up their fleets.
- Although air traffic at the smaller air carrier airports has continued to grow, it has not kept pace with ever-increasing aircraft size.
- Dramatic increases in fuel prices in recent years have had a marked effect on operating costs.
- Increasing aircraft size and operating cost have forced many local service carriers to cut back service frequency to smaller markets to maintain profitability.
- While third-level carriers have provided service in some markets, their operations have tended to be unstable. This is the consequence of several

factors, including financing, route selection, scheduling, and aircraft. Commuter carriers consequently have not provided the reliable, supplementary service deemed essential for smaller markets.

Air service decisions are simply too important to be left totally to individual carrier entrepreneurship. Michigan has long felt the service instability effects of such decisions, especially by commuter operators. Thus a periodic, systematic and comprehensive examination of intra-state air service needs is essential. This in itself isn't enough. Equally important is the identification of those specific actions that can be implemented by state and local governments and the airline companies to bring about improved air service to Michigan residents.

C. Objectives of the Study

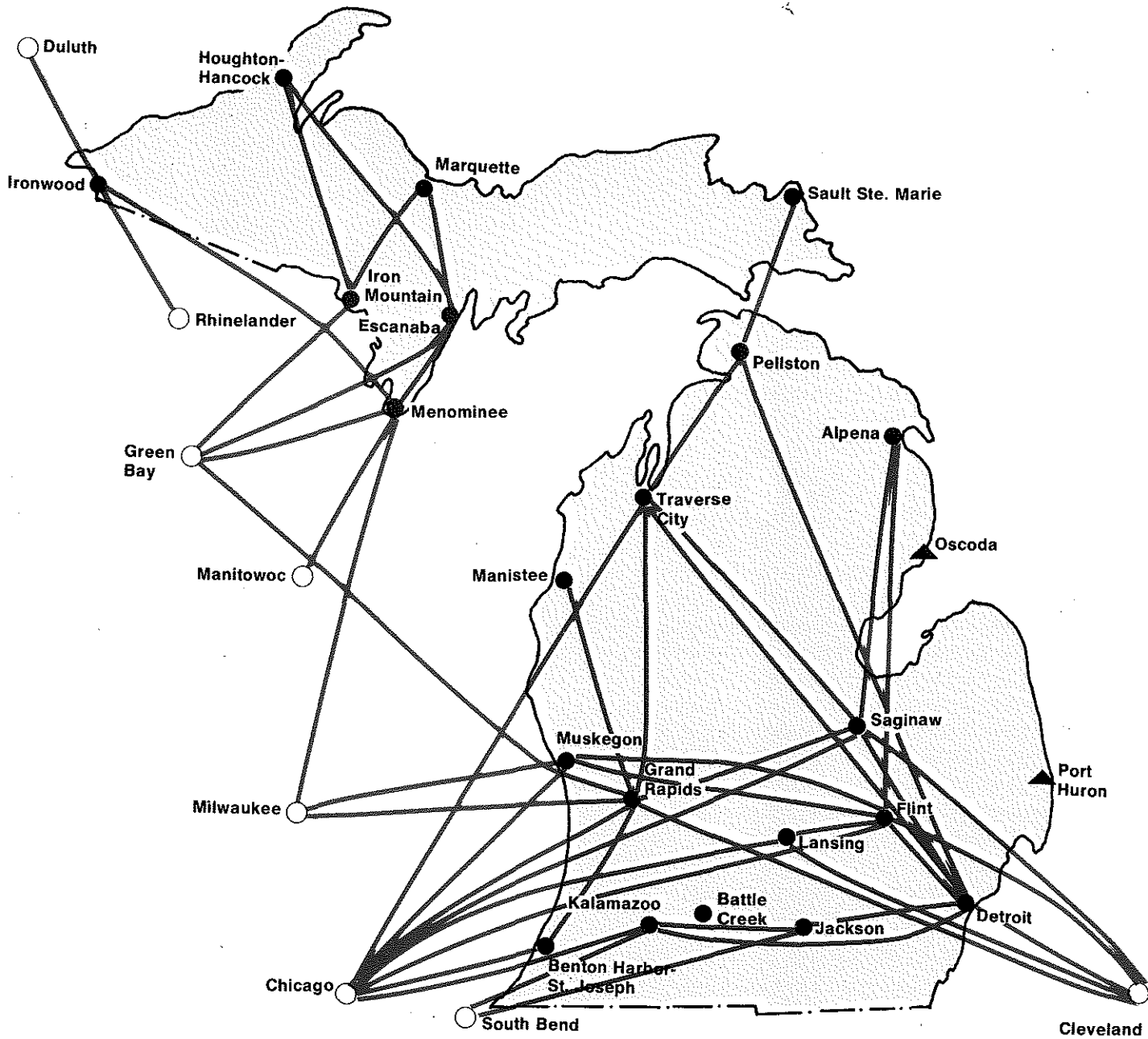
The objectives of the Michigan Scheduled Air Service Study were first to assess the adequacy of existing scheduled air service and the need for new service in the State and then to develop a series of options to resolve the needs identified. The end product is a plan and program leading to the implementation of improved air service by MDSH&T.



Airline freight is a major item for both the airlines and the airport operators. In 1977, 3¼ million pounds of freight were carried, inbound and outbound, at Michigan airports.

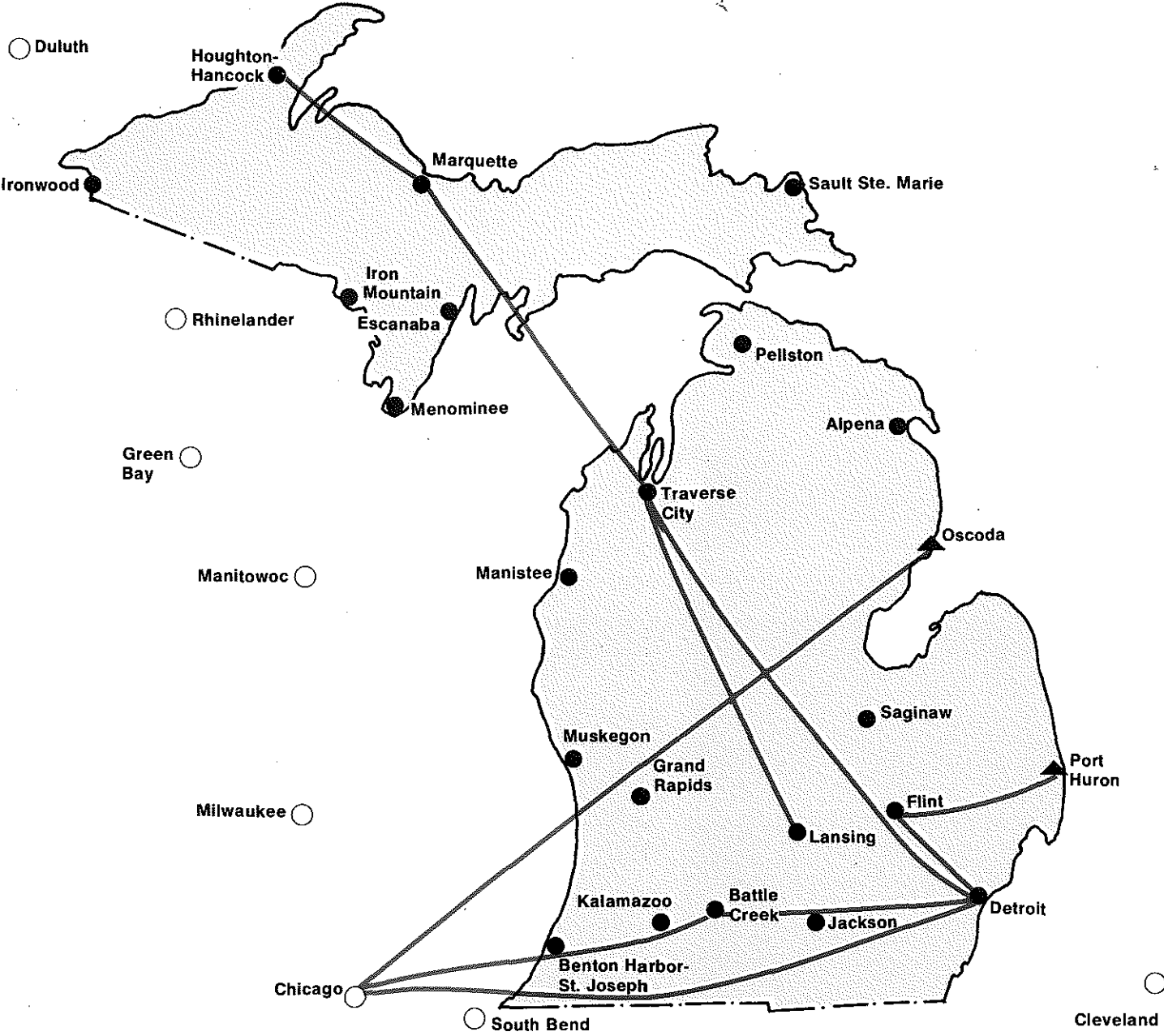
Scheduled Nonstop Service By Certificated Carriers

Figure 1



Scheduled Nonstop Service By Third Level Commuter Carriers

Figure 2



Changes in Certified and Third-Level Commuter Carrier Service: 1966-1976

Table 1

Air Carrier Airport	FLIGHTS PER DAY					
	Cert.	1966 ¹ Taxi	Total	Cert.	1976 ² Comm.	Total
Alpena	3		3	2		2
Battle Creek	8		8	0	13.5	13.5
Benton Harbor	7		7	7		7
Detroit City	0	7	7	6	2.5	8.5
Detroit Metropolitan ³	25		25	25.5	10.5	36
Escanaba	4		4	6		6
Flint	19		19	13	1.5	14.5
Grand Rapids	33		33	30.5	4.5	35
Hancock/Houghton	3		3	3	2	5
Iron Mountain	6		6	6		6
Ironwood	4		4	3		3
Jackson	4		4	5		5
Kalamazoo	4		4	16		16
Lansing	22		22	22	2	24
Manistee	3		3	1		1
Marquette	7		7	3	4.5	7.5
Menominee	4		4	5		5
Muskegon	12		12	10.5		10.5
Pellston	6		6	5		5
Saginaw	19		19	16		16
Sault Ste. Marie	3		3	2.5		2.5
Traverse City	5		5	5.5	5.5	11
Others ⁴	2		2			
Totals	213	7	220	195	45	240

¹As per the April 24, 1966 *Official Airline Guide*.

²Average of non-stop flights shown in the May and November 1976 *Official Airline Guides*.

³Interstate passengers only.

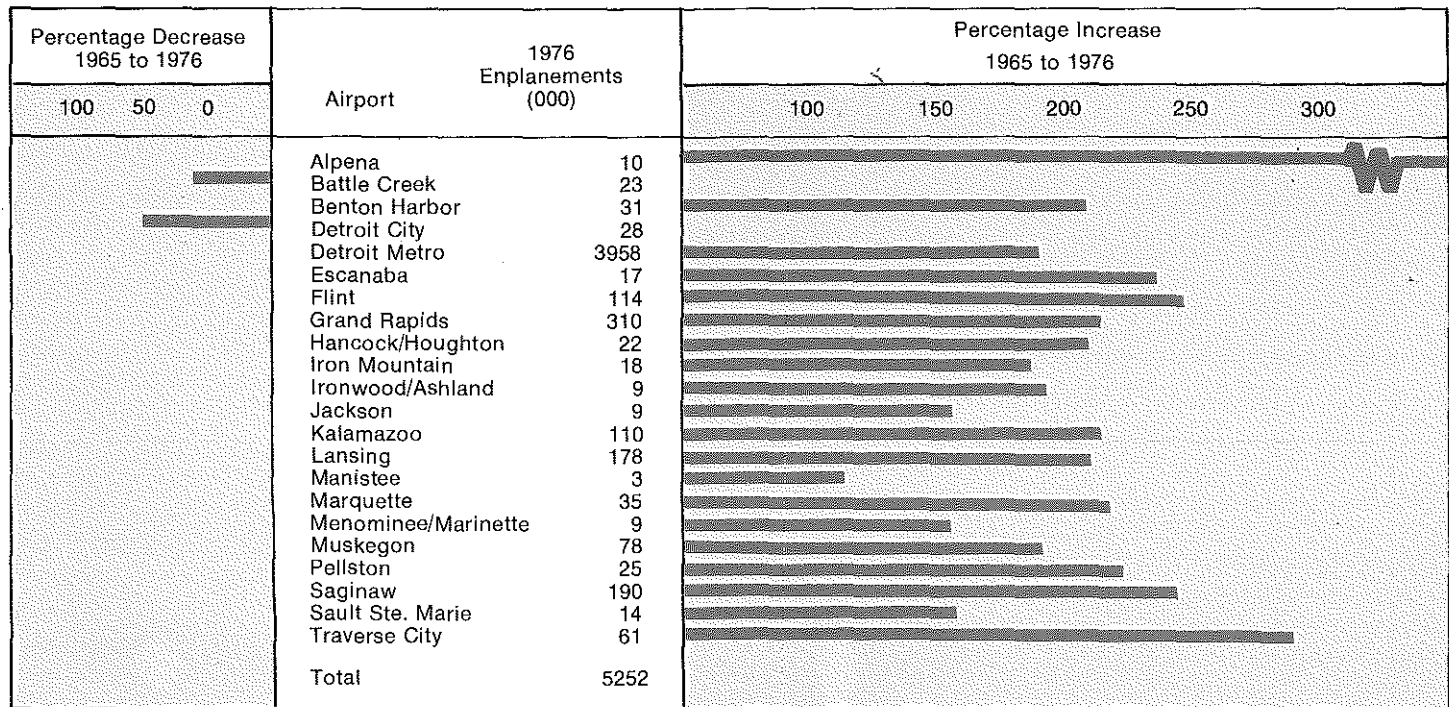
⁴Previous certificated service at Pontiac and Reed City.



Peak travel times place greater demands upon all airport personnel to ensure that passengers are able to be served as fast and efficiently as possible.

Figure 3

Airport Enplanements



NEED FOR ADDITIONAL AIR SERVICE

Need can be determined in two ways: by asking present users their perceptions of air service problems needing resolution, or by systematically examining the services provided and resulting patronage for individual markets using an objective "scoring" system to identify and assess present deficiencies. Both procedures complement each other and were utilized in this study.

A. Perceived Needs

The perceived need for new or modified air service was developed through a statewide attitudinal survey of selected individuals and agencies expected to be knowledgeable about the habits and problems of Michigan air travelers. This was followed by a market area analysis for each of the airports under study to identify those which produce a disproportionately low number of passengers.

The survey was conducted in April 1977. During this period, over 100 persons (airport managers, traffic

managers of major businesses or institutions, travel agents, and local chamber of commerce officials) were contacted as to the specific air service problems they were aware of, either through contact with the traveling public or from personal experience. The results obtained are shown in Figure 4 (Page 9) in a base city/reference city format. A base city is simply the respondent's place of residence. Reference cities represent the points to which travel deficiencies were felt to exist. Both sets of cities are grouped to simultaneously indicate regional patterns and needs.

A comprehensive analysis of selected demographic and socio-economic characteristics of the market area for each airport was also done to determine which airports produce above and below average enplanements. In doing this, the first step was to define the market area served by each airport. Then, the selected characteristics (those expected to be highly correlated with air travel, such as population, employees, and professionals) were summed for each



The airline airports in Michigan offer many services, such as restaurants, to the traveling public. These services also attract non-traveling members of the immediate vicinity.

market area. Next, the ratio of each characteristic to the number of enplanements was calculated for each market area. Finally, the ratios were reduced to a "realized enplanement score" and the different airports rank-ordered. The results obtained are shown in Table 2 (Page 10).

Since all airports are not equal in terms of service or facilities, diversion to larger airports affects productivity. For example, the three airports closest to Detroit Metropolitan (Jackson County — Reynolds Field, Flint Bishop, Detroit City) all have low realized enplanement scores. While this situation might be alleviated were higher quality air service offered, enplanements will likely remain low due to the convenience of hopping into an automobile and driving an hour or less to Detroit Metropolitan. Airports having high productivity scores show the dependency of those market areas on air service. Airlines are more receptive towards eliminating deficiencies in the more productive market areas.

B. Service Deficiencies

Air service quality consists of a combination of individual characteristics such as frequency, equipment type, departure time, and the number of intermediate stops and connections. These characteristics can be reduced to a single scale consisting of a series of service levels or steps, thereby making possible the objective rating of air carrier services in any market. Each market also has a "justified" level of air service; that is, a quality of service which can reasonably be provided by the airlines under prevailing industry economics to meet existing passenger demand. Justified service levels are dependent on the annual number of passengers in the market and the distance between cities. Due to the inability of certificated air carriers to economically provide high-quality service in markets exchanging less than 1,000 passengers a year, the

concept of justified service level can not be extended to include markets of this size.

By establishing a justified service level for each market, a "benchmark" is created against which the adequacy of present service can be determined. In this manner, the quality of air service at each air carrier airport under study was analyzed for the existence of deficiencies in service between other study airports and service to six "gateway" cities which serve as connecting points to more distant markets. These gateway cities are Chicago, Cleveland, Denver, Green Bay, Milwaukee, and Minneapolis. In all, 81 interstate and 121 intrastate markets were analyzed during this portion of the study. Figure 5 illustrates the application of the Air Service Scoring System in Michigan. Table 3 (Page 11) presents the results obtained by air carrier airport.

Markets which were found to have deficiencies in the quality of air service have a greater potential for air traffic. Service may be inadequate to the point where people may use another transportation mode for travel or they may decide to travel to another airport to utilize better service provided there. In addition, a market adequately served by scheduled air service today may develop deficiencies in the future unless improvements in air service are instituted. Situations like this occur as a result of natural market growth whereby market patronage increases annually in response to population increases and changing economic conditions. This increased patronage, in turn, may cause higher quality service (i.e., a higher level of justified service) to become warranted. By reviewing service provided to Michigan's airports over a ten-year period, growth factors were developed for the purpose of identifying future deficiencies of this type (assuming no change in service quality would occur).

In general, present air service is quite good. Less than 20 percent of existing markets have a deficiency in air service (see Table 4 Page 13). However, Table 4 also indicates that the number of deficient markets will gradually increase, both for interstate and intrastate travel.

Figure 4

Perceived Need for New Air Service

Reference Cities By Geographic Zone¹

Base Cities By Geographic Zone		Southern L.P.					Northern L.P. Eastern U.P.				Western U.P.			Bordering State				
		Detroit	Flint	Grand Rapids	Kalamazoo	Lansing	Saginaw	Alpena	Pellston	Sault Ste. Marie	Traverse City	Escanaba	Houghton/Hancock	Marquette	Chicago	Cleveland	Duluth	Milwaukee
Southern L.P.	Battle Creek	A												A				
	Benton Harbor	A				ND								A	A			
	Detroit								A									
	Flint	G BLM						N	N	N				RE				
	Grand Rapids	*							*A		*	*					*	*
	Jackson	BM RE							N	N		N		A				
	Kalamazoo	G RA												A			A	
	Lansing	A RLE							N	ND				RE RLE				
	Muskegon													*				*
	Saginaw	BLM RLE								N								
Northern L.P. Eastern U.P.	Alpena	BLM				ND								ND				
	Manistee	ND		A		ND				N				A			ND	
	Pellston					N				A								
	Sault Ste. Marie	AD			N	N						N		ND				
	Traverse City	G				N					N		N	G				
Western U.P.	Escanaba					ND	N			N				ND		N	ND	N
	Houghton/Hancock	A				A AD				N				AD		N		N
	Iron Mountain	ND	N		N	ND			N	N								N
	Ironwood	A				A				N				A		A		N
	Marquette	A				A										N		N
	Menominee					AD								AD				A ND

Summary of Codes:

A — More Service Needed	M — More Morning Peak (6 a.m.-10 a.m.) Flights Needed
AD — More Direct Service Needed	LM — More Late Morning Flights Needed
N — New Service Needed	EA — More Early Afternoon Flights Needed
ND — New Direct Service Needed	E — More Evening Peak (6:30 p.m.-7:30 p.m.) Flights Needed
G — Long Gaps in Service	LE — More Late Evening Flights Needed

Notes: "B" Prefix Means From Base City to Ref. City; "R" Means From Ref. City to Base City

BOLD TYPE INDICATES A NEED EXPRESSED BY MORE THAN ONE RESPONDENT.

* Unsatisfied service improvements suggested by external reports.

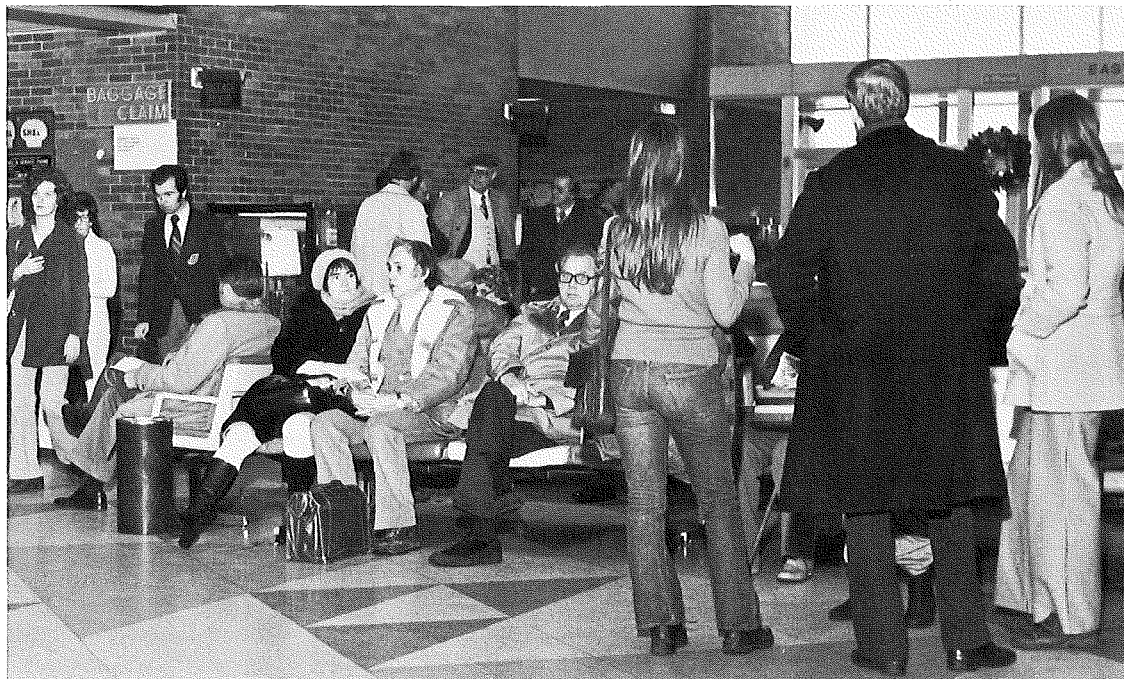
¹Michigan points not listed were not the object of any service related remarks.

Productivity of Air Carrier Airports in Michigan (Realized Enplanement Score)¹

Table 2

Relative Productivity	GEOGRAPHIC ZONE		
	Southern L.P.	Northern L.P./ Eastern U.P.	Western U.P.
Most Productive	Grand Rapids Lansing	Traverse City Pellston	Hancock/Houghton Marquette
Average	Saginaw Kalamazoo Muskegon Benton Harbor	Sault Ste. Marie	Escanaba Menominee Iron Mountain Ironwood
Least Productive	Flint Battle Creek Jackson Detroit City	Alpena Manistee	

¹Excluding Detroit Metropolitan. For further details, see Table 12 of the *Final Technical Report*.



The airport operators throughout the state must provide enough lobby space for members of the traveling public and others who frequent the airport.

Markets Analyzed and Deficiencies Found for 1980¹

Table 3

	No. of Markets Analyzed	Markets Deficient in 1980	Severity of Deficiency ²					Percent of Markets Deficient
			1	2	3	4	5	
Alpena	13	1	1					8
Battle Creek	0	0						0
Benton Harbor	20	0						0
Detroit	19	9	2	2	3		2	47
Escanaba	15	4	1	2	1			27
Flint	20	2		1		1		10
Grand Rapids	20	8	4		2	2		40
Hancock/Houghton	16	4	1	2			1	25
Iron Mountain	17	3	1	1	1			18
Ironwood	19	3	1	2				16
Jackson	11	0						0
Kalamazoo	18	3	1	1			1	17
Lansing	22	7	1	4	1	1		32
Manistee	7	1		1				14
Marquette	18	7	1	2		2	2	39
Menominee	14	2	2					14
Muskegon	14	1				1		7
Pellston	11	1			1			9
Saginaw	17	1			1			6
Sault Ste. Marie	16	2	1		1			13
Traverse City	17	5	1	2	1		1	29
Total	202	46						23

¹For 1977 deficiencies, see Table 20 of the *Final Technical Report*.

²Based on the following points.
 1 0-9 deficiency points
 2 10-19 deficiency points
 3 20-29 deficiency points
 4 30-59 deficiency points
 5 60 up deficiency points

Security has become an increasing part of the airline aviation scene. Expenditures for this necessary activity are very high and have been passed on to the passenger through higher ticket prices.

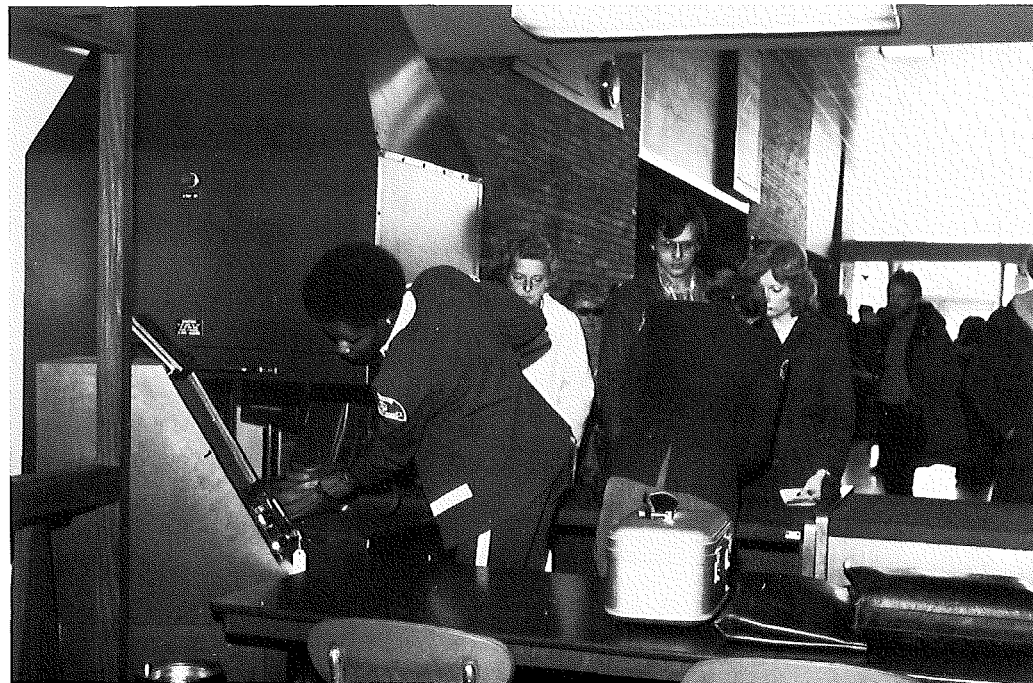
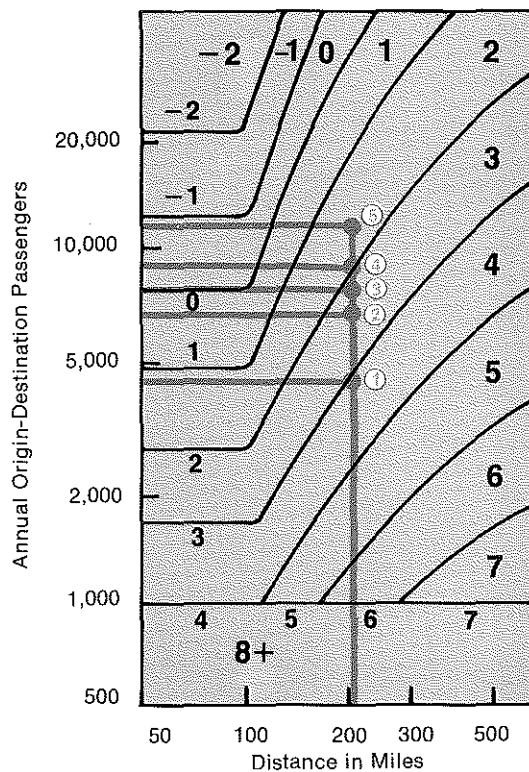


Figure 5

Air Service Scoring System Example



Passenger Level Standards for Each Service Class

EXAMPLE. The Flint-Milwaukee market is used to illustrate the scoring method employed.

- In 1975, the CAB estimated that 4,180 persons traveled by scheduled air service between these two cities. The actual distance between them is 211 miles. From the passenger level standards chart, level 4 service should have been provided (Point 1).
- Actual service in 1975 consisted of a mixture of non, one, and two-stop connecting flights through Detroit, which with the circuitry involved, became level 9 service (a 5-step deficiency). See the schedule equivalents table below.
- To determine what the patronage would have been, had level 4 service been offered, the actual patronage was multiplied five times by the stimulation factor (in Michigan, the factor was determined to be 11.3 percent for each step deficient) to obtain an estimate of 7,140 (Point 2).
- This amount of patronage would justify level 3 service. Therefore, the stimulation factor was again applied to obtain a 1975 demand estimate of 7,950 (Point 3).
- To determine 1977 patronage, the 1975 estimated patronage was multiplied twice by the natural growth factor (5.3 percent per year) to obtain a 1977 patronage estimate of 8,810 (Point 4).
- The same method can be used to estimate 1980 patronage. Application of the natural growth factor (3 times) produces a patronage estimate of 10,290, which in turn justifies level 2 service. Application of the stimulation factor produces a final 1980 patronage estimate of 11,450 (Point 5).
- The estimated origin-destination passengers (at the required service level) was multiplied by the number of steps deficient (actual service quality less required service quality) and divided by 1,000 to obtain scores of 48, 35, and 57 for 1975, 1977, and 1980, respectively. This corresponds to a "4" severity level. (See footnote 2 to Table 3).

Approximate Schedule Equivalents to Air Service Classifications

Service Class	Flights During	
	AM and PM Peak Hours	Mid-day Evening
-2	non-stops 2 hr. interval non-stops	+ non-stops 2 hr. interval one stop in both periods
-1	non-stops	+ one stop in one period
0	non-stops	or —
1	one-stops	or non-stops
2	two stops	or one stop
3	three stops	or two stops
4	non-stop connection	or three stops
5	one stop connection	or non-stop connection
6	two stop connection	or one stop connection
7	connection	or connection
8+	multi stops and inconvenient connections	

Table 4

Number of Deficient Markets

Type	1975		1977		1980	
	No.	Percent	No.	Percent	No.	Percent
Interstate	22	27.2	24	29.6	28	34.6
Intrastate	13	10.7	16	13.2	18	14.9
Total	35	17.3	40	19.8	46	22.8

Table 5

Severity of Deficient Markets

Deficiency Severity Points	1975		1977		1980	
	No.	Percent	No.	Percent	No.	Percent
1 0 to 9	9	26	11	28	11	24
2 10 to 19	10	29	12	30	16	35
3 20 to 29	8	23	10	25	8	17
4 30 to 59	6	17	6	15	6	13
5 60 and up	2	6	1	3	5	11
Total	35	100	40	100	46	100
Average Points (Deficient Markets Only)	22.6		20.5		24.3	

Simply identifying the number of deficient markets isn't enough; the magnitude of the deficiency is rather important. Magnitude has two dimensions: the affected annual patronage and the number of steps deficient. A market deficiency of one or two steps may seem unimportant. However, if large numbers of people are affected, the deficiency may be very significant. The reverse situation also holds. In order to put the magnitude of the deficiency into perspective, both dimensions have been combined as a simple measure, that of deficiency points. Five different severity categories were defined to accomplish this.

Table 5 (Page 13) shows that 55 to 60 percent of market deficiencies are fairly small (less than 20 deficiency points). While the average deficiency decreased somewhat between 1975 and 1977, this decrease was more than offset by the increased number

of markets found to be deficient. By 1980, the average deficiency is projected to increase by nearly 20 percent over 1977, unless service improvements are made.

Table 6 (Page 14) summarizes the number of passengers in deficient markets. Although only 23 percent of the number of markets studied were projected to have deficiencies in 1980, these markets were carrying 44 percent of the total 1975 O-D passengers who traveled by air in the markets analyzed. While proportionately fewer intrastate markets were deficient, the percentage of passengers affected was higher than was the case with interstate markets. This indicates that service deficiencies tend to be in higher volume markets.

The location of each market which was projected to be deficient in 1980 is illustrated in Figures 6 to 10 (Pages 15-19).

Number of 1975 O-D Passengers in Deficient Markets (1980 Deficiencies)

Table 6

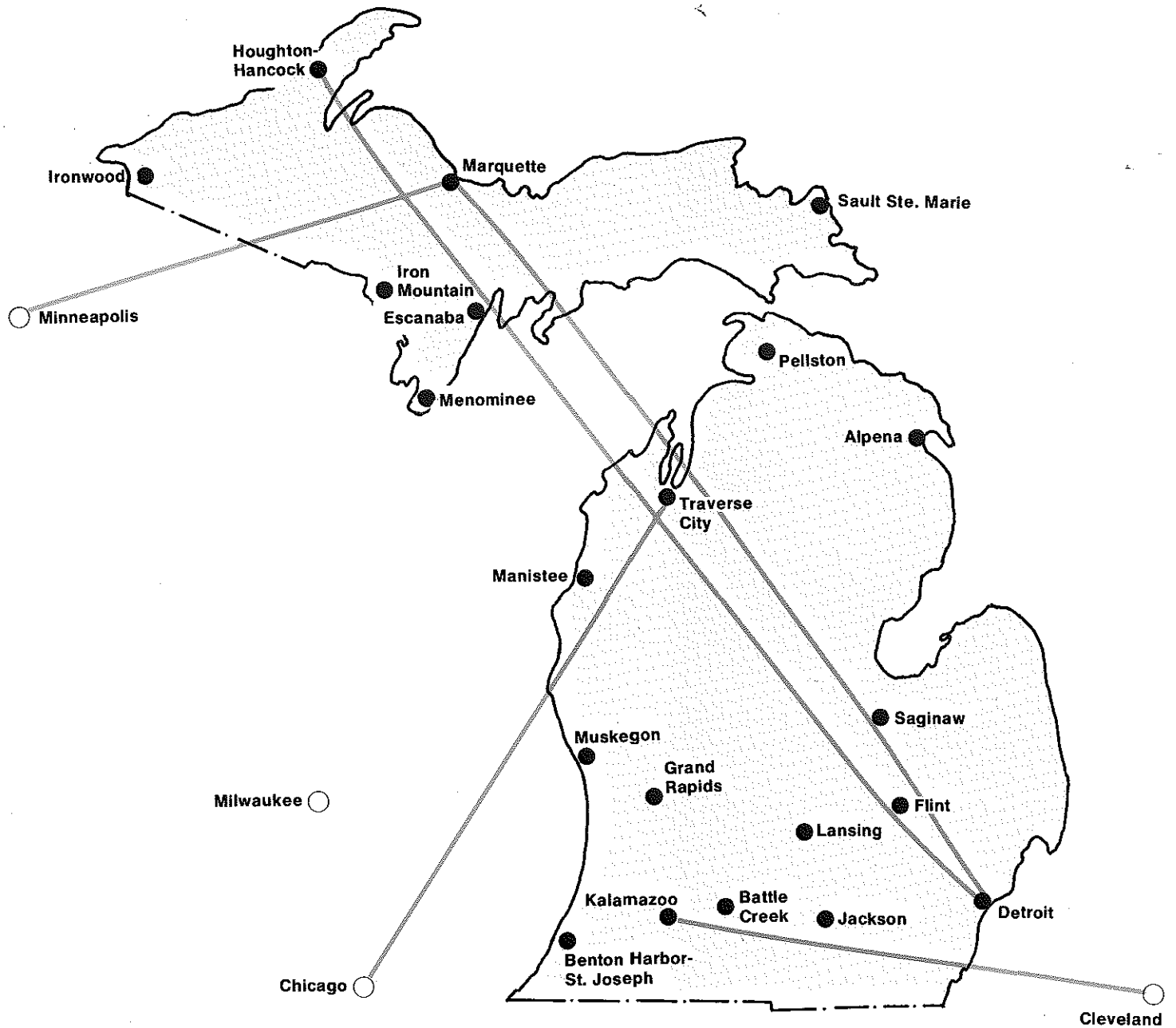
1975 O-D Passengers	Intra-State	%	Inter-State	%	Total	%
In Markets Analyzed	153,980	—	516,080	—	670,060	—
In Deficient Markets (1980)	95,120	62	202,510	39	297,630	44
In Seriously Deficient Markets (20 or more deficiency points)	70,090	46	142,370	28	214,460	32



Airline passengers represent a cross-section of the public in Michigan, as they do throughout the United States.

1980 Air Service Deficiencies 60 Deficiency Points or Greater

Figure 6



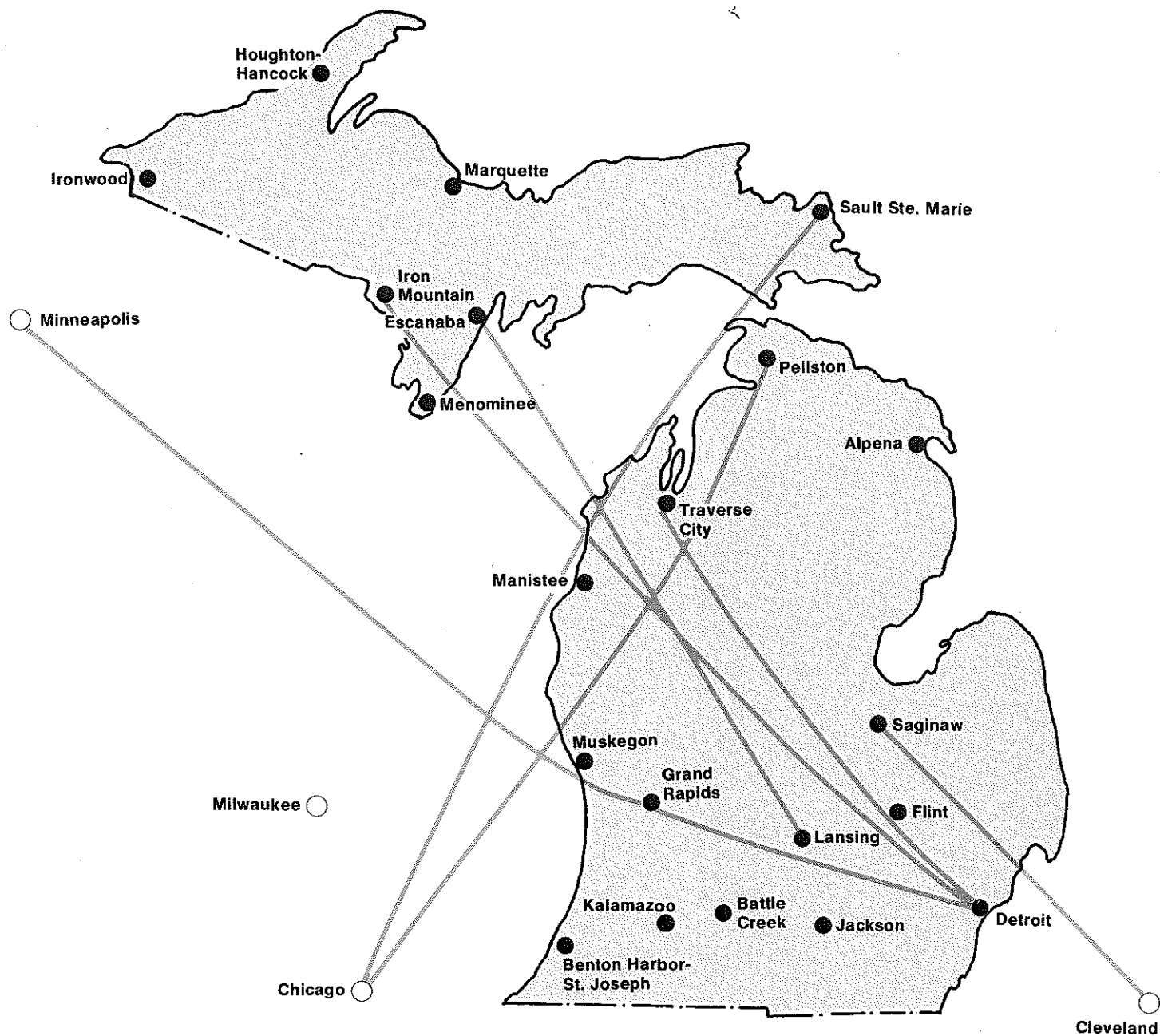
1980 Air Service Deficiencies 30-59 Deficiency Points

Figure 7



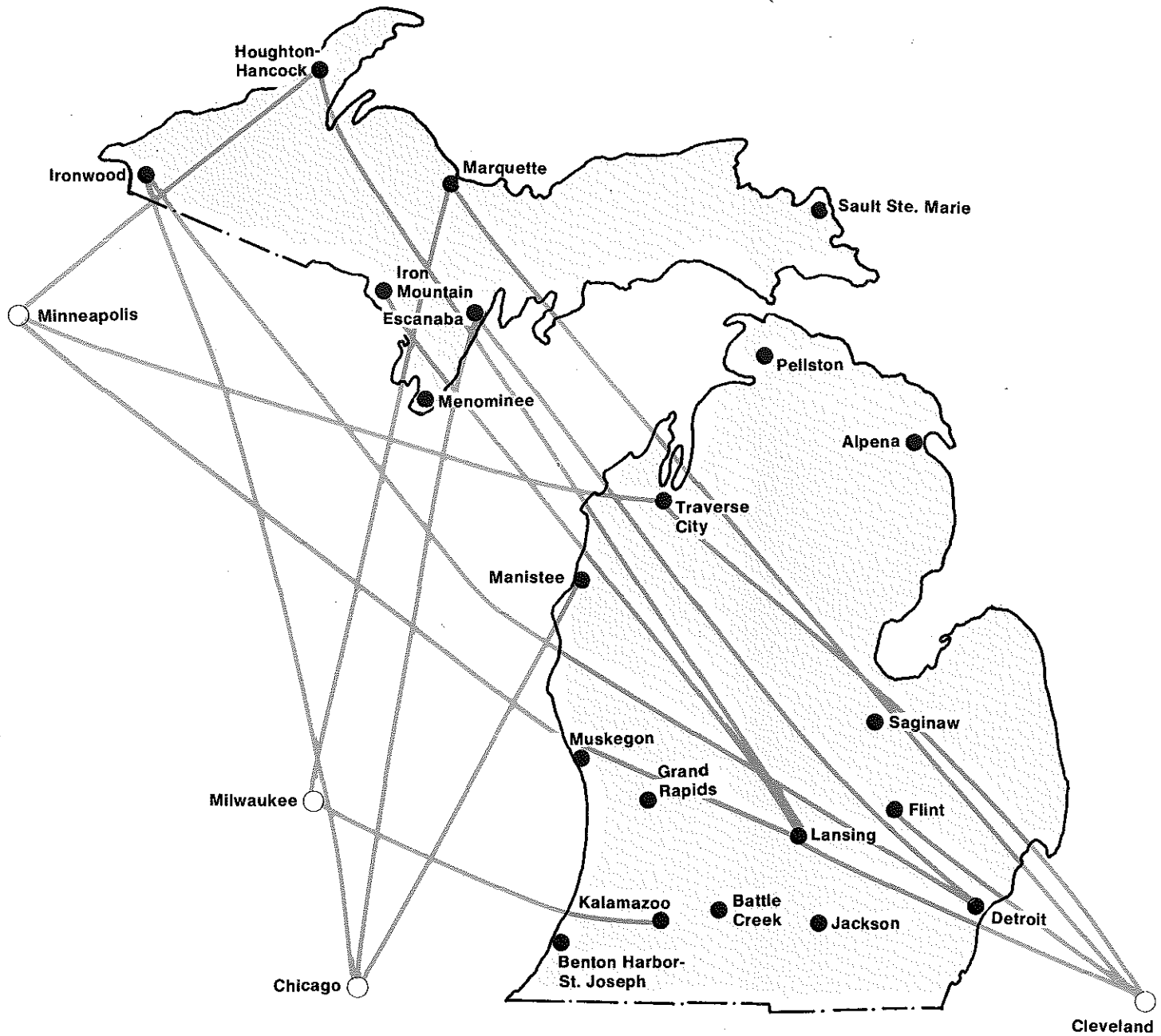
1980 Air Service Deficiencies 20-29 Deficiency Points

Figure 8



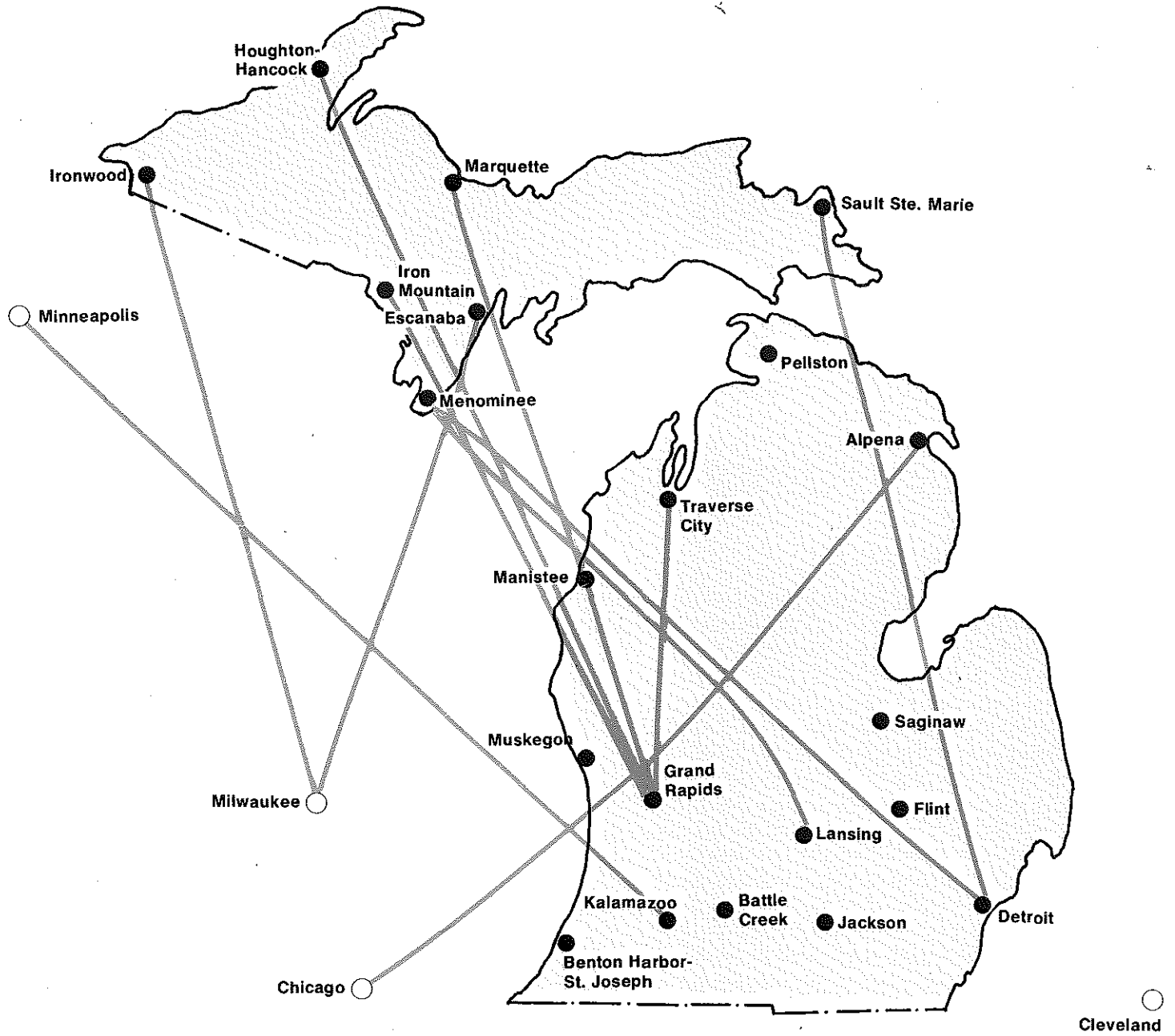
1980 Air Service Deficiencies 10-19 Deficiency Points

Figure 9



1980 Air Service Deficiencies 9 Deficiency Points or Less

Figure 10



BASIC STRATEGIES FOR IMPROVING AIR SERVICE

Before presenting specific proposals for improving air service, a brief discussion of the major options available to Michigan is requisite.

Implementing improved air service can be accomplished in three ways:

- Encouraging existing carriers to alter their service to better meet the needs of Michigan travelers.
- Bringing in new carriers to supplement existing service.
- Bringing in new carriers to replace existing service.

The extent to which each of these methods should be employed in resolving service deficiencies depends upon the nature of the deficiency to be resolved, the attitudes of present carriers, the willingness of the state and communities to strive for improved air service, and to a lesser extent, pending changes in Federal airline regulation. Each of these options is discussed in greater detail below.

A. Encouraging Present Carriers

Major efforts could be made to convince existing carriers of the desirability for them to provide supplemental or higher quality replacement service which will eliminate present deficiencies. Possibilities include adding flights, rescheduling existing flights to include morning or afternoon departures, and eliminating intermediate stops or connections. Such improvements can be made through rescheduling, using presently-owned aircraft. They do not necessarily require implementing new routes and services. They do not necessarily require the purchase of smaller aircraft. Such improvements can be scheduled over a several-year time period to minimize short-term impacts on airline operations. While the desire might be to have present carriers resolve deficiencies through service improvements, such expectations may not be realistic in all cases.

For those deficiencies which cannot be readily resolved by existing carriers, a decision may have to be

made whether to further try and persuade the appropriate carrier to provide the desired service, seek redress through the regulatory process, or drop the idea of obtaining improved service from existing carriers. The former conceivably could involve a compromise such as when a carrier agrees to improve service in return for state support of route extensions, being sought by the carrier before the CAB, that will be of value to Michigan travelers. Considerable opportunity exists for negotiation and bargaining. Seeking improved service through route proceedings does require the development of a documented case and the engagement of professionals qualified in presenting the case before the CAB. In addition, there is the likelihood that considerable time will pass before a decision is rendered (plus the opportunity for appeals), and the possibility that the petition for improved service may be denied. Use of the regulatory process to gain service improvements should be done only after a very careful decision has been made weighing the pros and cons of such action. The possibility of a petition's denial raises the fact that existing carriers will, in some cases, have sound reasons why they cannot provide the desired service and that improved service should be sought instead, from other certificated or commuter airlines. The third possibility is simply to drop efforts of obtaining service improvements from existing carriers and accept the deficiency as unavoidable.

B. Seeking Another Certificated Carrier to Provide Supplemental Service

Rather than simply dropping the idea of obtaining improved air service, another possibility is to seek another certificated carrier to provide supplemental and possibly replacement service. There is a certain permanency to such a course of action; once other carriers or operators are brought in, it unleashes changes in service for which there is no turning back. The starting point would be to determine which carriers are capable of providing such service and whether there is indeed sufficient interest to pursue a formal Request for Proposal (RFP) process. Generally, the choice will be limited to smaller carriers flying smaller aircraft and serving adjacent markets.

Many passengers have special needs that must be met by the airlines and the airports in providing for these demands. An example of this is the special services which are provided to handicapped passengers.

If it is decided to solicit proposals, the procedure would be for MDSH&T (with community assistance) to prepare and issue a RFP to certificated carriers interested in providing supplemental or replacement service in selected markets. The submitted proposals, which should follow a prescribed format, would then be reviewed by both MDSH&T and community officials using pre-established evaluation criteria (financial, operational, etc.) and a joint decision made as to whether to bring in another carrier to provide the desired service. If so, MDSH&T would then negotiate and execute an appropriate contract.

As a condition for this, communities may be required to provide certain types of economic assistance or in-kind services. Possibilities include:

- Economic assistance payments to offset operating deficits or to guarantee a minimum return on investment.
- Free or reduced cost terminal space.
- Waiver of landing fees.
- Promotional programs to attract passengers.

The cost of economic assistance payments, if utilized, could either be borne locally or by both state and local governments. Under the proposed Federal legislation, subsidy-eligible communities served by certificated air carriers may have some say in how the subsidy is distributed among the various markets served by those carriers. The other possibilities normally are carried out at the local level. In any event, active community support is essential in seeking various ways of reducing the operator's expenses or increasing his revenue.

The advent of a new certificated carrier in a market presently served (albeit poorly) by an existing carrier does have some risk. While under the pending legislation certificated air service is likely to be continued by these carriers (at least initially), the law will make it easier for the existing certificated air carrier to exit from markets also being served by another carrier. While such an event would normally be beneficial to the new carrier, such an event might be interpreted locally as a loss of service. Thus, it becomes important to ensure that the new carrier has the fiscal resources to provide



replacement as well as supplemental service should the existing certificated carrier ultimately decide to exit from the market.

C. Seeking a Commuter Operator to Provide Supplemental Service

If MDSH&T cannot find a certificated carrier willing to provide the desired services, then the next course of action would be to seek a commuter operator. The starting point is to screen the qualifications of potential and current commuter operators to determine those which have sufficient experience and fiscal resources to provide the required services. Once a list has been established, MDSH&T would then prepare and issue a RFP identifying the specific markets in which service is desired. The submitted proposals, which should follow a prescribed format, would then be carefully reviewed and evaluated. The ultimate choice of a carrier would be made jointly by MDSH&T and affected communities. MDSH&T would then negotiate and execute an appropriate contract. As was the case previously, communities may be required to provide certain types of economic assistance or in-kind services as their contribution to instituting improved air service.

In order to integrate commuter service with certificated service and to reach the market potential as rapidly as possible, operators should be required to negotiate interline ticketing agreements with certificated air carriers (and other commuters), to actively seek freight contracts, to promote charter and other special services, to offer group and other discount rates to promote travel, especially during non-peak hours, and to cooperate with MDSH&T in making adjustments to service standards and policies to reflect changing conditions.



A Federal Aviation Administration traffic control tower, such as the one shown here, is responsible for the efficient and safe movement of all air traffic at that particular airport.

PROPOSALS FOR SERVICE IMPROVEMENTS

Ideally, existing certificated carriers will, on the basis of this report and their own findings, improve service to eliminate identified deficiencies, especially those having 30 or more points. Since such action is uncertain, plans must be developed for additional or supplemental service to be provided by other certificated carriers or commuter operators. This section presents such service improvements proposals.

A. Development of Service Proposals

The deficient markets illustrated in Figures 6 through 10 (Pages 15-19) were assembled into route proposals based on the lines of travel demand. Those markets having the most severe deficiencies and greatest patronage potential provided the "backbones" for these proposals. The object was to design routings which would respond to the most significant deficiencies, and then, through route extensions and modifications, also respond to as many of the lower order deficiencies as possible while still maintaining required service levels in the major markets. Several

rules were adopted to guide the development of service proposals.

- Each route was to be structured so that service was provided to Detroit or one of the six gateway airports.
- A maximum of two intermediate stops per route (four airports served) was adopted in order to insure adequate service quality.

The route proposals which were developed through this process consisted of 12 separate routes providing either supplemental or full replacement service. Five other markets were also identified in which additional service by the existing carrier was the best alternative for providing the justified level of service. Figure 11 (Page 25) illustrates the route proposals which were developed.

Route proposals have to be economically viable. Thus, service parameters such as carrier type, aircraft type, and frequency had to be specified as follows:

- Four different operating scenarios were defined to define the type of operation:

Case A — Jet Service by a Certificated Carrier

Case B — Propeller Service by a Certificated Carrier

Case C — Jet Service by a Commuter Carrier

Case D — Propeller Service by a Commuter Carrier

- Three different service frequencies were also utilized:

Frequency 2 — Two round trips each weekday, one during each of the peak periods, and one round trip each weekend day at mid-day.

Frequency 3 — Three round trips each weekday, one during each of the peak periods and one at mid-day. Two Saturday round trips, one at mid-morning and one at mid-afternoon. On Sunday round trip at mid-day.

Frequency 4 — Four round trips each weekday, one during each of the peak periods, one at mid-morning and one at mid-afternoon. Two round trips each weekend day, one at mid-morning, and one at mid-afternoon.

Service proposals were then evaluated to determine their suitability for resolving market deficiencies.

B. Determination of Economic Feasibility

Each service option was then subjected to a rigorous economic evaluation consisting of three distinct tasks: (1) development of patronage forecasts, (2) estimation of revenues, and (3) determination of related cost.

Patronage Forecasting

Patronage estimates were originally developed in the process of determining justified service levels for deficient markets. If the proposed services were to be operated at the justified levels, these patronage estimates were used directly. Depending upon the specified service parameters for a given service option, slight deficiencies in service would remain. In these cases, the original patronage estimates were factored down to reflect the extent of the deficiency. If some

competition between services was projected to occur, proportions of the total market using each of the services were estimated. Using these market forecasts as a base, patronage estimates for each leg or stage of service were developed for each service option by adding and subtracting passengers on and off at each airport served.

Revenue Forecasting

The next step was to determine revenues for each service option. Separate revenue estimates were prepared for the component markets of each service option and then summed to give a total figure for each route. The projected revenues were based on previously developed forecasts of patronage and an appropriate fare which was either estimated or obtained from existing tariffs.

Cost Estimating

Using the "passengers per stage" estimates developed earlier, particular aircraft having appropriate passenger capacity and power type were selected for each service option. The economics of providing any particular air service option were evaluated by comparing the total annual operating cost with the anticipated revenue. The total cost to operate air service in a given year is dependent on the aircraft operating cost per block hour and the annual use of the aircraft. Aircraft utilization can be determined by analyzing the service schedule over the route as fixed by the aircraft's performance characteristics and stage length between the cities served.

The costs associated with providing air service are generally grouped into four categories. These are:

- **Flyaway Costs** The cost of purchasing aircraft including appropriate avionics. This cost consists of interest expense paid on borrowed capital or interest income foregone on committed capital used to purchase flight equipment.
- **Direct Operating Costs.** The costs associated with actually providing air service. Included are the costs of fuel and oil, maintenance, depreciation (of flight equipment only), hull and liability insurance and flight crew costs.



- **Indirect Operating Costs.** The costs associated with groundside operations and passenger service. Included are depreciation (of ground equipment), aircraft and traffic servicing, passenger service, general and administrative, reservations and sales, and development and pre-operation costs.
- **Return on Investment.** This category reflects the profit due on the equity of investors.

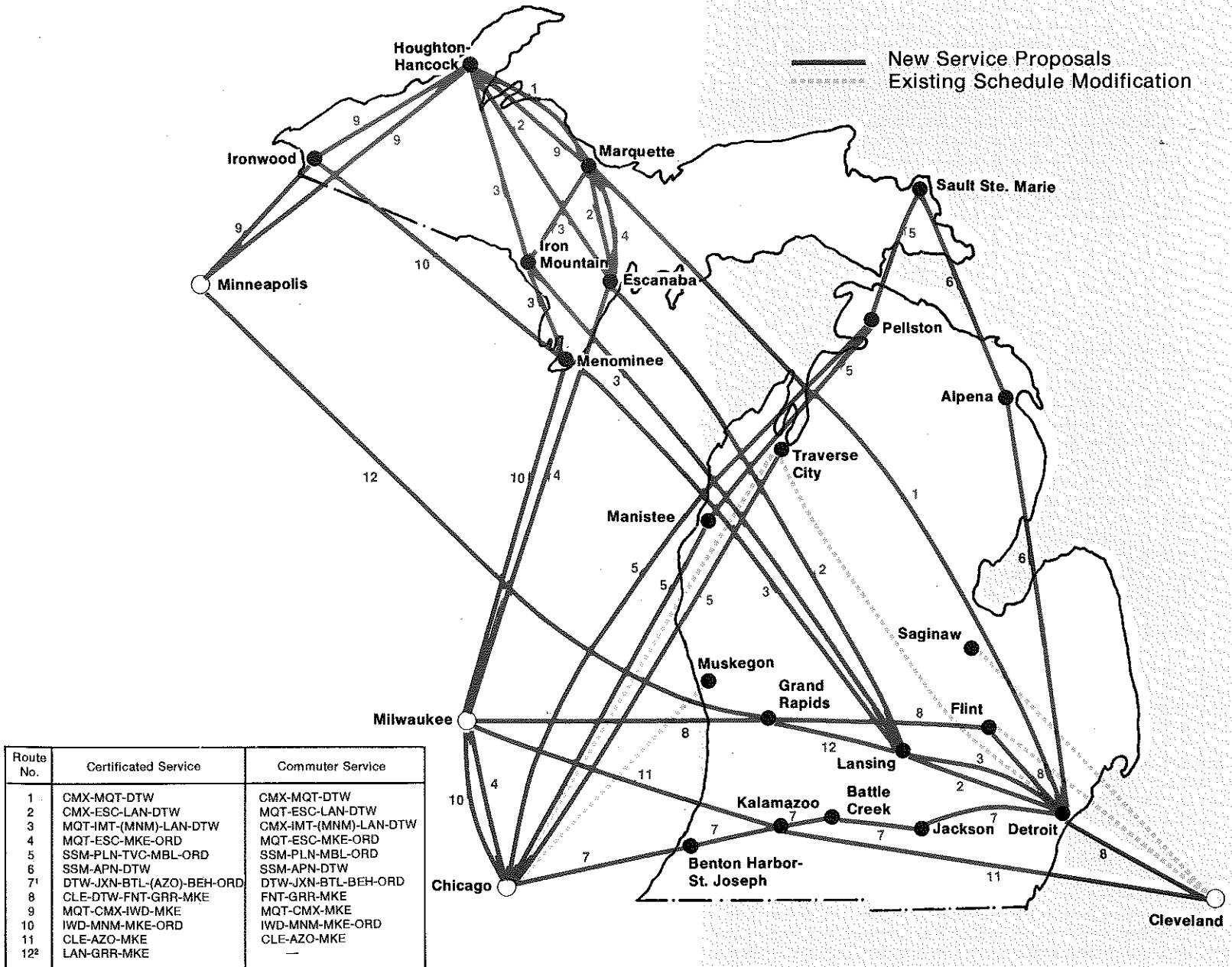
The direct and indirect costs of providing new air service were determined for each type of carrier and aircraft from airline financial reports and manufacturers' specifications. However, the costs in the other two categories are much less predictable because of the wide range of capitalization options available. Because of their highly variable nature, flyaway costs and return on investment cost were omitted from the cost analysis in favor of handling these costs on an individual basis during the implementation stage of the project. For each aircraft, the individual components of both types of operating costs were determined and then summed to provide figures for total operating cost per average block hour of operation. These costs were set at conservatively high levels to establish conditions which provided a buffer for the uncertain flyaway and return on investment costs.

On the basis of the comparison of cost and revenue estimates, the most promising service options for each route were selected. The operational and economic characteristics of these options, as well as their ability to resolve the air service deficiencies, are shown in Tables 7 and 8 (Pages 26-27). These tables provide at least one service proposal that would show an operating profit by 1980 for each route studied. While this is a satisfying result, in order to provide for as much flexibility as possible, all service options with a revenue/cost ratio greater than 0.9, are included in Table 7 (Page 26).

Commercial aircraft operate in all types of weather in Michigan. This requires a high degree of cooperation between the carriers and the airport operators to keep these facilities open.

Figure 11

Final Route Proposals



¹ Contingency in case of service curtailments due to restricted runway lengths.

² 1980 air service need.

Summary of 1980 Certificated Carrier Route Proposals

Table 7

Route	Option	Airports Served	Aircraft	Seat Capacity	Frequency ¹	Aggregate Service QUALITY SCORES			REV/T.O.C. Ratio
						Service Level If No Improvement	Service Level Warranted	Service Level Proposed	
1	1	Hancock, Marquette, Detroit	Prop	30	3	7.5	2.5	2.5	1.086
1	2	Hancock, Marquette, Detroit	Prop	20	4	7.5	2.5	2.0	1.079
2	1	Hancock, Escanaba, Lansing, Detroit	Prop	15	3	6.8	3.5	2.8	1.116
3	1	Marquette, Iron Mtn., Menominee, Lansing, Detroit	Prop	15	3	7.2	3.8	3.2	.894
3	2	Marquette, Iron Mtn., Lansing, Detroit	Prop	15	2	7.3	3.3	2.5	1.004
4	1	Marquette, Escanaba, Milwaukee, Chicago	Jet	100-115	2	5.3	3.5	2.0	1.083
4	2	Marquette, Escanaba, Milwaukee, Chicago	Prop	30	4	5.3	3.5	2.3	1.022
5	1	Sault Ste. Marie, Pellston, Traverse City, Manistee, Chicago	2 Prop	20/50	2-6	6.5	2.3	1.5	1.167
6	1	Sault Ste. Marie, Alpena, Detroit	Prop	15	2	5.0	4.0	3.0	.920
7	1	Detroit, Jackson, Battle Creek, Kalamazoo, Benton Harbor, Chicago	Prop	20	2-7	1.1	⁴	-0.1	1.656
7	2	Detroit, Jackson, Battle Creek, Benton Harbor, Chicago	Prop	20	2-4	1.7	⁴	0.8	1.184
8	1	Cleveland, Detroit, Flint, Grand Rapids, Milwaukee	Prop	20	2	2.4	0.4	1.0	1.079
8	2	Cleveland, Detroit, Flint, Grand Rapids, Milwaukee	Prop	15	3	2.4	0.4	0.6	1.258
9	1	Marquette, Hancock, Ironwood, Minneapolis	Prop	15	2	7.5	4.0	3.0	.910
10	1	Ironwood, Menominee, Milwaukee, Chicago	Prop	15	2	6.0	4.5	3.5	.950
11	1	Cleveland, Kalamazoo, Milwaukee	Prop	15	2	6.5	2.0	1.0	.959
12	1	Lansing, Grand Rapids, Minneapolis	Prop	20	2	3.5	2.5	2.5	1.104

¹The frequencies presented are in terms of the number of weekday round trips to be provided to the individual stations within each route. In cases where a range of frequencies is indicated, several aircraft would be operated over the route with some stations served more often than others. For a more detailed look at service frequencies see Table 30 in the *Final Technical Report* (pp. 124-131).

²The numbers entered in the columns below are overall average ratings of service quality for each service option. The lowest scores represent the highest quality service. Chapter III of the *Final Technical Report* summarizes the rating system which was used to analyze present and proposed air services.

³The ratio of revenue to total operating cost indicates the potential profitability of each route. A ratio of less than 1.0, therefore, represents a route where costs exceed revenues and where some form of subsidization may be warranted.

⁴Due to problems with the way in which data were reported, it was not possible to determine the level of service which is warranted for several stations included in this route, therefore, no aggregate score is presented.

Summary of 1980 Commuter Carrier Route Proposals

Table 8

Route	Option	Airports Served	Service Parameters			Aggregate Service QUALITY SCORES			
			Aircraft	Seat Capacity	Frequency ¹	Service Level If No Improvement	Service Level Warranted	Service Level Proposed	REV/T.O.C. Ratio
1	1	Hancock, Marquette, Detroit	Jet	30	2	7.5	2.5	3.5	.983
1	2	Hancock, Marquette, Detroit	Prop	30	2	7.5	2.5	4.5	1.350
1	3	Hancock, Marquette, Detroit	Prop	20	3	7.5	2.5	4.5	.985
1	4	Hancock, Marquette, Detroit	Prop	17	4	7.5	2.5	4.5	1.041
2	1	Marquette, Escanaba, Lansing, Detroit	Prop	10	3	7.3	3.0	4.0	1.307
3	1	Hancock, Iron Mtn., Menominee, Lansing, Detroit	Prop	10	3	6.8	4.4	4.8	1.075
3	2	Hancock, Iron Mtn., Lansing, Detroit	Prop	10	2	6.8	3.8	4.8	1.176
4	1	Marquette, Escanaba, Milwaukee, Chicago	Prop	10	3	5.3	3.5	4.3	1.075
5	1	Sault Ste. Marie, Pellston, Manistee, Chicago	2 Prop	15/10	2-3	7.7	2.7	3.3	1.201
6	1	Sault Ste. Marie, Alpena, Detroit	Prop	10	3	5.0	4.0	4.0	1.149
7	1	Detroit, Jackson, Battle Creek, Benton Harbor, Chicago	2 Prop	20/15	3	2.0	⁴	1.5	1.164
8	1	Flint, Grand Rapids, Milwaukee	Prop	15	2	4.0	0.5	2.0	1.302
8	2	Flint, Grand Rapids, Milwaukee	Prop	10	4	4.0	0.5	2.0	1.718
9	1	Marquette, Hancock, Minneapolis	Prop	10	2	7.5	4.0	4.0	1.437
10	1	Ironwood, Menominee, Milwaukee, Chicago	Prop	10	2	6.0	4.5	5.5	1.136
11	1	Cleveland, Kalamazoo, Milwaukee	Prop	10	2	6.5	2.0	2.5	1.038

¹The frequencies presented are in terms of the number of weekday round trips to be provided to the individual stations within each route. In cases where a range of frequencies is indicated, several aircraft would be operated over the route with some stations served more often than others. For a more detailed look at service frequencies see Table 30 in the *Final Technical Report* (pp. 124-131).

²The numbers entered in the columns below are overall average ratings of service quality for each service option. The lowest scores represent the highest quality service. Chapter III of the *Final Technical Report* summarizes the rating system which was used to analyze present and proposed air services.

³The ratio of revenue to total operating cost indicates the potential profitability of each route. A ratio of less than 1.0, therefore, represents a route where costs exceed revenues and where some form of subsidization may be warranted.

⁴Due to problems with the way in which data were reported, it was not possible to determine the level of service which is warranted for several stations included in this route, therefore, no aggregate score is presented.

RECOMMENDATIONS

The focus of this study has been on developing a practical plan, acceptable to state and local governments, the airline industry, and regulatory bodies, that will provide the necessary framework and guidance to all parties contributing to or influencing air service in Michigan.

Typically, a transportation plan sets out, in priority order, the capital facilities to be constructed or services to be provided by a target year. This study is different in that it is involved solely with services. To correct the deficiencies noted, some combination of additional or rescheduled air services is required, either by the present carrier or by other certificated airlines or commuter operators. The variety of solutions, built around the many aircraft types, frequency, intermediate stops/connections, route structure, and carrier possibilities, is virtually endless. The end goal — eliminating present air service deficiencies — is more important than the specific means for accomplishing it. Thus, the plan cannot at this point fully identify the specific service changes or additions that ultimately need to be made to alleviate noted deficiencies.

In lieu thereof, the focus must be on the actions needed to implement improved air service. These actions are diagrammed in Figure 12 (Page 30). Four distinct work phases are identified.

- Finalizing air service needs through interaction with communities and airlines.
- Determining the willingness and ability of present certificated carriers to meet identified needs.
- Exploring the possibilities of other certificated carriers meeting identified needs (assuming that some deficiencies cannot be met by present carriers).
- Interesting qualified commuter operators in providing services which apparently cannot be met by certificated airlines.

The latter two phases represent a “fall-back” position if and when it is concluded that existing certificated carriers will not or cannot provide service which will resolve identified deficiencies. Inherent in these “process-oriented” recommendations are four principles:



- **Partnership with Local Governments.** Historically, the responsibility for obtaining improved air service has rested with local officials and the business community. Rather than leave such needs totally up to individual communities, MDSH&T should now lend support to community efforts to promote better air service where they coincide with study findings. Several requirements need to be met before full scale state assistance: (1) genuine interest and desire on the part of local governments to work in partnership with the state, (2) both state and local promotional activities based on clearly-defined goals or an agreed-to plan for specific improvements within a stated time period, (3) coordinated activities and frequent communications, (4) recognition of the possible need for economic concessions to attract or sustain new services, and (5) local leadership and initiative (state role primarily one of supporting and guiding the work of local officials, rather than assuming full leadership and responsibility).
- **Service Preferences.** Before considering other certificated carriers or commuter operators, MDSH&T should first seek to convince existing certificated carriers of the desirability for them to supplement present service by adding flights, rescheduling to include AM or PM departures, and eliminating intermediate stops and connections. MDSH&T should seek to establish a



Commuter or third level airlines supplement existing certificated air carrier services with frequent schedules and routes to connect outstate Michigan cities with Detroit and Chicago.

time-sequenced implementation plan or schedule for route additions/supplemental services for a two-to-three year period. Should there be deficiencies which existing carriers are unwilling or unable to solve, MDSH&T should then try and interest another certificated carrier in providing the necessary services. Preference should be given to carriers servicing adjacent markets. Should this not work out, MDSH&T should then seek applications from qualified commuter operators. To the maximum extent possible, individual routes should be grouped into logical "system packages."

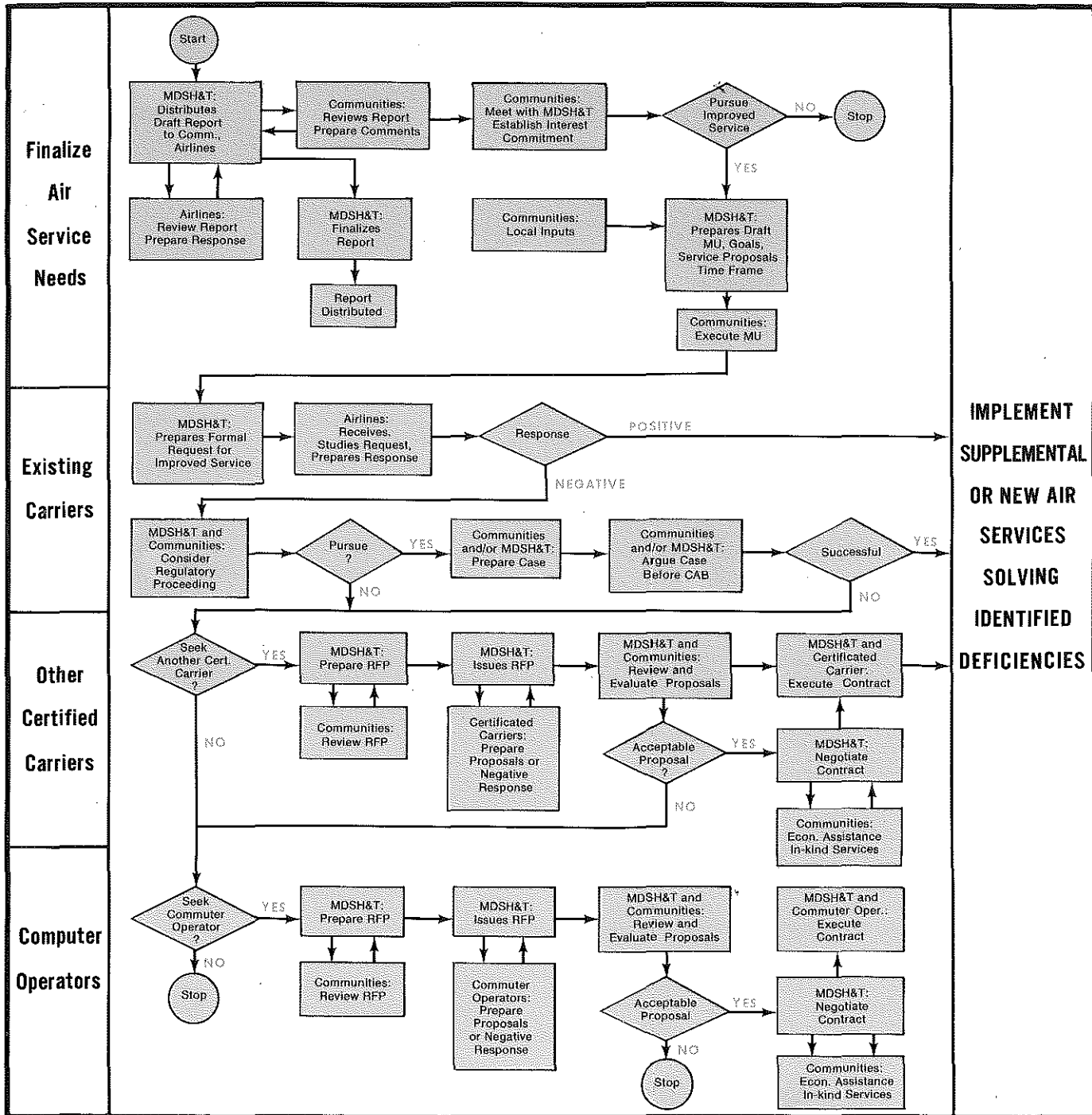
- **Voluntary versus Regulatory Actions.** To the maximum extent possible, MDSH&T should rely on persuasion rather than the regulatory process to implement service improvements.
- **Obtaining Authority.** MDSH&T should seek authority to control intrastate air service using appropriate route award criteria in choosing certificated carriers or commuter operators. Such award criteria should consider: (1) route structure from a demand and economic standpoint,

(2) aircraft choice and utilization, and (3) use of the cross-subsidy concept where the award of a more profitable route is contingent on serving a marginal route. To do this, MDSH&T should seek legislation for authority and funding to control market entry and intrastate routes and services of commuter operators. In addition, some start-up financial assistance may be essential to attract operators. MDSH&T should seek such funding.

The specific services to be instituted to resolve deficiencies can only be determined during implementation. Whether such services will indeed come into being depends upon how vigorous an effort is made by MDSH&T and the communities to obtain better air service.

A monitoring and evaluation program should also be instituted concurrent with service implementation, particularly that provided by other certificated carriers and commuter operators. MDSH&T must stay abreast of the quality of service being provided and usage thereof. Adjustments will inevitably have to be made — often, the tradeoff is one of increasing or retaining service in the face of potential but not yet realized patronage. These decisions are difficult, since operator profitability or state/local economic assistance may be at stake.

Finally, a complete reassessment of air service needs should be undertaken every three to five years. Such a reassessment should become an integral responsibility of the MDSH&T Aviation Planning Section.



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