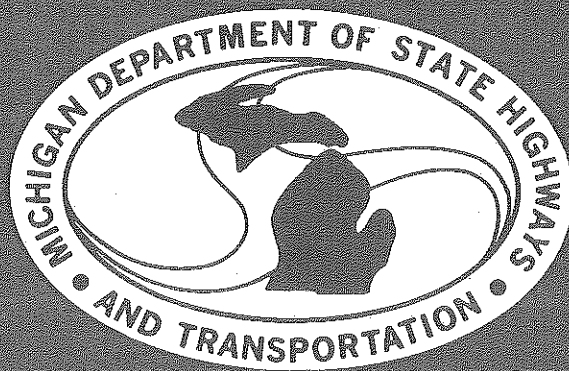
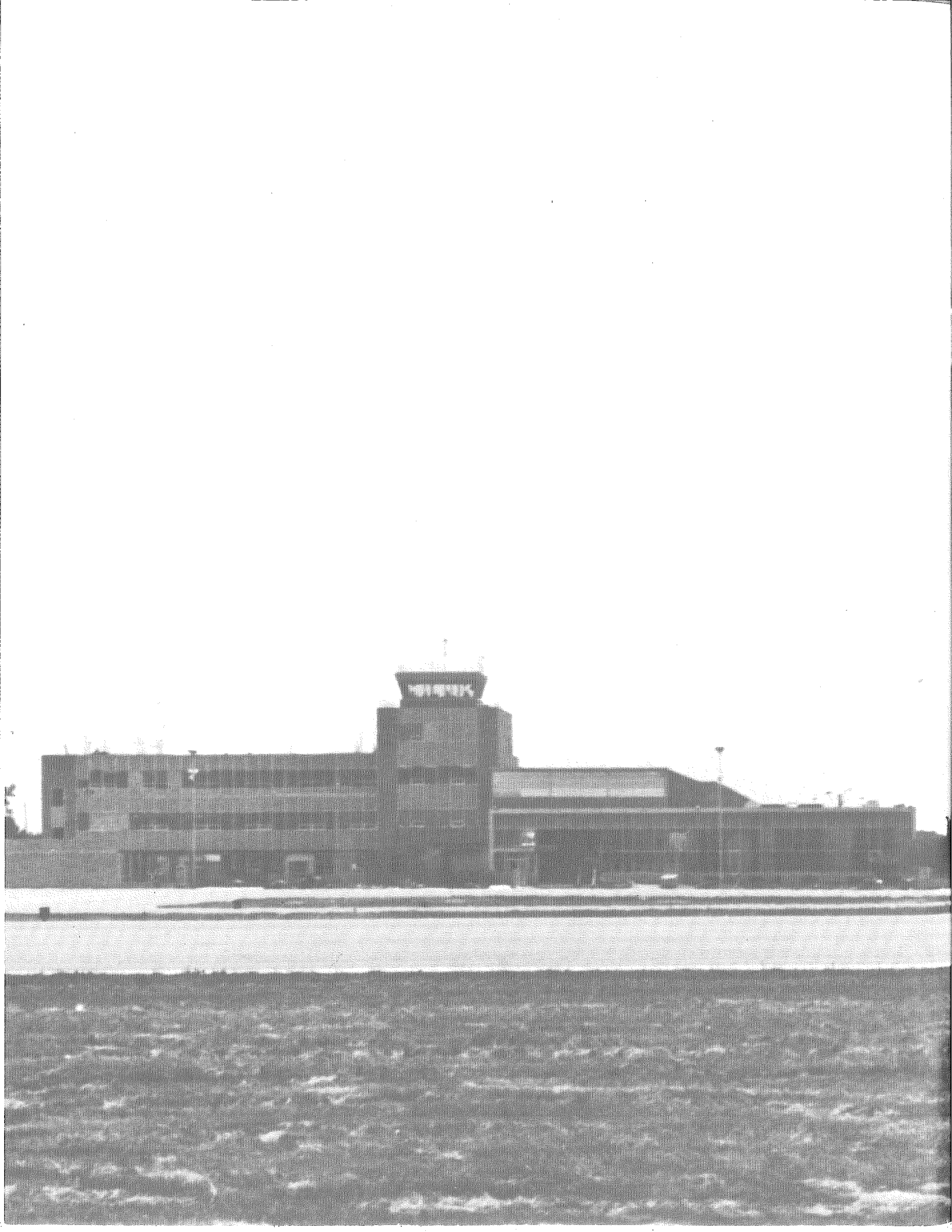


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MICHIGAN
STATE AIRPORT SYSTEM
PLAN
thru 1990





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DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION

JOHN P. WOODFORD, DIRECTOR

AERONAUTICS COMMISSION
CAPITAL CITY AIRPORT
LANSING, MICHIGAN 48906
517-373-0576

August 1974

Honorable William G. Milliken
Governor of Michigan
Lansing, Michigan

Dear Governor Milliken:

We are submitting our State Airport System Plan for the years 1975, 1980 and 1990. This plan was prepared under the auspices of a System Planning Grant from the Federal Aviation Administration and represents the needed improvements and additions to our State Aviation System which will enable us to serve the air transportation needs of the people of this state for the foreseeable future.

The aviation needs were determined by our staff and that of our prime consultant on the study, Stanford Research Institute. We feel that the results of this study will guide federal, state and local officials in establishing priorities for airport development in the State of Michigan.

During the course of our study, we had the benefit of the advice and suggestions of an Advisory Committee whose membership was composed of representatives of every geographical region of the state and every aviation interested organization as well as environmental concerns. We hope that this plan will be a continuing process of exchange of information with all levels of government as well as representatives of interested parties.

We look forward to working with these levels of government in developing the State Airport System which will best serve all citizens of our state.

Sincerely,

A handwritten signature in dark ink, appearing to read "James D. Ramsey".

James D. Ramsey, Director
MICHIGAN AERONAUTICS COMMISSION

bg/EAM



ACKNOWLEDGEMENTS

William G. Milliken, Governor

MICHIGAN DEPARTMENT OF STATE HIGHWAYS
AND TRANSPORTATION

John P. Woodford, Director

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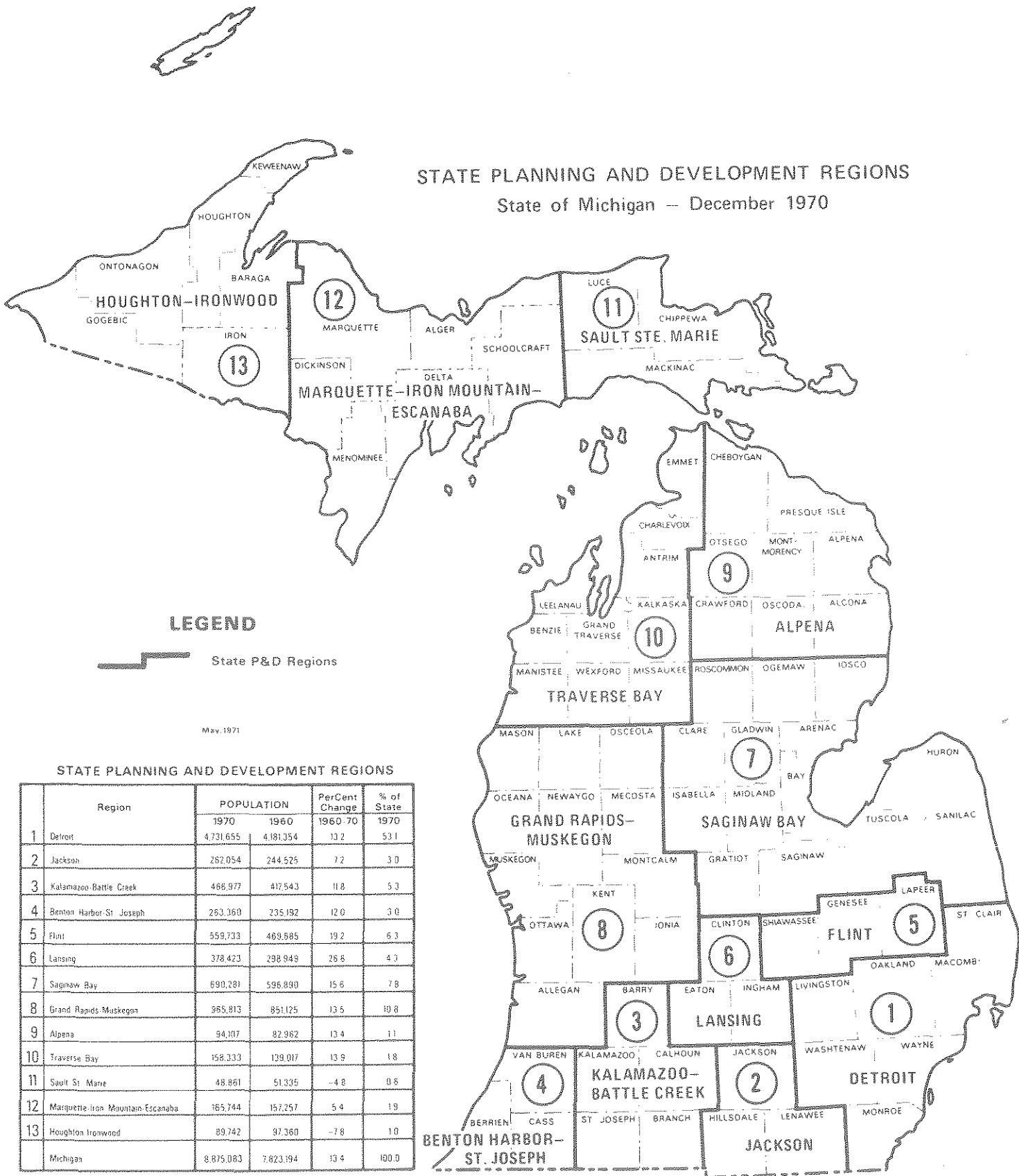
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STATE PLANNING AND DEVELOPMENT REGIONS

State of Michigan – December 1970



LEGEND

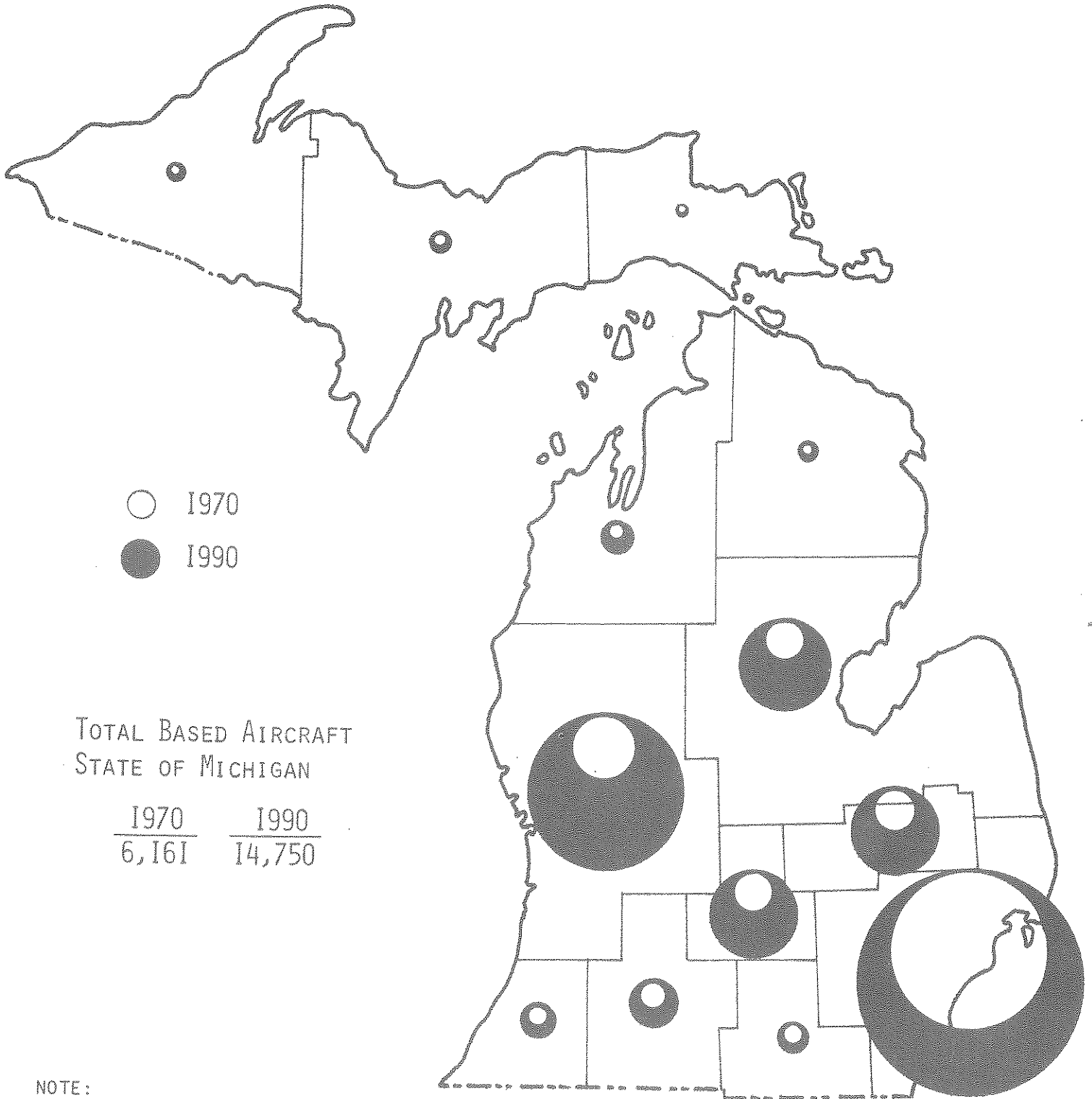
State P&D Regions

May, 1971

STATE PLANNING AND DEVELOPMENT REGIONS

Region	Region	POPULATION		PerCent Change 1960-70	% of State 1970
		1970	1960		
1	Detroit	4,731,655	4,181,354	13.2	53.1
2	Jackson	282,054	244,525	7.2	3.0
3	Kalamazoo-Battle Creek	466,977	417,543	11.8	5.3
4	Benton Harbor-St. Joseph	263,360	235,192	12.0	3.0
5	Flint	559,733	469,685	19.2	6.3
6	Lansing	378,423	298,949	26.6	4.3
7	Saginaw Bay	690,281	596,090	15.6	7.8
8	Grand Rapids-Muskegon	965,813	851,125	13.5	10.8
9	Alpena	94,107	82,962	13.4	1.1
10	Traverse Bay	158,333	129,017	13.9	1.8
11	Sault Ste. Marie	48,861	51,335	-4.8	0.6
12	Marquette-Iron Mountain-Escanaba	165,744	157,257	5.4	1.9
13	Houghton-Ironwood	89,742	97,360	-7.8	1.0
	Michigan	8,875,083	7,823,194	13.4	100.0

BASED AIRCRAFT DISTRIBUTION 1970 & 1990
 (BY STATE PLANNING AND DEVELOPMENT REGIONS)



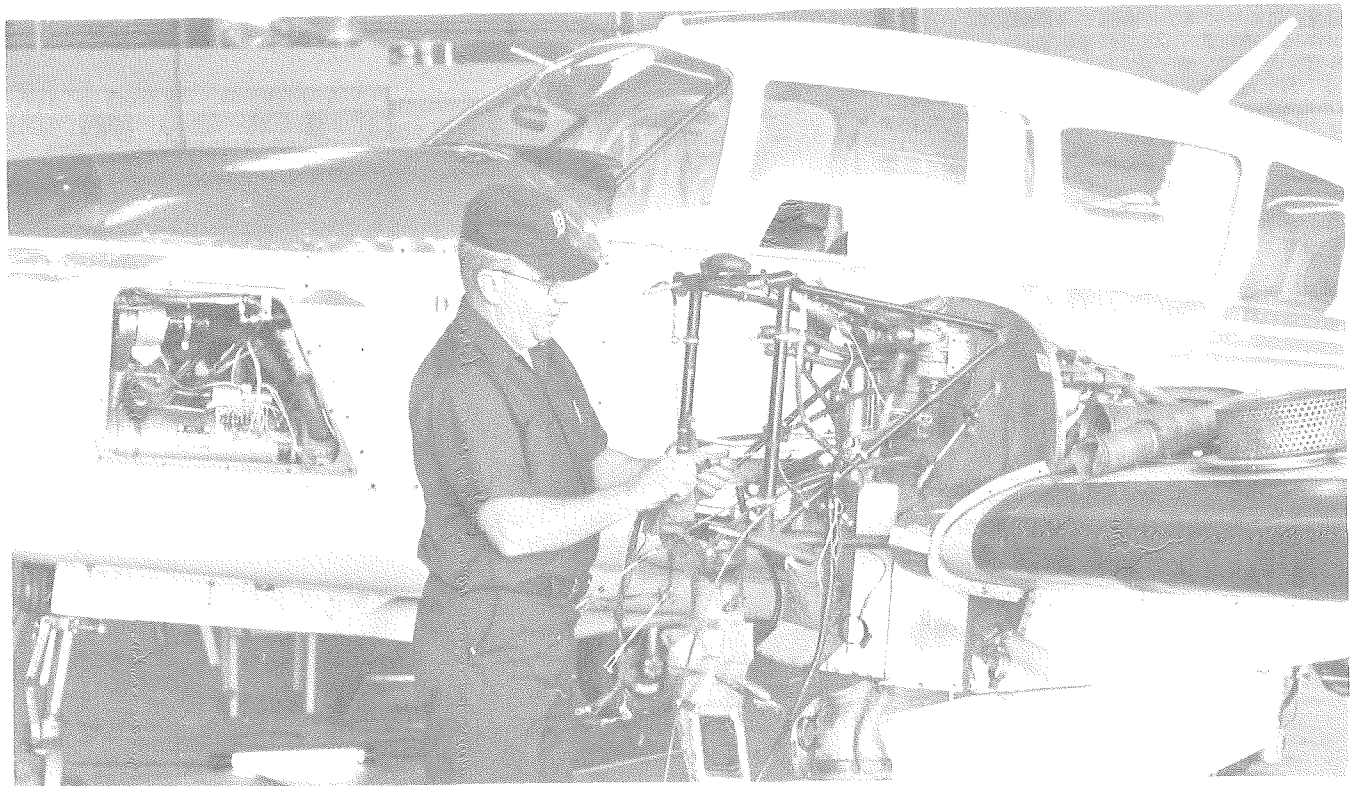
NOTE:

On May 25, 1973 the Executive Office of the State of Michigan established Region 14. Data for the region has not been prepared in this study.



The Airport Serves the Travelers' Many Needs.

Many People Are Responsible for a Safe and Efficient Aviation System.



INTRODUCTION

The Michigan Airport System Plan Study has been a two-year effort sponsored by the Michigan Aeronautics Commission and made possible by a grant from the Federal Aviation Administration. The purpose of the study is to develop a plan for the orderly and timely development of a system of airports adequate to meet the air transportation needs of Michigan.

This publication is a summary version of the final report. It has been preceded by a number of technical reports and working papers which detail the analysis employed during the course of study.

This summary report is being distributed to a wide audience at the same time that a technical report is being provided to regional and aviation planners in local, state and national organizations.

The following points are important to consider in reviewing the plan:

1. Applicable portions of the plan will be integrated into the National Airport System Plan. An airport must be included in this plan to qualify for federal participation in the funding of development.

2. The plan will provide a basis for coordination of airport planning with planning by state, regional and metropolitan agencies in such areas as transportation, land use and the environment, economic development and resource utilization.

3. The plan will provide a framework to assist in the development of individual airport master plans (and airport system plans at the regional or metropolitan level, if needed).

BACKGROUND OF STUDY

The study is the latest in a long line of aviation planning efforts, begun in 1962, by the Michigan Aeronautics Commission. In an effort to gather statistics at airports other than the 11 control tower airports operating in Michigan at that time, the Commission made a seven-day, 24-hour Fact Finder Survey. This survey measured travel patterns and the economic impact of airports and provided a numerical basis for measuring the number of aircraft operations throughout Michigan. Since that time, the Commission has compiled data on airline passengers, registered aircraft and number of aircraft operations at non-control tower airports through its mechanized traffic counter program.



Employee Installing Aircraft Traffic Counter.
Impulse Hoses Stretched Across Taxiway

During most of the 1960's, aviation increased in volume both in Michigan and nationwide. In fact, passenger levels, control tower operations and registered aircraft, the three key indicators of aviation growth, all showed huge increases. This changed with the recession of the late 1960's. There was a sharp curtailment of flights in Michigan and the rest of the United States by the scheduled airlines. For instance, the total number of daily departures at the five Mid-Michigan airports (Lansing-Capital City, Grand Rapids-Kent County, Muskegon County, Flint-Bishop and Saginaw-Tri-City), declined from 109 to 88, a decrease of almost 20 percent.

Accompanying the schedule reductions by the commercial airlines and a downturn in airline passengers at many Michigan airports, many control tower activities declined slightly. For the first time, many Michigan towers showed actual numerical decreases in both itinerant operations and local operations (take-offs and landings). Even though the number of registered aircraft continued to grow, the percentage increase was less than it had been in prior years. Nevertheless, the number of aircraft with sophisticated equipment grew, and this placed increased demands upon airport facilities, especially in larger urban areas of the state.

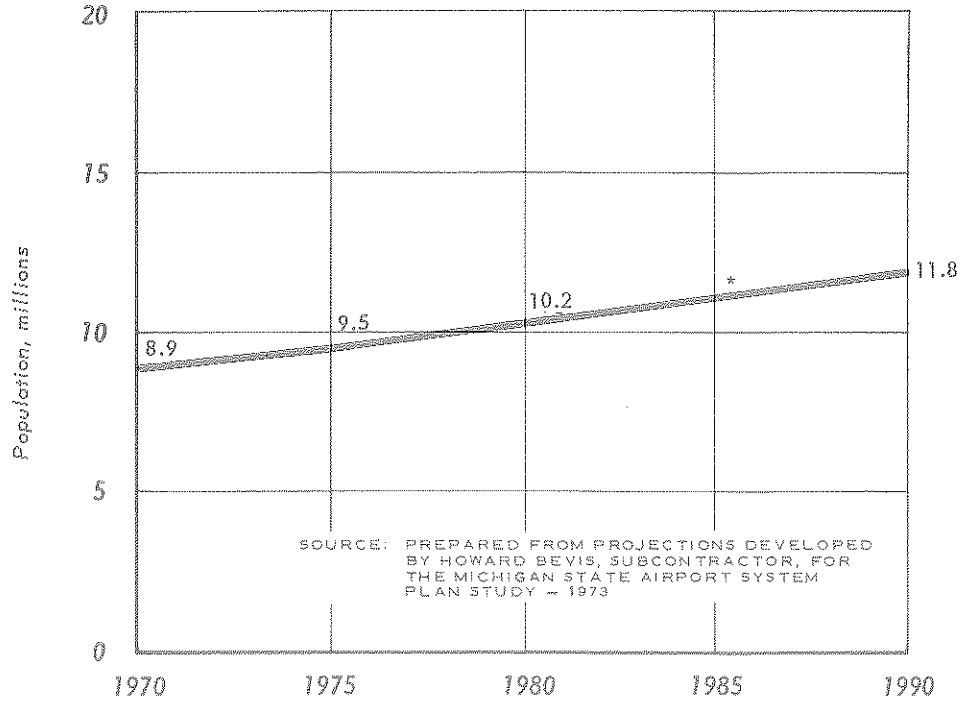
It was during this period that the Michigan Aeronautics Commission published a Five-Year State Airport Plan. This study of short-range needs indicated that substantial airport development might be undertaken to serve the then current aviation activity levels in Michigan.

The Michigan Aeronautics Commission knew that actual implementation of development recommended in the needs study depended on many factors, not the least of which was local initiative.

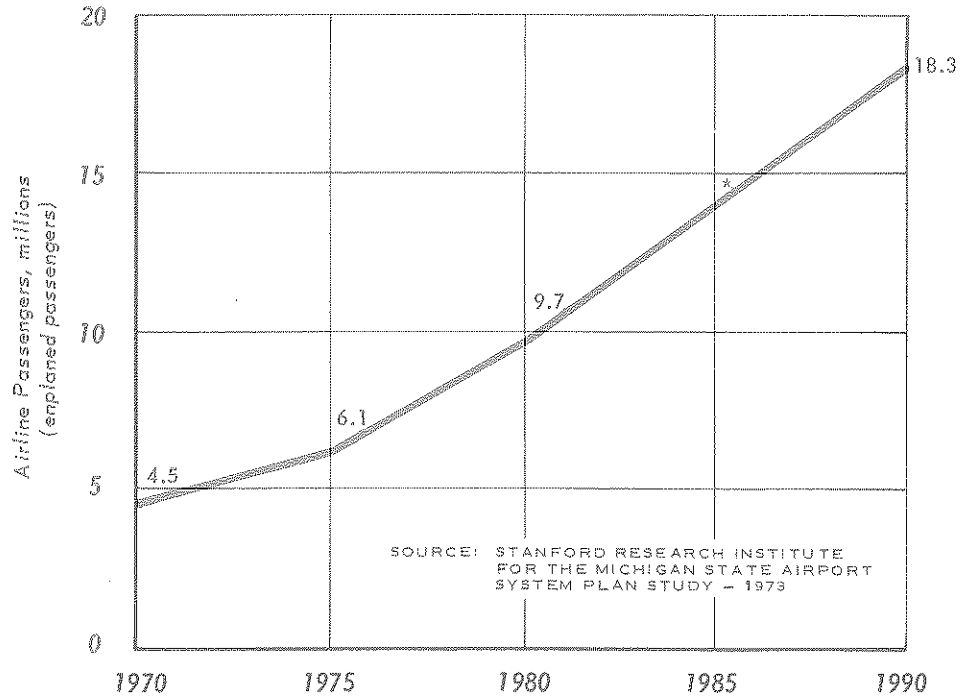
The final Five-Year study showed lack of information on which to base long-range forecasting. The Michigan Aeronautics Commission was thus convinced of the need for a long-range planning instrument. To meet this need, the Michigan Aeronautics Commission applied for, and was awarded, a System Planning Grant from the Federal Aviation Administration to develop a state airport plan that would provide adequate aviation facilities through the year 1990.

STATE OF MICHIGAN
 HISTORICAL AND FORECAST
 1970 - 1990

POPULATION



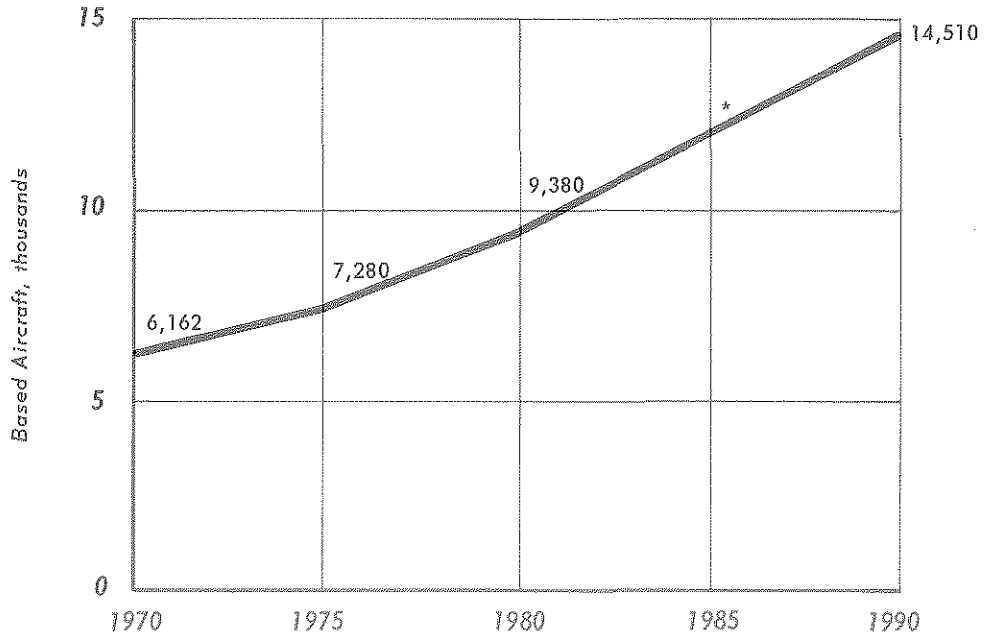
AIRLINE PASSENGERS



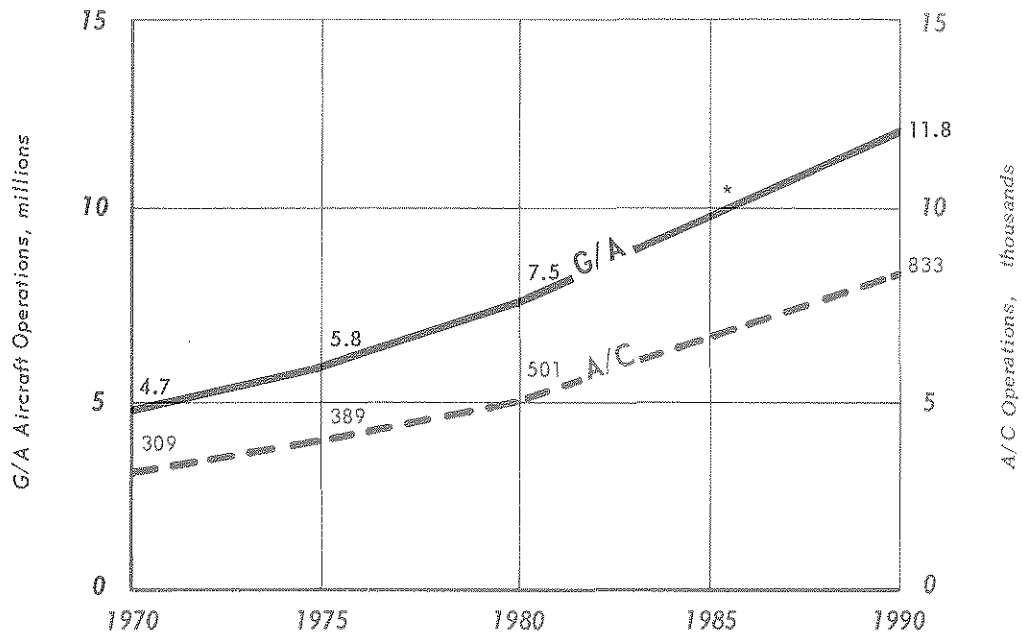
* NO AVAILABLE INFORMATION FOR 1985

STATE OF MICHIGAN
HISTORICAL AND FORECAST
1970 - 1990

BASED AIRCRAFT



GENERAL AVIATION VS. AIR CARRIER
AIRCRAFT OPERATIONS



* NO AVAILABLE INFORMATION FOR 1985

SOURCE: PREPARED FROM PROJECTIONS DEVELOPED BY THE
ENGINEERING DIVISION, BUREAU OF AERONAUTICS
MICHIGAN DEPARTMENT OF STATE HIGHWAYS
AND TRANSPORTATION - 1973

CONTEXT OF STUDY

The basic study approach has been to project future aviation activity and to investigate alternative means of accommodating this activity. The accompanying graphs display selected aeronautical projections together with study projections of Michigan population. As shown in the graphs, large increases are projected for Michigan aviation activities.

In the number of airline passengers, the increase is expected to be four-fold between 1970 and 1990. The number of based aircraft is expected to increase almost 2½ times during the same period.

An examination of the projections relating to operations shows an increase of 2½ times in both general aviation and scheduled airlines. These substantial increases in aviation are not matched by the projected 33 percent increase in population in Michigan.

Because aviation forecasts of the kind shown in the graphs provide the basis for much of this study, it must be noted that the projections were prepared and used before the emergence of the current "energy crisis." Recent events, such as the curtailment of oil imports from the Middle East, raise the possibility of national fuel shortages for an indeterminate period. There is also the prospect of substantial increases in the cost of transportation, arising from increases in fuel costs. It is judged too early to assess potential effects of such shortages on aviation activity; much depends on the methods by which available fuel supplies will be priced and allocated among competing uses. For example, demand for air travel may increase to the extent that restrictions are imposed on automobile travel. On the other hand, higher transportation costs might curtail all travel—including air travel. In light of these uncertainties, the projections of this study can be viewed in several ways:

1. The forecasts may significantly overstate future aviation activity.
2. Projected activity may occur, but at a later date than indicated (e.g., 1980 projections may not be reached until 1985 or 1990).
3. The projections may turn out to be accurate or even understated because of changes in travel patterns.



In the absence of reliable information on the pattern of future federal responses to the energy crisis, and considering that aviation is a small part of the overall energy picture, it is reasonable to assume that past patterns will tend to persist. (Extreme government responses to the present crisis are likely to be temporary.) If a change should occur, it is most likely to be in the direction of deferred growth. It must be emphasized that much of the recommended development of Michigan's airport system does not appear to be critically dependent on rapid growth in aviation activity.

The most significant effect of the present *energy crisis*, therefore, is that it highlights the need for continuing surveillance of Michigan aviation activity levels so that the State Airport System Plan can be modified to reflect changing conditions. The results of this study provide a framework for such efforts.

STUDY APPROACH

The Michigan Airport System Plan Study has been conducted as a joint effort of the Bureau of Aeronautics staff and a contractor team led by Stanford Research Institute. Guidance to the study team has been provided by an Advisory Committee representing a wide range of interests.

Study efforts were organized into five interrelated task groups, as displayed in the organizational chart on the following page. Meetings with the Advisory Committee and other interested organizations (Task Group 1) have been held at appropriate points throughout the study. Task Group 5 activities (on general aviation) and those of Task 2 and 3 (on the air carrier system) were conducted in parallel.

In addition to the forecasts of aviation activity, initial study efforts included the collection of data on existing airport facilities and surveys of freight and passenger movements.

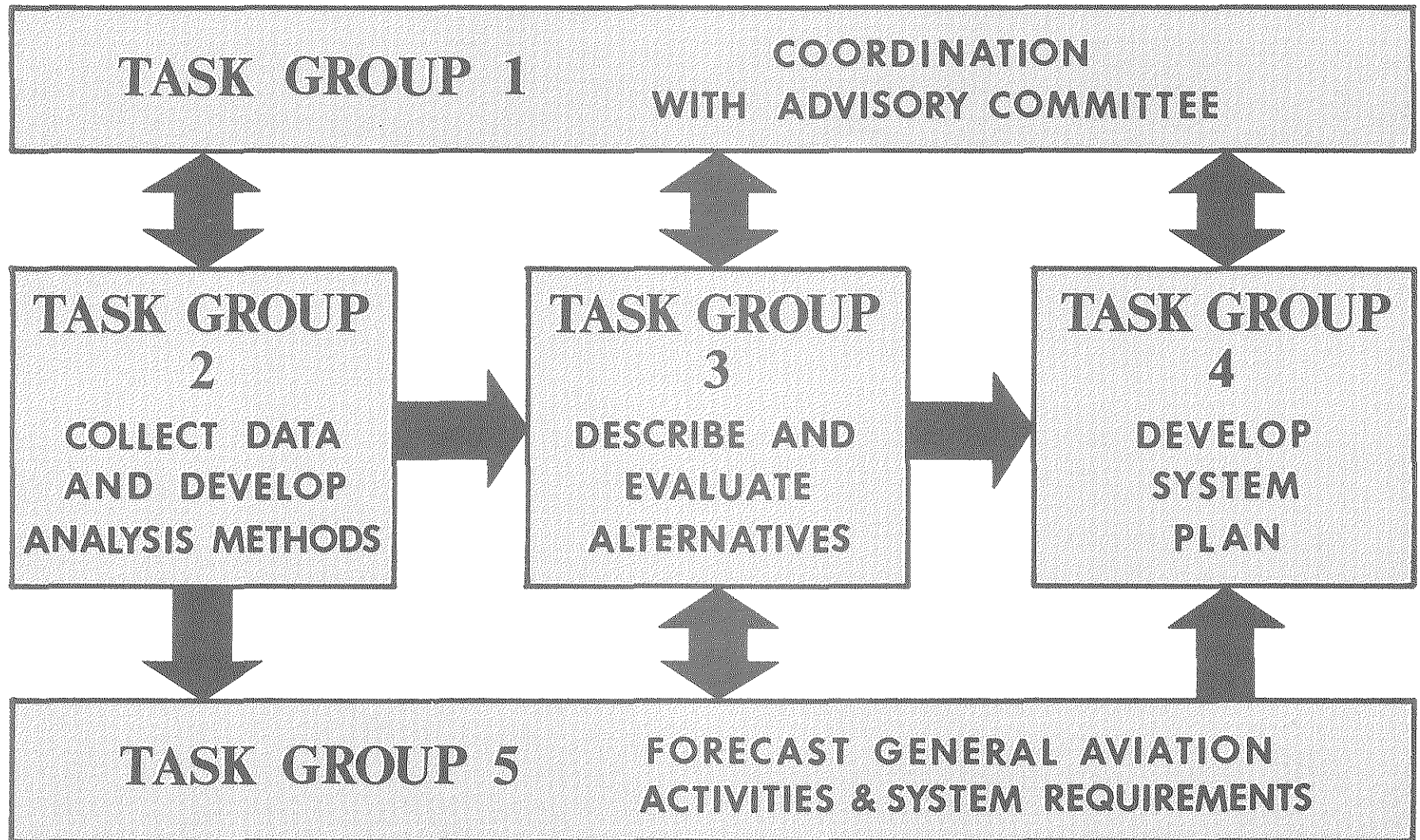
Task Group 3 focused on long-range (1990) needs and a number of airport system alternatives were examined. Included in this analysis was a study of 11 potential new airport locations and assessment of new service patterns (including possible discontinuance of service) for most airports in the existing air carrier system. It was found that most of the potential major changes would not yield sufficient benefits to justify their recommendation.

Task Group 5 placed emphasis on revising and extending a five-year (1975) general aviation plan that had been completed by the Michigan Aeronautics Commission before this study began.



TASK GROUPS

MICHIGAN AIRPORT SYSTEM PLANNING STUDY



RECOMMENDED SYSTEM PLAN

A major purpose of the State Airport System Plan is to show communities their projected level of aviation demand for future periods.

One method of illustrating this future demand is to categorize airports by a classification system based on the largest aircraft (critical aircraft) that is projected to use the facility.

To be consistent with federal planning programs, the State Airport Plan has used the classification system of airports as developed by the Federal Aviation Administration.

Table I shows the classification used for Air Carrier* and General Aviation Airports. For General Aviation Airports, the operational code indicates the critical aircraft that the airport will accommodate. For airports serving the scheduled air carriers, the operational code indicates both the critical aircraft and their trip lengths; the alpha part of the alpha-numeric indicator represents a specific critical family of air carrier aircraft for the airport and the numeric part represents the planned haul-length for that family of aircraft.

The maps on the following pages show the short, intermediate and long-range Michigan Airport System Plan. The maps should be read in conjunction with the listing of airports on the page opposite the maps.

The symbols on the maps show the existing airports that are included on the plan and also the new air carrier and general aviation airports that are projected to be included on the plan in that particular time period. The number on the maps correspond to the number on the chart which identifies the airport location and name. The codes on the chart represent the planned operational code for the short, intermediate, and long-range period.

In reviewing the maps, there are a number of factors to be considered:

1. The recommended system is shown by airport for three time periods—short-range (1975), intermediate (1980) and long-range (1990). The planning horizons for the analysis were as follows:

<i>Planning Period</i>	<i>Fiscal Years</i>	<i>Base for Aeronautical Activity Forecasts</i>
Short-Range	1973-1977	1975
Intermediate	1978-1982	1980
Long-Range	1983-1992	1990

2. The location of proposed new airports is approximate. A detailed master plan study will determine exact airport location for a new airport.

3. The air carrier system was developed principally by Stanford Research Institute. The general aviation system was developed principally by the staff of the Michigan Aeronautics Commission and then integrated with the air carrier system plan.

Recommended Air Carrier System: In 1970, which was used as the base year in this study, the air carrier system included scheduled certificated service at the following Michigan airports:

- Alpena—Phelps Collins
- Battle Creek—W. K. Kellogg Regional
- Benton Harbor—Ross Field
- Escanaba—Delta County
- Flint—Bishop
- Grand Rapids—Kent County
- Hancock—Houghton County Memorial
- Iron Mountain—Ford
- Ironwood—Gogebic County
- Jackson—Reynolds Municipal
- Kalamazoo—Municipal
- Lansing—Capital City
- Manistee—County-Blacker
- Marquette—County
- Menominee—County
- Muskegon—County
- Pellston—Emmet County
- Saginaw—Tri-City
- Sault Ste Marie—City-County
- Traverse City—Cherry Capital

*An Air Carrier Airport is an airport used by certificated scheduled airline service.

Airport Operational Role

CITY	AIRPORT NAME	SHORT RANGE	INTERMEDIATE	LONG RANGE
1. ADRIAN	LENAWEE COUNTY	BT	BT	BT
2. ALBION/HOMER	NEW *	B-I	B-II	B-III
3. ALLEGAN	PADGHAM FIELD	GU	GU	GU
4. ALMA	GRATIOT COUNTY	BT	BT	BT
5. ALMONT/IMLAY CITY	NEW *	B-II	B-II	B-II
6. ALPENA	PHELPS COLLINS	C3	C3	C3
7. ANN ARBOR	ANN ARBOR MUNICIPAL	BT	BT	BT
8. ATLANTA	ATLANTA MUNICIPAL	B-II	B-II	B-II
9. BAD AXE	HURON CO. MEMORIAL	GU	GU	BT
10. BALDWIN	BALDWIN MUNICIPAL	GU	GU	GU
11. BARAGA	CARLSON	B-I	B-I	B-II
12. BATTLE CREEK	W.K. KELLOGG REGIONAL	BT	BT	BT
13. BATTLE CREEK/KALAMAZOO	NEW REGIONAL	--	B3	B3
14. BAY CITY	JAMES CLEMENTS	GU	GU	GU
15. BEAVER ISLAND	BEAVER ISLAND	B-II	B-II	B-II
16. BELLAIRE	ANTRIM COUNTY	BT	BT	BT
17. BELLEVUE	NEW	--	B-I	B-II
18. BENTON HARBOR	ROSS FIELD	C3	C3	B3
19. BERRIEN SPRINGS	ANDREWS UNIVERSITY	B-I	B-I	B-II
20. BIG RAPIDS/REED CITY	NEW *	GU	BT	BT
21. BLISSFIELD	NEW *	--	B-II	B-II
22. BOIS BLANC ISLAND	BOIS BLANC	B-I	B-I	B-II
23. BOYNE CITY	BOYNE CITY MUNICIPAL	B-II	B-II	B-II
24. BRIGHTON	NEW *	B-II	GU	GU
25. BRUCE'S CROSSING/EWEN	NEW	B-I	B-I	B-I
26. CADILLAC	WEXFORD COUNTY	BT	BT	BT
27. CARO	CARO MUNICIPAL	B-II	GU	GU
28. CARSON CITY	NEW	B-I	B-I	B-II
29. CASS CITY	NEW	--	B-I	B-II
30. CHARLEVOIX	CHARLEVOIX	BT	BT	BT
31. CHARLOTTE	FITCH H. BEACH	GU	GU	BT
32. CHEBOYGAN	CHEBOYGAN	B-II	GU	BT
33. CHELSEA	NEW	B-II	B-II	B-II
34. CHESANING/ST. CHARLES	NEW *	GU	GU	BT
35. CLARE	CLARE MUNICIPAL	GU	GU	GU
36. COLDWATER	BRANCH CO. MEMORIAL	GU	GU	BT
37. COLON	NEW	B-I	B-I	B-II
38. COOPERSVILLE	NEW *	B-I	B-II	GU
39. CROSSWELL	NEW *	B-II	B-II	GU
40. CRYSTAL FALLS	IRON COUNTY	GU	GU	GU
41. DETROIT	DETROIT CITY	GT	GT	GT
42. DETROIT	GROSSE ILE MUNICIPAL	BT	BT	BT
43. DETROIT	DETROIT METROPOLITAN	A1	A1	A1
44. DETROIT	DETROIT - WILLOW RUN	GT	GT	GT
45. DOWAGIAC	CASS CO. MEMORIAL	BT	BT	BT
46. DRUMMOND ISLAND	DRUMMOND ISLAND	B-II	B-II	GU
47. DURAND	NEW	--	B-II	GU
48. EAST JORDAN	EAST JORDAN	B-II	B-II	B-II
49. E. LANSING/WILLIAMSTON	NEW *	GU	GU	GU
50. EAST TAWAS	IOSCO COUNTY	GU	BT	BT
51. EMMETT/YALE	NEW *	B-II	B-II	GU
52. EMPIRE	EMPIRE	B-I	B-I	B-I
53. ENGADINE/NAUBINWAY	NEW *	B-I	B-I	B-I
54. ESCANABA	DELTA COUNTY	B3	B3	B3
55. EVART	EVART MUNICIPAL	B-I	B-I	B-I
56. FARMINGTON	NEW	GU	BT	BT
57. FLINT	BISHOP	B3	B2	B2
58. FLINT/CLIO	NEW *	GU	GU	GU
59. FLINT/DAVISON	NEW *	GU	GU	GU
60. FRANKENMUTH/VASSER/ MILLINGTON	NEW *	B-II	B-II	B-II
61. FRANKFORT	FRANKFORT CITY - CO.	GU	--	--
62. FRANKFORT	NEW	--	GU	BT
63. FRASER	MC KINLEY	GU	GU	GU
64. FREMONT	FREMONT MUNICIPAL	BT	BT	BT
65. GAYLORD	OTSEGO COUNTY	BT	BT	BT
66. GLADWIN	GLADWIN MUNICIPAL	BT	BT	BT
67. GRAND HAVEN	GRAND HAVEN MEMORIAL	GU	GU	GU
68. GRAND LEDGE	NEW *	B-II	GU	GU
69. GRAND MARAIS	GRAND MARAIS	B-I	B-I	B-I
70. GRAND RAPIDS	KENT COUNTY	B2	B2	B2/A3
71. GRAND RAPIDS WEST	NEW *	GU	GU	GU
72. GRAYLING	GRAYLING AREA AIRPORT	GU	BT	BT
73. GREENVILLE	GREENVILLE	GU	BT	BT
74. HANCOCK	HOUGHTON CO. MEMORIAL	C3	C3	B3
75. HARBOR BEACH/WHITE ROCK	NEW	--	B-I	B-I
76. HARBOR SPRINGS	HARBOR SPRINGS CITY	GU	GU	GU
77. HARRISON	CLARE COUNTY	B-I	B-I	B-I
78. HARRISVILLE	HARRISVILLE	B-I	B-I	B-II
79. HART/SHELBY	HART SHELBY	B-II	GU	GU
80. HASTINGS	HASTINGS MUNICIPAL	GU	GU	BT
81. HERMANSVILLE	NEW	--	B-I	B-I
82. HESSEL	HESSEL	B-I	B-I	B-I
83. HILLSDALE	HILLSDALE MUNICIPAL	BT	BT	BT
84. HOLLAND	TULIP CITY	GU	BT	BT
85. HOLLY	NEW	B-II	GU	GU
86. HOLT/MASON	NEW *	GU	GU	GU
87. HOUGHTON LAKE	ROSCOMMON COUNTY	GU	GU	BT
88. HOWARD CITY	NEW	B-I	B-I	B-I
89. HOWELL	LIVINGSTON COUNTY	GU	BT	BT

CITY	AIRPORT NAME	S.R.	I.R.	L.R.
90. HUDSON/MORENCI	NEW *	B-I	B-II	B-III
91. INDIAN RIVER	CALVIN CAMPBELL	B-I	B-I	B-I
92. INTERLOCHEN	GREEN LAKE	B-I	B-I	B-I
93. IONIA	IONIA COUNTY	GU	BT	BT
94. IRON MOUNTAIN	FORD	B3	B3	B3
95. IRON RIVER	NEW *	B-I	B-II	B-II
96. IRONWOOD	GOGEBIC COUNTY	C3	C3	C3
97. JACKSON	REYNOLDS MUNICIPAL	C3	C3	C3
98. KALEVA	NEW	B-I	B-I	B-I
99. KALKASKA	KALKASKA	B-I	B-I	B-II
100. KALAMAZOO	KALAMAZOO MUNICIPAL	B3	BT	BT
101. LAKE CITY	NEW *	B-II	B-II	B-II
102. LAKE ODESSA	NEW	--	B-I	B-II
103. LAKEVIEW	LAKEVIEW	B-II	B-II	B-II
104. LAMBERTVILLE	WAGON WHEEL	GU	GU	GU
105. LANSING	CAPITAL CITY	B3	B3	B2
106. LAPEER	DUPONT LAPEER	GU	GU	BT
107. LITCHFIELD	NEW	--	B-I	B-II
108. LOWELL	LOWELL CITY	B-II	GU	GU
109. LUDINGTON	MASON COUNTY	GU	BT	BT
110. MACKINAC ISLAND	MACKINAC ISLAND	B-II	B-II	B-II
111. MANCELONA	MANCELONA MUNICIPAL	B-I	B-I	B-II
112. MANISTEE	MANISTEE - CO. BLACKER	C3	C3	C3
113. MANISTIQUE	SCHOOLCRAFT COUNTY	BT	BT	BT
114. MARENISCO	NEW	--	B-I	B-I
115. MARINE CITY	MARINE CITY	B-II	GU	GU
116. MARLETTE	NEW *	GU	BT	BT
117. MARQUETTE	MARQUETTE COUNTY	B3	B3	B3
118. MARSHALL	BROOKS FIELD	GU	BT	BT
119. MECOSTA	NEW *	B-I	B-I	B-II
120. MEMONINEE	MEMONINEE COUNTY	C3	C3	B3
121. MERRILL/HEMLOCK	NEW	B-I	B-II	B-II
122. MESICK	NEW	B-I	B-I	B-I
123. MICHIGAMME	NEW	--	B-I	B-I
124. MIDLAND	JACK BARSTOW	GU	GU	GU
125. MILAN	MILAN	B-II	GU	GU
126. MILFORD/NEW HUDSON	NEW *	GU	GU	GU
127. MIO	MIO	B-I	B-I	B-I
128. MONROE	MONROE MUNICIPAL	GU	BT	BT
129. MT. CLEMENS	NEW	BT	BT	BT
130. MT. PLEASANT	MT. PLEASANT MUNICIPAL	BT	BT	BT
131. MUNISING	HANLEY FIELD	B-II	B-II	GU
132. MUSKEGON	MUSKEGON COUNTY	B3	B3	B3
133. NAPOLEON/BROOKLYN	NEW *	B-II	GU	GU
134. NEEBISH ISLAND	NEW	B-I	B-I	B-I
135. NEWBERRY	LUCE COUNTY	B-II	GU	BT
136. NILES	JERRY TYLER MEMORIAL	GU	GU	GU
137. NORTHPORT	WOOLSEY MEMORIAL	B-I	B-I	B-I
138. OMER	NEW	--	B-II	GU
139. ONAWAY	ONAWAY	B-I	B-I	B-I
140. ONTONAGON	ONTONAGON COUNTY	B-II	GU	BT
141. OWOSSO	NEW *	GU	BT	BT
142. PARADISE	NEW	B-I	B-I	B-I
143. PAW PAW	NEW	B-II	GU	GU
144. PELLSTON	EMMET COUNTY	B3	B3	B3
145. PINCONNING	NEW *	--	B-II	B-II
146. PLAINWELL	OTSEGO PLAINWELL	B-II	B-II	B-II
147. PLYMOUTH	METTAL	B-II	B-II	B-II
148. PONTIAC	OAKLAND - PONTIAC	GT	GT	GT
149. PONTIAC	OAKLAND ORION	GU	GU	GU
150. PORT AUSTIN	NEW	B-I	B-I	B-I
151. PORT HURON	ST. CLAIR COUNTY	BT	BT	BT
152. RALPH	RALPH	B-I	B-I	B-I
153. ROCK	BONNIE FIELD	B-I	B-I	B-I
154. ROGERS CITY	PRESQUE ISLE COUNTY	B-II	GU	BT
155. ROMEO	ROMEO	GU	GU	GU
156. ROSCOMMON	CONSERVATION	B-I	GU	GU
157. SAGINAW	HARRY W. BROWNE	GU	GU	GU
158. SAGINAW	TRI CITY	B2	B2	B2
159. SALEM	SALEM	GU	GU	GU
160. SANDUSKY	SANDUSKY CITY	B-II	B-II	GU
161. SEBEWAING	SEBEWAING AIRPORT	B-II	B-II	B-II
162. SENEY	NEW	--	B-I	B-I
163. SOUTH BRANCH	TIMBERS SKY RANCH	B-I	B-I	B-I
164. SOUTH HAVEN	SO. HAVEN MUNICIPAL	GU	BT	BT
165. SPARTA	SPARTA	GU	GU	GU
166. S.S. MARIE	MUNICIPAL/NEW	C3	C3	C3
167. ST. HELEN	ST. HELEN	B-I	B-I	B-I
168. ST. IGNACE	MACKINAC COUNTY	B-II	GU	GU
169. ST. JOHNS	NEW *	B-II	B-II	GU
170. STANDISH	STANDISH CITY	B-I	--	--
171. STOCKBRIDGE/LESLIE	NEW	B-I	B-II	B-II
172. STURGIS	KIRSCH MUNICIPAL	BT	BT	BT
173. SUGAR ISLAND	NEW	B-I	B-I	B-I
174. TECUMSEH	TECUMSEH/PRODUCTS	GU	GU	GU
175. THREE OAKS	OSELKA	B-I	B-I	B-II
176. THREE RIVERS	HAINES	GU	GU	BT
177. TRAVERSE CITY	CHERRY CAPITAL	B3	B3	B3
178. TROY	GRAND PRIX	GU	GU	GU
179. UNION CITY	NEW	--	B-I	B-I
180. UTICA	BERZ MACOMB	GU	GU	GU
181. WATERVLIET	WATERVLIET	B-I	B-I	B-I
182. WAYLAND	WAYLAND MUNICIPAL	B-II	GU	GU
183. WEST BRANCH	W. BRANCH COMMUNITY	GU	GU	BT
184. WHITE CLOUD	WHITE CLOUD	B-I	B-I	B-I
185. WHITEHALL/MONTAGUE	NEW *	B-II	GU	GU
186. SITE 107	NEW	--	--	A2

* SITE SELECTION STUDY MIGHT SHOW THAT AN EXISTING AIRPORT IS ADEQUATE FOR EXPANSION

MICHIGAN PROPOSED AIRPORT SYSTEM PLAN

INTERMEDIATE RANGE TIME PERIOD

1978-1982



Table I
 Airport Operational Roles
 CLASSIFICATION OF AIRPORTS SERVING AIR CARRIERS

Type of Activity			
<u>Code for Operational Role*</u>	<u>Length of Longest Flight</u>	<u>Typical Length of Longest Runway</u> (Uncorrected, in feet)**	<u>Examples of Largest Aircraft Accommodated</u>
A1	Over 1500 miles	11,500'	} Large Jet Aircraft (i.e., B-747, B-707 and DC-8)
A2	500 to 1500 miles	9,500'	
A3	less than 500 miles	8,000'	
B2	500 to 1500 miles	8,000'	} 100-Passenger Jet (i.e., DC-9, B-727)
B3	less than 500 miles	6,000'	
C3	less than 500 miles	5,000'	} 50-Passenger Turbo-prop (i.e., CV-580) Small Aircraft (i.e., 15-passenger)
C5	less than 500 miles	5,000' (corrected)	

Airport Operational Roles
 CLASSIFICATION OF AIRPORTS SERVING GENERAL AVIATION

<u>Code for Operational Role</u>	<u>Examples of Largest Aircraft Accommodated</u>	<u>Level of Activity</u>	<u>Percentage of GA Fleet Accommodated</u>	<u>Typical Length of Longest Runway</u>
BI-(Basic Utility) Stage I	Cessna-172 Piper Tri-pacer, etc.	Less than 10 aircraft based at airport	75%	2700'
BII-(Basic Utility) Stage II	Cessna-310 Beech Baron, etc.	More than 10 based aircraft. Less than 20,000 operations per year	95%	3200'
GU-(General Utility)	Beech King & Queen Airs, Piper Navajo, etc.	More than 20,000 operations per year or 500 operations per year by general utility type aircraft	98%	3800'
BT-(Basic Transport)	Lear Jet, Sabliner Cessna Citation, etc.	500 or more operations per year by business jet aircraft	99+%	5000'
GT-(General Transport)	Convair 580, Boeing 727, DC-9, etc.	Substantial operations by very large general aviation aircraft (over 60,000 pounds gross weight)	100%	5000'+

*Includes those roles applicable only to Michigan.

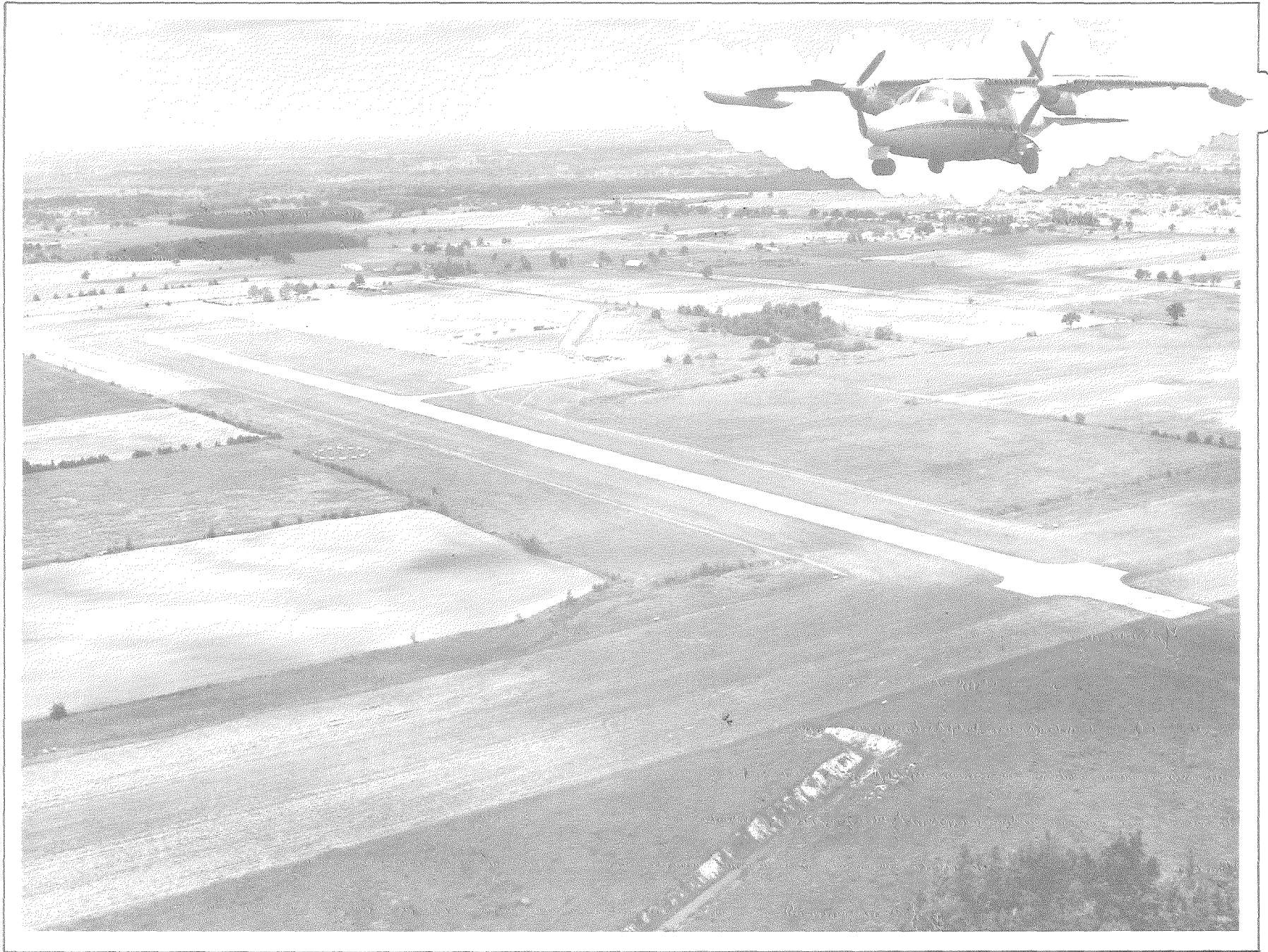
**Selected values are based primarily on Michigan experience; namely, corrected lengths of 6,500 feet for B3 role and 5,500 feet for C3 role.



TYPICAL B-I AIRPORT (Basic Utility—Stage I)
AIRCRAFT SHOWN, *as being typical for this size airport, IS A CESSNA 172*



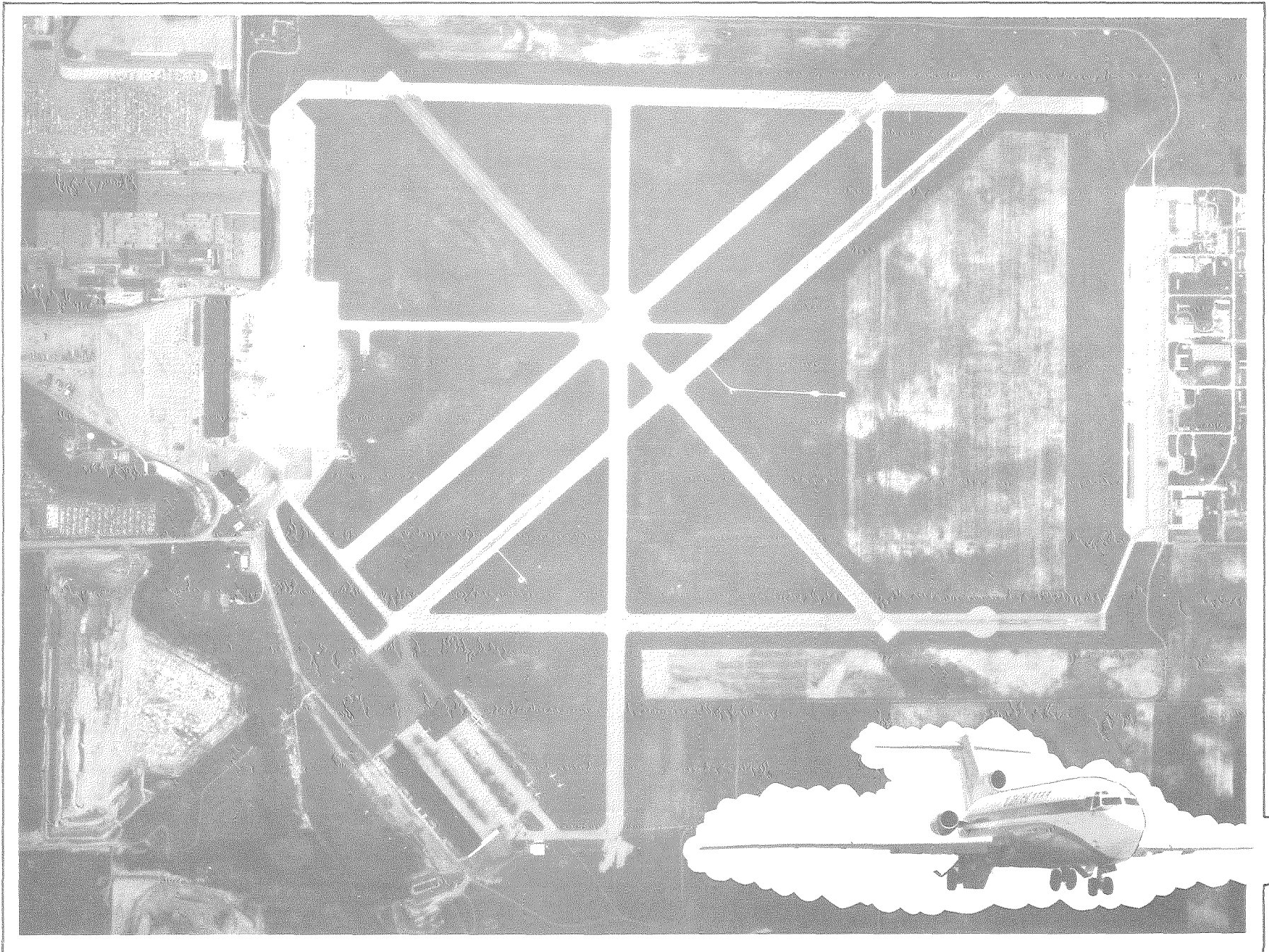
TYPICAL B-II AIRPORT (Basic Utility—Stage II)
AIRCRAFT SHOWN, *as being typical for this size airport,* IS A BEECH BARON



TYPICAL G.U. AIRPORT (General Utility)
AIRCRAFT SHOWN, *as being typical for this size airport,* IS A MITSUBISHI MU-2



TYPICAL B.T. AIRPORT (Basic Transport)
AIRCRAFT SHOWN, *as being typical for this size airport,* IS A LEAR JET



TYPICAL G.T. AIRPORT (General Transport)
AIRCRAFT SHOWN, *as being typical for this size airport, IS A BOEING 727*

After reviewing several alternative air carrier systems, it was the finding of Stanford Research Institute that a general concept of a few regional airports throughout the State of Michigan could not be supported. Instead, it was determined that the recommended air carrier system should remain similar to that which prevailed in 1970. The exceptions are as follows:

1. Site 107—A new short-haul air carrier airport is recommended in the general area of northern Oakland and Macomb Counties.

2. Battle Creek/Kalamazoo—A general location of a regional airport to serve the two communities of Battle Creek and Kalamazoo is recommended as the best alternative to provide air carrier service to the two cities. Under this alternative, the two existing airports would continue to serve general aviation activity.

3. Sault Ste. Marie—A new air carrier airport location for Sault Ste. Marie is recommended for the 1990 system. Because of its relative geographical isolation from other Michigan airports, the traveler benefits found in the analysis justified the extended construction cost of a new airport.

In addition, at a few locations (Jackson, Manistee, Escanaba-Iron Mountain-Menominee) the State Airport System Plan recommends either a change in aircraft equipment or routing structure. The specifics of these recommendations are as follows:

1. Jackson—Economic improvements can be made to Reynolds Airport in Jackson to accommodate scheduled commercial air service, so long as large expenditures for new runways are not required. In addition, analysis indicates that 1990 air service in Jackson will closely resemble the service of 1970 if this service is provided with aircraft of 50 seats or more.

2. Manistee—To improve frequency of air carrier service at Manistee and to avoid costly airport development, it is recommended that service at Manistee be provided by smaller aircraft (10-20 seats). With the smaller aircraft, flights per day would increase from one to three and the runway necessary to accommodate these smaller aircraft would be of less width and length than the ones required for larger commercial aircraft.

3. Escanaba-Iron Mountain-Menominee—It is recommended that air carrier service continue at all three airports through 1990, but that air traffic from Iron Mountain and Escanaba be routed through Menominee, thus justifying frequent nonstop service from Menominee to Detroit and Chicago.



Recommended General Aviation System: The recommended 1990 system for general aviation includes 162 airports, of which 59 are new. In general, there were two basic measures as to whether a particular airport was included in the 1990 general aviation system phase of the study. These were:

1. To provide aviation capacity sufficient to accommodate forecast levels of general aviation activity in a given geographic area.

2. To provide a reasonable geographic distribution of airports throughout the state.

The breakdown of the proposed airport system for each time period in the plan is shown in the table on the following page. The airports listed are:

- Those which are on both the State Airport System Plan and those which can be assumed qualify for inclusion on the National Airport System Plan of the Federal Aviation Administration.
- Those which serve both general aviation and air carrier.
- Those airports which serve general aviation only.
- Those which serve general aviation only and are on the State Airport System Plan, but which it is assumed will not qualify for the National Airport System Plan.

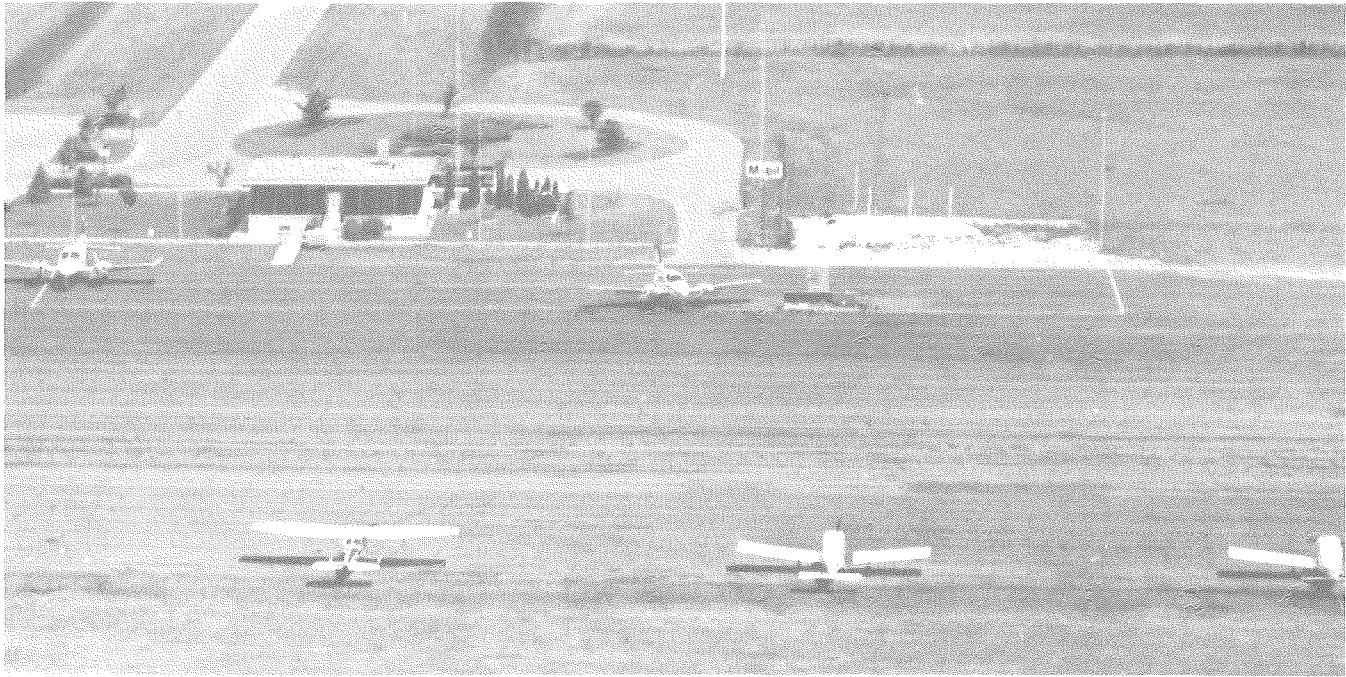


Table II
 NUMBER OF AIRPORTS IN PROPOSED STATE SYSTEM

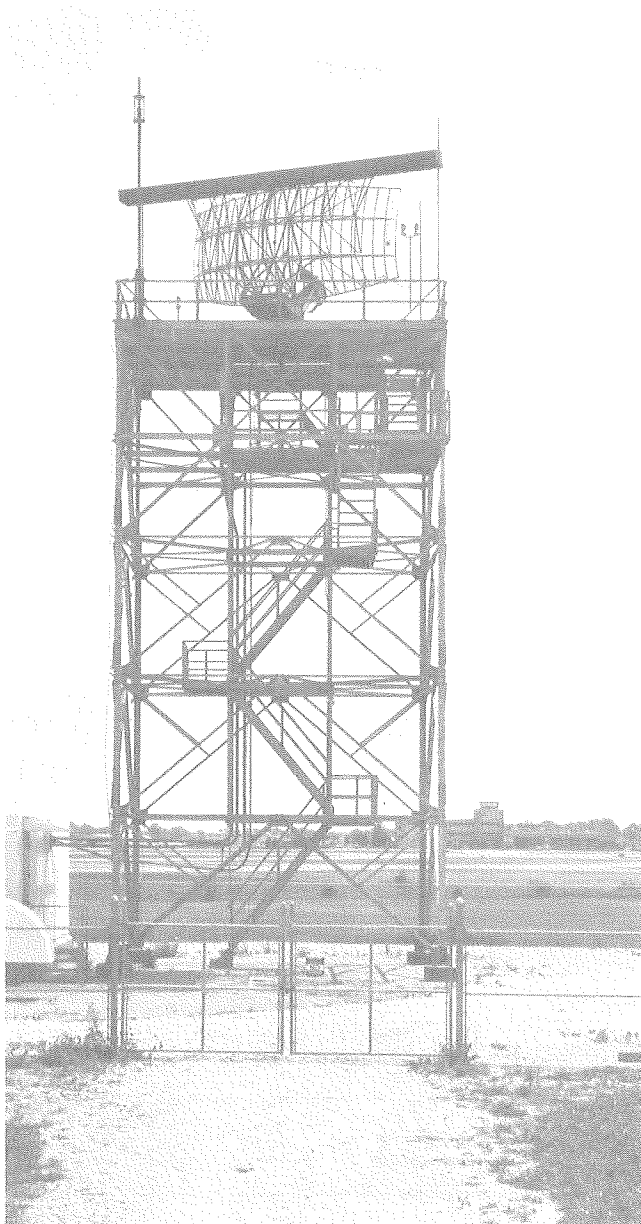
	<u>Short Range</u> <u>(1973-1977)</u>	<u>Intermediate</u> <u>Range</u> <u>(1978-1982)</u>	<u>Long Range</u> <u>(1983-1992)</u>
A. Airports in both State and National System Plans			
1. Airports serving air carriers and general aviation			
Existing ^o	20	18	20
New [†]	0	2	1
Subtotal	<u>20</u>	<u>20</u>	<u>21</u>
2. Airports serving general aviation only			
Existing ^o	81	113	131
New [†]	25	5	0
Subtotal	<u>106</u>	<u>118</u>	<u>131</u>
B. General Aviation Airports in State (but not National) System Plan			
Existing ^o	25	35	32
New [†]	18	10	0
Subtotal	<u>43</u>	<u>45</u>	<u>32</u>
Total Airports in State Plan	169	183	184

^oAn airport is categorized as "existing" if it was planned for the prior period. For the short-range period, the "prior period" is 1970.

[†]In some cases, a detailed site selection study might find that an existing airport location is suitable.

COST OF THE PLAN AND ESTIMATED FUNDING LEVELS

Generalized specifications were used in the study to estimate airport development requirements for each airport in the plan and to estimate system cost. The resulting cost estimates are shown in graphic form on the following page.



The estimated costs in millions of 1970 dollars of airport development are as follows:

	<i>Short-Range</i>	<i>Inter-mediate</i>	<i>Long-Range</i>	<i>Total</i>
Air Carrier/Reliever	\$294	\$123	\$139	\$556
General Aviation	79	29	21	129
Total	\$373	\$152	\$160	\$685

Available funds to finance airport development were also estimated in the study. The sources include:

- Federal Funds, through the Airport Development Aid Program (ADAP) and FAA Facility & Equipment Funds
- State Funds, through MAC revenues from a tax imposed on aviation fuel
- Local Funds, primarily through long-term borrowing

The estimates of available funds are also shown in graphic form on the following page.

The estimated funds available for airport development in millions of 1970 dollars are as follows:

	<i>Short-Range</i>	<i>Inter-mediate</i>	<i>Long-Range</i>	<i>Total</i>
Air Carrier/Reliever	\$200	\$126	\$212	\$538
General Aviation	17	18	40	75
Total	\$217	\$144	\$252	\$613

Comparisons of estimated costs and revenues are shown in graphic form on the page after the next.

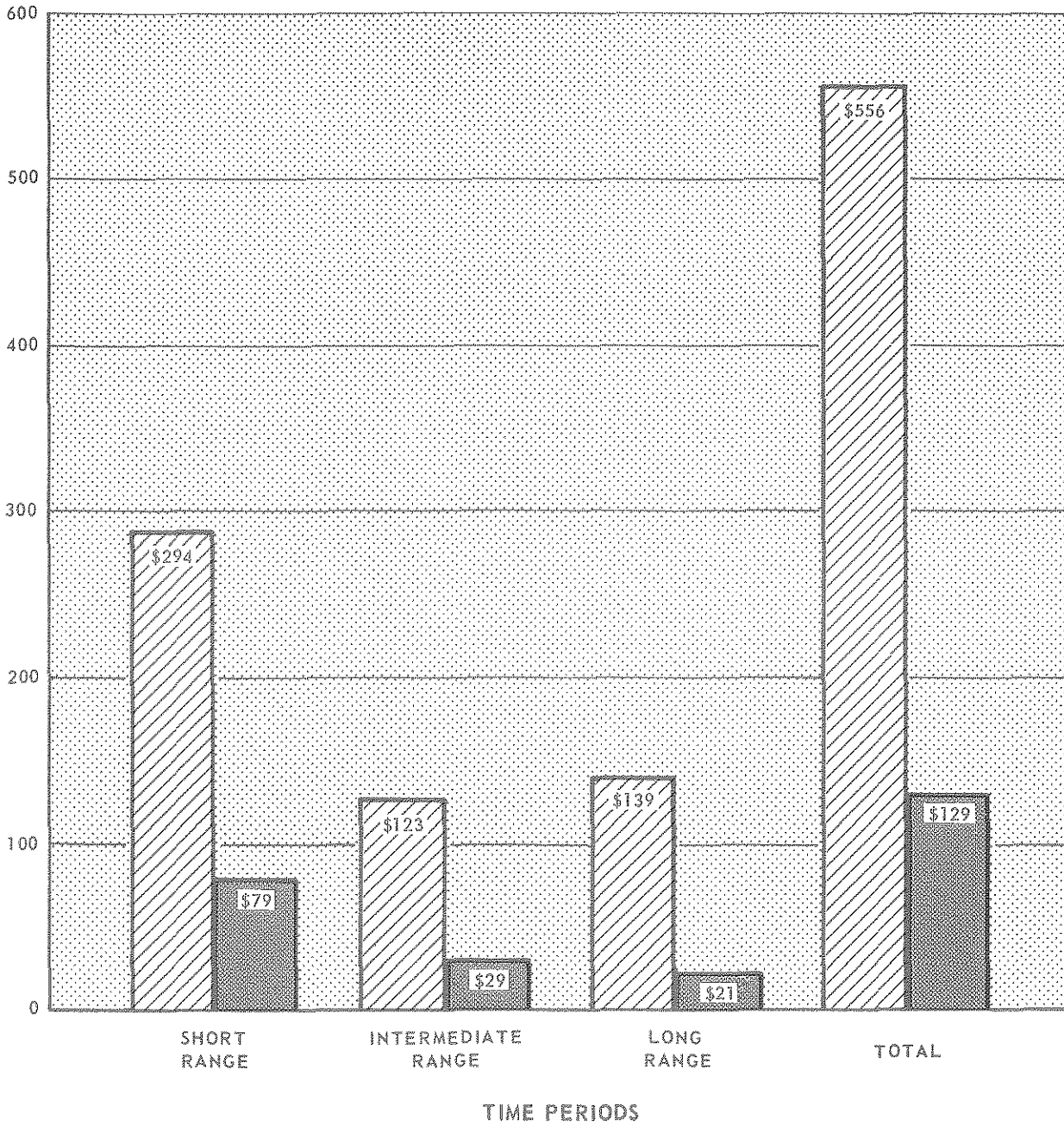
The comparisons show the following differences in millions of 1970 dollars between estimated costs and revenues:



	<i>Short-Range</i>	<i>Inter-mediate</i>	<i>Long-Range</i>	<i>Total</i>
Air Carrier/Reliever	\$ 94	\$ 3	\$ 73	— \$ 18
General Aviation	62	— 11	19	— 54
Total	— \$156	— \$ 8	\$ 92	— \$ 72

The comparisons indicate that deficits are estimated for both the air carrier system and the general aviation system, with the largest short-fall expected for airports that serve general aviation. Unless new sources of funds can be made available for airport development, substantial delays in implementing the general aviation system and some delays for the air carrier system can be expected. One potential new source of funds is the use of the Michigan Community Airport Authority Act of 1957 (Act 206), which authorizes a one-mill tax rate on state equalized valuation (S.E.V.), subject to approval by a vote of the people in the area to be encompassed by the authority.

ESTIMATED COST OF AIRPORT DEVELOPMENT

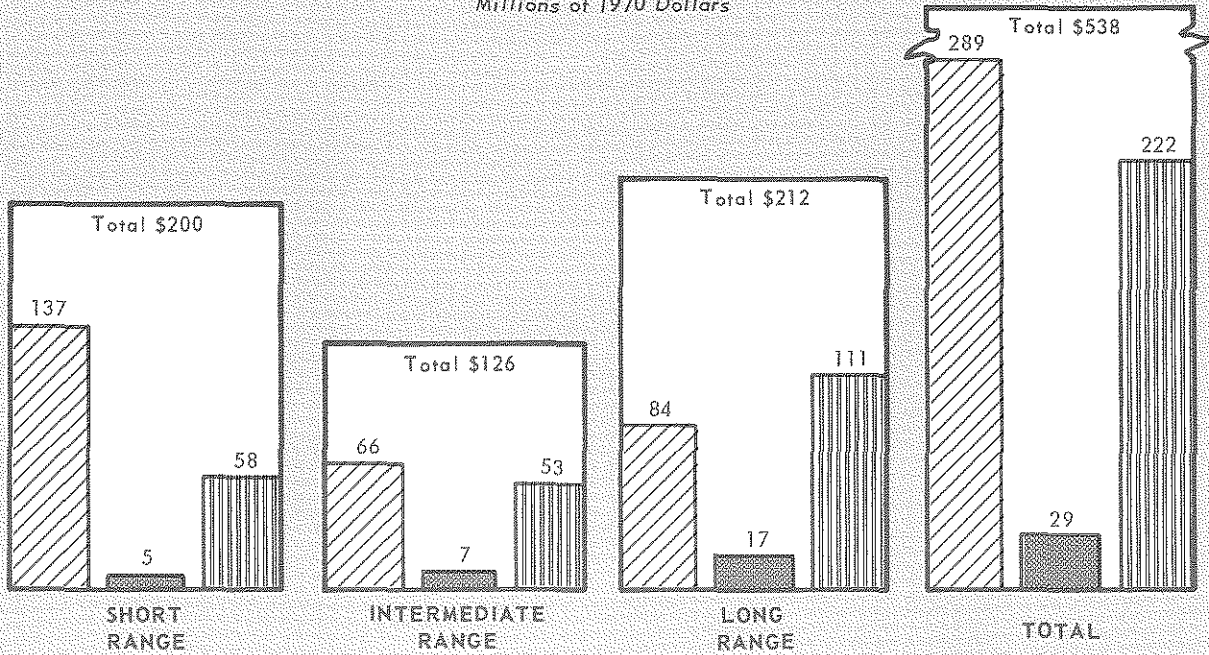
MILLIONS OF 1970 DOLLARS



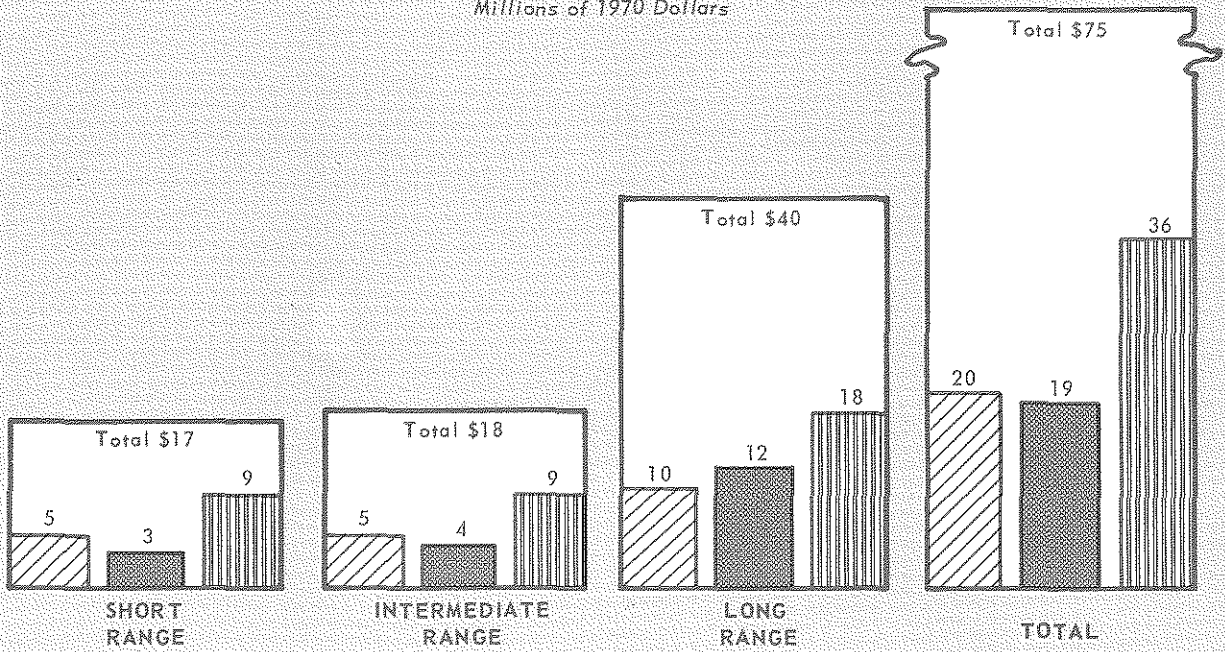
 *Air Carrier and Reliever Airports*
 *Airports Serving General Aviation Only*

ESTIMATED FUNDS AVAILABLE
FOR DEVELOPMENT OF THE

AIR CARRIER SYSTEM
Millions of 1970 Dollars



GENERAL AVIATION SYSTEM
Millions of 1970 Dollars



 Local
  State
  Federal

EXPECTED BENEFITS OF THE AIRPORT SYSTEM PLAN

The Michigan Airport System Plan is expected to produce a wide range of benefits to a broad spectrum of Michigan residents and visitors. The types of benefits that will accrue to affected groups from the Michigan Airport System Plan are summarized as follows:

Users

- Reduced travel time and costs for air travelers and shippers.
- Expanded recreational opportunities, due to increased accessibility of recreation areas and wider opportunities for pleasure flying.

Airlines and Airport Authorities

- Improved safety and convenience of aircraft operations.

Communities

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

Quantitative Benefits

The benefits discussed in this study may be defined as savings in both travel time and travel costs. These benefits were calculated by detailed cost and time analysis for each alternative.

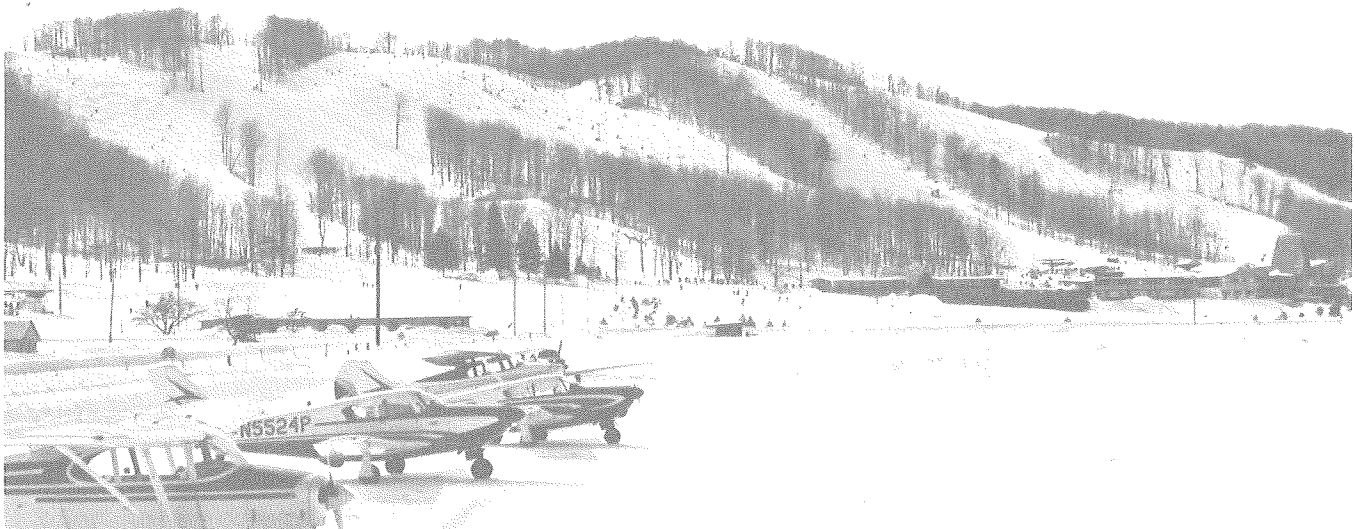
The entire air carrier system was subjected to a benefit-cost analysis to determine the best cost effective arrangement of air carrier airports. For proposed recommended air carrier system changes (a new short-haul airport, north of Detroit [Site 107], Battle Creek-Kalamazoo, Sault Ste. Marie, Jackson, Manistee, Escanaba-Iron Mountain-Menominee) special benefit-cost analyses were performed.

On a quantitative basis, the benefit-cost ratio for various segments of the air carrier system were as follows:

<u>Segment</u>	<u>Benefit/Cost Ratio</u>
Recommended changes	5 to 1
Remainder of systems	1 to 1
Total system	2 to 1

This analysis utilized a 25-year life of benefits and a discount rate of seven percent to complete future benefits and costs.

For the general aviation airport system, airport utilization and time and cost of ground access were considered as benefits for general aviation users in relation to costs of airport development. Guidelines were established as evaluation criteria.



ENVIRONMENTAL CONSIDERATIONS

Both federal and state policy recognize environmental criteria as being highly important in airport planning in Michigan. Indeed, it is virtually certain that all major future analyses relating to airport development in the state will include some version of the critical question, "What environmental costs, as well as economic costs, are required to provide benefits to travelers, shippers and others?" It is also highly likely that both federal and state funds will be withheld from any airport development projects that are in clear violation of environmental and related social goals.

During the study, it was determined that aircraft noise impacts are the principal environmental consideration bearing on state-wide air carrier system planning. Other potential environmental and community relations impacts of airport development (e.g., air and water pollution, aesthetics) can be best treated in more detailed planning studies, such as airport master plans.



The principal findings of this study's noise analysis for existing airports in the Michigan Airport System Plan are as follows:

No case was found where 1970 noise conflicts are severe enough to suggest moving the airport. Nevertheless, visual inspection of air carrier airports in the state reveals instances where local land use and zoning authorities have allowed the encroachment of residential and other urban development into areas too close to airports, and some are already experiencing noise complaints. In general, increased noise exposure resulting from higher 1990 airport activity should not result in severe conflicts with land use *if* 1990 land use in the vicinity of the airport remains essentially like that of 1970. But comprehensive land use plans have not yet been prepared for many of the locales near airports in the system. Moreover, for those airports where land use plans have been prepared, it is not clear that adherence can be insured.

With the important proviso that improved land use controls in the vicinity of airports may be required, the study concludes that potential noise impacts should not preclude implementation of the Michigan Airport System Plan. However, effective land use controls around airports may require changes in state authorizing legislation. At present, the Michigan Aeronautics Commission recommends a "model zoning ordinance" for local implementation that includes guidelines for land use compatibility zoning administered by joint zoning boards. The joint zoning boards are continuing bodies, appointed by the Michigan Aeronautics Commission with local and state representation. These joint zoning boards supervise temporary zoning commissions which prepare and hold hearings on an airport area zoning ordinance for adoption by the board. Until recently, the boards have concerned themselves only with height restrictions around airports rather than uses compatible with noise levels, but some boards have begun to include such uses in their ordinances.

Although the State System Plan has not examined environmental questions in detail, individual airport master planning studies will precede development.

It is a requirement of these master planning studies that a detailed analysis of environmental impact be made.

IMPLEMENTATION PROCEDURES

The Michigan Airport System Plan has been the product of a cooperative local, state and federal planning effort, at federal and state initiative. Implementation of the Michigan Airport System Plan will also require cooperative effort by local, state and federal interests, but the initiative will rest with local governments and airport authorities to carry out the following steps in accomplishing airport development:

1. Application through the Michigan Aeronautics Commission under Federal Aviation Administration's Planning Grant Program for matching funds to develop master plans for airport improvements.

2. Completion of master plan.

3. Application for matching ADAP and state funds to finance airport improvements.

4. Condemnation or purchase of (or option to purchase) all property interests required for clear zones, approach requirements, and airport construction, plus submission of certificates on the availability of local funds.

Because airport planning is a continuous process, the need will arise for variations from planned development in the Michigan Airport System Plan. It is possible that a given airport project may be accelerated into an earlier planning period or decelerated into a later planning period by a change in the growth rate, brought about by socio-economic factors, travel patterns or safety considerations.



