

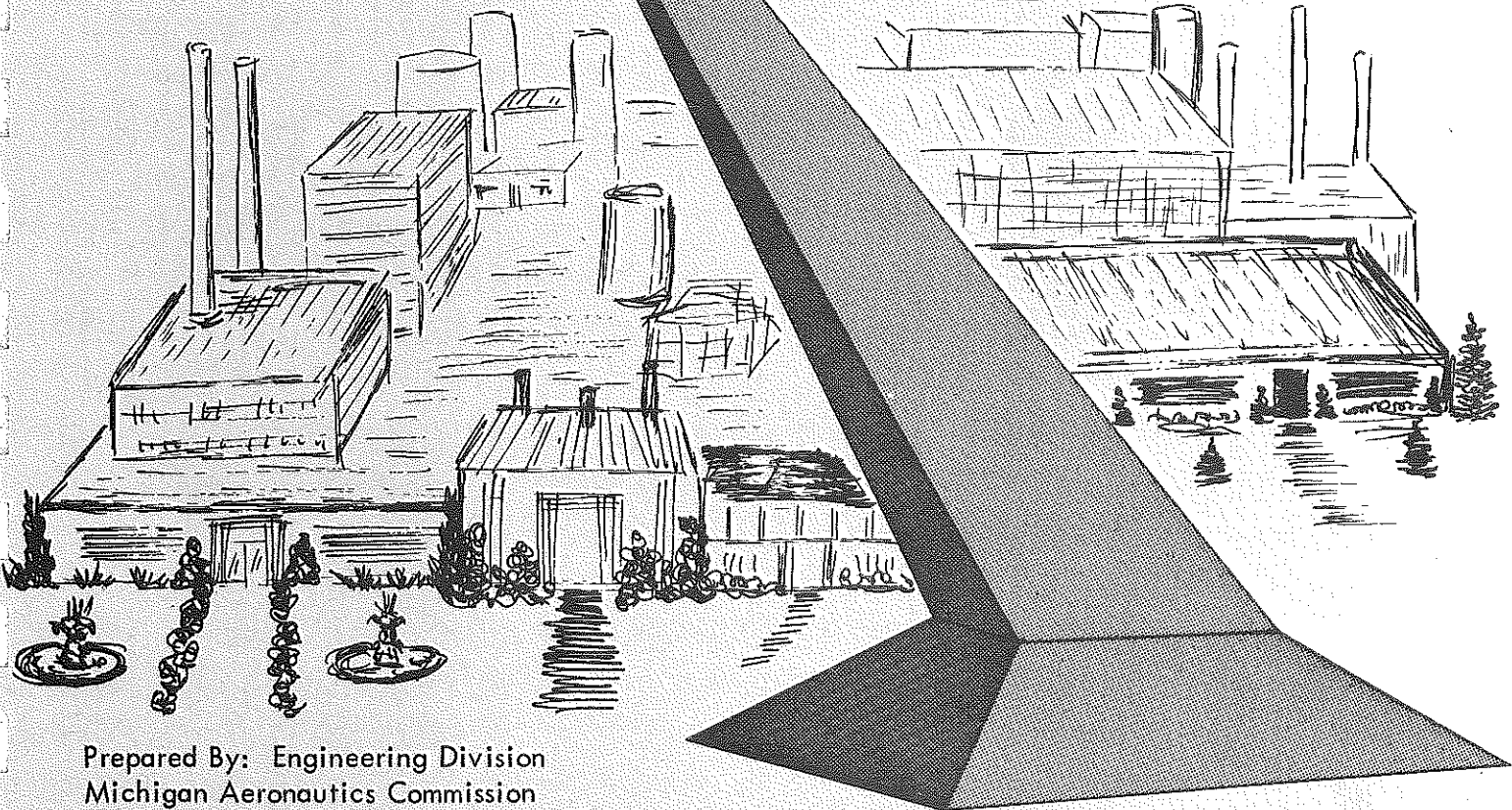
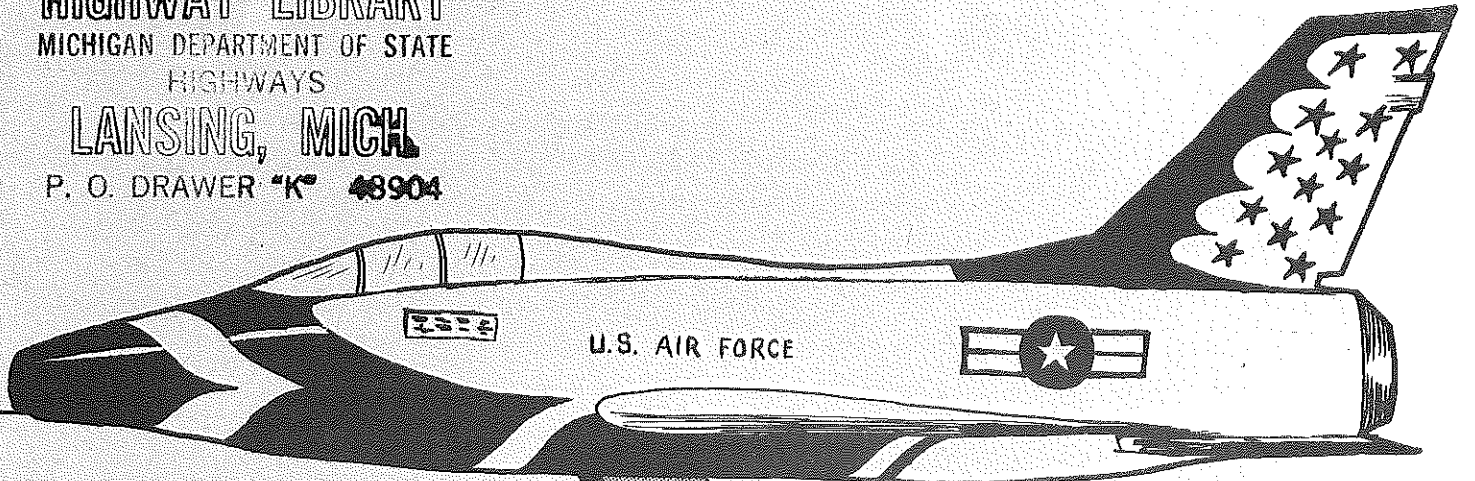
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GRAND HAVEN

Airport Study

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Prepared By: Engineering Division
Michigan Aeronautics Commission
Department of Commerce September, 1970

10405

STATE OF MICHIGAN



AERONAUTICS COMMISSION

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CAPITAL CITY AIRPORT
LANSING, MICHIGAN 48906

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DEPARTMENT OF COMMERCE

RICHARD E. WHITMER, Director

September 30, 1970

Subject: Grand Haven Airport Study

Mr. Roy Hierholzer, Chairman
Grand Haven Airport Board
Grand Haven, Michigan

Dear Mr. Hierholzer:

At the request of the Grand Haven Airport Board, the Michigan Aeronautics Commission has made a survey of aviation activity in the Grand Haven area.

The purpose of this survey was to show past, present and future usage and needs of the Grand Haven Memorial Airport.

In order to update existing data the Michigan Aeronautics Commission conducted three physical surveys concerning aviation activities in the Grand Haven area. A one-week origin and destination survey was conducted during the week of July 14-20, 1970. During this week each pilot arriving or leaving the airport was interviewed and asked a few questions about his flight activities. A two-day industrial use survey was conducted at which time representatives from many Grand Haven area industries indicated their usage and opinion of the Grand Haven Airport. Also, the Michigan Aeronautics Commission installed a mechanical traffic counter at Grand Haven Airport to determine the number of yearly aircraft operations. The information gathered from these surveys and other state-wide statistics on aviation show a considerable amount of aircraft activity at Grand Haven Memorial Airport.

We hope the information in this report will be useful to the Board in convincing interested persons of the importance of maintaining and upgrading the Grand Haven Memorial Airport to serve the residents and industry of the Grand Haven area.

Very truly yours,

L. C. Andrews, Assistant Director
MICHIGAN AERONAUTICS COMMISSION

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INTRODUCTION

There are a number of factors which are vital to the economic health of any community. Some factors include city services, utilities, reasonable taxes and highways. The availability of adequate airport facilities is another factor of ever-increasing importance. An erroneous concept held by some communities is that a regional airport terminal some 15 or 20 miles away can provide enough service to local businessmen. These communities are shortchanging both themselves and the local businessmen who provide the economic lifeblood of any community. The general aviation users, primarily businessmen, demand that an adequate airport be within easy access to their place of business for themselves and visiting customers and vendors.

It is estimated that general aviation aircraft account for approximately ten times as many operations as do the air carriers and as a national average they carry approximately 30% of all air passengers. In Michigan, at some air carrier airports, general aviation aircraft carry more passengers than do the scheduled airlines. The reason for the greater use of private aircraft can be summed up in one word--convenience.

Two magazines have mentioned the convenience factor of general aviation flying: Newsweek, "As one West Coast plane maker tells prospects, 'The difference between flying commercially and using a company plane is the difference between riding a bus and driving one's own car.'"; U.S. News and World Report, "The main advantage is the time-saving ability of a business plane. Top management, salesmen, engineers, purchasing agents, trouble shooters, all can be set down in the right place at the right time. In addition, the planes can carry light cargo, such as emergency spare parts or machinery, or they can rush deliveries to a customer."

The economic impact of general aviation facilities was illustrated by George J. Vavoulis, former mayor of St. Paul, Minnesota, who wrote in an article entitled, What Airports Have Done for St. Paul, "It is evident that the general aviation aircraft in our metropolitan area brings to our area a business volume of \$233 million a year which it would not otherwise get." It is further projected that by 1975, this annual level would increase to a figure of approximately \$386 million. Evaluating this, in the light of net requirements upon our cities, every \$1,000 of tax money invested in general aviation produces in excess of \$2 million per year."

GENERAL AVIATION AIRCRAFT DELIVERIES THROUGH THE 1960's

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	Total or Average
INDUSTRY TOTALS (as reported by Utility Airplane Council for member companies)											
Number Planes	7,588	6,811	6,723	7,603	9,371	11,967	15,747	13,577	13,698	12,457	105,542
Average Billing	\$19,900	\$18,249	\$20,645	\$20,176	\$21,225	\$24,631	\$25,922	\$26,488	\$30,770	\$46,918	\$27,069
Billings (millions)	\$151.2	\$124.3	\$136.8	\$153.4	\$198.9	\$318.7	\$408.2	\$359.6	\$421.5	\$584.4	\$2,857.0

In 1960, 966 of the aircraft built were twin engine as compared with 2,419 built in 1969. This increase in the number of twin engine aircraft is a good indicator of the increase in the business usage since most twin engine airplanes are owned and used solely for business purposes.

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ECONOMIC IMPORTANCE OF AIRPORT IMPROVEMENTS

Spurred by the rise in business flying, many communities around the country are feverishly building new airports to aid in both attracting new industry and keeping established firms. In Michigan, as throughout the United States, there are many communities improving their industrial climate by either establishing a new airport or modernizing an older airport to facilitate the needs of business flying.

During March of 1970, the Michigan Aeronautics Commission conducted a survey to determine whether improvements at ten representative airports have increased the economic activity in the area. The following is the result of that survey:

ALMA, MICHIGAN: The Alma Municipal Airport was relocated to a new site and opened as the Gratiot Community Airport. The low frequency, non-directional beacon with instrument approach procedures established at the old site one year before moving was then relocated at the new site.

Since the opening of the new Gratiot Community Airport the comparison with the old Alma Municipal Airport tells the story of the increase in aviation activity in this area. The number of based aircraft has increased from 21 to 28, average daily arrivals have gone from 9 to 13 and average daily gasoline sales from 294 to 442 gallons. Thus, based aircraft have increased 33%, daily arrivals 44% and gasoline sales have increased 50%. The old municipal airport would not accommodate jet traffic. There are presently 3 jet aircraft arriving at the Gratiot Community Airport regularly and there are indications that 3 or 4 additional jets will soon be using it. Expanding use of the new airport by jets convinced the city to proceed with plans to extend the E-W runway.

BELLAIRE, MICHIGAN: In addition to airport improvements, a low frequency, non-directional radio beacon with instrument approach procedures was established at Antrim County Airport. Since the expenditure of federal, state and local monies at Antrim County Airport, which serves a 25 mile radius around Bellaire, there has been experienced a rapid growth in industrial expansion, recreation and convention business. Shanty Creek and Schuss Mountain Lodge have a combined invest of \$11 million dollars. Since these investments were made real estate values have increased. The resort business has doubled every year and the Antrim County tax base has multiplied rapidly. Although air traffic has doubled, the passenger count at Antrim County Airport has quadrupled due to using the larger type aircraft, including business jets and airline charter. In July, 1969, commuter airline service was established at Bellaire to link this resort area with airline connections in metropolitan areas of the state.

CADILLAC, MICHIGAN: The 5,000' runway and the low frequency, non-directional radio beacon and instrument approach procedures at Cadillac Municipal Airport have been instrumental in enabling the area to acquire the following businesses: Four Star Corp. with a main plant and two branches; Premier Corp.; Hart Precision Products; Rex Air Corp., a branch of Mitchell Bentley Corp; and the Emerald Tree Co. of the Great Western Corp. In addition, it has also enabled existing companies in the area to operate larger and faster aircraft, thus reducing travel time from Cadillac to market centers, both within and outside of the State of Michigan.

CHARLEVOIX, MICHIGAN: Business firms have increased usage of the airport since establishment of the 3,500' paved runway.

Business firms using the airport are Freedman Art-Craft and Engineering, and LexaLight Corporation. Both have their own aircraft and make extensive use of this airport.

In addition, Daverman Associates of Grand Rapids has a branch in Petoskey and operate their own aircraft using the airport in Charlevoix.

A large attraction in the area is the Big Rock Nuclear Plant of Consumers Power Company and their aircraft is a regular user of this airport.

GAYLORD, MICHIGAN: With the extension of the runway to 5,000', in addition to the instrument approach procedures established on the state omni range station to provide instrument communication, our community and its airport have moved from the capability of handling small corporate twins to large corporate twin aircraft and jet aircraft.

Traffic statistics show the increasing use of the airport by larger and faster aircraft. In the calendar year 1969, there were 62 jet and turbo aircraft that landed and used the Otsego County Airport facilities. This airport is located in a vast resort area and a substantial number of visitors to the resort use this airport within a 30 mile radius.

The airport with its improved facilities is a major factor in anticipated economic growth in the Gaylord area. As the airport becomes known even better, further increases in use by large aircraft can be expected.

HOUGHTON LAKE: Since the lengthening of the runway to 2,900', along with the low frequency non-directional radio beacon with instrument approach procedures, business traffic has more than doubled at the airport, as a number of business firms now use the airport to transport personnel for both company meetings, conventions and vacations. Two of the largest industrial users of this airport are Hancock Industries and McClure Oil Co.

HOWELL, MICHIGAN: Since the 3,000' paved runway has been in existence at the Livingston County Airport, along with the instrument approach procedures from the existing VORTAC at Salem, a local fixed base operator provides

charter service on a frequent basis for eight local companies. Four companies with aircraft based elsewhere stop here regularly for their subsidiary or associated local companies. The Livingston County Airport now has 30 based aircraft of which seven are used for business purposes.

Several light manufacturing concerns, mainly subsidiaries of larger companies, have moved into the Howell area because of the availability of good airport facilities. The types of industry in the area now using the airport include real estate and insurance, electrical manufacturing, tool manufacturing, stamping and cement product work.

LAKEVIEW, MICHIGAN: The airport has shown a 50% increase since a 2,500' pavement was established. Most of this is business aircraft. This 2,500' runway has only been open a short time and the Chamber of Commerce counts it as a major item in attracting new industries. Two industries using the airport are Lakeview Area Sprayers and Bollinger's Auto Parts.

Before the 2,500' runway was open, the area lost a potential industry who needed airport services. The Chamber of Commerce is sure that the adequate airport facilities that they now enjoy, they will be able to offer adequate airport services to any firms interested in locating in Lakeview.

MARSHALL, MICHIGAN: The 3,500' runway extension, along with the instrument approach procedures from existing Battle Creek VORTAC at Brooks Field, has resulted in the largest employer in the area, Yale and Towne, (1,200 employees) being able to use their twin aircraft, facilitating movement of personnel and emergency deliveries. Two new companies have established facilities in the area based in large measure on the longer runway at Brooks Field. Kysor Industries has acquired local companies and specifically picked Marshall because of its adequate airport facilities. U. S. Chemical Corporation is about to move a facility to Marshall from a New Jersey location and are

locating adjacent to the airport to facilitate transportation. Their 65,000 square foot building and three million dollar investment will bring 100 new jobs to the area.

NEWBERRY, MICHIGAN: The paving of a 3,500' runway has brought a new company into the area, Newberry Cabinet Mills, with 35 to 60 new jobs. Present businesses which have been helped by this airport improvement are Superior Studs of Wisconsin, and Ironwood, Michigan, and the State and County Employees' Credit Union which owns a Cessna 411, the Newberry State Bank which owns a Cessna 421, the Kimberly-Clark Mill and Mobil Oil Co. In addition, the Newberry State Hospital makes use of the airport with state-owned aircraft. A state omni range station with instrument approach procedures is scheduled for installation by summer of 1970, which will, no doubt, assist existing businesses and be an attraction to potential industrial newcomers to Newberry.

SANDUSKY, MICHIGAN: Since the paving of the 3,000' runway, aviation activity has doubled with the largest increase in business aircraft. Firms using the airport for freight and charter are: Yale Lumber Company, Snover Stamping and the Huber Corporation.

In addition, Clements Manufacturing of Deckerville operates a Navaho out of the airport and Buskirk Lumber operates a Cessna 310. Detroit Edison makes use of the airport on their service calls into the area.

WEST BRANCH, MICHIGAN: Since the establishment of the 3,200' runway, various businesses in the area have used this airport. Villican-Lehman Associates, an urban planning firm, in developing a master plan for the West Branch area, has placed an industrial area adjacent to the airport. A stamping plant located in southern Michigan is interested in locating in the West Branch

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area and inquired about the airport facilities. Marine Electrical Company uses the airport for freight shipments and has customers and vendors using the airport.

STATEMENTS FROM GRAND HAVEN AREA INDUSTRY ON AIRPORT USE

As a means of determining specific airport use and potential, a survey was conducted of industry in the Grand Haven area.

This survey examines such factors as the aeronautics usage by the company of their own aircraft and those of customers or vendors. In addition, company representatives were also asked to comment and evaluate the relationship of the airport to the community and business. Following are the companies' statements on Grand Haven Memorial Airpark.

GRAND HAVEN

Rycenga Manufactured Homes

This company is one of several corporations, with over 50 employees in the Grand Haven area. They consider the airport absolutely useful to the community and a definite asset to them. This company charters twin engine aircraft to much of the midwest. They do this approximately 20 times a year. In addition, they use airline service to the West Coast several times a year and charter flight service up to a dozen times a year to various mid-western states.

Visitors to the company facility who arrive by general aviation include Con-El Development Company of Oscoda who now visit 6 times a year with a Piper Cherokee.

Mosher Company of Bay City visit 4 times a year in private aircraft.

Imperial Components of Chicago visit twice a year in private aircraft.

Beebe and Sons of Flint visit 12 times a year in a Beech Baron.

Hovey Company of Flint bring their Aero Commander into Grand Haven 6 times a year.

Good Homes Company of Valparaiso visit 18 times a year in a Cassna 206.

Van Palton Co. of Port Huron visit 15 times a year in a Piper Twin Apache.

Pitcher Bros. of Ithaca visit 12 times a year in a Piper Cherokee 180.

Mitchell Construction of La Porte, Indiana, visits 10 times a year in a Cessna 310.

Hartman Company of South Bend, Indiana, visit 18 times a year in their Piper 235.

Smith and Shcaller of Berrien Springs visit several times a year in their Cessna 310.

Dykehouse Bros.

This firm has 25 employees and several branches in western Michigan. They consider the airport absolutely useful to the community and a definite asset to them. They now use a Beech Travelaire throughout Michigan. They consider Grand Haven to have good airport facilities but would like a longer N-S runway. They use the Beech Travelaire over 25 times a year for destinations throughout Michigan.

In addition, Nelson Trailer Company of northern Ohio visits them several times a year in a Beech Bonanza.

Midwest Concrete Pipe

This company employs over 25 in the Division and is a Division of Zurn Company of Erie, Penn. Because of the growth of the corporation, it is expected that the parent corporation would bring their Lear jet in once a month. Now they bring a Cessna 310 into Grand Haven. The company uses airline travel all over the United States and they consider the Grand Haven Memorial Airpark a real asset to the community.

Grand Haven Stamped Products

This company is part of the Johnson-Jacobson group and employs 420 in their Grand Haven plant. They charter aircraft for use throughout the United States, especially the eastern part of the country. They consider that the Grand Haven Memorial Airpark helps meet the purpose of the community to sponsor industrial growth and expansion.

Gardner Denver Company

This company has their main office in Quincy, Ill. They employ 650 at their Grand Haven plant. They use a twin engine King Air at least once a week for trips to the main plant. In addition, they use airline service several times a week throughout the United States and also ship freight via airlines. The company considers the Grand Haven Municipal Airport of great benefit to them because of its convenience and closeness to the community and urges support for the airport.

Atco Rubber Products

This company employs 125 on 3 shifts. They estimate that 30% of their sales trips are made by general aviation aircraft and 50% of their sales are outside the state of Michigan. The company now charters twin engine aircraft and plans on purchasing such type of aircraft in the very near future. It was pointed out that many of the Atco customers are in smaller communities throughout the United States which do not offer scheduled airline service. They estimate that out of 100 customers, 22 must be serviced by general aviation, 8 more by general or air carrier, 6 by general aviation or automobile, and 4 by air carrier. The remaining 60 must be served by automobile only. Another company estimate is that \$250,000 per year in sales results from general aviation activity or \$1,000,000 over a four-year period. Atco feels that the airport is an important asset to the community and important to the company in that it figures prominently in their plans to expand operations in Grand Haven.

Michigan Plastic Products

This company employs 200 on 3 shifts and they charter aircraft 8 times a year for passengers and 12 times for freight. This is both single engine and twin engine aircraft. Their destinations are usually in the midwest. The company feels that they are fortunate to be in a community that has an airport of the high caliber of Grand Haven Memorial Airpark.

Customers who use Grand Haven include General Motors Corp. of Detroit who visit 2 or 3 times a year in twin engine aircraft.

Sheller-Globe of Union City, Ind., visit 3 times a year in a twin engine aircraft.

Magnavox Corp. of Fort Wayne, Ind., visit 6 times a year in a twin engine aircraft.

Automatic Spring Products

This company employs 100 and charter aircraft 12 times a year, mainly for freight. The company emphasizes that it needs the airport in Grand Haven and that its out of state customers are impressed with the facilities at Grand Haven Municipal Airport.

Werner Gear of Muncie, Ind., visit 6 times a year in various twin engine aircraft.

Jim Robins Corp. of Detroit visits 8 times a year in twin engine aircraft.

Frigidaire of Dayton, Ohio, visits 8 times a year in twin engine aircraft.

Birchwood Manufacturing

This company has its main plant in Rice Lake, Wisc., but the pilot bases the company aircraft at Grand Haven Memorial Airpark. He flies the company Piper Aztec approximately 120 times a year throughout the eastern 2/3 of the United States. The company feels that this airport is a vital link in its transportation program because of its convenience and adequate facilities.

J. B. Simms Professional Engineering

This company has a Beech Bonanza which they take to a number of cities in Michigan and other midwestern states from 50-75 times a year. They feel that the Grand Haven Municipal Airpark is an asset to the community for local business reasons and very convenient to visitors to Grand Haven. They also report that Grand Haven Municipal Airpark is an asset to air transportation in the Western Michigan area. Clients who come to Grand Haven by general aviation include Erie City Iron Works of Chicago who visit 12 times a year in a Piper Cherokee and Osceola Refining Company who visit 6 times a year in a Beech Bonanza.

Mona Shores Contracting Corp. of Celina, Ohio, visits Grand Haven 100 times a year in a Cessna 310.

Terrill, Kistler and Anderson Engineering

This engineering firm which has 25 employees intends to expand and has doubled in size in the past several years. They now charter aircraft and are considering the purchase of their own aircraft. They now travel 12 times a year throughout Michigan to consult with clients but could conceivably use an aircraft several times a week after possible expansion. The firm feels that business in Grand Haven would suffer greatly if the airport were not here.

Clients include Justine Construction of Indianapolis, Indiana, who visit 15 times a year in a Cessna 310.

Mt. Vernon Construction of Indianapolis, Indiana, visit 50 times a year in a Twin Beech.

Fine-Bilt Construction of Lansing visit 25 times a year in a single engine aircraft.

Alco Universal Construction Company of Lansing visit 12 times a year in a Twin Beech.

Land-Tech. Corp. of Hinsdale, Ill. who visit 50 times a year in a twin engine aircraft.

Union Mutual Life Insurance Co.

The agency manager of this firm services Muskegon, Grand Rapids, and Benton Harbor from the Grand Haven office. He uses a Piper Cherokee about 150 times a year to serve primary Michigan cities and a number of midwestern locations. The manager feels that Grand Haven Memorial Airpark is a transportation facility that is of great benefit to the city today but will be of more benefit tomorrow.

Clients include John Hancock Insurance of Grand Rapids who visit 15 times a year.

Russell Cote Insurance Co. of Grand Rapids who visit 15 times a year in a Cessna 180.

SPRING LAKE

Great Lakes Welding

This firm with 15 employees has a Twin Beech which they operate 150 times a year throughout the midwest. Customers include St. Clair Oil of Chicago who visit 20 times a year in a King Air.

Shell Oil of Chicago visits 20 times a year in a Cessna 310.

Consumers Power Co. of Jackson visits 10 times a year in a King Air.

Star Machine Co.

This firm charters twin engine aircraft 12-15 times a year for midwestern destinations. They feel that the Grand Haven Municipal Airpark is a convenient transportation facility.

Customers include Dumore of Wichita Falls, Texas, who visit 30 times a year in a Twin Beech.

Shelby Williams Co. of Chicago visits 10 times a year in a Beech Bonanza.

Anderson-Bolling Mfg. Co.

This firm employs 350 and charters both single engine and twin engine aircraft for trips on the average of 1 per week throughout the eastern one-half of the United States. They charter the aircraft at Holland because they feel that the runways at Grand Haven Memorial Airpark need repairing. They feel that if proper facilities were available they and other firms would use the Grand Haven Airport more.

Ferrysburg Construction Aggregate Co.

This firm charters aircraft 12 times a year to go anywhere within a 600 mile radius of Michigan for both passengers and freight. The firm feels that the Grand Haven Memorial Airpark is convenient to business.

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STATISTICAL DATA

The figures on this and the following pages show some of the statistics pertinent to aviation development in Grand Haven.

Figure I shows the number of hours flown in Grand Haven, Michigan and the United States and breaks the hours down by the percentage of hours flown for various purposes (i.e. Business, Commercial, Instructional, Personal, and Other). The Grand Haven statistics were gathered during the July, 1970 Fact Finder Survey at Grand Haven Memorial Airport.

Figure II is a graphic presentation of the latest data in Figure I.

Figures III and IV show the numerical and percentage increase in registered aircraft from 1959 to 1969 for Michigan, the six-county area around Grand Haven (Ottawa, Muskegon, Newaygo, Allegan, Barry and Kent), Ottawa County and Grand Haven. Figure III shows the number of registered aircraft by year for the ten-year period and Figure IV shows the percentage of increase for the whole ten-year period. As one can see from Figure IV, Grand Haven had a higher percentage increase than Ottawa County, the six-county area and the State of Michigan.

The population data in Figure V present a comparison between Ottawa County and the five surrounding counties. The percentages between the population figures represent the percentage of increase between the census years. Between 1950 and 1970, the percentage of increase of Ottawa County ranked highest of all six counties. The projections for 1980 and 1990 indicate that this lead in percentage increase in population now enjoyed by Ottawa County will continue. Between 1940 and 1959, Ottawa County ranked second. The projected increase in population indicates there will be a greater demand for aviation facilities for Ottawa County and Grand Haven in 1980 and 1990.

Figure VI is an attempt to compare the advantages of flying an airplane over driving an auto from Grand Haven to various locations. The distance to each location is given in air miles and land miles and the travel time is estimated based on an average of 150 mph for flying and an average of 60 mph for driving time. Using these average flying and driving times we can see that Ironwood, Michigan is 290 miles and 1 hour and 55 minutes by air, or 551 miles and 9 hours and 12 minutes by auto.

ESTIMATED AIRCRAFT OPERATIONS

During the summer of 1970 the Michigan Aeronautics Commission put mechanical traffic counters on the Grand Haven Airport in an attempt to estimate the yearly operations at this airport. The following yearly estimated operations are based on preliminary results for the traffic survey:

<u>1970</u>	
Local	11,200
Itinerant	<u>5,900</u>
Total Operations	17,100

FIGURE I

PERCENT OF HOURS FLOWN
BY PURPOSE

GRAND HAVEN*

	<u>Business</u>	<u>Commercial</u>	<u>Instruction</u>	<u>Personal</u>	<u>Other</u>	<u>TOTAL</u>
1970	28.21	1.98	21.28	41.58	6.95	100

MICHIGAN**

	<u>Business</u>	<u>Commercial</u>	<u>Instruction</u>	<u>Personal</u>	<u>Other</u>	<u>TOTAL</u>
1962	35.19	6.12	15.83	39.44	3.42	100
1964	37.84	8.24	13.98	38.35	1.59	100

UNITED STATES***

	<u>Business</u>	<u>Commercial</u>	<u>Instruction</u>	<u>Personal</u>	<u>Other</u>	<u>TOTAL</u>
1953	42.52	19.33	14.63	21.64	1.88	100
1957	44.46	18.40	17.04	19.28	.82	100
1963	37.99	20.99	16.00	24.00	1.02	100
1965	35.00	20.00	19.99	24.02	.99	100
1967	34.70	17.80	24.20	22.37	.93	100
1980	31.89	20.81	23.45	22.92	.91	100

*SOURCE: Michigan Aeronautics Commission's, GRAND HAVEN FACT FINDER SURVEY, 1970.

**SOURCE: Michigan Aeronautics Commission's, 1962 and 1964 STATE FACT FINDER SURVEY.

***SOURCE: R. D. Speas and Associates', The Magnitude and Economic Impact of General Aviation, 1967.

PURPOSE OF FLIGHT

Percentage of Hours Flown

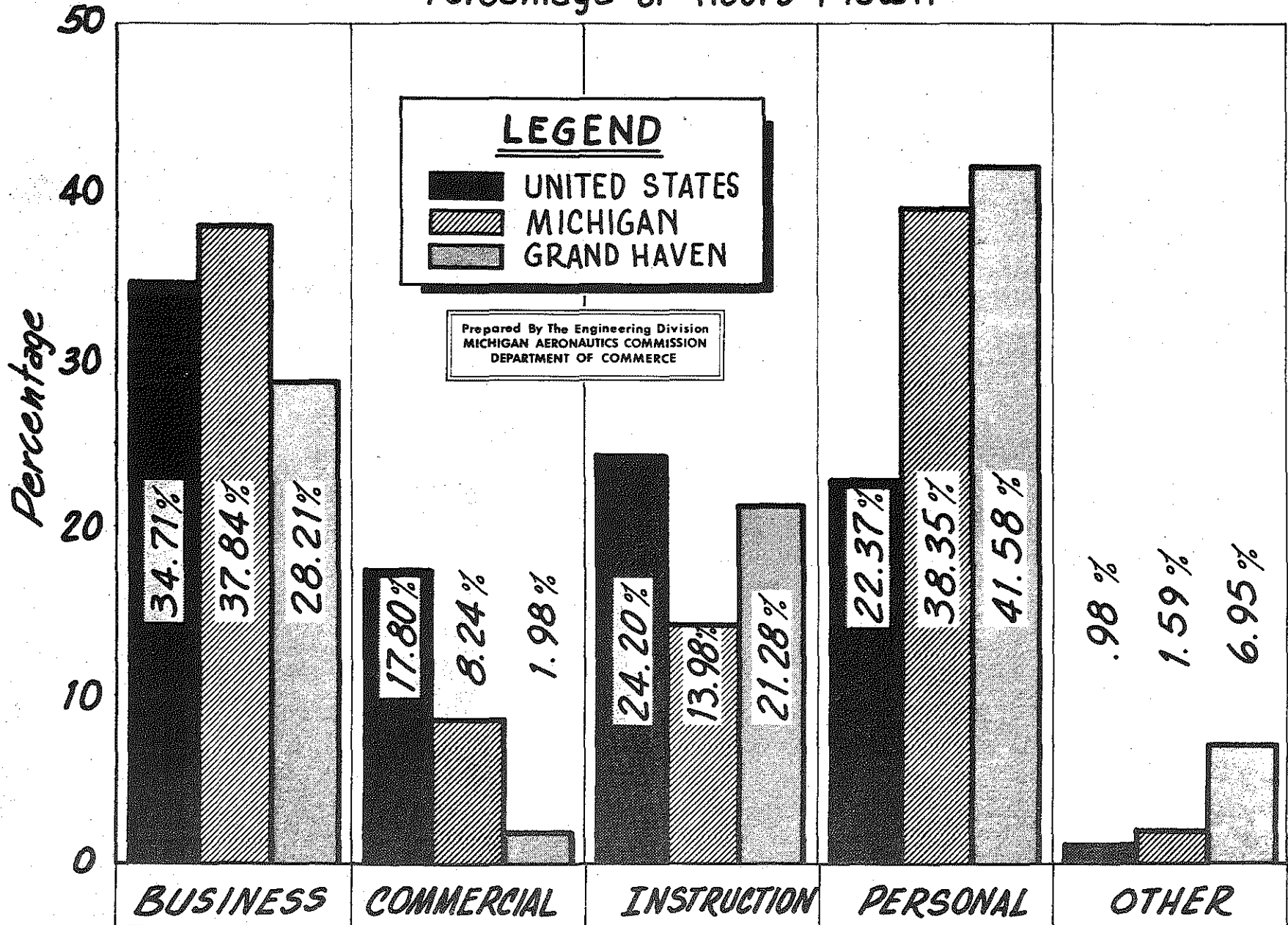


Figure II

FIGURE III

REGISTERED AIRCRAFT

Year	Michigan	Six County Total	Ottawa County	Grand Haven
1959	2,998	250	38	17
1960	3,136	276	37	18
1961	3,164	313	42	16
1962	3,232	318	44	19
1963	3,500	343	58	25
1964	3,569	356	65	30
1965	3,943	407	66	29
1966	4,229	430	60	25
1967	4,649	462	82	28
1968	5,039	479	64	26
1969	5,339	513	66	28

REGISTERED AIRCRAFT

Percent Change 1959-1969

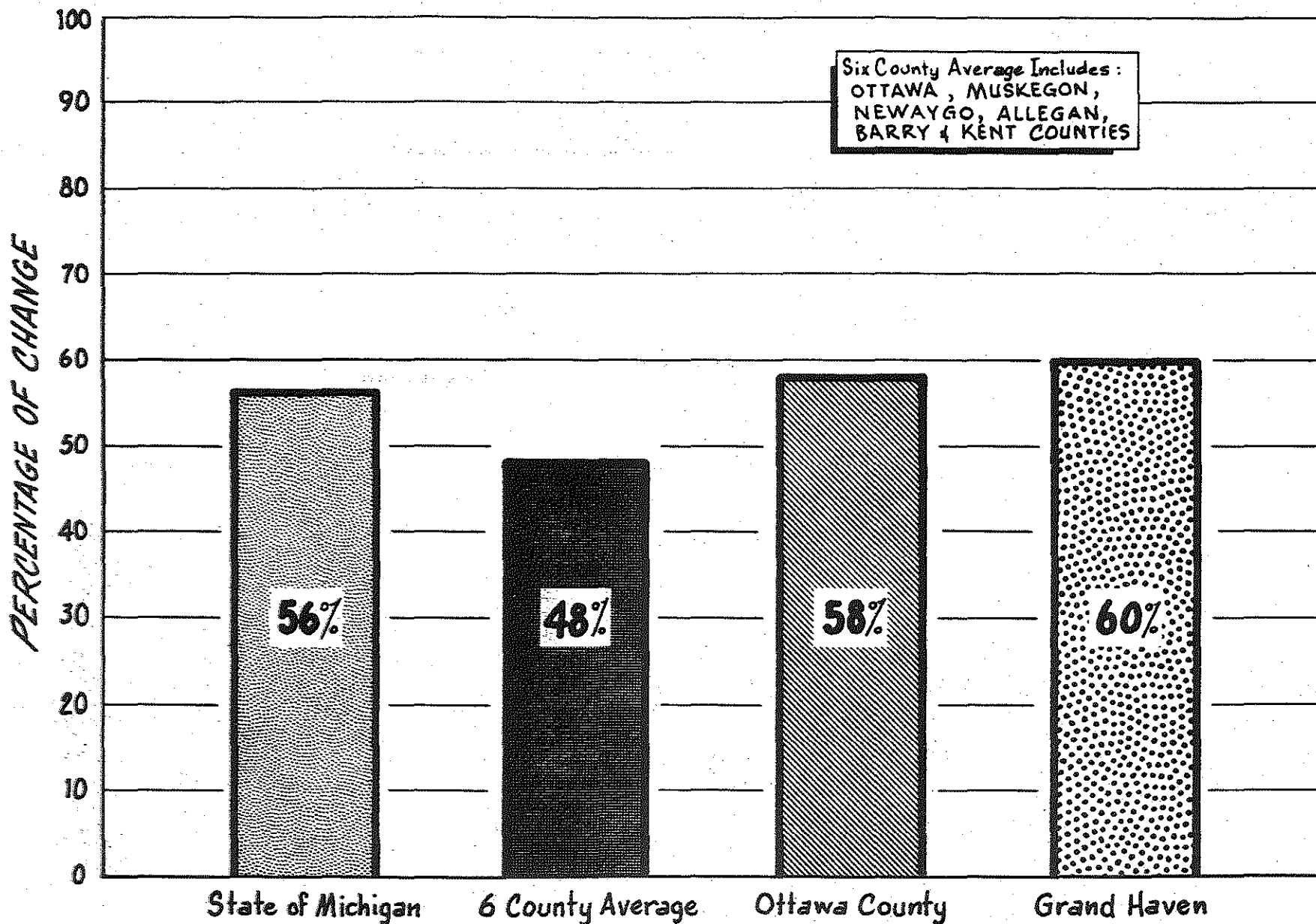


Figure IV

SOURCE: REGISTRATION RECORDS
MICHIGAN AERONAUTICS COMMISSION

Prepared By The Engineering Division
MICHIGAN AERONAUTICS COMMISSION
DEPARTMENT OF COMMERCE

FIGURE V

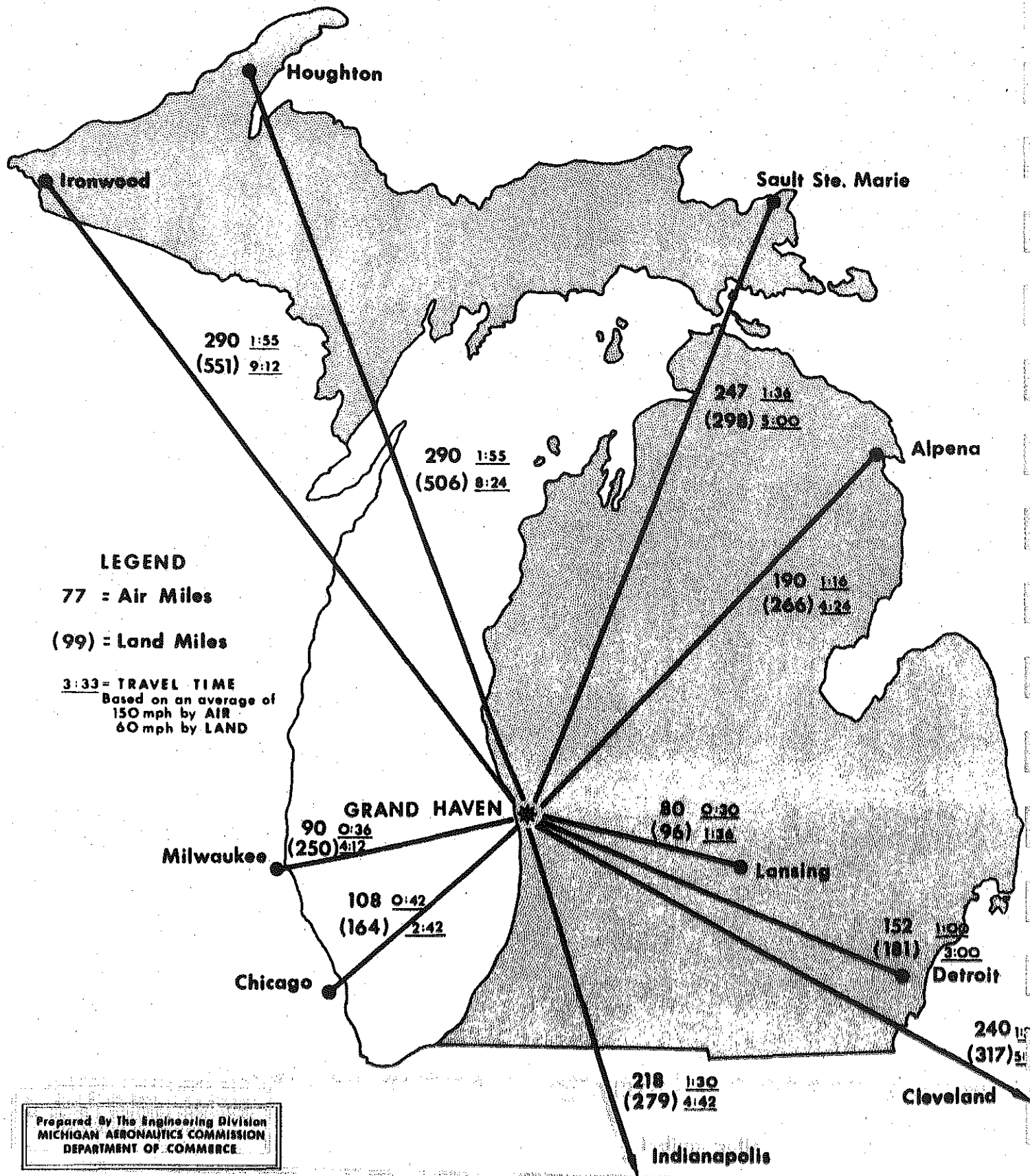
Population Growth for Six-County Area Around Grand Haven

County	Ottawa	Muskegon	Allegan	Barry	Kent	Newaygo
1940	59,660	94,501	41,839	22,613	246,338	19,286
1950	73,751	121,545	47,493	26,183	288,292	21,576
% of Increase	24%	29%	14%	16%	17%	12%
1950	73,751	121,545	47,493	26,183	288,292	21,576
1960	98,719	149,943	57,729	31,758	363,187	24,160
% of Increase	34%	23%	22%	21%	26%	12%
1960	98,719	149,943	57,729	31,758	363,187	24,160
1970	121,127	160,113	61,534	30,016	415,164	26,376
% of Increase	23%	7%	7%	5% Decrease	14%	9%
1970	121,127	160,113	61,534	30,016	415,164	26,376
1980	145,318	178,992	68,251	31,667	477,152	29,002
% of Increase	20%	11%	11%	6%	15%	10%
1980	145,318	178,992	68,251	31,667	477,152	29,002
1990	171,084	197,395	75,512	33,626	542,983	31,857
% of Increase	18%	11%	11%	6%	14%	10%

SOURCE: 1940-1960 United States Census of Population.
 1970-1990 Projections on Michigan Population,
 Executive Office, State of Michigan, 1969.

Figure VI

DISTANCE FROM GRAND HAVEN (AIR MILES VS. LAND MILES)



Prepared by The Engineering Division
MICHIGAN AERONAUTICS COMMISSION
DEPARTMENT OF COMMERCE

HISTORY OF CONSTRUCTION PROJECTS AT GRAND HAVEN MEMORIAL AIRPORT

In 1948, the City of Grand Haven initiated three projects for the construction and development of the Grand Haven Memorial Airport.

Project C-1 consisted of: Grading and drainage of E/W, N/S and NW/SE landing strips, intermediate, adjacent and building areas and access road; turfing and installation of segmented circle marker system.

Project C-2 consisted of: Relocating the Spring Lake-Lake Shore 22 KV Transmission line and primary distribution line.

Project C-3 consisted of: Paving E/W (3000' x 76') and N/S (2060' x 76') runways, taxiway (30' x 212') apron (150' x 150') and auto parking lot (140' x 450'); furnish and install electrical duct.

The total costs for Projects C-1, C-2 and C-3 amounted to \$94,700.57. Of this cost, the City of Grand Haven contributed \$23,675.12, the State of Michigan contributed \$23,675.17 and the Federal Government contributed \$47,350.20.

Project C-4, begun in 1956, consisted of: Bituminous surfacing of the N/S runway. This project cost \$7,772.72 with the City of Grand Haven and the State of Michigan both contributing \$3,886.36.

Project C-5, initiated in 1957, consisted of: Purchase land and clearing of east approach. The total cost of the project was \$21,669.22. Grand Haven contributed \$9,500.17, the State of Michigan contributed \$1,334.49 and the Federal Government contributed \$10,834.36.

Project C-6, initiated in 1962, consisted of: 750' E/W runway extension. The total cost of this project was \$24,918.30. The City of Grand Haven contributed \$12,699.57 and the State of Michigan contributed the remaining \$12,218.73.

Project C-7, 1965, consisted of: Construct taxi streets from apron to hangers. The cost of project C-7 amounted to \$4,847.23 with the City of Grand

Grand Haven contributing \$3,347.23 and the State of Michigan contributing \$1,500.00.

Projects C-8 and C-9 were both initiated in 1967: Pave entrance road parking area with service drive to apron; and drain south end of N/S runway. The total costs for projects C-8 and C-9 amounted to \$11,553.82. The City of Grand Haven and the State of Michigan both contributed \$5,776.91.

Of the nine projects initiated between 1948 and 1967, four were paid for by Local, State and Federal support and the remaining five paid for by State and Local monies. The total cost of all nine projects was \$165,461.86. The City of Grand Haven contributed \$58,885.36, the State of Michigan contributed \$48,391.66 and the Federal Government contributed \$58,184.36.

SOURCE: Michigan Aeronautics Commission Records.

Figure VII on the following page shows the breakdown of each project and the distribution of cost. In addition to the monies shown, much has been contributed to the development and maintenance of the Grand Haven Airport by private individuals and organizations.

Sponsor's Assurances

When Grand Haven or any other community accepts money under the Federal Aid or State/Local programs they agree on the following conditions which remain in full force and effect throughout the useful life of the facilities developed to a maximum of 20 years:

The sponsor will keep the airport open to all types, kinds and classes of aeronautical use without discriminating between each.

The sponsor will not grant an exclusive right to anyone that uses the airport for aeronautical operations.

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The sponsor will charge prices and furnish services on a fair, equal and nondiscriminatory basis.

The sponsor will operate and maintain the airport and all facilities and will not permit any activity which would interfere with its use for aeronautical purposes.

Insofar as is within its powers and reasonably possible, the sponsor will prevent the use of any land either within or outside the boundaries of the airport in any manner which would create a hazard to the landing, taking-off, or maneuvering of aircraft at the airport, or otherwise limit the usefulness of the airport.

The sponsor will maintain a current approved airport layout plan.

Past Federal Aid and State/Local Projects

Grand Haven Memorial Airport

<u>Project # and Date</u>	<u>Project Description</u>	<u>State</u>	<u>Local</u>	<u>Federal</u>	<u>Total</u>	
C-1 1948	Grading & drainage of E/W, N/S, and NW/SE landing strips, intermediate, adjacent and building areas and access road; turfing and installation of segmented circle marker system.	23,675.17	23,675.12	47,350.20	94,700.57	
C-2 1948						Relocating the Spring Lake-Lake Shore 22 KV Transmission line and primary distribution line.
C-3 1948						Paving E/W (76' x 3000') and N/S (76' x 2060') runways, taxiway (30' x 212'), apron (150' x 150') and auto parking area (140' x 450'); furnish and install electrical duct.
C-4 1956	Bituminous surfacing of north/south runway.	3,886.36	3,886.36	-0-	7,772.72	
C-5 1957	Purchase land and clearing of east approach.	1,334.49	9,500.17	10,834.36	21,669.22	
C-6 1962	750' E/W runway extension	12,218.73	12,699.57	-0-	24,918.30	
C-7 1965	Construct taxi streets from apron to hangars.	1,500.00	3,347.23	-0-	4,847.23	
C-8 1967	Pave entrance road parking area with service drive to apron.	5,776.91	5,776.91	-0-	11,553.82	
C-9 1967						Drain south end of N/S runway.
GRAND TOTALS		48,391.66	58,885.36	58,184.36	165,461.86	

FACT FINDER SURVEY

During a seven-day period starting July 14, 1970, and ending July 20, 1970, a Fact Finder Survey was conducted at the Grand Haven Memorial Airport. The purpose of the survey was to determine the type and quantities of aircraft and individuals that use the Grand Haven Airport. Each pilot that landed or departed during the week was interviewed and asked to answer a few questions pertinent to their flight activities. The combined daily results of the survey show that there were 100 itinerant operations with flights originating as far away as Tucson, Arizona. The total number of local operations for the seven-day period was 132. The combined local and itinerant operations totaled 232. The operations for the seven-day period have been further separated by "Purpose of Flight." Of the 232 total operations the interviewer was able to determine the "Purpose of Flight" for 202. Business flights totaled 57 (28.21%), 84 (41.58%) flights were for personal reasons, 43 (21.28%) were for instructions, 4 (1.98%) commercial, and 14 (6.95%) were listed as "other." There were 30 flights whose purpose was not determined.

During the 1962 Michigan Aeronautics Commission Fact Finder Survey, which was conducted on a state wide basis, it was determined that passengers spend an average of \$5.41 per general aviation itinerant passenger. The Michigan Aeronautics Commission estimates that there were 14,600 general aviation itinerant passengers in 1962 and 17,700 in 1969 at Grand Haven. Using the average of \$5.41 per passenger we estimate that \$79,000 was spent in the Grand Haven area in 1962 by general aviation passengers and pilots and increased to \$95,000 in 1969, an increase of 20%.

The following four pages are a day-by-day breakdown of the 1969 Grand

Haven Fact Finder Survey. Keep in mind that the weather during most of the survey week was fair to poor and, therefore, the operations shown are a minimum that would occur in a seven-day period.

Tuesday, July 14, 1970

Weather and Visibility Poor

Total Local Operations 10

ITINERANT			AIRCRAFT OPERATIONS	
<u>Type of Aircraft</u>	<u>Origin</u>	<u>Destination</u>	<u>Inbound</u>	<u>Outbound</u>
Beech King Air	Quincy, Ill.	Grand Haven	1	
Cessna 172	Grand Haven	Muskegon		1
Cessna 310	Muskegon	Muskegon	1	1
Beech Bonanza	Wilmington, Del.	Elkhart, Ind.	1	1
Bell 47 G (Helicopter)	Greenville	Greenville	1	1
Cessna 150	Muskegon	Muskegon	<u>1</u>	<u>1</u>
			5	5

Total Itinerant Operations 10

TOTAL OPERATIONS 20

Dollar Volume in This Area on This Date \$111.06

Wednesday, July 15, 1970

Weather and Visibility Poor

Total Local Operations 10

ITINERANT			AIRCRAFT OPERATIONS	
<u>Type of Aircraft</u>	<u>Origin</u>	<u>Destination</u>	<u>Inbound</u>	<u>Outbound</u>
Piper Cherokee	Pontiac	Grand Haven	1	
Beech D-18	Chi-Midway	Chi-Midway	1	1
Beech D-18	Chi-Midway	Chi-Midway	1	1
Beech King Air	O'Hare	O'Hare	1	1
Cessna 310	Milwaukee	Milwaukee	1	1
Bell 47 G (Helicopter)	Greenville	Hastings	1	1
Cessna 150	Kalamazoo	Kalamazoo	1	1
Piper Tri Pacer	Private Strip	Private Strip	<u>2</u>	<u>2</u>
			9	8

Total Itinerant Operations 17

TOTAL OPERATIONS 27

Dollar Volume in This Area on This Date \$24.86

Thursday, July 16, 1970

Weather and Visibility Good

Total Local Operations 40

ITINERANT			AIRCRAFT OPERATIONS	
<u>Type of Aircraft</u>	<u>Origin</u>	<u>Destination</u>	<u>Inbound</u>	<u>Outbound</u>
Beech Bonanza	Mettetal	Mettetal	1	1
Piper Cherokee	Grand Haven	Mackinac		1
Cessna 150	Muskegon	Muskegon	1	1
Piper Aztec	Quincy	Quincy, Ill.	1	1
Beech King Air	Grand Haven	Quincy, Ill.		1
Piper Cherokee	Greenville	Greenville	1	1
Piper Cherokee	Grand Haven	Holland		1
Cessna 172	Lansing	Lansing	1	1
Beech Bonanza	Mt. Pleasant	Mt. Pleasant	1	1
Cessna 172	Grand Haven	Chi-Miggs		1
Piper Comanche	Wabash, Ind.	Holland	1	1
Cessna Skywagon	Muskegon	Muskegon	4	4
Cessna 150	Greenville	Greenville	1	1
Meyers 200	Ada	Ada	1	1
Cessna 140	Montague	Montague	1	1
Kelly Balmer Home Built	Private Strip	Private Strip	1	1
			<u>15</u>	<u>19</u>

Total Itinerant Operations 34

TOTAL OPERATIONS 74

Dollar Volume in This Area on This Date \$506.05

Friday, July 17, 1970

Weather and Visibility Fair

Total Local Operations 12

ITINERANT			AIRCRAFT OPERATIONS	
<u>Type of Aircraft</u>	<u>Origin</u>	<u>Destination</u>	<u>Inbound</u>	<u>Outbound</u>
Cessna 310	Grand Haven	Milwaukee		1
Cessna 310	Milwaukee	Grand Haven	1	
Cessna 172	Det-Metro	Grand Haven	1	
Cessna 172	Chi-Miggs	Grand Haven	1	
Beech D-18	Tucson, Ariz.	Grand Haven	1	
Beech D-18	Grand Haven	Det-Metro		
Beech Travelair	Grand Haven	Kalamazoo		1
Piper Clipper	Grand Haven	Wallen		1
Beech D-18	Det-Metro	Grand Haven	<u>1</u>	<u>1</u>
			5	4

Total Itinerant Operations 9

TOTAL OPERATIONS 21

Saturday, July 18, 1970

Weather and Visibility Poor

Total Local Operations 30

ITINERANT			AIRCRAFT OPERATIONS	
<u>Type of Aircraft</u>	<u>Origin</u>	<u>Destination</u>	<u>Inbound</u>	<u>Outbound</u>
Cessna 182	Alaska	Grand Haven	1	
Piper Cherokee	Mackinac	Grand Haven	1	
Piper Tri Pacer	Reinlander, Wisc.	Grand Haven	1	
Piper Tri Pacer	Nunica	Nunica	1	1
Piper Cherokee	Grand Rapids	Grand Rapids	1	1
Cessna 172	Grand Haven	Boyne		<u>1</u>
			<u>5</u>	<u>3</u>

Total Itinerant Operations 8

TOTAL OPERATIONS 38

Sunday, July 19, 1970

Weather and Visibility Poor

Total Local Operations 12

<u>ITINERANT</u> <u>Type of Aircraft</u>	<u>Origin</u>	<u>Destination</u>	<u>AIRCRAFT OPERATIONS</u>	
			<u>Inbound</u>	<u>Outbound</u>
Piper Cub	Grand Haven	Lake Near Home		1
Piper Cherokee	Muskegon	Muskegon	1	1
Pitts Home Built	Muskegon	Muskegon	<u>1</u>	<u>1</u>
			2	3

Total Itinerant Operations 5

TOTAL OPERATIONS 17

Monday, July 20, 1970

Weather and Visibility Fair

Total Local Operations 18

<u>ITINERANT</u> <u>Type of Aircraft</u>	<u>Origin</u>	<u>Destination</u>	<u>AIRCRAFT OPERATIONS</u>	
			<u>Inbound</u>	<u>Outbound</u>
Piper Cherokee	Chi-Hammond	Grand Haven	1	
Cessna 310	Milwaukee	Grand Haven	1	
Beech K-35	Lansing	Kokomo	1	1
Beech Bonanza	Howell	Grand Haven	1	
Mooney Executive	Muskegon	Muskegon	1	1
Cessna 182	Lawrence Airport	Sparta	1	1
Beech Bonanza	Grand Haven	Definace, Ohio		1
Piper Cub	Charlevoix	Chi-Hammond	1	1
Piper Cherokee	Grand Haven	Ionia		1
Cessna 310	Indianapolis, Ind.	Grand Rapids	1	1
Cessna 310	Grand Haven	Cheboygan		1
Piper Tri Pacer	Grand Haven	Reinlander, Wisc.	<u>1</u>	<u>1</u>
			8	9

Total Itinerant Operations 17

TOTAL OPERATIONS 35

Dollar Volume in This Area on This Date \$121.71