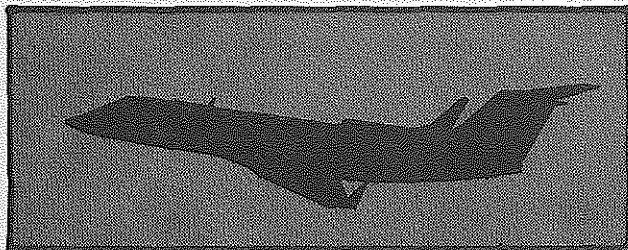
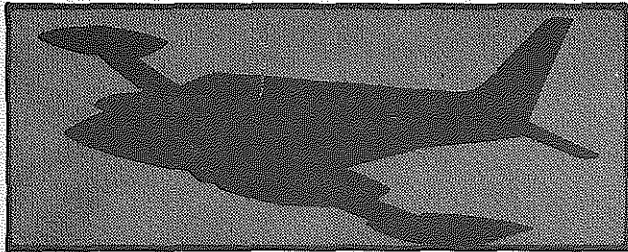
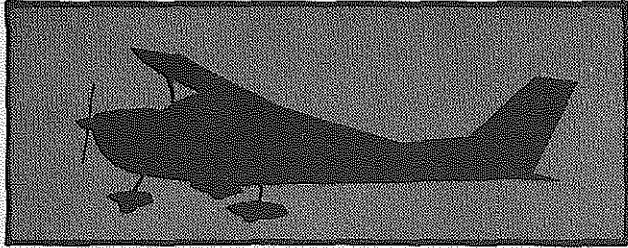


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**VALUE OF AIRPORTS TO THEIR COMMUNITIES —  
ECONOMIC IMPACT OF AVIATION ON MICHIGAN  
SUMMARY OF METHODOLOGY AND FINDINGS**



prepared for  
**MICHIGAN DEPARTMENT OF  
TRANSPORTATION**

**WILBUR SMITH ASSOCIATES**

AUGUST, 1989

**MICHIGAN DEPARTMENT OF TRANSPORTATION**  
**Bureau of Transportation Planning**

**Value of Airports To Their Communities -  
Economic Benefits of Aviation Study**

August, 1989

**SUMMARY OF METHODOLOGY AND FINDINGS**

This report represents the findings and/or professional opinions of the staffs of the Michigan Department of Transportation and their study consultants, Wilbur Smith Associates and F. Coleman and Associates. It is not an official opinion of the Michigan State Transportation Commission.

**STATE TRANSPORTATION COMMISSION**

**William C. Marshall, Chairperson**

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**FOR FURTHER INFORMATION**

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Aviation is generally perceived to be an important means of transport for people and goods. However, it does much more than this. Aviation has developed to the point that it has become the basis of a national and even global economy. Aviation is much more than large air carrier airports. In the U.S. only 25 of the more than 16,000 airports are considered to be "large hubs". Most are similar to Michigan's small and mid-sized commercial service airports and the dozens of general aviation airports which serve most of Michigan's cities and towns. A great deal of aviation induced economic activity takes place at these facilities.

Recognizing the importance of these small and mid-sized airports, and desiring to quantify that importance, the Michigan Department of Transportation supported by the Federal Aviation Administration, sponsored this study of aviation's economic role in Michigan.

### Study Purposes

This study identifies values of airports, both economic and non-economic, to Michigan communities. It quantifies the economic impacts of individual airports on their local area economies, and, in aggregate, on Michigan's economy. The economic value is gauged in terms of the economic transactions that the airports cause. These are the jobs, payroll and expenditures due to the provision and use of aviation, the businesses that use or serve the airports and the investments made because of them. The impacts are assessed in terms of the monetary values and jobs which the Michigan airports create for regional and state economies. The study also identified ways in which airports promote the health, safety and welfare of Michigan residents and cites airport-specific examples of these non-economic values.

### Methodology

The study includes detailed investigations of a selected sample of 32 Michigan airports, comprising a representative cross-section of airports in the state. It explains how the regions' residents and

industries benefit from aviation and the presence of an airport. Results were then extrapolated to the total state airport system, to quantify aggregate economic impacts of all airports, statewide.

The economic impact calculations include only those impact types that can be quantified in a credible manner, and which clearly can be attributed to the specific study airports. In this sense, the impact values may be viewed as conservative.

### Economic Impact Methodology

The methodology used to gauge the economic impact of each airport investigated is one which has evolved over the past decade, and is now nationally recognized as the standard for conducting economic impact studies of airports. The methodology is consistent with that advocated for use by the Federal Aviation Administration (FAA) and makes use of the Regional Input/Output Modeling System (RIMS-II), (the official econometric model of the United States Government, as developed by the U.S. Department of Commerce). The methodology as applied in Michigan uses impact definitions devised by the FAA and explicitly follows the FAA-suggested procedures.

The study used an "impact" approach rather than a "transportation benefits" approach. Therefore, it does not explore the efficiencies of air travel, or the benefits to be derived from air travel. Rather, it measures the importance of aviation as an industry, in terms of the employment it provides and the economic activity it generates as it makes use of locally-produced goods and services. The evaluation does not attempt to ask what would happen to the economy if the airport suddenly ceased to exist, since such events would be speculative at best.

All impacts are expressed in terms of annual expenditures of money, with all inputs calculated for the latest year for which data are available (some impacts are for the year 1987 while some others are for 1988).

**Economic Impact Types**

The economic impacts include locally purchased goods and services, calculated in "value-added" terms. The impacts are of three types: Direct, Indirect, and Induced. Impact types and their relationships are diagrammed below. Each airport's total impact is the sum of the three types.

**Direct Economic Impacts** - Occurring as a consequence of providing aviation services at an airport, the direct impacts comprise the financial expenditures by firms that carry passengers (air carrier, air charter and air taxi), firms that serve the air carrier and general aviation functions (airport tenants), governmental agencies which support aviation, ground transport firms, and others. In every instance, the impacts include only expenditures whose recipient is located within each airport's service area. Direct impacts typically (but not always) occur at the airport.

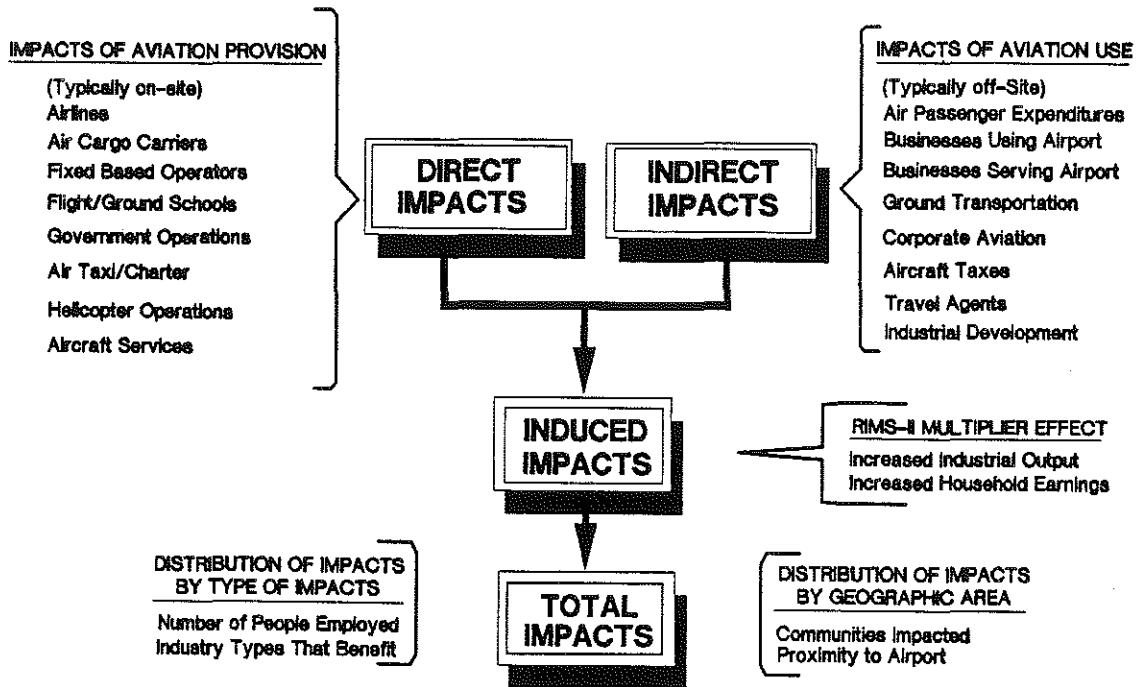
**Indirect Economic Impacts** - Indirect impacts occur as a result of the use of air

services and may occur at locations at, or away from the airport. They include the regional expenditures made by air passengers who visit the region, expenditures by the region's residents, (e.g., travel to and from the airport) and the value-added impacts of firms having economic activity which depends on the airport.

**Induced Economic Impacts** - The direct and indirect impacts are important, since they represent net increases in regional final demand. Such increases, however, do not represent the total economic impact attributable to an airport. Rather, there is also a "multiplier" or continued dollar circulation effect. The multiplier effect was determined using the U.S. Department of Commerce "Regional Input-Output Modeling system," with appropriate multiplier coefficients, specific to the study area.

The attached pages describe the results of this study. A glossary of economic and aviation terms used in the study may be found after the major findings.

**AIRPORT ECONOMIC IMPACT TYPES**



**Major Findings**

This study assessed Michigan's airport system to define the values which the airports create for their communities. The investigations found that the quantifiable economic impacts (shown in Exhibit B) are quite impressive. In terms of total economic activity:

- \* The airports generate a combined \$5.23 billion in annual economic activity, statewide;
- \* Detroit Metro dominates with \$4.08 billion (78 percent)
- \* The other 23 air carrier airports yield a \$780 million impact (15 percent)
- \* The 213 general aviation airports also are seen as important, creating a combined \$370 million annual impact (7 percent)
- \* Households earn an estimated \$1.70 billion from the economic activities related to Michigan airports;
- \* Of the total economic impacts at the surveyed airports, (shown in Exhibit C) direct impacts made up 23.6 percent; indirect, 36.1 percent and induced, 40.3 percent. This means that 40.3 percent of the aviation related impacts at airports accrue to people in the region who are neither suppliers nor users of aviation services and who may not perceive themselves as benefitting from the airports.
- \* Overall, it is estimated that 101,105 jobs result, directly or indirectly, from the economic activities at the state's airports.

The study also found a number of ways in which airports support and enhance the health, welfare and safety of Michigan residents and visitors but do not have a quantifiable economic value.

- \* Creation of consumers' surplus values -- additional unquantifiable economic savings to trip makers who would be willing to pay more than the actual cost of air travel;
- \* Michigan's airports add to transportation efficiency. For many trips, made by most people, the aviation mode offers the lowest total cost; for certain trips by certain

people, the fast, direct service offered by general aviation justifies the expense of air taxi, charter or a local-based corporate aircraft.

- \* Many Michigan employers depend upon the state's airports for a number of values which could not be quantified in dollar-terms:

- o clients -- current or prospective -- are flown in for meetings, inspection tours or presentations aimed at marketing or improved efficiency;

- o employees -- occasional general aviation use is justified by payoffs in sales, efficiencies or crisis management;

- o cargo -- instances of both routine and emergency use of general aviation for air cargo were found in the study surveys to be important to business users, although the value to the business could not be quantified.

- \* Specialized services were found during the surveys to occur at some airports. These are of value to all of Michigan and include support for forest fire control; wildlife and natural resource management; law enforcement support (bases for search and surveillance aircraft); utility patrols to inspect conditions along gas transmission pipes and power lines, to locate actual or potential trouble spots; aerial photography, agricultural seeding/spraying; or weather stations. Many Michigan airports aid in preparation for aviation careers by supporting or supplementing local school or college programs and by offering flight training or opportunities for job experience;

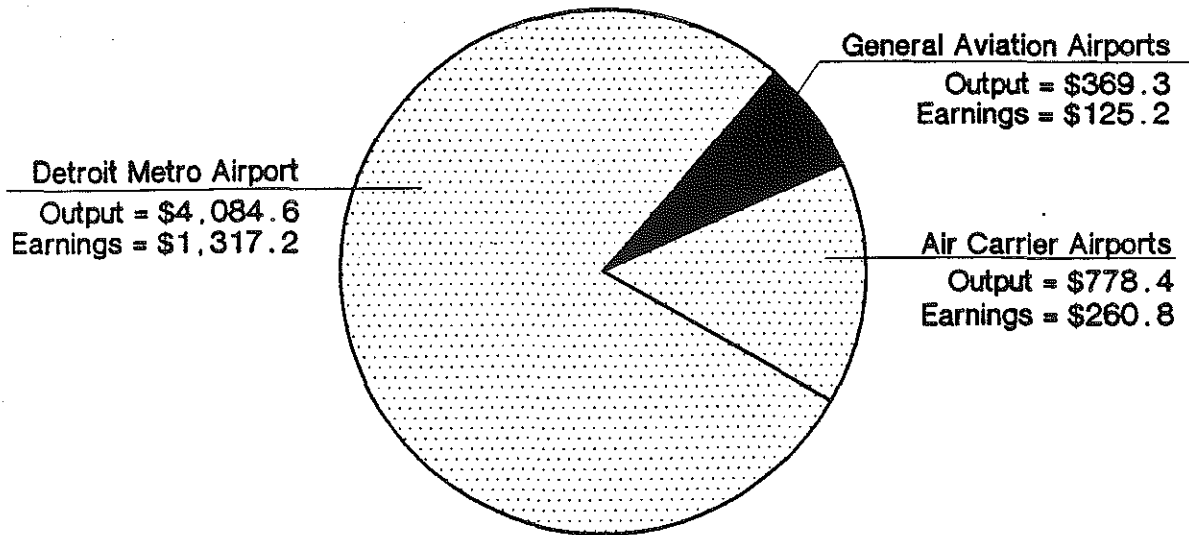
- \* Emergency services are provided when called for at many Michigan airports. Discussions with airport representatives at the 32 surveyed airports identified the following more frequent illustrations:

- o medical evacuation;

- o shipment of medical supplies or samples for diagnosis or treatment;

- o access after winter storms

**RELATIVE ECONOMIC ACTIVITY  
AIR CARRIER AND GENERAL AVIATION AIRPORTS  
( \$ in Millions )**



**Exhibit C**  
**AVIATION-RELATED LOCAL ECONOMIC IMPACTS**  
**BY STUDIED MICHIGAN AIRPORT**  
**1987-88**

ASSOCIATED COMMUNITY	AIRPORT NAME	ANNUAL ECONOMIC IMPACTS			
		Direct	Indirect	Induced	Total
Allegan	Padgham Field	\$ 149,300	\$ 105,120	\$ 103,580	\$ 358,000
Alma	Gratiot Community	1,149,600	387,400	780,000	2,317,000
Alpena	Phelps Collins	5,336,000	1,888,500	3,434,500	10,658,000
Bad Axe	Huron County Mem.	104,000	644,000	341,000	1,089,000
Baldwin	Municipal	-- (1)	141,400	59,600	201,000
Benton Harbor	Twin Cities Ross Fld.	1,272,000	4,636,000	3,826,000	9,734,000
Charlevoix	Municipal	197,000	924,000	563,000	1,684,000
East Lansing	Art Davis	116,000	33,000	54,000	203,000
Escanaba	Delta County	576,900	1,412,500	1,009,600	2,999,000
Fremont	Municipal	92,400	650,900	330,700	1,074,000
Gaylord	Otsego County	101,000	3,007,000	1,630,000	4,738,000
Gladwin	Gladwin	54,000	124,000	76,000	254,000
Grand Rapids	Kent County Int'l.	34,862,100	103,694,200	101,474,700	240,031,000
Hancock	Houghton County Mem.	1,083,300	2,475,000	1,793,700	5,352,000
Jackson	Reynolds Field	3,181,000	2,541,000	3,917,000	9,639,000
Kalkaska	Kalkaska City	--	--	--	--
Ludington	Mason County	618,400	334,800	485,800	1,439,000
Marquette	Marquette County	26,207,400	6,155,200	16,272,400	48,635,000
Monroe	Monroe Custer	177,300	460,100	391,600	1,029,000
Mt Pleasant	Municipal	695,000	1,121,000	902,000	2,718,000
Muskegon	Muskegon County	4,476,000	8,018,000	9,224,000	21,718,000
Plymouth	Mettetal Canton	748,200	1,243,800	1,460,000	3,452,000
Pontiac	Oakland-Pontiac	32,782,000	17,204,000	34,889,000	84,875,000
Saginaw	Harry Browne Int'l.	1,350,000	379,000	1,486,000	3,215,000
Saginaw	Tri-City Int'l.	9,934,600	34,988,700	34,340,700	79,264,000
Sandusky	Cowley Field	--	3,200	700	3,900
Sandusky	City	50,000	30,600	24,400	105,000
Sparta	Sparta	150,800	265,500	201,700	618,000
Sturgis	Kirsch Municipal	342,600	323,300	282,100	948,000
Traverse City	Cherry Capital	8,722,500	13,488,000	11,128,500	33,339,000
Utica	Berz-Macomb	1,010,000	669,000	1,163,000	2,842,000
Wayland	Municipal	800	33,290	5,910	40,000
<b>TOTALS</b>		<b>\$135,540,200</b>	<b>\$207,381,510</b>	<b>\$231,650,190</b>	<b>\$574,571,900</b>
<b>PERCENT OF TOTAL</b>		<b>23.6</b>	<b>36.1</b>	<b>40.3</b>	<b>100.0</b>

Note: Local impacts recognize those expenditures circulating through the economy of the airport service area.

(1) "--" indicates that this type of impact is not quantifiable at this airport.

\* Perceived community asset/stimulus to development -- many community leaders in Michigan regard the local airport as a desirable facility which adds to the quality of local life. During the study surveys, many local discussions, especially those relating to airports in non-urbanized areas, remarked on the need for economic development and job opportunities in rural Michigan. Reasonably convenient access to an airport is perceived as a distinct advantage to communities seeking to attract industrial development.

### Interpretation and Conclusions

The calculations show that Michigan's airport system has a substantial annual aggregate economic impact on the state in terms of total economic activity. This impact is approximately \$5.23 billion, of which, Detroit Metro Airport accounts for \$4.08 billion, or about 78 percent.

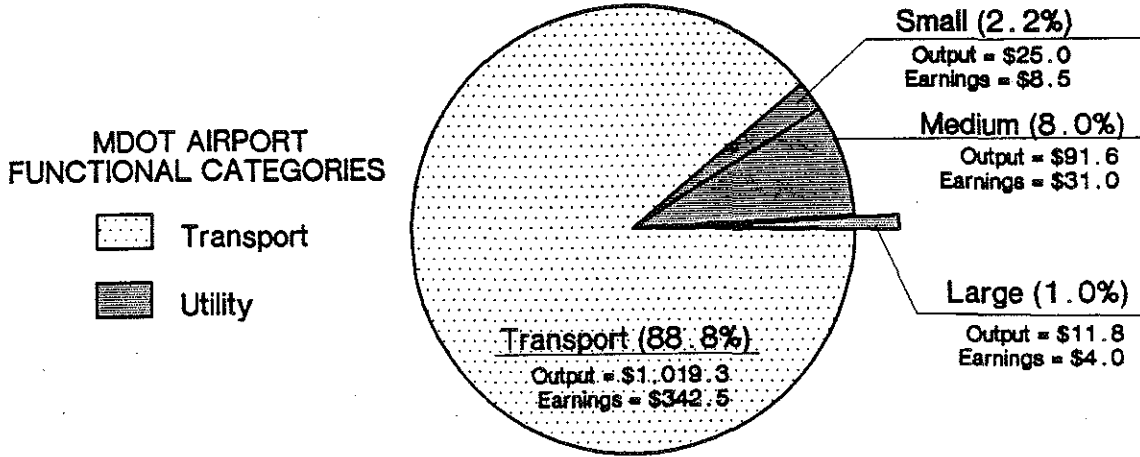
Of the total excluding Detroit Metro (\$1.15 billion), airports served by both commercial air carriers and general aviation account for approximately \$780 million or 68 percent. General aviation

airports yield approximately \$370 million in economic impacts, making up the remaining 32 percent. This relationship is diagrammed in Exhibit B.

When the total economic activity impacts are allocated to MDOT's airport functional categories, as diagrammed in Exhibits D and E, it becomes clear that larger airports generate a very high percentage of total economic impacts -- the Transport Airport Category accounts for 97.5 percent of the total. However, small facilities still generate high dollar impacts, particularly when placed in the context of the non-urbanized economies.

Results of the RIMS-II analyses (given in Exhibit F) show that 37 major industry groups in Michigan (of a total of 38 possible industry groups) show significant total economic impacts resulting from the economic activity at Michigan's airports. Also shown is how total statewide estimated household earnings (payroll) are distributed over major industry groups in Michigan. The Exhibit also shows that a total of more than 101,105 jobs statewide, are attributed to airports' economic activity, and indicates in which industry groups the jobs are located.

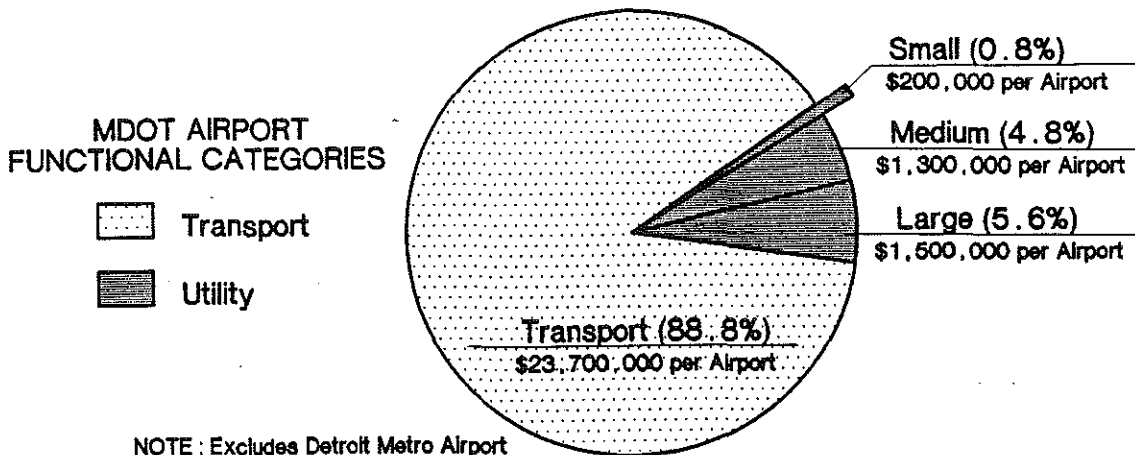
### TOTAL ECONOMIC IMPACTS BY MDOT's AIRPORT FUNCTIONAL CATEGORIES EXCLUSIVE OF DETROIT METRO ( \$ in Millions )



NOTE : Detroit Metro Airport  
Output = \$4,084.6  
Earnings = \$1,317.2

Exhibit D

### AVERAGE ECONOMIC IMPACTS PER AIRPORT BY MDOT's AIRPORT FUNCTIONAL CATEGORIES



NOTE : Excludes Detroit Metro Airport

Exhibit E

**Exhibit F**  
**STATEWIDE ECONOMIC IMPACT OF AVIATION IN MICHIGAN**  
**BY IMPACTED INDUSTRY TYPE**  
**(\$ Thousands)**  
**1987**

<u>IMPACTED INDUSTRY GROUPS</u>	<u>TOTAL ANNUAL IMPACT (Output)</u>	<u>TOTAL ANNUAL PAYROLL (Earnings)(1)</u>	<u>EMPLOYMENT (Jobs)</u>
Ag. Prod., Forestry Svcs.	\$40,818	\$11,411	1,379
Forestry Products	506	81	12
Coal Mining	0	0	0
Crude Petrol.	6,227	633	16
Other Mining	1,821	477	16
New Construction	16,929	5,995	224
Maint. and Repair Const.	51,263	23,463	875
Food, Kindred Prod.	166,920	23,544	847
Textile Mill Products	1,181	210	9
Apparel	5,512	1,532	45
Paper, Allied Products	27,732	5,798	172
Printing, Publishing	43,045	14,834	628
Chemicals, Refined Petrol.	108,270	10,525	258
Rubber, Leather Prod.	27,598	6,788	290
Lumber, Furniture Prod.	9,568	2,686	103
Stone, Clay, Glass Prod.	12,935	4,069	124
Primary Metals	28,309	6,541	167
Fabricated Metals	29,108	8,123	246
Non-electrical Machinery	20,443	6,428	188
Electrical Machinery	16,547	4,361	137
Motor Vehicles, Equipment	67,749	11,121	223
Other Transportation Equip.	26,300	9,072	269
Instruments	3,417	1,031	37
Miscellaneous Mfg.	10,182	2,850	147
Transportation	1,904,483	655,789	23,846
Communications	68,547	18,089	501
Utilities	134,063	13,849	358
Wholesale Trade	144,614	56,647	1,930
Retail Trade	243,367	120,926	8,992
Finance	48,425	14,304	614
Insurance	58,712	19,363	726
Real Estate	220,670	5,193	1,292
Lodging, Amusements	657,144	233,137	22,607
Personal Services	40,299	18,247	1,813
Business Services	279,711	125,452	5,775
Eating, Drinking Estab.	518,794	162,134	20,285
Health Services	94,787	55,092	2,437
Other Services	96,286	36,958	2,126
Households	N/A	6,419	1,391
<b>TOTALS</b>	<b>\$5,232,282</b>	<b>\$1,703,172</b>	<b>101,105</b>

N/A denotes "not applicable."

(1) The portion of the "output" column that is payroll to employed persons.



## GLOSSARY

The following is a glossary of economic and aviation terms used in the study.

### Economic Impact Terms:

**Direct Economic Impact** - Financial transactions that occur due to the provision of aviation service. Typically occurs at the airport, and includes airport, airline, FBO, and other airport tenant payrolls and expenditures which are of value to the region.

**Indirect Economic Impact** - Financial transactions due to the use of an airport. They include expenditures by aviation users, and expenditures by businesses whose existence is tied to the airport or to aviation (e.g., corporate air operations, travel agencies). Expenditures may occur at the airport, or elsewhere in the service area.

**Induced Economic Impact** - The "multiplier" implications associated with the direct and indirect impacts. These are subsequent economic transactions, as money circulates through the economy.

**Total Economic Impact** - The "Direct" plus "Indirect" plus "Induced" economic impacts.

**Value Added** - The local (service area) content of a firm's expenditures, typically the value of a firm's output minus the value of the inputs it purchases from other firms located outside of the region.

**FEQ** - Full-time equivalent jobs (two part-time jobs equals one FEQ) that are attributable to the airport.

**RIMS-II** - A regional input-output econometric model developed by the U.S. Department of Commerce which is used to calculate the Induced Economic Impact. The model is specific to the Michigan area of impact considered.

**Leakages** - That portion of expenditures which leaves the impact area (federal taxes, fuel purchases, aircraft and parts purchases external to the region, etc.). Not included as a local economic impact.

**Final Demand** - The value of the aviation-related financial expenditures that comprise the airport's direct and indirect impacts.

### Aviation Terms:

**Based Aircraft** - Airplanes located at the subject airport when not in use.

**FBO** - Fixed-Base Operator, a business at the airport which may offer a variety of services often including aircraft storage and parking, fuel sales, and maintenance, flight instruction, sales of aircraft, parts, etc.

**General Aviation** - That portion of civil aviation which encompasses all facets of aviation except air carriers holding a certificate of convenience and necessity from the Federal Aviation Administration, and large aircraft commercial operators.

**Itinerant Flight** - A flight which originates at one airport and terminates at another.

**Local Flight** - A flight which terminates at the point of departure.

**Operation** - One aircraft takeoff or one aircraft landing at an airport.

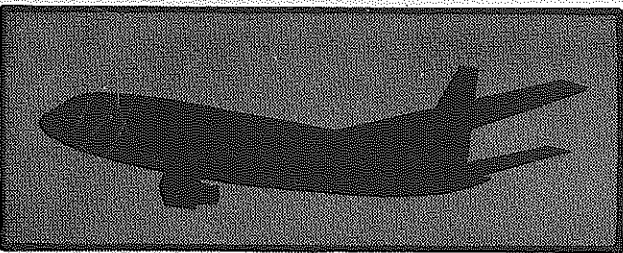
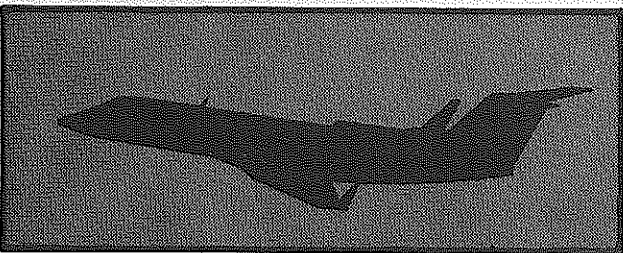
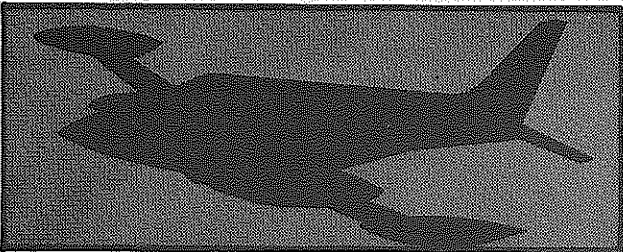
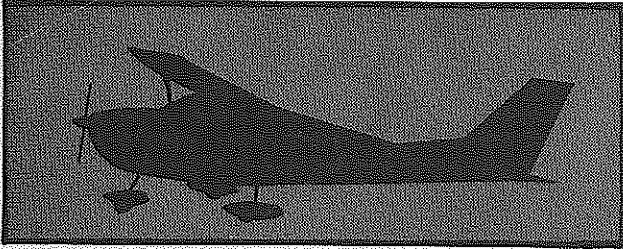
**Visitor** - A person (aircraft passenger and/or pilot) who resides outside of the service area and who arrived in the area via one of the airports.

**Private Airport** - An airport that is privately owned, but is open for use by the general public.

**Airport Tenant** - A firm which is located on the airport's property, and which leases land and/or buildings directly or indirectly from the airport owner.

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**WILBUR SMITH ASSOCIATES**

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## ACKNOWLEDGEMENTS

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Appreciation is extended to the airport managers and their staffs and to airport tenants at the 32 airports investigated in detail, for their assistance in providing data and answering inquiries. Local perspectives of airport activity also were provided by the airport managers.

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## EXECUTIVE SUMMARY

This study assessed Michigan's airport system to define the values which the airports create for their communities. The investigations found that the quantifiable economic impacts are quite impressive, in terms of total economic activity:

- \* the airports generate a combined \$5.23 billion in annual economic activity, statewide;
- \* Detroit Metro dominates with \$4.08 billion;
- \* the other 23 air carrier airports yield a \$0.78 billion impact;
- \* the 213 general aviation airports also are seen as important, creating a combined \$0.37 billion annual impact;
- \* households earn an estimated total of \$1.70 billion from the economic activities related to Michigan airports;
- \* overall, it is estimated that 101,105 jobs result, directly or indirectly, from the economic activities at the state's airports.

The study also found a number of ways in which airports support and enhance the health, welfare and safety of Michigan residents and visitors:

- \* Creation of consumers' surplus values -- additional unquantifiable economic savings to trip makers who would be willing to pay more than the actual cost of air travel;
- \* Michigan's airports add to transportation efficiency. For many trips, made by most people, the aviation mode offers the lowest total cost; for certain trips by certain people, the fast, direct service offered by general aviation justifies the expense of air taxi, charter or a local-based corporate aircraft.
- \* Many Michigan employers depend upon the state's airports for a number of values which could not be quantified in dollar-terms;
  - o clients -- current or prospective -- are flown in for meetings, inspection tours or presentations aimed at marketing or improved efficiency;
  - o employees -- occasional general aviation use is justified by payoffs in sales, efficiencies or crisis management;
  - o cargo -- instances of both routine and emergency use of general aviation for air cargo were found in the study surveys to be important to business users, although the value to the business could not be quantified.

- \* specialized services were found during the surveys to occur at some airports. These are of value to all of Michigan and include support for forest fire control; wildlife and natural resource management; law enforcement support (bases for search and surveillance aircraft); utility patrols to inspect conditions along gas transmission pipes and power lines, to locate actual or potential trouble spots; aerial photography, agricultural seeding/spraying; or weather stations. Many Michigan airports aid in preparation for aviation careers by supporting or supplementing local school or college programs and by offering flight training or opportunities for job experience;
  
- \* emergency services are provided periodically at many Michigan airports. Discussions with airport representatives at the 32 surveyed airports identified the following more frequent illustrations:
  - medical evacuation;
  - shipment of medical supplies or samples for diagnosis or treatment;
  - access after winter storms
  
- \* perceived community asset/stimulus to development -- many community leaders in Michigan regard the local airport as a desirable facility which adds to the quality of local life. During the study surveys, many local discussions, especially those relating to airports in non-urbanized areas, remarked on the need for economic development and job opportunities in rural Michigan. Reasonably convenient access to an airport is perceived as a distinct advantage to communities seeking to attract industrial development.

# Chapter 1

## INTRODUCTION AND METHODOLOGY

Aviation is generally perceived to be an important means of transport for goods and people. However, it does much more than merely serve as a key form of transportation. Aviation has developed to the point that it is now a key part of the nation's total economy. The rapid and efficient transport of people and goods has literally become the basis of a national and even a global economy.

People are relatively familiar with the value of the nation's large commercial service airports, e.g., Detroit-Metropolitan Wayne County Airport or Kent County International Airport. Airports such as these handle millions of passengers and thousands of tons of cargo annually, and their economic impacts are measured in tens of millions of dollars. Aviation, however, is much more than large airports. In the U.S. there are 16,291 airports, only 25 of which are considered to be "large hub" airports. However, much of the aviation activity occurs at the smaller airports -- the small and mid-sized commercial service airports (e.g., Tri-City Airport in Saginaw) and the dozens of general aviation airports which serve most of Michigan's cities and towns.

Recognizing the importance of these small and mid-sized airports, and desiring to quantify that importance, the Michigan Department of Transportation supported by the Federal Aviation Administration, sponsored this study of aviation's economic role in Michigan.

### Study Purposes

Airports provide values of two types to Michigan communities: economic and non-economic. Economic activity is quantifiable in terms of dollars and jobs having impacts in the airport service area and the state. Non economic activity, though generally unquantifiable, can be described in terms of community service roles.

This study seeks to identify and quantify the economic impact of individual airports on their local economies, and, in aggregate, on Michigan's economy. The economic value is measured in terms of the economic transactions that the airports cause -- the jobs, payroll and expenditures due to the provision of aviation services and aviation use, the businesses that use or serve facilities, and the investments that are made because of them. The impacts are assessed in economic "value-added" terms; that is, the monetary values which Michigan airports create for the local and state economies.

Most non-economic community value impacts of Michigan airports contribute significantly to the health, welfare and safety of the state's citizens. Study results suggest that they can be grouped into six general categories (discussed in Chapter 5): provision of specialized services (e.g., support of law enforcement, natural resource management); provision of emergency services (e.g., medical evacuation); support for dependent businesses (e.g., access for clients or executives, cargo shipments); perceived asset for development (e.g., attracting new employers); enhancing transportation efficiency (e.g., alternative to congested hubs); and encouraging the distribution of development to non-urbanized areas.

The study conducted detailed investigations of a selected sample of 32 airports in Michigan, comprising a reasonably representative cross-section of all airports in the State. The study is explanatory and documentation-oriented. It documents the local economic impacts which the individual airports make, and explains how the region's residents and industries benefit from aviation at the airports. Results were then extrapolated to the total Michigan airport system, to quantify aggregate economic impacts of all airports, statewide.

The economic calculations include only those impact types that can be quantified in a credible manner, and only those that clearly can be attributed to the specific airports. In this sense, the impact values are likely to be viewed as conservative. Overall, the study has five goals:

1. Quantify the annual economic impacts of 32 individual airports on their service areas.
2. Determine the number of jobs at each airport, and estimate the total number of people in the service area who, directly or indirectly, owe their jobs to the airports.
3. Assess pertinent non-economic impacts.
4. Determine the extent to which the communities in proximity to each airport benefit from the airports' activities.
5. Determine the value to Michigan of the state airports system, quantified and described in both economic and non-economic terms.

**Glossary of Terms -- Economic Impact**

The conduct of this economic impact study utilized a series of economic impact categories and terms which are defined as follows:

1. **Direct Economic Impact** - Financial transactions that occur due to the provision of aviation services. Typically they occur at the airport (on-site), and include airport, airline, FBO, and other airport tenant payrolls and expenditures which are of value to the region.
2. **Indirect Economic Impact** - Financial transactions due to the use of an airport. Indirect impacts include expenditures by aviation users, and expenditures by businesses whose existence is tied to the airport or to aviation (e.g., corporate air operations, travel agencies). The expenditures may occur at the airport, or elsewhere in the service area.
3. **Induced Economic Impact** - The "multiplier" implications associated with the direct and indirect impacts. These are subsequent economic transactions, as money circulates through the economy.
4. **Total Economic Impact** - The "Direct" plus "Indirect" plus "Induced" economic impacts.
5. **Value Added** - The local (service area) content of a firm's expenditures, typically the value of a firm's output minus the value of the inputs it purchases from other firms located outside of the region.
6. **Margin** - The "value added" portion of a firms expenditures.
7. **Impact Area** - Two levels of impact area are considered in this study: Local (the airport service area, loosely taken to be a generalized surrounding county or counties of "urbanized," or "non-urbanized" characteristics, as appropriate), or statewide.
8. **FEQ** - Full-time equivalent jobs (two part-time jobs equals one FEQ) that are directly or indirectly attributable to the airport.
9. **RIMS-II** - A regional input-output econometric model developed by the U.S. Department of Commerce which is used to calculate the induced economic impact. The model has been made Michigan-specific by use of groups of multipliers which represent only the Michigan economy.

10. **Earnings Impact** - That portion of the total economic impact that is wages paid to employed residents of the impact area.
11. **Leakages** - That portion of expenditures which leaves the impact area (federal taxes, fuel purchases, aircraft and parts purchases external to the region, etc.). These are not included as local economic impacts.
12. **Final Demand** - The value of the aviation-related financial expenditures that comprise the airport's direct and indirect impacts.

#### Glossary of Terms -- Aviation

The study also utilizes airport and aviation terms which, for the purposes of this impact study, are defined as follows:

1. **Based Aircraft** - General aviation airplanes believed to be located at the subject airport when not in use. The belief would be based on a summary of aircraft registration records, indicating that the airport was named as a base location and/or observation of the aircraft by the airport manager or FBO.
2. **FAA** - Federal Aviation Administration.
3. **FBO** - Fixed-Base Operator. A business on an airport which offers a variety of aviation services possibly including aircraft storage and parking, fuel sales, aircraft sales, parts and maintenance, flight instruction, etc.
4. **General Aviation** - That portion of civil aviation which encompasses all facets of aviation except air carriers holding a certificate of convenience and necessity from the Federal Aviation Administration, and large aircraft commercial operators.
5. **Itinerant Flight** - A flight which originates at one airport and terminates at another airport.
6. **Local Flight** - A flight which terminates at the point of departure.

7. **Operation** - One aircraft takeoff or one aircraft landing at an airport.
8. **Originating Passenger** - An air passenger whose trip originated from within the service area.
9. **Terminating Passenger** - An air passenger whose trip is destined within the service area.
10. **Visitor** - A person (aircraft passenger and/or pilot) who resides outside of the service area and who arrived in the area via one of the airports.
11. **Private Airport** - An airport that is privately owned, but is open for use by the general public.
12. **Public Airport** - An airport open to the general public which is owned by a community, county or regional agency.
13. **Airport Tenant** - A firm located on the airport's property which leases land and/or buildings directly or indirectly from the airport owner.
14. **Air Carrier Airport** - A facility served by at least one scheduled flight per day, on at least five different days of the week.

#### Economic Impact Methodology

The methodology used to gauge the economic impact of each airport investigated is one which has evolved over the past decade, and is now nationally recognized as the standard for conducting economic impact studies of airports. The methodology is consistent with that advocated for use by the Federal Aviation Administration (FAA),<sup>(1)</sup> uses the impact definitions devised by the FAA and explicitly follows FAA-suggested procedures. Additional steps relating to non-economic impacts, give extra information on Michigan. This study also makes use of the official econometric model of the United States Government, as developed by the U.S. Department of Commerce,<sup>(2)</sup> with multipliers which are specific to Michigan.

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(1) "Measuring the Regional Economic Significance of Airports, "Federal Aviation Administration, Washington, D.C., 1986.

(2) "Regional Input-Output Modeling System," U.S. Department of Commerce, Bureau of Economic Analysis.

The methodology is an "impact" approach rather than a "transportation benefits" approach. Therefore, it does not explore the efficiencies of, or the benefits to be derived from air travel. Rather, it measures the importance of aviation as an industry, in terms of the employment it provides and the locally-produced goods and services which it consumes.

For study purposes, each airport is evaluated as it presently exists. The evaluation does not attempt to ask what would happen to the economy if the airport suddenly ceased to exist, since such events would be speculative at best. The study examines each airport as an industrial sector, and explains the local value of the economic activity that occurs at the airport or because of it.

All impacts are expressed in annual terms, with all input calculations based on the latest year for which data are available (some impacts are for the year 1987 while some others are for 1988). All economic impacts are expressed in terms of dollars.

The economic impacts themselves comprise financial transactions that are of benefit to the residents and businesses of the impact areas. Any financial transaction that is of such regional benefit, and that is attributable to an airport, is included. Care is taken to avoid double counting of impacts, e.g., an FBO's lease payment or fuel flowage fee payment to an airport operator is included in the FBO's impact, it is not then also included in the airport operator's impact.

The impacts that are truly and directly attributable to the aviation function are listed as "aviation-related" impacts. If an airport has tenants whose activities are not related to aviation, the economic impacts of those tenants are not included.

### Economic Impact Types

This study examined the 32 selected sample airports and identified those activities which create economic impact. The impacts are of three types:

- Direct Impacts
- Indirect Impacts
- Induced Impacts

Direct Economic Impacts - Occurring as a consequence of providing aviation services at the airports, the direct impacts comprise the financial expenditures by firms that carry passengers (air carrier, air charter and air taxi), firms that serve the air carrier and general aviation functions (airport tenants), governmental agencies which support aviation, ground transport firms and

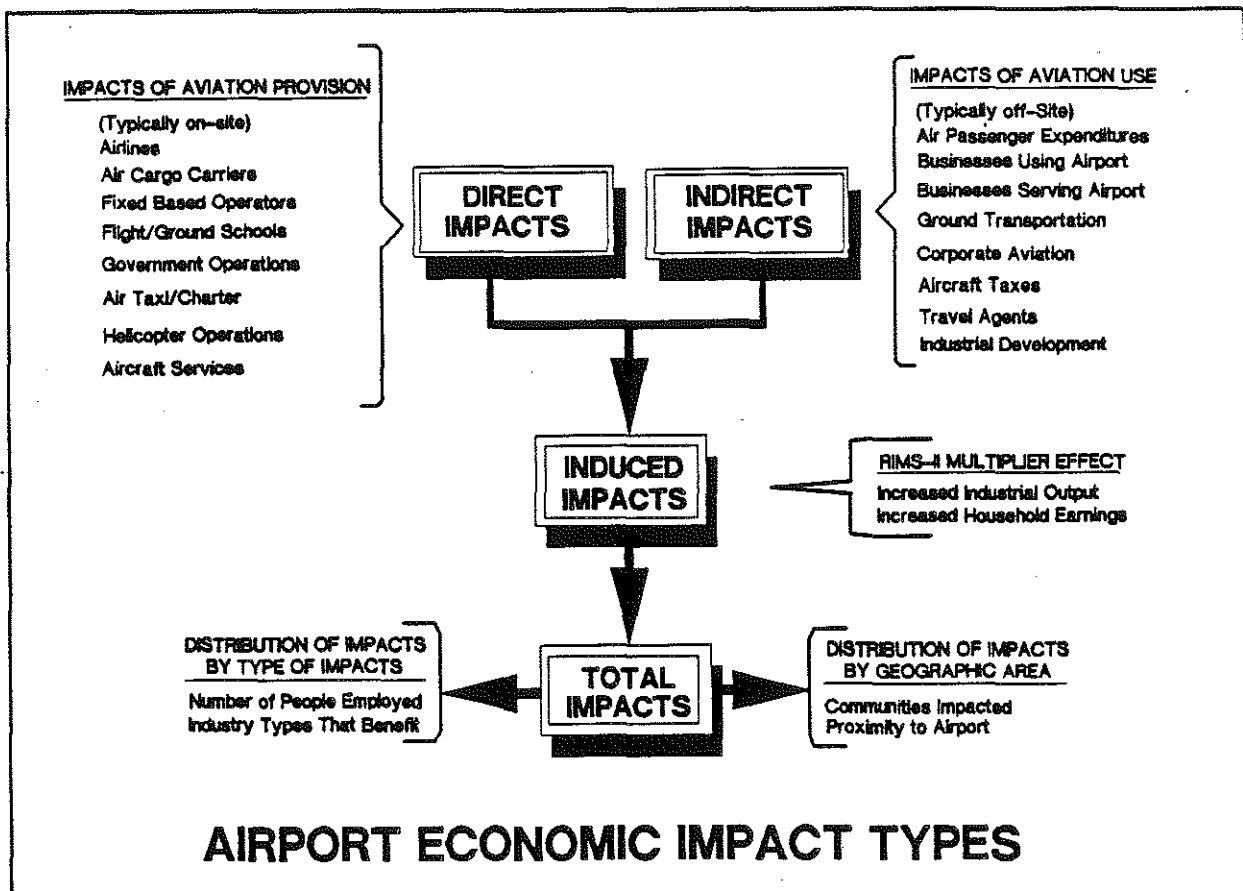


others. In every instance, the impacts include only expenditures whose recipient is located within each airport's service area. Direct impacts typically (but not always) occur at the airport.

**Indirect Economic Impacts** - Indirect impacts occur as a result of the use of air services and may occur at or away from the airport. They include the regional expenditures made by air passengers who visit the region, expenditures by the region's residents, (e.g., travel to and from the airport) and those of firms having economic activity which is dependent in part or entirely on the airport.

**Induced Economic Impacts** - Direct and indirect impacts are important, since they represent net increases in regional final demand. Such increases, however, do not represent the total economic impact attributable to the airports. Rather, there is also a "multiplier" effect. The multiplier effect was determined using the U.S. Department of Commerce "Regional Input-Output Modeling system," with appropriate multiplier coefficients for the study area.

Each airport's total economic impact is the sum of the direct, indirect, and induced impacts. The relationship of these impact types and the activities that cause them, are diagrammed below.



### Direct Impacts Methodology

The direct impacts include local (service area) expenditures by airports and firms involved in the provision of airports and airport services. Each airport's "direct impacts" are tabulated into three general classifications:

- \* Direct Payroll - The annual gross payroll of any employed person whose job is at the airport and attributable to the airport's aviation function.
- \* Capital Expenditures - Investment at or near the airport by either the airport owner/operator or by the airport's various public and private tenants. Only the money spent locally, within the impact areas region is included.
- \* Operating Expenses - The annual costs of operation of the airport's tenants, the airport, and other firms included in the direct impacts. Only the expenditures made locally (in the impact area) are included.

To make these direct impact calculations, a series of steps were taken.

1. Airport Data Request - A four-page written "data request" was mailed to each airport owner/operator with a supporting letter from MDOT, requesting cooperation (a copy of this request is in the Appendix). Most owners/operators responded by mail; the others responded when the study team visited the airport (a 100 percent response rate was attained).
2. Airport Visits - The Consultant then visited all 32 selected airports. During the airport visits the Consultant interviewed the airport owner/operators, verified information, and obtained insights into the economic and non-economic roles which each airport plays. Representatives of all 32 airports were visited, and responded with data.
3. Participating Firms Surveys - The Consultant developed a list of airport tenants and of other firms believed to provide some type of aviation service and/or to be a major user of the airport. In-person interviews were then sought with each firm. A survey form (see Appendix) was designed and used for the tenants at each airport, or for firms that are not located at the airport but which might be related to it. When personal contact proved impossible, the surveys were handled by mail and telephone. At most airports a 100 percent survey response was attained; at a few, the response rate was 75 percent or better.

4. Field Work/Data Collection Conduct - To ensure consistency between airports, a three-page list of things to seek at each airport was devised (this list is in the Appendix).
5. Airport Caused Impacts - Each airport activity and firm was designated as being "airport-related" or "non-related". Economic impacts caused by those judged to be truly related to the airport function were included in the direct impacts. Those judged to be "non-related" were tenants of the airport whose activities are not related to aviation. Impacts caused by them were not included.
6. Direct Impact Calculations - The direct impacts include only those expenditures that are of benefit to the impact area. Therefore, adjustments were made to reflect those expenditures that "leak" to places outside of the region, e.g., fuel, aircraft, and parts expenditures when the source was external to the region. Checks were used to verify survey results, e.g., reasonableness of payroll per employed persons, etc.

The direct impacts by airport were then related, each airport with the others, to ensure consistency between airports.

#### Indirect Impacts Methodology

The indirect impacts include the expenditures by airport users that are made in the impact area. These include expenditures by visitors to the region that arrive via the airports, expenditures by corporations that have aircraft based at the airports (pilots, mechanics, etc.), local taxes on based aircraft. The indirect economic impacts are placed into two principal categories:

- \* Visitor Expenditures - Money spent in the regional economy by air passengers and pilots who arrived in the region via the specific airport. Only money spent by visitors (people that do not reside in the region) is included, and only the "margin" is included, e.g., money that is of real benefit to the region.
- \* Regional Expenditures - Financial transactions by regional users of the airports, including wages paid to pilots and mechanics by firms which have aircraft based at the airport, the daily costs of aircraft use, expenditures by dependent businesses (such as travel agents), and ground travel expenditures in connection with airport usage by area residents.

The steps involved with the development of these indirect impacts included the following:

1. **Air Passenger Impacts** - Generalized results of previous surveys concerning average duration of stay and average amounts and categories of trip-related expenditures were applied to all airports in Michigan, modified where local information warranted. As an overall general rule, the general aviation air passenger surveys suggest that 80 percent of the arriving passengers are visitors, and that between 15 and 50 percent of the visitors spend one or more nights in the region, depending on size of the airport (the others depart the same day as their arrival). Those who spend the night, stay 1.5 days, on average, spending an average \$76 per person per day, while those who do not spend the night spend \$21 per person on average.

Of passengers arriving by commercial air carriers, the surveys indicate that, on average, 50 percent are visitors; that visitors stay for an average of 4.0 days, spending an average of \$69 per day.

2. **Air Visitor Impacts** - Using the survey results as a guide, the expenditures by visitors were estimated for each airport by estimating the number of visitors, the number of visitor days and nights, and the expenditures per visitor. Impact credit was taken for the total visitor expenditures, exclusive of the "margin" component of each expenditure. The number of itinerant aircraft operations was used to develop the annual visitor expenditure.
3. **Corporate Operations Impacts** - The numbers of pilots, mechanics, etc. by each firm with based aircraft were estimated, as were the expenditures associated with aircraft use.
4. **Other Airport-Dependent Firms** - The "value-added" component of each firm's local expenditures which were related to aviation activity, was estimated, based on surveys of these firms.

In each case care was taken to avoid "double counting" of impacts. For example, if a corporation with a based aircraft purchased fuel and parts from an FBO, the FBO's expenditures were included (as a direct impact) but the corporate operations expenditures on those items were not included.

### Induced Impacts Methodology

The "direct" economic impacts and the "indirect" economic impacts represent net increases in final demand in the airport impact areas. Such final demand increases, however, do not represent the total economic impact value attributable to the airports. Rather, there is also a "multiplier" effect which must be added to the final demand increases to attain total economic impact. This multiplier effect is developed utilizing the RIMS-II multiplier coefficients for the impact areas, as developed by the U.S. Department of Commerce, Bureau of Economic Analysis.

Multiplier Methodology - The "induced" economic impacts which constitute, on average, 44.2 percent of the total local impacts at the studied airports, comprise the "multiplier" effect of increasing the final demand for goods and services. Standard definitions of the multiplier were used in this study. Furthermore, multiplier models specific to the types of impact areas were used to develop the induced impacts.<sup>3</sup>

Multiplier Concept - The "multiplier" is used to trace money as it flows through the regional economy. The longer that the money stays in the region, the better off is the region and the higher is the multiplier. The multiplier indicates that, as the money is used over and over again, many people and businesses benefit, even if they do not use or directly serve the airports.

For example, if an FBO employee earns \$100 at the airport, and uses it to buy \$100 worth of groceries, he is better off by \$100 because he has \$100 worth of groceries, and the local grocer is better off because he has the \$100. The grocer then pays his employees, the delivery truck operator, etc. who are all slightly better off due to the airport. The multiplier traces this flow of funds until the money ultimately leaks to places outside of the impact areas. The larger and more developed the impact area, the longer the money tends to remain in the regional economy with the result that a higher average multiplier is found. For example, for generalized non-urbanized impact areas in Michigan, the average multiplier is 1.4957; for urbanized areas, 1.7182 and for the statewide impact area, 1.7335. This means that for urbanized areas, on average, for each \$1 spent on aviation (increase in final demand), roughly \$0.72 more is generated in induced (multiplier) impact.

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(3) "Regional Input-Output Modeling System," U.S. Department of Commerce, Bureau of Economic Analysis, 1981, and  
"Regional Multipliers: A User Handbook for the Regional Input-Output Modeling System," U.S. Department of Commerce, Bureau of Economic Analysis, May, 1986.

**RIMS-II Model** - The latest version of the U.S. Department of Commerce "Regional Input-Output Modeling System" (RIMS-II) was used to estimate the multipliers. Specific coefficients for appropriate impact areas in Michigan were used. To use the model, the direct impact and indirect impact values were categorized for input/output model use. The multiplier calculation process used the full 39 row by 531 column industries matrix, in computerized format. The multipliers used herein are the total multipliers, in that they treat household earnings as an industry, and they are "input/output" based.

A more detailed explanation of the multiplier concept and its application is given in the Appendix.

## Chapter 2

# MICHIGAN'S AIRPORTS SYSTEM

In working to promote the safe movement of people and goods, and other basic goals relating to the aviation mode, the Michigan Department of Transportation (MDOT) administers a statewide system of airports. The system is intended to provide adequate and dependable support for demand and to enhance the overall transportation system.<sup>1</sup> Currently, there are 237 public-use airport facilities in Michigan; 121 (51.1 percent) of which are publicly owned, and 116 (48.9 percent), privately owned.

The Michigan Aviation System Plan (MASP) defines four basic categories applicable to this study to be used in the future for all airports. These categories are based on operational roles and number and type of runways. These are described in Exhibit 1, which also shows the current distribution of public-use airports among these categories. Inspection of Exhibit 1 reveals that the 237 airfields which make up Michigan's system of public-use airports, have differing characteristics of usage and levels of development.

### Airports Selected For Detailed Analyses

In order to ensure appropriate recognition in the study of the range and diversity of the state's airport system, a sample of 32 airports was selected for surveys and detailed analyses. Airports selected for surveys are mapped in Exhibit 2 and listed in Exhibit 3, which also shows the MASP functional classification and operational characteristics. Data in the table show that the sample embraces a range of annual flight operations from a low of 300 (Sandusky, Cowley Field) to a high of approximately 381,700 (Oakland-Pontiac), and includes a range of air carrier activity from a low of 488 enplaning passengers (Jackson, Reynolds Field) to a high of approximately 673,700, at Grand Rapids, Kent County International Airport.

The sample was designed to include airports of all classifications. It provided a higher level of representation for larger airports, due to their higher levels of activity and employment, and larger economic impacts. Exhibit 4 contains a three-tiered grouping of MASP airport classifications and compares the representation of each grouping in the study sample, with their representation in the total system.

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1 Michigan Aviation System Plan, General Aviation Facilities, p. 27, MDOT, 1987.

**Exhibit 1**

**CLASSIFICATIONS AND CHARACTERISTICS SUMMARY  
FOR MICHIGAN GENERAL AVIATION AIRPORTS**

<u>MASP CLASS</u>	<u>TYPE</u>	<u>CURRENT NUMBER</u> <sup>1</sup>	<u>SIZE, TYPE COMMUNITY SERVED</u>	<u>ANNUAL FLIGHT OPERATIONS</u>	<u>PROPORTION OF G. A. AIRCRAFT TYPES ACCOMMODATED</u>
U-2	Small Utility	113	Population: 2,500 (-) (remote).	10,000 (-)	75%
U-4	Medium Utility	72	Population: 2,500 (+) (geographically isolated).	10,000-20,000	95%
U-5	Large Utility	8	Population: 10,000 (-) (and near large recreation centers).	20,000 (+)	98%
T-5	Transport	<u>44</u>	Population: large (near major mfg./ business centers).	20,000 (+)	99% (+)
	<b>Total</b>	<b>237</b>			

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Note: G.A. denotes general aviation.

(1) Includes airports currently included in lower classifications

SOURCE: Michigan Airports System Plan (MASP), op. cit. p. 4



Exhibit 2  
SURVEYED AIRPORTS  
1988

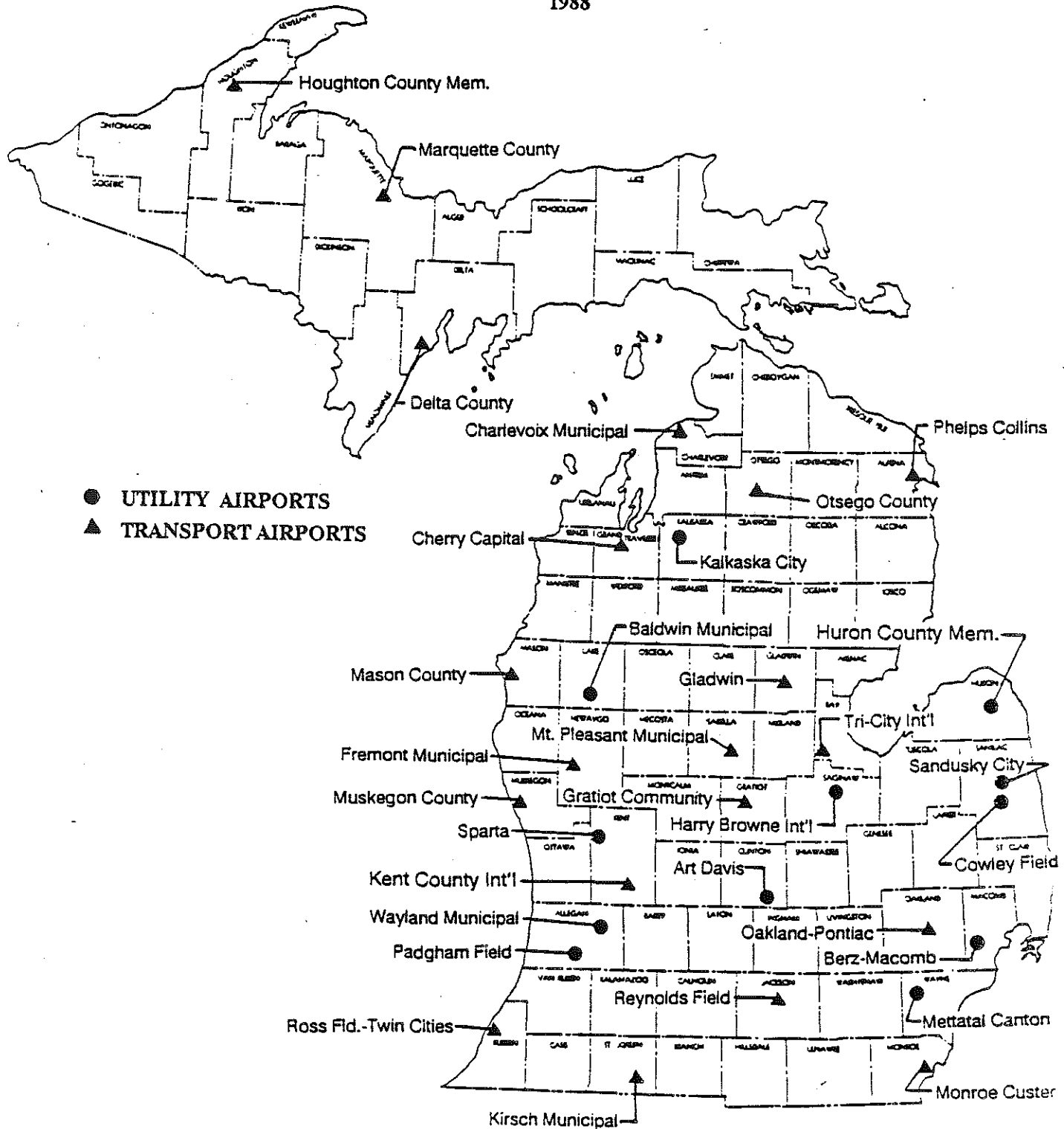


Exhibit 3  
ACTIVITY CHARACTERISTICS OF SURVEYED AIRPORTS  
1987

<u>ASSOCIATED COMMUNITY</u>	<u>AIRPORT NAME</u>	<u>CLASS</u>	<u>ANNUAL AIRCRAFT OPERATIONS</u>			<u>ANNUAL ENPLANING PASSENGERS</u>
			<u>Itiner.</u>	<u>Local</u>	<u>Total</u>	
Allegan	Padgham Field	U4	2,620	6,100	8,720	
Alma	Gratiot Community	T5	2,800	4,200	7,000	
Alpena	Phelps Collins	T5	11,028	7,135	18,163	4,754
Bad Axe	Huron County Mem.	U4	4,790	4,790	9,580	
Baldwin	Municipal	U4	2,390	0	2,390	
Benton Harbor	Twin Cities - Ross Fld.	T5	16,050	16,050	32,100	3,882
Charlevoix	Municipal	U4	17,870	11,910	29,780	
East Lansing	Art Davis	U2	2,530	2,530	5,060	
Escanaba	Delta County	T5	14,990	14,990	29,980	6,140
Fremont	Municipal	T5	3,140	7,320	10,460	
Gaylord	Otsego County	T5	9,060	2,270	11,330	
Gladwin	Gladwin	T4	3,780	3,780	7,560	
Grand Rapids	Kent County Int'l.	T5	108,118	37,180	145,298	673,736
Hancock	Houghton County Mem.	T5	9,960	6,640	16,600	15,417
Jackson	Reynolds Field	T5	39,233	31,709	70,942	488
Kalkaska	Kalkaska City	U1	1,460	630	2,090	
Ludington	Mason County	T5	8,160	8,160	16,320	
Marquette	Marquette County	T5	22,630	15,090	37,720	32,196
Monroe	Monroe Custer	T3	5,200	5,200	10,400	
Mt Pleasant	Municipal	T4	17,170	11,450	28,620	
Muskegon	Muskegon County	T5	38,033	22,574	60,607	38,773
Plymouth	Mettetal Canton	U3	16,080	16,080	32,160	
Pontiac	Oakland-Pontiac	T5	176,806	204,861	381,667	
Saginaw	Harry Browne Int'l.	U5	10,490	24,480	34,970	
Saginaw	Tri-City Int'l.	T5	41,595	14,237	55,832	220,788
Sandusky	Cowley Field	U1	150	150	300	
Sandusky	City	U4	2,550	2,550	5,100	
Sparta	Sparta	U3	7,550	840	8,390	
Sturgis	Kirsch Municipal	T5	10,220	2,560	12,780	
Traverse City	Cherry Capital	T5	58,532	64,026	122,558	75,721
Utica	Berz-Macomb	U3	13,820	20,730	34,550	
Wayland	Municipal	U2	1,080	1,080	2,160	

SOURCE: MDOT, BTP.

Exhibit 4  
COMPARISON OF AIRPORTS SAMPLE  
VS. STATEWIDE AIRPORTS SYSTEM

<u>CLASS</u>	<u>DESCRIPTION</u>	<u>STUDY SAMPLE</u>		<u>STATEWIDE<sup>1</sup>MASP SYSTEM</u>		<u>SAMPLE PERCENT</u>
		<u>No.</u>	<u>Percent</u>	<u>No.</u>	<u>Percent</u>	
T3-T5, U5	Transport/large utility	20	62.5	51	22.0	39.2
U3, U4	Medium Utility	8	25.0	72	30.4	11.1
U1, U2	Small Utility	4	12.5	113	47.6	3.5
	Totals	32	100.0	236	100.0	13.6

Note: MASP denotes Michigan Airports System Plan.

(1) Excluding Detroit Metropolitan Airport.

SOURCE: MDOT and BTP Study Consultant, Wilbur Smith Associates.

For example, the Transportation and Large Utility Airports group (MASP classes T3 - T5 and U5) consists of 51 airports in the Statewide system, accounting for 22.0 percent of the system total. In the study sample, 20 airports of this group were included, accounting for 62.5 percent of the sample total, representing a 39.2 percent sample of this group of large airports. Michigan's 72 Medium Utility airports make up 30.4 percent of the Statewide system total. This category represented 25.0 percent of the study sample group -- a sampling rate of 11.1 percent. The grouping of smallest airports -- the Small Utility classes -- make up 47.6 percent of the Statewide system. In the study sample, they accounted for only 12.5 percent, which resulted in an overall sampling rate of 3.5 percent.

Michigan Air Carrier Airports

A listing of all Michigan airports having scheduled air carrier service, is given in Exhibit 5. The listing is arranged in order of total passenger boardings and conveys a sense of the wide range of activity in the state's airport system.

Exhibit 5  
MICHIGAN AIRPORTS WITH SCHEDULED AIR CARRIER SERVICE  
1987

STUDIED	COMMUNITY	AIRPORT	MASP CLASS	BASED AIRCRAFT	ANNUAL OPERATIONS			ANNUAL PASSENGERS		
					Itin.	Local	Total	Enplan.	Deplan.	Total
	Detroit	Metropolitan Wayne Co.	T5	160	404,632	0	404,632	9,574,493	9,520,816	19,095,309
Yes	Grand Rapids	Kent County International	T5	163	108,118	37,180	145,298	673,736	665,230	1,338,966
Yes	Saginaw	Tri-City International	T5	26	41,595	14,237	55,832	220,788	215,286	436,074
	Kalamazoo	Kalamazoo County	T5	155	69,783	32,906	102,689	208,822	205,840	414,662
	Lansing	Capital City	T5	192	94,169	72,630	166,799	180,653	178,395	359,048
	Flint	Bishop	T5	238	55,267	61,584	116,851	112,555	110,388	222,943
Yes	Traverse City	Cherry Capital	T5	86	58,532	64,026	122,558	75,721	75,794	151,515
Yes	Muskegon	Muskegon County	T5	60	38,033	22,574	60,607	38,773	38,737	77,510
Yes	Marquette	Marquette County	T5	76	22,630	15,090	37,720	32,196	31,282	63,478
	Pellston	Emmet County	T5	18	19,340	4,840	24,180	17,936	18,508	36,444
	Detroit	City	T5	318	108,351	55,785	164,136	16,062	16,385	32,447
Yes	Hancock	Houghton County Memorial	T5	17	9,960	6,640	16,600	15,417	14,311	29,728
Yes	Escanaba	Delta County	T5	40	14,990	14,990	29,980	6,140	5,841	11,981
	Battle Creek	W. K. Kellogg Regional <sup>3</sup>	T5	97	25,862	17,739	43,601	5,009	4,649	9,658
Yes	Alpena	Phelps Collins	T5	26	11,028	7,135	18,163	4,754	4,688	9,442
	Sault Ste Marie	Chippewa County International	T3	7	9,730	6,490	16,220	4,624	4,521	9,145
	Iron Mtn,	Ford	T5	14	9,020	13,530	22,550	4,289	4,427	8,716
Yes	Benton Harbor	Twin Cities-Ross Field	T5	55	16,050	16,050	32,100	3,882	3,926	7,808
	Ironwood	Gogebic County	T3	8	8,200	2,050	10,250	2,807	2,558	5,365
	Manistee	Manistee County-Blacker	T5	17	7,150	7,150	14,300	1,419	1,314	2,733
	Menominee	Twin County	T5	25	17,660	4,410	22,070	1,158	1,122	2,280
Yes	Jackson	Jackson County Reynolds Field	T5	139	39,233	31,709	70,942	488	429	917
	Mackinac Island	Mackinac Island <sup>2</sup>	U3	0	13,428	0	13,428	278	246	524
	East Tawas	Iosco County <sup>1</sup>	T3	30	4,950	2,120	7,070	13	13	26
<b>TOTALS</b>				<b>1,967</b>	<b>1,207,711</b>	<b>510,865</b>	<b>1,718,576</b>	<b>11,202,013</b>	<b>11,124,706</b>	<b>22,326,719</b>

(1) Commenced Service in December.

(2) Seasonal Service Only.

(3) Air Carrier Service discontinued in September.

NOTE: ITIN. denotes itinerant, ENPL. denotes enplaning; DEPL. denotes deplaning.

SOURCE: MDOT, BTP.

The Exhibit indicates those airports included in the sample studied in detail, and reveals that all air carrier airports are designated in the MASP "Transport" classification, except for Mackinac Island Airport, which is a Medium Utility Airport (U3). Detroit Metro is unusual among Michigan's air carrier airports because it is far larger and more active than the others -- its 1987 volume of 19.1 million enplaning and deplaning passengers was 85.5 percent of the state total of 22.3 million. Because air carrier activity is so high, local flight operations are prohibited. Based aircraft range from a high of 318, at Detroit City Airport to 7, at Chippewa County International, and none, at Mackinac Island. Total annual aircraft operations range from a high (excluding Detroit Metro) of 166,799, at Lansing's Capital City Airport, to a low of 7,070 at Iosco County Airport. Total passenger volumes (enplaning plus deplaning passengers, again excluding Detroit Metro) range from a high of 1.3 million, at Kent County International Airport in Grand Rapids, to a low value<sup>1</sup> of 917, at Jackson County, Reynolds Field. Overall, the air carrier airports handle a total of approximately 11.2 million enplaning passengers annually. Detroit Metro accounts for about 9.6 million, or 85.7 percent of the total. Nevertheless, the remaining 1.6 million passengers, handled at other Michigan air carrier airports represent 14.3 percent of the State total and are an important factor in the state's economy.

#### Michigan General Aviation Airports

Michigan's 213 general aviation airports not served by scheduled air carriers, are listed in Exhibit 6. The listing is presented in order of total annual aircraft operations and, again, designates those investigated in detail for this study. Based aircraft and annual aircraft operations are shown, broken down by type of operation, i.e., itinerant and local. The tabulation reveals that nearly 5,400 aircraft are based at these Michigan airports (in addition to the 1,967 based at those served by air carriers). Michigan's general aviation airports handled an estimated total of more than 2.0 million aircraft operations in 1988. As the Exhibit shows, annual activity levels ranged from a high in excess of 380,000, at Oakland-Pontiac, to minimal values of less than 1,000 annual operations at a number of remote fields in non-urbanized areas.

The U.S. Census of Aviation for 1987 reports that there were 20,348 active pilots in Michigan who flew some 903,000 hours in 1986. Assuming these statistics to apply for 1988, would indicate that a hypothetical "average" pilot flew about 44 annual hours and that the "average" based aircraft flew about 123 hours, in developing the estimated general aviation economic impacts.

(1) Excluding Iosco County Airport and Mackinac Island. Service at the former commenced in December. Service at the latter is seasonal.

Exhibit 6

MICHIGAN GENERAL AVIATION AIRPORTS

1987

<u>STUDIED</u>	<u>ASSOCIATED COMMUNITY</u>	<u>AIRPORT NAME</u>	<u>MASP CLASS</u>	<u>BASED AIRCRAFT</u>	<u>ANNUAL AIRCRAFT OPERATIONS</u>		
					<u>Int.</u>	<u>Local</u>	<u>Total</u>
YES	Pontiac	Oakland-Pontiac	T5	785	176,806	204,861	381,667
	Detroit	Willow Run	T5	196	86,073	58,515	144,588
	Ann Arbor	Ann Arbor Municipal	U4	197	41,725	60,934	102,659
	Troy	Troy/Oakland	U3	176	45,480	19,490	64,970
	Port Huron	St Clair County International	T5	87	22,180	14,790	36,970
YES	Saginaw	Harry W Browne	U5	66	10,490	24,480	34,970
YES	Utica	Bertz-Macomb	U3	85	13,820	20,730	34,550
	Troy	Big Beaver	U4	42	17,240	17,240	34,480
	Goose Ile	Grosse Ile Municipal	T5	163	19,960	14,310	34,270
YES	Plymouth	Mettetal-Canton	U3	140	16,080	16,080	32,160
	Brighton	Brighton	U3	88	15,750	15,750	31,500
	Holland	Tulip City	U3	37	12,050	18,080	30,130
YES	Charlevoix	Charlevoix Municipal	T4	18	17,870	11,910	29,780
YES	Mt Pleasant	Mt Pleasant Municipal	T4	38	17,170	11,450	28,620
	Owosso	Owosso Community	U4	38	15,730	10,490	26,220
	Lapeer	Dupont-Lapeer	U4	43	10,000	15,000	25,000
	Howell	Livingston County	U3	76	11,560	11,560	23,120
	Coldwater	Branch County Memorial	T5	58	9,220	13,830	23,050
	New Hudson	New Hudson	U4	110	11,390	11,390	22,780
	Lambertville	Toledo Suburban	U3	81	6,670	15,560	22,230
	Niles	Jerry Tyler Memorial	U5	30	6,600	15,390	21,990
	Bay City	James Clement Municipal	U5	65	4,020	16,090	20,110
	Romeo	Romeo	T5	82	5,750	13,430	19,180
	Adrian	Lenawee County	U4	65	3,750	15,010	18,760
	Harbor Springs	Harbor Springs	U3	15	14,980	3,740	18,720
	Midland	Jack Barstow	U5	76	9,100	9,100	18,200
	Mason	Mason Jewett Field	U3	66	8,260	8,260	16,520
YES	Ludington	Mason County	T5	22	8,160	8,160	16,320
	Charlotte	Fitch H Beach	U4	42	6,510	9,770	16,280
	Marshall	Brooks Field	U3	25	7,920	7,920	15,840

Exhibit 6  
**MICHIGAN GENERAL AVIATION AIRPORTS**  
 1987  
 (continued)

<u>STUDIED</u>	<u>ASSOCIATED COMMUNITY</u>	<u>AIRPORT NAME</u>	<u>MASP CLASS</u>	<u>BASED AIRCRAFT</u>	<u>ANNUAL AIRCRAFT OPERATIONS</u>		
					<u>Itir.</u>	<u>Local</u>	<u>Total</u>
	Grand Haven	Memorial Air Park	U5	65	7,830	7,830	15,660
	Ionia	Ionia County	U4	39	7,740	7,740	15,480
	Cadillac	Wexford County	T4	48	10,730	4,600	15,330
	Marine City	Marine City	U3	28	7,330	7,330	14,660
	Tecumseh	Al Meyers	U4	14	7,090	7,090	14,180
	Belleville	Larsen Air Park	U1	52	6,870	6,870	13,740
YES	Sturgis	Kirsch Municipal	T5	24	10,220	2,560	12,780
	Berrien Springs	Andrew University	U4	37	5,840	5,840	11,680
YES	Gaylord	Otsego County	T5	59	9,060	2,270	11,330
	Bellaire	Antrim County	T3	32	10,130	1,130	11,260
	Grayling	Grayling Army Airfield	T5	13	9,870	1,100	10,970
	South Haven	South Haven Area Regional	U4	28	5,470	5,470	10,940
	Hastings	Hastings	U4	37	3,280	7,650	10,930
	Three Rivers	Municipal, Dr Haines	U5	24	6,430	4,290	10,720
	Fowlerville	Maple Grove	U2	26	5,250	5,250	10,500
YES	Fremont	Fremont Municipal	T5	29	3,140	7,320	10,460
YES	Monroe	Custer	T3	24	5,200	5,200	10,400
	Linden	Prices	U4	63	5,170	5,170	10,340
	Lakeview	Lakeview	U3	24	4,970	4,970	9,940
	Flushing	Daltons	U2	41	4,950	4,950	9,900
	Plainwell	Otsego-Plainwell Municipal	U4	30	5,930	3,960	9,890
	Marlette	Marlette	U5	26	4,890	4,890	9,780
	Frankfort	City-County	U3	12	2,900	6,770	9,670
	St James	Beaver Island	U4	6	5,750	3,840	9,590
YES	Bad Axe	Huron County Memorial	U4	23	4,790	4,790	9,580
	Almont	Almont	U4	50	4,760	4,760	9,520
	St Ignace	Mackinac County	U3	14	8,130	900	9,030
YES	Allegan	Padgham Field	U4	34	2,620	6,100	8,720
	Davison	Davison Township	U3	3	3,450	5,180	8,630
	Grand Rapids	South Kent	U1	32	4,200	4,200	8,400

Exhibit 6  
**MICHIGAN GENERAL AVIATION AIRPORTS**  
 1987  
 (continued)

<u>STUDIED</u>	<u>ASSOCIATED COMMUNITY</u>	<u>AIRPORT NAME</u>	<u>MASP CLASS</u>	<u>BASED AIRCRAFT</u>	<u>ANNUAL AIRCRAFT OPERATIONS</u>		
					<u>Itir.</u>	<u>Local</u>	<u>Total</u>
YES	Sparta	Sparta	U3	29	7,550	840	8,390
	Cheboygan	Cheboygan City-County	U4	27	3,150	4,720	7,870
	Big Rapids	Roben-Hood	U3	19	5,440	2,340	7,780
	Hillsdale	Hillsdale Municipal	U3	23	3,840	3,840	7,680
YES	Gladwin	Gladwin	T4	15	3,780	3,780	7,560
	Frankemuth	Frankemuth Airport, Inc	U1	14	3,750	3,750	7,500
	New Haven	Macomb	U4	55	3,710	3,710	7,420
	Boyne City	Boyne City Municipal	U3	12	4,420	2,950	7,370
	Houghton Lake	Roscommon County	U4	13	5,840	1,460	7,300
	Greenville	Greenville Municipal	U4	54	2,120	4,940	7,060
	White Cloud	White Cloud	U3	6	3,530	3,530	7,060
	Sault Ste Marie	Sault Saint Marie Municipal	U3	8	4,210	2,800	7,010
YES	Alma	Gratiot Community	T5	33	2,800	4,200	7,000
	Holland	Park Township	U4	17	3,420	3,420	6,840
	Eaton Rapids	Skyway Estates	U1	23	3,300	3,300	6,600
	Grand Ledge	Abrams Municipal	U4	132	1,280	5,110	6,390
	St Johns	Schiffer Acres	U1	4	3,190	3,190	6,380
	Kalamazoo/Vicksburg	Austin Lake & Seaplane Base	U2	0	3,150	3,150	6,300
	Napoleon	Napoleon	U2	36	3,150	3,150	6,300
	Manistique	Schoolcraft County	T5	7	2,310	3,460	5,770
	West Branch	West Branch Community	T3	17	3,370	2,250	5,620
	Dowagic	Cass County Memorial	T4	35	2,800	2,800	5,600
	Weidman	Lake Isabella	U3	16	2,750	2,750	5,500
	Stambaugh	Stambaugh	U3	6	540	4,880	5,420
	Crosswell	Arnold Field	U2	10	2,640	2,640	5,280
	Gregory	Richmond Field	U1	28	2,550	2,550	5,100
YES	Sandusky	Sandusky City	U4	14	2,550	2,550	5,100
YES	East Lansing	Davis	U2	38	2,530	2,530	5,060
	Hart/Shelby	Oceana County	U4	17	2,400	2,400	4,800
	Caro	Caro Municipal	U4	27	2,260	2,260	4,520
	Clare	Clare Municipal	U4	13	2,070	2,070	4,140



Exhibit 6  
**MICHIGAN GENERAL AVIATION AIRPORTS**  
 1987  
 (continued)

<u>STUDIED</u>	<u>ASSOCIATED COMMUNITY</u>	<u>AIRPORT NAME</u>	<u>MASP CLASS</u>	<u>BASED AIRCRAFT</u>	<u>ANNUAL AIRCRAFT OPERATIONS</u>		
					<u>Itir.</u>	<u>Local</u>	<u>Total</u>
	Newberry	Luce County Hale	U4	9	2,750	1,180	3,930
	Boyne Falls	Boyne Mountain	U3	2	3,910	0	3,910
	Ishpeming	Edward F. Johnson	U1	11	1,950	1,950	3,900
	Evert	Evert Municipal	U4	8	2,270	1,510	3,780
	Sebewaing	Sebewaing	U4	7	1,820	1,820	3,640
	Athens	David's	U1	11	1,800	1,800	3,600
	Wixom	Spencer Field	U2	46	1,800	1,800	3,600
	Empire	Empire	U2	5	1,030	2,390	3,420
	Clio	Cagney	U2	5	1,650	1,650	3,300
	Onsted	Loars Field Inc	U1	14	1,650	1,650	3,300
	East Jordan	East Jordan City	U4	16	1,970	1,310	3,280
	South Rockwood	Carls	U1	12	1,560	1,560	3,120
	Coopersville	Coopersville	U1	16	1,190	1,780	2,970
	Drummond Island	Drummond Island	U4	12	1,690	1,120	2,810
	Kalamazoo	Newman's	U1	30	1,350	1,350	2,700
	Newaygo	Newaygo	U4	6	1,340	1,340	2,680
	Milan	Milan	U2	18	1,280	1,280	2,560
	Harrison	Clare County	U4	4	1,530	1,020	2,550
	St Johns	Archer Field	U1	5	1,200	1,200	2,400
	Pinconning	Gross	U1	14	1,200	1,200	2,400
	Roscommon	Roscommon Conservation	U4	13	1,410	940	2,350
YES	Wayland	Wayland Municipal	U2	7	1,080	1,080	2,160
	Northport	Woolsey Memorial	U2	5	1,280	860	2,140
	Paw Paw	Almena	U1	18	1,050	1,050	2,100
	Blissfield	Betz	U1	10	1,050	1,050	2,100
YES	Kalkaska	Kalkaska City	U1	9	1,460	630	2,090
	Rogers City	Presque Isle County	U3	6	1,220	810	2,030
	Grant	Grant	U1	2	900	900	1,800
	Nunica	Jablonski	U2	0	900	900	1,800
	Bath	University Airpark	U1	4	900	900	1,800
	St James	Welke	U2	12	900	900	1,800

Exhibit 6  
**MICHIGAN GENERAL AVIATION AIRPORTS**  
 1987  
 (continued)

<u>STUDIED</u>	<u>ASSOCIATED COMMUNITY</u>	<u>AIRPORT NAME</u>	<u>MASP CLASS</u>	<u>BASED AIRCRAFT</u>	<u>ANNUAL AIRCRAFT OPERATIONS</u>		
					<u>Int.</u>	<u>Local</u>	<u>Total</u>
	Standish	Standish Industrial	U3	2	1,070	720	1,790
	Ontonagon	Ontonagon County	U3	7	1,040	690	1,730
	Acme	Acme Skyport	U2	27	980	660	1,640
	Lake City	Home Acres Sky Ranch	U2	43	920	620	1,540
	Crystal Falls	Iron County	U4	1	910	610	1,520
	Petersburg	Gradolph Field	U1	14	750	750	1,500
	Rockford	Wells	U1	2	750	750	1,500
	Point Aux Pins	Bois Blanc	U1	2	950	410	1,360
	Hessel	Albert J. Lindberg	U3	4	810	540	1,350
	Montague	Ottiger	U5	7	660	660	1,320
	Onaway	Leo E Goetz County	U3	3	780	520	1,300
	St Charles	Fraser	U1	1	600	600	1,200
	Albion	Midway	U1	1	600	600	1,200
	Muskegon	Northside	U2	7	600	600	1,200
	Carelton	Wickenheiser	U2	0	600	600	1,200
	Yale	Yale	U1	7	600	600	1,200
	Mecosta	Mecosta Morton Township	U2	0	1,150	0	1,150
	Mecosta	Canadian Lakes	U1	4	1,150	0	1,150
YES	Baldwin	Baldwin Municipal	U4	1	500	500	1,000
	Harrisville	Harrisville	U1	1	590	400	990
	Watervliet	Watervliet Municipal	U2	8	480	480	960
	Indian River	Calvin Campbell Municipal	U1	0	840	100	940
	Mason	Bergeon Field	U1	15	450	450	900
	Genesee	Duford Field	U1	5	450	450	900
	Mulliken	George'S Acres	U1	1	450	450	900
	Petersburg	Lada	U2	1	450	450	900
	Moorestown	Moorestown Air Park	U2	0	450	450	900
	Erie	Erie Aerodrome	U1	0	630	160	790
	Atlanta	Atlanta Municipal	U4	5	460	310	770
	Luzerne	Lost Creek	U2	0	380	260	640
	Avoca	Tackaberry Field	U1	1	300	300	600

Exhibit 6  
**MICHIGAN GENERAL AVIATION AIRPORTS**  
 1987  
 (continued)

<u>STUDIED</u>	<u>ASSOCIATED COMMUNITY</u>	<u>AIRPORT NAME</u>	<u>MASP CLASS</u>	<u>BASED AIRCRAFT</u>	<u>ANNUAL AIRCRAFT OPERATIONS</u>		
					<u>Itir.</u>	<u>Local</u>	<u>Total</u>
	Harrietta	Bunch's	U2	0	300	300	600
	Gregory	Carriage Lane	U1	3	300	300	600
	Gaines	Cole Field	U1	1	300	300	600
	Lainesburg	Dennis Farm	U1	0	300	300	600
	Hudson	Dvoracek Field	U1	3	300	300	600
	Deckerville	Lamont	U2	7	300	300	600
	Galesburg	Matheson Farm	U1	0	300	300	600
	Interlochen	Green Lake	U2	4	350	240	590
	Munising	Hanley Field	U1	6	300	200	500
	Houghton Lk. Hgts.	Houghton Lake State	U1	2	300	200	500
	Gaylord	Lake Of The North	U3	0	250	250	500
	Mancelona	Mancelona Municipal	U2	1	300	200	500
	Reed City	Nartron Field	U3	0	250	250	500
	Jenison	Riverview	U3	31	250	250	500
	Hillman	Hillman	U2	4	280	190	470
	Grand Marais	Grand Marais	U2	1	370	90	460
	South Branch	Timbers Sky Camp	U2	2	280	180	460
	St Helen	St Helen	U2	2	130	290	420
	Chesaning	Chesaning	U2	11	160	160	320
	Argyle	Argyle-Adair Field	U1	2	150	150	300
	New Baltimore	Bergeron Field	U1	0	150	150	300
	Harbor Springs	Boyne Highlands	U1	0	150	150	300
	Dexter	Cackleberry	U1	15	150	150	300
	Stanwood	Cain Field	U1	7	150	150	300
YES	Sandusky	Cowley Field	U1	1	150	150	300
	Napoleon	Day Field	U1	0	150	150	300
	Bad Axe	Engler Field	U1	0	150	150	300
	Yale	Gavagan Field	U1	0	150	150	300
	Elwell	Hamp	U1	0	150	150	300
	Clinton	Honey Acres	U1	0	150	150	300
	Dewitt	Horner	U1	0	150	150	300

Exhibit 6  
**MICHIGAN GENERAL AVIATION AIRPORTS**  
 1987  
 (continued)

<u>STUDIED</u>	<u>ASSOCIATED COMMUNITY</u>	<u>AIRPORT NAME</u>	<u>MASP CLASS</u>	<u>BASED AIRCRAFT</u>	<u>ANNUAL AIRCRAFT OPERATIONS</u>		
					<u>Itir.</u>	<u>Local</u>	<u>Total</u>
	St Clair	Hyden Field	U1	0	150	150	300
	Smith Creek	Johnson Field	U1	0	150	150	300
	Forestville	J. Sabatus	U1	0	150	150	300
	Bennington	Lee Field	U1	1	150	150	300
	Lowell	Lowell Municipal	U2	0	150	150	300
	Carson City	Mayes	U1	1	150	150	300
	Tecumseh	Merillat	U1	17	150	150	300
	Weidman	Ojibwa	U1	0	150	150	300
	Yale	Para Field	U1	0	150	150	300
	Topinabee	Pbeaaye	U1	21	150	150	300
	St Johns	Randolph's Landing Area	U1	1	150	150	300
	Manchester	Rossettie	U1	35	150	150	300
	Brooklyn	Shamrock Field	U1	2	150	150	300
	Unadilla	Smith Farm	U1	0	150	150	300
	Ada	Sommerville	U1	0	150	150	300
	Schoolcraft	Prarie Ronde	U1	0	150	150	300
	Traverse City	Sugar Loaf Village	U3	0	150	150	300
	Charlotte	Tinkerville	U1	3	150	150	300
	Parchment	Triple "H"	U2	0	150	150	300
	St Johns	Tripp Creek	U1	5	150	150	300
	Gladstone	W Gladstone	U1	4	150	150	300
	Pullman	Walle Field	U1	0	150	150	300
	Kent City	Wilderness Airpark	U1	0	150	150	300
	Napoleon	Wolf Lake	U1	0	150	150	300
	Winn	Woodruff Lake	U1	0	150	150	300
	Elk Rapids	Yuba	U1	0	150	150	300
	Mio	Fun Valley	U1	0	170	120	290
	Thompsonville	Thompsonville	U2	0	130	90	220
	Rock	Bonnie Field	U1	0	50	40	90
		<b>TOTALS</b>		<b>5,397</b>	<b>1,016,514</b>	<b>1,004,830</b>	<b>2,021,344</b>

NOTE: ITIR. denotes itinerant  
 SOURCE: MDOT, BTP

## Chapter 3

# ECONOMIC IMPACTS OF STUDIED AIRPORTS

Detailed investigations of economic impacts were conducted at the 32 airports selected to represent a cross section of airport types and locations throughout Michigan. Results of the investigations, which included on-site observations and surveys, indicate that the combined economic impacts of these 32 airports amount to over \$773,219,000 annually.

### Impacts By Major Types\*

Exhibit 7 lists the estimated \$571.6 million total economic activity impacts for the 32 studied airports, by major impact type. The total comprises \$135,540,200 in direct impacts; \$207,381,510 of indirect impacts and induced impacts of \$231,650,190. These are impacts which can be reasonably attributed to aviation activities at each of the studied airports. That is, these impacts are due to the provision of aviation services (the direct impacts) or to the use of aviation services (the indirect impacts) or to the multiplier effect of subsequent transactions throughout the local economies (induced impacts).

### Exhibit 7

#### TOTAL ANNUAL ECONOMIC IMPACTS STUDIED MICHIGAN AIRPORTS, 1987-88

<u>IMPACT TYPE</u>	<u>ANNUAL ECONOMIC IMPACT</u>
Direct	\$135,540,200
Indirect	207,381,510
Induced	<u>231,650,190</u>
Total	\$574,571,900 <sup>(1)</sup>

(1) Impact of the 32 studied airports only.

SOURCE: MDOT, BTP Study Consultant, Wilbur Smith Associates

### Impacts By Studied Airport

Exhibit 8 itemizes the economic impacts for each of the 32 studied airports, showing the breakdown by major impact category. The tabulation reveals the following:

- \* direct impacts, associated with the provision of aviation services, make up 23.6 percent of total aviation-related impacts;
- \* indirect impacts, associated with the use of aviation services, account for 36.1 percent of the total;
- \* induced impacts, arising from the multiplier effect, are 40.3 percent of the total. This means that almost half of the airports' aviation-related impacts accrue to people in the region who are neither suppliers nor users of aviation services and who may not perceive themselves as benefitting from the airports.
- \* as would be expected, the airport's impacts are generally in proportion to their size in terms of passengers, aircraft operations, based aircraft, etc.

Direct Impacts - The direct aviation-oriented impacts are caused by the firms and others located at the airport and engaged in the provision of aviation services. These impacts, for each airport, are given in Exhibit 9. The tabulation shows that payroll to people who work at the airports and typically live in the region totals \$69.9 million annually. The "capital" impact comprises capital investments that are made where the recipient of the expenditures is located in the region. Capital investment represents physical improvements to airport facilities either public or private. Funds may come from private sources, or aid grants from the FAA or MDOT. A sizeable share of the capital expenditures is in the form of payroll (employees of construction firms, etc.). The direct impact expenses include expenditures by firms that pay for local utilities, employ people, and make local purchases. All of these are of economic value to the individual airport service areas, and to Michigan.

Indirect Impacts - The estimated "aviation-oriented" indirect impacts for each airport are shown in Exhibit 10. These are the impacts that can be readily identified as attributable to airport use. These include payroll paid to pilots by firms which have aircraft based at the airport, plus other expenses associated with corporate aircraft use.

**Exhibit 8**  
**AVIATION-RELATED LOCAL ECONOMIC IMPACTS**  
**BY STUDIED MICHIGAN AIRPORT**  
**1987-88**

		<u>ANNUAL ECONOMIC IMPACTS</u>			
<u>ASSOCIATED COMMUNITY</u>	<u>AIRPORT NAME</u>	<u>Direct</u>	<u>Indirect</u>	<u>Induced</u>	<u>Total</u>
Allegan	Padgham Field	\$ 149,300	\$ 105,120	\$ 103,580	\$ 358,000
Alma	Gratiot Community	1,149,600	387,400	780,000	2,317,000
Alpena	Phelps Collins	5,336,000	1,888,500	3,434,500	10,658,000
Bad Axe	Huron County Mem.	104,000	644,000	341,000	1,089,000
Baldwin	Municipal	-- (1)	141,400	59,600	201,000
Benton Harbor	Twin Cities Ross Fld.	1,272,000	4,636,000	3,826,000	9,734,000
Charlevoix	Municipal	197,000	924,000	563,000	1,684,000
East Lansing	Art Davis	116,000	33,000	54,000	203,000
Escanaba	Delta County	576,900	1,412,500	1,009,600	2,999,000
Fremont	Municipal	92,400	650,900	330,700	1,074,000
Gaylord	Otsego County	101,000	3,007,000	1,630,000	4,738,000
Gladwin	Gladwin	54,000	124,000	76,000	254,000
Grand Rapids	Kent County Int'l.	34,862,100	103,694,200	101,474,700	240,031,000
Hancock	Houghton County Mem.	1,083,300	2,475,000	1,793,700	5,352,000
Jackson	Reynolds Field	3,181,000	2,541,000	3,917,000	9,639,000
Kalkaska	Kalkaska City	--	--	--	--
Ludington	Mason County	618,400	334,800	485,800	1,439,000
Marquette	Marquette County	26,207,400	6,155,200	16,272,400	48,635,000
Monroe	Monroe Custer	177,300	460,100	391,600	1,029,000
Mt Pleasant	Municipal	695,000	1,121,000	902,000	2,718,000
Muskegon	Muskegon County	4,476,000	8,018,000	9,224,000	21,718,000
Plymouth	Mettetal Canton	748,200	1,243,800	1,460,000	3,452,000
Pontiac	Oakland-Pontiac	32,782,000	17,204,000	34,889,000	84,875,000
Saginaw	Harry Browne Int'l.	1,350,000	379,000	1,486,000	3,215,000
Saginaw	Tri-City Int'l.	9,934,600	34,988,700	34,340,700	79,264,000
Sandusky	Cowley Field	--	3,200	700	3,900
Sandusky	City	50,000	30,600	24,400	105,000
Sparta	Sparta	150,800	265,500	201,700	618,000
Sturgis	Kirsch Municipal	342,600	323,300	282,100	948,000
Traverse City	Cherry Capital	8,722,500	13,488,000	11,128,500	33,339,000
Utica	Berz-Macomb	1,010,000	669,000	1,163,000	2,842,000
Wayland	Municipal	800	33,290	5,910	40,000
<b>TOTALS</b>		<b>\$135,540,200</b>	<b>\$207,381,510</b>	<b>\$231,650,190</b>	<b>\$574,571,900</b>

Note: Local impacts recognize those expenditures circulating through the economy of the airport service area.

(1) "--" indicates that this type of impact is not quantifiable at this airport.

SOURCE: MDOT, BTP Consultant, Wilbur Smith Associates

Exhibit 9  
**MAKEUP OF "DIRECT" ECONOMIC IMPACTS  
 BY STUDIED MICHIGAN AIRPORTS  
 1987-88**

<u>ASSOCIATED CITY</u>	<u>AIRPORT NAME</u>	<u>Payroll<sup>1</sup></u>	<u>Capital<sup>2</sup></u>	<u>Operations<sup>3</sup></u>	<u>Total</u>
Allegan	Padgham Field	130,000	0	19,300	149,300
Alma	Gratiot Community	309,500	190,000	650,100	1,149,600
Alpena	Phelps Collins	3,921,000	15,000	1,400,000	5,336,000
Bad Axe	Huron County Mem.	28,500	20,000	55,500	104,000
Baldwin	Baldwin Municipal	0	0	0	0
Benton Harbor	Ross Fld.-Twin Cities	774,000	110,000	388,000	1,272,000
Charlevoix	Charlevoix Municipal	160,000	0	37,000	197,000
East Lansing	Art Davis	60,000	10,000	46,000	116,000
Escanaba	Delta County	364,000	61,700	151,200	576,900
Fremont	Fremont Municipal	47,900	5,000	39,500	92,400
Gaylord	Otsego County	62,000	1,000	38,000	101,000
Gladwin	Gladwin	50,000	0	4,000	54,000
Grand Rapids	Kent County Int'l.	19,438,700	927,000	14,496,400	34,862,100
Hancock	Houghton County Mem.	700,400	11,400	371,500	1,083,300
Jackson	Reynolds Field	1,466,000	34,000	1,681,000	3,181,000
Kalkaska	Kalkaska City	0	0	0	0
Ludington	Mason County	136,800	355,100	126,500	618,400
Marquette	Marquette County	13,549,800	1,215,000	11,442,600	26,207,400
Monroe	Monroe Custer	60,400	0	116,900	177,300
Mt Pleasant	Mt Pleasant Municipal	454,000	150,000	91,000	695,000
Muskegon	Muskegon County	2,527,000	568,000	1,381,000	4,476,000
Plymouth	Mettetal Canton	220,800	68,300	459,100	748,200
Pontiac	Oakland-Pontiac	12,225,000	1,082,000	19,475,000	32,782,000
Saginaw	Harry Browne Int'l.	391,000	662,000	297,000	1,350,000
Saginaw	Tri-City Int'l.	5,429,400	2,748,300	1,756,900	9,934,600
Sandusky	Cowley Field	0	0	0	0
Sandusky	Sandusky City	44,400	0	5,600	50,000
Sparta	Sparta	70,000	0	80,800	150,800
Sturgis	Kirsch Municipal	230,900	1,000	110,700	342,600
Traverse City	Cherry Capital	6,493,400	0	2,229,100	8,722,500
Utica	Berz-Macomb	572,000	20,000	418,000	1,010,000
Wayland	Wayland Municipal	700	0	100	800
		69,917,600	8,254,800	57,367,800	135,540,200

(1) Paid to employees having aviation-related jobs at airport.

(2) Hangar, terminal and runway construction and/or major maintenance by airport owner and/or airport tenants.

(3) Local operating expenditures by tenants. Includes refueling service.

SOURCE: MDOT, BTP Study Consultant, Wilbur Smith Associates.



Exhibit 10  
 MAKEUP OF "INDIRECT" ECONOMIC IMPACTS  
 BY STUDIED MICHIGAN AIRPORTS  
 1987-88

ASSOCIATED COMMUNITY	AIRPORT NAME	INDIRECT IMPACTS			
		Visitor	Regional	Other	Total
Allegan	Padgham Field	\$ 101,620	\$ 3,500	\$ --	\$ 105,120
Alma	Gratiot Community	243,700	2,000	141,700	387,400
Alpena	Phelps Collins	864,900	6,000	1,017,600	1,888,500
Bad Axe	Huron County Mem.	258,400	500	385,100	644,000
Baldwin	Municipal	49,300	300	91,800	141,400
Benton Harbor	Twin Cities-Ross Fld.	1,340,000	6,000	3,290,000	4,636,000
Charlevoix	Municipal	922,000	2,000	--	924,000
East Lansing	Art Davis	31,000	2,000	--	33,000
Escanaba	Delta County	1,266,300	4,200	142,000	1,412,500
Fremont	Municipal	121,600	2,800	526,500	650,900
Gaylord	Otsego County	2,895,000	2,000	110,000	3,007,000
Gladwin	Gladwin	104,000	--	20,000	124,000
Grand Rapids	Kent County Int'l.	89,258,900	2,353,500	12,081,800	103,694,200
Hancock	Houghton County Mem.	2,256,700	9,900	208,400	2,475,000
Jackson	Reynolds Field	1,792,000	24,000	725,000	2,541,000
Kalkaska	Kalkaska City	--	--	--	--
Ludington	Mason County	269,000	1,700	64,100	334,800
Marquette	Marquette County	4,902,100	28,900	1,224,200	6,155,200
Monroe	Monroe Custer	165,000	1,100	294,000	460,100
Mt Pleasant	Municipal	938,000	3,000	180,000	1,121,000
Muskegon	Muskegon County	7,162,000	31,000	825,000	8,018,000
Plymouth	Mettetal Canton	1,190,000	3,500	50,300	1,243,800
Pontiac	Oakland-Pontiac	11,039,000	207,000	5,958,000	17,204,000
Saginaw	Harry Browne Int'l.	333,000	6,000	40,000	379,000
Saginaw	Tri-City Int'l.	29,878,700	181,700	4,928,300	34,988,700
Sandusky	Cowley Field	2,800	400	--	3,200
Sandusky	City	29,900	700	--	30,600
Sparta	Sparta	264,500	1,000	--	265,500
Sturgis	Kirsch Municipal	322,800	500	-	323,300
Traverse City	Cherry Capital	12,236,700	20,700	1,230,600	13,488,000
Utica	Berz-Macomb	579,000	10,000	80,000	669,000
Wayland	Municipal	33,170	120	--	33,290
	<b>TOTALS</b>	<b>\$170,851,090</b>	<b>\$2,916,020</b>	<b>\$33,614,400</b>	<b>\$207,381,510</b>

SOURCE: MDOT, BTP Study Consultant, Wilbur Smith Associates

The "Visitors Expenditures" are those monies spent in the region by visitors who arrived via the airports. Expenditures by such visitors comprise 83 percent of the indirect impacts and illustrate the importance of tourism and business visitors to the service areas of the studied airports. The visitor expenditures are based on findings from air passenger surveys that were taken as part of several recent aviation economic impact studies elsewhere. The surveys sought to determine how many of the airports' users are visitors, how long the visitors stayed, how much money they spent, and what they spent it on.

The "Regional Expenditures" include expenditures by local residents associated with aviation use. The "Other" impacts include expenditures associated with corporate air operations (e.g., payroll costs for pilots and ground support staff and local value added components of allowable operating expense, being careful to avoid double counting payments) and those by dependent firms, such as travel agencies.

Non-Aviation Airport Tenants - Airports often lease buildings or office space to firms whose activities are not aviation-related and which, in reality, could be located anywhere. These airport tenants are important because they employ people, make local expenditures, make payments to the airport owner, etc. However, they were excluded from the aviation-related impacts because they do not depend upon the airport and presumably might be located elsewhere in the community, if the airport did not exist.

#### Impact/Aviation Activity Relationships

This study found that airports in Michigan perform many different roles. As a result, economic impacts are a function of many different things, including:

- \* Number of visitors using the airport
- \* Number of based aircraft
- \* Annual aircraft operations
- \* Number of private firms providing aviation support services
- \* Number of jobs at the airport
- \* Number of corporate aircraft with paid crews
- \* Capital investment at the airport
- \* Types of firms at the airport
- \* Airport's aviation roles

Because of the variety of activities that cause economic impact, the impacts of Michigan's airports are not simply a function of any single event or characteristic, and impacts vary considerably from airport to airport.

**Relationship to Aircraft Operations** - The study found that, to a point, there is a general relationship between aircraft activity and economic impact. Two measures of aircraft activity are: (1) the number of itinerant aircraft operations and (2) total operations. These are general indications of airport size and function and bear some relationship to airport roles (business or recreational/instructional).

Exhibit 11 lists both the number of itinerant and total aircraft operations at each airport, and the average economic impact per operation of each type. There are general relationships between impact magnitude and the number of aircraft operations, though there are some airports that fall outside of this relationship. Inspection of the average total economic impacts per itinerant and per total aircraft operation, reveals similar overall patterns in the relationships. The average total impact per itinerant operation at the studied sample of air carrier airports is \$1,273, and the average at studied general aviation airports is \$356.

**Atypical Airport Situations** - Of the airports, three exhibit impact magnitudes that are well outside of the expected range:

- \* **Kent County International Airport** shows impacts per operation considerably greater than the normal range. This is attributed to the extremely high relative level of air carrier activity associated with the second-ranking air passenger volumes in Michigan plus major corporate air operations at this airport (Amway, Steelcase, Herman Miller, and others).
- \* **Tri City Airport** also produces exceptionally high average impacts per operation. It is suggested that the rationale is similar to that for Kent County Airport: a relatively high-level of air carrier and passenger activity (third-ranking in Michigan) coupled with major corporate air operations (Dow Chemical, Dow-Corning).
- \* **Marquette County Airport** is unusual because it is the location of Simmons Airlines' corporate headquarters. This generates major economic impacts because it includes the firm's central aircraft maintenance base and air crew training facility.

The other airports, while varying in terms of impact significance, are closer to the norm for airports of their various sizes and functions.

**Exhibit 11**  
**AVIATION-RELATED ECONOMIC IMPACTS PER OPERATION**  
**BY STUDIED MICHIGAN AIRPORTS**  
**1987-88**

ASSOCIATED CITY	AIRPORT NAME	ANNUAL AIRCRAFT OPERATIONS			TOTAL IMPACT PER OPERATION	
		Itinerant	Local	Total	Itinerant	Total
Allegan	Padgham Field	2,620	6,100	8,720	\$147	41
Alma	Gratiot Community	2,800	4,200	7,000	763	305
Alpena	Phelps Collins	11,028	7,135	18,163	966	587
Bad Axe	Huron County Mem.	4,790	4,790	9,580	227	114
Baldwin	Baldwin Municipal	500	500	1,000	402	201
Benton Harbor	Ross Fld.-Twin Cities	16,050	16,050	32,100	606	303
Charlevoix	Charlevoix Municipal	17,870	11,910	29,780	94	57
East Lansing	Art Davis	2,530	2,530	5,060	80	40
Escanaba	Delta County	14,990	14,990	29,980	200	100
Fremont	Fremont Municipal	3,140	7,320	10,460	342	103
Gaylord	Otsego County	9,060	2,270	11,330	523	418
Gladwin	Gladwin	3,780	3,780	7,560	67	34
Grand Rapids	Kent County Int'l.	108,118	37,180	145,298	2,220	1,652
Hancock	Houghton County Mem.	9,960	6,640	16,600	537	322
Jackson	Reynolds Field	39,233	31,709	70,942	246	136
Kalkaska	Kalkaska City	1,460	630	2,090	0	0
Ludington	Mason County	8,160	8,160	16,320	176	88
Marquette	Marquette County	22,630	15,090	37,720	2,149	1,289
Monroe	Monroe Custer	5,200	5,200	10,400	198	99
Mt Pleasant	Mt Pleasant Municipal	17,170	11,450	28,620	158	95
Muskegon	Muskegon County	38,033	22,574	60,607	497	312
Plymouth	Mettetal Canton	16,080	16,080	32,160	215	107
Pontiac	Oakland-Pontiac	176,806	204,861	381,667	480	222
Saginaw	Harry Browne Int'l.	10,490	24,480	34,970	306	92
Saginaw	Tri-City Int'l.	41,595	14,237	55,832	1,906	1,420
Sandusky	Cowley Field	150	150	300	26	13
Sandusky	Sandusky City	2,550	2,550	5,100	41	21
Sparta	Sparta	7,550	840	8,390	82	74
Sturgis	Kirsch Municipal	10,220	2,560	12,780	93	74
Traverse City	Cherry Capital	58,532	64,026	122,558	570	272
Utica	Berz-Macomb	13,820	20,730	34,550	206	82
Wayland	Wayland Municipal	1,080	1,080	2,160	37	19
<b>TOTALS</b>		<b>677,995</b>	<b>571,802</b>	<b>1,249,797</b>	<b>\$843</b>	<b>\$457</b>

Notes: One aircraft landing and then taking off equals two aircraft operations.

Local operations occur when an aircraft takes off from an airport, flies, then returns to the same airport without landing at another airport.

Itinerant operations occur when an aircraft takes off from one airport, flies, and then lands at another airport.

(1) Relationship not quantifiable at this airport.

SOURCE: MDOT, BTP Study Consultant, Wilbur Smith Associates

Relationship to Based Aircraft - A less discernible, non-linear relationship exists between each airport's economic impact and its number of based aircraft. Exhibit 12 lists this relationship, in terms of annual economic impact per based aircraft. As a general rule, the smallest airports (fewest based aircraft) also have the lowest impact per based aircraft, and the impact per based aircraft generally increases as the number of based aircraft increases. Exceptions occur when numbers of based aircraft are extremely small (as in the case of Baldwin Airport). The larger airports tend to have very large impacts per based aircraft.

#### Airport Employment

An important feature of each airport relative to its economic impact is the number of jobs that it creates. People are employed at the airport -- by the airport owner, the FBO's, the various other tenants, etc. In addition, people off the airport also often owe their jobs to the airport, e.g., at some motels, restaurants, etc.

Exhibit 13 shows the jobs estimated to be attributable to each airport. The "Aviation-Related" jobs are included in the airports' aviation-related economic impacts. Those at the airport include tenant employees as well as paid pilots, mechanics and others. Those listed as off-airport are the "indirect" jobs which serve the air passengers plus the "induced" jobs that are spread throughout the local economy.

Exhibit 12  
**AVIATION-RELATED ECONOMIC IMPACT  
 PER BASED AIRCRAFT**  
 Studied Michigan Airports  
 1987-88

ASSOCIATED CITY	AIRPORT	BASED AIRCRAFT					TOTAL IMPACT PER BASED AIRCRAFT
		Single Engine	Multi- Engine	Jet	Other	Total	
Allegan	Padgham Field	34	--	--	--	34	\$ 10,529
Alma	Gratiot Community	24	9	--	--	33	64,758
Alpena	Phelps Collins	19	6	1	--	26	409,923
Bad Axe	Huron County Mem.	22	1	--	--	23	47,348
Baldwin	Baldwin Municipal	1	0	--	--	1	201,000
Benton Harbor	Ross Fld.-Twin Cities	42	11	2	--	55	176,982
Charlevoix	Charlevoix Municipal	12	6	--	--	18	93,556
East Lansing	Art Davis	37	--	--	1	38	5,342
Escanaba	Delta County	33	5	--	2	40	74,975
Fremont	Fremont Municipal	22	4	2	1	29	37,034
Gaylord	Otsego County	48	9	--	2	59	80,305
Gladwin	Gladwin	15	--	--	--	15	16,933
Grand Rapids	Kent County Int'l.	92	47	20	4	163	1,472,583
Hancock	Houghton County Mem.	13	4	--	--	17	314,824
Jackson	Reynolds Field	95	35	8	1	139	69,345
Kalkaska	Kalkaska City	9	--	--	--	9	0
Ludington	Mason County	18	4	--	--	22	65,409
Marquette	Marquette County	18	57	1	--	76	639,934
Monroe	Monroe Custer	21	3	--	--	24	42,875
Mt Pleasant	Mt Pleasant Municipal	28	9	--	1	38	71,526
Muskegon	Muskegon County	44	12	4	--	60	314,933
Plymouth	Metttetal Canton	133	5	--	2	140	24,657
Pontiac	Oakland-Pontiac	509	226	47	3	785	108,121
Saginaw	Harry Browne Int'l.	55	10	--	1	66	48,712
Saginaw	Tri-City Int'l.	12	6	8	--	26	3,048,615
Sandusky	Cowley Field	1	--	--	--	1	3,900
Sandusky	Sandusky City	14	--	--	--	14	7,500
Sparta	Sparta	27	1	--	1	29	21,310
Sturgia	Kirsch Municipal	18	5	--	1	24	39,500
Traverse City	Cherry Capital	69	10	--	7	86	387,663
Utica	Berz-Macomb	65	20	--	--	85	33,435
Wayland	Wayland Municipal	7	--	--	--	7	5,714
<b>TOTALS</b>		<b>1,557</b>	<b>505</b>	<b>93</b>	<b>27</b>	<b>2,192</b>	<b>\$260,753</b>

Note: S.E. denotes single-engine; M.E., multi-engine.

(1) Relationship not quantifiable at this airport.

SOURCE: Surveys by MDOT, BTP Study Consultant, Wilbur Smith Associates.

Exhibit 13  
 NUMBER OF JOBS ATTRIBUTABLE TO THE  
 STUDIED MICHIGAN AIRPORTS  
 1987-88

<u>ASSOCIATED CITY</u>	<u>AIRPORT NAME</u>	<u>AT AIRPORT</u>	<u>OFF AIRPORT</u>	<u>TOTAL</u>
Allegan	Padgham Field	4	1	5
Alma	Gratiot Community	20	18	38
Alpena	Phelps Collins	113	66	179
Bad Axe	Huron County Mem.	1	16	17
Baldwin	Baldwin Municipal	0	5	5
Benton Harbor	Ross Fld.-Twin Cities	75	81	156
Charlevoix	Charlevoix Municipal	6	31	37
East Lansing	Art Davis	2	1	3
Escanaba	Delta County	22	41	63
Fremont	Fremont Municipal	11	3	14
Gaylord	Otsego County	8	104	112
Gladwin	Gladwin	2	1	3
Grand Rapids	Kent County Int'l.	806	4,369	5,175
Hancock	Houghton County Mem.	34	78	112
Jackson	Reynolds Field	81	90	171
Kalkaska	Kalkaska City	0	0	0
Ludington	Mason County	5	18	23
Marquette	Marquette County	408	398	806
Monroe	Monroe Custer	2	12	14
Mt Pleasant	Mt Pleasant Municipal	21	31	52
Muskegon	Muskegon County	135	253	388
Plymouth	Mettetal Canton	7	62	69
Pontiac	Oakland-Pontiac	632	846	1,478
Saginaw	Harry Browne Int'l.	19	30	49
Saginaw	Tri-City Int'l.	335	1,373	1,708
Sandusky	Cowley Field	0	0	0
Sandusky	Sandusky City	1	0	1
Sparta	Sparta	10	2	12
Sturgis	Kirsch Municipal	14	2	16
Traverse City	Cherry Capital	285	382	667
Utica	Berz-Macomb	31	18	49
Wayland	Wayland Municipal	1	0	0
<b>TOTALS</b>		<b>3,091</b>	<b>8,332</b>	<b>11,422</b>

**NOTES:** Direct Jobs, usually at-airport, are provided by the airport owner/operator, the FBO(s), airport aviation tenants, (e.g., paid pilots, aircraft servicing).

Indirect and Induced Jobs, usually off-airport are at motels and restaurants that serve the air passengers, and include induced jobs due to the economic activity at the many industry types that indirectly serve aviation.

SOURCE: MDOT, BTP Study Consultant, Wilbur Smith Associates

## Chapter 4

# STATEWIDE ECONOMIC IMPACTS OF AVIATION

The economic impacts estimated for the 32 study airports were used as data inputs to an extrapolation process which developed an estimate of total economic impacts for all of Michigan's airports, excluding Detroit Metropolitan Airport<sup>1</sup> and Willow Run Airport (both of which were treated separately, because of unique characteristics). This chapter describes the impact extrapolation process, and presents the estimated annual economic impact of all of Michigan's public use airports.

### Impact Extrapolation Process

Results of the direct and indirect economic impacts determination for the 32 study airports were subjected to stepwise multiple regression analyses to establish correlations of impacts with pertinent independent variables. The process consisted of the following sequence of procedures.

1. An initial list of relevant candidate independent variables was identified, based on consideration of the analyses of the sample airports;
2. The list was refined and shortened, based on data available for the non-sample airports, to be used in the extrapolation process. The refined list of candidate variables included number of based aircraft, annual total and itinerant aircraft operations, and air passenger enplanements.
3. The entire population of variables and impacts for studied airports was subjected to regression investigations using computerized techniques. Results were analyzed, with special attention to data points not fitting the general pattern.
4. Explanations were developed for airports that did not fit the regression lines (after recheck of basic input data). Sample populations then were restructured, and steps 3 and 4 were reiterated until satisfactory relationships between impact estimates and airport activity statistics could be developed.

---

(1) The Wayne County Airports Division has commissioned an economic impact study which is currently being conducted by another consultant.



**Extrapolation Equations** - The regression analyses produced two sets of equations: one dealing with air carrier airports, the other with general aviation airports. Each set consisted of one equation to extrapolate direct impacts and a second equation to extrapolate indirect impacts. The equations and statistical measures of performance are given in Exhibits 14 and 15.

**Air Carrier Airports** - Of the sample population of 32 airports, 10 have scheduled air carrier service. Regression analyses revealed that the air carrier airports have significantly different characteristics from general aviation airports; therefore, each was treated as a separate category. In developing the final extrapolation equation, two airports were excluded:

- \* **Marquette County Airport** - The regression analyses produced calculated impacts significantly lower than those observed. The airport is unique because it is the headquarters of Simmons Airlines, with its high employment due to the central maintenance base and staff training facilities.
- \* **Kent County International Airport** - Because of its high level of economic activity, this airport generates extremely large economic impacts. Because of their magnitude, they tend to drive the extrapolation formula. Since the activity levels are well outside those which are encountered in the airports population for which impacts are to be extrapolated, it was concluded that these data were not representative of conditions to be extrapolated.

Both airports were eliminated from the sample airports population used to develop the final equations, resulting in an improved fit of estimated-to-observed results. The commercial air service airport equations are given in Exhibit 14.

**General Aviation Airports** - The entire sample population of 22 general aviation airports was subjected to regression analysis. Initial testing identified two airports which, upon further analyses, were determined to have unique characteristics, as discussed below. Accordingly, they were eliminated when the final equations were developed.

**Oakland-Pontiac Airport** - The exceptionally high level of general aviation activity at this airport (much of it related to business use) places the data considerably outside the data range of other studied airports. Both direct and indirect economic impacts calculated by the extrapolation equations are much less than those determined by the on-site surveys. Accordingly, this airport was eliminated from the population used to develop the final extrapolation equations.

## Exhibit 14

## AIR CARRIER AIRPORTS EXTRAPOLATION OF ECONOMIC IMPACTS

## Equations and Evaluation Measures

## Direct Impacts (\$000)

Equation:  $859.77161 + \text{TOPS} (0.03946) + \text{PASS} (0.03184)$

Where: TOPS = Total aircraft operations  
 PASS = Enplaning passengers

## Evaluation Measures:

<u>SUM OF (RESIDUALS)<sup>2</sup></u>	<u>STANDARD ERROR OF ESTIMATE</u>
18,234,092	1909.7

## Indirect Impacts (\$000)

Equation:  $1793.68970 + \text{PASS} (0.15056)$

Where: PASS = Enplaning passengers

## Evaluation Measures:

<u>SUM OF (RESIDUALS)<sup>2</sup></u>	<u>STANDARD ERROR OF ESTIMATE</u>
10,569,710	1327.3

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NOTE: Equations are not applicable to Detroit Metropolitan, Kent County International or Marquette County Airports.

SOURCE:MDOT, BTP Study Consultant, Wilbur Smith Associates

\* **Otsego County Airport, Gaylord** - Because of its resort-country location, this airport experiences unusually high levels of air taxi and charter activity. These visitors, in turn, generate relatively high levels of visitor expenditures at this modest-sized general aviation airport.

Final extrapolation equations for the general aviation airports, together with evaluation statistics, are given in Exhibit 15.

**Evaluation** - For both types of airports the sum of squared residuals (errors of individual estimates) are large numbers. This reflects the inability of the study to survey enough airports to achieve a significant statistical sample (a budgetary limitation) as well as the relatively diverse characteristics of Michigan's airports, a factor which cannot be avoided. Although, for an individual airport, this implies the likelihood of a significant error in estimating economic impacts, the aggregated estimates for the statewide airport system are affected to a lesser degree. As the model's data base is expanded in the future, by including additional surveyed airports, the results will become more accurate.

#### Additional Direct and Indirect Economic Impacts

The detailed analyses developed impacts for the 32 Michigan airports included in the detailed study; the regression analyses developed impact estimates for 203 airports. To these must be added the impacts of Detroit Metro and Willow Run Airports. These airports are unique in Michigan, a fact which causes them not to reflect typical impact values.

#### Estimated Economic Impacts at Unsurveyed Airports

The regression equations, developed from data and findings at the studied airports, were used with appropriate data for the unsurveyed airports (except for Willow Run and Detroit Metro airports) to calculate estimates of direct and indirect economic impacts. To do this, the computer file of airports data furnished by MDOT's Bureau of Transportation Planning, was adjusted to eliminate the 32 studied airports (for which economic impacts had been determined) and both Detroit Metro and Willow Run. These two airports were treated individually, because of both their unique characteristics and the magnitude of their operations, which places them well outside the range covered by the studied airports.

## Exhibit 15

## GENERAL AVIATION AIRPORTS EXTRAPOLATION OF ECONOMIC IMPACTS

## Equations and Evaluation Measures

## Direct Impacts (\$000)

Equation:  $4.39212 + \text{TOPS} (0.02591)$ 

Where: TOPS = Total aircraft operations

## Evaluation Measures:

<u>SUM OF (RESIDUALS)<sup>2</sup></u>	<u>STANDARD ERROR OF ESTIMATE</u>
1,630,594	301.0

## Indirect Impacts (\$000)

Equation:  $34.01014 + \text{IOPS} (0.05451)$ 

Where: IOPS = Itinerant aircraft operations

## Evaluation Measures:

<u>SUM OF (RESIDUALS)<sup>2</sup></u>	<u>STANDARD ERROR OF ESTIMATE</u>
794,930	210.1

---

NOTE: Equations are not applicable to Oakland-Pontiac, Willow Run, or Otsego County Airports .

SOURCE: MDOT, BTP Study Consultant, Wilbur Smith Associates

The adjusted file then consisted of data relating to the 13 air carrier airports and 190 general aviation airports for which estimates of direct and indirect impacts were to be extrapolated. The airports data then were sorted into Michigan Aviation System Plan (MASP) categories of airports, within the two realms of air carrier and general aviation airports. Data on aircraft operations and passenger enplanements then were used with the appropriate equation to calculate the initial estimates of direct and indirect economic impacts for the unsurveyed airports. Results were combined with the impact values determined for the surveyed airports.

Willow Run Airport - Direct and indirect economic impacts for Willow Run Airport were estimated individually. One of the nation's largest air cargo facilities, Willow Run Airport operates largely in support of the automotive industry. Contact was made with the airport representatives to obtain information on the nature of airport activity. Operating statistics for Willow Run and for a selection of the studied airports were reviewed. In addition, other non-Michigan airports with comparable large cargo operations were researched, to determine the relationships between activity and key parameters. Based aircraft was the parameter used to estimate economic impacts at Willow Run, using the relationship derived from Kent County Airport data, and also recognizing impacts generated by air cargo activity at major air freight centers such as Ontario International Airport in the Los Angeles area.

The direct and indirect economic impact data for the air carrier and general aviation airport realms (except for Detroit Metro Airport) then were input to the RIMS-II model, to calculate total economic impacts and employment. The induced impact components were derived by subtracting the sum of direct and indirect impacts from total impacts. Induced economic impacts were estimated for each of the MASP airport categories, using average multipliers for each of the two realms of airports. The individual treatment of Detroit Metro Airport is described in the following section.

Metropolitan Wayne County Airport, Detroit (DTW) - Detroit Metro Airport was not evaluated in-depth in this statewide study. Instead, the direct economic impacts of Detroit Metropolitan Airport were developed through inference from data relating to other airports of comparable activity levels. Indirect impacts generated by expenditures of visitors arriving via commercial air carriers, general aviation, and corporate aviation activity, were estimated using available passenger enplanements and general aviation itinerant aircraft operations data. Additional indirect impacts were derived from other sources, as described below.

**DTW Direct Economic Impacts** - The direct economic impacts at Detroit Metro were developed by relating Metro Airport to other large U.S. airports. A selection of pertinent data available in the consultant's files relating to estimated direct economic impacts and enplaning passengers (used to represent overall airport activity) is given in Exhibit 16. Placing Wayne County Metropolitan Airport in this context, suggests that the direct economic impacts would be in the magnitude of \$1.2 billion, annually.

## Exhibit 16

## DIRECT IMPACTS AND PASSENGER ENPLANEMENT RELATIONSHIP

## Sample of Large Metropolitan Airports

<u>AIRPORT</u>	<u>1987 ENPLANEMENTS</u>	<u>ESTIMATED DIRECT ECONOMIC IMPACTS</u> (Millions)
Chicago-O'Hare International	27.6	\$ 2,448
Los Angeles International	21.8	2,898
Newark International	11.8	1,400
Minneapolis-St. Paul International	10.9	1,300
Metropolitan Wayne County	9.6	1,201
Houston Intercontinental	7.4	962

SOURCE: MDOT, BTP Consultant files.

**DTW Visitor Expenditures** - Visitors to Michigan who arrive at the Detroit Metropolitan airport by commercial air services or general aviation, produce significant economic impacts from their expenditures on food, lodging, transportation and other items. Specific visitor expenditure data were not available for Detroit Metropolitan. Therefore, the average expenditure per trip for visitors arriving by commercial air service at other large U.S. airports was used. This average is estimated to be \$518 per visitor trip. This rate is the average of air passenger surveys and airport economic impact studies conducted at the following major airports:

Anchorage International	Los Angeles International
Hartsfield Atlanta International	Minneapolis-St. Paul International
Boston Logan International	Newark International
Burbank-Glendale-Pasadena	Ontario International
Chicago-O'Hare International	Orlando International
Ronkonkoma (Long Island) MacArthur	Philadelphia International
John F. Kennedy International	Phoenix Sky Harbor International
La Guardia	Pittsburgh International
McCarran International (excluding visitors coming to Las Vegas for gaming)	San Francisco International
	San Luis Obispo County

Expenditures for visitors arriving via general aviation at larger airports were estimated to average \$103 per trip, based on available surveys at a number of airports. The figure is much lower than that for commercial air service visitors, due principally to a shorter average duration of stay. To estimate visitor expenditures for Detroit Metro Airport, the following calculation was performed, using Michigan data inputs where available:

- a) Commercial air service visitors = (annual enplaning passengers) x (percent locally originating) x (percent visitors).
- b) Commercial Air Service Estimated Gross Visitor Expenditures = (Commercial air service visitors) x (\$518 average expenditure per trip).
- c) General Aviation Visitors = (general aviation annual itinerant aircraft operations) / 2 x (percent visiting aircraft) x (average occupants per aircraft).
- d) Annual Gross General Aviation Visitor Expenditures = (annual visitors) x (\$103 average expenditure per trip).

The estimated visitor expenditures for those visitors who use Detroit Metro are presented in Exhibit 17.

#### Exhibit 17

#### ESTIMATED GROSS VISITOR EXPENDITURES Detroit Metropolitan Airport

<u>Air Carrier Visitors</u>		<u>General Aviation Visitors</u>	
Annual passenger enplanements:	\$9,574,493	Annual itinerant G/A Aircraft Operations:	68,289
Percent originating passengers:	64.9	Percent Visiting Aircraft:	73.4
Percent Visitors:	39.0	Average Occupancy:	4
Annual Visitors:	2,423,400	Annual Visitors:	100,250
Average Expenditure:	\$518	Average Expenditure:	\$103
Total Gross Expenditures:	\$1,255.3 million	Total Gross Expenditures:	\$10.3 million

SOURCES: Air Carrier passenger enplanements from Air Carrier Statistics, 1988, MDOT Passenger Planning Section; Percentages of originating passengers and visitors, from draft Master Plan Study, Detroit Metropolitan Wayne County Airport, Wayne County Division of Airports consultants, Landrum and Brown; general aviation itinerant aircraft operations, from Michigan Control Tower Airport Operations, April 1988, MDOT Passenger Planning Section.

Visitor Expenditure Patterns - Since economic impacts in Michigan are created by expenditures which stimulate local economic activity, gross visitor expenditures were adjusted to delete the portion of expenditures estimated to represent values imported into Michigan. To do this, major categories of expenditures were identified. The distributions of visitor expenditures among major categories found in several recent passenger surveys are shown in Exhibit 18. Results of all surveys are in good general agreement and the average of all results (shown in the right hand column) was used to calculate an estimate for Detroit Metro Airport. Expenditures on retail goods were adjusted to reflect that local value-added consists of distribution and retail services, estimated to represent 20 percent of retail price. The resulting estimated visitor expenditures for Detroit Metro are given in Exhibit 19.

Exhibit 18  
PERCENT VISITOR EXPENDITURES BY ITEM  
Air Carrier Passengers

EXPENDITURE ITEM	SURVEY RESULTS BY AIRPORT (PERCENT)						Average
	Buffalo BUF	Los Angeles LAX	Orlando MCO	Ontario ONT	Pittsburgh PIT	Phoenix PHX	
Hotels/Lodging	36.7	29.5	28.4	36.7	30.6	34.7	32.8
Food/Restaurants	32.6	17.0	31.8	18.5	25.8	28.3	25.7
Entertainment/Amusements	7.0	8.5	10.8	8.7	7.9	7.0	8.3
Local Transportation	4.9	10.1	13.2	7.4	6.9	10.0	8.7
Retail Trade	10.3	17.3	11.1	19.4	11.7	16.7	14.4
Other	8.5	17.6	4.7	9.3	17.1	3.3	10.1
Totals	100.0	100.0	100.0	100.0	100.0	100.0	100.0

SOURCE: Surveys and economic impact studies at each of the above airports.

Other DTW Indirect Impacts - Two additional sources of indirect economic impacts were recognized. These arise from the activities of businesses which depend on Detroit Metro Airport: travel arrangements for air transportation, conducted by travel agents, and corporate air activities related to the airport. Both values were derived from results developed for a national aviation study,<sup>2</sup> just completed by Wilbur Smith Associates.

(2) The Economic Impact of Civil Aviation on the U.S. Economy, for the Partnership for Improved Air Travel by Wilbur Smith Associates, 1989.



## Exhibit 19

## ESTIMATED VISITOR EXPENDITURES

## Detroit Metro Airport

1987

<u>EXPENDITURE CATEGORY</u>	<u>PERCENT OF TOTAL</u>	<u>AMOUNT (000)</u>
Hotels/lodging	32.8	\$415,117
Food/Restaurants	25.7	325,259
Entertainment/Amusements	8.3	105,045
Local Transportation	8.7	110,107
Retail Trade	14.4	182,246
Other	<u>10.1</u>	<u>127,826</u>
<b>Total</b>	<b>100.0</b>	<b>\$1,265,600</b>
Less 80% of retail sales		<u>(145,797)</u>
<b>Estimated Economic Impact</b>		<b>\$1,119,803</b>

SOURCE: MDOT, BTP Consultant, Wilbur Smith Associates.

Impacts generated by travel agent activity were developed from data on employment and commissions earned on air ticket sales, by state. A portion of the Michigan total was allocated to Detroit Metro Airport based on relative levels of air carrier operations. The estimated impact is \$48.5 million.

Economic impacts generated from corporate air operations (and not accounted for elsewhere) were estimated to be generated principally from earnings of paid pilots and support staff associated with multi-engine, jet and helicopter aircraft based at the airport. Results of the current salary survey conducted by the National Business Aircraft Association (NBAA) were reviewed, to determine an appropriate range of earnings for pilots and maintenance technicians. Recognizing that paid pilots are used on virtually all helicopter aircraft, but only a portion of multi-engine propeller-driven aircraft, it was estimated that the average multi-engine aircraft generates at least \$13,000 in annual economic impacts not elsewhere accounted for, and the average corporate helicopter produces a minimum of \$40,000 in impacts. Using the FAA data base of active aircraft, Detroit Metropolitan Airport is reported to have based there, some 24 multi-engine aircraft and 5 helicopters. These are estimated to have generated \$512,000 in annual economic impacts in 1987.

Total Economic Activity Impact of Detroit Metro Airport - The direct and indirect economic impacts estimated for Detroit Metro Airport then were input to RIMS-II, to calculate total output generated in the community. Exhibit 20 brings together the estimated economic impacts discussed in the previous paragraphs. As shown, direct impacts are estimated at \$1.20 billion, indirect impacts at \$1.17 billion, and induced impacts at \$1.61 billion. This results in total economic activity of \$3.98 billion.

Exhibit 20  
**ESTIMATED TOTAL ECONOMIC ACTIVITY IMPACTS  
 OF WAYNE COUNTY METROPOLITAN AIRPORT  
 ON THE DETROIT METROPOLITAN COMMUNITY  
 1987**

<u>IMPACT TYPE</u>	<u>ANNUAL ECONOMIC IMPACT</u> (.....thousands.....)
Direct	\$1,201,000
Indirect:	
Visitor Expenditures	\$1,119,800
Travel Agents	48,500
Corporate Aviation	<u>512</u>
Total Indirect	1,168,812
Induced	<u>1,613,299</u>
<b>Total</b>	<b>\$3,983,111</b>

SOURCE: MDOT, BTO Consultant, Wilbur Smith Associates.

Total Economic Impacts of Detroit Metro Airport - The estimated total economic activity impacts of Detroit Metro Airport on the Detroit Metropolitan area are as follows:

<b>Total Annual</b>	
Economic Activity	\$3.98 billion
Annual Household Earnings	\$1.30 billion
Jobs	77,360

**Total Impacts Process**

To review, the process of estimating total statewide economic impacts consisted of the following steps:

1. A computer file was developed from data furnished by MDOT's Bureau of Transportation Planning, containing relevant data for each of Michigan's 237 airports. These were edited, for extrapolation purposes to eliminate the 32 studied airports, plus the two unique airports not included in the extrapolation process (Detroit Metropolitan, and Willow Run Airports).
2. Data for the remaining 203 airports were entered into appropriate extrapolation equations to develop initial estimates of direct and indirect economic impacts. The extrapolated results were added to the direct and indirect impacts determined for the 32 studied airports.
3. To these, were added the direct and indirect impacts for Detroit Metro and Willow Run Airports.
4. Impacts then were allocated to appropriate expenditure categories for input to the RIMS-II model, using statewide multiplier coefficients for Michigan, to determine the induced impacts.

**Total Estimated Economic Impacts of Michigan's Airport System**

Economic impacts by major category are summarized in Exhibit 21. Total economic activity generated by Michigan's 237 airports is approximately \$5.23 billion. Major components comprising the total are \$1.48 billion of direct impacts; \$1.54 billion of indirect and \$2.21 of induced impacts. General aviation airports generate about \$0.37 billion while air carrier airports produce \$4.86 billion (\$4.08 billion from Detroit Metro Airport and \$0.78 billion by the 23 others). A breakdown was made of the extrapolated results, using average multipliers for air carrier and general aviation categories, to develop an estimate of impacts by the airport categories used in MDOT's Michigan Aviation System Plan (MASP). These are given in Exhibit 22. The Transport Airport category is shown to account for \$5.10 billion -- \$4.08 billion by Detroit Metro and \$1.02 billion by the 43 other facilities in the Transport category. The entire Utility category combined generates \$0.13 billion. Average total economic impacts per airport range from \$23.7 million per transport airport, (other than Detroit Metro) through values in the \$1.3 million to 1.5 million range for medium and large utility airports, to approximate \$200,000 per small utility airport -- still a considerable impact.

**Exhibit 21**  
**SUMMARY OF STATEWIDE TOTAL ECONOMIC ACTIVITY IMPACTS**  
**Michigan Airports System**

<b><u>IMPACT CATEGORY</u></b>	<b><u>AIR CARRIER AIRPORTS</u></b>			<b><u>GENERAL AVIATION AIRPORTS</u></b>	<b><u>TOTAL</u></b>
	<b><u>Detroit Metro</u></b>	<b><u>All Others</u></b>	<b><u>Subtotal</u></b>		
	(.....Millions.....)				
Direct	\$1,201.0	\$153.1	\$1,354.1	\$121.6	\$1,475.7
Indirect	1,168.8	286.3	1,455.1	87.6	1,542.7
Induced	<u>1,714.8</u>	<u>339.0</u>	<u>2,053.8</u>	<u>160.1</u>	<u>2,213.9</u>
<b>Totals</b>	<b>\$4,084.6</b>	<b>\$778.4</b>	<b>\$4,863.0</b>	<b>369.3</b>	<b>\$5,232.3</b>
 Number of Airports	1	23		213	237

**SOURCE:** MDOT, BTP Study Consultant, Wilbur Smith Associates

Exhibit 22

ANNUAL STATEWIDE TOTAL ECONOMIC ACTIVITY IMPACTS

By Airport Categories<sup>1</sup>

1988

IMPACT TYPE	TRANSPORT			UTILITY			TOTALS
	Detroit Metro	All Others	Subtotal	Large	Medium	Small	
	(.....Millions.....)						
Direct	\$1,201.0	\$241.7	\$1,442.7	\$3.9	\$23.8	\$5.3	\$1,475.7
Indirect	1,168.8	334.2	1,503.0	2.8	28.0	8.9	1,542.7
Induced	<u>1,714.8</u>	<u>443.4</u>	<u>2,158.2</u>	<u>5.1</u>	<u>39.8</u>	<u>10.8</u>	<u>2,213.9</u>
Totals	\$4,084.6	\$1,019.3	\$5,103.9	\$11.8	\$91.6	\$25.0	\$5,232.3
Number of Airports	1	43		8	73	112	237
Average Total Impact Per Airport (Millions)	\$4,084.6	\$23.7	--	\$1.5	\$1.3	\$0.2	--
Taxes <sup>2</sup> (Millions)	\$11.3	\$7.8	\$19.1	\$0.1	\$1.2	\$0.2	\$20.6

(1) Michigan Aviation System Plan (MASP) Categories.

(2) Aviation fuel and sales tax payments.

SOURCE: MDOT, BTP Study Consultant, Wilbur Smith Associates

**Taxes** - Also shown in Exhibit 22 are payments for aviation fuel taxes and general sales taxes, totalling \$20.6 million, which are generated by local airport activity. Since they flow directly to the State of Michigan, they were not recognized at the local airport level.

### **Employment Impacts**

Total statewide employment resulting from the aviation-related economic activity is shown in Exhibit 23 to be 101,105. The analyses show that 78,504 jobs throughout the state's economy result from the aviation-related economic activity at Detroit Metro, an additional 15,873 are associated with the other air carrier airports and 6,728 stem from the 213 general aviation airports.

**Exhibit 23  
EMPLOYMENT IMPACTS OF  
AIRPORTS IN MICHIGAN  
1988**

<b><u>AIRPORT CATEGORY</u></b>	<b><u>JOBS</u></b>
Detroit Metro	78,504
23 Other Air Carrier Airports <sup>1</sup>	15,873
213 General Aviation Airports	<u>6,728</u>
<b>Total</b>	<b>101,105</b>

(1) Includes the jobs due to general aviation activity at these air carrier airports.

SOURCE: MDOT, BTP Study Consultant, Wilbur Smith Associates

### **Industry Types Impacted by Airports**

Exhibit 24 displays the results of the RIMS-II model. This illustrates how the multiplier effect involves other industry groups as the aviation-related expenditures work their way through Michigan's economy. The tabulations show how the total aviation-related economic impacts (i.e., direct, indirect and induced) are distributed through 38 industry groups plus households (payroll) and also show the distribution of the impacts amount each industry group, in terms of total economic activity, earnings and employment.

Exhibit 24  
 STATEWIDE ECONOMIC IMPACT OF AVIATION IN MICHIGAN  
 BY IMPACTED INDUSTRY TYPE  
 (\$ Thousands)  
 1987

<u>IMPACTED INDUSTRY GROUPS</u>	<u>TOTAL ANNUAL IMPACT (Output)</u>	<u>TOTAL ANNUAL PAYROLL (Earnings)(1)</u>	<u>EMPLOYMENT (Jobs)</u>
Ag. Prod., Forestry Svcs.	\$40,818	\$11,411	1,379
Forestry Products	506	81	12
Coal Mining	0	0	0
Crude Petrol.	6,227	633	16
Other Mining	1,821	477	16
New Construction	16,929	5,995	224
Maint. and Repair Const.	51,263	23,463	875
Food, Kindred Prd.	166,920	23,544	847
Textile Mill Products	1,181	210	9
Apparel	5,512	1,532	45
Paper, Allied Products	27,732	5,798	172
Printing, Publishing	43,045	14,834	628
Chemicals, Refined Petrol.	108,270	10,525	258
Rubber, Leather Prod.	27,598	6,788	290
Lumber, Furniture Prod.	9,568	2,686	103
Stone, Clay, Glass Prod.	12,935	4,069	124
Primary Metals	28,309	6,541	167
Fabricated Metals	29,108	8,123	246
Non-electrical Machinery	20,443	6,428	188
Electrical Machinery	16,547	4,361	137
Motor Vehicles, Equipment	67,749	11,121	223
Other Transportation Equip.	26,300	9,072	269
Instruments	3,417	1,031	37
Miscellaneous Mfg.	10,182	2,850	147
Transportation	1,904,483	655,789	23,846
Communications	68,547	18,089	501
Utilities	134,063	13,849	358
Wholesale Trade	144,614	56,647	1,930
Retail Trade	243,367	120,926	8,992
Finance	48,425	14,304	614
Insurance	58,712	19,363	726
Real Estate	220,670	5,193	1,292
Lodging, Amusements	657,144	233,137	22,607
Personal Services	40,299	18,247	1,813
Business Services	279,711	125,452	5,775
Eating, Drinking Estab.	518,794	162,134	20,285
Health Services	94,787	55,092	2,437
Other Services	96,286	36,958	2,126
Households	-----	6,419	1,391
<b>TOTALS</b>	<b>\$5,232,282</b>	<b>\$1,703,172</b>	<b>101,105</b>

(1) The portion of the "output" column that is payroll to employed persons.

SOURCE: Rims II Multipliers, MDOT, BTP Study Consultant, Wilbur Smith Associates.

### Interpretation and Conclusions

The calculations show that Michigan's airport system has a substantial annual aggregate economic impact on the state in terms of total economic activity. This impact is approximately \$5.23 billion, of which, Detroit Metro Airport accounts for \$4.08 billion, or about 78 percent.

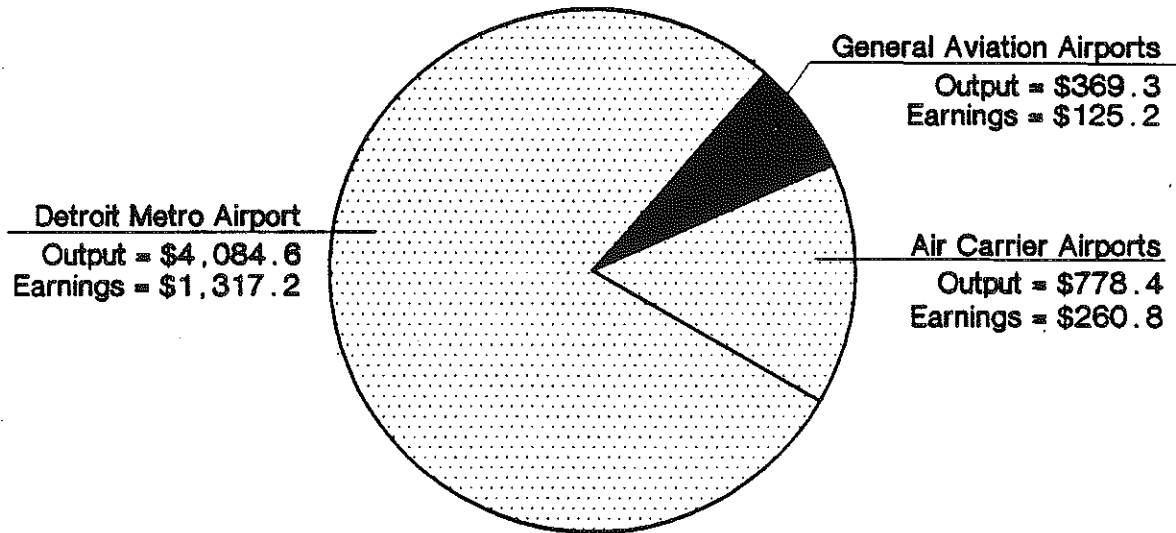
Of the total excluding Detroit Metro (\$1.15 billion), airports served by both commercial air carriers and general aviation account for approximately \$0.78 billion or 68 percent, as shown in Exhibit 21. General aviation airports yield approximately \$0.36 billion in economic impacts, making up the remaining 32 percent. This relationship is diagrammed in Exhibit 25.

When the total economic activity impacts are allocated to MDOT's airport functional categories, as tabulated in Exhibit 32 and diagrammed in Exhibits 26 and 27, it becomes clear that larger airports generate a very high percentage of total economic impacts -- the Transport Airport Category above accounts for 97.5 percent of the total. However, small facilities still generate high dollar impacts, particularly when placed in the context of the non-urbanized economies.

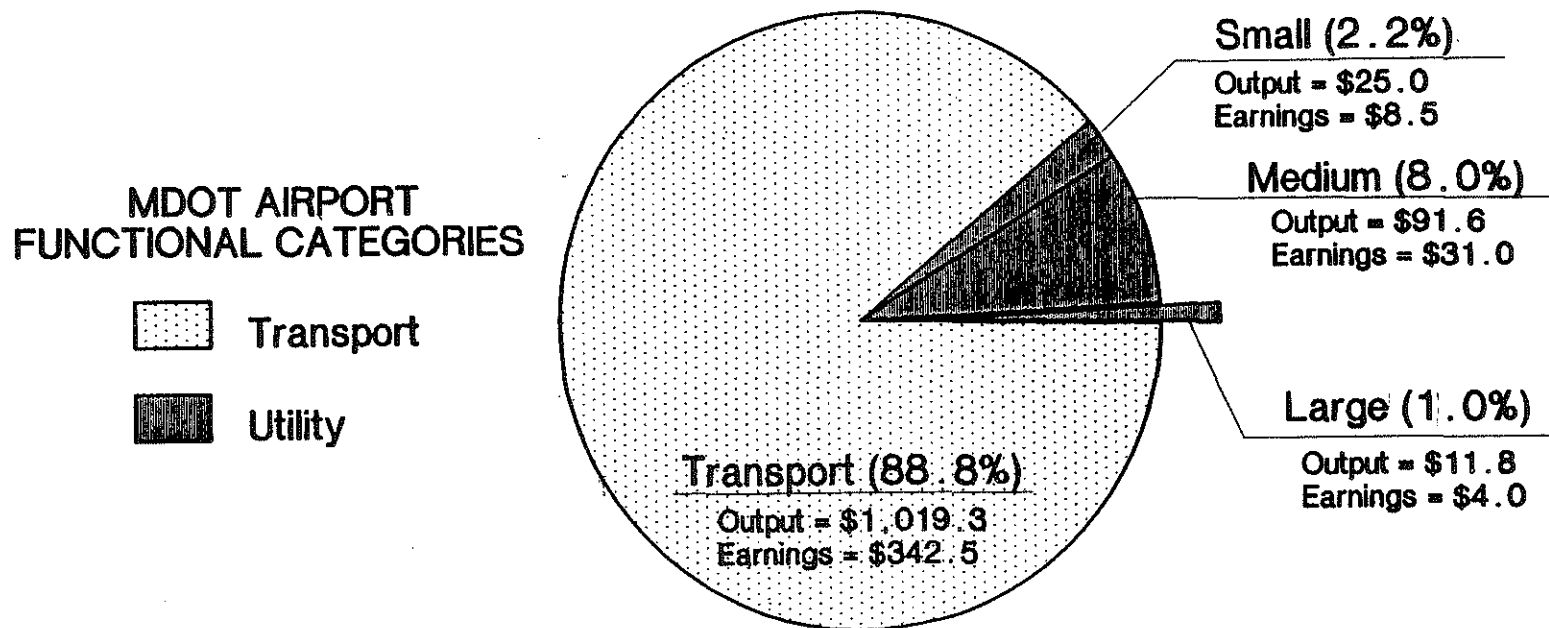
Results of the RIMS-II analyses (given in Exhibit 24) show that 37 major industry groups in Michigan (of a total of 39) show significant total economic impacts resulting from the economic activity at Michigan's airports. Also shown is how total statewide estimated household earnings (payroll) are distributed over major industry groups in Michigan. The Exhibit also shows that a total of more than 101,105 jobs statewide, are attributed to airports' economic activity, and indicates in which industry groups the jobs are located.



**RELATIVE ECONOMIC ACTIVITY  
AIR CARRIER AND GENERAL AVIATION AIRPORTS  
( \$ in Millions )**

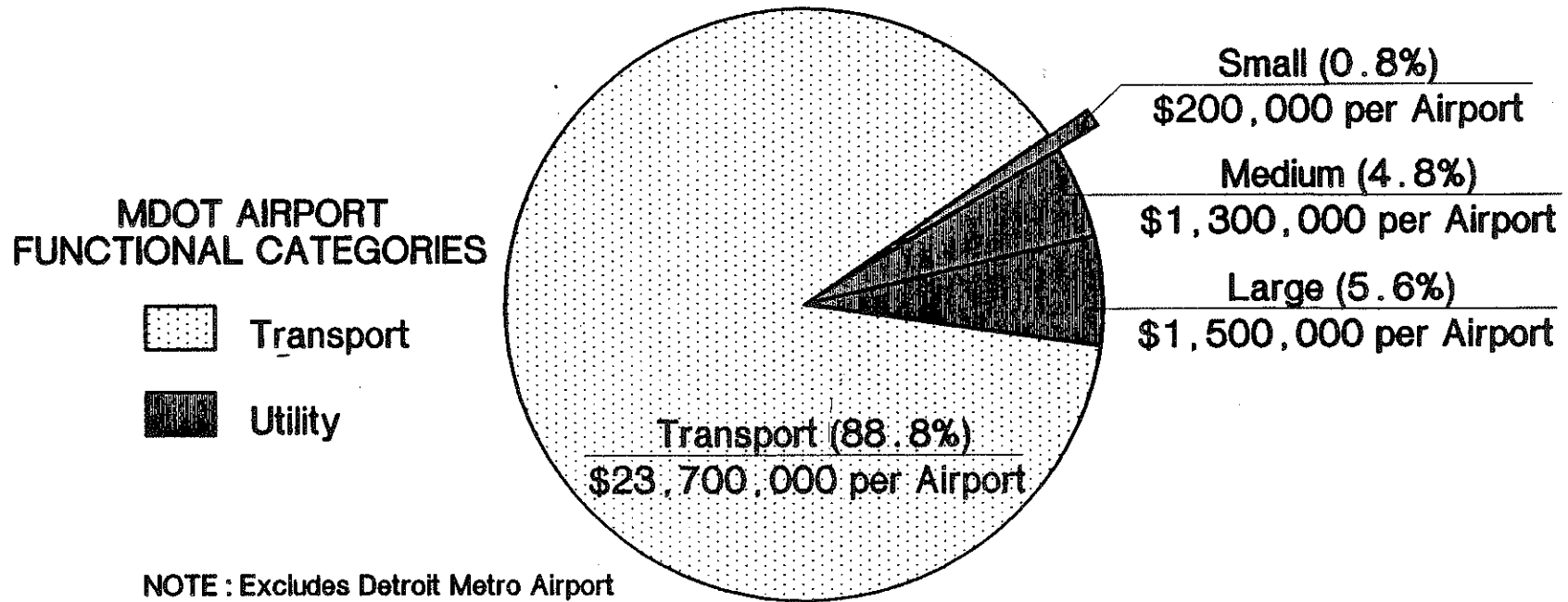


# TOTAL ECONOMIC IMPACTS BY MDOT's AIRPORT FUNCTIONAL CATEGORIES ( \$ in Millions )



**NOTE:** Excludes Detroit Metro Airport  
 Output = \$4,084.6  
 Earnings = \$1,317.2

## AVERAGE ECONOMIC IMPACTS PER AIRPORT BY MDOT'S AIRPORT FUNCTIONAL CATEGORIES



## Chapter 5

# HEALTH SAFETY. AND WELFARE IMPACTS OF MICHIGAN'S AIRPORTS

The preceding chapters treated aviation as an industry and estimated the value of that industry to the state and localities in monetary and employment terms. That analysis indicated that the contributions of airports to the State's economy is some \$5.23 billion in total economic activity, \$1.70 billion in household earnings and more than 101,100 jobs annually.

These impacts, while impressive, are only part of the picture. There are two additional impact types which, if they could be quantified, might be more significant than the amounts estimated using the Federal Aviation Administration economic impacts methodology:



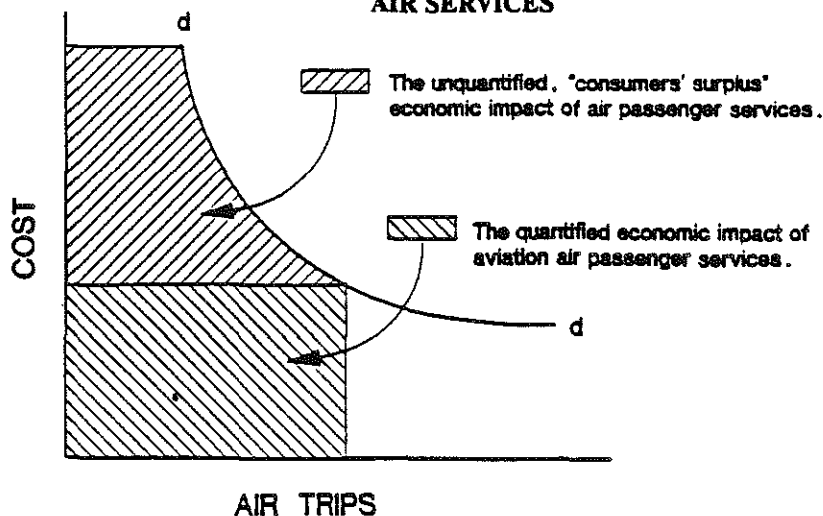
1. **Consumers' Surplus Value of Airports** - Direct economic impacts related to Michigan's statewide airports system are shown in Exhibit 21 to total \$1.48 billion. This represents the local value added portion of expenditures made to provide air service and is an amount which is covered by revenues obtained from ticket sales, air taxi/charter fees and air cargo charges. However, many people and firms value the air service much more than the amount they pay, i.e., they would pay more if they had to. The value of the air trip, or the value of shipping cargo by air is, therefore, in excess of the amount they actually pay. The \$1.48 billion impact does not include this extra value derived and should therefore be viewed as very conservative. This concept is described in Exhibit 28 below, where line "d" is the demand curve,  is the cost of air service (the \$1.48 billion direct impact), and  is the surplus beneficial impact that is not recognized in this impact study. The consumers of aviation services (e.g., Michigan's business community, citizens and visitors) benefit from the surplus described. In the case of Michigan businesses, the surplus savings in cost can be passed along to shareholders, in the form of increased dividends, or can be treated as a reduced cost of production and passed along to customers in the form of lower prices. This could result in some increase in sales and a strengthening of the competitiveness of Michigan's industry -- significant contributions to the welfare of Michigan citizens.

Exhibit 28  
CONSUMERS' SURPLUS VALUE OF  
AIR SERVICES



2. Non-Economic Impacts of Airports - In addition to the economic values of airports to their service regions, airports also offer features and services which provide non-quantifiable benefits to local communities. These impacts are very real and very important.

During the conduct of this study, each of the 32 airports selected for study were visited, the roles of each airport were identified, and discussions were held with representatives of the communities, the airports, and airport users. One of the purposes of these visits and discussions was to seek opinions and insights into the intangible impacts of airports in Michigan. The visits made clear that not all values a community derives from an airport are quantifiable in dollar terms. Virtually all of Michigan's airports bring certain non-economic values to their communities which protect and enhance the health, safety and welfare of local residents.

For example, the airport provides alternative travel linkages to the rest of Michigan and beyond. This is particularly important to Michigan communities which can become isolated due to extremes of winter weather. Even when the weather is more moderate, island communities are cut off when the ice is thick enough to prevent marine travel but is not solid enough to support a surface transit. Examples of this are Mackinaw, Drummond and Beaver Islands.

The airport also provides local residents with access to the latest medical diagnosis and treatment procedures. Samples of blood or tissue are regularly sent by air from many Michigan airports to medical centers or specialist laboratories for analysis. Medical supplies not available locally, (such as serums, antitoxins or isotopes and organs for transplant operations) are shipped by air, and patients are moved by air as may be needed, for treatment procedures not available locally. Among the many airports specifically reporting use for medical transportation, Gratiot Community Airport at Alma reported handling roughly 100 flights per year to the tissue bank at Lansing's Sparrow Hospital, as well as air ambulance services from time-to-time; Delta County Airport, at Escanaba, reported regular use to transport medical samples and, in addition, received a total of 16 flights evacuating patients in medical emergencies in 1987; and Otsego County Airport advised that some 3,000 medical samples per year passed through the airport on courier service flights.

Michigan airports also help to maintain the security and welfare of the state's citizens in a number of ways, such as supporting patrols to maintain fire watches; patrols to locate trouble spots in pipelines or power lines; police search or surveillance activities or Coast Guard search

and rescue missions, or by serving as a staging point for airlifts to combat forest fires. Gladwin Airport routinely acts as a communications link during periods of forest fire danger; Kent County International Airport at Grand Rapids served as a regional mobilization center for the U.S. Forest Service during the summer, 1987 forest fire emergency in the far west. Scores of fire fighters drove to the Kent County International Airport and left their vehicles in a secure storage area, to board flights bound for the Pacific Northwest, where they were dispatched to fire sites in various national parks. Delta County Airport supported a sheriff's department search and surveillance operation in mid 1988 which resulted in the apprehension of a criminal fugitive and rescue of a hostage. At Charlevoix Airport some years ago, an Island Airways pilot participated in the rescue of three persons who had become lost in a storm on Lake Michigan. In case of natural disasters (fire, flood or blizzard) airports can be resources for supply and/or evacuation.

In recent years, aviation has become an important field of employment and general aviation has evolved into a major career training ground. Many of Michigan's airports support local programs to inform, interest and train people for aviation careers. Ross Field, Twin Cities Airport in Benton Harbor/St. Joseph, Padgham Field in Allegan, and Marquette County Airport are among a number which reported hosting tours from schools and community groups; Mount Pleasant airport furnishes flight instruction for credit in an aviation program at Central Michigan University; Cherry Capital Airport at Traverse City is the site of an aviation career education program offered by Northwestern Michigan College; Kent County funds a career intern position at the airport in Grand Rapids, and a flight school and maintenance instruction are offered at Mettetal Canton Airport, in Plymouth, among other locations.

#### Value of Air Carrier Airports to Communities

The study found that community representatives generally recognize the value of scheduled air service to their communities. The most recognizable value is that of travel efficiency (time, cost, convenience), which was not measured in the economic impact study. In every air trip instance the trip maker perceives the cost of air travel (in time and money terms) to be less than that of its modal alternatives (if not, the other mode would have been used). Those surveyed also recognized the dependence of local businesses and institutions (e.g., hospitals, colleges) on air services, the importance of the airports to economic development and industrial recruitment, and the need to retain such scheduled air carrier services.

Value of General Aviation to Communities

Less well recognized in Michigan are the intangible benefits of general aviation (both general aviation airports and general aviation activity at commercial service airports). The predominant finding, while not universal, was that the more a person knows about an airport, the greater the likelihood that he or she recognizes the value of general aviation. Those who never use general aviation, and perhaps never visit such an airport, typically do not recognize either the quantifiable or the intangible benefits. This is unfortunate, because this study found that many of these people benefit, even though they are not aware of how they benefit.

For this reason, the study paid considerable attention to general aviation, and the intangible community values of the general aviation industry and services. The study suggests that the three types of general aviation use cause varying types of community values:

- \* Air taxi -- general aviation open for rent or charter to both businesses and the general public.
- \* Corporate aviation -- general aviation aircraft owned and operated by companies for their own use and purposes.
- \* Private aviation -- individuals, groups and others that use general aviation for their own specific purposes.

All of these general aviation types were found to have some positive impact on Michigan's communities.

The study suggests that the non-economic community value impacts of Michigan's general aviation airports can be grouped into six general categories. Some are applicable to all airports, others only to specific airports.

1. Transportation Efficiency
2. Dependent Businesses
3. Specialized Services
4. Emergency Services
5. Perceived Community Asset/Economic Development
6. Distribution of Michigan Development

Transportation Efficiency

People and firms use commercial airline services for certain trips because, for those trips, the total cost (cost, time, convenience) is less than the cost of alternative modes. For many trips (long-distance, overnight) the airplane is perceived to be the only viable mode. Just as the commercial airline is selected for some trips on a total cost basis, general aviation may be selected in place of air carrier services, also on a total cost basis. Certain people, for certain trips, need the fast and direct services of general aviation. Many of Michigan's major corporations were found in this study to have private corporate aircraft based at the state's airports; and many others were found to use air taxi services. Clearly there are total cost savings accruing to Michigan's business community via the use of general aviation.

Local Michigan persons involved in the industrial development effort seem to understand this efficiency -- if a community has no airport whatsoever, its chances of attracting significant new business (that can locate anywhere) are very poor. In this sense, the airport, especially one that can handle business aircraft, is an essential asset when it comes to job creation and economic diversification.

Michigan's businesses appear to be watching air carrier services and costs rather closely. The "hub" concept has introduced delays in some instances, and the outlook for future levels of air fares is uncertain. As a result, increased reliance on general aviation at some Michigan airports is possible. To the extent that this happens, the value of general aviation services to a community could increase.

Dependent Businesses

The quantitative economic impact estimates include travel related expenditures by firms that use the airports. There are other values, however, that could not be included as dollar-quantifiable impacts. For example:

- \* Client Fliers -- Companies located throughout Michigan must, from time to time, bring current or prospective clients to their businesses. The values derived generally involve either efficiency, or development of increased market penetration or retention. The value of a new market is translated into increased sales, increased profits, increased jobs and increased tax payments -- which ultimately would increase the quantitative impact estimates.
- \* Company Fliers -- Similarly, companies located throughout Michigan must, from time to time, have their own employees travel by general aviation. The community value impacts are again a combination of efficiency and sales.



- \* **Emergency Fliers** -- Equally important, is the value derived from the sudden and unexpected need to travel at a moments notice. The statement "I don't use air taxis very often but, when I do, I really need it" seems to fit many of Michigan's businesses.
- \* **Cargo Transport** -- Quite a number of firms were found which use general aviation for routine cargo purposes, especially at Detroit Willow Run Airport, Oakland-Pontiac Airport, and other large airports. Even more firms use general aviation for emergency shipment purposes. The value of those shipments to the company are not included in the quantitative economic impact calculation.

### Specialized Services

While the above general aviation community values apply generally to all general aviation airports, especially the larger facilities, other benefits are derived from specialized services offered by some airports. Examples that were found during the impact study include the following:

- \* **Forest Fire Fighting** -- The capability to support fire fighting activities, such as transporting fire fighters quickly to a specific location, monitoring fire fighting activities, and rewatering air tankers was found to be important at a number of Michigan's airports. For example, the U.S. Forest Service in 1988 installed a 10,000 gallon tank for fire retardant chemicals at Delta County Airport, to enable air tanker use for fire fighting purposes. The capability to fight forest fires efficiently from the air has immense value statewide.
- \* **Wildlife Management** -- The Michigan Department of Natural Resources was found to have general aviation aircraft positioned at a number of small and mid-sized airports throughout the State.
- \* **Law Enforcement** -- Law enforcement has a periodic need to be able to conduct searches and/or surveillance from an airport near the search site. For example, the FBI used Delta County Airport to coordinate its Summer, 1988 Loonesfoot fugative search. This public protection value is potentially applicable to any airport capable of handling twin engine aircraft (generally medium utility and larger).
- \* **Other Services** -- Dozens of other specialized services were observed at Michigan's airports, all of which are of some generally nonquantifiable value to Michigan's communities. A number of the airports have aerial photography services, utility companies use some airports for utility line inspection, several have weather stations, several have agricultural aerial seeding and insect spraying services and quite a number have flight training services. All of these are of value to their served communities.
- \* **Career Path** -- In recent years, general aviation has evolved into a major training ground for aviation services careers. Local airports often support or supplement local high school or college participation in such programs included Benton Harbor Ross Field; Houghton County Memorial; Marquette County; and Gladwin Airports.

Emergency Services

Discussions with airport representatives at the 32 study airports found that many, if not most, are used periodically for true emergency purposes. Emergencies come in many forms, with the most frequent including the following:

- \* Medical Evacuation -- Seven of the 32 study airports are regularly used by fixed-wing and helicopter air ambulance services to move passengers on a routine basis. In addition, many more indicate that they sometimes are used on an emergency basis for such services. A life saved due to a Michigan airport being available has a definite community value which cannot be quantified.
- \* Medical Shipments -- A number of the study airports also indicate that they are used to receive air shipments of medical supplies not available locally (serums, antitoxins, isotopes, transplant organs, etc.) and to ship items for diagnosis (blood and tissue samples etc.).
- \* Access in Snow -- Quite often following a blizzard, roads to rural areas of the state are either closed, or so slow as to make travel untimely and even hazardous. In those times, local airports, when they open, can be the only access point to the community for emergencies. This too has value of a non-quantifiable nature.

Perceived Community Asset/Economic Development

Many, but certainly not all, community leaders in Michigan seem to understand that a community airport, even if it is a small general aviation airport, is a nice thing to have, and is one of the infrastructure items generally needed before industrial recruitment efforts can be successful. Possibly the most extreme example is the town of Kalkaska which is sufficiently proud of its turf runway and its 9 based aircraft that it channels several thousand dollars annually to its airport -- even though Kalkaska Airport was the only study airport found to have no quantifiable economic impact. Many other communities and counties certainly spend more funds on their airports, but they tend to have quantifiable economic impacts which, for every studied airport, exceed the funding levels.

During the study, several firms were found for which the single dominant site location criterion was a contiguous location at and direct access to a paved general aviation airport. These were also the most extreme cases, although most businesses that have important connections beyond the local region feel that an airport has some value and is considered in their site location decisions.

Distribution of Michigan Development

A recurring theme that arose in many local discussions, especially those relating to airports in non-urbanized areas, was the need for economic development opportunities and jobs in rural Michigan. Without any type of airport or air service, new plants and offices have no choice but to locate near the larger cities. Businesses that need air carrier or air taxi/corporate aviation while not necessarily needing to locate at an airport, at least need convenient access to one.

Such a situation has implications for state policy regarding industrial development and recruitment. It is impossible to have airports everywhere; however, those communities that do have airports appear to have a perceived advantage over those that do not.

Conclusions

This study assessed the state's airport system in an attempt to define the extent to which the airports impact state and local economies. The investigations found that the quantifiable impacts are quite impressive:

- \* The airports have a combined \$5.23 billion annual impact statewide;
- \* Detroit Metro dominates with \$4.08 billion (78 percent of the total);
- \* The other 23 air carrier airports have a \$780 million impact (15 percent);
- \* The exclusively general aviation airports are also seen as important, with a combined \$370 million annual impact (7 percent).
- \* Aviation activity in Michigan generates an estimated \$1.70 billion of household income in the form of wages and salaries; and
- \* Overall, it appears that more than 101,100 Michigan residents owe their jobs, directly or indirectly, to the State's airports.

Impressive as these impact values are, the study (Chapter 5) goes on to explain that there are many positive impacts of airports which contribute to the health, welfare and safety of Michigan businesses, citizens and visitors, that cannot be quantified. These other community values, while perhaps subjective in nature, are very real -- and valuable, according to spokespersons for many communities and businesses. Industrial development professionals suggest that when it comes to decisions on site locations, when decision-makers believe that they need a particular feature, they will locate where they can get it.

## **APPENDICES**

**Contains detailed description of application of Regional Input-Output Model (RIMS-II) to calculate induced impacts.**

**Description of Michigan Regions Used for RIMS-II**

**Contains bibliography of other studies of relevance**

**Contains Visitor Expenditure Data and samples of survey forms used.**

## APPLICATION OF THE RIMS-II MODEL

The "direct" and the "indirect" economic impacts attributable to Michigan airports in this study represent increases in final demand in the impact areas. These increases in final demand are estimated by type, e.g., capital investment, lodging, etc. These are financial transactions that are directly or indirectly attributable to each airport. However, such final demand increases do not represent the total economic impact of the airports. Rather, there is also a "multiplier effect," which is added to the final demand increases to attain total economic impact. This multiplier effect is developed utilizing the RIMS-II multipliers for the appropriate Michigan airport impact areas, as developed by the U.S. Department of Commerce.<sup>1</sup>

### The Multiplier Concept

Multipliers are estimates of the total changes in output of regional industries caused by an increase in final demand. Exhibit A-1 presents a hypothetical example of the multiplier concept. In that Exhibit, assume that an airport's Fixed-Base Operator spends \$100 on building construction, which is the direct, on-site expenditure. The construction company which receives the \$100 then increases its spending within the impact area by \$37.5 (\$11.1 on manufactured goods, \$6.7 on trade items, etc.). Those receiving the \$37.5 then increase their spending in the area by \$30.1 and so on. Ultimately, according to this example, the regional economy is back in equilibrium when a total of \$212.3 has been spent in the region. Therefore, according to this example, the initial expenditure of \$100 on construction generates an additional \$112.3 for a multiplier of 2.123. Of the total \$212.3, approximately \$74.6 goes to payroll (Household Earnings).

### RIMS-II Multipliers

Rather than develop a costly multiplier estimate, on the one extreme, or simply use an average on the other extreme, this study used the "Regional Input-Output Modeling System (RIMS-II)" as

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1 "Regional Input-Output Modeling System," U.S. Department of commerce, Bureau of Economic Analysis, 1981.

"Regional Multipliers: A User Handbook for the Regional Input-Output Modeling System," U.S. Department of Commerce, Bureau of Economic Analysis, May, 1986.

Exhibit A-1  
MULTIPLIER HYPOTHETICAL EXAMPLE

INDUSTRY TYPE	ORIGINAL EXPENDITURE	INDUCED IMPACTS (MULTIPLIER PURCHASES)					SUM
	Round <u>1</u>	Round <u>2</u>	Round <u>3</u>	Round <u>4</u>	Round <u>5</u>	Round <u>6</u>	
Construction	\$100	\$--	\$--	\$--	\$--	\$--	100.0
Manufacturing	--	11.1	8.9	6.6	4.4	2.2	33.2
Trade	--	6.7	5.4	4.0	2.7	1.3	20.1
Services	--	8.5	6.8	5.1	3.4	1.6	25.4
Other	--	<u>11.2</u>	<u>9.0</u>	<u>6.7</u>	<u>4.5</u>	<u>2.2</u>	<u>33.6</u>
Totals	\$100	\$37.5	\$30.1	\$22.4	\$15.0	\$7.3	212.3
		\$112.3 Total					
Payroll <sup>2</sup>	74.6						

(1) Increase in final demand

(2) Included in expenditures

SOURCE: Wilbur Smith Associates

developed by the U.S. Department of Commerce. The RIMS-II multipliers that are specific to appropriate economic impact areas in Michigan were used (e.g., generalized urbanized impact areas, non-urbanized, and statewide). The full 39 row by 531 column RIMS-II matrix was used, in computerized format, to enable the tracing of 20,709 inter-industry relationships for each type of direct or indirect impact. A single page depicting the 39 rows, but only 15 of the columns, is shown in Exhibit A-2. Column 65.0500 refers to "Air Transportation," column 68.0100 refers to electric utilities, and so on. The multipliers are as stated in the Exhibit, for each row industry (impacted) and for each column industry (industry of increased final demand).

An authoritative paper on Rims-II<sup>2</sup> notes that, overall, ".... the RIMS-II approach can be viewed as a three-step process. In the first step, the national I-O matrix is made region-specific by using corresponding four-digit SIC location quotients (LQ's). The LQ's are used to estimate the extent to which requirements are supplied by firms within the region. For this purpose, RIMS-II employs LQ's based on two types of data. According to this mixed-LQ approach, Bureau of Economic Analysis data on county personal income, by place of residence, are used for the calculation of LQ's in the service sectors, while BEA data on earnings, by place of work, are used for the LQ's in the nonservice sectors.

"The second step involves estimations of the household row and the household column of the matrix. The household-row coefficients are estimated based on value-added gross-output ratios from the national I-O table and introduced into each industry's coefficient column. A household column is constructed, based on national consumption and savings rate data and national and regional tax rate data.

"The last step in the RIMS II estimating procedure is to calculate the multipliers. Since it is most often necessary to trace the impact of changes in final demand on numerous individual directly and indirectly affected industries. RIMS-II applications employ the Leontief inversion approach for obtaining multipliers. This inversion process produces output and earnings multipliers for all additionally affected industries."

To use the RIMS-II multipliers, each Direct and Indirect aviation-related expenditure was assigned to a RIMS-II industry (one of the 531 industry columns). The most significant column placements are given in Exhibit A-3.

There are three types of multipliers -- "total economic activity," "earnings" and "employment." The earnings multiplier appears as row 39 of the total economic activity matrix, which represents household earnings (payroll), and the economic activity element comprises rows 1-38 (impacted industry type). The economic activity, earnings and employment for one example industry (65.0500: Air Transportation) are shown in Exhibit A-4. The computerized application of the RIMS-II procedures allowed all of these multipliers, plus thousands of others, to be utilized.

<sup>2</sup> "Regional Input-Output Modeling System: A Brief Description," by J. Cartwright, R. Beemiller, Z. Ambargis.

**Exhibit A-2  
EXAMPLE RIMS-II MULTIPLIERS**

MICHIGAN

05/06/88

Table A-1.1.39-Industry-by-531-Industry Multipliers for Output--Continued  
(Dollars)

	64.0900	64.1000	64.1100	64.1200	65.0100	65.0200	65.0300	65.0400	65.0500	65.0600	65.0701	65.0702	65.0800	67.0000	68.0100
1	0	0.0075	0.0083	0.0082	0.0090	0.0087	0.0088	0.0044	0.0065	0.0037	0.0095	0.0105	0.0055	0.0052	0.0055
2	0	0.0002	0.0002	0.0004	0.0001	0.0001	0.0001	0.0001	0.0001	0	0.0001	0.0001	0.0001	0.0001	0.0001
3	0	0.0012	0.0013	0.0018	0.0019	0.0021	0.0016	0.0014	0.0028	0.0040	0.0011	0.0009	0.0006	0.0005	0.0052
4	0	0.0072	0.0028	0.0033	0.0023	0.0009	0.0005	0.0006	0.0004	0.0011	0.0005	0.0004	0.0003	0.0003	0.0005
5	C	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6		0.0177	0.0165	0.0132	0.1147	0.0186	0.0156	0.0183	0.0089	0.0544	0.0123	0.0137	0.0291	0.0090	0.0399
7		0.0355	0.0368	0.0352	0.0421	0.0409	0.0415	0.0208	0.0317	0.0141	0.0460	0.0490	0.0227	0.0251	0.0129
8		0.0111	0.0005	0.0007	0.0004	0.0004	0.0005	0.0026	0.0002	0.0007	0.0003	0.0004	0.0002	0.0002	0.0001
9		0.0018	0.0019	0.0071	0.0020	0.0021	0.0028	0.0019	0.0014	0.0052	0.0019	0.0022	0.0011	0.0011	0.0006
10															
11		0.0109	0.0522	0.0558	0.0073	0.0076	0.0073	0.0046	0.0059	0.0038	0.0121	0.0110	0.0045	0.0049	0.0027
12		0.0118	0.0178	0.0089	0.0100	0.0115	0.0095	0.0074	0.0121	0.0042	0.0272	0.0279	0.0070	0.0092	0.0039
13		0.0625	0.0936	0.1291	0.0366	0.0397	0.0320	0.0235	0.0403	0.0164	0.0238	0.0231	0.0158	0.0133	0.0350
14		0.0096	0.0549	0.0357	0.0078	0.0107	0.0099	0.0051	0.0051	0.0036	0.0095	0.0074	0.0048	0.0042	0.0028
15		0.0094	0.0211	0.0186	0.0052	0.0032	0.0034	0.0018	0.0021	0.0014	0.0068	0.0035	0.0018	0.0018	0.0014
16		0.0056	0.0066	0.0072	0.0042	0.0050	0.0030	0.0022	0.0018	0.0043	0.0028	0.0030	0.0019	0.0015	0.0016
17		0.1583	0.0736	0.0725	0.0359	0.0202	0.0114	0.0147	0.0077	0.0162	0.0097	0.0086	0.0069	0.0050	0.0072
18		0.1266	0.0320	0.0429	0.0202	0.0200	0.0110	0.0126	0.0069	0.0149	0.0097	0.0085	0.0066	0.0048	0.0079
19		0.0155	0.0134	0.0179	0.0149	0.0170	0.0086	0.0212	0.0052	0.0207	0.0068	0.0056	0.0062	0.0033	0.0053
20		0.0067	0.0177	0.0056	0.0085	0.0114	0.0072	0.0048	0.0045	0.0056	0.0064	0.0067	0.0046	0.0089	0.0042
21		0.0243	0.0255	0.0228	0.0299	0.0446	0.0346	0.0154	0.0190	0.0124	0.0304	0.0315	0.0182	0.0154	0.0093
22		0.0022	0.0023	0.0022	0.0038	0.0029	0.0026	0.0050	0.0141	0.0012	0.0034	0.0028	0.0015	0.0015	0.0015
23		0.0015	0.0017	0.0018	0.0016	0.0015	0.0014	0.0021	0.0010	0.0007	0.0015	0.0017	0.0009	0.0013	0.0010
24	1.0000	0.0319	0.0182	0.0156	0.0034	0.0036	0.0033	0.0038	0.0026	0.0013	0.0044	0.0051	0.0022	0.0021	0.0011
25		0.0466	0.0416	0.0485	0.0771	0.0356	0.1675	0.0881	0.0664	0.0226	0.0611	0.0299	0.0178	0.0188	0.0339
26		0.1633	0.0215	0.0193	0.0158	0.0179	0.0199	0.0158	0.0182	0.0087	0.0395	0.0388	0.0201	0.0189	0.0078
27		0.0467	0.0432	0.0437	0.0359	0.0398	0.0338	0.0261	0.0246	0.0317	0.0380	0.0428	0.0240	0.0246	0.0556
28		0.1176	0.0755	0.0793	0.0497	0.0562	0.0561	0.0302	0.0390	0.0248	0.0447	0.0413	0.0232	0.0233	0.0279
29		0.0612	0.0641	0.0575	0.0760	0.0362	0.0838	0.0369	0.0491	0.0302	0.0764	0.0834	0.0470	0.0403	0.0233
30		0.0161	0.0157	0.0169	0.0177	0.0175	0.0166	0.0193	0.0125	0.0145	0.0314	0.0315	0.0114	0.0129	0.0086
31		0.0186	0.0191	0.0175	0.0209	0.0352	0.0277	0.0268	0.0146	0.0133	0.0412	0.0237	0.0121	0.0120	0.0077
32		0.0732	0.0810	0.0714	0.0842	0.0878	0.0883	0.0487	0.0615	0.0346	0.0923	0.1215	0.0523	0.0557	0.0277
33		0.0044	0.0067	0.0059	0.0075	0.0069	0.0073	0.0038	0.0055	0.0048	0.0085	0.0089	0.0041	0.0801	0.0025
34		0.0111	0.0112	0.0099	0.0123	0.0130	0.0122	0.0065	0.0107	0.0050	0.0125	0.0144	0.0074	0.0122	0.0047
35		0.0484	0.0495	0.0411	0.0588	0.0379	0.0382	0.0522	0.0467	0.0258	0.0757	0.0721	0.0319	0.0416	0.0195
36		0.0360	0.0360	0.0326	0.0355	0.0340	0.0354	0.0189	0.0437	0.0154	0.0613	0.0508	0.0201	0.0310	0.0116
37		0.0344	0.0361	0.0323	0.0429	0.0420	0.0424	0.0205	0.0279	0.0159	0.0415	0.0477	0.0230	0.0229	0.0129
38		0.0315	0.0344	0.0322	0.0408	0.0379	0.0668	0.0241	0.0254	0.0158	0.0447	0.0407	0.0206	0.0221	0.0139
39		0.0208	0.0506	0.05824	0.7732	0.7548	0.7638	0.3683	0.5030	0.2869	0.7460	0.8592	0.4153	0.4128	0.2332
Total/1/	1.0000	2.1131	2.0345	2.0182	1.9370	1.8506	1.9122	1.5919	1.6261	1.5661	1.8950	1.8711	1.4492	1.5472	1.4373

1. Each column total is the sum of the entries in rows 1-38; these entries include earnings paid to households employed in industries 1-38. Each column total excludes the entry in row 39; this entry is the sum of earnings paid to households.

NOTE.--Each entry represents the dollar change in output that occurs in the row industry for each additional dollar of output delivered to final demand by the column industry. Table C identifies the column industries, and table D identifies the row industries.

SOURCE.--Regional Input-Output Modeling System (RIMS II), Regional Economic Analysis Division, Bureau of Economic Analysis.



Exhibit A-3  
**PLACEMENT OF EXPENDITURES INTO  
 INPUT-OUTPUT CATEGORIES**  
 Economic Impact of Michigan Airports

<u>DIRECT AND INDIRECT EXPENDITURE ITEMS (1)</u>	<u>INPUT-OUTPUT CLASSIFICATION (2)</u>	
	<u>Code</u>	<u>Description</u>
<b>DIRECT EXPENDITURES:</b>		
Payroll	65.0500	Air Transportation
Capital-Buildings	11.0201	New Buildings
Capital-Runways	11.0400	Highways & Runways
Ground Transportation	65.0200	Land Transportation
Tenant Operations	65.0500	Air Transportation
Air Carrier Operations	65.0500	Air Transportation
Government Operations	79.0300	State & Local Gov't.
Utilities	68.0100	Electric Services
Restaurant	74.0000	Eating Places
Air Cargo	65.0701	Freight
Corp. Air Operations	65.0500	Air Transportation
Military Operations	12.0212	Maint.-Military
Maintenance	12.0201	Maint. & Repair
Instruction	65.0500	Air Transportation
Taxes	79.0300	State & Local Gov't.
Rental Cars	75.0001	Auto Rental
Fuel	65.0500	Air Transportation
<b>INDIRECT EXPENDITURES</b>		
Visitor Expenditures:		
Lodging	72.0100	Hotels & Lodging
Food & Beverage	74.0000	Eating & Drinking
Retail Sales (20%)	69.0200	Retail Trade
Entertainment	76.0206	Amusements & Recreation
Transport	65.0200	Passenger Transport.
Business	73.0109	Business Services
Other	65.0500	Air Transportation
Regional Expenditures:		
Land Transport	65.0200	Passenger Transport.
Direct Taxes, etc.	79.0300	State & Local Gov't.
Pilots, Other Use	65.0500	Air Transportation
Travel Agencies	65.0702	Travel Arrangement
Industrial Development:		
Aviation Mfg.	60.0100	Aircraft Mfg.
Other Mfg.	64.1200	Misc. Mfg.

NOTE: This table presents the principal direct and indirect expenditure items found in the study's surveys, and the I/O codes which apply to each. Transaction-specific, rather than average, multipliers were used.

<sup>1</sup> Direct and indirect expenditures from surveys.  
<sup>2</sup> I/O classifications from RIMS-II model.

**Exhibit A-4**  
**EXAMPLE ECONOMIC IMPACT MULTIPLIERS**  
**65.0500: Air Transportation**  
**Michigan Urban Economic Region**

<u>URBAN MULTIPLIERS</u>			
<u>Total Economic</u>			
<u>Activity</u> (1)	<u>Earnings</u> (2)	<u>Employment</u> (3)	
(Dollars)	(Dollars)	(Jobs)	
Ag. Prod., Forestry Svcs.	0.0013	0.0005	0.655
Forestry Products	0.0000	0.0000	0.001
Coal Mining	0.0000	0.0000	0.000
Crude Petrol.	0.0001	0.0000	0.004
Other Mining	0.0000	0.0000	0.005
New Construction	0.0000	0.0000	0.000
Maint. and Repair Const.	0.0086	0.0038	1.426
Food, Kindred Prd.	0.0247	0.0034	1.228
Textile Mill Products	0.0001	0.0000	0.010
Apparel	0.0010	0.0003	0.081
Paper, Allied Products	0.0016	0.0004	0.102
Printing, Publishing	0.0121	0.0042	1.775
Chemicals, Refined Petrol.	0.0259	0.0016	0.395
Rubber, Leather Prod.	0.0039	0.0010	0.410
Lumber, Furniture Prod.	0.0009	0.0003	0.100
Stone, Clay, Glass Prod.	0.0015	0.0005	0.141
Primary Metals	0.0047	0.0011	0.283
Fabricated Metals	0.0060	0.0017	0.515
Non-electrical Machinery	0.0033	0.0012	0.340
Electrical Machinery	0.0022	0.0006	0.206
Motor Vehicles, Equipment	0.0187	0.0030	0.595
Other Transportation Equip.	0.0062	0.0022	0.658
Instruments	0.0005	0.0002	0.056
Miscellaneous Mfg.	0.0022	0.0006	0.323
Transportation	1.0807	0.3442	125.191
Communications	0.0205	0.0054	1.494
Utilities	0.0253	0.0024	0.635
Wholesale Trade	0.0385	0.0150	5.131
Retail Trade	0.0475	0.0235	17.498
Finance	0.0137	0.0043	1.835
Insurance	0.0175	0.0057	2.142
Real Estate	0.0656	0.0016	3.936
Lodging, Amusements	0.0057	0.0017	1.681
Personal Services	0.0119	0.0052	5.127
Business Services	0.0517	0.0232	10.668
Eating, Drinking Estab.	0.0417	0.0130	16.259
Health Services	0.0276	0.0160	7.081
Other Services	0.0239	0.0092	5.275
Households	---	0.0019	4.068
<b>TOTALS</b>	<b>1.5973</b>	<b>0.4989</b>	<b>217.330</b>

- 1 Each entry in column 1 represents the total dollar change in output that occurs in all row industries for each additional dollar of output delivered to final demand by the industry corresponding to the entry.
- 2 Each entry in column 2 represents the total dollar change in earnings of households employed by all row industries for each additional dollar of output delivered to final demand by the industry corresponding to the entry.
- 3 Each entry in column 3 represents the total change in number of jobs in all row industries for each additional 1 million dollars of output delivered to final demand by the industry corresponding to the entry.

**SOURCE:** Regional Input-Output Modeling System (RIMS-II), Regional Economic Analysis Division, Bureau of Economic Analysis, U.S. Department of Commerce.

## DESCRIPTION OF MICHIGAN REGIONS USED FOR DEVELOPING RIMS-II MULTIPLIERS

The State of Michigan comprises all Michigan counties.

The Urban Region, MI is comprised of the following Michigan counties:

Livingston	St. Clair
Macomb	Washtenaw
Monroe	Wayne
Oakland	

The Rural Region, MI is comprised of the following Michigan counties:

Grand Traverse	Kalkaska
Huron	Marquette

## AVIATION ECONOMIC IMPACT RESOURCE DOCUMENTS

This Appendix lists many of the detailed studies of relevance to the impact analyses conducted for the Michigan study.

<u>STATE</u>	<u>STATEWIDE AVIATION ECONOMIC IMPACT STUDIES</u>
Indiana	<u>The Economic Impact of Airports in Indiana</u> , Aviation Association of Indiana, 1986
West Virginia	<u>Financial Support for, and Economic Impact of, General Aviation Airports in West Virginia</u> , West Virginia Community and Economic Development, Wilbur Smith Associates, 1984
Virginia	<u>Virginia's Airports ... an Economic Advantage</u> , Virginia Department of Aviation, Simat Helliesen & Eichner, October, 1986
West Virginia	<u>West Virginia Statewide Airport Systems Plan Update, Part VI. Economic Impact</u> , Office of Community and Industrial Development, Aviation Planning Associates, 1988
North Dakota	<u>Economic Impact of Aviation, North Dakota</u> , North Dakota Aeronautics Commission, Aviation Planning Associates, Inc., 1989
New Jersey	<u>Aviation Economic Impact Assessment</u> , New Jersey Division of Aeronautics, May, 1979
Texas	<u>Economic Impact of Aviation in Texas</u> , The Texas A&M University System, Texas Transportation Institute, Summer, 1988
Wyoming	<u>Estimating The Economic Benefits of Airports</u> , Wyoming Aeronautics Commission, Isbill Associates/Marjorie Hanley & Associates, 1985
Pennsylvania	<u>The Economic Impact of Aviation in Pennsylvania</u> , Pennsylvania Department of Transportation, Aviation Planning Associates, 1983
Illinois	<u>The Economic Impact of Aviation in Illinois</u> , Illinois Department of Transportation
Montana	<u>Economic Benefits of Aviation, Montana State Aviation System Plan</u> , Montana Department of Commerce, 1989
Colorado	<u>The Economic Impact of General Aviation in Colorado</u> ,
Minnesota	<u>Minnesota Has Been Good for Northwest Airlines ... The Airline and its Employees are Good for Minnesota</u> , Northwest Airlines, 1986
California	<u>State of California Airport Economic Impact Model</u> , California Department of Transportation, 1988

**REGION**                      **REGIONAL AVIATION ECONOMIC IMPACT STUDIES**

- Pittsburgh                      The Economic Impact of Aviation in Southwestern Pennsylvania, Southwestern Pennsylvania Regional Planning Commission, Wilbur Smith Associates, 1986
- Dallas                              Economic Impacts of Aviation of North Central Texas, North Central Texas Council of Governments, Wilbur Smith Associates, 1988
- New York                         The Economic Impact of the Aviation Industry on the New York/New Jersey Metropolitan Region, The Port Authority of New York & New Jersey, March, 1986
- Washington, DC                Economic Impact of the Region's Airports, Technical Report, March 1988, Department of Metropolitan Development and Information Resources, Metropolitan Washington Council of Government. BWI, Washington National, Washington Dulles International
- St. Louis                         The Economic Impact of General Aviation in the St. Louis Metropolitan Aarea, East-West Gateway Coordinating Council, 1987
- Kansas City                      Economic Impact of Aviation in the Kansas City Metropolitan Region, Mid-America Regional Council, 1985

**U.S. NATIONAL AVIATION ECONOMIC IMPACT STUDIES**

- U.S.                                The Economic Benefits of Air Transportation, Air Transport Association of America, 1988
- U.S.                                Economic Significance of the U.S. All Cargo (Air Cargo) Industry, Air Freight Association, Leeper, Cambridge & Campbell, 1988
- U.S.                                Business Aircraft Operations. Financial Benefits and Intangible Advantages, General Aviation Manufacturers Association and National Business Aircraft Association, 1987
- U.S.                                Business Aviation: The Economic Essential, National Business Aircraft Association, 1988
- U.S.                                The Magnitude and Economic Impact of General Aviation, Utility Aircraft Council, Aerospace Industries Association, 1981
- U.S.                                The Economic Impacts of Increased Aircraft Exports, Aerospace Industries Association of America, Chase Econometrics, 1982
- U.S.                                The Contribution of Air Transportation to the U.S. Economy, ATA (impact of Airports on Local Economy)
- U.S.                                National Benefits of Aerospace Exports, Aerospace Industries Association of America, 1983
- U.S.                                What Do New Jetliner Exports Mean to the United States? Boeing Commercial Airplane Company, 1983

U.S. The Contribution of Air Transportation to the U.S. Economy, Air Transport Association of America, 1981

U.S. The Relationship of General Aviation - Associated Products and Services to the National Economy, Federal Aviation Administration, 1980.

**AIRPORT**      **INDIVIDUAL AIRPORT ECONOMIC IMPACT STUDIES**

Los Angeles The Economic Impact of the Los Angeles Airport, L.A. Department of Airports, Wilbur Smith Associates, 1988

Los Angeles The Economic Impact of Ontario International Airport, L.A. Department of Airports, Wilbur Smith Associates, 1988

Los Angeles The Economic Impact of Van Nuys Airport, L.A. Department of Airports, Wilbur Smith Associates, 1988

Orlando The Economic Impact of Orlando International Airport, Florida Department of Transportation, Wilbur Smith Associates, 1987

Chicago Economic Impact of Chicago O'Hare International Airport on Region, City of Chicago, 1987

Phoenix The Economic Impact of the Phoenix Airport System, Bureau of Business and Economic Research, Arizona State University, 1984

Las Vegas McCarran International Airport Economic Impact Study, Market Opinion Research, 1988

Dallas The Economic Impact of the Dallas/Fort Worth International Airport, D/FW International Airport, Gellman Research Associates, 1988

Washington, DC Economic Impact of Baltimore/Washington International Airport on the State of Maryland, Gellman Research Associates, 1986

San Francisco The Economic Impact of San Francisco International Airport, Martin Associates, 1988

Buffalo Economic Impact Study of Greater Buffalo International Airport, Peat Marwick Airport Consulting Services, 1985

Fort Wayne The Economic Impact of the Fort Wayne and Allen County Airport Authority's Aviation Complexes, Indiana University - Purdue University at Fort Wayne, 1988

Minneapolis The Economic Impact of the Minneapolis/St. Paul International Airport, Martin Associates, 1988

Washington, DC The Economic Impact of Washington Dulles International Airport, Simat International Ltd., 1983

Seattle Economic Impact Study of SEA-TAC International Airport, Port of Seattle, 1988

- Washington, DC The Local and Regional Economic Impact of the Washington National and Dulles International Airports, Martin O'Connell Associates, 1989
- Houston Economic Impact of Current Airport Activities, Hobby Airport Houston, Texas, Peat Marwick Airport Consulting Services, 1988
- Orlando The Economic Importance of the Orlando International Airport, Department of Economics, University of Central Florida, 1987
- Houston Economic Analysis of Proposed West Houston Airport, 1988
- Philadelphia Philadelphia International Airport. A \$1.8 Billion Dollar Impact, City of Philadelphia, Department of Commerce, 1983
- Baltimore Summary of the Economic Impact of BWI Airport on the State of Maryland, Gellman Research Associates, 1985
- Norfolk The Economic Impact of Norfolk International Airport, Department of Aviation, Commonwealth of Virginia, 1984
- Phoenix The Economic Impact of the Phoenix Airport System, 1986
- San Jose San Jose International Airport Economic Impact Report, Corning & Associates, August, 1986
- Indianapolis Economic Impact of Indianapolis International Airport, Indianapolis Airport Authority, 1975
- New Orleans New Orleans International Airport a \$121,049,000 Bonus for the Greater New Orleans Area, 1970
- Sarasota Sarasota - Bradenton Airport. An Annual \$150,000,000 Community Asset
- Seattle SEA-TAC International Airport: The People Port Stimulating Economic Activity, 1972
- Wichita Wichita Mid-Continent Airport: More Than A \$101 Million Contribution to the Community, Wichita Mid-Continent Economic Impact Committee, 1976
- Chicago O'Hare International Airport: "Aviation Gateway to the 21st Century", April, 1988
- Boston The Economic Impact of Logan International Airport, Massport, 1988
- Boston One Billion Dollars to Your Economy: Logan International Airport, 1980
- Sacramento Sacramento Metro & Executive Airports: A \$600 Million Asset to the Local Community, County of Sacramento Department of Airports, February, 1980
- Harrisburg Harrisburg International Airport ... Central Pennsylvania's Most Valuable Resource, Aviation Planning Associates, Inc., 1892
- Manchester The Importance of Manchester Airport, KPMG Peat Marwick, 1987-1988
- Southern Illinois Airport's Economic Impact, Southern Illinois Airport Authority, 1982

- Atlanta Hartsfield Atlanta International Airport Economic Impact Report, 1987
- Burbank Burbank, Glendale, Pasadena Airport
- San Francisco San Francisco International Airport Economic Impact, City and County of San Francisco
- Denver The Regional Economic Impact of Stapleton International Airport and Future Airport Development, Booz, Allen & Hamilton, Inc., September 2, 1986
- Jacksonville Jacksonville International Airport, Jacksonville Port Authority, Reynolds Smith Hill, 1983
- Milwaukee The Economic Impact of the General Mitchell International Airport, Martin Associates, February, 1988
- Toulumne The Economic Impact of Columbia Airport on Tuolumne County, California, Department of Transportation, Division of Aeronautics, 1987
- Anchorage The Economic Impact of the Anchorage International Airport, Alaska Department of Transportation and Public Facilities, Applied Economics Associates, 1985
- Warren County The Economic Benefits Derived from the Warren County Airport - Warren & Washington Counties, Continuous Airport System Planning Process for the Northern New York Region, Lake Champlain - Lake George Regional Planning Board, January, 1985.
- Warren County The Policy Direction for Warren County Airport - Technical Report, The Airport Committee of the Warren County Board of Supervisors, Gellman Research Associates, Inc., October 19, 1988.
- Genesee County A Study to Determine the Economic Impact of the Genesee County Airport Genesee County, New York, Genesee/Finger Lakes Regional Planning Council, June, 1984.
- Madison County Economic Value Assessment of the Canastota Municipal Airport Madison County, New York, Central New York Regional Planning and Development Board, December, 1986.
- Upper Hudson Upper Hudson Regional Aviation System Plan - Economic Impacts of General Aviation Activity, Capital District Regional Planning Commission, November, 1984.
- Fulton County Fulton County Airport Economic Impact Study, Capital District Regional Planning Commission Fulton County Planning Department, Hoyle, Tanner & Associates Engineers, P.C., December, 1987.
- Palm Springs PSP Palm Springs Regional Airport - What's It Worth to the Coachella Valley?
- Corpus Christi Corpus Cristi Texas Aviation Industry - Economic Impact Report, 1987
- Louisville The Economic Impact of our Airport on the Louisville Economy, Regional Airport Authority Louisville and Jefferson County, 1987.
- Naples Economic Impact Naples Municipal Airport, Naples, Florida, 1986.



- Gulfport-Biloxi Gulfport-Biloxi Regional Airport Economic Impact, The LPA Group Incorporated Consulting Engineers and Planners, October, 1986.
- New Orleans The Economic Impact of the New Orleans International Airport, Division of Business and Economic Research, University of New Orleans, Timothy P. Ryan and Michael A. Conte, October, 1987.
- Riverside Economic Impact of Riverside Municipal Airport, Riverside Municipal Airport, Economics Research Associates, August, 1982.
- Indianapolis The Economic Impact of Indianapolis International Airport, Indianapolis Airport Authority, Simat International Ltd., May 1983.
- Salt Lake City Economic Impact Study Salt Lake City. Salt Lake City Airport Authority, 1985.
- Reno The Economic Impact of Cannon International Airport, The Airport Authority of Washoe County, Gloria J. Fitch, Bureau of Business and Economic Research, College of Business Administration. University of Nevada, Reno, October, 1981.
- Topeka Economic Impact of Forbes Field and Philip Billard Airports and the Topeka Air Industrial Park, Jean Davis, August, 1988.
- Sacramento Economic Impact of Sacramento Metropolitan and Executive Airports for the Fiscal Year July 1, 1978 through June 30, 1979, Gary William Redmond.
- Seattle The Economic Impact of the Seattle Harbor and the Seattle - Tacoma International Airport, Martin O'Connel Associates, 1989
- Seattle Economic Impact Analysis Boeing Field, 1984.
- Springfield Economic Impact Capital Airport, Springfield Airport Authority, 1987.
- Omaha The Economic Impact of Eppley and Millard Airfields on the Omaha Metro Area, The Omaha Airport Authority, 1986.
- Tuscon Tuscon International Airport an Economic Report, Tuscon Airport Authority, 1987.
- New Hanover County An Economic Impact Study for the New Hanover County Airport, New Hanover County Airport Commission, W. W. Hall, Jr. Claude Farrell, and Roger P. Hill, Cameron School of Business Administration, The University of North Carolina at Wilmington.
- Palm Beach Estimating the Economic Impact of Palm Beach International Airport, Palm Beach County Department of Airports, April, 1988.
- Miami The Economic Impact of Miami International Airport, Dade County Aviation Department, 1984
- Cincinnati The Greater Cincinnati International Airport: A Preliminary Economic Impact Study, The Greater Cincinnati Center for Economic Education, 1988
- Jacksonville Economic Impacts of the Airside of Jaxport, Jacksonville Port Authority, 1988

## INDIVIDUAL AIRPORT ECONOMIC IMPACT BROCHURES

- Pittsburgh Economic Impact of Proposed Midfield Terminal, Greater Pittsburgh International Airport, The Southwestern Pennsylvania Regional Planning Commission, Wilbur Smith Associates, 1988
- Economic Impact of Butler Farm Show Airport 3G9, The Southwestern Pennsylvania Regional Planning Commission, Wilbur Smith Associates, 1988
- Economic Impact of McVillie Airport G06, The Southwestern Pennsylvania Regional Planning Commission, Wilbur Smith Associates, 1988
- Economic Impact of Inter-County Airport 31D, The Southwestern Pennsylvania Regional Planning Commission, Wilbur Smith Associates, 1988
- Economic Impact of Finleyville Airport G05, The Southwestern Pennsylvania Regional Planning Commission, Wilbur Smith Associates, 1988
- Economic Impact of West Penn Airport 9G1, The Southwestern Pennsylvania Regional Planning Commission, Wilbur Smith Associates, 1988
- Economic Impact of Rostraver Airport G08, The Southwestern Pennsylvania Regional Planning Commission, Wilbur Smith Associates, 1988
- Economic Impact of Pittsburgh-Monroeville Airport 4G0, The Southwestern Pennsylvania Regional Planning Commission, Wilbur Smith Associates, 1988
- Economic Impact of Pittsburgh-Metro Airport 8G4, The Southwestern Pennsylvania Regional Planning Commission, Wilbur Smith Associates, 1988
- San Francisco The Dynamic Impact of the Airlines on San Francisco, ATA, 1985
- Chicago Economic Impact of Chicago O'Hare International Airport on Region, ATA, 1987
- Omaha Aviation Dollars Boost Omaha - Council Bluffs Economy, ATA, 1976
- Brings \$184 Million Annually to The Hartford-Springfield Area, ATA, 1981
- Rochester The Rochester-Monroe County Airport - A \$16.7 Million Bonus for Rochester, ATA, 1974
- Rhode Island Rhode Island & T.F. Green Airport: A Vital Economic Partnership, ATA, 1971
- Boston Logan International Airport ... \$668 Million Boon to Boston, ATA, 1975
- Albuquerque What Does ABO Mean? \$183 Million a Year to the Albuquerque Area, ATA and City of Albuquerque, 1981
- Charlotte Douglas Municipal Airport ... \$117 Million Asset to Charlotte Mecklenburg --- Metroina, ATA, 1977
- Los Angeles Aviation and Los Angeles a \$3.6 Billion Partnership, ATA, 1972
- Lehigh A \$51 Million Asset to the Lehigh Valley, ATA and Lehigh-Northhampton Airport Authority, 1980

- Hartford Bradley International Airport: 112 Million Dollar Economic Magnet for the Hartford-Springfield Economy, ATA, 1974
- St. Louis Lambert St. Louis International Airport Means \$2.2 Billion Annually to St. Louis, ATA, 1986
- Washington, DC Washington National \$661 Million Boost to Economy, ATA, 1980
- Atlanta Hartsfield Atlanta International Airport, ATA, 1976
- New Orleans New Orleans International Airport, ATA, 1983
- New York New York and the Airlines, ATA, 1984
- Massachusetts Massachusetts and the Airlines, ATA, 1985
- Houston Airlines Economic Contribution to Houston, ATA, 1988
- Connecticut Bradley International Airport, ATA, 1981
- Florida Florida and the Airlines, ATA, 1983
- Columbus Columbus Metropolitan Airport, ATA, 1979
- Colorado Colorado and the Airlines, ATA, 1985
- Chicago Chicago and the Airlines, ATA, 1987
- California The Airlines Contribution to California, ATA, 1985
- Texas Texas and the Airlines, ATA, 1988
- New Jersey New Jersey and the Airlines, ATA, 1988
- Jacksonville Jacksonville International Airport, Jacksonville Port Authority, Reynolds Smith Hill, 1983

### OTHER SOURCE DOCUMENTS

Measuring the Regional Economic Significance of Airports, U.S. Department of Transportation, Federal Aviation Administration, 1986

Airport Economic Impact on the Communities, National Airports Conference, 1978

Economic Benefits and Financing of General Aviation Airport, Transportation Research Board, Circular 259, 1983

Regional Multipliers: A User Handbook for the Regional Input-Output Modeling System (RIMS-II), U.S. Department of Commerce, Bureau of Economic Analysis, 1986

How To Do An Airport Economic Impact Study, Air Transport Association of America, 1982

The Economic Impact of an Airport on its Community, Houston Department of Aviation, 1988

Airport Economic Impact on the Communities, National Airports Conference, 1978

Recommended Regional Economic Impact Procedures for Aviation-Related Projects, Transportation Research Record 1147, Douglas McLeod, 1988

Regional Economic Impacts of Airports and Airport Systems, U.S. Department of Transportation, Transportation Systems Center, 1985

Airports and Regional/State Economics: An Overview of the Literature, National Governor's Association, 1988

Case Studies - Successful Airport Capacity Expansion: Baltimore/Washington International Airport, Yampa Valley Regional Airport, State of Florida and Orlando International Airport, State of Pennsylvania and Harrisburg International Airport, Center for Policy Research, National Governor's Association, December, 1988

**VISITOR EXPENDITURE DATA**  
**SURVEY FORMS**

**EXPENDITURES BY VISITORS ARRIVING BY AIR**

**Example Survey Results**

<u>LOCATION</u>	<u>EXPENDITURES BY VISITORS</u>			
	<u>Per Visitor</u>	<u>Per Day</u>	<u>Per Visitor</u>	<u>Per Trip</u>
	<u>General</u>	<u>Air</u>	<u>General</u>	<u>Air</u>
	<u>Aviation</u>	<u>Carrier</u>	<u>Aviation</u>	<u>Carrier</u>
<b><u>MICHIGAN: No Surveys Taken</u></b>				
Unless Michigan-specific or airport-specific data is found use:				
General Aviation				
Day Visitors	\$21	--	\$21	--
Overnight Visitors	\$76	--	\$160	--
Air Carrier/Commuter	--	\$69	--	\$276
<b><u>Surveys Used to Derive Michigan Data</u></b>				
North Central Texas, (1988)				
General Aviation				
Day Visitors	\$21.18	--	\$21.18	--
Overnight Visitors	\$76.10	--	\$159.80	--
Total Visitors	\$51.53	--	\$72.52	--
Air Carrier:	--	--	--	--
West Virginia (1985):				
General Aviation:				
Day Visitors	\$13	--	--	--
Overnight Visitors	\$128	--	--	--
Virginia (1986):				
General Aviation	\$86	--	--	--
Scheduled Air Carrier	--	\$70	--	--
Harrisburg Int'l Airport (1982)	--	--	--	\$175
Ontario Int'l Airport (1987)	--	\$69.04	--	\$391
Van Nuys Airport (1987)	--	--	\$272	--
Los Angeles Int'l (1987)	--	\$92.49	--	\$526
Pittsburgh Int'l Airport (1986)	--	--	--	\$263
Pennsylvania General Aviation (1985)	--	--	\$140	--
Illinois General Aviation (1982)	\$68	--	--	--

SOURCE: Surveys by MDOT, BTP Study Consultant, Wilbur Smith Associates

# DATA REQUEST FOR MICHIGAN AIRPORTS

## Value of Airports to Their Communities -- Economic Impact of Aviation in Michigan 1987/1988

This data request is made by the Michigan Department of Transportation. Results will be used to estimate how important your airport is to its community. The consulting firm of Wilbur Smith Associates will conduct the analysis. Representatives of that firm will contact you in the near future. Prior to that contact, please complete as much of this survey form as possible and return it to the Consultant in the enclosed envelope. By providing this information, you will be ensuring that your airport's impacts will be properly calculated.

1. AIRPORT: \_\_\_\_\_

2. AIRPORT CONTACTS: This data request was sent to:

\_\_\_\_\_

Telephone: ( ) \_\_\_\_\_

Is this person the contact we should meet with when visiting the airport to follow up on this questionnaire, or is another airport-oriented person more appropriate?

Name: \_\_\_\_\_

Telephone: ( ) \_\_\_\_\_

3. AIRPORT USE: The following number of aircraft are registered with the State of Michigan to your facility. Next to the registered number, please list the number based at your airport. Aircraft operations numbers are from MDOT sources. In your opinion are these operations statistics accurate, or should they be revised? (revise them if you can)

	Number of Aircraft			Annual Number of 1987 Aircraft Operations	
	<u>Registered</u>	<u>Based</u>		<u>Number</u>	<u>Revised</u>
Single Engine	_____	_____	Air Carrier	_____	_____
Multi-Engine	_____	_____	Commuter	_____	_____
Jet	_____	_____	Air Taxi	_____	_____
Helicopters	_____	_____	General Aviation:		
Gliders	_____	_____	Local	_____	_____
Military	_____	_____	Itinerant	_____	_____
Ultra-Light	_____	_____	Military	_____	_____
Total Aircraft	_____	_____	Total Operations	_____	_____

4. AVIATION SERVICES: Identify which of the following aviation services are provided at the airport:

Scheduled Air Carrier	_____	Aircraft Sales	_____	Restaurant	_____
Comuter Air	_____	Jet Fuel Sales	_____	Vending	_____
Air Taxi	_____	Avgas Fuel Sales	_____	Control Tower	_____
General Aviation	_____	Aircraft Repair	_____	_____	_____
Hangar Rental	_____	Avionics	_____	_____	_____
Tie Down	_____	Flight Instruction	_____	_____	_____
Aircraft Rental	_____	Car Rental	_____	_____	_____

5. JOBS AT AIRPORT: How many aviation-related jobs exist currently at the airport: (consult your tax records?)

	Full-time jobs	Part-time jobs
Airport owner/operator jobs	_____	_____
Estimated other jobs	_____	_____
Total jobs at airport	_____	_____

6. AIRPORT OWNER/OPERATOR ECONOMIC IMPACT: Airport owner/operator annual costs and revenues: (Either estimate your airport authority's costs and revenue below, OR provide a copy of your airport's 1987 or 1988 budget).

<u>Expense Item</u>	Airport Owner's Annual Expenditures in Airport's Service Area	<u>Revenue Source</u>	Airport Owner's Annual Revenues
Payroll and Fringes	\$ _____	Landing Fees	\$ _____
Airport Utilities	\$ _____	Hangar and Tie Down Rental	\$ _____
Av./Jet Fuel	\$ _____	Fuel Sales	\$ _____
Other Operating Expenses	\$ _____	Other Sales	\$ _____
Capital Expenditures	\$ _____	Government Aid	\$ _____
Total Local Expenditures	\$ _____	Other Revenues	\$ _____
		Total Annual Revenues	\$ _____

7. AIRPORT TENANTS: List any firm or government entity located at the airport which conducts business of any type at the airport, e.g., airlines, FBO, aircraft maintenance, instruction, vending, restaurant, etc. The Consultant will contact many of these tenants to estimate their impacts. Use the reverse side of this page if more room is required. Indicate the tenant firm's name, a contact name, address and telephone if possible. In order to be certain that we include all of your airport's impacts, it is important that this list of airport tenants be as complete as possible.

Airport Tenant Firms	Contact Name, Address, Telephone
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____



8. MAJOR AIRPORT USERS: List companies that have general aviation aircraft based at the airport. These companies will not necessarily be contacted by the Consultant. Use the reverse side of this page if you need additional space.

Airport User Firms	Contact Name, Address, Telephone
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

9. OFF-AIRPORT DEPENDENT BUSINESSES: List any businesses located in your airport's service region that are extremely dependent on your airport, e.g., heavy air users, air freight shippers, local manufacturing co., etc. Use the reverse side of this page if necessary.

Airport User Firms	Contact Name, Address, Telephone
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Thank you for your assistance. The results of this study will be provided to your airport and will prove valuable to your airport and to the aviation industry in general. When you have completed this form, please mail it in the enclosed envelope to:

Mr. Robert J. Zuelsdorf  
c/o F. Coleman & Associates  
1423 Elmwood  
Lansing, Michigan 48917

If you have any questions or concerns regarding this data request or the impact study, please call Mr. Zuelsdorf at (803) 251-2029 or Mr. Marty Lontz at the Michigan Department of Transportation in Lansing at (517) 373-9585.

**AIRPORT ECONOMIC IMPACT SURVEY -- PRIVATE FIRMS COMPONENT**  
**Michigan Airports**  
**1987/1988**

Location/Airport: \_\_\_\_\_

The Michigan Department of Transportation is conducting a study of the economic importance of Michigan's airports. To assist, each private firm serving, using or being impacted by a study airport is requested to answer the following 5 questions. Your answers will be treated as CONFIDENTIAL and will not be disclosed as attributable in any way to your specific company. Your answers should apply to your company as it exists at or relates to the above named airport only.

YOUR FIRM
<p>1. a. Company Name: _____            _____</p> <p>b. Company Function: _____            _____</p> <p>c. Degree of Airport Dependence:            100% _____, _____% or zero _____%</p>
<p>2. a. Contact: _____</p> <p>b. Telephone: (____) _____</p>
<p>3. Company Location: Is your company, (the part of your company that is related in some way to this airport) located (check one only):</p> <p>_____ On this airport's land</p> <p>_____ Adjacent to this airport</p> <p>_____ Away from airport but:            _____ Within 1/2 mile</p> <p>_____ Beyond 1/2 mile from airport</p>

EMPLOYMENT JOBS
<p>4. How many people are employed by your firm that:</p> <p>a. Work at this Airport            _____ full-time employees            _____ part-time employees</p> <p>b. Work elsewhere in the airport's service area but whose job depends on this Airport:            _____ full-time employees            _____ part-time employees</p>
<p style="text-align: center;"><b>YOUR FIRM'S ECONOMIC IMPACT</b></p> <p>5. This very confidential question deals with the amount of money your company spends <u>in this part of Michigan</u>. Please provide an estimate of your firm's annual expenditures that are in some way due to this airport. Provide these costs for as many of the following categories as possible for the most recent year you have data for.            Year Used _____</p> <p>Annual Payroll                   \$ _____</p> <p>Capital Expenses               \$ _____</p> <p>Operations Costs                \$ _____</p> <p>Other Costs                      \$ _____</p> <p>Total Airport-            Related Expenditures \$ _____</p>

Thank you for your assistance. The results of this analysis will prove useful to this airport and to your aviation industry. Please return this form to:

Wilbur Smith Associates  
 c/o F. Coleman & Associates  
 1423 Elmwood  
 Lansing, Michigan 48917  
 Tele: (517) 321-8932

**AIRLINE ECONOMIC IMPACT SURVEY**  
**Michigan Airports**  
**1987/1988**

Airline: \_\_\_\_\_

Location/Airport: \_\_\_\_\_

The Michigan Department of Transportation is conducting a study of the economic importance of Michigan's airports. To assist, each airline serving a study airport is requested to answer the following 3 questions. Your answers will be treated as CONFIDENTIAL and will not be disclosed as attributable in any way to your specific company. Your answers should apply to your airline as it exists at or relates to the above named airport only.

**AIRLINE EMPLOYMENT**

1. How many people are employed by your airline, that owe their jobs to the above named airport and that live in the general service region of that airport:

- \_\_\_\_\_ Ground personnel (ticket agents, ground crew, baggage handlers, maintenance, supervisory, etc.)
- \_\_\_\_\_ Airplane crew based at the airport (pilots, engineers, flight attendants)
- \_\_\_\_\_ Other employees of your airline located in the airport's region but not working at the airport location (city ticketing, etc.)
- \_\_\_\_\_ Any other employees not included above that owe their jobs to this airport
- \_\_\_\_\_ Total airline employees whose jobs are due to this airport

**AIRLINE EXPENDITURES/ECONOMIC IMPACT**

2. Estimate your airline's annual expenditures made in this airport's service region for the most recent year for which you have such data available (treated as CONFIDENTIAL):

- Year Used \_\_\_\_\_
- Annual Payroll \$ \_\_\_\_\_
  - Fuel Costs (or gallons) \$ \_\_\_\_\_
  - Capital Investment at airport \$ \_\_\_\_\_
  - Operation Costs, etc. at this airport \$ \_\_\_\_\_
  - Total "Airport Caused" Local Expenses by your airline \$ \_\_\_\_\_

**FLIGHT CREW LAYOVERS**

3. Estimate the number of annual hotel room nights generated by your flight crews in layovers at this airport, (e.g., one flight crew, spending one layover night in the airport's region, equals one person night).

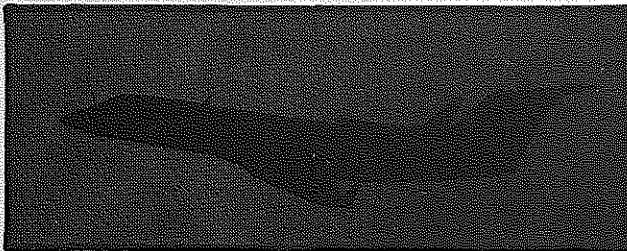
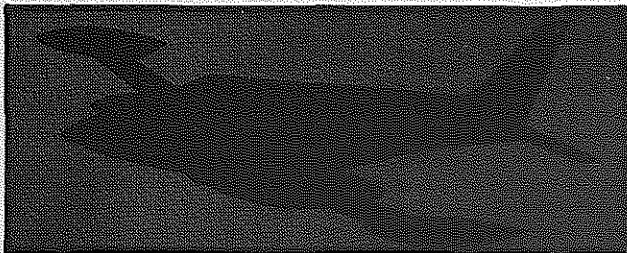
Person nights per year: \_\_\_\_\_

Thank you for your assistance. The results of this analysis will prove useful to your aviation industry. Please return this form to:

Wilbur Smith Associates  
c/o F. Coleman & Associates  
1423 Elmwood  
Lansing, Michigan 48917  
Tele: (517) 321-8932

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**VALUE OF AIRPORTS TO THEIR COMMUNITIES —  
ECONOMIC IMPACT OF AVIATION ON MICHIGAN  
VOLUME 2 - INDIVIDUAL AIRPORT IMPACT ASSESSMENTS**



prepared for  
**MICHIGAN DEPARTMENT OF  
TRANSPORTATION**

**WILBUR SMITH ASSOCIATES**

AUGUST, 1989

**MICHIGAN DEPARTMENT OF TRANSPORTATION**  
**Bureau of Transportation Planning**

**Value of Airports To Their Communities -  
Economic Benefits of Aviation Study**

August, 1989

**VOLUME 2 - INDIVIDUAL AIRPORT IMPACT ASSESSMENTS**

This report represents the findings and/or professional opinions of the staffs of the Michigan Department of Transportation and their study consultants, Wilbur Smith Associates and F. Coleman and Associates. It is not an official opinion of the Michigan State Transportation Commission.

**STATE TRANSPORTATION COMMISSION**

**William C. Marshall, Chairperson**

**Rodger D. Young**  
**Hannes Meyers, Jr.**  
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**Director**

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## ACKNOWLEDGEMENTS

This document was prepared by the Aviation Planning Unit of MDOT's Bureau of Transportation Planning, through study consultant Wilbur Smith Associates, in association with Fred Coleman and Associates.

Appreciation is extended to the airport managers and their staffs and to airport tenants at the 32 airports investigated in detail, for their assistance in providing data and answering inquiries. Local perspectives of airport activity also were provided by the airport managers.

If further information is needed or additional copies of this report are desired, please contact:

Aviation Planning Unit  
Bureau of Transportation Planning  
Michigan Department of Transportation  
PO Box 30050  
Lansing, Michigan 48909  
Attn: Value of Airports

Telephone: (517) 373-9585

## ORDER OF PRESENTATION

### ASSOCIATED COMMUNITY

### AIRPORT NAME

Allegan	Padgham Field
Alma	Gratiot Community
Alpena	Phelps Collins
Bad Axe	Huron County Mem.
Baldwin	Municipal
Benton Harbor	Twin Cities - Ross Fld.
Charlevoix	Municipal
East Lansing	Art Davis
Escanaba	Delta County
Fremont	Municipal
Gaylord	Otsego County
Gladwin	Gladwin
Grand Rapids	Kent County Int'l.
Hancock	Houghton County Mem.
Jackson	Reynolds Field
Kalkaska	Kalkaska City
Ludington	Mason County
Marquette	Marquette County
Monroe	Monroe Custer
Mt Pleasant	Municipal
Muskegon	Muskegon County
Plymouth	Mettetal Canton
Pontiac	Oakland-Pontiac
Saginaw	Harry Browne Int'l.
Saginaw	Tri-City Int'l.
Sandusky	Cowley Field
Sandusky	City
Sparta	Sparta
Sturgis	Kirsch Municipal
Traverse City	Cherry Capital
Utica	Berz-Macomb
Wayland	Municipal



# VALUE OF PADGHAM FIELD TO THE ALLEGAN AREA

## Economic Values

Padgham Field is estimated to have an economic impact on its service area of approximately \$358,000 annually in total economic activity, \$102,000 of which is household earnings. This impact is due principally to the provision of and use of general aviation services.

## Airport Characteristics

Owned and operated by the City of Allegan, the airport is open to the public and has a "U-4" classification.

Airport Services - Padgham Field is a general aviation airport, offering a number of services for private flying. Services available are listed in Exhibit 1.

### Exhibit 1

#### SERVICES OFFERED AT PADGHAM FIELD AIRPORT

Air Taxi	Aircraft Sales
General Aviation	Avgas Fuel Sales
Hangar Rental	Aircraft Repair
Tie Down	Flight Instruction
Aircraft Rental	Vending

SOURCE: Surveys by MDOT, Bureau of Transportation Planning (BTP) study consultants, Wilbur Smith Associates.

All of these services have positive economic significance to the Allegan area. This is due to the creation of employment, generation of taxes and potential attraction and retention of businesses for the area.

Airport Facilities - The airport is a visual flight rules facility with no tower. It has two runways, a rotating beacon, segmented circle and lighted wind indicator, and one Fixed-Base Operator (FBO) who provides aviation support services. Additional facilities are listed in Exhibit 2.

## Exhibit 2

### FACILITIES AT PADGHAM FIELD

RUNWAYS	DESCRIPTION									
	<u>Lgth.</u>	<u>Surf.</u>	<u>Sys.</u>	<u>Taxi</u>	<u>Edge</u>	<u>Lts.</u>	<u>REIL</u>	<u>VASI</u>	<u>Instr.</u>	<u>Appr.</u>
Primary	3,500	PV	N	MIRL	Y	Y	Y	Y	NP	NP
Crosswind	1,735	TF	N	None	N	N	N	N	VIS	VIS

NOTES: PV denotes paved surface; Taxi system definitions are: FP = full parallel; PP = part parallel; and TN = turnaround area at runway ends. Runway lighting systems (Edge Lights) are designated HIRL = high intensity runway lights. MIRL medium intensity; or LIRL, low intensity. Column heading REIL denotes Runway End Indicator Lights; VASI denotes Visual Approach Slope Indicator; column entries refer to presence of the equipment (Y denotes "yes"; N, "no"). Instrument approach facilities are: PR, Precision; NP, Non-Precision; or VIS, visual.

SOURCE: MDOT, BTP.

Airport Use - Based aircraft at Padgham Field number 34 planes, as given in Exhibit 3.

### Exhibit 3

#### NUMBERS OF BASED AIRCRAFT PADGHAM FIELD

<u>AIRCRAFT TYPE</u>	<u>1988</u>
Single Engine	34
<b>Total Aircraft</b>	<b>34</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Padgham Field has no commercial or commuter airline service, but has significant general aviation activity, as indicated by the current operating statistics, given in Exhibit 4.

Exhibit 4

**AIRCRAFT OPERATIONS  
PADGHAM FIELD**

<u>TYPE OPERATION</u>	<u>1987</u>
Itinerant:	
Air Taxi	260
General Aviation	<u>2,360</u>
Subtotal Itinerant	2,620
Local:	
General Aviation	<u>6,100</u>
<b>Total</b>	<b>8,720</b>

SOURCE: MDOT, BTP.

Available data indicate that the level of activity at Padgham Field has declined somewhat over the past several years. As shown in Exhibit 5, count surveys in 1979 indicated 13,600 total operations; a factor-derived estimate for 1983 indicated 10,330 operations; while 1987 the survey indicated 8,720 operations.

Exhibit 5

**OPERATIONS TREND  
PADGHAM FIELD**

<u>OPERATIONS</u>	<u>1979</u>	<u>1983<sup>1</sup></u>	<u>1987</u>
Itinerant	4,700	3,570	2,620
Local	<u>8,900</u>	<u>6,760</u>	<u>6,100</u>
<b>Totals</b>	<b>13,600</b>	<b>10,330</b>	<b>8,720</b>

(1) No count survey was conducted at this airport for the indicated year. Estimate is based on factor derived from representative airports.

SOURCE: MDOT, BTP.

Airport Economic Roles

Padgham Field is a private flying-oriented airport, with some business use. There has been no significant nearby economic development that is directly attributable to the airport.

Business-Oriented General Aviation - A portion of general aviation use at Padgham Field is "business-oriented" and a number of area businesses have aircraft at the field, including those listed in Exhibit 6.

Exhibit 6

**A SAMPLE OF FIRMS  
WHICH BASE AIRCRAFT  
AT PADGHAM FIELD**

- |   |   |
|---|---|
| Ossineke Bldg. Supply<br>Transportation Partners,<br>Inc. | Allegan Tubular<br>Products<br>Coleman Enterprises,<br>Inc. |
| Miller Brothers<br>Allegan Airways, Inc.                  | Grandpa's Flying<br>Service                                 |

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

In addition to firms with general aviation aircraft based at Padgham Field, limited air taxi use by local firms is reported. When required, service is called-in from Kalamazoo or Holland. Recently some charter work has been booked by the Perrigo Corp., a local pharmaceutical manufacturer. Allegan Airways, a tenant at the field, deals in sales of used aircraft. Usually, the planes are brought into Padgham Field. The activity generates some pre-sale inspections and repair work at the FBO hanger. Also some potential customers come in to look at planes and stay overnight and/or take meals in town.

Private Flying General Aviation - In addition to recreational flying by local residents, considerable itinerant traffic is generated by summer visitors to lakeside vacation accommodations, according to the Fixed-Base Operator.

#### Airport Economic Impact

Padgham Field aviation-related economic impact of \$358,000 annually comprises the impact types given in Exhibit 7.

#### Exhibit 7

#### ANNUAL AVIATION-RELATED TOTAL ECONOMIC ACTIVITY IMPACT OF PADGHAM FIELD

<u>IMPACT TYPE</u>	<u>AMOUNT</u>
Direct	\$ 149,300
Indirect	105,120
Induced	<u>103,580</u>
<b>Total</b>	<b>\$358,000</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

The total impacts, by type, are summarized in Exhibit 8. There are some impacts which are not necessarily attributable to aviation or which serve more than just the airport. There are no non-aviation related impacts at Padgham Field. This study assesses only the aviation-related impacts.

Direct Economic Impact - The "direct" impacts comprise the value of those activities involved in providing aviation services at the airport. Exhibit 9 lists the airport tenants and others included in the impact estimates. The makeup of direct impacts is given in Exhibit 10.

#### Exhibit 10

#### ESTIMATED "DIRECT" ANNUAL IMPACTS PADGHAM FIELD

<u>DIRECT IMPACT</u>	<u>AMOUNT</u>
Direct Payroll	\$130,000
Operating Expenses	12,300
Refueling Service	<u>7,000</u>
<b>Total</b>	<b>\$149,300</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

"Direct" payroll comprises payments to those people who work at the airport, are employed by the FBO, or other tenants. "Capital expenditures" include improvements to on-site facilities of tenants as well as to the airport itself. "Operating expenses" are local expenditures by the tenants or airport operator.

Indirect Economic Impacts - Padgham Field "indirect" impacts are caused by airport use in the form of expenditures by air travelers and by those firms that depend on the airport for their business.

It is estimated that over 2,550 visitors to the Allegan area arrive via Padgham Field annually (2,360 by general aviation, and 190 by air taxi in 1987). Based on approximate proportions of those staying overnight (more than one day) it is estimated that the average visitor spends approximately \$43.87 per trip at off-airport locations in the Allegan area. Local residents using the airport also spend money -- some \$3,500 per year locally.

## Exhibit 8

## ESTIMATED ANNUAL ECONOMIC IMPACTS

Padgham Field

1987

<u>IMPACT TYPE AND SOURCE</u>	<u>AVIATION</u>	<u>NON-AVIATION</u>	<u>TOTAL(1)</u>
	<u>RELATED</u>	<u>RELATED (1)</u>	
	(-----thousands-----)		
<b>Direct Impacts:</b>			
Local Governments	19.3	0	19.3
Aviation Services	80.0	0	80.0
Corporate Operations & Other	<u>50.0</u>	<u>-</u>	<u>50.0</u>
Subtotal	\$149.3	\$ 0	\$149.3
<b>Indirect Impacts:</b>			
Visitor Expenditures	\$101.6	\$ 0	\$101.6
Regional Expenditure	3.5	0	3.5
Dependent Firms	<u>0.0</u>	<u>0</u>	<u>0.0</u>
Subtotal	\$105.1	\$ 0	\$105.1
<b>Induced Impacts:</b>	103.6		
<b>Total Annual Impacts</b>	<u>\$358.0</u>		

(1) Only aviation-related impacts are considered in this study.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

## Exhibit 9

## ORGANIZATIONS AND FIRMS CREATING ECONOMIC IMPACTS

Padgham Field

1987

<u>ORGANIZATION</u>	<u>ATTRIBUTION OF ACTIVITY</u>			<u>ECONOMIC ACTIVITY</u>
	<u>Aviation-Related</u>			
	<u>On-Site</u> (1)	<u>Off-Site</u> (2)	<u>Non-Aviation</u> (3)	
<b>Local Government:</b>				
City of Allegan	X			Airport Maintenance
<b>Aviation Services:</b>				
Grandpa's Flying Service	X			Fixed Base Operator
Allegan Airways	X			Used Aircraft, Sales Broker

(1) Economic activity on airport property, by an airport tenant, treated as "direct" economic impact.

(2) Economic activity not taking place on airport property, but which is directly aviation-related to this airport. Treated as an "indirect" economic impact.

(3) Activity which is not related to or dependent on aviation activities. Not included in the impact estimates.

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

The aviation-related indirect economic impacts attributable to Padgham Field total \$105,120, as shown in Exhibit 11. The visitor expenditures breakdown by expenditure type is based on a mix of tourist, business and personal travel derived from the results of surveys made at other airports. Since no Michigan surveys were available, these were adjusted to reflect a range of values judged to be appropriate for local conditions. All visitor expenditures are at the actual cost outlay except retail sales which, since it is a margin industry, is shown at 20 percent of the actual expenditures. Expenditures by airport dependent firms consist of those costs attributable to airport-related activity.

Exhibit 11

**INDIRECT IMPACTS OF  
PADGHAM FIELD**

<u>REGIONAL EXPENDITURES BY SOURCE</u>	<u>ANNUAL IMPACT</u>
Visitor Expenditures:	
Lodging	\$ 34,300
Food & Beverage	28,900
Retail Sales	2,620
Entertainment	8,900
Ground Transport	7,700
Business	6,300
Other	<u>12,900</u>
Subtotal	\$101,620
Resident Expenditures	3,500
Dependent Firm Expenditures	<u>0</u>
Total	\$105,120

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

**Induced Economic Impact** - "Direct" economic impacts of about \$149,300, and "indirect" impacts of \$105,120, represent increases in final demand for goods and services in the Allegan region. To these must be added a "multiplier" effect produced by circulation of the money through the regional economy. To determine this "induced" impact, the U.S. Department of Commerce "Regional Input-Output Modeling System" (RIMS-II) was used. It was found that the induced impact produced by Padgham Field in 1987 was approximately \$103,580.

**Industries Which Benefit**

The economic activities at Padgham Field produce expenditures for a wide variety of goods and services. Many types of industry benefit, whether or not they are themselves airport users. Exhibit 12 lists impacted industry groups, and shows the extent to which each benefits from Padgham Field in terms of total output, earnings and employment.

**Airport Derived Employment**

One element in the airport's economic impact total is the employment which the airport creates. People are employed in airport-related activities at the airport (the FBO, the City, etc.) and at other off-airport sites (hotels, manufacturing concerns, etc.). Furthermore, the direct and indirect expenditures attributable to the airport continue to flow through the region's economy creating additional employment (the "multiplier" effect). A summary of the jobs estimated to be attributable to Padgham Field is given in Exhibit 13.

Exhibit 13

**JOBS ATTRIBUTABLE TO  
PADGHAM FIELD**

<u>JOB SOURCE</u>	<u>Full Time</u>	<u>Part Time</u>	<u>Total FEQ</u>
Direct On-Site Jobs	4	2	5
Indirect Off-Site Jobs at Surveyed Firms	0	0	0
Induced and Other Indirect Jobs			<u>0</u>
		<b>Total Jobs</b>	<b>5</b>

NOTE: FEQ denotes "full-time equivalent" jobs, calculated as two part-time jobs equal one full-time job.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

Exhibit 12  
ANNUAL ECONOMIC IMPACTS OF PADGHAM FIELD  
1987

<u>IMPACTED INDUSTRY GROUPS</u>	<u>TOTAL ECONOMIC ACTIVITY (Output)</u> (.....Thousands.....)	<u>TOTAL ANNUAL PAYROLL (Earnings)(1)</u>	<u>EMPLOYMENT (Jobs)</u>
Ag. Prod., Forestry Svcs.	\$3	\$0	0
Crude Petrol.	1	0	0
Maint. and Repair Const.	11	5	0
Food, Kindred Prd.	4	0	0
Printing, Publishing	1	0	0
Transportation	174	52	2
Communications	7	1	0
Utilities	11	0	0
Wholesale Trade	5	1	0
Retail Trade	16	6	1
Finance	3	1	0
Insurance	1	0	0
Real Estate	13	0	0
Lodging, Amusements	44	15	1
Personal Services	1	0	0
Business Services	14	6	0
Eating, Drinking Estab.	38	11	1
Health Services	6	3	0
Other Services	5	1	0
Households	0	0	0
<b>TOTALS</b>	<b>\$358</b>	<b>\$102</b>	<b>5</b>

(1) The portion of the "output" column that is payroll to employed persons.

SOURCE: Rims II Multipliers, MDOT, BTP study consultant, Wilbur Smith Associates.

The RIMS model treats jobs as full-time-equivalents (FEQ). Consequently, the split between full-time and part-time for induced employment is not shown. The Exhibit shows that there are five FEQ jobs at the airport that are attributable to the airport and none elsewhere in the region.

#### Other Impacts

Beyond the quantifiable economic impacts discussed above, Padgham Field serves some vacation season visitors to western Michigan. The resulting ease of access supports the local recreation industry by encouraging families from relatively distant locations to rent local accommodations and remain for extended visits. To the extent that out-of-state families are involved, "new" money is brought into Michigan and circulates through the economic system, triggering further multiplier effects, beyond those of average visitors.

#### Non-Economic Values

Not all values a community derives from an airport are quantifiable in dollar terms. Padgham Field provides Allegan residents with alternative linkages to Michigan and beyond.

The airport provides access to the latest diagnosis and treatment procedures. For example, blood and tissue samples are sent to medical centers, or other specialist locations, for analysis; medical supplies not available locally (such as serums, antitoxins, isotopes, and organs for transplant operations) are shipped by air; and patients are moved by air for treatment procedures not available in their community.

Padgham Field also supports the maintenance of essential community services and security. The airport is used as needed, to help locate and combat forest fires, to patrol pipelines and power lines, to support police, Civil Air Patrol and National Guard Activities. In case of natural disasters (fire, flood or blizzards) Padgham Field is a resource for supply and evacuation.

In recent years, general aviation has become a major training ground for rewarding careers in the airline and aeronautical fields. The presence of an airport gives residents the option of flight instruction and ground service training. Padgham Field supports local school and community group programs to inform students about aviation careers.

# VALUE OF GRATIOT COMMUNITY AIRPORT TO THE ALMA AREA

## Economic Values

Gratiot Community Airport is estimated to have an economic impact on its service area of approximately \$2.3 million annually in total economic activity, \$743,000 of which is household earnings. This impact is due principally to the provision and use of general aviation services at the airport.

## Airport Characteristics

Owned and operated by Gratiot County, the airport is open to the public and has a "T-5" classification.

Airport Services - Gratiot Community Airport is a general aviation airport, offering the services listed in Exhibit 1.

### Exhibit 1

#### SERVICES OFFERED AT GRATIOT COMMUNITY AIRPORT

Air Taxi	Jet Fuel Sales
General Aviation	Avgas Fuel Sales
Hangar Rental	Aircraft Repair
Tie Down	Flight Instruction
Aircraft Rental	Vending

SOURCE: Surveys by MDOT, Bureau of Transportation Planning (BTP) study consultants, Wilbur Smith Associates.

All of these services have positive economic significance to the Alma area. This is due to the

creation of employment, generation of taxes and potential attraction and retention of businesses for the area.

Airport Facilities - The airport is an all-weather facility capable of handling virtually all general aviation aircraft types. It has two runways, is not towered, has a passenger terminal, hangar space and one Fixed-Base Operator (FBO) who provides aviation support services. Additional facilities are listed in Exhibit 2.

### Exhibit 2

#### FACILITIES AT GRATIOT COMMUNITY AIRPORT

	RUNWAYS		DESCRIPTION				
	Lgth.	Surf.	Taxi Sys.	Edge Lts.	REIL	VASI	Instr. Appr.
Primary	5,000	PV	No	MIRL	Y	Y	NP
Crosswind	3,200	PV	No	MIRL	N	N	VIS

NOTES: PV denotes paved surface; Taxi system definitions are: FP = full parallel; PP = part parallel; and TN = turnaround area at runway ends. Runway lighting systems (Edge Lights) are designated HIRL = high intensity runway lights. MIRL medium intensity; or LIRL, low intensity. Column heading REIL denotes Runway End Indicator Lights; VASI denotes Visual Approach Slope Indicator; column entries refer to presence of the equipment (Y denotes "yes"; N, "no"). Instrument approach facilities are: PR, Precision; NP, Non-Precision; or VIS, visual.

SOURCE: MDOT, BTP.



**Airport Use** - Gratiot Community Airport is not served by any scheduled air carriers but has substantial general aviation activity. A total of 33 general aviation aircraft are based at the airport, as itemized in Exhibit 3.

Although the 7,000 estimated annual aircraft operations for 1987 are below the level estimated for 1981, as shown in Exhibit 5, they are higher than the 1983 and 1986 estimates. Introduction of air taxi service in 1987 has increased estimated itinerant movements to slightly more than 50 percent of total operations. The current nearly equal split between itinerant and local movements indicates that business travel is increasing in importance at Gratiot Community Airport, and now is comparable in importance to recreational and training activities.

**Exhibit 3**

**NUMBERS OF BASED AIRCRAFT  
GRATIOT COMMUNITY AIRPORT**

<u>AIRCRAFT TYPE</u>	<u>1988</u>
Single Engine	24
Multi-Engine	<u>9</u>
<b>Total Aircraft</b>	<b>33</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Estimated aircraft operations for 1987 are given in Exhibit 4. Military operations are normally training for Air National Guard aircraft based elsewhere.

**Exhibit 4**

**AIRCRAFT OPERATIONS  
GRATIOT COMMUNITY AIRPORT**

<u>TYPE OPERATION</u>	<u>1987</u>
Itinerant:	
General Aviation	<u>2,800</u>
Subtotal Itinerant	2,800
Local:	
General Aviation	<u>4,200</u>
<b>Total</b>	<b>7,000</b>

SOURCE: MDOT, BTP.

**Exhibit 5**

**OPERATIONS TREND  
GRATIOT COMMUNITY AIRPORT**

<u>OPERATIONS TYPE</u>	<u>1981</u>	<u>1983<sup>1</sup></u>	<u>1986</u>	<u>1987<sup>1</sup></u>
Itinerant	3,450	2,640	1,910	2,800
Local	<u>6,550</u>	<u>5,000</u>	<u>3,610</u>	<u>4,200</u>
<b>Totals</b>	<b>10,000</b>	<b>7,640</b>	<b>5,520</b>	<b>7,000</b>

(1) No count survey was conducted at this airport for the indicated year. Estimate is based on factor derived from representative airports.

SOURCE: MDOT, BTP.

The Fixed-Base Operator reports that general aviation moves significant volumes of air cargo at Gratiot Community Airport, noting that about 90 percent of the estimated 1987 total of nearly 70 tons was inbound. Local manufacturing plants of Ford and General Motors generate roughly 85 to 90 percent of the total, which is handled by non-local aircraft. Local aircraft carry the remainder.

**Airport Economic Roles**

At Gratiot Community Airport, important economic roles are played both by business activity and by the combination of recreational flying and flight instruction. Business generates the following airport activities.

**Retention of Private Business** - Gratiot Community Airport is considered valuable to the competitive position of a number of local firms and plants, some of which might choose to locate elsewhere if the facility were not present. These organizations use the air taxi and general aviation services made possible by the airport. "Just-in-Time" cargo delivery to the area's industries is seen as a valuable service made possible by the airport's existence. However, the facility was not found to be directly responsible for any significant economic development in the service area.

**Business-Oriented General Aviation** - An estimated 45-50 percent of general aviation use at the airport is "business-oriented," and many of the region's businesses have aircraft at the airport including those listed in Exhibit 6.

**Exhibit 6**

**A SAMPLE OF FIRMS  
WHICH BASE AIRCRAFT  
AT GRATIOT COMMUNITY AIRPORT**

Davidson Construction	Hansen Flying Svc.
D&J Refuse	King Ledsing
Freed Construction	McKinley Trucking
	McLaughlin's Mobile Mart

**SOURCE:** Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

In addition to firms with general aviation aircraft based at the airport, there are many others that depend on the airport, for various services, such as air taxi/charter service, air freight etc. These are important for sales, management and production activities at such firms as: Consumers Power, Ford Motor, Garr Tool, General Motors, General Telephone, Lippert Compts., Lobdell Emery, Michigan Tissue Bank, United Technologies Automotive Division and Weber Electronics.

**Airport Economic Impact**

The Gratiot Community Airport aviation-related economic impact of \$2.3 million annually comprises the impact types listed in Exhibit 7.

**Exhibit 7**

**ANNUAL AVIATION-RELATED  
ECONOMIC IMPACT OF  
GRATIOT COMMUNITY AIRPORT**

<u>IMPACT TYPE</u>	<u>AMOUNT</u>
Direct	\$ 1,149,600
Indirect	387,400
Induced	<u>780,000</u>
<b>Total</b>	<b>\$ 2,317,000</b>

**SOURCE:** Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

The total impacts, by type, are summarized in Exhibit 8. This study assesses only the aviation-related impacts.

**Direct Economic Impact** - The "direct" impacts comprise the value of those activities involved in providing aviation services at the airport. Exhibit 9 lists the airport tenants and others included in the impact estimates. The makeup of direct impacts is given in Exhibit 10.

**Exhibit 10**

**ESTIMATED "DIRECT" ANNUAL IMPACTS  
GRATIOT COMMUNITY AIRPORT**

<u>DIRECT IMPACT</u>	<u>AMOUNT</u>
Direct Payroll	\$ 309,500
Capital Expenditures	190,000
Operating Expenses	579,100
Refueling Service	<u>71,000</u>
<b>Total</b>	<b>\$1,149,600</b>

**SOURCE:** Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

## Exhibit 8

**ESTIMATED ANNUAL ECONOMIC IMPACTS**  
**Gratiot Community Airport**  
**1987**

<u>IMPACT TYPE AND SOURCE</u>	<u>AVIATION RELATED</u>	<u>NON-AVIATION RELATED (1)</u>	<u>TOTAL(1)</u>
	(-----thousands-----)		
<b>Direct Impacts:</b>			
Local Governments	38.0	0.0	38.0
Air Passenger Services	0.6	0.0	0.6
Aviation Services	<u>1,111.0</u>	<u>0.0</u>	<u>1,111.0</u>
Subtotal	\$ 1,149.6	\$ 0.0	\$ 1,149.6
<b>Indirect Impacts:</b>			
Visitor Expenditures	\$ 243.7	\$ 0.0	\$ 243.7
Regional Expenditure	2.0	0.0	2.0
Corporate Air Operations	<u>141.7</u>	<u>1,278.3</u>	<u>1,420.0</u>
Subtotal	\$ 387.4	\$1,278.3	\$ 1,665.7
<b>Induced Impacts:</b>			
	780.0		
<b>Total Annual Impacts</b>	<u>\$2,317.0</u>		

(1) Only aviation-related impacts are considered in this study.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

Exhibit 9  
**ORGANIZATIONS AND FIRMS CREATING ECONOMIC IMPACTS**  
 Gratiot Community Airport  
 1988

<u>ORGANIZATION</u>	<u>ATTRIBUTION OF ACTIVITY</u>			<u>ECONOMIC ACTIVITY</u>
	<u>Aviation-Related</u>		<u>Non-Aviation</u> <sup>(3)</sup>	
	<u>On-Site</u> <sup>(1)</sup>	<u>Off-Site</u> <sup>(2)</sup>		
Federal Government:				
U.S. Forest Svc.		X		Forest Fire Control
Local Government:				
Metro. Air. Comm.	X			Airport Management
Air Passenger Services:				
Johnny's Vending Svc.	X			Vending Service
Aviation Services:				
Hansen Flying Svc.	X			Fixed-Base Operator
Other:				
Corp. Air Operations	X	X		Company Aircraft Activity

- (1) Economic activity on airport property, by an airport tenant, treated as "direct" economic impact.  
 (2) Economic activity not taking place on airport property, but which is directly aviation-related to this airport. Treated as an "indirect" economic impact.  
 (3) Activity which is not related to or dependent on aviation activities. Not included in the impact estimates.

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

"Direct" payroll comprises payments to those people who work at the airport, are employed by the airlines, FBO, corporate users, restaurant, or other tenants. "Capital expenditures" include improvements to on-site facilities of tenants as well as to the airport itself. "Operating expenses" are local expenditures by the tenants or airport operator.

**Indirect Economic Impacts** - Gratiot Community Airport "indirect" impacts are caused by airport use in the form of expenditures by air travelers and by those firms that depend on the airport for their business.

It is estimated that over 3,900 visitors to the Alma area arrive via Gratiot Community Airport annually (2,800 by personal or corporate aircraft and 1,125 by air taxi in 1987). Based on approximate proportions of those staying overnight (more than one day) it is estimated that the average visitor spends approximately \$68.50 per trip at off-airport locations in the Alma area. Local residents using the airport also spend money -- some \$2,000 per year locally.

The aviation-related indirect economic impacts attributable to Gratiot Community Airport total \$387,400, as shown in Exhibit 11. The visitor expenditures breakdown by expenditure type is based on a mix of tourist, business and personal travel derived from the results of surveys made at other airports. Since no Michigan surveys were available, these were adjusted to reflect a range of values judged to be appropriate for local conditions. All visitor expenditures are at the actual cost outlay except retail sales which, since it is a margin industry, is shown at 20 percent of the actual expenditures. Expenditures by airport-dependent firms consist of those costs attributable to airport-related activity.

**Induced Economic Impact** - "Direct" economic" impacts of about \$1.1 million, and "indirect" impacts of \$387,400, represent increases in final demand for goods and services in the Alma region. To these must be added a "multiplier"

## Exhibit 11

INDIRECT IMPACTS OF  
GRATIOT COMMUNITY AIRPORT

<u>REGIONAL EXPENDITURES BY SOURCE</u>	<u>ANNUAL IMPACT</u>
Visitor Expenditures:	
Lodging	\$ 82,300
Food & Beverage	69,400
Retail Sales	6,300
Entertainment	21,200
Ground Transport	18,500
Business	15,100
Other	<u>30,900</u>
Subtotal	\$243,700
Resident Expenditures	2,000
Corporate Air Opns.	<u>141,700</u>
<b>Total</b>	<b>\$387,400</b>

**SOURCE:** Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

effect produced by circulation of the money through the regional economy. To determine this "induced" impact, the U.S. Department of Commerce "Regional Input-Output Modeling System" (RIMS-II) was used. It was found that the induced impact produced by Gratiot Community Airport in 1987 was approximately \$780,000.

**Industries Which Benefit**

The economic activities at Gratiot Community Airport produce expenditures for a wide variety of goods and services. Many types of industry benefit, whether or not they are themselves airport users. Exhibit 12 lists impacted industry groups, and shows the extent to which each benefits from Gratiot Community Airport in terms of total economic activity, earnings and employment.

Exhibit 12  
ANNUAL ECONOMIC IMPACTS OF  
GRATIOT COMMUNITY AIRPORT  
1987

<u>IMPACTED INDUSTRY GROUPS</u>	<u>TOTAL ANNUAL IMPACT (Output)</u> (.....Thousands.....)	<u>TOTAL ANNUAL PAYROLL (Earnings)(1)</u>	<u>EMPLOYMENT (Jobs)</u>
Ag. Prod., Forestry Svcs.	\$16	\$3	0
Crude Petrol.	6	0	0
New Construction	190	71	3
Maint. and Repair Const.	53	22	1
Food, Kindred Prd.	20	3	0
Printing, Publishing	13	3	0
Chemicals, Refined Petrol.	3	0	0
Rubber, Leather Prod.	8	1	0
Lumber, Furniture Prod.	1	0	0
Stone, Clay, Glass Prod.	7	2	0
Primary Metals	2	0	0
Fabricated Metals	23	4	0
Non-electrical Machinery	3	1	0
Motor Vehicles, Equipment	5	0	0
Miscellaneous Mfg.	2	0	0
Transportation	762	249	9
Communications	65	15	0
Utilities	99	9	0
Wholesale Trade	41	13	1
Retail Trade	101	50	4
Finance	22	5	0
Insurance	13	3	0
Real Estate	85	0	0
Lodging, Amusements	113	37	4
Personal Services	8	2	0
Business Services	449	175	8
Eating, Drinking Estab.	124	36	5
Health Services	44	23	1
Other Services	39	14	1
Households	--	2	1
<b>TOTALS</b>	<b>\$2,317</b>	<b>\$743</b>	<b>38</b>

(1) The portion of the "output" column that is payroll to employed persons.

SOURCE: Rims II Multipliers, MDOT, BTP study consultants, Wilbur Smith Associates.

Airport Derived Employment

An important element in the Gratiot Community Airport economic impact total is the employment which the airport creates. People are employed in airport-related activities at the airport (the FBO, the Airport sites Commission, etc.) and at other off-airport sites (hotels, manufacturing concerns, etc.). Furthermore, the direct and indirect expenditures attributable to the airport continue to flow through the region's economy creating additional employment (the "multiplier" effect). A summary of the jobs estimated to be attributable to Gratiot Community Airport is given in Exhibit 13.

The RIMS model treats jobs as full-time-equivalents (FEQ). Consequently, the split between full-time and part-time for induced employment is not shown. The Exhibit shows that there are 20 FEQ

jobs at the airport, and another 18 located elsewhere in the greater Southeastern Michigan region that are attributable to the airport.

Non-Economic Values

Not all values a community derives from an airport are quantifiable in dollar terms. Alma, Gratiot Community Airport, provides residents with alternative linkages to Michigan and beyond.

The airport provides access to the latest diagnosis and treatment procedures. For example, blood and tissue samples are sent to medical centers, and specialist locations, for analysis; medical supplies not available locally (such as serums, antitoxins, isotopes, or organs for transplant operations) are shipped by air; and patients are moved by air for treatment procedures not available in their community. At Gratiot Community Airport, roughly 100 flights per year are made to the Tissue Bank at Sparrow Hospital, Lansing, to transport donor items and medical teams. Also, air ambulance services have transported patients from the Alma area in need of specialized care, to such medical centers as the Mayo clinic, or have rushed infants to a premature baby clinic in Detroit.

Exhibit 13

**JOBS ATTRIBUTABLE TO  
GRATIOT COMMUNITY AIRPORT**

<u>JOB SOURCE</u>	<u>Full Time</u>	<u>Part Time</u>	<u>Total FEQ</u>
Direct On-Site Jobs	17	6	20
Indirect Off-Site Jobs at Surveyed Firms	0	5	2
Induced and Other Indirect Jobs			<u>16</u>
	<b>Total Jobs</b>		<b>38</b>

NOTE: FEQ denotes "full-time equivalent" jobs, calculated as two part-time jobs equal one full-time job.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

Alma Gratiot airport also supports the maintenance of essential community services and security. It is used to help locate and combat forest fires; to patrol pipelines and power lines, to support police, Civil Air Patrol and National Guard Activities. In case of natural disasters (fire or flood) it is a vital resource for supply and evacuation. Gratiot Community Airport provides necessary refueling facilities which support such essential activities as location of downed power lines (Consumers Power) and State Police search and surveillance flights.

In recent years, general aviation has become a major training ground for rewarding careers in the airline and aeronautical fields. The presence of an airport gives residents the option of flight instruction and ground service training.

# VALUE OF PHELPS COLLINS AIRPORT TO THE ALPENA AREA

## Economic Values

Phelps Collins Airport is estimated to have an economic impact on its service area of approximately \$10.7 million annually. This impact is due principally to the provision and use of commuter air carrier services, general aviation services, federal government services and the sizable Michigan Air National Guard operations at the airport.

## Airport Characteristics

Owned and operated by Alpena County, the Airport is divided into civilian and military areas. The civilian area of the airport is open to the public, has a "T-5" classification, and is the eighth largest airport in Michigan in terms of usage by passengers of air carriers.

Airport Services - Phelps Collins Airport is a commuter air carrier and general aviation airport, offering the services listed in Exhibit 1.

### Exhibit 1

#### SERVICES OFFERED AT PHELPS COLLINS AIRPORT

Commuter Air	Avgas Fuel Sales
General Aviation	Aircraft Repair
Hangar Rental	Avionics
Tie Down	Flight Instruction
Aircraft Rental	Car Rental
Jet Fuel Sales	Vending
Control Tower	

SOURCE: Surveys by MDOT, Bureau of Transportation Planning (BTP) study consultants, Wilbur Smith Associates.

All of these services have positive economic significance to the Alpena area. This is due to

the creation of employment, generation of taxes and potential attraction and retention of businesses for the area.

Airport Facilities - The airport is an all-weather facility capable of handling virtually all general aviation aircraft types. It has three runways, a rotating beacon, segmented circle and lighted wind direction indicator, has a passenger terminal, hangar space, and two Fixed-Base Operators (FBOs) who provide aviation support services. Air traffic is controlled by the Air National Guard tower. Additional facilities are listed in Exhibit 2.

### Exhibit 2

#### FACILITIES AT PHELPS COLLINS AIRPORT

	RUNWAYS		DESCRIPTION				
	Lgth.	Surf.	Taxi Sys.	Edge Lts.	REIL	VASI	Instr. Appr.
Primary	9,000	PV	FP	HIRL	Y	Y	PR
Crosswind	5,030	PV	N	None	N	N	NP
Crosswind	5,030	PV	N	None	N	N	NP

NOTES: PV denotes paved surface; Taxi system definitions are: FP = full parallel; PP = part parallel; and TN = turnaround area at runway ends. Runway lighting systems (Edge Lights) are designated HIRL = high intensity runway lights. MIRL medium intensity; or LIRL, low intensity. Column heading REIL denotes Runway End Indicator Lights; VASI denotes Visual Approach Slope Indicator; column entries refer to presence of the equipment (Y denotes "yes"; N, "no"). Instrument approach facilities are: PR, Precision; NP, Non-Precision; or VIS, visual.

SOURCE: MDOT, BTP.



Airport Use - Phelps Collins Airport currently is served by one commuter air carrier (Northwest Airlink) and has substantial general aviation activity. A total of 26 general aviation aircraft are based at the airport, as itemized in Exhibit 3.

Exhibit 3

NUMBERS OF BASED AIRCRAFT  
PHELPS COLLINS AIRPORT

<u>AIRCRAFT TYPE</u>	<u>1988</u>
Single Engine	19
Multi-Engine	6
Jet	1
<b>Total Aircraft</b>	<b>26</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Estimated aircraft operations for 1986 are given in Exhibit 4. Military operations, which make up roughly half the total, are normally training for Michigan Air National Guard (ANG) military aircraft operating from the military area on the airport. Michigan Air National Guard offices advise that no military aircraft are permanently based at Phelps Collins Airport, but planes are brought in by ANG units training there. Training exercises for fixed-wing aircraft normally take place between April and October, while some helicopter units come in during November and December.

Fixed-wing aircraft units normally consist of 18 to 24 aircraft. Training exercises range from 4 to 15 days duration. At any time during the training season, the fleet of military aircraft operating at the ANG based may range from 18 to 70 planes.

Airport operations count data for several recent years are given in Exhibit 5. Aircraft operations at the airport have generally remained

Exhibit 4

AIRCRAFT OPERATIONS  
PHELPS COLLINS AIRPORT

<u>TYPE OPERATION</u>	<u>1986</u>
Itinerant:	
General Aviation	6,497
Military	<u>4,531</u>
Subtotal Itinerant	11,028
Local:	
General Aviation	2,187
Military	<u>4,948</u>
Subtotal Local	<u>7,135</u>
<b>Total</b>	<b>18,163</b>

SOURCE: MDOT, BTP.

stable in recent years for civilian operations, and are largely itinerant in nature reflecting the use of the airport as a transportation facility rather than as a general aviation training airport. Scheduled daily flights number four on Mondays through Fridays, and two each on Saturdays and Sundays.

Exhibit 5

OPERATIONS TREND  
PHELPS COLLINS AIRPORT

<u>OPERATIONS</u>	<u>1985</u>	<u>1986</u>	<u>1987<sup>1</sup></u>
Itinerant	12,230	10,994	11,028
Local	<u>6,669</u>	<u>6,910</u>	<u>7,135</u>
<b>Totals</b>	<b>18,899</b>	<b>17,904</b>	<b>18,163</b>

(1) Estimated by MDOT, BTP Study Consultant, Wilbur Smith Associates, based on data reported by military tower at Phelps Collins, adjusted to include scheduled air carrier operations.

SOURCE: MDOT, BTP.

As shown by the data in Exhibit 6, air passenger traffic in 1987 averaged approximately 25 passengers daily, and was six percent lower than the 1986 level. This followed four consecutive years of growth averaging 5.8 percent annually on a compound basis. The single air carrier has cut back service to the minimum level required by essential air service (24 weekly flights); has filed notice of intent to suspend essential service at this location and has been working under a US Department of Transportation order extending its service obligation.

Exhibit 6

**AIR CARRIER PASSENGERS  
PHELPS COLLINS AIRPORT**

<u>PASSENGERS</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>
Deplaned	5,008	5,169	4,688
Enplaned	<u>4,985</u>	<u>4,879</u>	<u>4,754</u>
Totals	9,993	10,048	9,442

SOURCE: MDOT, BTP.

Air cargo volume at Phelps Collins Airport (given in Exhibit 7) increased sharply in 1986, in response to a corporate decision by Federal Express to replace trucking with air service. Tonnage decreased by about six percent in 1987, in line with experience statewide.

Exhibit 7

**AIR CARGO HANDLED AT  
PHELPS COLLINS AIRPORT**

<u>CARGO MOVEMENT</u>	<u>CARGO TONS</u>		
	<u>1985</u>	<u>1986</u>	<u>1987</u>
Deplaned	4.8	63.1	65.1
Enplaned	<u>1.6</u>	<u>69.5</u>	<u>59.3</u>
Totals	6.4	132.6	124.4

SOURCE: MDOT, BTP.

**Airport Economic Roles**

Civilian flight activity at Phelps Collins Airport is business-oriented, with the following comprising the airport's principal economic impact types.

**Retention of Private Business** - Phelps Collins Airport is considered valuable to the competitive position of a number of local firms and plants, some of which might choose to locate elsewhere if the facility were not present. These organizations use the commuter air and general aviation services made possible by the airport's existence. However, the facility was not found to be directly responsible for any significant economic development in the service area.

3

**Business-Oriented General Aviation** - An estimated 70-80 percent of general aviation use at the airport is "business-oriented," and a number of the region's businesses have aircraft at the airport including those listed in Exhibit 8.

Exhibit 8

**A SAMPLE OF FIRMS  
WHICH BASE AIRCRAFT  
AT PHELPS COLLINS AIRPORT**

Alpena Power Co. Insta-Flite, Inc.  
Besser Corp. Ossineke Bldg. Supply  
Glawe Phelps Collins Av.  
Widell Industries

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

In addition to firms with general aviation aircraft based at the airport, there are others that depend on the airport, for various services, such as scheduled passenger service, air taxi/charter service, air freight etc. These services are important for sales, management and production activities of such firms as: D. G. Trim Products, Fletcher Paper and LaFarge Corporation. Some other local firms report having reduced airport usage after recent service cutbacks.

**Airport Economic Impact**

The Phelps Collins Airport aviation-related economic impact of \$10.7 million annually comprises the impact types listed in Exhibit 9.

## Exhibit 9

**ANNUAL AVIATION-RELATED  
ECONOMIC IMPACT OF  
PHELPS COLLINS AIRPORT**

<u>IMPACT TYPE</u>	<u>AMOUNT</u>
Direct	\$ 5,336,000
Indirect	1,888,500
Induced	<u>3,433,500</u>
<b>Total</b>	<b>\$10,658,000</b>

**SOURCE:** Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

The total impacts, by type, are summarized in Exhibit 10. There are some impacts at the airport which are not necessarily attributable to aviation, e.g., a fire station and weather service that serve more than just the airport, etc. This study assesses only the aviation-related impacts.

**Direct Economic Impact** - The "direct" impacts comprise the value of those activities involved in providing aviation services at the airport. Exhibit 11 lists the airport tenants and others included in the impact estimates. The makeup of direct impacts is given in Exhibit 12.

## Exhibit 12

**ESTIMATED "DIRECT" ANNUAL IMPACTS  
PHELPS COLLINS AIRPORT**

<u>DIRECT IMPACT</u>	<u>AMOUNT</u>
Direct Payroll	\$3,921,000
Capital Expenditures	15,000
Operating Expenses	1,274,000
Refueling Service	<u>126,000</u>
<b>Total</b>	<b>\$5,336,000</b>

**SOURCE:** Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

"Direct" payroll comprises payments to those people who work at the airport, are employed by the airlines, FBO, corporate users, restaurant, or other tenants. "Capital expenditures" include

improvements to on-site facilities of tenants as well as to the airport itself. "Operating expenses" are local expenditures by the tenants or airport operator.

**Indirect Economic Impacts** - Phelps Collins Airport "indirect" impacts are caused by airport use in the form of expenditures by air travelers and by those firms that depend on the airport for their business.

It is estimated that approximately 11,000 visitors to the Alpena area arrive via Phelps Collins Airport annually (2,400 by scheduled air carrier, and 8,600 by general aviation, including air taxi, in 1987). Based on approximate proportions of those staying overnight (more than one day) it is estimated that the average visitor spends approximately \$87.47 per trip at off-airport locations in the Alpena area. The aggregate of local impact expenditures of visitors arriving by air in 1987, is estimated to be \$864,900. In addition, roughly 10,600 participants attend various training programs held throughout the year at the Air National Guard base at the airport. Trainees come from many parts of the country, for programs having durations from one weekend, through two full weeks. During off-duty hours, many participants visit the community, adding significantly to the economic impact of airport-related visitors. It is estimated that Guard visitors spent approximately \$851,600 in 1987. Local residents using the airport also spend money -- some \$6,000 per year locally (in addition to money spent at the airport). Corporate air operations at the airport produced an estimated \$166,000 of local expenditures during 1987.

The aviation-related indirect economic impacts attributable to Phelps Collins Airport total approximately \$1.9 million, as shown in Exhibit 13. The visitor expenditures breakdown by expenditure type is based on a mix of tourist, business and personal travel derived from the results of surveys made at other airports. Since no Michigan surveys were available, these were adjusted to reflect a range of values judged to be appropriate for local conditions. All visitor expenditures are at the actual cost except retail sales which, since it is a margin industry, is shown at 20 percent of the actual expenditures. Expenditures by airport-dependent firms consist of those costs attributable to airport-related activity.

## Exhibit 10

**ESTIMATED ANNUAL ECONOMIC IMPACTS**  
**Phelps Collins Airport**  
**1987**

<u>IMPACT TYPE AND SOURCE</u>	<u>AVIATION RELATED</u>	<u>NON-AVIATION RELATED (1)</u>	<u>TOTAL(1)</u>
	(-----thousands-----)		
<b>Direct Impacts:</b>			
Air Carrier Operations	\$ 70	\$ 0	\$ 70
Federal Government	43	173	216
Local Governments	61	0	61
Mich. Air Nat'l. Guard	4,724	65	4,789
Air Passenger Services	70	0	70
Aviation Services	<u>368</u>	<u>0</u>	<u>368</u>
Subtotal	\$ 5,336	\$ 238	\$ 5,574
<b>Indirect Impacts:</b>			
Visitor Expenditures	\$ 865	\$ 0	\$ 865
Off-duty Expenditures by			
ANG trainees	851	0	851
Regional Expenditure	6	0	6
Corporate Operations & Other	<u>166</u>	<u>0</u>	<u>166</u>
Subtotal	\$ 1,888	\$ 0	\$ 1,888
Induced Impacts:	3,434		
<b>Total Annual Impacts</b>	<u>\$10,658</u>		

(1) Only aviation-related impacts are considered in this study.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

**Exhibit 11**  
**ORGANIZATIONS AND FIRMS CREATING ECONOMIC IMPACTS**  
**Phelps Collins Airport**  
**1988**

<u>ORGANIZATION</u>	<u>ATtribution OF ACTIVITY</u>			<u>ECONOMIC ACTIVITY</u>
	<u>Aviation-Related</u>		<u>Non-Aviation</u> (3)	
	<u>On-Site</u> (1)	<u>Off-Site</u> (2)		
Air Carrier Operations: Northwest Link	X			Airline
Federal Government: National Oceanographic and Atmospheric Administration	X		X	National Weather Service
Local Government: County Airport	X			Airport Operations
Michigan Air National Guard	X			Training Facility
Air Passenger Services: Hertz	X			Car Rental
Avis	X			Car Rental
Aviation Services: N.E. Mich. Flight Svcs.	X			Fixed-Base Operator
Welch Aviation	X			Air Charter Service
Daedaliens Flying Club	X			Flying Club
Other: Corporate Air Operations	X	X		Hangar Leases, Company Aircraft Activity

- 
- (1) Economic activity on airport property, by an airport tenant, treated as "direct" economic impact.
  - (2) Economic activity not taking place on airport property, but which is directly aviation-related to this airport. Treated as an "indirect" economic impact.
  - (3) Activity which is not related to or dependent on aviation activities. Not included in the impact estimates.

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Exhibit 13

**INDIRECT IMPACTS OF  
PHELPS COLLINS AIRPORT**

<u>REGIONAL EXPENDITURES BY SOURCE</u>	<u>ANNUAL IMPACT</u>
Visitor Expenditures:	
Lodging	\$ 292,000
Food & Beverage	246,200
Retail Sales	22,300
Entertainment	75,400
Ground Transport	66,000
Business	53,000
Other	<u>110,000</u>
Subtotal	\$ 864,900
ANG Trainees, Off-duty Expenditures	851,600
Resident Expenditures	6,000
Corporate Air Opns.	<u>166,000</u>
Total	\$1,888,500

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Induced Economic Impact - "Direct" economic impacts of about \$5.3 million, and "indirect" impacts of \$1.9 million, represent increases in final demand for goods and services in the Alpena region. To these must be added a "multiplier" effect produced by circulation of the money through the regional economy. To determine this "induced" impact, the U.S. Department of Commerce "Regional Input-Output Modeling System" (RIMS-II) was used. It was found that the induced impact produced by Phelps Collins Airport in 1987 was approximately \$3,433,500.

Industries Which Benefit

The economic activities at Phelps Collins Airport produce expenditures for a wide variety of goods and services. Many types of industry benefit, whether or not they are themselves airport users. Exhibit 14 lists impacted industry groups, and shows the extent to which each benefits from Phelps Collins Airport in terms of total economic activity, earnings and employment.

Airport Derived Employment

An important element in the Phelps Collins Airport economic impact total is the employment which the airport creates. People are employed in airport-related activities at the airport (the FBO, the airlines, the federal government, the County, The Air National Guard (ANG) etc.) and at other off-airport sites (hotels, manufacturing concerns, etc.). Furthermore, the direct and indirect expenditures attributable to the airport continue to flow through the region's economy creating additional employment (the "multiplier" effect). A summary of the jobs estimated to be attributable to Phelps Collins Airport is given in Exhibit 15. Of the total of 112 full-time equivalent jobs at the airport, the ANG accounts for 86.

Exhibit 15

**JOBS ATTRIBUTABLE TO  
PHELPS COLLINS AIRPORT**

<u>JOB SOURCE</u>	<u>Full Time</u>	<u>Part Time</u>	<u>Total FEQ</u>
Direct On-Site Jobs	106	12	112
Indirect Off-Site Jobs at Surveyed Firms	0	0	0
Induced and Other Indirect Jobs			<u>67</u>
Total Jobs			179

NOTE: FEQ denotes "full-time equivalent" jobs, calculated as two part-time jobs equal one full-time job.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

The RIMS model treats jobs as full-time-equivalents (FEQ). Consequently, the split between full-time and part-time for induced employment is not shown. The Exhibit shows that there are 112 FEQ jobs at the airport, and another 67 located elsewhere in the greater northern Michigan region that are attributable to the airport.

Exhibit 14  
ANNUAL ECONOMIC IMPACT OF PHELPS COLLINS AIRPORT  
1987

<u>IMPACTED INDUSTRY GROUPS</u>	<u>TOTAL ANNUAL IMPACT (Output)</u> (.....Thousands.....)	<u>TOTAL ANNUAL PAYROLL (Earnings)(1)</u> (.....Thousands.....)	<u>EMPLOYMENT (Jobs)</u>
Ag. Prod., Forestry Svcs.	\$96	\$18	2
Forestry Products	4	1	0
Crude Petrol.	37	3	0
New Construction	15	5	0
Maint. and Repair Const.	345	152	6
Food, Kindred Prd.	119	17	1
Apparel	5	1	0
Printing, Publishing	59	20	1
Chemicals, Refined Petrol.	16	1	0
Rubber, Leather Prod.	32	6	0
Lumber, Furniture Prod.	4	0	0
Stone, Clay, Glass Prod.	7	1	0
Primary Metals	4	0	0
Fabricated Metals	35	8	0
Non-electrical Machinery	11	3	0
Electrical Machinery	1	0	0
Motor Vehicles, Equipment	20	4	0
Miscellaneous Mfg.	8	1	0
Transportation	5,126	1,592	58
Communications	233	57	2
Utilities	258	26	1
Wholesale Trade	178	66	2
Retail Trade	441	203	15
Finance	98	29	1
Insurance	55	16	1
Real Estate	377	6	2
Lodging, Amusements	688	229	22
Personal Services	43	19	2
Business Services	1,051	413	19
Eating, Drinking Estab.	903	264	33
Health Services	190	103	5
Other Services	199	56	3
Households	--	13	3
<b>TOTALS</b>	<b>\$10,658</b>	<b>\$3,333</b>	<b>179</b>

(1) The portion of the "output" column that is payroll to employed persons.

SOURCE: Rims II Multipliers, MDOT, BTP study consultant, Wilbur Smith Associates.

### Non-Economic Impacts

Not all values a community derives from an airport are quantifiable in dollar terms. Phelps Collins Airport provides Alpena residents with alternative linkages to Michigan and beyond. But for the local airport, heavy winter snows could isolate service area communities such as Cathro, Bolton, Ossinetre or Alpena itself, from the rest of Michigan, for extensive periods.

Phelps Collins Airport provides access to the latest medical diagnosis and treatment procedures. For example, blood and tissue samples are sent to downstate medical centers, and other specialist locations, for analysis. Medical supplies not available locally (such as serums, antitoxins, isotopes, and organs for transplant operations) are shipped by air; and patients are moved by air for treatment procedures not available in their community.

Phelps Collins Airport also supports the maintenance of essential community services and security. It is used to help locate and combat forest fires or chemical spills; to patrol

pipelines and power lines, to support police, Civil Air Patrol and National Guard Activities. In case of natural disasters (fire or flood) it is a vital resource for supply and evacuation.

The Phelps Collins Air National Guard (ANG) Base is an important adjunct of the airport. It has been used for military training since 1953. The base operates in conjunction with others in Michigan and elsewhere to improve the nation's defense capability and the readiness of specialized air units for a variety of missions. The ANG Base also participates in summer work programs for Michigan youth, funded by the State legislature. These jobs are not included in the Exhibit 15 data.

In recent years, general aviation has become a major training ground for rewarding careers in the airline and aeronautical fields. The presence of an airport gives residents the option of flight instruction and ground service training. Phelps Collins Airport supports community efforts to interest young people in aviation by hosting tours of the facility for scouts and local school groups.



# VALUE OF HURON COUNTY MEMORIAL AIRPORT TO THE BAD AXE AREA

## Economic Values

Huron County Memorial Airport is estimated to have an economic impact on its service area of approximately \$1.1 million annually in total economic activity, \$326,000 of which is household earnings. This impact is due principally to the provision and use of general aviation services at the airport.

## Airport Characteristics

Owned and operated by Huron County, the airport is open to the public and has a "U-4" classification.

Airport Services - Huron County Memorial Airport is a general aviation airport, offering the services listed in Exhibit 1.

### Exhibit 1

#### SERVICES OFFERED AT HURON COUNTY MEMORIAL AIRPORT

Air Taxi	Avgas Fuel Sales
General Aviation	Aircraft Repair
Hangar Rental	Flight Instruction
Tie Down	Courtesy Car
Aircraft Rental	Vending
Aircraft Sales	

SOURCE: Surveys by MDOT, Bureau of Transportation Planning (BTP) study consultants, Wilbur Smith Associates.

All of these services have positive economic significance to the Bad Axe area. This is due to the creation of employment, generation of taxes and potential attraction and retention of businesses for the area.

Airport Facilities - The airport is an all season facility, capable of accommodating 95 percent of general aviation aircraft types. It has three runways, a rotating beacon, segmented circle and lighted wind direction indicator. It has a small passenger terminal, hangar space, and one Fixed-Base Operator (FBO) who provides aviation support services.

### Exhibit 2

#### FACILITIES AT HURON COUNTY MEMORIAL AIRPORT

RUNWAYS	DESCRIPTION						
	Lgth.	Surf.	Sys.	Taxi Lts.	Edge REIL	VASI	Instr. Appr.
Primary	3,500	PV	PP	MIRL	Y	N	NP
Crosswind	1,950	TF	N	ULMK	N	N	VIS
Crosswind	1,810	TF	N	ULMK	N	N	VIS

NOTES: PV denotes paved surface; Taxi system definitions are: FP = full parallel; PP = part parallel; and TN = turnaround area at runway ends. Runway lighting systems (Edge Lights) are designated HIRL = high intensity runway lights. MIRL medium intensity; LIRL, low intensity; ULMK, unlighted markers. Column heading REIL denotes Runway End Indicator Lights; VASI denotes Visual Approach Slope Indicator; column entries refer to presence of the equipment (Y denotes "yes"; N, "no"). Instrument approach facilities are: PR, Precision; NP, Non-Precision; or VIS, visual.

SOURCE: MDOT, BTP.

**Airport Use** - Huron County Memorial Airport has substantial general aviation activity. A total of 23 general aviation aircraft are based at the airport, as itemized in Exhibit 3.

## Exhibit 3

**NUMBERS OF BASED AIRCRAFT  
HURON COUNTY MEMORIAL  
AIRPORT**

<u>AIRCRAFT TYPE</u>	<u>1988</u>
Single Engine	22
Multi-Engine	<u>1</u>
<b>Total Aircraft</b>	<b>23</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Estimated aircraft operations for 1987 are given in Exhibit 4.

## Exhibit 4

**AIRCRAFT OPERATIONS  
HURON COUNTY MEMORIAL  
AIRPORT**

<u>TYPE OPERATION</u>	<u>1987</u>
Itinerant:	
General Aviation	4,790
Local:	
General Aviation	<u>4,790</u>
<b>Total</b>	<b>9,580</b>

SOURCE: MDOT, BTP.

Aircraft operations at the airport have declined somewhat in recent years, as indicated in Exhibit 5. The airport manager/Fixed-Base Operator observes that flight operations are largely itinerant in nature, reflecting the use of the airport as a transportation facility rather than a training airport.

## Exhibit 5

**OPERATIONS TREND  
HURON COUNTY MEMORIAL  
AIRPORT**

<u>OPERATIONS</u>	<u>1985</u>	<u>1986<sup>1</sup></u>	<u>1987</u>
Itinerant	6,750	9,200	4,790
Local	<u>3,360</u>	<u>4,590</u>	<u>4,790</u>
<b>Totals</b>	<b>10,110</b>	<b>13,790</b>	<b>9,580</b>

(1) No survey was conducted at this airport for the indicated year. Estimated is based on factor derived from representative airports.

SOURCE: MDOT, BTP and Fixed-Base Operator.

Considerable air cargo is moved through the Huron County Memorial Airport by general aviation services. The FBO notes that shipments are predominantly outbound movements of finished components. The local plant of GM's Saginaw Steering Gear Division ships an estimated 63 tons per year in its own plane (based elsewhere), while local charter services carry another 19 tons of auto parts such as stampings, bumpers and steel parts to Chrysler and GM plants in Detroit and Toledo.

Airport Economic Roles

Huron County Memorial Airport is primarily a business-oriented airport, with the following comprising the airport's principal economic impact types.

Retention of Private Business - Huron County Memorial Airport is considered valuable to the competitive position of a number of local firms

and plants, some of which might choose to locate elsewhere if the facility were not present. These organizations use the air cargo and general aviation services made possible by the airport. "Just-in-Time" cargo delivery to the area's industries is seen as a valuable service made possible by the airport's existence. However, the facility was not found to be directly responsible for any significant economic development in the service area.

**Business-Oriented General Aviation** - An estimated 70 percent of general aviation use at the airport is "business-oriented," and some of the region's businesses have aircraft at the airport including those listed in Exhibit 6.

**Exhibit 6**

**A SAMPLE OF FIRMS WHICH BASE AIRCRAFT AT HURON COUNTY MEMORIAL AIRPORT**

- Active Feed
- Huron Aviation
- Nanlo Development
- Pigeon Telephone Company

**SOURCE:** Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

In addition to firms with general aviation aircraft based at the airport, there are others which depend on the airport, for various services, such as air taxi/charter service, air freight etc. These are important for sales, management and production activities at such firms as Advanced Drainage Systems; Gemini Plastics; Jackson National Life; Lyntex Manufacturing; Thumb Tool & Die; U.S. Manufacturing and Walbro Plastics.

**Airport Economic Impact**

The Huron County Memorial Airport aviation-related economic impact of \$1.1 million annually comprises the impact types listed in Exhibit 7.

**Exhibit 7**

**ANNUAL AVIATION-RELATED ECONOMIC IMPACT OF HURON COUNTY MEMORIAL AIRPORT**

<u>IMPACT TYPE</u>	<u>AMOUNT</u>
Direct	\$ 104,000
Indirect	644,000
Induced	341,000
<b>Total</b>	<b>\$1,089,000</b>

**SOURCE:** Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

The total impacts, by type, are summarized in Exhibit 8. This study assesses only the aviation-related impacts.

**Direct Economic Impact** - The "direct" impacts comprise the value of those activities involved in providing aviation services at the airport. Exhibit 9 lists the airport tenants and others included in the impact estimates. The makeup of the direct impacts is shown in Exhibit 10.

**Exhibit 10**

**ESTIMATED "DIRECT" ANNUAL IMPACTS HURON COUNTY MEMORIAL AIRPORT**

<u>DIRECT IMPACT</u>	<u>AMOUNT</u>
Direct Payroll	\$ 28,500
Capital Expenditures	20,000
Operating Expenses	22,300
Refueling Service	33,200
<b>Total</b>	<b>\$104,000</b>

**SOURCE:** Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

**Exhibit 8**  
**ESTIMATED ANNUAL ECONOMIC IMPACTS**  
**Huron County Memorial Airport**  
**1987**

<u>IMPACT TYPE AND SOURCE</u>	<u>AVIATION RELATED</u>	<u>NON-AVIATION RELATED (1)</u>	<u>TOTAL(1)</u>
	(-----thousands-----)		
<b>Direct Impacts:</b>			
Local Governments	7.8	0.0	7.8
Aviation Services	<u>96.2</u>	<u>0.0</u>	<u>96.2</u>
Subtotal	\$ 104.0	\$ 0.0	\$ 104.0
<b>Indirect Impacts:</b>			
Visitor Expenditures	\$ 258.4	\$ 0.0	\$ 258.4
Regional Expenditure	0.5	0.0	0.5
Corporate Operations & Other	<u>385.1</u>	<u>0.0</u>	<u>385.1</u>
Subtotal	\$ 644.0	\$ 0.0	\$ 644.0
<b>Induced Impacts:</b>	341.0		
<b>Total Annual Impacts</b>	<u>\$1,089.0</u>		

(1) Only aviation-related impacts are considered in this study.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

**Exhibit 9**  
**ORGANIZATIONS AND FIRMS CREATING ECONOMIC IMPACTS**  
**Huron County Memorial Airport**  
**1988**

<u>ORGANIZATION</u>	<u>ATTRIBUTION OF ACTIVITY</u>			<u>ECONOMIC ACTIVITY</u>
	<u>Aviation- Related</u>			
	<u>On- Site<sup>(1)</sup></u>	<u>Off- Site<sup>(2)</sup></u>	<u>Non- Aviation<sup>(3)</sup></u>	
<b>Local Government:</b>				
County Airport	X			Airport Operations
<b>Aviation Services:</b>				
Huron Aviation	X			Fixed-Base Operator
<b>Other:</b>				
Corporate Air Operations	X	X		Hangar Leases, Company Aircraft Activity

(1) Economic activity on airport property, by an airport tenant, treated as "direct" economic impact.

(2) Economic activity not taking place on airport property, but which is directly aviation-related to this airport. Treated as an "indirect" economic impact.

(3) Activity which is not related to or dependent on aviation activities. Not included in the impact estimates.

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

"Direct" payroll comprises payments to those people who work at the airport, are employed by the FBO or corporate users. "Capital expenditures" include improvements to on-site facilities of tenants as well as to the airport itself. "Operating expenses" are local expenditures by the tenants or airport operator.

**Indirect Economic Impacts** - Huron County Memorial Airport "indirect" impacts are caused by airport use in the form of expenditures by air travelers and by those firms that depend on the airport for their business.

It is estimated that some 6,600 visitors to the Bad Axe area arrive via Huron County Municipal Airport annually (6,390 by personal or corporate aircraft and 210 by air taxi in 1987). Based on approximate proportions of those staying overnight (more than one day) it is estimated that the average visitor spends approximately \$43.20 per trip at off-airport locations in the Bad Axe area. Local residents using the airport also spend money -- some \$500 per year.

The aviation-related indirect economic impacts attributable to Huron County Memorial Airport total \$644,000, as shown in Exhibit 11. The visitor expenditures breakdown by expenditure type is based on a mix of tourist, business and personal travel derived from the results of surveys made at other airports. Since no Michigan surveys were available, these were adjusted to reflect a range of values judged to be appropriate for local conditions. All visitor expenditures are at the actual cost outlay except retail sales which, since it is a margin industry, is shown at 20 percent of the actual expenditures. Expenditures by airport-dependent firms consist of those costs attributable to airport-related activity.

**Induced Economic Impact** - "Direct" economic impacts of about \$104,000, and "indirect" impacts of \$644,000, represent increases in final demand for goods and services in the Bad Axe region. To these must be added a "multiplier"

## Exhibit 11

**INDIRECT IMPACTS OF  
HURON COUNTY MEMORIAL  
AIRPORT**

<u>REGIONAL EXPENDITURES BY SOURCE</u>	<u>ANNUAL IMPACT</u>
Visitor Expenditures:	
Lodging	\$ 87,200
Food & Beverage	73,500
Retail Sales	6,700
Entertainment	22,500
Ground Transport	19,700
Business	16,000
Other	<u>32,800</u>
Subtotal	\$258,400
Resident Expenditures	500
Corporate Air Opns.	<u>385,100</u>
<b>Total</b>	<b>\$644,000</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

effect produced by circulation of money through the regional economy. To determine this "induced" impact, the U.S. Department of Commerce "Regional Input-Output Modeling System" (RIMS-II) was used. It was found that the induced impact produced by Huron County Memorial Airport in 1987 was approximately \$341,000.

**Industries Which Benefit**

The economic activities at Huron County Memorial Airport produce expenditures for a wide variety of goods and services. Many types of industry benefit, whether or not they are themselves airport users. Exhibit 12 lists impacted industry groups, and shows the extent to which each benefits from Huron County Memorial Airport in terms of total economic activity.

Exhibit 12  
ANNUAL ECONOMIC IMPACT OF  
HURON COUNTY MEMORIAL AIRPORT  
1987

<u>IMPACTED INDUSTRY GROUPS</u>	<u>TOTAL ANNUAL IMPACT (Output)</u> (.....Thousands.....)	<u>TOTAL ANNUAL PAYROLL (Earnings)(1)</u> (.....Thousands.....)	<u>EMPLOYMENT (Jobs)</u>
Ag. Prod., Forestry Svcs.	\$9	\$2	0
Crude Petrol.	3	0	0
New Construction	20	7	0
Maint. and Repair Const.	12	5	0
Food, Kindred Prd.	11	2	0
Printing, Publishing	6	1	0
Chemicals, Refined Petrol.	1	0	0
Rubber, Leather Prod.	3	0	0
Stone, Clay, Glass Prod.	1	0	0
Fabricated Metals	3	0	0
Non-electrical Machinery	1	0	0
Motor Vehicles, Equipment	1	0	0
Transportation	545	166	6
Communications	20	5	0
Utilities	22	2	0
Wholesale Trade	19	6	0
Retail Trade	46	22	2
Finance	10	2	0
Insurance	5	1	0
Real Estate	40	0	0
Lodging, Amusements	113	37	4
Personal Services	4	1	0
Business Services	54	22	1
Eating, Drinking Estab.	105	30	4
Health Services	20	9	0
Other Services	15	5	0
Households	--	1	0
<b>TOTALS</b>	<b>\$1,089</b>	<b>\$326</b>	<b>17</b>

(1) The portion of the "output" column that is payroll to employed persons.

SOURCE: Rims II Multipliers, MDOT, BTP study consultant, Wilbur Smith Associates.

**Airport Derived Employment**

An important element in the Huron County Memorial Airport economic impact total is the employment which the airport creates. People are employed in airport-related activities at the airport (the FBO, the County, etc.) and at other off-airport sites (hotels, manufacturing concerns, etc.). Furthermore, the direct and indirect expenditures attributable to the airport continue to flow through the region's economy creating additional employment (the "multiplier" effect). A summary of the jobs estimated to be attributable to Huron County Memorial Airport is given in Exhibit 13.

**Exhibit 13**

**JOBS ATTRIBUTABLE TO  
HURON COUNTY MEMORIAL  
AIRPORT**

<u>JOB SOURCE</u>	<u>Full Time</u>	<u>Part Time</u>	<u>Total FEQ</u>
Direct On-Site Jobs	1	1	1
Indirect Off-Site Jobs at Surveyed Firms	0	0	0
Induced and Other Indirect Jobs			<u>16</u>
	<b>Total Jobs</b>		<b>17</b>

NOTE: FEQ denotes "full-time equivalent" jobs, calculated as two part-time jobs equal one full-time job.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

The RIMS model treats jobs as full-time-equivalents (FEQ). Consequently, the split between full-time and part-time for induced employment is

not shown. The Exhibit shows that there is one FEQ job at the airport, and another 16 elsewhere in the region that are attributable to the airport.

**Non-Economic Values**

Not all values a community derives from an airport are quantifiable in dollar terms. Huron County Memorial Airport, provides Bad Axe residents with alternative linkages to Michigan and beyond. But for the local airport, heavy winter snows could isolate many remote places for extensive periods.

The airport provides access to the latest medical diagnosis and treatment procedures. For example, blood and tissue samples are sent to large medical centers, and specialist locations, for analysis. Medical supplies not available locally (such as serums, antitoxins, isotopes, and organs for transplant operations) are shipped by air; and patients are moved by air for treatment procedures not available in their community.

Huron County Memorial Airport also supports the maintenance of essential community services and security. On a number of occasions it provided refueling for Sheriff's Department helicopters on search and rescue missions. Local-based aircraft have also participated in such missions. The airport is a resource available to help locate and combat forest fires or chemical spills; to patrol pipelines and power lines. In case of natural disasters (fire or flood) they are vital resources for supply and evacuation.

In recent years, general aviation has become a major training ground for rewarding careers in the airline and aeronautical fields. The presence of an airport gives residents the option of flight instruction and ground service training. The airport flight school furnishes training useful in preparing for an aviation career and supplements local high school programs to help interest students in possible aviation careers.

# VALUE OF BALDWIN MUNICIPAL AIRPORT TO THE BALDWIN AREA

## Economic Values

Baldwin Municipal Airport is estimated to have an economic impact on its service area of approximately \$201,000 annually in total economic activity \$64,000 of which is household earnings. This impact is due principally to the provision and use of general aviation services at the airport.

## Airport Characteristics

Owned and operated by the City of Baldwin, the airport is open to the public and has a "U-4" classification.

Airport Services - Baldwin Municipal Airport is a general aviation airport. The field is unattended and, beyond aircraft tie-downs, no services are offered for private flying.

Airport Facilities - The airport is a visual flight rules facility, with a segmented circle, but no tower, rotating beacon, or lighted wind indicator. As shown in Exhibit 1, it has two runways, one 3,800 foot paved and one 1,850 foot long turf.

Airport Use - There is only one single-engine aircraft based at Baldwin Municipal Airport.

The Airport has no commercial or commuter airline service and only modest general aviation activity. As indicated in Exhibit 2, no recent operations counts have been made. The 1983 operations estimate has been adopted as representing 1987 activity, for study purposes.

Local sources suggest that the level of activity at Baldwin Municipal Airport has followed a generally flat trend since 1983, the most recent year for which operations have been estimated by MDOT. The assumed recent operations trend is indicated by the data in Exhibit 2.

## Exhibit 1

### FACILITIES AT BALDWIN MUNICIPAL AIRPORT

RUNWAYS	DESCRIPTION						
	Lgth.	Surf.	Sys.	Edge Lts.	REIL	VASI	Instr. Appr.
Primary	3,800	PV	N	NONE	N	N	NP
Crosswind	1,850	TF	N	ULMK	N	N	NP

NOTES: PV denotes paved surface; TF, Turf; Taxi system definitions are: FP = full parallel; PP = part parallel; and TN = turnaround area at runway ends. Runway lighting systems (Edge Lights) are designated HIRL = high intensity runway lights. MIRL medium intensity; LIRL, low intensity; or ULMK, unlit markers. Column heading REIL denotes Runway End Indicator Lights; VASI denotes Visual Approach Slope Indicator; column entries refer to presence of the equipment (Y denotes "yes"; N, "no"). Instrument approach facilities are: PR, Precision; NP, Non-Precision; or VIS, visual.

SOURCE: MDOT, BTP.

## Exhibit 2

### OPERATIONS TREND BALDWIN MUNICIPAL AIRPORT

OPERATIONS	1976	1978	1983	1987
Itinerant	1,600	2,500	2,390(1)	2,390(1)
Local	0	0	0	0
<b>Totals</b>	<b>1,600</b>	<b>2,500</b>	<b>2,390</b>	<b>2,390</b>

(1) No count conducted. Estimated based on factor derived from representative airports.

(2) Extrapolation by Wilbur Smith Associates

SOURCE: MDOT, BTP.



Airport Economic Roles

Baldwin Municipal Airport is a private flying-oriented airport, with limited business use. The Whirlpool Corporation operates a corporate conference center lodge nearby. The development of this facility in Baldwin is attributable to the convenient access afforded by the airport.

Business-Oriented General Aviation - The Whirlpool Corporation Lodge facility generates significant airport traffic activity in connection with conferences, meetings with customers, training activity and stockholder's meetings. Typically, visitors are flown in by a company aircraft from Benton Harbor, Chicago, or other locations and are accommodated at the lodge facility. Resulting economic impacts include employment of the local operating caretakers staff and local purchase of miscellaneous supplies and equipment. The state economy also benefits from purchases of special items, not available locally, brought in from elsewhere in Michigan.

Private Flying General Aviation - Since Baldwin Airport is an unattended facility, routine observations of operations are not available. However, available MDOT counts indicate that some activity takes place beyond periodic visits by Whirlpool Corporation Aircraft. This is assumed to be recreation-oriented activity.

Airport Economic Impact

The Baldwin Municipal Airport aviation-related economic impact of \$201,000 annually comprises the impact types listed in Exhibit 3.

Total economic impacts are listed by type in Exhibit 4. Since this study assesses only the aviation-related impacts, Exhibit 4 separates out any which are not attributable to aviation. At Baldwin Municipal Airport there are no non aviation-related activities.

## Exhibit 3

**ANNUAL AVIATION-RELATED  
ECONOMIC IMPACT OF  
BALDWIN MUNICIPAL AIRPORT**

<u>IMPACT TYPE</u>	<u>AMOUNT</u>
Direct	\$ 0
Indirect	141,400
Induced	59,600
<b>Total</b>	<b>\$201,000</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Direct Economic Impact - The "direct" impacts comprise the value of those activities involved in providing aviation services at the airport. The Whirlpool Corporation is the only "tenant" at Baldwin Municipal Airport, but their aircraft are based elsewhere. Since there are no on-site employees or facilities at Baldwin Municipal Airport, there are no direct economic impacts.

Indirect Economic Impacts - Baldwin Municipal Airport "indirect" impacts are caused by airport use in the form of expenditures by air travelers and by the Whirlpool Corporation.

It is estimated that 2,390 visitors to the Baldwin area arrive via Baldwin Municipal Airport annually. Of these, it is estimated that about 880 stay at the Whirlpool Corporation Conference Center lodge and the remaining 1,510 use other local accommodations. Based on approximate proportions of those staying overnight (more than one day) it is estimated that the average visitor spends approximately \$36.02 per trip at off-airport locations in the Baldwin area. In addition, residents who use the airport spend an estimated \$300 yearly on airport-related ground travel.

## Exhibit 4

**ESTIMATED ANNUAL ECONOMIC IMPACTS**  
**Baldwin Municipal Airport**  
**1987**

<u>IMPACT TYPE AND SOURCE</u>	<u>AVIATION RELATED</u>	<u>NON-AVIATION RELATED (1)</u>	<u>TOTAL(1)</u>
<b>Direct Impacts:</b>			
Aviation Services	0	0	0
Corporate Operations & Other	<u>0</u>	<u>0</u>	<u>0</u>
Subtotal	\$ 0	\$ 0	\$ 0
<b>Indirect Impacts:</b>			
Visitor Expenditures	\$ 49,300	\$ 0	\$ 49,300
Regional Expenditure	300	0	300
Dependent Firms	<u>91,800</u>	<u>0</u>	<u>91,800</u>
Subtotal	\$141,400	\$ 0	\$141,400
Induced Impacts:	59,600		
<b>Total Annual Impacts</b>	<b>\$201,000</b>		

(1) Only aviation-related impacts are considered in this study.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

The aviation-related indirect economic impacts attributable to Baldwin Municipal Airport total \$141,400, as shown in Exhibit 5. The visitor expenditures breakdown by expenditure type is based on a mix of tourist, business and personal travel derived from the results of surveys made at other airports. Since no Michigan surveys were available, these were adjusted to reflect a range of values judged to be appropriate for local conditions. All visitor expenditures are at the actual cost outlay except retail sales which, since it is a margin industry, is shown at 20 percent of the actual expenditures. Expenditures by airport-dependent firms consist of those costs attributable to airport-related activity.

**Induced Economic Impact** - Although there are no "direct" economic impacts, the "indirect" impacts of \$141,400 represent increases in final demand for goods and services in the Baldwin area. To these must be added a "multiplier" effect produced by circulation of the money through the regional economy. To determine this "induced" impact, the U.S. Department of Commerce "Regional

## Exhibit 5

**INDIRECT IMPACTS OF  
BALDWIN MUNICIPAL AIRPORT**

<u>REGIONAL EXPENDITURES BY SOURCE</u>	<u>ANNUAL IMPACT</u>
<b>Visitor Expenditures:</b>	
Lodging	\$ 16,600
Food & Beverage	14,000
Retail Sales	1,300
Entertainment	4,300
Ground Transport	3,800
Business	3,000
Other	<u>6,300</u>
Subtotal	\$ 49,300
Resident Expenditures	300
Dependent Firm Expenditures	<u>91,800</u>
<b>Total</b>	<b>\$ 141,400</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Input-Output Modeling System" (RIMS-II) was used. It was found that the induced impact produced by Baldwin Municipal Airport in 1987 was approximately \$59,600.

#### Industries Which Benefit

The economic activities at Baldwin Municipal Airport produce expenditures for a wide variety of goods and services. Many types of industry benefit, whether or not they are themselves airport users. Exhibit 6 lists impacted industry groups, and shows the extent to which each benefits from Baldwin Municipal Airport in terms of total economic activity earnings and employment.

#### Airport Derived Employment

An important element in an airports economic impact total is the employment which the airport creates. People are employed in airport-related activities at off-airport sites (e.g. restaurants and at the Whirlpool Corporate Conference lodge). Furthermore, the direct and indirect expenditures attributable to the airport continue to flow through the region's economy creating additional employment (the "multiplier" effect). A summary of the jobs estimated to be attributable to Baldwin Municipal Airport is given in Exhibit 7.

Exhibit 6  
TOTAL ANNUAL ECONOMIC IMPACT  
Baldwin Municipal Airport  
1987

<u>IMPACTED INDUSTRY GROUPS</u>	<u>TOTAL ANNUAL IMPACT (Output)</u> (.....Thousands.....)	<u>TOTAL ANNUAL PAYROLL (Earnings)(1)</u> (.....Thousands.....)	<u>EMPLOYMENT (Jobs)</u>
Ag. Prod., Forestry Svcs.	\$2	\$0	0
Maint. and Repair Const.	4	2	0
Food, Kindred Prd.	2	0	0
Printing, Publishing	1	0	0
Rubber, Leather Prod.	1	0	0
Transportation	13	5	0
Communications	4	1	0
Utilities	7	1	0
Wholesale Trade	3	1	0
Retail Trade	8	4	0
Finance	2	1	0
Insurance	1	0	0
Real Estate	8	0	0
Lodging, Amusements	113	37	4
Personal Services	1	1	0
Business Services	7	3	0
Eating, Drinking Estab.	18	5	1
Health Services	3	2	0
Other Services	3	1	0
Households	-	0	0
<b>TOTALS</b>	<b>\$201</b>	<b>\$64</b>	<b>5</b>

(1) The portion of the "output" column inputs that is payroll to employed persons.

SOURCE: Rims II Multipliers, Wilbur Smith Associates.

Exhibit 7

**JOBS ATTRIBUTABLE TO  
BALDWIN MUNICIPAL AIRPORT**

<u>JOB SOURCE</u>	<u>Full Time</u>	<u>Part Time</u>	<u>Total FEQ</u>
Direct On-Site Jobs	0	0	0
Indirect Off-Site Jobs at Surveyed Firms	1	6	4
Induced and Other Indirect Jobs			<u>1</u>
		<b>Total Jobs</b>	<b>5</b>

NOTE: FEQ denotes "full-time equivalent" jobs, calculated as two part-time jobs equal one full-time job.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

The RIMS model treats jobs as full-time-equivalents (FEQ). Consequently, the split between full-time and part-time for induced employment is

not shown. The Exhibit shows that although there are no FEQ jobs at the airport, there are five located elsewhere in the region that are attributable to the airport.

Non-Economic Values

Not all values a community derives from an airport are quantifiable in dollar terms. The absence of refueling facilities and on-site staff restrict the role which Baldwin Airport can play in support of many community activities. Nevertheless, it can serve as a potential resource to provide residents of the Baldwin area with linkages to Michigan and beyond.

The Baldwin Airport also provides access to the latest medical treatment and diagnosis procedures. For example, to send blood and tissue samples to large medical centers and specialist locations, for analysis; to obtain medical supplies not available locally (such as serums or antitoxins), or to move patients by air for treatment procedures not available locally.

# VALUE OF TWIN CITIES ROSS FIELD TO THE BENTON HARBOR/ST. JOSEPH AREA

## Economic Values

Twin Cities Ross Field is estimated to have an economic impact on its service area of approximately \$9.7 million annually in total economic activity \$3.1 million of which is household earnings. This impact is due principally to the provision and use of scheduled air carrier services and general aviation services.

## Airport Characteristics

Owned and operated by the Twin Cities Airport Board (Benton Harbor and St. Joseph) the airport is open to the public and has a "T-5" classification.

Airport Services - Twin Cities Ross Field is a scheduled air carrier and general aviation airport, offering services customarily found at such airports. These include the services listed in Exhibit 1.

### Exhibit 1

#### SERVICES OFFERED AT TWIN CITIES ROSS FIELD

Scheduled Air Carrier	Jet Fuel Sales
Air Taxi	Avgas Fuel Sales
General Aviation	Aircraft Repair
Hangar Rental	Flight Instruction
Tie Down	Car Rental
Aircraft Rental	Vending
Aircraft Sales	CFR Unit

SOURCE: Surveys by MDOT, Bureau of Transportation Planning (BTP) study consultants, Wilbur Smith Associates.

All of these services have positive economic significance to the Benton Harbor/St. Joseph area. This is due to the creation of employment, generation of taxes and potential attraction and retention of businesses for the area.

Airport Facilities - The airport is an all-weather facility capable of handling up to turbojet aircraft. It has three runways, a tower, which is currently closed, an amply sized passenger terminal, and one Fixed-Base Operator (FBO) who provides aviation support services.

### Exhibit 2

#### FACILITIES AT TWIN CITIES ROSS FIELD

	RUNWAYS		DESCRIPTION				
	Lgth.	Surf.	Taxi Sys.	Edge Lts.	REIL	VASI	Instr. Appr.
Primary	5,100	PV	FP	HIRL	Y	Y	PR
Crosswind	3,661	PV	N	MIRL	N	N	VIS
Crosswind	2,507	PV	N	MIRL	N	N	VIS

NOTES: PV denotes paved surface; Taxi system definitions are: FP = full parallel; PP = part parallel; and TN = turnaround area at runway ends. Runway lighting systems (Edge Lights) are designated HIRL = high intensity runway lights. MIRL medium intensity; or LIRL, low intensity. Column heading REIL denotes Runway End Indicator Lights; VASI denotes Visual Approach Slope Indicator; column entries refer to presence of the equipment (Y denotes "yes"; N, "no"). Instrument approach facilities are: PR, Precision; NP, Non-Precision; or VIS, visual.

SOURCE: MDOT, BTP.

**Airport Use** - Twin Cities Ross Field is currently served by one scheduled air carrier (Midway Connection) and has substantial general aviation activity. A total of 55 general aviation aircraft are based at the airport, as itemized in Exhibit 3.

**Exhibit 3  
NUMBERS OF BASED AIRCRAFT  
TWIN CITIES ROSS FIELD**

<u>AIRCRAFT TYPE</u>	<u>1988</u>
Single Engine	42
Multi-Engine	11
Jet	<u>2</u>
<b>Total Aircraft</b>	<b>55</b>

**SOURCE:** Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Estimated aircraft operations for 1987 are given in Exhibit 4. Military operations are normally training for military aircraft based elsewhere.

**Exhibit 4  
AIRCRAFT OPERATIONS  
TWIN CITIES ROSS FIELD**

<u>TYPE OPERATION</u>	<u>1987</u>
<b>Itinerant:</b>	
Air Carrier	1,836
Air Taxi	700
General Aviation	13,484
Military	<u>30</u>
Subtotal Itinerant	16,050
<b>Local:</b>	
General Aviation	16,050
Military	<u>0</u>
<b>Total</b>	<b>32,100</b>

**SOURCE:**MDOT, BTP. Breakdown of Itinerant General Aviation and Air Taxi Operations by MDOT, BTP study consultant, Wilbur Smith Associates.

Although aircraft activity at the airport has declined in recent years from over 40,000 annual operations experienced in the mid- 1970's, latest count surveys indicate that substantial itinerant and local air traffic continues to use Ross Field.

**Exhibit 5  
OPERATIONS TREND  
TWIN CITIES ROSS FIELD**

<u>OPERATIONS</u>	<u>1983<sup>1</sup></u>	<u>1986<sup>1</sup></u>	<u>1987</u>
Itinerant	10,220	23,800	16,050
Local	<u>19,330</u>	<u>15,930</u>	<u>16,050</u>
<b>Totals</b>	<b>29,550</b>	<b>39,730</b>	<b>32,100</b>

(1) No count survey was conducted for the indicated year. Estimate based on factor from representative airports.

**SOURCE:** MDOT, BTP.

Air passenger use has fluctuated with the level of services provided by the air carrier. In 1987, the air carrier serviced about 21 enplaning and deplaning passengers daily. Scheduled flights number six per day.

**Exhibit 6  
AIR CARRIER PASSENGERS  
TWIN CITIES ROSS FIELD**

<u>PASSENGERS</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>
Deplaned	11,255	7,410	3,926
Enplaned	<u>11,536</u>	<u>8,128</u>	<u>3,882</u>
<b>Totals</b>	<b>22,791</b>	<b>15,538</b>	<b>7,808</b>

**SOURCE:** MDOT, BTP.

Air cargo tonnage has also declined in recent years, but continues to be an important activity at Ross Field, as shown in Exhibit 7.

**Exhibit 7  
AIR CARGO HANDLED AT  
TWIN CITIES ROSS FIELD**

<u>CARGO MOVEMENT</u>	<u>CARGO TONS</u>	<u>1986</u>	<u>1987</u>
Deplaned		13.3	3.7
Enplaned		<u>2.8</u>	<u>1.5</u>
<b>Totals</b>		<b>16.1</b>	<b>5.2</b>

**SOURCE:** MDOT, BTP.

**Airport Economic Roles**

Ross Field is a business-oriented airport, with the following comprising the airport's principal economic roles.

**Retention of Private Business** - Ross Field is considered valuable to the competitive position of a number of local firms and plants, some of which might choose to locate elsewhere if the facility were not present. These organizations use the commuter air and general aviation services made possible by the airport. "Just-in-Time" cargo delivery to the area's industries is seen as a valuable service made possible by the airport's existence. However, the facility was not found to be directly responsible for any significant economic development in the service area.

**Business-Oriented General Aviation** - An important portion of general aviation use at the airport is "business-oriented," and many of the region's businesses have aircraft at the airport including those listed in Exhibit 8.

**Exhibit 8**

**A SAMPLE OF FIRMS  
WHICH BASE AIRCRAFT  
AT TWIN CITIES ROSS FIELD**

All-Phase Electric Supply, Inc.	Multech, Inc. Superior Builders
Avsat Inc.	Taildragger Flyers, Inc.
Benton Harbor Flying Service	Weldun International
Heyn Enterprises, Inc.	Whirlpool Corp.

**SOURCE:** Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

In addition to firms with general aviation aircraft based at the airport, there are many others that depend on the airport, for various services, such as scheduled passenger service, air taxi/charter service, air freight etc. These services provide

support important for sales, management and production activities. Firms in this category of airport use include: Alreco Metals, Inc; Auto Specialties Mfg. Co.; Airborne Express; Emery Air; Federal Express; Gast Mfg. Corp; Heath Mfg. Co.; Indiana-Michigan Power Co. (Cooke Nuclear Facility); Leco Corp.; Med-A-Vac; Medic I; Michigan Fruit Cannery; Michigan State Police; Air National Guard; Army Guard and PDO Corp. (transportation of financial documents serving 12 local financial institutions).

**Airport Economic Impact**

The Ross Field aviation-related economic impact of \$9.7 million annually comprises the impact types listed in Exhibit 9.

**Exhibit 9  
ANNUAL AVIATION-RELATED  
ECONOMIC IMPACT OF  
TWIN CITIES ROSS FIELD**

<u>IMPACT TYPE</u>	<u>AMOUNT</u>
Direct	\$ 1,272,000
Indirect	4,636,000
Induced	<u>3,826,000</u>
<b>Total</b>	<b>\$ 9,734,000</b>

**SOURCE:** Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

The total impacts, by type, are summarized in Exhibit 10. The direct impacts include 45,000 in federal capital aid funds which impact the local economy. Since this study assesses only the aviation-related impacts, Exhibit 10 identifies those which are not attributable to aviation. At Ross Field there are no non-aviation-related activities.

**Direct Economic Impact** - The "direct" impacts comprise the value of those activities involved in providing aviation services at the airport. Exhibit 11 lists the airport tenants and others included in the impact estimates. Direct impacts are listed in Exhibit 12.

## Exhibit 10

**ESTIMATED ANNUAL ECONOMIC IMPACTS**  
**Twin Cities Ross Field**  
**1987**

<u>IMPACT TYPE AND SOURCE</u>	<u>AVIATION RELATED</u>	<u>NON-AVIATION RELATED (1)</u>	<u>TOTAL(1)</u>
	(-----thousands-----)		
<b>Direct Impacts:</b>			
Air Carrier Operations	\$ 279	\$ 0	\$ 279
Local Governments	299	0	299
Air Passenger Services	197	0	197
Aviation Services	<u>497</u>	<u>0</u>	<u>497</u>
Subtotal	\$ 1,272	\$ 0	\$ 1,272
<b>Indirect Impacts:</b>			
Visitor Expenditures	\$ 1,340	\$ 0	\$ 1,340
Regional Expenditure	6	0	6
Corporate Operations & Other	3,290	0	3,290
Dependent Firms	<u>0</u>	<u>0</u>	<u>0</u>
Subtotal	\$ 4,636	\$ 0	\$ 4,636
<b>Induced Impacts:</b>	3,826		
<b>Total Annual Impacts</b>	<u>\$9,734</u>		

(1) Only aviation-related impacts are considered in this study.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.



**Exhibit 11**  
**ORGANIZATIONS AND FIRMS CREATING ECONOMIC IMPACTS**  
**Twin Cities Ross Field**  
**1988**

<u>ORGANIZATION</u>	<u>ATtribution OF ACTIVITY</u>			<u>ECONOMIC ACTIVITY</u>
	<u>Aviation-Related</u>			
	<u>On-Site</u> <sup>(1)</sup>	<u>Off-Site</u> <sup>(2)</sup>	<u>Non-Aviation</u> <sup>(3)</sup>	
Air Carrier Operations: Midway Connection	X			Airline
Local Government: Ross Field Twin Cities Airport Board	X			Airport Operations
Air Passenger Services: Hertz	X			Car Rental
Avis	X			Car Rental
Aviation Services: Avsat	X			Fixed-Base Operator
Benton Harbory Flying Service	X			Flight Instruction
Taildragger Flyers	X			Flying Club
Fruit Belt Flyers	X			Flying Club
Other: Corporate Air Operations	X	X		Hangar Leases, Company Aircraft Activity
Travel Agencies	X	X	X	Travel Arrangements

- (1) Economic activity on airport property, by an airport tenant, treated as "direct" economic impact.
- (2) Economic activity not taking place on airport property, but which is directly aviation-related to this airport. Treated as an "indirect" economic impact.
- (3) Activity which is not related to or dependent on aviation activities. Not included in the impact estimates.

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

**Exhibit 12**  
**ESTIMATED "DIRECT" ANNUAL IMPACTS**  
**TWIN CITIES ROSS FIELD**

<u>DIRECT</u> <u>IMPACT</u>	<u>AMOUNT</u>
Direct Payroll	\$ 774,000
Capital Expenditures	110,000
Operating Expenses	378,000
Refueling Service	<u>10,000</u>
<b>Total</b>	<b>\$1,272,000</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

"Direct" payroll comprises payments to those people who work at the airport, are employed by the airlines, FBO, corporate users, or other tenants. "Capital expenditures" include improvements to on-site facilities of tenants as well as to the airport itself. "Operating expenses" are local expenditures by the tenants or airport operator.

Indirect Economic Impacts - Ross Field "indirect" impacts are caused by airport use in the form of expenditures by air travelers and by those firms that depend on the airport for their business.

It is estimated that over 17,600 visitors to the Twin Cities area arrive via Ross Field annually (1,952 by scheduled air carrier, 14,450 by individually owned or corporate plane, and 1,200 by air taxi in 1987). Based on approximate proportions of those staying overnight (more than one day) it is estimated that the average visitor spends approximately \$83.99 per trip at off-airport locations in the Twin Cities area. Local residents using the airport also spend money -- some \$5,600 per year locally (in addition to moneys spent at the airport).

The aviation-related indirect economic impacts attributable to Ross Field total \$4.6 million, as shown in Exhibit 13. The visitor expenditures breakdown by expenditure type is based on a mix of tourist, business and personal travel derived from the results of surveys made at other airports.

Since no Michigan surveys were available, these were adjusted to reflect a range of values judged to be appropriate for local conditions. All visitor expenditures are at the actual cost outlay except retail sales which, since it is a margin industry, is shown at 20% of the actual expenditures. Expenditures by airport-dependent firms consist of those costs attributable to airport-related activity.

**Exhibit 13**  
**INDIRECT IMPACTS OF**  
**TWIN CITIES ROSS FIELD**

<u>REGIONAL</u> <u>EXPENDITURES</u> <u>BY SOURCE</u>	<u>ANNUAL</u> <u>IMPACT</u>
Visitor Expenditures:	
Lodging	\$ 452,000
Food & Beverage	381,000
Retail Sales	35,000
Entertainment	117,000
Ground Transport	102,000
Business	83,000
Other	<u>170,000</u>
Subtotal	\$1,340,000
Resident Expenditures	6,000
Corp. Air Opns.	3,277,000
Dependent Firm Expenditures	<u>13,000</u>
<b>Total</b>	<b>\$4,636,000</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Induced Economic Impact - "Direct" economic" impacts of about \$1.3 million, and "indirect" impacts of \$4.6 million, represent increases in final demand for goods and services in the Twin Cities region. To these must be added a "multiplier" effect produced by circulation of the money through the regional economy. To determine this "induced" impact, the U.S. Department of Commerce "Regional Input-Output Modeling System" (RIMS-II) was used. It was found that the induced impact produced by Ross Field in 1987 was approximately \$3,826,000.

Industries Which Benefit

The economic activities at Ross Field produce expenditures for a wide variety of goods and services. Many types of industry benefit, whether or not they are themselves airport users. Exhibit 14 lists impacted industry groups, and shows the extent to which each benefits from Twin Cities Ross Field in terms of total economic activity, earnings and employment.

Airport Derived Employment

An important element in the Ross Field economic impact total is the employment which the airport creates. People are employed in airport-related activities at the airport (the FBO, the airlines, the Airport Board, etc.) and at other off-airport sites (hotels, manufacturing concerns, etc.). Furthermore, the direct and indirect expenditures attributable to the airport continue to flow through the region's economy creating additional employment (the "multiplier" effect). A summary of the jobs estimated to be attributable to Ross Field is given in Exhibit 15.

The RIMS model treats jobs as full-time-equivalents (FEQ). Consequently, the split between full-time and part-time for induced employment is not shown. The Exhibit shows that there are 75 FEQ jobs at the airport, and 80 located elsewhere in the Southern Michigan region that are attributable to the airport.

Non-Economic Values

Not all values a community derives from an airport are quantifiable in dollar terms. Ross Field is a valuable community resource in a number of important non-economic ways. It increases the effectiveness of medical treatment available to area residents by serving as a base for medical aircraft services. These services contribute to the prompt diagnosis and treatment of disease. Blood and tissue samples are sent by air to medical facilities for analysis. Isotopes, serum and antitoxins that cannot be stored locally are shipped by air as needed. Organs for transplant operations, are air-shipped, and patient's themselves are often carried by air for special treatment not available locally.

## Exhibit 15

JOBS ATTRIBUTABLE TO  
TWIN CITIES ROSS FIELD

<u>JOB SOURCE</u>	<u>Full Time</u>	<u>Part Time</u>	<u>Total FEQ</u>
Direct On-Site Jobs	72	7	75
Indirect Off-Site Jobs at Surveyed Firms	1	0	1
Induced and Other Indirect Jobs			80
		<b>Total Jobs</b>	<b>156</b>

NOTE: FEQ denotes "full-time equivalent" jobs, calculated as two part-time jobs equal one full-time job.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

All nuclear reactors require the presence of a nearby transport type airport. Ross Field fulfills this requirement for the Cooke Nuclear Facility of the Indiana-Michigan Power Co. In the event of an accident, personnel and equipment would be in place in a short period of time.

The Airport also supports Coast Guard search and rescue missions in southeast Lake Michigan, by serving as a contingent refueling base, and aids in civil defense, military and police activities and training.

In recent years, general aviation has become a major training ground for rewarding careers in the airline and aeronautical fields. The presence of an airport gives residents the option of flight instruction and ground service training. Ross Field cooperates with local school systems to provide tours for school classes at various levels, which serve to familiarize students with activities in the industry.

Exhibit 14  
**TOTAL ANNUAL ECONOMIC IMPACT**  
 Twin Cities Ross Field  
 Benton Harbor/St. Joseph  
 1987

<b>IMPACTED INDUSTRY GROUPS</b>	<b>TOTAL ANNUAL IMPACT (Output) (.....Thousands.....)</b>	<b>TOTAL ANNUAL PAYROLL (Earnings)(1) (.....)</b>	<b>EMPLOYMENT (Jobs)</b>
Ag. Prod., Forestry Svcs.	\$11	\$3	1
Other Mining	1	0	0
New Construction	111	40	1
Maint. and Repair Const.	130	58	2
Food, Kindred Prd.	204	29	1
Apparel	5	1	0
Paper, Allied Products	12	4	0
Printing, Publishing	75	25	1
Chemicals, Refined Petrol.	137	9	0
Rubber, Leather Prod.	36	7	0
Lumber, Furniture Prod.	5	1	0
Stone, Clay, Glass Prod.	21	5	0
Primary Metals	40	9	0
Fabricated Metals	59	15	0
Non-electrical Machinery	22	7	0
Electrical Machinery	17	3	0
Motor Vehicles, Equipment	121	19	0
Other Transportation Equip.	27	9	0
Instruments	2	1	0
Miscellaneous Mfg.	13	4	0
Transportation	4,809	1,568	57
Communications	141	36	1
Utilities	260	25	1
Wholesale Trade	257	100	3
Retail Trade	341	169	13
Finance	91	27	1
Insurance	121	39	1
Real Estate	421	10	3
Lodging, Amusements	607	213	21
Personal Services	77	32	3
Business Services	590	262	12
Eating, Drinking Estab.	607	187	24
Health Services	173	100	4
Other Services	190	61	3
Households	-	11	3
<b>TOTALS</b>	<b>\$9,734</b>	<b>\$3,089</b>	<b>156</b>

(1) The portion of the "output" column that is payroll to employed persons.

SOURCE: Rims II Multipliers, MDOT, BTP study consultant, Wilbur Smith Associates.

# VALUE OF CHARLEVOIX MUNICIPAL AIRPORT TO THE CHARLEVOIX AREA

## Economic Values

Charlevoix Municipal Airport is estimated to have an economic impact on its service area of approximately \$1.7 million annually. This impact is due principally to the provision and use of general aviation services at the airport.

## Airport Characteristics

Owned by the City of Charlevoix, and operated under contract by the Fixed-Base Operator, the airport is open to the public and has a "T-4" classification.

Airport Services - Charlevoix Municipal Airport is a general aviation airport, offering the services listed in Exhibit 1.

### Exhibit 1

#### SERVICES OFFERED AT CHARLEVOIX MUNICIPAL AIRPORT

Air Taxi	Avgas Fuel Sales
General Aviation	Aircraft Repair
Hangar Rental	Avionics
Tie Down	Flight Instruction
Jet Fuel Sales	Car Rental
	Vending

SOURCE: Surveys by MDOT, Bureau of Transportation Planning (BTP) study consultants, Wilbur Smith Associates.

All of these services have positive economic significance to the Charlevoix area. This is due to the creation of employment, generation of taxes and potential attraction and retention of businesses for the area.

Airport Facilities - The airport is capable of handling virtually all general aviation aircraft types. It has three runways, a rotating beacon, segmented circle and lighted wind direction indicator. It has a passenger terminal, hangar space, and one Fixed-Base Operator (FBO) who provides aviation support services. Additional facilities are listed in Exhibit 2.

### Exhibit 2

#### FACILITIES AT CHARLEVOIX MUNICIPAL AIRPORT

	RUNWAYS		DESCRIPTION				Instr.
	Lgth.	Surf.	Taxi Sys.	Edge Lts.	REIL	VASI	
Primary	4,500	PV	N	MIRL	N	N	NP
Crosswind	1,550	TF	N	ULMK	N	N	VIS
Crosswind	1,310	TF	N	ULMK	N	N	VIS

NOTES: PV denotes paved surface; Taxi system definitions are: FP = full parallel; PP = part parallel; and TN = turnaround area at runway ends. Runway lighting systems (Edge Lights) are designated HIRL = high intensity runway lights. MIRL medium intensity; LIRL, low intensity; or ULMK, unlighted markers. Column heading REIL denotes Runway End Indicator Lights; VASI denotes Visual Approach Slope Indicator; column entries refer to presence of the equipment (Y denotes "yes"; N, "no"). Instrument approach facilities are: PR, Precision; NP, Non-Precision; or VIS, visual.

SOURCE: MDOT, BTP.

**Airport Use** - Charlevoix Municipal Airport has substantial general aviation activity. A total of 18 general aviation aircraft are based at the airport, as itemized in Exhibit 3.

## Exhibit 3

**NUMBERS OF BASED AIRCRAFT  
CHARLEVOIX MUNICIPAL AIRPORT**

<u>AIRCRAFT TYPE</u>	<u>1988</u>
Single Engine	12
Multi-Engine	6
<b>Total Aircraft</b>	<b>18</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Estimated aircraft operations for 1987 are given in Exhibit 4. Itinerant operations include roughly 100 refueling stops by USCG patrols, based elsewhere.

## Exhibit 4

**AIRCRAFT OPERATIONS  
CHARLEVOIX MUNICIPAL AIRPORT**

<u>TYPE OPERATION</u>	<u>1987</u>
Itinerant:	
Air Taxi	2,000
General Aviation	15,870
Subtotal Itinerant	17,870
Local:	
General Aviation	11,910
<b>Total</b>	<b>29,780</b>

SOURCE: MDOT, BTP.

Aircraft operations at the airport have generally increased in recent years. Itinerant operations have been a major component of aircraft traffic for many years, reflecting the use of the airport as a transportation facility and as a link to Beaver Island. Local operations have increased recently as local flying clubs have popularized recreational flying and flight instruction.

## Exhibit 5

**OPERATIONS TREND  
CHARLEVOIX MUNICIPAL AIRPORT**

<u>OPERATIONS</u>	<u>1983<sup>1</sup></u>	<u>1986<sup>1</sup></u>	<u>1987</u>
Itinerant	9,470	12,690	17,870
Local	5,040	5,160	11,910
<b>Totals</b>	<b>14,510</b>	<b>17,850</b>	<b>29,780</b>

(1) No survey was conducted at this airport for the indicated years. Estimate is based on factor derived from representative airports.

SOURCE: MDOT, BTP.

Airport Economic Roles

Activity at Charlevoix Municipal Airport during the summer, is estimated to consist of about one quarter business use, about one half tourism/vacation use and about one quarter local recreational flying. After the vacation season, business activity remains active and recreational skiing also generates considerable traffic.

Retention of Private Business - Charlevoix Municipal Airport is considered valuable to the competitive position of a number of local firms and plants, some of which might choose to locate elsewhere if the facility were not present. These organizations use the air taxi and general aviation services made possible by the airport's existence. However, the facility was not found to be directly responsible for any significant economic development in the service area.

Exhibit 6

A SAMPLE OF  
CORPORATE AIRCRAFT USERS  
AT CHARLEVOIX MUNICIPAL AIRPORT

Michigan Scientific  
Flood Enterprises  
Oz Enterprises

Business-Oriented General Aviation - A significant portion of general aviation use at the airport is "business-oriented". Although only a few local firms base aircraft at the airport, there are others that depend on the airport for various services, such as air taxi/charter service, air freight etc. These are important for sales, management and production activities at such firms as Medusa Cement Company, Lexalite Corp., and Consumers Power.

Airport Economic Impact

The Charlevoix Municipal Airport aviation-related economic impact of approximately \$1.7

million annually comprises the impact types listed in Exhibit 7.

Exhibit 7

ANNUAL AVIATION-RELATED  
ECONOMIC IMPACT OF  
CHARLEVOIX MUNICIPAL AIRPORT

<u>IMPACT TYPE</u>	<u>AMOUNT</u>
Direct	\$ 197,000
Indirect	924,000
Induced	<u>563,000</u>
Total	\$1,684,000

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

The total impacts, by type, are summarized in Exhibit 8. This study assesses only the aviation-related impacts.

Exhibit 8

ESTIMATED ANNUAL ECONOMIC IMPACTS  
Charlevoix Municipal Airport  
1987

<u>IMPACT TYPE AND SOURCE</u>	<u>AVIATION RELATED</u>	<u>NON-AVIATION RELATED (1)</u>	<u>TOTAL(1)</u>
	(-----thousands-----)		
<b>Direct Impacts:</b>			
Aviation Services	<u>197</u>	<u>0</u>	<u>197</u>
Subtotal	\$ 197	\$ 0	\$ 197
<b>Indirect Impacts:</b>			
Visitor Expenditures	\$ 922	\$ 0	\$ 922
Regional Expenditure	<u>2</u>	<u>0</u>	<u>2</u>
Subtotal	\$ 924	\$ 0	\$ 924
<b>Induced Impacts:</b>	563		
<b>Total Annual Impacts</b>	<u>\$ 1,684</u>		

(1) Only aviation-related impacts are considered in this study.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

**Direct Economic Impact** - The "direct" impacts comprise the value of those activities involved in providing aviation services at the airport. Exhibit 9 lists the airport tenants and others included in the impact estimates. The makeup of the estimated direct impacts is given in Exhibit 10.

"Direct" payroll comprises payments to those people who work at the airport, are employed by the FBO, or other tenants. "Capital expenditures" include improvements to on-site facilities of tenants as well as to the airport itself. "Operating expenses" are local expenditures by the tenants or airport operator.

**Exhibit 10**

**ESTIMATED "DIRECT" ANNUAL IMPACTS  
CHARLEVOIX MUNICIPAL AIRPORT**

<u>DIRECT IMPACT</u>	<u>AMOUNT</u>
Direct Payroll	\$ 160,000
Operating Expenses	22,000
Refueling Service	15,000
<b>Total</b>	<b>\$ 197,000</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

**Indirect Economic Impacts** - Charlevoix Municipal Airport "indirect" impacts are caused by airport use in the form of expenditures by air travelers and by those firms that depend on the airport for their business.

It is estimated that over 17,300 visitors to the Charlevoix area arrive via Charlevoix Municipal Airport annually (roughly 15,700 by personal or corporate aircraft and 1,600 by air taxi in 1987). Based on approximate proportions of those staying overnight (more than one day) it is estimated that the average visitor spends approximately \$58.72 per trip at off-airport locations in the Charlevoix area. Local residents using the airport also spend money -- some \$2,000 per year locally.

**Exhibit 9  
ORGANIZATIONS AND FIRMS CREATING ECONOMIC IMPACTS  
Charlevoix Municipal Airport  
1988**

<u>ORGANIZATION</u>	<u>ATTRIBUTION OF ACTIVITY</u>			<u>ECONOMIC ACTIVITY</u>
	<u>On-Site</u> <sup>(1)</sup>	<u>Off-Site</u> <sup>(2)</sup>	<u>Non-Aviation</u> <sup>(3)</sup>	
Aviation Services:				
Island Airways	X			Fixed-Base Operator
Charlevoix Soaring Club	X			Flying Club
Charlevoix Flying Club, Inc.	X			Flying Club
Other:				
Corporate Air Operations		X	X	Hangar Leases, Company Aircraft Activity

- (1) Economic activity on airport property, by an airport tenant, treated as "direct" economic impact.
- (2) Economic activity not taking place on airport property, but which is directly aviation-related to this airport. Treated as an "indirect" economic impact.
- (3) Activity which is not related to or dependent on aviation activities. Not included in the impact estimates.

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.



The aviation-related indirect economic impacts attributable to Charlevoix Municipal Airport total \$924,000, as shown in Exhibit 11. The visitor expenditures breakdown by expenditure type is based on a mix of tourist, business and personal travel derived from the results of surveys made at other airports. Since no Michigan surveys were available, these were adjusted to reflect a range of values judged to be appropriate for local conditions. All visitor expenditures are at the actual cost outlay except retail sales which, since it is a margin industry, is shown at 20 percent of the actual expenditures. Expenditures by airport-dependent firms consist of those costs attributable to airport-related activity.

Induced Economic Impact - "Direct" economic impacts of about \$197,000, and "indirect" impacts of \$924,000, represent increases in final demand for goods and services in the Charlevoix region. To these must be added a "multiplier" effect produced by circulation of the money through the regional economy. To determine this "induced" impact, the U.S. Department of Commerce "Regional Input-Output Modeling System" (RIMS-II) was used. It was found that the induced impact produced by Charlevoix Municipal Airport in 1987 was approximately \$563,000.

Exhibit 11

**INDIRECT IMPACTS OF  
CHARLEVOIX MUNICIPAL AIRPORT**

<u>REGIONAL EXPENDITURES BY SOURCE</u>	<u>ANNUAL IMPACT</u>
Visitor Expenditures:	
Lodging	\$311,000
Food & Beverage	263,000
Retail Sales	24,000
Entertainment	80,000
Ground Transport	70,000
Business	57,000
Other	<u>117,000</u>
Subtotal	\$922,000
Resident Expenditures	<u>2,000</u>
Total	\$924,000

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Industries Which Benefit

The economic activities at Charlevoix Municipal Airport produce expenditures for a wide variety of goods and services. Many types of industry benefit, whether or not they are themselves airport users. Exhibit 12 lists impacted industry groups, and shows the extent to which each benefits from Charlevoix Municipal Airport in terms of total economic activity earnings and employment.

Airport Derived Employment

An important element in the Charlevoix Municipal Airport economic impact total is the employment which the airport creates. People are employed in airport-related activities at the airport (the FBO), and at other off-airport sites (hotels, manufacturing concerns, etc.). Furthermore, the direct and indirect expenditures attributable to the airport continue to flow through the region's economy creating additional employment (the "multiplier" effect). A summary of the jobs estimated to be attributable to Charlevoix Municipal Airport is given in Exhibit 13.

Exhibit 13

**JOBS ATTRIBUTABLE TO  
CHARLEVOIX MUNICIPAL AIRPORT**

<u>JOB SOURCE</u>	<u>Full Time</u>	<u>Part Time</u>	<u>Total FEQ</u>
On-Site Jobs	6	1	6
Off-Site Jobs at Surveyed Firms	4	0	4
Induced Jobs			<u>27</u>
		<b>Total Jobs</b>	<b>37</b>

NOTE: FEQ denotes "full-time equivalent" jobs, calculated as two part-time jobs equal one full-time job.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

The RIMS model treats jobs as full-time-equivalents (FEQ). Consequently, the split between full-time and part-time for induced employment is not shown. The Exhibit shows that there are six FEQ jobs at the airport, and another 31 located elsewhere in the greater northern Michigan region that are attributable to the airport.

Exhibit 12  
**ECONOMIC IMPACT OF CHARLEVOIX MUNICIPAL AIRPORT  
 BY IMPACTED INDUSTRY TYPE  
 1987**

<u>IMPACTED INDUSTRY GROUPS</u>	<u>TOTAL ANNUAL IMPACT (Output) (.....Thousands.....)</u>	<u>TOTAL ANNUAL PAYROLL (Earnings)(a) (.....Thousands.....)</u>	<u>EMPLOYMENT (Jobs)</u>
Ag. Prod., Forestry Svcs.	\$27	\$4	1
Forestry Products	1	0	0
Crude Petrol.	3	0	0
Maint. and Repair Const.	26	10	0
Food, Kindred Prd.	28	4	0
Printing, Publishing	10	3	0
Chemicals, Refined Petrol.	2	0	0
Rubber, Leather Prod.	7	2	0
Lumber, Furniture Prod.	1	0	0
Stone, Clay, Glass Prod.	1	0	0
Fabricated Metals	4	0	0
Non-electrical Machinery	1	0	0
Motor Vehicles, Equipment	2	0	0
Transportation	409	137	5
Communications	36	8	0
Utilities	48	4	0
Wholesale Trade	31	12	0
Retail Trade	87	39	3
Finance	16	4	0
Insurance	11	3	0
Real Estate	64	0	0
Lodging, Amusements	398	133	13
Personal Services	8	3	0
Business Services	105	43	2
Eating, Drinking Estab.	301	89	11
Health Services	31	16	1
Other Services	26	10	1
Households	--	1	0
<b>TOTALS</b>	<b>\$1,684</b>	<b>\$525</b>	<b>37</b>

(1) The portion of the "output" column that is payroll to employed persons.

SOURCE: Rims II Multipliers, MDOT, BTP study consultant, Wilbur Smith Associates.

### Non-Economic Values

Not all values a community derives from an airport are quantifiable in dollar terms. Charlevoix Municipal Airport provides local residents with alternative linkages to Michigan and beyond. Without this facility, heavy winter snows could isolate many locations for extensive periods. Charlevoix Municipal Airport plays an important non-economic role in the Upper Lake Michigan area by providing a base for the air link to Beaver Island and its satellites. This is necessary when ice prevents marine access, but is not solid enough to permit surface transit. The facility brings island residents within reach of prompt emergency services, should they be necessary.

Charlevoix Municipal provides access to the latest medical diagnosis and treatment procedures. For example, blood and tissue samples are sent to downstate medical centers and other specialist locations, for analysis; medical supplies not available locally (such as serums, antitoxins,

isotopes, and organs for transplant operations) are shipped by air; and patients are moved by air for treatment procedures not available in their community.

Charlevoix Airport also supports the maintenance of essential community services and security. It is used to help locate and combat forest fires or chemical spills; to patrol pipelines and power lines, to support police, Civil Air Patrol and National Guard Activities. In case of natural disasters (flood or fire) it is a vital resource for supply and evacuation. Charlevoix Airport provides a refueling base and participation in search and rescue missions. Some years ago, an Island Airways pilot, based at Charlevoix, located and participated in the rescue of three persons who were lost in a storm on Lake Michigan.

In recent years, general aviation has become a major training ground for rewarding careers in the airline and aeronautical fields. The presence of an airport gives residents the option of flight instruction and ground service training.

# VALUE OF ART DAVIS AIRPORT TO THE EAST LANSING AREA

## Economic Values

Art Davis Airport is estimated to have an economic impact on its service area of approximately \$203,000 annually in total economic activity, of which \$61,000 is household earnings. This impact is due principally to the provision and use of general aviation services.

## Airport Characteristics

Privately owned and operated, the airport is open to the public and has a "U-2" classification.

Airport Services - East Lansing, Art Davis Airport is a general aviation airport, offering the services listed in Exhibit 1.

### Exhibit 1

#### SERVICES OFFERED AT EAST LANSING, ART DAVIS AIRPORT

General Aviation	Avgas Fuel Sales
Hangar Rental	Aircraft Repair
Tie Down	Flight Instruction
Aircraft Rental	Vending
Aircraft Sales	

SOURCE: Surveys by MDOT, Bureau of Transportation Planning (BTP) study consultants, Wilbur Smith Associates.

All of these services have positive economic significance to the East Lansing area. This is due to the creation of employment, generation of taxes and potential attraction and retention of businesses for the area.

Airport Facilities - The airport is a visual flight rules facility, capable of handling approximately 75 percent of the aircraft types used for general aviation, including small multi-engine aircraft. It has two turf-surface runways available for itinerant and local air traffic plus a third, reserved for local traffic. Snow removal

is provided on the primary runway to permit winter operations. However, the airport customarily closes in the spring, until the runways become firm. There is a Fixed-Base Operator (FBO) who provides aviation support services. Available airport facilities are summarized in Exhibit 2.

### Exhibit 2

#### FACILITIES AT ART DAVIS AIRPORT

	RUNWAYS		DESCRIPTION				Instr.
	Lgth.	Surf.	Taxi Sys.	Edge Lts.	REIL	VASI	
Primary	2,530	TF	N	LIRL	N	N	VIS
Crosswind	2,460	TF	N	NONE	N	N	VIS
Crosswind (1)		TF	N	NONE	N	N	VIS

NOTES: PV denotes paved surface; Taxi system definitions are: FP = full parallel; PP = part parallel; and TN = turnaround area at runway ends. Runway lighting systems (Edge Lights) are designated HIRL = high intensity runway lights. MIRL medium intensity; or LIRL, low intensity. Column heading REIL denotes Runway End Indicator Lights; VASI denotes Visual Approach Slope Indicator; column entries refer to presence of the equipment (Y denotes "yes"; N, "no"). Instrument approach facilities are: PR, Precision; NP, Non-Precision; or VIS, visual.

(1) Length not specified. Reserved for local use only.

SOURCE: MDOT, BTP.

Airport Use - Art Davis Airport has substantial general aviation activity. A total of 38 general aviation aircraft are based at the airport, as itemized in Exhibit 3.

## Exhibit 3

NUMBERS OF BASED AIRCRAFT  
ART DAVIS AIRPORT

<u>AIRCRAFT TYPE</u>	<u>1988</u>
Single Engine	37
Helicopter	<u>1</u>
<b>Total Aircraft</b>	<b>38</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Estimated aircraft operations for 1987 are given in Exhibit 4. Airport management advises that the itinerant aircraft operations include a few by military aircraft based elsewhere, during training exercises.

## Exhibit 4

AIRCRAFT OPERATIONS  
ART DAVIS AIRPORT

<u>TYPE OPERATION</u>	<u>1987</u>
Itinerant:	2,530
Local:	
General Aviation	<u>2,530</u>
<b>Total</b>	<b>5,060</b>

SOURCE: MDOT, BTP.

NOTE: No survey count was conducted at the airport for the indicated year. Estimate is based on factor derived from representative airports.

It is estimated from limited available count data, that aircraft operations at the airport have generally declined somewhat in recent years, and are largely local in nature reflecting the use of the airport as a training facility rather than as a transportation airport.

## Exhibit 5

OPERATIONS TREND  
EAST LANSING, ART DAVIS AIRPORT

<u>OPERATIONS</u>	<u>1983</u>	<u>1986</u>	<u>1987</u>
Itinerant	2,290	1,730	2,530
Local	<u>4,290</u>	<u>3,780</u>	<u>2,530</u>
<b>Totals</b>	<b>6,580</b>	<b>5,510</b>	<b>5,060</b>

SOURCE: MDOT, BTP.

Airport Economic Roles

Art Davis Airport is a recreation and training-oriented airport, with limited business activity. There has been no significant nearby economic development that is directly attributable to the airport. Rather, this privately owned airport serves a number of individual users for pleasure flying and flight training.

Business-Oriented General Aviation

Business-oriented used at the airport is estimated to be in the range of five to ten percent, according to the FBO. Aircraft based at the airport are owned by individuals, with no corporations represented. Visits by incoming aircraft on business trips are infrequent.

Airport Economic Impact

The Art Davis Airport aviation-related economic impact of \$203,000 annually comprises the impact types listed in Exhibit 6.

Exhibit 6

**ANNUAL AVIATION-RELATED  
ECONOMIC IMPACT OF  
ART DAVIS AIRPORT**

<u>IMPACT TYPE</u>	<u>AMOUNT</u>
Direct	\$ 116,000
Indirect	33,000
Induced	<u>54,000</u>
<b>Total</b>	<b>\$ 203,000</b>

SOURCE: Surveys by MDOT, BTP study consultants,  
Wilbur Smith Associates.

The total impacts, by type, are summarized in Exhibit 7. This study assesses only the aviation-related impacts.

Direct Economic Impact - The "direct" impacts comprise the value of those activities involved in providing aviation services at the airport. Exhibit 8 lists the airport tenants and others included in the impact estimates. Direct impacts are listed in Exhibit 9.

Exhibit 9

**ESTIMATED "DIRECT" ANNUAL IMPACTS  
ART DAVIS AIRPORT**

<u>DIRECT IMPACT</u>	<u>AMOUNT</u>
Direct Payroll	\$ 60,000
Capital Expenditures	10,000
Operating Expenses	40,000
Refueling Service	<u>6,000</u>
<b>Total</b>	<b>\$ 116,000</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Exhibit 7

**ESTIMATED ANNUAL ECONOMIC IMPACTS  
Art Davis Airport  
1987**

<u>IMPACT TYPE AND SOURCE</u>	<u>AVIATION RELATED</u>	<u>NON-AVIATION RELATED (1)</u>	<u>TOTAL(1)</u>
	(-----thousands-----)		
<b>Direct Impacts:</b>			
Aviation Services	<u>\$116</u>	<u>\$ 0</u>	<u>\$116</u>
Subtotal	\$116	\$ 0	\$116
<b>Indirect Impacts:</b>			
Visitor Expenditures	\$ 31	\$ 0	\$ 31
Regional Expenditure	<u>2</u>	<u>0</u>	<u>2</u>
Subtotal	\$ 33	\$ 0	\$ 33
<b>Induced Impacts:</b>	54		
<b>Total Annual Impacts</b>	<u>\$203</u>		

(1) Only aviation-related impacts are considered in this study.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

"Direct" payroll comprises payments to those people who work at the airport, are employed by the FBO or owner. "Capital expenditures" include improvements to on-site facilities of tenants as well as to the airport itself. "Operating expenses" are local expenditures by the tenants or airport operator.

Indirect Economic Impacts - Art Davis Airport "indirect" impacts are caused by airport use in the form of expenditures by air travelers.

It is estimated that over 1,100 visitors to the East Lansing area arrive via East Lansing, Art Davis Airport annually by general aviation. Based on approximate proportions of those staying overnight (more than one day) it is estimated that the average visitor spends approximately \$30.29 per trip at off-airport locations in the East Lansing

area. Local residents using the airport also spend money -- some \$2,000 per year locally (in addition to moneys spent at the airport).

The aviation-related indirect economic impacts attributable to Art Davis Airport total \$33,000, as shown in Exhibit 10. The visitor expenditures breakdown by expenditure type is based on a mix of tourist, business and personal travel derived from the results of surveys made at other airports. Since no Michigan surveys were available, these were adjusted to reflect a range of values judged to be appropriate for local conditions. All visitor expenditures are at the actual cost outlay except retail sales which, since it is a margin industry, is shown at 20 percent of the actual expenditures. Expenditures by airport-dependent firms consist of those costs attributable to airport-related activity.

**Exhibit 8**  
**ORGANIZATIONS AND FIRMS CREATING ECONOMIC IMPACTS**  
**Art Davis Airport**  
**1988**

<u>ORGANIZATION</u>	<u>ATTRIBUTION OF ACTIVITY</u>			<u>ECONOMIC ACTIVITY</u>
	<u>On-Site</u> <sup>(1)</sup>	<u>Off-Site</u> <sup>(2)</sup>	<u>Non-Aviation</u> <sup>(3)</sup>	
Aviation Services:				
Art Davis Airport	X			Owner
Community Aviation, Inc.	X			Fixed Base Operator

- (1) Economic activity on airport property, by an airport tenant, treated as "direct" economic impact.
- (2) Economic activity not taking place on airport property, but which is directly aviation-related to this airport. Treated as an "indirect" economic impact.
- (3) Activity which is not related to or dependent on aviation activities. Not included in the impact estimates.

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Exhibit 10

**INDIRECT IMPACTS OF  
ART DAVIS AIRPORT**

<u>REGIONAL EXPENDITURES BY SOURCE</u>	<u>ANNUAL IMPACT</u>
Visitor Expenditures:	
Lodging	\$10,000
Food & Beverage	9,000
Retail Sales	1,000
Entertainment	3,000
Ground Transport	2,000
Business	2,000
Other	<u>4,000</u>
Subtotal	\$31,000
Resident Expenditures	<u>2,000</u>
Total	\$33,000

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

**Induced Economic Impact** - "Direct" economic impacts of about \$116,000, and "indirect" impacts of \$33,000, represent increases in final demand for goods and services in the East Lansing region. To these must be added a "multiplier" effect produced by circulation of the money through the regional economy. To determine this "induced" impact, the U.S. Department of Commerce "Regional Input-Output Modeling System" (RIMS-II) was used. It was found that the induced impact produced by Art Davis Airport in 1987 was approximately \$54,000.

**Industries Which Benefit**

The economic activities at Art Davis Airport produce expenditures for a wide variety of goods and services. Many types of industry benefit, whether or not they are themselves airport users. Exhibit 11 lists impacted industry groups, and shows the extent to which each benefits from East Lansing, Art Davis Airport in terms of total economic activity earnings and employment.

**Airport Derived Employment**

One element in an airport's economic impact total is the employment which the airport creates. People are employed in airport-related activities at the airport (the FBO), and at other off-airport sites (hotels, manufacturing concerns, etc.). Furthermore, the direct and indirect expenditures attributable to the airport continue to flow through the region's economy creating additional employment (the "multiplier" effect). A summary of the jobs estimated to be attributable to Art Davis Airport is given in Exhibit 12.

Exhibit 12

**JOB ATTRIBUTABLE TO  
ART DAVIS AIRPORT**

<u>JOB SOURCE</u>	<u>Full Time</u>	<u>Part Time</u>	<u>Total FEQ</u>
Direct On-Site Jobs	1	2	2
Indirect Off-Site Jobs at Surveyed Firms	0	0	0
Induced and Other Indirect Jobs			<u>1</u>
		<b>Total Jobs</b>	<b>3</b>

NOTE: FEQ denotes "full-time equivalent" jobs, calculated as two part-time jobs equal one full-time job.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

The RIMS model treats jobs as full-time-equivalents (FEQ). Consequently, the split between full-time and part-time for induced employment is not shown. The Exhibit shows that there are two FEQ jobs at the airport and another one elsewhere in the greater Capital City Area which is attributable to the airport.



Exhibit 11  
**ECONOMIC IMPACT OF ART DAVIS AIRPORT  
 BY IMPACTED INDUSTRY TYPE  
 1987**

<u>IMPACTED INDUSTRY GROUPS</u>	<u>TOTAL ANNUAL IMPACT (Output)</u> (.....Thousands.....)	<u>TOTAL ANNUAL PAYROLL (Earnings)(1)</u> (.....Thousands.....)	<u>EMPLOYMENT (Jobs)</u>
New Construction	10	4	0
Maint. and Repair Const.	3	1	0
Food, Kindred Prd.	2	0	0
Printing, Publishing	1	0	0
Fabricated Metals	1	0	0
Transportation	88	28	1
Communications	5	1	0
Utilities	6	0	0
Wholesale Trade	3	1	0
Retail Trade	9	3	0
Finance	2	0	0
Real Estate	8	0	0
Lodging, Amusements	13	4	0
Business Services	34	13	1
Eating, Drinking Estab.	13	4	1
Health Services	3	2	0
Other Services	2	0	0
Households	--	0	0
<b>TOTALS</b>	<b>\$203</b>	<b>\$61</b>	<b>3</b>

(1) The portion of the "output" column inputs that is payroll to employed persons.

SOURCE: Rims II Multipliers, Wilbur Smith Associates.

**Non-Economic Impacts**

Not all values a community derives from an airport are quantifiable in dollar terms. However, these other impacts are limited at Art Davis Airport, due mainly to its proximity to Lansing, Capital City Airport. The facility does, however provide local residents with alternative linkages to Michigan and beyond.

In recent years, general aviation has become a major training ground for rewarding careers in the airline and aeronautical fields. The presence of an airport gives residents the option of flight instruction and ground service training.

# VALUE OF THE DELTA COUNTY AIRPORT TO THE ESCANABA AREA

## Economic Values

Delta County Airport is estimated to have an economic impact on the Escanaba area of approximately \$3.0 million annually in total economic activity, of which nearly \$1.0 million is household earnings. This impact is due principally to the provision and use of scheduled air carrier services, general aviation services, and sizeable federal government operations at the airport.

## Airport Characteristics

Owned and operated by Delta County, the airport is open to the public, has a "T-5" classification, and is the 13th largest airport in Michigan in terms of annual scheduled passenger usage.

Airport Services - Delta County Airport accomodates a commuter carrier and general aviation activity and offers the services listed in Exhibit 1.

### Exhibit 1

#### SERVICES OFFERED AT DELTA COUNTY AIRPORT

Commuter Air	Aircraft Sales
Air Taxi	Jet Fuel Sales
General Aviation	Avgas Fuel Sales
Hangar Rental	Aircraft Repair
Tie Down	Flight Instruction
Aircraft Rental	Car Rental
	Vending

SOURCE: Surveys by MDOT, Bureau of Transportation Planning (BTP) study consultants, Wilbur Smith Associates.

All of these services have positive economic significance to the Escanaba area. This is due to the creation of employment, generation of taxes and potential attraction and retention of businesses for the area.

Airport Facilities - The airport is an all-weather facility capable of handling virtually all general aviation aircraft types. It has two runways, a rotating beacon, segmented circle and lighted wind direction indicator. It also has a passenger terminal, hangar space, and one Fixed-Base Operator (FBO) who provides aviation support services. Additional services are listed in Exhibit 2.

### Exhibit 2

#### FACILITIES AT DELTA COUNTY AIRPORT

	RUNWAYS		DESCRIPTION				
	Lgth.	Surf.	Taxi Sys.	Edge Lts.	REIL	VASI	Instr. Appr.
Primary	6,500	PV	FP	HIRL	Y	Y	PR
Crosswind	3,800	PV	PP	MIRL	Y	Y	NP

NOTES: PV denotes paved surface; Taxi system definitions are: FP = full parallel; PP = part parallel; and TN = turnaround area at runway ends. Runway lighting systems (Edge Lights) are designated HIRL = high intensity runway lights. MIRL medium intensity; or LIRL, low intensity. Column heading REIL denotes Runway End Indicator Lights; VASI denotes Visual Approach Slope Indicator; column entries refer to presence of the equipment (Y denotes "yes"; N, "no"). Instrument approach facilities are: PR, Precision; NP, Non-Precision; or VIS, visual.

SOURCE: MDOT, BTP.

Airport Use - Delta County Airport currently is served by one scheduled commuter carrier (American Eagle) and has substantial general aviation activity. A total of 42 general aviation aircraft are based at the airport, as itemized in Exhibit 3.

Aircraft operations at the airport have increased modestly in recent years and are estimated to be divided evenly between itinerant and local flights, as shown in Exhibit 5. This indicates that airport use consists of both business and recreational/instructional activity.

Exhibit 3

NUMBERS OF BASED AIRCRAFT  
DELTA COUNTY AIRPORT

<u>AIRCRAFT TYPE</u>	<u>1988</u>
Single Engine	35
Multi-Engine	5
Ultra-light	<u>2</u>
<b>Total Aircraft</b>	<b>42</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Estimated aircraft operations for 1987 are given in Exhibit 4.

Exhibit 4

AIRCRAFT OPERATIONS  
DELTA COUNTY AIRPORT

<u>TYPE OPERATION</u>	<u>1987</u>
Itinerant:	
General Aviation	14,990
Local:	
General Aviation	<u>14,990</u>
<b>Total</b>	<b>29,980</b>

SOURCE: MDOT, BTP.

Exhibit 5

OPERATIONS TREND  
DELTA COUNTY AIRPORT

<u>OPERATIONS</u>	<u>1981</u>	<u>1983</u> <sup>1</sup>	<u>1986</u> <sup>1</sup>	<u>1987</u>
Itinerant	12,600	9,620	12,900	14,990
Local	<u>12,600</u>	<u>9,620</u>	<u>12,900</u>	<u>14,990</u>
<b>Totals</b>	<b>25,200</b>	<b>19,240</b>	<b>25,800</b>	<b>29,980</b>

(1) No count survey was made in the indicated years. Estimate is based on factor derived from representative airports.

SOURCE: MDOT, BTP and airport manager (1987).

Air passenger use has decreased with reduced levels of service provided by the carrier. Currently an average of about 33 people use the air carrier services daily. Scheduled flights number two per day, Sunday through Friday and one on Saturday.

Exhibit 6

AIR CARRIER PASSENGERS  
DELTA COUNTY AIRPORT

<u>PASSENGERS</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>
Deplaned	15,160	10,577	7,836	5,841
Enplaned	<u>15,459</u>	<u>10,865</u>	<u>7,725</u>	<u>6,140</u>
<b>Totals</b>	<b>30,619</b>	<b>21,442</b>	<b>15,561</b>	<b>11,981</b>

SOURCE: MDOT, BTP.

Air cargo tonnage has increased substantially over the past two years, as shown in Exhibit 7, reflecting the start of UPS service through Escanaba, to much of the Upper Peninsula. Tonnages continued to increase in 1988.



## Exhibit 10

**ESTIMATED ANNUAL ECONOMIC IMPACTS**  
**Delta County Airport**  
**1987**

<u>IMPACT TYPE AND SOURCE</u>	<u>AVIATION RELATED</u>	<u>NON-AVIATION RELATED (1)</u>	<u>TOTAL(1)</u>
	(-----thousands-----)		
<b>Direct Impacts:</b>			
Air Carrier Operations	\$ 85.5	\$ 0.0	\$ 85.5
Local Governments	156.4	0.0	156.4
Air Passenger Services	32.0	1.6	33.6
Aviation Services	<u>303.0</u>	<u>0.0</u>	<u>303.0</u>
Subtotal	\$ 576.9	\$ 1.6	\$578.5
<b>Indirect Impacts:</b>			
Visitor Expenditures	\$ 1,266.3	\$ 0.0	\$ 1,266.3
Regional Expenditure	4.2	0.0	4.2
Corporate Operations & Other	45.0	0.0	45.0
Dependent Firms	<u>97.0</u>	<u>139.1</u>	<u>236.1</u>
Subtotal	\$ 1,412.5	\$139.1	\$ 1,551.6
<b>Induced Impacts:</b>	1,009.6		
<b>Total Annual Impacts</b>	<u>\$2,999.0</u>		

(1) Only aviation-related impacts are considered in this study.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

Exhibit 11  
**ORGANIZATIONS AND FIRMS CREATING ECONOMIC IMPACTS**  
 Delta County Airport  
 1988

<u>ORGANIZATION</u>	<u>ATTRIBUTION OF ACTIVITY</u>			<u>ECONOMIC ACTIVITY</u>
	<u>Aviation-Related</u>		<u>Non-Aviation</u> <sup>(3)</sup>	
	<u>On-Site</u> <sup>(1)</sup>	<u>Off-Site</u> <sup>(2)</sup>		
Air Carrier Operations:				
American Eagle	X			Airline
Local Government:				
County Airport	X			Airport Operations
Air Passenger Services:				
National	X			Car Rental
Aviation Services:				
Jon Thorin Avn.	X			Fixed-Base Operator
Upper Penin. Aero	X			Fixed-Base Operator
Warm Aviation	X			Fixed-Base Operator
Bay DeNoc Flying Club, Inc.	X			Flying Club
Other:				
MI Dept. of Nat'l. Res.	X	X		Hangar Leases, Company Aircraft Activity
Travel Agencies		X	X	Travel Arrangements

- 
- (1) Economic activity on airport property, by an airport tenant, treated as "direct" economic impact.
  - (2) Economic activity not taking place on airport property, but which is directly aviation-related to this airport. Treated as an "indirect" economic impact.
  - (3) Activity which is not related to or dependent on aviation activities. Not included in the impact estimates.

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

## Exhibit 12

ESTIMATED "DIRECT" ANNUAL IMPACTS  
DELTA COUNTY AIRPORT

<u>DIRECT IMPACT</u>	<u>AMOUNT</u>
Direct Payroll	\$ 364,000
Capital Expenditures	61,700
Operating Expenses	126,600
Refueling Service	<u>24,600</u>
<b>Total</b>	<b>\$ 576,900</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

"Direct" payroll comprises payments to those people who work at the airport, are employed by the airlines, FBOs, corporate users or other tenants. "Capital expenditures" include improvements to on-site facilities of tenants as well as to the airport itself. "Operating expenses" are local expenditures by the tenants or airport operator.

Indirect Economic Impacts - Delta County Airport "indirect" impacts are caused by airport use in the form of expenditures by air travelers and by those firms that depend on the airport for their business.

It is estimated that over 14,000 visitors to the Escanaba area arrive via Delta County Airport annually (3,070 by commuter air carrier and 11,242 by general aviation including air taxi, in 1987). Based on approximate proportions of those staying overnight (more than one day) it is estimated that the average visitor spends approximately \$98 per trip at off-airport locations in the Escanaba area. Local residents using the airport also spend money -- some \$4,200 per year locally. Furthermore, there are two travel agencies in the Escanaba region. Surveys indicate that, taken together, about 90 percent of their economic

activity (e.g. ticket sales) is related to aviation. Of this, about 33 percent is related to Delta County Airport.

The aviation-related indirect economic impacts attributable to Delta County Airport total \$1.4 million, as shown in Exhibit 13. The visitor expenditures breakdown by expenditure type is based on a mix of tourist, business and personal travel derived from the results of surveys made at other airports. Since no Michigan surveys were available, these were adjusted to reflect a range of values judged to be appropriate for local conditions. All visitor expenditures are at the actual cost outlay except retail sales which, since it is a margin industry, is shown at 20 percent of the actual expenditures. Expenditures by airport-dependent firms consist of those costs attributable to airport-related activity.

## Exhibit 13

INDIRECT IMPACTS OF  
DELTA COUNTY AIRPORT

<u>REGIONAL EXPENDITURES BY SOURCE</u>	<u>ANNUAL IMPACT</u>
Visitor Expenditures:	
Lodging	\$ 427,500
Food & Beverage	360,400
Retail Sales	32,700
Entertainment	110,400
Ground Transport	96,400
Business	78,200
Other	<u>160,700</u>
Subtotal	\$1,266,300
Resident Expenditures	4,200
Corporate Air Opns.	45,000
Dependent Firm Expenditures	<u>97,000</u>
<b>Total</b>	<b>\$1,412,500</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

**Induced Economic Impact** - "Direct" economic impacts of about \$600,000, and "indirect" impacts of \$1.4 million, represent increases in final demand for goods and services in the Escanaba region. To these must be added a "multiplier" effect produced by circulation of the money through the regional economy. To determine this "induced" impact, the U.S. Department of Commerce "Regional Input-Output Modeling System" (RIMS-II) was used. It was found that the induced impact produced by Delta County Airport in 1987 was approximately \$1,009,600.

#### Industries Which Benefit

The economic activities at Delta County Airport produce expenditures for a wide variety of goods and services. Many types of industry benefit, whether or not they are themselves airport users. Exhibit 14 lists impacted industry groups, and shows the extent to which each benefits from Delta County Airport in terms of total economic activity earnings and employment.

#### Airport Derived Employment

An important element in the Delta County Airport economic impact total is the employment which the airport creates. People are employed in airport-related activities at the airport (the FBO, the airlines, the federal government, the County, etc.) and at other off-airport sites (hotels, manufacturing concerns, etc.). Furthermore, the direct and indirect expenditures attributable to the airport continue to flow through the region's economy creating additional employment (the "multiplier" effect). A summary of the jobs estimated to be attributable to Delta County Airport is given in Exhibit 15.

The RIMS model treats jobs as full-time-equivalents (FEQ). Consequently, the split between full-time and part-time for induced employment is not shown. The Exhibit shows that there are 23 FEQ jobs at the airport, and another 40 located elsewhere in the region that are attributable to the airport.

#### Exhibit 15

#### JOBS ATTRIBUTABLE TO DELTA COUNTY AIRPORT

<u>JOB SOURCE</u>	<u>Full Time</u>	<u>Part Time</u>	<u>Total FEQ</u>
Direct On-Site Jobs	18	10	23
Indirect Off-Site Jobs at Surveyed Firms	14	0	14
Induced and Other Indirect Jobs			<u>26</u>
		<b>Total Jobs</b>	<b>63</b>

NOTE: FEQ denotes "full-time equivalent" jobs, calculated as two part-time jobs equal one full-time job.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

#### Non-Economic Values

Not all values a community derives from an airport are quantifiable in dollar terms. Delta County Airport provides residents of the Escanaba area with essential linkages Michigan and beyond. But for the local airport, heavy winter snows could isolate many remote places for extensive periods.

The Airport provides access to the latest medical diagnosis and treatment procedures. For example, blood and tissue samples are sent to downstate medical centers, and specialist locations, for analysis. Medical supplies not available locally (such as serums, antitoxins, isotopes, and organs for transplant operations) are shipped by air; and patients are moved by air for treatment procedures not available in their community. Delta County Airport supports a variety of medical transportation services considered important by the Community. For example, a



Exhibit 14  
**ECONOMIC IMPACT OF DELTA COUNTY AIRPORT  
 BY IMPACTED INDUSTRY TYPE**  
 (Thousands)  
 1987

<u>IMPACTED INDUSTRY GROUPS</u>	<u>TOTAL ANNUAL IMPACT (Output)</u> (.....Thousands.....)	<u>TOTAL ANNUAL PAYROLL (Earnings)(1)</u> (.....Thousands.....)	<u>EMPLOYMENT (Jobs)</u>
Ag. Prod., Forestry Svcs.	\$37	\$7	1
Forestry Products	2	1	0
Crude Petrol.	8	0	0
New Construction	62	23	1
Maint. and Repair Const.	48	20	1
Food, Kindred Prd.	46	5	0
Apparel	1	0	0
Printing, Publishing	20	5	0
Chemicals, Refined Petrol.	3	0	0
Rubber, Leather Prod.	10	2	0
Lumber, Furniture Prod.	1	0	0
Stone, Clay, Glass Prod.	4	1	0
Primary Metals	1	0	0
Fabricated Metals	12	2	0
Non-electrical Machinery	3	0	0
Motor Vehicles, Equipment	7	0	0
Miscellaneous Mfg.	2	0	0
Transportation	898	309	11
Communications	65	18	0
Utilities	88	7	0
Wholesale Trade	53	19	1
Retail Trade	146	68	5
Finance	32	9	0
Insurance	18	5	0
Real Estate	115	1	1
Lodging, Amusements	551	184	18
Personal Services	13	4	1
Business Services	219	90	4
Eating, Drinking Estab.	432	126	16
Health Services	54	31	1
Other Services	48	17	1
Households	--	3	1
<b>TOTALS</b>	<b>\$2,999</b>	<b>\$957</b>	<b>63</b>

(1) The portion of the "output" column inputs that is payroll to employed persons.

SOURCE: Rims II Multipliers, Wilbur Smith Associates.

spokesman at St. Francis Hospital, which serves the Delta County area, advises that medical samples for testing normally are handled by courier dispatch using commercial air services. Routine patient transfers are handled by air ambulance services. Currently, these are based elsewhere.

"Flight for Life," is an emergency medical evacuation service operated in conjunction with the Milwaukee Regional Medical Center. The service began in 1986, with five emergency evacuations out of Delta County Airport. In 1988, there were 16. Recently, these included the case of a child who fell into Ford River and had been under water for 15 minutes and another case of a workman whose hand had been severed in a sawmill accident.

Delta County Airport also supports the maintenance of essential community services and security. It is used to locate and combat forest

fires or chemical spills; to patrol pipelines and power lines, to support police, Civil Air Patrol and National Guard Activities. In case of natural disasters (flood or fire) it is a vital resource for supply and evacuation. Delta County Airport supported the FBI-directed air search during the summer of 1988, for a fugitive who had murdered members of a family near Escanaba and kidnapped the wife. She was rescued and he was recaptured.

In recent years, general aviation has become a major training ground for rewarding careers in the airline and aeronautical fields. The presence of an airport gives residents the option of flight instruction and ground service training. Delta County Airport supplements a local college program to train students for aviation careers. Aviation professionals from the airport act as instructors for some classes.

# VALUE OF FREMONT MUNICIPAL AIRPORT TO THE FREMONT AREA

## Economic Values

Fremont Municipal Airport is estimated to have an economic impact on its service area of approximately \$1.1 million annually in total economic activity of which \$332,000 is household earnings. This impact is due principally to the provision of and use of general aviation services, at the airport.

## Airport Characteristics

Owned and operated by the City of Fremont, the airport is open to the public and has a "T-5" classification.

Airport Services - Fremont Municipal Airport is a general aviation airport, offering a number of services for private flying. Services available are listed in Exhibit 1.

### Exhibit 1

#### SERVICES OFFERED AT FREMONT MUNICIPAL AIRPORT

Air Taxi	Avgas Fuel Sales
General Aviation	Aircraft Repair
Hangar Rental	Avionics (limited)
Tie Down	Car Rental
Aircraft Rental	Vending
Aircraft Sales	

SOURCE: Surveys by MDOT, Bureau of Transportation Planning (BTP) study consultants, Wilbur Smith Associates.

All of these services have positive economic significance to the Fremont area. This is due to the creation of employment, generation of taxes and potential attraction and retention of businesses for the area.

Airport Facilities - The airport is an all-weather facility, equipped with rotating beacon, unlighted wind indicator and segmented

circle. There is no local tower. There are two paved runways: the primary, 5,826 feet in length, has a non-precision instrument approach; visual approach slope indicator (VASI); medium-intensity runway lights (MIRL); runway end indicator lights (REIL); and turnarounds for taxiing aircraft (TN). The crosswind runway also has a non-precision instrument approach and MIRL. However, there is no VASI, REIL or taxiway system. Aircraft storage space is provided in hangers or with tie-downs. A Fixed-Base Operator (FBO) provides aviation support services. Airport facilities are summarized in Exhibit 2.

### Exhibit 2

#### FACILITIES AT FREMONT MUNICIPAL AIRPORT

	<u>RUNWAYS</u>		<u>DESCRIPTION</u>				Instr. <u>Appr.</u>
	<u>Lgth.</u>	<u>Surf.</u>	<u>Taxi Sys.</u>	<u>Edge Lts.</u>	<u>REIL</u>	<u>VASI</u>	
Primary	5,826	PV	TN	MIRL	Y	Y	NP
Crosswind	3,500	PV	N	MIRL	N	N	NP

NOTES: PV denotes paved surface; Taxi system definitions are: FP = full parallel; PP = part parallel; and TN = turnaround area at runway ends. Runway lighting systems (Edge Lights) are designated HIRL = high intensity runway lights. MIRL medium intensity; or LIRL, low intensity. Column heading REIL denotes Runway End Indicator Lights; VASI denotes Visual Approach Slope Indicator; column entries refer to presence of the equipment (Y denotes "yes"; N, "no"). Instrument approach facilities are: PR, Precision; NP, Non-Precision; or VIS, visual.

SOURCE: MDOT, BTP.

**Airport Use** - There are currently 29 civil aircraft based at Fremont Municipal Airport. These are predominantly single-engine, but also include multi-engine craft, jets, and an ultra-light, as listed in Exhibit 3.

## Exhibit 3

**NUMBERS OF BASED AIRCRAFT  
FREMONT MUNICIPAL AIRPORT**

<u>AIRCRAFT TYPE</u>	<u>1988</u>
Single Engine	22
Multi-Engine	4
Jet	2
Ultra-Light	<u>1</u>
<b>Total Aircraft</b>	<b>29</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Estimated aircraft operations for 1987 are given in Exhibit 4. Some 3,140 itinerant operations combined with 7,320 local operations to total 10,460.

## Exhibit 4

**AIRCRAFT OPERATIONS  
FREMONT MUNICIPAL AIRPORT**

<u>TYPE OPERATION</u>	<u>1987</u>
Itinerant:	
Air Taxi	310
General Aviation	<u>2,830</u>
Subtotal Itinerant	3,140
Local:	
General Aviation	<u>7,320</u>
<b>Total</b>	<b>10,460</b>

SOURCE: MDOT, BTP.

Available data indicate that the level of activity at Fremont Municipal Airport has declined somewhat over the past several years. As shown in Exhibit 5, the 1978 count survey was the basis for an estimate of 12,850 total annual operations. For 1983, the factor-derived estimate (in the absence of a local survey) was 12,280 total annual operations. The 1987 count survey resulted in an estimate for the year of 10,460 total operations.

## Exhibit 5

**OPERATIONS TREND  
FREMONT MUNICIPAL AIRPORT**

<u>OPERATIONS</u>	<u>1978</u>	<u>1983<sup>1</sup></u>	<u>1987</u>
Itinerant	4,450	4,250	3,140
Local	<u>8,400</u>	<u>8,030</u>	<u>7,320</u>
<b>Totals</b>	<b>12,850</b>	<b>12,280</b>	<b>10,460</b>

(1) No count survey was conducted for the indicated year. Estimate based on factor derived from representative airports.

SOURCE: MDOT, BTP.

Airport Economic Roles

Fremont Municipal Airport is a private-flying-oriented airport, with some business use. There has been no significant nearby economic development which is directly attributable to the airport. However, the airport is used by a number of firms involved in the local economy. Usage involves air passenger and freight services and aerial inspection patrols (Consumers' Power Co.).

**Business-Oriented General Aviation** - A significant portion of air traffic operations at Fremont is business-related. Exhibit 6 identifies several companies which either base aircraft at Fremont, or frequently use it.

Exhibit 6

**A SAMPLE OF  
CORPORATE AIRCRAFT USERS  
AT FREMONT MUNICIPAL AIRPORT**

Gerber Products	Whirlpool
Fremont Glass	Sears
Weaver Oil	Teledyne
Consumers' Power	Anchor-Hocking Glass
Lee Aircraft Sales	Ball Glass

Also, Fremont is used as an air access point for the Teledyne Corporate Training Facility at Bitley and for the North American Refractories Co. (NARCO) industrial technology unit at White Cloud, for occasional inspection visits by potential customers. Consumers Power uses Fremont as a refueling stop for its helicopters when conducting line-patrol flights.

Air taxi service, when needed, serves Fremont Airport from bases at larger airports nearby, such as Kent County or Muskegon.

SOURCE: Surveys by MDOT, BTP, study consultants, Wilbur Smith Associates.

Because of its location and all-weather capability, Fremont Municipal serves as a back-up airport for other nearby facilities. For example, the Whirlpool Corporation operates a Conference lodge at Baldwin. However, Baldwin has no instrument approach equipment. Hence, Fremont serves as the air access point, when necessary.

Airport Economic Impact

The Fremont Municipal Airport aviation-related economic impact of \$1.1 million annually comprises the impact types shown in Exhibit 7. The total impacts, by type, are summarized in Exhibit 8. Since this study assesses only the aviation-related impacts, Exhibit 8 provides identification of those which are not attributable to aviation. At Fremont Municipal, there are no activities which are not related to aviation.

Exhibit 8

**ESTIMATED ANNUAL ECONOMIC IMPACTS  
FREMONT MUNICIPAL AIRPORT  
1987**

<u>IMPACT TYPE AND SOURCE</u>	<u>AVIATION</u>	<u>NON-AVIATION</u>	<u>TOTAL(1)</u>
	<u>RELATED</u>	<u>RELATED (1)</u>	
	-----thousands-----		
<b>Direct Impacts:</b>			
Local Governments	15.1	0	15.1
Aviation Services	77.3	0	77.3
Subtotal	\$92.4	\$0	\$92.4
<b>Indirect Impacts:</b>			
Visitor Expenditures	\$121.6	\$0	\$121.6
Regional Expenditure	2.8	0	2.8
Dependent Firms	65.5	0	65.5
Corporate Operations & Other	<u>461.0</u>	<u>0</u>	<u>461.0</u>
Subtotal	\$650.9	\$0	\$650.9
<b>Induced Impacts:</b>	330.7		
<b>Total Annual Impacts</b>	<u>\$1,074.0</u>		

(1) Only aviation-related impacts are considered in this study.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

Exhibit 7

ANNUAL AVIATION-RELATED  
ECONOMIC IMPACT OF  
FREMONT MUNICIPAL AIRPORT

<u>IMPACT TYPE</u>	<u>AMOUNT</u>
Direct	\$ 92,400
Indirect	650,900
Induced	<u>330,700</u>
<b>Total</b>	<b>\$1,074,000</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

**Direct Economic Impacts** - The "direct" impacts comprise the value of those activities involved in providing aviation services at the airport. Exhibit 9 lists the airport tenants and others included in the impact estimates. Direct impacts are summarized in Exhibit 10.

"Direct" payroll comprises payments to those people who work at the airport, are employed by the FBO, corporate users, or other tenants. "Capital expenditures" include improvements to on-site facilities of tenants as well as to the airport itself. "Operating expenses" are local expenditures by the tenants or airport operator.

Exhibit 9

ORGANIZATIONS AND FIRMS CREATING ECONOMIC IMPACTS  
FREMONT MUNICIPAL AIRPORT  
1988

<u>ORGANIZATION</u>	<u>ATTRIBUTION OF ACTIVITY</u>			<u>ECONOMIC ACTIVITY</u>
	<u>On-Site</u> <sup>(1)</sup>	<u>Off-Site</u> <sup>(2)</sup>	<u>Non-Aviation</u> <sup>(3)</sup>	
Local Government: City of Fremont	X			Airport Maintenance
Air Passenger Services: Hertz	X			Car Rental
Aviation Services: Community Corp. Air	X			Fixed Base Operator
Other: Gerber Products, Aviation Division	X			Corporate Aviation Service
Fremont Glass	X	X		Hangar Leases, Company Aircraft Activity
Weaver Oil	X			Hangar Leases, Company Aircraft Activity
NARCO		X		Plant Visits by Potential Customers
Teledyne, Bitely		X		Staff Training Facility

- (1) Economic activity on airport property, by an airport tenant, treated as "direct" economic impact.
- (2) Economic activity not taking place on airport property, but which is directly aviation-related to this airport. Treated as an "indirect" economic impact.
- (3) Activity which is not related to or dependent on aviation activities. Not included in the impact estimates.

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Exhibit 10

ESTIMATED "DIRECT" ANNUAL IMPACTS  
FREMONT MUNICIPAL AIRPORT

<u>DIRECT IMPACT</u>	<u>AMOUNT</u>
Direct Payroll	\$ 47,900
Capital Expenditures	5,000
Operating Expenses	27,200
Refueling Service	<u>12,300</u>
<b>Total</b>	<b>\$ 92,400</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Indirect Economic Impacts - Fremont Municipal Airport "indirect" impacts are caused by airport use in the form of expenditures by air travelers and by those firms that depend on the airport for their business.

It is estimated that approximately 4,000 annual visitors to the Fremont area arrive via Fremont Municipal Airport annually (3,535 by general aviation, and 465 by air taxi in 1987). Based on approximate proportions of those staying overnight (more than one day) it is estimated that the average visitor spends approximately \$30.38 per trip at off-airport locations in the Fremont area. Local residents using the airport also spend money -- some \$2,800 per year locally.

The aviation-related indirect economic impacts attributable to Fremont Municipal Airport total almost \$190,000 annually, as shown in Exhibit 11. The visitor expenditures breakdown by expenditure type is based on a mix of tourist, business and personal travel derived from the results of surveys made at other airports. Since no Michigan surveys were available, these were adjusted to reflect a range of values judged to be appropriate for local conditions. All visitor expenditures are at the actual cost outlay except retail sales which, since it is a margin industry, is shown at 20 percent of the actual expenditures. Expenditures by airport-dependent firms consist of those costs attributable to airport-related activity.

Exhibit 11

INDIRECT IMPACTS OF  
FREMONT MUNICIPAL AIRPORT

<u>REGIONAL EXPENDITURES BY SOURCE</u>	<u>ANNUAL IMPACT</u>
Visitor Expenditures:	
Lodging	\$41,100
Food & Beverage	34,600
Retail Sales	3,100
Entertainment	10,600
Ground Transport	9,300
Business	7,500
Other	<u>15,400</u>
Subtotal	\$121,600
Resident Expenditures	2,800
Dependent Firm Expenditures	65,500
Corporate Air Opns.	<u>461,000</u>
Total	<b>\$650,900</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Induced Economic Impact - "Direct" economic impacts of \$92,400, and "indirect" impacts of \$650,900, represent increases in final demand for goods and services in the Fremont region. To these must be added a "multiplier" effect produced by circulation of the money through the regional economy. To determine this "induced" impact, the U.S. Department of Commerce "Regional Input-Output Modeling System" (RIMS-II) was used. It was found that the induced impact produced by Fremont Municipal Airport in 1987 was approximately \$330,700.

Industries Which Benefit

The economic activities at Fremont Municipal Airport produce expenditures for a wide variety of goods and services. Many types of industry benefit, whether or not they are themselves airport users. Exhibit 12 lists impacted industry groups, and shows the extent to which each benefits from Fremont Municipal Airport in terms of total economic activity earning and employment.

**Exhibit 12**  
**ECONOMIC IMPACT OF FREEMONT MUNICIPAL AIRPORT**  
**BY IMPACTED INDUSTRY TYPE**  
**1987**

<u>IMPACTED INDUSTRY GROUPS</u>	<u>TOTAL ANNUAL IMPACT (Output)</u> (.....Thousands.....)	<u>TOTAL ANNUAL PAYROLL (Earnings)(1)</u>	<u>EMPLOYMENT ( Jobs )</u>
Ag. Prod., Forestry Svcs.	\$8	\$1	0
Crude Petrol.	3	0	0
New Construction	5	2	0
Maint. and Repair Const.	12	5	0
Food, Kindred Prd.	10	1	0
Printing, Publishing	6	1	0
Chemicals, Refined Petrol.	1	0	0
Rubber, Leather Prod.	1	0	0
Fabricated Metals	2	0	0
Non-electrical Machinery	1	0	0
Motor Vehicles, Equipment	1	0	0
Miscellaneous Mfg.	1	0	0
Transportation	657	214	8
Communications	22	5	0
Utilities	26	2	0
Wholesale Trade	16	5	0
Retail Trade	42	20	1
Finance	9	3	0
Insurance	4	1	0
Real Estate	40	0	0
Lodging, Amusements	56	19	2
Personal Services	3	1	0
Business Services	49	19	1
Eating, Drinking Estab.	65	18	2
Health Services	19	9	0
Other Services	15	5	0
Households	--	1	0
<b>TOTALS</b>	<b>\$1,074</b>	<b>\$332</b>	<b>14</b>

(1) The portion of the "output" column that is payroll to employed persons.

SOURCE: Rims II Multipliers, MDOT, BTP study consultant, Wilbur Smith Associates.



**Airport Derived Employment**

An important element in the Fremont Municipal Airport economic impact total is the employment which the airport creates. People are employed in airport-related activities at the airport (the FBO, airport tenants, the City, etc.) and at other off-airport sites (hotels, manufacturing concerns, etc.). Furthermore, the direct and indirect expenditures attributable to the airport continue to flow through the region's economy creating

additional employment (the "multiplier" effect). A summary of the jobs estimated to be attributable to Fremont Municipal Airport is given in Exhibit 13.

The RIMS model treats jobs as full-time-equivalents (FEQ). Consequently, the split between full-time and part-time for induced employment is not shown. The Exhibit shows that there are 11 FEQ jobs at the airport, and another three located elsewhere in the region that are attributable to the airport.

Exhibit 13

**JOBS ATTRIBUTABLE TO  
FREMONT MUNICIPAL AIRPORT**

<u>JOB SOURCE</u>	<u>Full Time</u>	<u>Part Time</u>	<u>Total FEQ</u>
Direct On-Site Jobs	5	13	11
Indirect Off-Site Jobs at Surveyed Firms	0	0	0
Other	0	6	3
Induced and Other Indirect Jobs			<u>0</u>
		<b>Total Jobs</b>	<b>14</b>

NOTE: FEQ denotes "full-time equivalent" jobs, calculated as two part-time jobs equal one full-time job.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

**Non-Economic Values**

Not all values a community derives from an airport are quantifiable in dollar terms. Fremont Municipal provides local residents with alternative linkages to Michigan and beyond.

The Airport provides access to the latest medical diagnosis and treatment procedures. For example, blood and tissue samples are sent to large medical centers, and specialist locations for analysis: Medical supplies not available locally (such as serums, antitoxins, isotopes, and organs for transplant operations) are shipped by air; and patients are moved by air for treatment procedures not available in their community.

Fremont Airport also supports the maintenance of essential community services and security. It is used to help locate and combat forest fires or chemical spills; to patrol pipelines and power lines (Fremont Municipal Airport serves as a refueling base for Consumers' Power helicopters, when on line patrol flights), to support police, Civil Air Patrol and National Guard Activities. In case of natural disasters (flood or fire) it is a vital resource for supply and evacuation.

# VALUE OF OTSEGO COUNTY AIRPORT TO THE GAYLORD AREA

## Economic Values

Otsego County Airport is estimated to have an economic impact on its service area of approximately \$4.7 million annually in total economic activity, of which \$1.5 million is household earnings. This impact is due principally to the provision and use of general aviation services at the airport.

## Airport Characteristics

Owned and operated by Otsego County, the airport is open to the public and has a "T-5" classification.

Airport Services - Otsego County Airport is a general aviation airport, offering the services listed in Exhibit 1.

### Exhibit 1

#### SERVICES OFFERED AT OTSEGO COUNTY AIRPORT

General Aviation	Jet Fuel Sales
Hangar Rental	Avgas Fuel Sales
Tie Down	Flight Instruction
Aircraft Rental	Car Rental
Aircraft Sales	Vending

SOURCE: Surveys by MDOT, Bureau of Transportation Planning (BTP) study consultants, Wilbur Smith Associates.

All of these services have positive economic significance to the Gaylord area. This is due to the creation of employment, generation of taxes and potential attraction and retention of businesses for the area.

Airport Facilities - The airport is capable of handling virtually all general aviation type aircraft. It has two runways, a rotating beacon,

segmented circle and a lighted wind direction indicator. It has a passenger terminal, hangar space, and one Fixed-Base Operator (FBO) who provides aviation support services. Additional facilities are listed in Exhibit 2.

### Exhibit 2

#### FACILITIES AT OTSEGO COUNTY AIRPORT

	RUNWAYS		DESCRIPTION				
	Lgth.	Surf.	Taxi Sys.	Edge Lts.	REIL	VASI	Instr. Appr.
Primary	5,015	PV	FP	MIRL	Y	Y	NP
Crosswind	3,000	PV	TN	MIRL	N	N	VIS

NOTES: PV denotes paved surface; Taxi system definitions are: FP = full parallel; PP = part parallel; and TN = turnaround area at runway ends. Runway lighting systems (Edge Lights) are designated HIRL = high intensity runway lights. MIRL medium intensity; or LIRL, low intensity. Column heading REIL denotes Runway End Indicator Lights; VASI denotes Visual Approach Slope Indicator; column entries refer to presence of the equipment (Y denotes "yes"; N, "no"). Instrument approach facilities are: PR, Precision; NP, Non-Precision; or VIS, visual.

SOURCE: MDOT, BTP.

Airport Use - Otsego County Airport has substantial general aviation activity. A total of 59 general aviation aircraft are based at the airport, as itemized in Exhibit 3.

## Exhibit 3

NUMBERS OF BASED AIRCRAFT  
OTSEGO COUNTY AIRPORT

<u>AIRCRAFT TYPE</u>	<u>1988</u>
Single Engine	48
Multi-Engine	9
Glider	1
Ultra-Light	<u>1</u>
<b>Total Aircraft</b>	<b>59</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Estimated aircraft operations for 1987 are given in Exhibit 4. The data shown are estimates by the local airport management.

## Exhibit 4

AIRCRAFT OPERATIONS  
OTSEGO COUNTY AIRPORT

<u>TYPE OPERATION</u>	<u>1987</u>
Itinerant:	
General Aviation	9,060
Local:	
General Aviation	<u>2,270</u>
<b>Total</b>	<b>11,330</b>

SOURCE: MDOT, BTP.

Aircraft operations at the airport increased sharply in the early 1980s, with completion of several fine golfing resorts in the area. Air

traffic is predominantly itinerant in nature reflecting the use of the airport as a transportation facility rather than a training airport. Tourism generates a considerable portion of the business traffic including the high proportion of air taxi activity.

## Exhibit 5

OPERATIONS TREND  
OTSEGO COUNTY AIRPORT

<u>OPERATIONS</u>	<u>1984</u>	<u>1986<sup>1</sup></u>	<u>1987</u>
Itinerant	15,720	16,740	17,670
Local	<u>1,750</u>	<u>1,840</u>	<u>930</u>
<b>Totals</b>	<b>17,330</b>	<b>18,580</b>	<b>18,600</b>

(1) No survey was conducted at this airport for the indicated year. Estimate is based on factor derived from representative airports.

SOURCE: MDOT, BTP.

Airport Economic Roles

Otsego County Airport is a business-oriented airport, with the following comprising the airport's principal economic impact types.

Retention of Private Business - Otsego County Airport is considered valuable to the competitive position of a number of local firms and plants, some of which might choose to locate elsewhere if the facility were not present. These organizations use the air taxi and general aviation services made possible by the airport's existence. However, the facility was not found to be directly responsible for any significant economic development in the service area.

The airport furnishes important access to area resorts and, for handling bank receipts, serves the entire upper portion of the lower peninsula.

**Business-Oriented General Aviation** - An estimated 80-95 percent of general aviation use at the airport is "business-oriented," and many of the region's businesses have aircraft at the airport including those listed in Exhibit 6.

category include: Georgia Pacific; FAX and Federal Armour (both transporting financial documents); Superior Air (a UPS subcontractor); Amoco Oil and Standard Products.

**Exhibit 6**

**A SAMPLE OF FIRMS  
WHICH BASE AIRCRAFT  
AT OTSEGO COUNTY AIRPORT**

Aiken-Ziegler, Inc.	Mich. Dept. of Nat'l.
Bozzer Bros., Inc.	Resources
Hidden Valley Resort	North County Aviation
Glens Market #1, Inc.	Otsego Log Cabin Co.
H&S Mold, Inc.	Roberts Boring
	White Tool Corp.

**Airport Economic Impact**

The Otsego County Airport aviation-related economic impact of \$4.7 million annually comprises the impact types listed in Exhibit 7.

The total impacts, by type, are summarized in Exhibit 8. This study assesses only the aviation-related impacts.

**SOURCE:** Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

In addition to firms with general aviation aircraft based at the airport, there are many others that depend on the airport, for various services, such as air taxi/charter service, air freight etc. These services are important for sales, management and production activities as well as providing convenient access to area resorts. Firms in this

**Exhibit 7**

**ANNUAL AVIATION-RELATED  
ECONOMIC IMPACT OF  
OTSEGO COUNTY AIRPORT**

<u>IMPACT TYPE</u>	<u>AMOUNT</u>
Direct	\$ 101,000
Indirect	3,007,000
Induced	<u>1,630,000</u>
<b>Total</b>	<b>\$4,738,000</b>

**SOURCE:** Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

**Exhibit 8**

**ESTIMATED ANNUAL ECONOMIC IMPACTS  
Ostego County Airport  
1987**

<u>IMPACT TYPE AND SOURCE</u>	<u>AVIATION RELATED</u>	<u>NON-AVIATION RELATED (1)</u>	<u>TOTAL(1)</u>
	(-----thousands-----)		
<b>Direct Impacts:</b>			
Local Governments	25	0	25
Aviation Services	<u>76</u>	<u>0</u>	<u>76</u>
<b>Subtotal</b>	<b>\$ 101</b>	<b>\$ 0</b>	<b>\$ 101</b>
<b>Indirect Impacts:</b>			
Visitor Expenditures	\$ 2,895	\$ 0	\$ 2,895
Regional Expenditure	2	0	2
Corporate Operations & Other	<u>110</u>	<u>0</u>	<u>110</u>
<b>Subtotal</b>	<b>\$ 3,007</b>	<b>\$ 0</b>	<b>\$ 3,007</b>
<b>Induced Impacts:</b>	<b>1,630</b>		
<b>Total Annual Impacts</b>	<b>\$ 4,738</b>		

(1) Only aviation-related impacts are considered in this study.

**Direct Economic Impact** - The "direct" impacts comprise the value of those activities involved in providing aviation services at the airport. Exhibit 9 lists the airport tenants and others included in the impact estimates. The makeup of the direct impacts is given in Exhibit 10.

"Direct" payroll comprises payments to those people who work at the airport, are employed by the County, FBO, or corporate users. "Capital expenditures" include improvements to on-site facilities of tenants as well as to the airport itself. "Operating expenses" are local expenditures by the tenants or airport operator.

Exhibit 10

**ESTIMATED "DIRECT" ANNUAL IMPACTS  
OTSEGO COUNTY AIRPORT**

<u>DIRECT IMPACT</u>	<u>AMOUNT</u>
Direct Payroll	\$ 62,000
Capital Expenditures	1,000
Operating Expenses	18,000
Refueling Service	20,000
<b>Total</b>	<b>\$101,000</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Exhibit 9

**ORGANIZATIONS AND FIRMS CREATING ECONOMIC IMPACTS  
Otsego County Airport  
1988**

ATTRIBUTION OF ACTIVITY

<u>ORGANIZATION</u>	<u>Aviation-Related</u>			<u>ECONOMIC ACTIVITY</u>
	<u>On-Site</u> <sup>(1)</sup>	<u>Off-Site</u> <sup>(2)</sup>	<u>Non-Aviation</u> <sup>(3)</sup>	
Local Government: County Airport	X			Airport Operations
Aviation Services: N. County Aviation	X			Fixed Base Operator
Other: Corporate Air Operations <sup>4</sup>	X	X		Hangar Leases, Company Aircraft Activity

- (1) Economic activity on airport property, by an airport tenant, treated as "direct" economic impact.
- (2) Economic activity not taking place on airport property, but which is directly aviation-related to this airport. Treated as an "indirect" economic impact.
- (3) Activity which is not related to or dependent on aviation activities. Not included in the impact estimates.
- (4) Treated as indirect economic impact.

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

**Indirect Economic Impacts** - Otsego County Airport "indirect" impacts are caused by airport use in the form of expenditures by air travelers and by those firms that depend on the airport for their business.

It is estimated that over 25,000 visitors to the Gaylord area arrive via Otsego County Airport annually approximately 5,300 by private or corporate plane, and 19,800 by air taxi in 1987). Based on approximate proportions of those staying overnight (more than one day) it is estimated that the average visitor spends approximately \$152.00 per trip at off-airport locations in the Gaylord area. Local residents using the airport also spend money -- some \$2,000 per year locally.

The aviation-related indirect economic impacts attributable to Otsego County Airport total \$3.0 million, as shown in Exhibit 11. The visitor expenditures breakdown by expenditure type is based on a mix of tourist, business and personal travel derived from the results of surveys made at other airports. Since no Michigan surveys were available, these were adjusted to reflect a range of values judged to be appropriate for local conditions. All visitor expenditures are at the actual cost outlay except retail sales which, since it is a margin industry, is shown at 20 percent of the actual expenditures. Expenditures by airport-dependent firms consist of those costs attributable to airport-related activity.

**Induced Economic Impact** - "Direct" economic impacts of about \$101,000, and "indirect" impacts of \$3.0 million, represent increases in final demand for goods and services in the Gaylord region. To these must be added a "multiplier" effect produced by circulation of the money through the regional economy. To determine this "induced" impact, the U.S. Department of Commerce "Regional Input-Output Modeling System" (RIMS-II) was used. It was found that the induced impact produced by Otsego County Airport in 1987 was approximately \$1,630,000.

**Industries Which Benefit**

The economic activities at Otsego County Airport produce expenditures for a wide variety of goods and services. Many types of industry

Exhibit 11

**INDIRECT IMPACTS OF OTSEGO COUNTY AIRPORT**

<u>REGIONAL EXPENDITURES BY SOURCE</u>	<u>ANNUAL IMPACT</u>
Visitor Expenditures:	
Lodging	\$ 977,000
Food & Beverage	824,000
Retail Sales	75,000
Entertainment	252,000
Ground Transport	220,000
Business	179,000
Other	<u>368,000</u>
Subtotal	\$2,895,000
Resident Expenditures	2,000
Corporate Air Opns.	<u>110,000</u>
<b>Total</b>	<b>\$3,007,000</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

benefit, whether or not they are themselves airport users. Exhibit 12 lists impacted industry groups, and shows the extent to which each benefits from Otsego County Airport in terms of total economic activity, earnings and employment.

**Airport Derived Employment**

An important element in the Otsego County Airport economic impact total is the employment which the airport creates. People are employed in airport-related activities at the airport (the FBO, the airlines, the federal government, the County, etc.) and at other off-airport sites (hotels, manufacturing concerns, etc.). Furthermore, the direct and indirect expenditures attributable to the airport continue to flow through the region's economy creating additional employment (the "multiplier" effect). A summary of the jobs estimated to be attributable to Otsego County Airport is given in Exhibit 13.

Exhibit 12  
**GAYLORD - OTSEGO COUNTY AIRPORT**  
**BY IMPACTED INDUSTRY TYPE**  
**1987**

<u>IMPACTED INDUSTRY GROUPS</u>	<u>TOTAL ANNUAL IMPACT (Output)</u> (.....Thousands.....)	<u>TOTAL ANNUAL PAYROLL (Earnings)(1)</u>	<u>EMPLOYMENT (Jobs)</u>
Ag. Prod., Forestry Svcs.	\$78	\$14	2
Forestry Products	4	1	0
Crude Petrol.	11	0	0
New Construction	1	0	0
Maint. and Repair Const.	77	33	1
Food, Kindred Prd.	86	12	0
Apparel	3	0	0
Printing, Publishing	29	10	0
Chemicals, Refined Petrol.	6	0	0
Rubber, Leather Prod.	23	5	0
Lumber, Furniture Prod.	2	0	0
Stone, Clay, Glass Prod.	5	1	0
Primary Metals	3	0	0
Fabricated Metals	14	3	0
Non-electrical Machinery	5	1	0
Motor Vehicles, Equipment	10	2	0
Miscellaneous Mfg.	3	0	0
Transportation	888	310	11
Communications	101	25	1
Utilities	130	13	0
Wholesale Trade	91	33	1
Retail Trade	253	116	9
Finance	48	13	1
Insurance	31	10	0
Real Estate	182	2	1
Lodging, Amusements	1,250	417	40
Personal Services	24	10	1
Business Services	290	117	5
Eating, Drinking Estab.	927	272	34
Health Services	88	45	2
Other Services	75	28	2
Households	--	4	1
<b>Total</b>	<b>\$4,738</b>	<b>\$1,497</b>	<b>112</b>

(1) The portion of the "output" column that is payroll to employed persons.

SOURCE:Rims II Multipliers, MDOT, BTP study consultant, Wilbur Smith Associates.

## Exhibit 13

**JOBS ATTRIBUTABLE TO  
OTSEGO COUNTY AIRPORT**

<u>JOB SOURCE</u>	<u>Full Time</u>	<u>Part Time</u>	<u>Total FEQ</u>
On-Site Jobs	7	3	8
Off-Site Jobs at Surveyed Firms	0	2	1
Induced Jobs			<u>103</u>
	<b>Total Jobs</b>		<b>112</b>

NOTE: FEQ denotes "full-time equivalent" jobs, calculated as two part-time jobs equal one full-time job.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

The RIMS model treats jobs as full-time-equivalents (FEQ). Consequently, the split between full-time and part-time for induced employment is not shown. The Exhibit shows that there are eight FEQ jobs at the airport, and another 104 located elsewhere in the northern lower peninsula region that are attributable to the airport. Many of these jobs are estimated to be in the hospitality industry, e.g. lodging, accommodations, recreation and food and beverage fields.

**Non-Economic Values**

Not all values a community derives from an airport are quantifiable in dollar terms. Otsego

County Airport plays an important role in linking area communities with services and markets in "downstate" Michigan.

The airport provides access to the latest medical diagnosis and treatment procedures. For example, blood and tissue samples are sent to downstate medical centers, and other specialist locations, for analysis, medical supplies not available locally (such as serums, antitoxins, isotopes, and organs for transplant operations) are shipped by air; and patients are moved by air for treatment procedures not available in their community. The airport manager reports that some 3,000 medical samples per year pass through the airport, enroute to downstate medical facilities for testing. The airport currently is served by seven scheduled courier flights weekly, which speed urgent and/or high value items onward to their destinations.

Otsego County Airport also supports the maintenance of essential community services and security. It is used for refueling to help locate and combat forest fires or chemical spills; to patrol pipelines and power lines, to support police, Civil Air Patrol and National Guard Activities. In case of natural disasters (fire, flood or blizzard) it is a resource for supply and evacuation.

In recent years, general aviation has become a major training ground for rewarding careers in the airline and aeronautical fields. The presence of an airport gives residents the option of flight instruction and ground service training.

The Airport and its staff participate in information programs aimed at assisting area young people to investigate career opportunities in aviation and to prepare for them. By doing so, they support local school programs.



# VALUE OF GLADWIN AIRPORT TO THE GLADWIN AREA

## Economic Values

Gladwin Airport is estimated to have an economic impact on its service area of approximately \$254,000 annually in total economic activity, of which \$71,000 is household earnings. This impact is due principally to the provision and use of general aviation services at the airport.

## Airport Characteristics

Owned jointly by the City and County of Gladwin, and operated by the City/County Airport Board, the airport is open to the public and has a "T-4" classification.

Airport Services - Gladwin Airport is a general aviation airport, offering the services listed in Exhibit 1.

### Exhibit 1

#### SERVICES OFFERED AT GLADWIN AIRPORT

General Aviation	Avgas Fuel Sales
Hangar Rental	Aircraft Repair
Tie Down	Flight Instruction
Aircraft Rental	Vending
Jet Fuel Sales	

SOURCE: Surveys by MDOT, Bureau of Transportation Planning (BTP) study consultants, Wilbur Smith Associates.

All of these services have positive economic significance to the Gladwin area. This is due to

the creation of employment, generation of taxes and potential attraction and retention of businesses for the area.

Airport Facilities - The airport is equipped for non-precision instrument approaches to its primary runway and is capable of handling over 90 percent of general aviation aircraft types. It has two runways, a passenger terminal, hangar space, and one Fixed-Base Operator (FBO) who provides aviation support services. Additional facilities are listed in Exhibit 2.

### Exhibit 2

#### FACILITIES AT GLADWIN AIRPORT

RUNWAYS	DESCRIPTION						
	<u>Lgth.</u>	<u>Surf.</u>	<u>Taxi Sys.</u>	<u>Edge Lts.</u>	<u>REIL</u>	<u>VASI</u>	<u>Instr. Appr.</u>
Primary	4,700	PV	TN	MIRL	Y	Y	NP
Crosswind	2,500	TF	N	ULMK	N	N	VIS

NOTES: PV denotes paved surface; Taxi system definitions are: FP = full parallel; PP = part parallel; and TN = turnaround area at runway ends. Runway lighting systems (Edge Lights) are designated HIRL = high intensity runway lights. MIRL medium intensity; LIRL, low intensity; ULMK = unlighted markers; Column heading REIL denotes Runway End Indicator Lights; VASI denotes Visual Approach Slope Indicator; column entries refer to presence of the equipment (Y denotes "yes"; N, "no"). Instrument approach facilities are: PR, Precision; NP, Non-Precision; or VIS, visual.

SOURCE: MDOT, BTP.

Airport Use - Gladwin Airport has substantial general aviation activity. A total of 15 single-engine general aviation aircraft are based at the airport.

Estimated aircraft operations for 1987 are given in Exhibit 3.

Exhibit 3

**AIRCRAFT OPERATIONS  
GLADWIN AIRPORT**

<u>TYPE OPERATION</u>	<u>1987</u>
Itinerant:	
General Aviation & Air Taxi <sup>1</sup>	3,780
Local:	
General Aviation	<u>3,780</u>
<b>Total</b>	<b>7,560</b>

SOURCE: MDOT, BTP.

(1) No split available.

Aircraft operations at the airport have generally remained stable in recent years, and are divided about equally between itinerant and local operations reflecting the use of the airport for recreation/training as well as for business purposes. The recent trend, revealed in Exhibit 4, shows a relative increase in itinerant operations.

Airport Economic Roles

A significant portion of aircraft activity at Gladwin Airport is business-related. Economic impacts are generated as follows.

Retention of Private Business - Gladwin Airport is considered valuable to the competitive position of a number of local firms and plants,

Exhibit 4

**OPERATIONS TREND  
GLADWIN AIRPORT**

<u>OPERATIONS</u>	<u>1983<sup>1</sup></u>	<u>1986<sup>1</sup></u>	<u>1987</u>
Itinerant	2,200	2,620	3,780
Local	<u>4,100</u>	<u>4,900</u>	<u>3,780</u>
<b>Totals</b>	<b>6,300</b>	<b>7,520</b>	<b>7,560</b>

(1) No count survey was made at this airport for the indicated years. Estimate is based on factor derived from representative airport.

SOURCE: MDOT, BTP.

some of which might choose to locate elsewhere if the facility were not present. These organizations use the general aviation services made possible by the airport's existence. However, the facility was not found to be directly responsible for any significant economic development in the service area.

Business-Oriented General Aviation - An estimated 40-50 percent of general aviation use at the airport is "business-oriented," and many of the region's businesses have aircraft at the airport including those listed in Exhibit 5.

Exhibit 5

**A SAMPLE OF FIRMS  
WHICH BASE AIRCRAFT  
GLADWIN AIRPORT**

Central Products, Inc.	MacLargo Machinery
Gladwin Flying Services	Robinson Industries
Wegner Forest Products	

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

In addition to firms with general aviation aircraft based at the airport, there are many others that depend on the airport, for various services, such as air taxi/charter service, air freight or corporate operations. These are important for sales, management and production activities of firms such as: Brown Machine; Consumers Power; Gladwin Auto Auction; GTE; Have Racing; Lyle Development; Northern Trails Trucking and Perry Drugs.

Airport Economic Impact

The Gladwin Airport aviation-related economic impact of \$254,000 annually is comprised of the impact types listed in Exhibit 6. The total impacts, by type, are summarized in Exhibit 7.

Exhibit 6

ANNUAL AVIATION-RELATED  
ECONOMIC IMPACT OF  
GLADWIN AIRPORT

<u>IMPACT TYPE</u>	<u>AMOUNT</u>
Direct	\$ 54,000
Indirect	124,000
Induced	<u>76,000</u>
<b>Total</b>	<b>\$254,000</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Exhibit 7

ESTIMATED ANNUAL ECONOMIC IMPACTS  
Gladwin Airport  
1987

<u>IMPACT TYPE AND SOURCE</u>	<u>AVIATION RELATED</u>	<u>NON-AVIATION RELATED (1)</u>	<u>TOTAL(1)</u>
	(-----thousands-----)		
<b>Direct Impacts:</b>			
Local Governments	9	0	9
Aviation Services	<u>45</u>	<u>0</u>	<u>45</u>
Subtotal	\$ 54	\$ 0	\$ 54
<b>Indirect Impacts:</b>			
Visitor Expenditures	\$ 104	\$ 0	\$ 104
Regional Expenditure	0	0	0
Corporate Operations & Other	<u>20</u>	<u>0</u>	<u>20</u>
Subtotal	\$ 124	\$ 0	\$ 124
<b>Induced Impacts:</b>	76		
<b>Total Annual Impacts</b>	<u>\$ 254</u>		

(1) Only aviation-related impacts are considered in this study.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

Direct Economic Impact - The "direct" impacts comprise the value of those activities involved in providing aviation services at the airport. Exhibit 8 lists the airport tenants and others included in the impact estimates. Direct impacts are listed in Exhibit 9.

"Direct" payroll comprises payments to those people who work at the airport, are employed by the Airport Board, FBO, corporate users, or other tenants. "Capital expenditures" include improvements to on-site facilities of tenants as well as to the airport itself. "Operating expenses" are local expenditures by the tenants or airport operator.

Exhibit 9

ESTIMATED "DIRECT" ANNUAL IMPACTS  
GLADWIN AIRPORT

<u>DIRECT IMPACT</u>	<u>AMOUNT</u>
Direct Payroll	\$50,000
Operating Expenses	3,000
Refueling Service	<u>1,000</u>
<b>Total</b>	<b>\$54,000</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Exhibit 8  
ORGANIZATIONS AND FIRMS CREATING ECONOMIC IMPACTS  
Gladwin Airport  
1988

<u>ORGANIZATION</u>	<u>ATTRIBUTION OF ACTIVITY</u>			<u>ECONOMIC ACTIVITY</u>
	<u>On-Site</u> <sup>(1)</sup>	<u>Off-Site</u> <sup>(2)</sup>	<u>Non-Aviation</u> <sup>(3)</sup>	
Local Government: City/County Airport	X			Airport Operations
Aviation Services: Gladwin Air Service	X			Fixed-Base Operator
Skyvue	X			Flying Club
Other: Corporate Air Operations		X		Hangar Leases, Company Aircraft Activity

- (1) Economic activity on airport property, by an airport tenant, treated as "direct" economic impact.
- (2) Economic activity not taking place on airport property, but which is directly aviation-related to this airport. Treated as an "indirect" economic impact.
- (3) Activity which is not related to or dependent on aviation activities. Not included in the impact estimates.

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

**Indirect Economic Impacts** - Gladwin Airport "indirect" impacts are caused by airport use in the form of expenditures by air travelers and by those firms that depend on the airport for their business.

It is estimated that almost 4,000 visitors to the Gladwin area arrived via Gladwin Airport by general aviation in 1987. Based on approximate proportions of those staying overnight (more than one day) it is estimated that the average visitor spends approximately \$30.30 per trip at off-airport locations in the Gladwin area. Local residents using the airport spend only nominal amounts of money.

The aviation-related indirect economic impacts attributable to Gladwin Airport total \$124,000, as shown in Exhibit 10. The visitor expenditures breakdown by expenditure type is based on a mix of tourist, business and personal travel derived from the results of surveys made at other airports. Since no Michigan surveys were available, these were adjusted to reflect a range of values judged to be appropriate for local conditions. All visitor expenditures are at the actual cost outlay except retail sales which, since it is a margin industry, is shown at 20 percent of the actual expenditures. Expenditures by airport-dependent firms consist of those costs attributable to airport-related activity.

**Induced Economic Impact** - "Direct" economic impacts of about \$54,000, and "indirect" impacts of \$124,000, represent increases in final demand for goods and services in the Gladwin region. To these must be added a "multiplier" effect produced by circulation of the money through the regional economy. To determine this "induced" impact, the U.S. Department of Commerce "Regional Input-Output Modeling System" (RIMS-II) was used. It was found that the induced impact produced by Gladwin Airport in 1987 was approximately \$76,000.

**Airport Derived Employment**

One element in an airport's economic impact total is the employment which the airport creates. People are employed in airport-related activities at the airport (the FBO, the Airport Board, etc.) and at other off-airport sites (hotels, manufacturing concerns, etc.). Furthermore, the direct and indirect expenditures attributable to the airport continue to flow through the region's

Exhibit 10

**INDIRECT IMPACTS OF  
GLADWIN AIRPORT**

<u>REGIONAL EXPENDITURES BY SOURCE</u>	<u>ANNUAL IMPACT</u>
Visitor Expenditures:	
Lodging	\$ 35,000
Food & Beverage	30,000
Retail Sales	3,000
Entertainment	9,000
Ground Transport	8,000
Business	6,000
Other	<u>13,000</u>
Subtotal	\$104,000
Resident Expenditures	-- (negl.)
Corporate Air Opns.	<u>20,000</u>
<b>Total</b>	<b>\$124,000</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

economy creating additional employment (the "multiplier" effect). A summary of the jobs estimated to be attributable to Gladwin Airport is given in Exhibit 11.

Exhibit 11

**JOBS ATTRIBUTABLE TO  
GLADWIN AIRPORT**

<u>JOB SOURCE</u>	<u>Full Time</u>	<u>Part Time</u>	<u>Total FEQ</u>
Direct On-Site Jobs	1	2	2
Indirect Off-Site Jobs at Surveyed Firms	--	2	1
Induced and Other Indirect Jobs			--
<b>Total Jobs</b>			<b>3</b>

NOTE: FEQ denotes "full-time equivalent" jobs, calculated as two part-time jobs equal one full-time job.

SOURCE: MDOT, BTP study consultants, Wilbur

The RIMS model treats jobs as full-time-equivalents (FEQ). Consequently, the split between full-time and part-time for induced employment is not shown. The Exhibit shows that there are two FEQ jobs at the airport, and another one located elsewhere in the region, that are attributable to the airport.

Industries Which Benefit

The economic activities at Gladwin Airport produce expenditures for a wide variety of goods and services. Many types of industry benefit, whether or not they are themselves airport users. Exhibit 12 lists impacted industry groups, and shows the extent to which each benefits from Gladwin Airport in terms of total economic activity earnings and employment.

Exhibit 12  
**ECONOMIC IMPACT OF GLADWIN MUNICIPAL AIRPORT  
 1987**

<u>IMPACTED INDUSTRY GROUPS</u>	<u>TOTAL ANNUAL IMPACT (Output) (.....Thousands.....)</u>	<u>TOTAL ANNUAL PAYROLL (Earnings)(1)</u>	<u>EMPLOYMENT (Jobs)</u>
Ag. Prod., Forestry Svcs.	\$3	\$0	0
Crude Petrol.	1	0	0
Maint. and Repair Const.	3	1	0
Food, Kindred Prd.	3	0	0
Printing, Publishing	1	0	0
Transportation	99	30	1
Communications	5	0	0
Utilities	5	0	0
Wholesale Trade	4	2	0
Retail Trade	13	5	0
Finance	2	0	0
Insurance	1	0	0
Real Estate	11	0	0
Lodging, Amusements	44	15	1
Business Services	13	5	0
Eating, Drinking Estab.	36	10	1
Health Services	4	2	0
Other Services	6	1	0
<b>Total</b>	<b>\$254</b>	<b>\$71</b>	<b>3</b>

(1) The portion of the "output" column inputs that is payroll to employed persons.

SOURCE: Rims II Multipliers, MDOT, BTP study consultant, Wilbur Smith Associates.

### Non-Economic Values

Not all values a community derives from an airport are quantifiable in dollar terms. Gladwin Airport provides local residents with alternative linkages to Michigan and beyond.

The local airport provides access to the latest medical diagnosis and treatment procedures. For example, blood and tissue samples are sent to large medical centers, and other specialist locations, for analysis: Medical supplies not available locally (such as serums, antitoxins, isotopes, and organs for transplant operations) are shipped by air; and patients are moved by air for treatment procedures not available in their community.

Gladwin Airport also supports the maintenance of essential community services and security. It is used to help locate and combat forest fires

(e.g. aircraft flying in and out of Gladwin generally cooperate with the Michigan Department of Natural Resources to be alert to signs of smoke in the forest area and to pass along information on suspicious sightings); to patrol pipelines and power lines, to support police, Civil Air Patrol and National Guard Activities. In case of natural disasters (flood or fire) it is a vital resource for supply and evacuation.

In recent years, general aviation has become a major training ground for rewarding careers in the airline and aeronautical fields. The presence of an airport gives residents the option of flight instruction and ground service training. Gladwin Airport's non-precision approach equipment is frequently used for practice instrument approaches by pilots from other airports, according to the FBO.

# VALUE OF KENT COUNTY INTERNATIONAL AIRPORT TO THE GRAND RAPIDS AREA

## Economics Values

Kent County International Airport is estimated to have an economic impact on its service area of approximately \$240 million annually in total economic activity, of which \$81 million is household earnings. This impact is due principally to the provision of and use of scheduled air carrier services, general aviation services, and to the sizeable federal government operations at the airport.

## Airport Characteristics

Owned and operated by Kent County, the airport is open to the public, has a "T-5" classification, and is the second largest airport in Michigan in terms of annual scheduled passenger usage.

Airport Services - Kent County International Airport is a full-service scheduled air carrier and general aviation airport, offering nearly everything desired of such airports, including the items listed in Exhibit 1.

### Exhibit 1

#### SERVICES OFFERED AT KENT COUNTY INTERNATIONAL AIRPORT

Scheduled Air Carrier	Avgas Fuel Sales
Commuter Air	Aircraft Repair
General Aviation	Avionics Repair
Hangar Rental	Flight Instruction
Tie Down	Car Rental
Aircraft Rental	Restaurant
Aircraft Sales	Vending
Jet Fuel Sales	Control Tower
Fire Station	U.S. Customs
Post Office	Weather Bureau

SOURCE: Surveys by MDOT, Bureau of Transportation Planning (BTP) study consultants, Wilbur Smith Associates.

All of these services have positive economic significance to the Grand Rapids area. This is due to the creation of employment, generation of taxes

and potential attraction and retention of businesses for the area.

Airport Facilities - The airport is an all-weather facility capable of handling up to 747 jet aircraft on the primary 10,000-foot runway. It has three runways, is towered, has a fine passenger terminal, recently constructed additional hangar space, and has three Fixed-Base Operators (FBO) who provide aviation support services.

### Exhibit 2

#### FACILITIES AT KENT COUNTY INTERNATIONAL AIRPORT

RUNWAYS	DESCRIPTION						
	Lgth.	Surf.	Sys.	Taxi Lts.	Edge REIL	Inst. VASI	Instr. Appr.
Primary	10,000	PV	FP	HIRL	Y	Y	PR
Crosswind	3,400	PV	FP	MIRL	Y	Y	VIS
Crosswind	3,900	PV	FP	MIRL	Y	Y	VIS

NOTES: PV denotes paved surface; Taxi system definitions are: FP = full parallel; PP = part parallel; and TN = turnaround area at runway ends. Runway lighting systems (Edge Lights) are designated HIRL = high intensity runway lights. MIRL medium intensity; or LIRL, low intensity. Column heading REIL denotes Runway End Indicator Lights; VASI denotes Visual Approach Slope Indicator; column entries refer to presence of the equipment (Y denotes "yes"; N, "no"). Instrument approach facilities are: PR, Precision; NP, Non-Precision; or VIS, visual.

SOURCE: MDOT, BTP.

Airport Use - Kent County Airport currently is served by ten scheduled air carriers:

Air Canada	Northwest Airlink
American	Piedmont
American Eagle	Midway Connection
Delta Connection	United
Northwest	US Air



The facility also has substantial general aviation activity. A total of 163 general aviation aircraft are based at the airport, as itemized in Exhibit 3.

**Exhibit 3  
NUMBERS OF BASED AIRCRAFT  
KENT COUNTY INTERNATIONAL  
AIRPORT**

<u>AIRCRAFT TYPE</u>	<u>1988</u>
Single Engine	92
Multi-Engine	47
Jet	20
Helicopters	<u>4</u>
<b>Total Aircraft</b>	<b>163</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Estimated aircraft operations for 1986 and 1987 are given in Exhibit 4. Military operations are normally training for military aircraft based elsewhere.

**Exhibit 4  
AIRCRAFT OPERATIONS  
KENT COUNTY INTERNATIONAL  
AIRPORT**

<u>TYPE OPERATION</u>	<u>1986</u>	<u>1987</u>
<b>Itinerant:</b>		
Air Carrier	26,730	23,290
Air Taxi	14,732	22,286
General Aviation	57,136	61,245
Military	<u>1,373</u>	<u>1,297</u>
Subtotal Itinerant	99,971	108,118
<b>Local:</b>		
General Aviation	31,242	35,808
Military	<u>1,969</u>	<u>1,372</u>
Subtotal Local	33,211	37,180
<b>Total</b>	<b>133,182</b>	<b>145,298</b>

SOURCE: MDOT, BTP.

Aircraft operations at the airport declined about three percent in 1986, then increased by nine percent in 1987, to post an overall gain of about six percent for the 1985-1987 period as shown in Exhibit 5. Aircraft operations are largely itinerant in nature, reflecting use of the airport as a transportation facility rather than as a training airport.

**Exhibit 5  
OPERATIONS TREND  
KENT COUNTY INTERNATIONAL  
AIRPORT**

<u>OPERATIONS</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>
Itinerant	100,958	99,971	108,118
Local	<u>36,202</u>	<u>33,211</u>	<u>37,180</u>
<b>Totals</b>	<b>137,160</b>	<b>133,182</b>	<b>145,298</b>

SOURCE: MDOT, BTP.

Air passenger traffic increased significantly from about 1.2 million in 1985 to over 1.3 million in 1987. Currently, scheduled air carrier passenger traffic averages about 3,700 arrivals and departures per day. These are served by 51 flights.

**Exhibit 6  
AIR CARRIER PASSENGERS  
KENT COUNTY INTERNATIONAL  
AIRPORT**

<u>PASSENGERS</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>
Deplaned	99,636	626,168	665,230
Enplaned	<u>595,605</u>	<u>617,461</u>	<u>673,736</u>
<b>Totals</b>	<b>1,195,241</b>	<b>1,243,629</b>	<b>1,338,966</b>

SOURCE: MDOT, BTP.

Air cargo tonnage increased from 8,726 in 1985 to over 10,400 in 1986, as shown in Exhibit 7. The sharp drop in 1987, to 1,668.7 tons, reflects a decision by United Parcel Service to relocate their lower Michigan consolidation point from Kent County International Airport to Capital City Airport in Lansing, where a comparable increase occurred. Even after the change, air cargo movement continues to be an important activity at Kent County International Airport.

**Exhibit 7  
AIR CARGO HANDLED AT  
KENT COUNTY INTERNATIONAL  
AIRPORT**

CARGO MOVEMENT	CARGO TONS		
	1985	1986	1987
Deplaned	4,176.4	5,084.4	1,291.4
Enplaned	<u>4,549.6</u>	<u>5,361.1</u>	<u>377.3</u>
Totals	<u>8,726.0</u>	<u>10,445.5</u>	<u>1,668.7</u>

SOURCE: MDOT, BTP.

**Airport Economic Roles**

Kent County International Airport is a business-oriented airport, with the following comprising the airport's principal economic impact types.

**Retention of Private Business** - Kent County International Airport is considered valuable to the competitive position of a number of local firms and plants, some of which might choose to locate elsewhere if the facility were not present. These organizations use the use the air passenger, commuter air and general aviation services made possible by the airport. "Just-in-Time" cargo delivery to the area's industries is seen as a valuable service made possible by the airport's existence. However, the facility was not found to be directly responsible for any significant economic development in the service area.

**Business-Oriented General Aviation** - An estimated 75-85 percent of general aviation use at the airport is "business-oriented," and many of the region's businesses have aircraft at the airport including those listed in Exhibit 8.

In addition to firms with general aviation aircraft based at the airport, there are many others that depend on the airport, for various services, such as scheduled passenger service, air taxi/charter service, air freight etc. These are important for sales, management and production activities.

**Exhibit 8  
A SAMPLE OF FIRMS  
WHICH BASE AIRCRAFT  
AT KENT COUNTY INTERNATIONAL  
AIRPORT**

Amerkam, Inc.	Michigan Petroleum Exploration, Inc.
Amway Corp.	Meijer, Inc.
Bissell, Inc.	Northern Air Service
Booth Newspapers	Omega Construction Ptnrs.
Grand Rapids School of Bible and Music	Progressive Heat Treating
Guardman Chemical Co.	Steelcase, Inc.
Herman Miller, Inc.	Ter-Low, Inc.
Isseway Flying Club	US Engineering Corp.
Jet Electronics & Technology	Universal Forest Products
K&N Enterprises, Inc.	Wolverine Worldwide
Lacks Industries, Inc.	
West Michigan Aviation	

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

**Airport Economic Impact**

The Kent County International Airport Airport aviation-related economic impact of \$240 million annually comprises the impact types listed in Exhibit 9.

**Exhibit 9  
ANNUAL AVIATION-RELATED  
ECONOMIC IMPACT OF  
KENT COUNTY INTERNATIONAL  
AIRPORT**

IMPACT TYPE	AMOUNT
Direct	\$ 34,862,100
Indirect	103,694,200
Induced	<u>101,474,700</u>
<b>Total</b>	<b>\$240,031,000</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

The total impacts, by type, are summarized in Exhibit 10. These include \$381,945 in capital aid funds: \$374,940 Federal and \$6,455 from MDOT. There are some impacts at the airport which are not necessarily attributable to aviation, e.g., the weather service that serves more than just the airport. Also, some aviation activities serve more than the Grand Rapids locality (e.g., an FAA district office involving General Aviation Safety). This study assesses only the local aviation-related impacts.

**Direct Economic Impact** - The "direct" impacts comprise the value of those activities involved in providing aviation services at the airport. Exhibit 11 lists the airport tenants and others included in the impact estimates. The make-up of the direct impacts is given in Exhibit 12.

**Exhibit 12**  
**ESTIMATED "DIRECT" ANNUAL IMPACTS**  
**KENT COUNTY INTERNATIONAL**  
**AIRPORT**

<u>DIRECT</u> <u>IMPACT</u>	<u>AMOUNT</u>
Direct Payroll	\$19,438,700
Capital Expenditures	927,000
Operating Expenses	14,337,200
Refueling Service	<u>159,200</u>
<b>Total</b>	<b>\$34,862,100</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

**Exhibit 10**

**ESTIMATED ANNUAL ECONOMIC IMPACTS**  
**Kent County International Airport**  
**1987**

<u>IMPACT TYPE AND SOURCE</u>	<u>AVIATION</u> <u>RELATED</u>	<u>NON-AVIATION</u> <u>RELATED (1)</u>	<u>TOTAL(1)</u>
	(-----thousands-----)		
<b>Direct Impacts:</b>			
Air Carrier Operations	\$8,183.7	\$ 0	\$ 8,183.7
Federal Government	4,076.3	235.9	4,312.2
Local Governments	3,679.3	0	3,679.3
Air Passenger Services	5,161.9	368.5	5,530.4
Aviation Services	<u>13,760.9</u>	<u>87.3</u>	<u>13,848.2</u>
Subtotal	\$ 34,862.1	\$ 691.7	\$ 35,553.8
<b>Indirect Impacts:</b>			
Visitor Expenditures	\$ 89,258.9	\$ 0	\$ 89,258.9
Regional Expenditure	2,353.5	0	2,353.5
Corporate Operations & Other	5,898.8	0	5,898.8
Dependent Firms	<u>6,183.0</u>	<u>0</u>	<u>6,183.0</u>
Subtotal	\$103,694.2	\$ 0	\$103,694.2
<b>Induced Impacts:</b>	<b>101,474.7</b>		
<b>Total Annual Impacts</b>	<b>\$240,031.0</b>		

(1) Only aviation-related impacts are considered in this study.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

Exhibit 11  
**ORGANIZATIONS AND FIRMS CREATING ECONOMIC IMPACTS**  
**Kent County International Airport**  
**1988**

<u>ORGANIZATION</u>	<u>ATTRIBUTION OF ACTIVITY</u>			<u>ECONOMIC ACTIVITY</u>
	<u>Aviation-Related</u>		<u>Non-Aviation</u> <sup>(3)</sup>	
	<u>On-Site</u> <sup>(1)</sup>	<u>Off-Site</u> <sup>(2)</sup>		
<b>Air Carrier Operations:</b>				
Air Canada	X			Airline
American Airlines	X			Airline
American Eagle	X			Airline
Delta Connection	X			Airline
Midway Connection	X			Airline
Northwest	X			Airline
Northwest AirlinK	X			Airline
Piedmont	X			Airline
United	X			Airline
USAir	X			Airline
<b>Federal Government:</b>				
Federal Aviation Admin.				
Air Traffic Control	X			Control Tower
Airways Facils. Svs.	X	X		Facility Maintenance Unit
General Aviation				
District Office	X	X		Aviation Safety Supervision
National Oceanographic and Atmospheric Administration				
	X		X	National Weather Service
<b>Local Government:</b>				
County Airport	X			Airport Operations
<b>Aviation Services:</b>				
AMR Services	X			Fixed-Base Operator
Northern Air	X			Fixed-Base Operator
Sparta Rapid Air Svs.	X			Fixed-Base Operator
W. Mich. Av. Svs.	X	X		Air Charter Services
Air Transfer Svs.	X	X		Air Cargo Handling
Airborne Express	X	X		Air Cargo
Federal Express	X	X		Express Parcel Service
R.J. McCracken	X		X	Customs Broker
Butterworth Aero Med	X			Emergency Medical Transpt.

(continued)

Exhibit 11  
(continued)  
**ORGANIZATIONS AND FIRMS CREATING ECONOMIC IMPACTS**  
Kent County International Airport  
1988

<u>ORGANIZATION</u>	<u>ATTRIBUTION OF ACTIVITY</u>			<u>ECONOMIC ACTIVITY</u>
	<u>Aviation-Related</u>		<u>Non-Aviation</u> <sup>(3)</sup>	
	<u>On-Site</u> <sup>(1)</sup>	<u>Off-Site</u> <sup>(2)</sup>		
<b>Air Passenger Services:</b>				
Hertz	X			Car Rental
National	X			Car Rental
Budget	X			Car Rental
Host International	X		X	Restaurant, Snack bar, Gift Shop
Airport Parking Co.	X			Parking
J&J Security	X			Passenger Screening
<b>Other:</b>				
Corporate Air Operations	X	X		Hangar Leases, Company Aircraft Activity
Travel Agencies		X	X	Travel Arrangements

- (1) Economic activity on airport property, by an airport tenant, treated as "direct" economic impact.
- (2) Economic activity not taking place on airport property, but which is directly aviation-related to this airport. Treated as an "indirect" economic impact.
- (3) Activity which is not related to or dependent on aviation activities. Not included in the impact estimates.

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

"Direct" payroll comprises payments to those people who work at the airport, are employed by the airlines, FBO, corporate users, restaurant, or other tenants. "Capital expenditures" include improvements to on-site facilities of tenants as well as to the airport itself. "Operating expenses" are local expenditures by the tenants or airport operator.

**Indirect Economic Impacts** - Kent County International Airport "indirect" impacts are caused by airport use in the form of expenditures by air travelers and by those firms that depend on the airport for their business.

It is estimated that over 410,000 visitors to the Grand Rapids area arrive via Kent County International Airport annually (332,600 by scheduled air carrier, 61,200 by private or corporate aircraft and 16,700 by air taxi in 1987). Based on approximate proportions of those staying overnight (more than one day) it is estimated that the average visitor spends approximately \$239.85 per trip at off-airport locations in the Grand Rapids area. Local residents using the airport also spend money -- some \$2.35 million per year locally (in addition to moneys spent at the airport). Furthermore, there are some 55 travel agencies in the region. Surveys indicate that, taken together, about 90 percent of their economic activity (e.g. ticket sales) is related to aviation. Of this, about 40 percent is related to Kent County International Airport.

The aviation-related indirect economic impacts attributable to Kent County International Airport total \$103.7 million, as shown in Exhibit 13. The visitor expenditures breakdown by expenditure type is based on a mix of tourist, business and personal travel derived from the results of surveys made at other airports. Since no Michigan surveys were available, these were adjusted to reflect a range of values judged to be appropriate for local conditions. All visitor expenditures are at the actual cost outlay except retail sales which, since it is a margin industry, is shown at 20 percent of the actual expenditures. Expenditures by airport-dependent firms consist of those costs attributable to airport-related activity.

**Induced Economic Impact** - "Direct" economic" impacts of about \$34.9 million, and

## Exhibit 13

**INDIRECT IMPACTS OF  
KENT COUNTY INTERNATIONAL  
AIRPORT**

<u>REGIONAL EXPENDITURES BY SOURCE</u>	<u>ANNUAL IMPACT</u>
Visitor Expenditures:	
Lodging	\$30,133,700
Food & Beverage	25,406,900
Retail Sales	2,304,300
Entertainment	7,779,600
Ground Transport	6,794,900
Business	5,514,700
Other	<u>11,324,800</u>
Subtotal	\$89,258,900
Resident Expenditures	2,353,500
Corp. Air Opns.	5,898,800
Dependent Firm Expenditures	<u>6,183,000</u>
Total	\$103,694,200

**SOURCE:** Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

"indirect" impacts of \$103.7 million, represent increases in final demand for goods and services in the Grand Rapids region. To these must be added a "multiplier" effect produced by circulation of the money through the regional economy. To determine this "induced" impact, the U.S. Department of Commerce "Regional Input-Output Modeling System" (RIMS-II) was used. It was found that the induced impact produced by Kent County International Airport in 1987 was approximately \$101,474,700.

**Industries Which Benefit**

The economic activities at Kent County International Airport produce expenditures for a wide variety of goods and services. Many types of industry benefit, whether or not they are themselves airport users. Exhibit 14 lists impacted industry groups, and shows the extent to which each benefits from Kent County International Airport in terms of total economic activity earnings and employment.

Exhibit 14  
**TOTAL ANNUAL ECONOMIC IMPACT**  
 Kent County International Airport  
 1987

<u>IMPACTED INDUSTRY GROUPS</u>	<u>TOTAL ANNUAL IMPACT (Output)</u> (.....Thousands.....)	<u>TOTAL ANNUAL PAYROLL (Earnings)(1)</u> (.....Thousands.....)	<u>EMPLOYMENT (Jobs)</u>
Ag. Prod., Forestry Svcs.	\$457	\$177	22
Crude Petrol.	11	0	0
Other Mining	18	3	0
New Construction	927	364	14
Maint. and Repair Const.	3,303	1,520	57
Food, Kindred Prd.	7,501	1,053	37
Textile Mill Products	33	4	0
Apparel	211	55	2
Apparel, Allied Products	496	117	3
Printing, Publishing	2,047	704	30
Chemicals, Refined Petrol.	2,491	228	6
Rubber, Leather Prod.	1,304	311	13
Lumber, Furniture Prod.	234	65	3
Stone, Clay, Glass Prod.	615	196	6
Primary Metals	967	226	6
Fabricated Metals	1,422	390	12
Non-electrical Machinery	658	221	6
Electrical Machinery	485	139	5
Motor Vehicles, Equipment	3,285	543	11
Other Transportation Equip.	387	130	4
Instruments	81	28	1
Miscellaneous Mfg.	471	137	7
Transportation	61,009	23,589	858
Communications	4,111	1,084	30
Utilities	7,782	783	20
Wholesale Trade	7,000	2,730	93
Retail Trade	10,413	5,161	384
Finance	2,744	772	33
Insurance	3,538	1,158	43
Real Estate	11,638	321	80
Lodging, Amusements	40,019	14,173	1,375
Personal Services	2,153	975	97
Business Services	21,449	9,528	439
Eating, Drinking Estab.	30,534	9,519	1,191
Health Services	4,510	2,614	116
Other Services	5,727	1,834	105
Households	--	305	66
<b>TOTALS</b>	<b>\$240,031</b>	<b>\$81,137</b>	<b>5,175</b>

(1) The portion of the "output" column inputs that is payroll to employed persons.

SOURCE: Rims II Multipliers, Wilbur Smith Associates.

**Airport Derived Employment**

An important element in the Kent County International Airport economic impact total is the employment which the airport creates. People are employed in airport-related activities at the airport (the FBO, airlines, federal government, County, etc.) and at other off-airport sites (hotels, manufacturing concerns, etc.). Furthermore, the direct and indirect expenditures attributable to the airport continue to flow through the region's economy creating additional employment (the "multiplier" effect). A summary of the jobs estimated to be attributable to Kent County International Airport is given in Exhibit 15.

Exhibit 15

**JOBS ATTRIBUTABLE TO  
KENT COUNTY INTERNATIONAL  
AIRPORT**

<u>JOB SOURCE</u>	<u>Full Time</u>	<u>Part Time</u>	<u>Total FEQ</u>
Direct On-Site Jobs	732	152	808
Indirect Off-Site Jobs at Surveyed Firms	6	12	12
Induced and Other Indirect Jobs			<u>4,355</u>
		<b>Total Jobs</b>	<b>5,175</b>

NOTE: FEQ denotes "full-time equivalent" jobs, calculated as two part-time jobs equal one full-time job.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

The RIMS model treats jobs as full-time-equivalents (FEQ). Consequently, the split between full-time and part-time for induced employment is not shown. The Exhibit shows that there are 808 FEQ jobs at the airport, and another 12 located

elsewhere in the region that are attributable to the airport. Airport economic activity supports an estimated 4,355 jobs elsewhere in the Southern Michigan regional economy to bring the total estimated employment impact to some 5,175 full-time equivalent jobs.

**Non-Economic Values**

Not all values a community derives from an airport are quantifiable in dollar terms. Kent County International provides Grand Rapids residents with alternative linkages to Michigan and beyond.

The airport provides speedy access to the latest medical diagnosis and treatment procedures. For example, blood and tissue samples are sent to specialist locations for analysis; medical supplies not available locally (such as serums, antitoxins, isotopes, and organs for transplant operations) are shipped by air; and patients are moved by air for treatment procedures not available in their community. Air ambulance services make frequent use of Kent County Airport and Butterworth Aeromed, Inc. bases its helicopter and emergency medical evacuation team at the Airport.

Kent County Airport also supports the maintenance of essential community services and security. It is a refueling resource for patrol, search and surveillance aircraft. In case of natural disasters (fire, flood or blizzard) it is a vital resource for supply and evacuation. During the summer of 1988, the Airport served as a U.S. Forest Service mobilization point (with free parking) for volunteer forest fire fighters who assembled for flights to the Pacific Northwest.

In recent years, general aviation has become a major training ground for rewarding careers in the airline and aeronautical fields. The presence of an airport gives residents the option of flight instruction and ground service training. Kent County Airport supports and supplements local school and college programs by hosting visits by groups from schools or community organizations, such as the scouts. Kent County Airport operated a career intern program for community college upperclass students.



# VALUE OF HOUGHTON COUNTY MEMORIAL AIRPORT TO THE HOUGHTON/HANCOCK AREA

## Economic Values

Houghton County Memorial Airport is estimated to have an economic impact on its service area of approximately \$5.4 million annually in total economic activity, \$1.7 million of which is household earnings. This impact is due principally to the provision and use of commuter air carrier and general aviation services at the airport.

## Airport Characteristics

Owned and operated by Houghton County, the airport is open to the public, has a "T-5" classification, and is the twelfth largest airport in Michigan in terms of annual scheduled passenger usage.

Airport Services - Houghton County Memorial Airport is a commuter air carrier and general aviation airport, offering the services listed in Exhibit 1.

### Exhibit 1

#### SERVICES OFFERED AT HOUGHTON COUNTY MUNICIPAL AIRPORT

Commuter Air	Avgas Fuel Sales
Air Taxi	Flight Instruction
General Aviation	Car Rental
Hangar Rental	Restaurant
Tie Down	Vending
Aircraft Rental	Ground Transport
Jet Fuel Sales	Weather Station

SOURCE: Surveys by MDOT, Bureau of Transportation Planning (BTP) study consultants, Wilbur Smith Associates.

All of these services have positive economic significance to the Hancock area. This is due to the creation of employment, generation of taxes and potential attraction and retention of businesses for the area.

Airport Facilities - The airport is an all-weather facility capable of handling virtually all general aviation aircraft types. It has two runways, a rotating beacon, segmented circle, lighted wind direction indicator, passenger terminal and hangar space. Additional facilities are listed in Exhibit 2.

### Exhibit 2

#### FACILITIES AT HOUGHTON COUNTY MEMORIAL AIRPORT

	<u>RUNWAYS</u>							<u>DESCRIPTION</u>		
	<u>Lgth.</u>	<u>Surf.</u>	<u>Sys.</u>	<u>Taxi</u>	<u>Edge</u>	<u>REIL</u>	<u>VASI</u>	<u>Instr.</u>	<u>Appr.</u>	
Primary	6,500	PV	N		HIRL	Y	N	PR		
Crosswind	5,200	PV	N		HIRL	Y	N	NP		

NOTES: PV denotes paved surface; Taxi system definitions are: FP = full parallel; PP = part parallel; and TN = turnaround area at runway ends. Runway lighting systems (Edge Lights) are designated HIRL = high intensity runway lights. MIRL medium intensity; or LIRL, low intensity. Column heading REIL denotes Runway End Indicator Lights; VASI denotes Visual Approach Slope Indicator; column entries refer to presence of the equipment (Y denotes "yes"; N, "no"). Instrument approach facilities are: PR, Precision; NP, Non-Precision; or VIS, visual.

SOURCE: MDOT, BTP.

Airport Use - Houghton County Memorial Airport currently is served by two commuter air carriers, (Northwest Air Link and American Eagle, both operated by Simmons) and has substantial general aviation activity. A total of 17 general aviation aircraft are based at the airport, as itemized in Exhibit 3.

## Exhibit 3

**NUMBERS OF BASED AIRCRAFT  
HOUGHTON COUNTY MEMORIAL  
AIRPORT**

<u>AIRCRAFT TYPE</u>	<u>1988</u>
Single Engine	13
Multi-Engine	<u>4</u>
<b>Total Aircraft</b>	<b>17</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Estimated aircraft operations for 1987 are given in Exhibit 4. Military operations are normally operations for USCG or other armed forces aircraft based elsewhere.

## Exhibit 4

**AIRCRAFT OPERATIONS  
HOUGHTON COUNTY MEMORIAL  
AIRPORT**

<u>TYPE OPERATION</u>	<u>1987</u>
Itinerant	9,960
Local	<u>6,640</u>
<b>Total</b>	<b>16,600</b>

SOURCE: MDOT, BTP.

Aircraft operations at the airport have generally remained stable in recent years, and consist of roughly equal proportions of itinerant and local flights, reflecting the use of the airport both as a transportation facility and a training airport. Recent annual data are given in Exhibit 5.

Air passenger use has declined since 1985, after a period of stability. Airport management suggests that the decrease reflects transfer of passengers

## Exhibit 5

**OPERATIONS TREND  
HOUGHTON COUNTY MEMORIAL  
AIRPORT**

<u>OPERATIONS</u>	<u>1981</u>	<u>1983<sup>1</sup></u>	<u>1987<sup>1</sup></u>	<u>1987</u>
Itinerant	7,800	5,960	7,990	9,960
Local	<u>7,800</u>	<u>5,960</u>	<u>7,990</u>	<u>6,640</u>
<b>Totals</b>	<b>15,600</b>	<b>11,920</b>	<b>15,980</b>	<b>16,600</b>

(1) No count survey was conducted at this airport for the indicated years. Estimate is based on factor derived from representative airports.

SOURCE: MDOT, BTP.

to alternative airports (Green Bay and Marquette) where better service is perceived. Recent trends are shown in Exhibit 6. Currently, an average of about 81 people use the scheduled air carrier services daily. Scheduled flights number six per day to the hubs in Detroit and Chicago via Marquette.

## Exhibit 6

**AIR CARRIER PASSENGERS  
HOUGHTON COUNTY MEMORIAL  
AIRPORT**

<u>PASSENGERS</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>
Deplaned	20,448	16,026	14,311
Enplaned	<u>21,167</u>	<u>16,674</u>	<u>15,417</u>
<b>Totals</b>	<b>41,615</b>	<b>32,700</b>	<b>29,728</b>

SOURCE: MDOT, BTP.

Although air cargo tonnage has declined over the period 1985-1987, it continues to be an important activity at Houghton County Memorial Airport, as shown in Exhibit 7. Preliminary figures for 1988 indicated a sharp increase in cargo volumes.

## Exhibit 7

**AIR CARGO HANDLED AT  
HOUGHTON COUNTY MEMORIAL  
AIRPORT**

CARGO MOVEMENT	CARGO TONS		
	1985	1986	1987
Deplaned	23.0	11.6	8.6
Enplaned	24.0	15.9	11.1
Totals	47.0	27.5	19.7

SOURCE: MDOT, BTP.

Airport Economic Roles

Houghton County Memorial Airport has substantial business-related activity, with the following comprising the airport's principal economic impact types.

Retention of Private Business - Houghton County Memorial Airport is considered valuable to the competitive position of a number of local firms and plants, some of which might choose to locate elsewhere if the facility were not present. These organizations use the general aviation services made possible by the airport's existence. However, the facility was not found to be directly responsible for any significant economic development in the service area.

Business-Oriented General Aviation - An estimated 40-50 percent of general aviation use at the airport is "business-oriented," and a number of of the region's businesses have aircraft at the airport including those listed in Exhibit 8.

## Exhibit 8

**A SAMPLE OF FIRMS  
WHICH BASE AIRCRAFT  
AT HOUGHTON COUNTY MEMORIAL  
AIRPORT**

Alex Aviation	MI Dept. of Nat'l.
Maki Oil Company	Resources
	Superior Aviation

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

In addition to firms with general aviation aircraft based at the airport, there are others that depend on the airport, for various services, such as

scheduled passenger service, air taxi/charter service, air freight etc. These are important for sales, management and production activities at such firms as Superior Manufacturing and the D&N Bank. Michigan Technological University (MTU) also contributes heavily to airport use, e.g., for transportation of non-resident students and faculty between semesters, and for guest faculty during the school year, as well as for recruiters of potential employees, as students complete their academic work.

Another important generator of airport traffic is the Keweenaw Research Center (KRC), a research institute affiliated with MTU. KRC conducts externally funded research in science and engineering related to the University's educational activities. This includes operation of the Keweenaw Field Station for the U.S. Army Tank-Automotive Command (TACOM). Considerable air travel is generated by TACOM personnel during winter months in connection with cold environment research projects conducted at KRC.

United Parcel Service uses Houghton/Hancock as a regional distribution center, and charters daily flights. Express package volumes are expected to expand at the airport in 1989, as Federal Express has announced plans to initiate service.

Airport Economic Impact

The Houghton County Memorial Airport aviation-related economic impact of nearly \$5.4 million annually comprises the impact types listed in Exhibit 9.

## Exhibit 9

**ANNUAL AVIATION-RELATED  
ECONOMIC IMPACT OF  
HOUGHTON COUNTY MEMORIAL  
AIRPORT**

IMPACT TYPE	AMOUNT
Direct	\$ 1,083,300
Indirect	2,475,000
Induced	1,793,700
<b>Total</b>	<b>\$ 5,352,000</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

The total impacts, by type, are summarized in Exhibit 10. There are some impacts at the airport which are not necessarily attributable to aviation, e.g., the weather service that serves more than just the airport, etc. This study assesses only the aviation-related impacts.

**Direct Economic Impact** - The "direct" impacts comprise the value of those activities involved in providing aviation services at the airport. Exhibit 11 lists the airport tenants and others included in the impact estimates. The makeup of the direct impacts is given in Exhibit 12.

Exhibit 12

**ESTIMATED "DIRECT" ANNUAL IMPACTS  
HOUGHTON COUNTY MEMORIAL  
AIRPORT**

<u>DIRECT IMPACT</u>	<u>AMOUNT</u>
Direct Payroll	\$ 700,400
Capital Expenditures	11,400
Operating Expenses	352,400
Refueling Service	<u>19,100</u>
<b>Total</b>	<b>\$1,083,300</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

"Direct" payroll comprises payments to those people who work at the airport, are employed by the airlines, corporate users, diner or other tenants. "Capital expenditures" include improvements to on-site facilities of tenants as well as to the airport itself. "Operating expenses" are local expenditures by the tenants or airport operator.

**Indirect Economic Impacts** - Houghton County Memorial Airport "indirect" impacts are caused by airport use in the form of expenditures by air travelers and by those firms that depend on the airport for their business.

It is estimated that over 10,700 visitors to Copper Country arrive via Houghton County Memorial Airport annually (7,709 by commuter air carrier, 2,225 by private or corporate aircraft and 843 by air taxi in 1987). Based on approximate proportions of those staying overnight (more than one day) it is estimated that the average visitor

spends approximately \$231 per trip at off-airport locations in the Houghton/Hancock area. Local residents using the airport also spend money -- some \$9,900 per year locally. Furthermore, there are two travel agencies in the region. Surveys indicate that, taken together, about 90 percent of their economic activity (e.g. ticket sales) is related to aviation. Of this, about 90 percent is related to Houghton County Memorial Airport.

The aviation-related indirect economic impacts attributable to Houghton County Memorial Airport total about \$2.5 million, as shown in Exhibit 13. The visitor expenditures breakdown by expenditure type is based on a mix of tourist, business and personal travel derived from the results of surveys made at other airports. Since no Michigan surveys were available, these were adjusted to reflect a range of values judged to be appropriate for local conditions. All visitor expenditures are at the actual cost outlay except retail sales which, since it is a margin industry, is shown at 20 percent of the actual expenditures. Expenditures by airport-dependent firms consist of those costs attributable to airport-related activity.

Exhibit 13

**INDIRECT IMPACTS OF  
HOUGHTON COUNTY MEMORIAL  
AIRPORT**

<u>REGIONAL EXPENDITURES BY SOURCE</u>	<u>ANNUAL IMPACT</u>
Visitor Expenditures:	
Lodging	\$ 761,900
Food & Beverage	642,300
Retail Sales	58,300
Entertainment	196,700
Ground Transport	171,800
Business	139,400
Other	<u>286,300</u>
Subtotal	\$2,256,700
Resident Expenditures	9,900
Corporate Air Opns.	88,000
Dependent Firm Expenditures	<u>120,400</u>
Total	<b>\$2,475,000</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

## Exhibit 10

**ESTIMATED ANNUAL ECONOMIC IMPACTS**  
**Houghton County Memorial Airport**  
**1987**

<u>IMPACT TYPE AND SOURCE</u>	<u>AVIATION RELATED</u>	<u>NON-AVIATION RELATED (1)</u>	<u>TOTAL(1)</u>
	(-----thousands-----)		
<b>Direct Impacts:</b>			
Commuter Air Operations	\$ 134.4	\$ 0.0	\$ 134.4
Federal Government	85.0	0.0	85.0
Local Governments	549.1	24.6	573.7
Air Passenger Services	113.8	15.0	128.8
Aviation Services	<u>201.0</u>	<u>0.0</u>	<u>201.0</u>
Subtotal	\$ 1,083.3	\$ 39.6	\$ 1,122.9
<b>Indirect Impacts:</b>			
Visitor Expenditures	\$ 2,256.7	\$ 0.0	\$ 2,256.7
Regional Expenditure	9.9	0.0	9.9
Corporate Operations & Other	88.0	5.2	93.2
Dependent Firms	<u>120.4</u>	<u>30.1</u>	<u>150.5</u>
Subtotal	\$ 2,475.0	\$ 35.3	\$ 2,510.3
<b>Induced Impacts:</b>	1,793.7		
<b>Total Annual Impacts</b>	<u>\$ 5,352.0</u>		

(1) Only aviation-related impacts are considered in this study.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

Exhibit 11  
**ORGANIZATIONS AND FIRMS CREATING ECONOMIC IMPACTS**  
 Houghton County Memorial Airport  
 1988

<u>ORGANIZATION</u>	<u>ATTRIBUTION OF ACTIVITY</u>			<u>ECONOMIC ACTIVITY</u>
	<u>Aviation-Related</u>		<u>Non-Aviation</u> <sup>(3)</sup>	
	<u>On-Site</u> <sup>(1)</sup>	<u>Off-Site</u> <sup>(2)</sup>		
<b>Commuter Air Operations:</b>				
Northwest Link	X			Airline
Simmons Airline	X			Airline
<b>Federal Government:</b>				
Federal Aviation Administration Airways Facilities Services	X			Facility Maintenance Unit
<b>Local Government:</b>				
County Airport	X			Airport Operations
Weather Unit	X		X	Weather Observations & reporting
<b>Air Passenger Services:</b>				
Hertz	X			Car Rental
National	X			Car Rental
Avis	X			Car Rental
CCC Airport Diner	X		X	Restaurant
<b>Aviation Services:</b>				
Alex Aviation	X			Flight Instruction, Charter
Superior Aviation	X			Air Charter Service
<b>Other:</b>				
Corporate Air Operations	X	X		Hangar Leases, Company Aircraft Activity
Travel Agencies		X	X	Travel Arrangements
Peckham Engineering	X		X	Airport Planning, Design Constr. Supvn.

- (1) Economic activity on airport property, by an airport tenant, treated as "direct" economic impact.  
 (2) Economic activity not taking place on airport property, but which is directly aviation-related to this airport. Treated as an "indirect" economic impact.  
 (3) Activity which is not related to or dependent on aviation activities. Not included in the impact estimates.

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Induced Economic Impact - "Direct" economic impacts of about \$1.1 million, and "indirect" impacts of \$2.5 million, represent increases in final demand for goods and services in the Houghton/Hancock region. To these must be added a "multiplier" effect produced by circulation of the money through the regional economy. To determine this "induced" impact, the U.S. Department of Commerce "Regional Input-Output Modeling System" (RIMS-II) was used. It was found that the induced impact produced by Houghton County Memorial Airport in 1987 was approximately \$1,793,700.

Industries Which Benefit

The economic activities at Houghton County Memorial Airport produce expenditures for a wide variety of goods and services. Many types of industry benefit, whether or not they are themselves airport users. Exhibit 14 lists impacted industry groups, and shows the extent to which each benefits from Houghton County Memorial Airport in terms of total economic activity earnings and employment.

Airport Derived Employment

An important element in the Houghton County Memorial Airport economic impact total is the employment which the airport creates. People are employed in airport-related activities at the airport (the airlines, the federal government, the County, etc.) and at other off-airport sites (hotels, manufacturing concerns, etc.). Furthermore, the direct and indirect expenditures attributable to the airport continue to flow through the region's economy creating additional employment (the "multiplier" effect). A summary of the jobs estimated to be attributable to Houghton County Memorial Airport is given in Exhibit 15.

The RIMS model treats jobs as full-time-equivalents (FEQ). Consequently, the split between full-time and part-time for induced employment is not shown. The Exhibit shows that there are 34 FEQ jobs at the airport, and another 78 located elsewhere in the region that are attributable to the airport.

Exhibit 15

**JOBS ATTRIBUTABLE TO  
HOUGHTON COUNTY MEMORIAL  
AIRPORT**

<u>JOB SOURCE</u>	<u>Full Time</u>	<u>Part Time</u>	<u>Total FEQ</u>
Direct On-Site Jobs	30	8	34
Indirect Off-Site Jobs at Surveyed Firms	10	3	11
Induced and Other Indirect Jobs			<u>67</u>
		<b>Total Jobs</b>	<b>112</b>

NOTE: FEQ denotes "full-time equivalent" jobs, calculated as two part-time jobs equal one full-time job.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

Non-Economic Values

Not all values a community derives from an airport are quantifiable in dollar terms. Houghton County Memorial Airport provides area citizens with essential linkages to Michigan and beyond. But for the local airport, heavy winter snows could isolate many remote places for extensive periods.

The local airport provides access to the latest medical diagnosis and treatment procedures. For example, blood and tissue samples are sent to downstate medical centers, and specialist locations, for analysis; medical supplies not available locally (such as serums, antitoxins, isotopes, and organs for transplant operations) are shipped by air; and patients are moved by air for treatment procedures not available in their community. Several emergency and routine medical

Exhibit 14  
**TOTAL ANNUAL ECONOMIC IMPACT**  
**Houghton County Memorial Airport**  
**1987**

<u>IMPACTED INDUSTRY GROUPS</u>	<u>TOTAL ANNUAL IMPACT (Output)</u> (.....Thousands.....)	<u>TOTAL ANNUAL PAYROLL (Earnings)(1)</u> (.....Thousands.....)	<u>EMPLOYMENT (Jobs)</u>
Ag. Prod., Forestry Svcs.	\$70	\$13	2
Forestry Products	3	1	0
Crude Petrol.	14	1	0
New Construction	11	3	0
Maint. and Repair Const.	131	57	2
Food, Kindred Prd.	80	10	0
Apparel	3	0	0
Printing, Publishing	33	11	0
Chemicals, Refined Petrol.	6	0	0
Rubber, Leather Prod.	23	4	0
Lumber, Furniture Prod.	2	0	0
Stone, Clay, Glass Prod.	5	1	0
Primary Metals	2	0	0
Fabricated Metals	17	5	0
Non-electrical Machinery	5	2	0
Motor Vehicles, Equipment	10	1	0
Miscellaneous Mfg.	3	0	0
Transportation	1,567	542	20
Communications	120	30	1
Utilities	199	20	1
Wholesale Trade	93	35	1
Retail Trade	262	122	9
Finance	56	16	1
Insurance	32	9	0
Real Estate	205	3	1
Lodging, Amusements	979	325	32
Personal Services	23	12	1
Business Services	447	179	8
Eating, Drinking Estab.	769	225	28
Health Services	98	53	2
Other Services	84	30	2
Households	--	5	1
<b>TOTALS</b>	<b>\$5,352</b>	<b>\$1,715</b>	<b>112</b>

(1) The portion of the "output" column inputs that is payroll to employed persons.

SOURCE: Rims II Multipliers, Wilbur Smith Associates.



air evacuations take place each year through Houghton County Memorial Airport. Most emergency flights use the "Flight for Life" service, which is linked to Milwaukee Regional Medical Center. Aircraft used in these evacuations are currently based elsewhere.

Houghton/Hancock airport supports the maintenance of essential community services and security. It is a refueling base available to help locate and combat forest fires or chemical spills; to patrol pipelines and power lines, to support police, Civil Air Patrol and National Guard

Activities. In case of natural disasters (fire, flood or blizzard) it is a resource for supply and evacuation. The airport supports the cold-weather research program at Keweenaw Field Station by providing access for the support and supervisory staff of the U.S. Army Tank-Automotive Command.

In recent years, general aviation has become a major training ground for rewarding careers in the airline and aeronautical fields. The presence of an airport gives residents the option of flight instruction and ground service training.

# VALUE OF REYNOLDS FIELD TO THE JACKSON COUNTY AREA

## Economic Values

Jackson County-Reynolds Field is estimated to have an economic impact on its service area of approximately \$9.6 million annually in total economic activity of which \$3.2 million is household earnings. This impact is due principally to the provision and use of scheduled air carrier services, general aviation services and federal government operations at the airport.

## Airport Characteristics

Owned and operated by Jackson County, the airport is open to the public, has a "T-5" classification, and is the 22nd largest airport in Michigan in terms of annual scheduled passenger usage.

Airport Services - Jackson County-Reynolds Field is a scheduled air carrier and general aviation airport, offering a number of services, including:

### Exhibit 1

#### SERVICES OFFERED AT JACKSON COUNTY-REYNOLDS FIELD

Commuter Air	Jet Fuel Sales
Air Taxi	Avgas Fuel Sales
General Aviation	Aircraft Repair
Hangar Rental	Flight Instruction
Tie Down	Car Rental
Aircraft Rental	Restaurant
Aircraft Sales	Control Tower

SOURCE: Surveys by MDOT, Bureau of Transportation Planning (BTP) study consultants, Wilbur Smith Associates.

All of these services have positive economic significance to the Jackson area. This is due to the creation of employment, generation of taxes and potential attraction and retention of businesses for the area.

Airport Facilities - The airport is an all-weather facility capable of handling up to jet aircraft. It has two runways, is towered, has an adequate passenger terminal as well as a rotating beacon, segmented circle and unlighted wind indicator. It has two Fixed-Base Operators (FBOs) who provide aviation support services. Additional facilities are summarized in Exhibit 2.

### Exhibit 2

#### FACILITIES AT JACKSON COUNTY-REYNOLDS FIELD

RUNWAYS	DESCRIPTION						
	Lgth.	Surf.	Sys.	Edge Lts.	REIL	VASI	Instr. Appr.
Primary	5,344	PV	FP	HIRL	Y	N	PR
Crosswind	3,501	PV	PP	HIRL	Y	N	NP

NOTES: PV denotes paved surface; Taxi system definitions are: FP = full parallel; PP = part parallel; and TN = turnaround area at runway ends. Runway lighting systems (Edge Lights) are designated HIRL = high intensity runway lights. MIRL medium intensity; or LIRL, low intensity. Column heading REIL denotes Runway End Indicator Lights; VASI denotes Visual Approach Slope Indicator; column entries refer to presence of the equipment (Y denotes "yes"; N, "no"). Instrument approach facilities are: PR, Precision; NP, Non-Precision; or VIS, visual.

SOURCE: MDOT, BTP.

Airport Use - Jackson County-Reynolds Field currently is served by one scheduled commuter air carrier (Northwest AirlinK) under an essential air service subsidy. General aviation is the major air activity at the airport. A total of 139 general aviation aircraft are based at the airport, as itemized in Exhibit 3.

## Exhibit 3

**NUMBERS OF BASED AIRCRAFT  
JACKSON COUNTY-REYNOLDS FIELD**

<u>AIRCRAFT TYPE</u>	<u>1988</u>
Single Engine	95
Multi-Engine	35
Jet	8
Helicopters	<u>1</u>
<b>Total Aircraft</b>	<b>139</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Estimated aircraft operations for 1987 are given in Exhibit 4. Military operations are normally training and refueling for military aircraft based elsewhere.

## Exhibit 4

**AIRCRAFT OPERATIONS  
JACKSON COUNTY REYNOLDS FIELD**

<u>TYPE OPERATION</u>	<u>1987</u>
Itinerant:	
Air Carrier	1,248
Air Taxi	1,131
General Aviation	36,418
Military	<u>436</u>
Subtotal Itinerant	39,233
Local:	
General Aviation	31,442
Military	<u>267</u>
Subtotal Local	31,709
<b>Total</b>	<b>70,942</b>

SOURCE: MDOT, BTP.

Aircraft operations at the airport in 1987 are slightly above the 1985 level, after having declined by about nine percent in 1986. As shown in Exhibit 5, operations currently are about 55 percent itinerant and 45 percent local, reflecting active use of the airport for transportation purposes as well as for recreation and training activities.

## Exhibit 5

**OPERATIONS TREND  
JACKSON COUNTY-REYNOLDS FIELD**

<u>OPERATIONS</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>
Itinerant	38,561	37,472	39,233
Local	<u>32,003</u>	<u>26,636</u>	<u>31,709</u>
<b>Totals</b>	<b>70,564</b>	<b>64,108</b>	<b>70,942</b>

SOURCE: MDOT, BTP.

Air passenger use has declined steadily since 1983. This trend, illustrated by the data in Exhibit 6, is attributed to limited air carrier service and proximity to Detroit, Metropolitan Wayne County Airport. Scheduled flights number two per day.

## Exhibit 6

**AIR CARRIER PASSENGERS  
JACKSON COUNTY-REYNOLDS FIELD**

<u>PASSENGERS</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>
Deplaned	1,029	570	429
Enplaned	<u>1,021</u>	<u>608</u>	<u>488</u>
<b>Totals</b>	<b>2,050</b>	<b>1,178</b>	<b>917</b>

SOURCE: MDOT, BTP.

Although air cargo tonnage has declined in recent years, it continues to be important at Jackson County-Reynolds Field, as shown in Exhibit 7.

## Exhibit 7

AIR CARGO HANDLED AT  
JACKSON COUNTY-REYNOLDS FIELD

CARGO MOVEMENT	CARGO TONS		
	1985	1986	1987
Deplaned	2.5	1.2	0.6
Enplaned	<u>1.0</u>	<u>0.2</u>	<u>0.2</u>
Totals	3.5	1.4	0.8

SOURCE: MDOT, BTP.

Airport Economic Roles

Jackson County-Reynolds Field is a business-oriented airport, with the following comprising the airport's principal economic impact types.

Retention of Private Business - Jackson County-Reynolds Field is considered valuable to the competitive position of a number of local firms and plants, some of which might choose to locate elsewhere if the facility were not present. These organizations use the commuter air, air taxi, and general aviation services made possible by the airport's existence. However, the facility was not found to be directly responsible for any significant economic development in the service area.

Business-Oriented General Aviation - An estimated 60 percent of general aviation use at the airport is "business-oriented," and many of the region's businesses have aircraft at the airport including those listed on Exhibit 8.

## Exhibit 8

A SAMPLE OF FIRMS  
WHICH BASE AIRCRAFT  
AT JACKSON COUNTY-REYNOLDS FIELD

Aeroquip Corp.	Patrick Petroleum
Addison Prods.	Jackson Seat Co.
Consumers Power	Fountainhead, Inc.

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

In addition to firms with general aviation aircraft based at the airport, there are many others that depend on the airport, for various services, such as scheduled passenger service, air taxi/charter service, air freight etc. These are important for sales, management and production activities at such firms as: Gilbert Commonwealth, Worthington Steel, and Wyman Gordon Co.

Airport Economic Impact

The Jackson County Airport aviation-related economic impact of \$9.6 million annually comprises the impact types listed in Exhibit 9.

## Exhibit 9

ANNUAL AVIATION-RELATED  
ECONOMIC IMPACT OF  
JACKSON COUNTY-REYNOLDS FIELD

IMPACT TYPE	AMOUNT
Direct	\$ 3,181,000
Indirect	2,541,000
Induced	<u>3,917,000</u>
Total	\$9,639,000

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

The total impacts, by type, are summarized in Exhibit 10. There are some impacts at the airport which are not necessarily attributable to aviation, primarily businesses in which only a portion of activity (or none) is aviation-related. This study assesses only the aviation-related impacts.

Direct Economic Impact - The "direct" impacts comprise the value of those activities involved in providing aviation services at the airport. Exhibit 11 lists the airport tenants and others included in the impact estimates. The makeup of the direct economic impacts is listed in Exhibit 12.

## Exhibit 10

**ESTIMATED ANNUAL ECONOMIC IMPACTS**  
**Jackson County-Reynolds Field**  
**1987**

<u>IMPACT TYPE AND SOURCE</u>	<u>AVIATION RELATED</u>	<u>NON-AVIATION RELATED (1)</u>	<u>TOTAL(1)</u>
	(-----thousands-----)		
<b>Direct Impacts:</b>			
Air Carrier Operations	\$ 42	\$ 0	\$ 42
Federal Government	445	0	445
Local Governments	235	0	235
Air Passenger Services	426	663	1,089
Aviation Services	<u>2,033</u>	<u>919</u>	<u>2,952</u>
Subtotal	\$ 3,181	\$ 1,582	\$ 4,763
<b>Indirect Impacts:</b>			
Visitor Expenditures	\$ 1,792	\$ 0	\$ 1,792
Regional Expenditures	24	0	24
Corp. Air Opns.	<u>725</u>	<u>0</u>	<u>725</u>
Subtotal	\$ 2,541	\$ 0	\$ 2,541
<b>Induced Impacts:</b>	3,917		
<b>Total Annual Impacts</b>	<u>\$9,639</u>		

(1) Only aviation-related impacts are considered in this study.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

**Exhibit 11**  
**ORGANIZATIONS AND FIRMS CREATING ECONOMIC IMPACTS**  
**Jackson County-Reynolds Field**  
**1988**

<u>ORGANIZATION</u>	<u>ATTRIBUTION OF ACTIVITY</u>			<u>ECONOMIC ACTIVITY</u>
	<u>On-Site</u> <sup>(1)</sup>	<u>Off-Site</u> <sup>(2)</sup>	<u>Non-Aviation</u> <sup>(3)</sup>	
Air Carrier Operations:				
Northwest Link	X			Airline
Federal Government:				
Federal Aviation Administration				
Air Traffic Control	X			Control Tower
Airways Facilities				
Services	X			Facility Maintenance Unit
Flight Service Station	X			Pilot Weather Briefings
Local Government:				
County Airport	X			Airport Operations
Air Passenger Services:				
Avis	X			Car Rental
Don's Airport Rest.	X		X	Restaurant
Aviation Services:				
Gimbel Aviation	X			Fixed-Base Operator
Skyway Aviation	X			Fixed-Base Operator
Boorum Aircraft, Inc.	X			Aircraft Repair
Jackson Comm. College	X			Aviation Instruction
Comtronics	X		X	Mfr.
Aeroquip.	X		X	Mfr.
Jackson Food Service			X	Restaurant Equipt.
Energy Consultants			X	Oil, Gas leasing
Other:				
Corporate Air Operations	X	X		Hangar Leases, Company Aircraft Activity

(1) Economic activity on airport property, by an airport tenant, treated as "direct" economic impact.

(2) Economic activity not taking place on airport property, but which is directly aviation-related to this airport. Treated as an "indirect" economic impact.

(3) Activity which is not related to or dependent on aviation activities. Not included in the impact estimates.

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

## Exhibit 12

ESTIMATED "DIRECT" ANNUAL IMPACTS  
JACKSON COUNTY-REYNOLDS FIELD

<u>DIRECT IMPACT</u>	<u>AMOUNT</u>
Direct Payroll	\$1,466,000
Capital Expenditures	34,000
Operating Expenses	1,552,000
Refueling Service	<u>129,000</u>
Total	\$3,181,000

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

"Direct" payroll comprises payments to those people who work at the airport, are employed by the airline, FBO, corporate users, restaurant, or other tenants. "Capital expenditures" include improvements to on-site facilities of tenants as well as to the airport itself. "Operating expenses" are local expenditures by the tenants or airport operator.

Indirect Economic Impacts - Jackson County-Reynolds Field Airport "indirect" impacts are caused by airport use in the form of expenditures by air travelers and by those firms that depend on the airport for their business.

It is estimated that over 37,500 visitors to the Jackson area arrive via Jackson County-Reynolds Field annually (244 by scheduled air carrier, 36,418 by general aviation, and 849 by air taxi in 1987). Based on approximate proportions of those staying overnight (more than one day) it is estimated that the average visitor spends approximately \$52.71 per trip at off-airport locations in the Jackson area. Local residents using the airport also spend money -- some \$24,000 per year locally (in addition to moneys spent at the airport).

The aviation-related indirect economic impacts attributable to Jackson County-Reynolds Field total \$2.5 million, as shown in Exhibit 13. The visitor expenditures breakdown by expenditure type is based on a mix of tourist, business and personal travel derived from the results of surveys made at other

airports. Since no Michigan surveys were available, these were adjusted to reflect a range of values judged to be appropriate for local conditions. All visitor expenditures are at the actual cost outlay except retail sales which, since it is a margin industry, is shown at 20 percent of the actual expenditures. Expenditures by airport-dependent firms consist of those costs attributable to airport-related activity.

## Exhibit 13

INDIRECT IMPACTS OF  
JACKSON COUNTY-REYNOLDS FIELD

<u>REGIONAL EXPENDITURES BY SOURCE</u>	<u>ANNUAL IMPACT</u>
Visitor Expenditures:	
Lodging	\$ 605,000
Food & Beverage	511,000
Retail Sales	46,000
Entertainment	156,000
Ground Transport	136,000
Business	111,000
Other	<u>227,000</u>
Subtotal	\$1,792,000
Resident Expenditures	24,000
Corporate Air Opns.	<u>725,000</u>
Total	\$2,541,000

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Induced Economic Impact - "Direct" economic impacts of about \$3.2 million, and "indirect" impacts of \$2.5 million, represent increases in final demand for goods and services in the Jackson region. To these must be added a "multiplier" effect produced by circulation of the money through the regional economy. To determine this "induced" impact, the U.S. Department of Commerce "Regional Input-Output Modeling System" (RIMS-II) was used. It was found that the induced impact produced by Jackson County-Reynolds Field in 1987 was approximately \$3,917,000.

**Industries Which Benefit**

The economic activities at Jackson County-Reynolds Field produce expenditures for a wide variety of goods and services. Many types of industry benefit, whether or not they are themselves airport users. Exhibit 14 lists impacted industry groups, and shows the extent to which each benefits from Jackson County-Reynolds Field in terms of total economic activity earnings and employment.

**Airport Derived Employment**

An important element in the Jackson County-Reynolds Field economic impact total is the employment which the airport creates. People are employed in airport-related activities at the airport (the FBO, the airlines, the federal government, the County, etc.) and at other off-airport sites (hotels, manufacturing concerns, etc.). Furthermore, the direct and indirect expenditures attributable to the airport continue to flow through the region's economy creating additional employment (the "multiplier" effect). A summary of the jobs estimated to be attributable to Jackson County-Reynolds Field is given in Exhibit 15.

The RIMS model treats jobs as full-time-equivalents (FEQ). Consequently, the split between full-time and part-time for induced employment is not shown. The Exhibit shows that there are 97 FEQ jobs at or near the airport, and another 74 located elsewhere in the greater South Central Michigan region that are attributable to the airport.

**Non-Economic Values**

Not all values a community derives from an airport are quantifiable in dollar terms. Jackson County Reynolds Field provides local residents with alternative linkages to Michigan and beyond.

The local airport provides access to the latest medical diagnosis and treatment procedures. For example, blood and tissue samples are sent to medical centers and other specialist locations for analysis; medical supplies not available locally (such as serums, antitoxins, isotopes, and organs for transplant operations) are shipped by air and patients are moved by air for treatment procedures

**Exhibit 15**

**JOBS ATTRIBUTABLE TO JACKSON COUNTY-REYNOLDS FIELD**

<u>JOB SOURCE</u>	<u>Full Time</u>	<u>Part Time</u>	<u>Total FEQ</u>
Direct On-Site Jobs	73	16	81
Indirect Off-Site Jobs at Surveyed Firms	15	1	16
Induced and Other Indirect Jobs			74
		<b>Total Jobs</b>	<b>171</b>

NOTE: FEQ denotes "full-time equivalent" jobs, calculated as two part-time jobs equal one full-time job.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

not available in their community. According to airport management, some 50 to 100 medical evacuations occur each year. Reynolds Field directly touches many Jackson area families.

Reynolds Field also supports the maintenance of essential community services and security. It is a refueling base, in case of need, for police, Civil Air Patrol and National Guard search or surveillance activities. In case of natural disasters (fire, flood or blizzard), it is a resource for supply and evacuation. Operations statistics reveal that the airport is used routinely by military aircraft.

In recent years, general aviation has become a major training ground for rewarding careers in the airline and aeronautical fields. The presence of an airport gives residents the option of flight instruction and ground service training. The Jackson Community College flight school is located at the airport and provides opportunities for young people interested in pursuing an aviation career.



Exhibit 14  
ANNUAL ECONOMIC IMPACTS OF REYNOLDS FIELD  
1987

<u>IMPACTED INDUSTRY GROUPS</u>	<u>TOTAL ANNUAL IMPACT (Output)</u> (.....Thousands.....)	<u>TOTAL ANNUAL PAYROLL (Earnings)(1)</u> (.....Thousands.....)	<u>EMPLOYMENT (Jobs)</u>
Ag. Prod., Forestry Svcs.	\$14	\$4	1
New Construction	34	12	0
Maint. and Repair Const.	170	79	3
Food, Kindred Prd.	220	30	1
Apparel	8	1	0
Paper, Allied Products	18	4	0
Printing, Publishing	76	25	1
Chemicals, Refined Petrol.	122	9	0
Rubber, Leather Prod.	42	11	0
Lumber, Furniture Prod.	7	1	0
Stone, Clay, Glass Prod.	20	7	0
Primary Metals	40	8	0
Fabricated Metals	58	14	0
Non-electrical Machinery	26	8	0
Electrical Machinery	20	6	0
Motor Vehicles, Equipment	128	20	0
Other Transportation Equip.	21	6	0
Instruments	2	1	0
Miscellaneous Mfg.	19	5	0
Transportation	3,390	1,173	43
Communications	179	47	1
Utilities	430	42	1
Wholesale Trade	263	103	4
Retail Trade	369	182	14
Finance	96	29	1
Insurance	131	41	2
Real Estate	434	10	3
Lodging, Amusements	800	282	27
Personal Services	75	33	3
Business Services	1,330	572	26
Eating, Drinking Estab.	707	221	28
Health Services	177	102	5
Other Services	213	67	4
Households	--	11	3
<b>TOTALS</b>	<b>\$9,639</b>	<b>\$3,166</b>	<b>171</b>

(1) The portion of the "output" column that is payroll to employed persons.

SOURCE: Rims II Multipliers, MDOT, BTP study consultant, Wilbur Smith Associates.

# VALUE OF KALKASKA AIRPORT TO THE KALKASKA AREA

## Economic Values

Kalkaska Airport is estimated to have no significant dollar-quantifiable impact on the economy of its service area.

## Airport Characteristics

Owned and operated by the City of Kalkaska, the airport is open to the public and has a "U-1" classification, designating small utility airport.

Airport Services - Kalkaska Airport is a general aviation airport, offering general aviation and tie-down services.

Airport Facilities - The airport is a warm season facility, capable of handling approximately 75 percent of general aviation aircraft types. It has one turf-surface runway, a segmented circle and lighted wind direction indicator, but no tower or rotating beacon. There is a small administration

### Exhibit 1

#### FACILITIES AT KALKASKA AIRPORT

RUNWAYS	DESCRIPTION						
	Lgth.	Surf.	Taxi Sys.	Edge Lts.	REIL	VASI	Instr. Appr.
Primary	3,800	TF	N	LIRL	N	N	VIS

NOTES: PV denotes paved surface; Taxi system definitions are: FP = full parallel; PP = part parallel; and TN = turnaround area at runway ends. Runway lighting systems (Edge Lights) are designated HIRL = high intensity runway lights. MIRL medium intensity; or LIRL, low intensity. Column heading REIL denotes Runway End Indicator Lights; VASI denotes Visual Approach Slope Indicator; column entries refer to presence of the equipment (Y denotes "yes"; N, "no"). Instrument approach facilities are: PR, Precision; NP, Non-Precision; or VIS, visual.

SOURCE: MDOT, BTP.

building, but the airport is unattended and has no refueling facilities. Runway facilities are listed in Exhibit 1.

Airport Use - Kalkaska Airport has some general aviation activity. A total of nine single-engine general aviation aircraft are based at the airport.

Estimated aircraft operations for 1987 are given in Exhibit 2.

### Exhibit 2

#### AIRCRAFT OPERATIONS KALKASKA AIRPORT

<u>TYPE OPERATION</u>	<u>1987</u>
Itinerant:	
General Aviation	1,460
Local:	
General Aviation	<u>630</u>
<b>Total</b>	<b>2,090</b>

SOURCE: MDOT, BTP.

Aircraft operations at the airport have generally increased in recent years, and are largely itinerant in nature, reflecting the use of the

### Exhibit 3

#### OPERATIONS TREND KALKASKA AIRPORT

<u>OPERATIONS</u>	<u>1981</u>	<u>1983<sup>1</sup></u>	<u>1986</u>	<u>1987</u>
Itinerant	850	650	1,230	1,460
Local	<u>450</u>	<u>340</u>	<u>460</u>	<u>630</u>
<b>Totals</b>	<b>1,300</b>	<b>900</b>	<b>1,690</b>	<b>2,090</b>

(1) No survey count was conducted at this airport for the indicated year. Estimate is based on factor derived from representative airports.

SOURCE: MDOT, BTP.

airport as a transportation facility rather than a training airport. Available operations counts are shown in Exhibit 3.

**Airport Economic Roles**

Kalkaska Airport is a community-oriented facility which generates little or no economic impact. No usage fees are charged to generate revenue, no aviation services are provided, and no on-site staff is in attendance. There has been no significant nearby development that is attributable to the airport.

**Business-Oriented General Aviation** - There is little or no identifiable business use of the airport. The airport manager estimates that the airport receives about 100 visiting aircraft per year.

**Airport Economic Impact**

Because of the nature of Kalkaska Airport's operation and use, it is estimated that no

significant direct, indirect or induced economic impacts are generated, as calculated in conventional terms.

**Non Economic Values**

Kalkaska Airport provides citizens of the area with alternative linkages to Michigan and beyond. In case of need during the warm season, the airport can be used for medical evacuation of patients to a larger regional hospital.

A local spokesman suggests that the airport is regarded as a community service, such as a museum or a library. In 1987, the City provided about \$7,000 from its general fund, to cover airport costs (roughly \$3,800 for operating costs plus another \$3,000 for liability insurance). This outlay represents one measure of the community's perception of the airport's value.

# VALUE OF MASON COUNTY AIRPORT TO THE LUDINGTON AREA

## Economic Values

Mason County Airport is estimated to have an economic impact on its service area of approximately \$1.4 million annually in total economic activity, \$453,000 of which is household earnings. This impact is due principally to the provision and use of general aviation services at the airport.

## Airport Characteristics

Owned and operated by Mason County, the airport is open to the public and has a "T-5" classification.

Airport Services - Mason County Airport is a general aviation airport, offering the range of services listed in Exhibit 1.

### Exhibit 1

#### SERVICES OFFERED AT MASON COUNTY AIRPORT

Air Taxi	Jet Fuel Sales
General Aviation	Avgas Fuel Sales
Hangar Rental	Aircraft Repair
Tie Down	Flight Instruction
Aircraft Rental	Car Rental
Aircraft Sales	Vending

SOURCE: Surveys by MDOT, Bureau of Transportation Planning (BTP) study consultants, Wilbur Smith Associates.

All of these services have positive economic significance to the Ludington area. This is due to the creation of employment, generation of taxes and potential attraction and retention of businesses for the area.

Airport Facilities - The airport is an all season facility capable of handling virtually all general aviation aircraft types. It has two runways, a rotating beacon, segmented circle, lighted wind direction indicator, passenger terminal, hangar space, and one Fixed-Base Operator (FBO) who provides aviation support services.

### Exhibit 2

#### FACILITIES AT MASON COUNTY AIRPORT

	RUNWAYS		DESCRIPTION				
	Lgth.	Surf.	Taxi Sys.	Edge Lts.	REIL	VASI	Instr. Appr.
Primary	5,000	PV PP		MIRL	N	Y	NP
Crosswind	3,500	PV N		MIRL	N	N	VIS

NOTES: PV denotes paved surface; Taxi system definitions are: FP = full parallel; PP = part parallel; and TN = turnaround area at runway ends. Runway lighting systems (Edge Lights) are designated HIRL = high intensity runway lights. MIRL medium intensity; or LIRL, low intensity. Column heading REIL denotes Runway End Indicator Lights; VASI denotes Visual Approach Slope Indicator; column entries refer to presence of the equipment (Y denotes "yes"; N, "no"). Instrument approach facilities are: PR, Precision; NP, Non-Precision; or VIS, visual.

SOURCE: MDOT, BTP.

**Airport Use** - Mason County Airport has substantial general aviation activity. A total of 22 general aviation aircraft are based at the airport, as itemized in Exhibit 3.

## Exhibit 3

**NUMBERS OF BASED AIRCRAFT  
MASON COUNTY AIRPORT**

<u>AIRCRAFT TYPE</u>	<u>1988</u>
Single Engine	18
Multi-Engine	<u>4</u>
<b>Total Aircraft</b>	<b>22</b>

**SOURCE:** Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Estimated aircraft operations for 1987 are given in Exhibit 4. Military operations are normally training for military aircraft based elsewhere.

## Exhibit 4

**AIRCRAFT OPERATIONS  
MASON COUNTY AIRPORT**

<u>TYPE OPERATION</u>	<u>1987</u>
Itinerant:	
Air Taxi	1,100
General Aviation	7,045
Military	<u>15</u>
Subtotal Itinerant	8,160
Local:	
General Aviation	<u>8,160</u>
<b>Total</b>	<b>16,320</b>

**SOURCE:** MDOT, BTP, and Airport Manager.

Aircraft operations at the airport have generally increased somewhat in recent years, and the current

mix is estimated to be evenly divided between itinerant and local flights, reflecting substantial use for transportation as well as for recreational and training flights. Operations data for the past few years are given in Exhibit 5.

## Exhibit 5

**OPERATIONS TREND  
MASON COUNTY AIRPORT**

<u>OPERATIONS TYPE</u>	<u>1981</u>	<u>1983</u> <sup>1</sup>	<u>1986</u> <sup>1</sup>	<u>1987</u>
Itinerant	4,300	3,280	4,400	8,160
Local	<u>8,200</u>	<u>6,260</u>	<u>8,390</u>	<u>8,160</u>
<b>Totals</b>	<b>12,500</b>	<b>9,540</b>	<b>12,790</b>	<b>16,320</b>

(1) No count survey was conducted at this airport for the indicated years. Estimate is based on factor derived from representative airports.

**SOURCE:** MDOT, BTP.

**Airport Economic Roles**

Mason County Airport supports substantial business and recreational flying. Vacation homes and resorts in the area also attract significant air traffic. The following comprise the airport's principal economic impact types.

**Retention of Private Business** - Mason County Airport is considered valuable to the competitive position of a number of local firms and plants, some of which might choose to locate elsewhere if the facility were not present. These organizations use the air taxi and general aviation services made possible by the airport's existence. However, the facility was not found to be directly responsible for any significant economic development in the service area.

Ludington is a regional collection center for United Parcel Service, (UPS) which is an important user of the airport. Office staff and drivers are headquartered in Ludington and their jobs are linked to the airport in considerable measure. UPS planes, based in Lansing, call-in routinely.

**Business-Oriented General Aviation** - An estimated 20-30 percent of general aviation use at the airport is "business-oriented," and some of the region's businesses have aircraft at the airport including those listed in Exhibit 6.

**Exhibit 6**

**A SAMPLE OF FIRMS WHICH BASE AIRCRAFT AT MASON COUNTY AIRPORT**

Austin Marine	Mason County Aviation
Kaines Manufacturing	Superior Aviation
	WKLA, Inc.

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

In addition to firms with general aviation aircraft based at the airport, there are many others that depend on the airport, for various services, such as accomodation of corporate aircraft, air taxi/charter service, air freight etc. These are important for sales, management and production activities at such local firms as Dow Chemical; Metalworks; ~~Kaines Manufacturing~~; Great Lakes Casting; Straits Steel & Wire; UPS and the local tourist and resort industry.

**Airport Economic Impact**

The Mason County Airport aviation-related economic impact of \$1.4 million annually comprises impact types listed in Exhibit 7.

**Exhibit 7**

**ANNUAL AVIATION-RELATED ECONOMIC IMPACT OF MASON COUNTY AIRPORT**

<u>IMPACT TYPE</u>	<u>AMOUNT</u>
Direct	\$ 618,400
Indirect	334,800
Induced	<u>485,800</u>
<b>Total</b>	<b>\$1,439,000</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

The total impacts, by type, are summarized in Exhibit 8. This study assesses only the aviation-related impacts.

**Direct Economic Impact** - The "direct" impacts comprise the value of those activities involved in providing aviation services at the airport. Exhibit 9 lists the airport tenants and others included in the impact estimates. The makeup of the direct impacts is given in Exhibit 10. The capital expenditures item is comprised of \$355,100 in aid grants, of which \$336,400 is federal funds and 18,700 is from MDOT.

**Exhibit 10**

**ESTIMATED "DIRECT" ANNUAL IMPACTS MASON COUNTY AIRPORT**

<u>DIRECT IMPACT</u>	<u>AMOUNT</u>
Direct Payroll	\$136,800
Capital Expenditures	355,100
Operating Expenses	114,700
Refueling Service	<u>11,800</u>
<b>Total</b>	<b>\$618,400</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

"Direct" payroll comprises payments to those people who work at the airport, are employed by the County, the FBO, corporate users or other tenants. "Capital expenditures" include improvements to on-site facilities of tenants as well as to the airport itself. "Operating expenses" are local expenditures by the tenants or airport operator.

**Indirect Economic Impacts** - Mason County Airport "indirect" impacts are caused by airport use in the form of expenditures by air travelers and by those firms that depend on the airport for their business.

## Exhibit 8

**ESTIMATED ANNUAL ECONOMIC IMPACTS**  
**Mason County Airport**  
**1987**

<u>IMPACT TYPE AND SOURCE</u>	<u>AVIATION RELATED</u>	<u>NON-AVIATION RELATED (1)</u>	<u>TOTAL(1)</u>
	(-----thousands-----)		
<b>Direct Impacts:</b>			
Federal Government	336.4	0.0	336.4
MDOT	18.7	0.0	18.7
Local Governments	9.5	0.0	9.5
Aviation Services	<u>253.8</u>	<u>0.0</u>	<u>253.8</u>
Subtotal	\$ 618.4	\$ 0.0	\$ 618.4
<b>Indirect Impacts:</b>			
Visitor Expenditures	\$ 269.0	\$ 0.0	\$ 269.0
Regional Expenditure	1.7	0.0	1.7
Corporate Operations & Other	10.0	0.0	10.0
Dependent Firms	<u>54.1</u>	<u>0.0</u>	<u>54.1</u>
Subtotal	\$ 334.8	\$ 0.0	\$ 334.8
<b>Induced Impacts:</b>	485.8		
<b>Total Annual Impacts</b>	<u>\$1,439.0</u>		

(1) Only aviation-related impacts are considered in this study.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

**Exhibit 9**  
**ORGANIZATIONS AND FIRMS CREATING ECONOMIC IMPACTS**  
**Mason County Airport**  
**1988**

<u>ORGANIZATION</u>	<u>ATTRIBUTION OF ACTIVITY</u>			<u>ECONOMIC ACTIVITY</u>
	<u>On- Site</u> <sup>(1)</sup>	<u>Off- Site</u> <sup>(2)</sup>	<u>Non- Aviation</u> <sup>(3)</sup>	
Federal Government:				
Federal Aviation Administration		X		Capital Grant
Local Government:				
County Airport	X			Airport Operations
MDOT		X		Capital Grant
Aviation Services:				
Mason County Avi. Inc.	X			Fixed-Base Operator
Superior Aviation	X			Air/Taxi Charter Service
Other:				
Corporate Air Operations	X	X		Hangar Leases, Company Aircraft Activity
Dependent Firms		X	X	Linked to Gen. Aviation Svcs.

(1) Economic activity on airport property, by an airport tenant, treated as "direct" economic impact.

(2) Economic activity not taking place on airport property, but which is directly aviation-related to this airport. Treated as an "indirect" economic impact.

(3) Activity which is not related to or dependent on aviation activities. Not included in the impact estimates.

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.



It is estimated that over 7,700 visitors to the Ludington area arrive via Mason County Airport annually (6,605 by individually owned or corporate aircraft and 1,100 by air taxi in 1987). Based on approximate proportions of those staying overnight (more than one day) it is estimated that the average visitor spends approximately \$38.50 per trip at off-airport locations in the Ludington area. Local residents using the airport also spend money -- some \$1,700 per year locally.

The aviation-related indirect economic impacts attributable to Mason County Airport total \$334,800, as shown in Exhibit 11. The visitor expenditures breakdown by expenditure type is based on a mix of tourist, business and personal travel derived from the results of surveys made at other airports. Since no Michigan surveys were available, these were adjusted to reflect a range of values judged to be appropriate for local conditions. All visitor expenditures are at the actual cost outlay except retail sales which, since it is a margin industry, is shown at 20 percent of the actual expenditures. Expenditures by airport-dependent firms consist of those costs attributable to airport-related activity.

Induced Economic Impact - "Direct" economic" impacts of about \$618,400, and "indirect" impacts of \$334,800, represent increases in final demand for goods and services in the Ludington region. To these must be added a "multiplier" effect produced by circulation of the money through the regional economy. To determine this "induced" impact, the U.S. Department of Commerce "Regional Input-Output Modeling System" (RIMS-II) was used. It was found that the induced impact produced by Mason County Airport in 1987 was approximately \$485,800.

#### Industries Which Benefit

The economic activities at Mason County Airport produce expenditures for a wide variety of goods and services. Many types of industry benefit, whether or not they are themselves airport users. Exhibit 12 lists impacted industry groups, and shows the extent to which each benefits from Mason County Airport in terms of total economic activity earnings and employment.

#### Exhibit 11

### INDIRECT IMPACTS OF MASON COUNTY AIRPORT

<u>REGIONAL EXPENDITURES BY SOURCE</u>	<u>ANNUAL IMPACT</u>
Visitor Expenditures:	
Lodging	\$90,800
Food & Beverage	76,600
Retail Sales	7,000
Entertainment	23,400
Ground Transport	20,500
Business	16,600
Other	<u>34,100</u>
Subtotal	\$269,000
Resident Expenditures	1,700
Corporate Air Opns.	10,000
Dependent Firm Expenditures	<u>54,100</u>
Total	\$334,800

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

#### Airport Derived Employment

An important element in the Mason County Airport economic impact total is the employment which the airport creates. People are employed in airport-related activities at the airport (the FBO, the airlines, the federal government, the County, etc.) and at other off-airport sites (hotels, manufacturing concerns, etc.). Furthermore, the direct and indirect expenditures attributable to the airport continue to flow through the region's economy creating additional employment (the "multiplier" effect). A summary of the jobs estimated to be attributable to Mason County Airport is given in Exhibit 13.

Exhibit 12  
**ECONOMIC IMPACT OF MASON COUNTY AIRPORT**  
 1987

<b>IMPACTED INDUSTRY GROUPS</b>	<b>TOTAL ANNUAL IMPACT (Output) (.....Thousands.....)</b>	<b>TOTAL ANNUAL PAYROLL (Earnings)(1) (.....)</b>	<b>EMPLOYMENT (Jobs)</b>
Ag. Prod., Forestry Svcs.	\$14	\$2	0
Crude Petrol.	2	0	0
New Construction	355	106	4
Maint. and Repair Const.	23	10	0
Food, Kindred Prd.	14	2	0
Printing, Publishing	7	1	0
Chemicals, Refined Petrol.	1	0	0
Rubber, Leather Prod.	4	0	0
Lumber, Furniture Prod.	1	0	0
Stone, Clay, Glass Prod.	10	3	0
Primary Metals	3	1	0
Fabricated Metals	19	4	0
Non-electrical Machinery	1	0	0
Motor Vehicles, Equipment	3	0	0
Transportation	330	118	4
Communications	28	7	0
Utilities	37	3	0
Wholesale Trade	28	10	0
Retail Trade	63	29	2
Finance	12	2	0
Insurance	8	1	0
Real Estate	52	0	0
Lodging, Amusements	121	40	4
Personal Services	5	1	0
Business Services	142	58	3
Eating, Drinking Estab.	105	32	4
Health Services	27	14	1
Other Services	24	8	1
Households	--	1	0
<b>TOTALS</b>	<b>\$1,439</b>	<b>\$453</b>	<b>23</b>

(1) The portion of the "output" column that is payroll to employed persons.

SOURCE: Rims II Multipliers, MDOT, BTP study consultant, Wilbur Smith Associates.

## Exhibit 13

JOBS ATTRIBUTABLE TO  
MASON COUNTY AIRPORT

<u>JOB SOURCE</u>	<u>Full Time</u>	<u>Part Time</u>	<u>Total FEQ</u>
Direct On-Site Jobs	4	3	5
Indirect Off-Site Jobs at Surveyed Firms	7	2	8
Induced and Other Indirect Jobs			<u>10</u>
		<b>Total Jobs</b>	<b>23</b>

NOTE: FEQ denotes "full-time equivalent" jobs, calculated as two part-time jobs equal one full-time job.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

The RIMS model treats jobs as full-time-equivalents (FEQ). Consequently, the split between full-time and part-time for induced employment is not shown. The Exhibit shows that there are five FEQ jobs at the airport, and another 18 located elsewhere in the region that are attributable to the airport.

Non-Economic Values

Mason County Airport provides Ludington area residents with alternative linkages to the rest of the state and beyond. But for the local airport, heavy winter snows could isolate many remote places for extensive periods.

The airport provides access to the latest medical diagnosis and treatment procedures. For example, blood and tissue samples are sent to medical centers and specialist locations for analysis. Medical supplies not available locally (such as serums, antitoxins, isotopes, and organs for transplant operations) are shipped by air and patients are moved by air for treatment procedures not available in their community.

Mason County Airport also supports the maintenance of essential community services and security. It is available as a refueling base, to support police, Civil Air Patrol and National Guard search or surveillance activities. In case of natural disasters (fire, flood or blizzard) it is a resource for supply and evacuation.

In recent years, general aviation has become a major training ground for rewarding careers in the airline and aeronautical fields. The presence of an airport gives residents the option of flight instruction and ground service training.

# VALUE OF MARQUETTE COUNTY AIRPORT TO THE MARQUETTE AREA

**Economic Values**

Marquette County Airport is estimated to have an economic impact on its service area of approximately \$48.6 million annually in total economic activity of which nearly \$16.1 million is household earnings. This impact is due principally to the provision and use of scheduled air carrier services, general aviation services, and sizeable federal government operations at the airport.

**Airport Characteristics**

Owned and operated by Marquette County, the airport is open to the public, has a "T-5" classification, and is the ninth largest airport in Michigan in terms of annual scheduled passenger usage.

**Airport Services** - Marquette County Airport is a commuter air carrier and general aviation airport, offering the services listed in Exhibit 1.

All of these services have positive economic significance to the Marquette area. This is due to the creation of employment, generation of taxes and potential attraction and retention of businesses for the area.

**Airport Facilities** - The airport is an all-weather facility capable of handling virtually all general aviation aircraft types. It has two runways, a rotating beacon, segmented circle, lighted wind direction indicator, passenger terminal, hangar space, and two Fixed-Base Operators (FBOs) who provide aviation support services. Additional facilities are listed in Exhibit 2.

**Exhibit 2**

**FACILITIES AT  
MARQUETTE COUNTY AIRPORT**

**Exhibit 1**

**SERVICES OFFERED AT  
MARQUETTE COUNTY AIRPORT**

- |                  |                    |
|------------------|--------------------|
| Commuter Air     | Avgas Fuel Sales   |
| Air Taxi         | Aircraft Repair    |
| General Aviation | Avionics Repair    |
| Hangar Rental    | Flight Instruction |
| Tie Down         | Car Rental         |
| Aircraft Rental  | Restaurant         |
| Aircraft Sales   | Vending            |
| Jet Fuel Sales   | Flight Services    |
| Avionics Sales   | Station            |

**SOURCE:** Surveys by MDOT, Bureau of Transportation Planning (BTP) study consultants, Wilbur Smith Associates.

	<u>RUNWAYS</u>		<u>DESCRIPTION</u>				
	<u>Lgth.</u>	<u>Surf.</u>	<u>Taxi Sys.</u>	<u>Edge Lts.</u>	<u>REIL</u>	<u>VASI</u>	<u>Instr. Appr.</u>
Primary	6,500	PV FP	FP	HIRL	Y	Y	PR
Crosswind	3,000	PV PP	PP	None	N	N	VIS

**NOTES:** PV denotes paved surface; Taxi system definitions are: FP = full parallel; PP = part parallel; and TN = turnaround area at runway ends. Runway lighting systems (Edge Lights) are designated HIRL = high intensity runway lights. MIRL medium intensity; or LIRL, low intensity. Column heading REIL denotes Runway End Indicator Lights; VASI denotes Visual Approach Slope Indicator; column entries refer to presence of the equipment (Y denotes "yes"; N, "no"). Instrument approach facilities are: PR, Precision; NP, Non-Precision; or VIS, visual.

**SOURCE:** MDOT, BTP.

Airport Use - Marquette County Airport currently is served by two commuter air carriers (American Eagle and Northwest Airlinck). In 1987, these were both operated by Simmons Airlines, which is, in part, headquartered here. The airport also has substantial general aviation activity. A total of 76 general aviation aircraft are based at the airport, as itemized in Exhibit 3.

Exhibit 3

NUMBERS OF BASED AIRCRAFT  
MARQUETTE COUNTY AIRPORT

<u>AIRCRAFT TYPE</u>	<u>1988</u>
Single Engine	18
Multi-Engine	57
Jet	<u>1</u>
<b>Total Aircraft</b>	<b>76</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Estimated aircraft operations 1987 are given in Exhibit 4. Military operations are normally training for military aircraft based elsewhere. Frequency of commuter air service operations varies seasonally.

Aircraft operations at the airport have fluctuated in recent years, in response to the training and servicing activities of Simmons Airlines. Itinerant operations have recently comprised from 40 to 60 percent of total flight activity, reflecting use of the airport as both a transportation facility and a training airport. Annual operations for several recent years are shown in Exhibit 5.

Exhibit 4

AIRCRAFT OPERATIONS  
MARQUETTE COUNTY AIRPORT

<u>TYPE OPERATION</u>	<u>1987</u>
<u>Itinerant:</u>	
Commuter Carrier	7,410
Air Taxi	3,480
General Aviation	11,630
Military	<u>110</u>
Subtotal Itinerant	22,630
<u>Local:</u>	
General Aviation	<u>15,090</u>
<b>Total</b>	<b>37,720</b>

NOTE: Commuter Carrier operations include flights related to Simmons training and maintenance activities. Itinerant operations are defined locally as flights by visiting aircraft.

SOURCE: MDOT, BTP Breakdown estimated by Study consultant, Wilbur Smith Associates, based on information from Airport Manager.

Exhibit 5

OPERATIONS TREND  
MARQUETTE COUNTY AIRPORT

<u>OPERATIONS TYPE</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>
Itinerant	13,180	25,050	17,790	22,630
Local	<u>19,770</u>	<u>47,370</u>	<u>26,680</u>	<u>15,090</u>
<b>Totals</b>	<b>32,950</b>	<b>72,420</b>	<b>44,470</b>	<b>37,720</b>

SOURCE: MDOT, BTP.

Air passenger use has declined over the past two years, as indicated in Exhibit 6. Local airport management feels this is due to a significant proportion of non-pressurized flights and new, higher fare schedules. This is particularly true in markets lacking "through" fares with major carriers. The new trade pact with Canada is seen as a potential growth opportunity for Marquette County Airport which some local citizens feel may emerge as a feeder hub. Plans are being developed for expanding the terminal. Currently, an average of about 170 people use the air carrier services daily. Scheduled flights number eight per day in July and somewhat fewer in winter.

## Exhibit 6

**AIR CARRIER PASSENGERS  
MARQUETTE COUNTY AIRPORT**

PASSENGER COUNT	1984				1985				1986				1987			
	1984				1985				1986				1987			
Deplaned	36,258	37,039	34,847	31,282												
Enplaned	<u>35,898</u>	<u>38,171</u>	<u>35,085</u>	<u>32,196</u>												
Totals	72,156	75,210	69,932	63,478												

SOURCE: MDOT, BTP.

Although air cargo tonnage has declined in recent years, it continues to be an important activity at Marquette County Airport, as shown in Exhibit 7. To a considerable extent, air cargo volumes are influenced by factors external to the local economy, such as decisions on distributional activities by management of express package delivery firms.

## Exhibit 7

**AIR CARGO HANDLED AT  
MARQUETTE COUNTY AIRPORT**

CARGO MOVEMENT	CARGO TONS		
	1985	1986	1987
Deplaned	106.8	35.3	57.9
Enplaned	<u>37.3</u>	<u>15.8</u>	<u>17.4</u>
Totals	144.1	51.1	75.3

SOURCE: MDOT, BTP.

Airport Economic Roles

Marquette County Airport has considerable business-oriented activity, with the following comprising the airport's principal economic impact types.

Retention of Private Business - Industrial park-type development has been occurring adjacent to the Airport, with county encouragement. Efforts are underway to attract airport-oriented activity, including express package forwarders. The park also is the site of the crew training headquarters of Simmons Airlines, a major commuter carrier. The headquarters operations generate significant economic activity which is attributable to the airport. Simmons' firmwide maintenance and training activities account for an estimated 350 jobs in the area and important economic impact. The airport also serves a number of private firms located in the service area.

Business-Oriented General Aviation - An estimated 40-60 percent of general aviation use at the airport is "business-oriented," and some of the region's businesses have aircraft at the airport including those listed in Exhibit 8.

## Exhibit 8

**A SAMPLE OF FIRMS  
WHICH BASE AIRCRAFT  
AT MARQUETTE COUNTY AIRPORT**

Capital City Express	Simmons Airlines
Mich. Dept. of Nat. Res.	U.P. Aero, Inc.
Northern Helicopters, Inc.	U.P. Executive Air

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

In addition to firms with general aviation aircraft based at the airport, there are others that depend on the airport, for various services, such as commuter passenger service, air taxi/charter service, air freight etc. These are important to sales, management and/or production activities at: Cleveland Cliffs Inc., Michigan Bell Telephone and the KI Sawyer Air Force Base, which ships parts in and out.

Airport Economic Impact

Exhibit 12

The Marquette County Airport aviation-related economic impact of nearly \$48.6 million annually comprises the impact types listed in Exhibit 9.

**ESTIMATED "DIRECT" ANNUAL IMPACTS  
MARQUETTE COUNTY AIRPORT**

Exhibit 9

**ANNUAL AVIATION-RELATED  
ECONOMIC IMPACT OF  
MARQUETTE COUNTY AIRPORT**

<u>IMPACT TYPE</u>	<u>AMOUNT</u>
Direct	\$26,207,400
Indirect	6,155,200
Induced	<u>16,272,400</u>
<b>Total</b>	<b>\$48,635,000</b>

<u>DIRECT IMPACT</u>	<u>AMOUNT</u>
Direct Payroll	\$13,549,800
Capital Expenditures	1,215,000
Operating Expenses	11,372,600
Refueling Service	<u>70,000</u>
<b>Total</b>	<b>\$26,207,400</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

The total impacts, by type, are summarized in Exhibit 10. There are some impacts at the airport which are not necessarily attributable to aviation, e.g., the weather service that serves more than just the airport, etc. This study assesses only the aviation-related impacts.

improvements to on-site facilities of tenants as well as to the airport itself. "Operating expenses" are local expenditures by the tenants or airport operator.

Direct Economic Impact - The "direct" impacts comprise the value of those activities involved in providing aviation services at the airport. Exhibit 11 lists the airport tenants and others included in the impact estimates. Direct impacts are listed in Exhibit 12.

Indirect Economic Impacts - Marquette County Airport "indirect" impacts are caused by airport use in the form of expenditures by air travelers and by those firms that depend on the airport for their business.

"Direct" payroll comprises payments to those people who work at the airport, are employed by the airlines, FBO, corporate users, restaurant, or other tenants. "Capital expenditures" include

It is estimated that over 35,000 visitors to the Marquette area arrive via Marquette County Airport annually (16,098 by commuter air carrier, 16,732 by personal or corporate aircraft, and 2,504 by air taxi in 1987). Based on approximate proportions of those staying overnight (more than one day) it is estimated that the average visitor spends approximately \$153 per trip at off-airport locations in the Marquette area. Local residents using the airport also spend money -- some \$29,800 per year locally (in addition to moneys spent at the airport). Furthermore, there are three travel agencies in the region. Surveys indicate that, taken together, about 90 percent of their economic activity (e.g. ticket sales) is related to aviation. Of this, virtually all are related to Marquette County Airport.

## Exhibit 10

**ESTIMATED ANNUAL ECONOMIC IMPACTS**  
**Marquette County Airport**  
**1987**

<u>IMPACT TYPE AND SOURCE</u>	<u>AVIATION RELATED</u>	<u>NON-AVIATION RELATED (1)</u>	<u>TOTAL(1)</u>
	(-----thousands-----)		
<b>Direct Impacts:</b>			
Air Carrier Operations	\$23,720.0	\$ 0.0	\$23,720.0
Federal Government	615.0	160.0	775.0
Local Governments	708.4	0.0	708.4
Air Passenger Services	183.0	0.0	183.0
Aviation Services	<u>981.0</u>	<u>0.0</u>	<u>981.0</u>
Subtotal	\$26,207.4	\$ 160.0	\$26,367.4
<b>Indirect Impacts:</b>			
Visitor Expenditures	\$ 4,902.1	\$ 0.0	\$ 4,902.1
Regional Expenditure	28.9	0.0	28.9
Corporate Operations & Other	111.0	0.0	111.0
Dependent Firms	<u>1,113.2</u>	<u>895.8</u>	<u>2,009.0</u>
Subtotal	\$ 6,155.2	\$ 895.8	\$ 7,051.0
<b>Induced Impacts:</b>	16,272.4		
<b>Total Annual Impacts</b>	<u>\$48,635.0</u>		

(1) Only aviation-related impacts are considered in this study.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.



**Exhibit 11**  
**ORGANIZATIONS AND FIRMS CREATING ECONOMIC IMPACTS**  
**Marquette County Airport**  
**1988**

<u>ORGANIZATION</u>	<u>ATTRIBUTION OF ACTIVITY</u>			<u>ECONOMIC ACTIVITY</u>
	<u>On-Site</u> <sup>(1)</sup>	<u>Off-Site</u> <sup>(2)</sup>	<u>Non-Aviation</u> <sup>(3)</sup>	
<b>Air Carrier Operations:</b>				
American Eagle	X			Airline
Northwest Link	X			Airline
Simmons Airline	X			Airline
<b>Federal Government:</b>				
Federal Aviation Administration				
Airways Facilities Services	X			Facility Maintenance Unit
Flight Services Station	X			Flight Conditions Advisory
National Oceanographic and Atmospheric Administration	X		X	National Weather Service
<b>Local Government:</b>				
County Airport	X			Airport Operations
<b>Air Passenger Services:</b>				
Hertz	X			Car Rental
National	X			Car Rental
Avis	X			Car Rental
Terminal Food Service	X		X	Restaurant
<b>Aviation Services:</b>				
Capital City Express	X			Fixed-Base Operator (FBO)
U.P. Exec. Air	X			FBO, Air Charter Service
U.P. Aero Inc.	X			Charter, Flight Instruction
<b>Other:</b>				
Federal Express	X	X	X	Express Package Service
UPS		X	X	Express Package Service
Corporate Air Oprns.	X	X	X	Hangar Leases, Company Aircraft Activity
Travel Agencies		X	X	Travel Arrangements

- (1) Economic activity on airport property, by an airport tenant, treated as "direct" economic impact.
- (2) Economic activity not taking place on airport property, but which is directly aviation-related to this airport. Treated as an "indirect" economic impact.
- (3) Activity which is not related to or dependent on aviation activities. Not included in the impact estimates.

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

The aviation-related indirect economic impacts attributable to Marquette County Airport total \$6.2 million, as shown in Exhibit 13. The visitor expenditures breakdown by expenditure type is based on a mix of tourist, business and personal travel derived from the results of surveys made at other airports. Since no Michigan surveys were available, these were adjusted to reflect a range of values judged to be appropriate for local conditions. All visitor expenditures are at the actual cost outlay except retail sales which, since it is a margin industry, is shown at 20 percent of the actual expenditures. Expenditures by airport-dependent firms consist of those costs attributable to airport-related activity.

**Exhibit 13**

**INDIRECT IMPACTS OF  
MARQUETTE COUNTY AIRPORT**

<u>REGIONAL EXPENDITURES BY SOURCE</u>	<u>ANNUAL IMPACT</u>
Visitor Expenditures:	
Lodging	\$1,655,000
Food & Beverage	1,395,300
Retail Sales	126,600
Entertainment	427,200
Ground Transport	373,200
Business	302,800
Other	<u>622,000</u>
Subtotal	\$4,902,100
Resident Expenditures	28,900
Corporate Air Opns.	111,000
Dependent Firm Expenditures	<u>1,113,200</u>
Total	\$6,155,200

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Induced Economic Impact - "Direct" economic impacts of about \$26.2 million, and "indirect" impacts of \$6.2 million, represent increases in final demand for goods and services in the Marquette region. To these must be added a "multiplier" effect produced by circulation of the money through the regional economy. To determine this "induced" impact, the U.S. Department of Commerce "Regional Input-Output Modeling System"

(RIMS-II) was used. It was found that the induced impact produced by Marquette County Airport in 1987 was approximately \$16,272,400.

**Industries Which Benefit**

The economic activities at Marquette County Airport produce expenditures for a wide variety of goods and services. Many types of industry benefit, whether or not they are themselves airport users. Exhibit 14 lists impacted industry groups, and shows the extent to which each benefits from Marquette County Airport in terms of total economic activity earnings and employment.

**Airport Derived Employment**

An important element in the Marquette County Airport economic impact total is the employment which the airport creates. People are employed in airport-related activities at the airport (the FBO, the airlines, the federal government, the County, etc.) and at other off-airport sites (hotels, manufacturing concerns, etc.). Furthermore, the direct and indirect expenditures attributable to the airport continue to flow through the region's economy creating additional employment (the "multiplier" effect). A summary of the jobs estimated to be attributable to Marquette County Airport is given in Exhibit 15.

**Exhibit 15**

**JOBS ATTRIBUTABLE TO  
MARQUETTE COUNTY AIRPORT**

<u>JOB SOURCE</u>	<u>Full Time</u>	<u>Part Time</u>	<u>Total FEQ</u>
Direct On-Site Jobs	390	36	408
Indirect Off-Site Jobs at Surveyed Firms	5	14	12
Induced and Other Indirect Jobs			<u>386</u>
		<b>Total Jobs</b>	<b>806</b>

NOTE: FEQ denotes "full-time equivalent" jobs, calculated as two part-time jobs equal one full-time job.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

Exhibit 14  
ANNUAL ECONOMIC IMPACTS OF MARQUETTE COUNTY AIRPORT  
1987

<u>IMPACTED INDUSTRY GROUPS</u>	<u>TOTAL ANNUAL IMPACT (Output)</u> (.....Thousands.....)	<u>TOTAL ANNUAL PAYROLL (Earnings)(1)</u> (.....Thousands.....)	<u>EMPLOYMENT (Jobs)</u>
Ag. Prod., Forestry Svcs.	\$350	\$70	8
Forestry Products	16	4	1
Crude Petrol.	149	14	0
New Construction	1,215	427	16
Maint. and Repair Const.	4,962	2,191	82
Food, Kindred Prd.	487	68	2
Apparel	29	7	0
Paper, Allied Products	2	0	0
Printing, Publishing	253	83	4
Chemicals, Refined Petrol.	73	11	0
Rubber, Leather Prod.	217	43	2
Lumber, Furniture Prod.	50	9	0
Stone, Clay, Glass Prod.	135	33	1
Primary Metals	55	11	0
Fabricated Metals	394	98	3
Non-electrical Machinery	62	20	1
Electrical Machinery	13	2	0
Motor Vehicles, Equipment	108	27	1
Other Transportation Equip.	1	0	0
Instruments	1	0	0
Miscellaneous Mfg.	40	9	0
Transportation	18,881	6,137	223
Communications	1,089	271	7
Utilities	1,633	163	4
Wholesale Trade	874	320	11
Retail Trade	2,249	1,047	78
Finance	463	143	6
Insurance	265	78	3
Real Estate	1,782	26	7
Lodging, Amusements	2,586	860	83
Personal Services	199	82	8
Business Services	5,415	2,137	98
Eating, Drinking Estab.	2,906	852	107
Health Services	916	496	22
Other Services	765	280	16
Households	--	59	12
<b>TOTALS</b>	<b>\$48,635</b>	<b>\$16,078</b>	<b>806</b>

(1) The portion of the "output" column inputs that is payroll to employed persons.

SOURCE: Rims II Multipliers, MDOT, BTP study consultant, Wilbur Smith Associates.

The RIMS model treats jobs as full-time-equivalents (FEQ). Consequently, the split between full-time and part-time for induced employment is not shown. The Exhibit shows that there are 420 FEQ jobs at or near the airport, and another 386 located elsewhere in the region that are attributable to the airport.

#### Non-Economic Values

Not all values a community derives from an airport are quantifiable in dollar terms. Marquette County Airport provides area residents with essential linkages to Michigan and beyond. But for the local airport, heavy winter snows could isolate many remote places for extensive periods.

The airport houses a National Weather Service unit which provides weather advisories to many local interests in addition to aviation, e.g., fishing and boating; forestry, agriculture and the resort industry. Recently installed severe weather radar equipment monitors storm conditions over most of Lake Superior.

The local airport provides access to the latest medical diagnosis and treatment procedures. For

example, blood and tissue samples are sent to downstate medical centers and specialist locations, for analysis: Medical supplies not available locally (such as serums, antitoxins, isotopes, and organs for transplant operations) are shipped by air; and patients are moved by air for treatment procedures not available in their community.

Marquette County Airport also supports the maintenance of essential community services and security. It is used to locate and combat forest fires or chemical spills; to patrol pipelines and power lines, to support police, Civil Air Patrol and National Guard Activities. In case of natural disasters (fire, flood or blizzard) it is a resource for supply and evacuation.

In recent years, general aviation has become a major training ground for rewarding careers in the airline and aeronautical fields. The presence of an airport gives residents the option of flight instruction and ground service training. Marquette County Airport supports or supplements local school programs to train students for aviation careers. The Simmons Airline training and maintenance base at the airport illustrates this career path activity.

# VALUE OF MONROE, CUSTER AIRPORT TO THE MONROE AREA

## Economic Values

Monroe Custer Airport is estimated to have an economic impact on its service area of approximately \$1.0 annually in total economic activity, \$322,000 of which is household earnings. This impact is due principally to the provision and use of general aviation services at the airport.

## Airport Characteristics

Owned and operated by the City of Monroe, the airport is open to the public and has a "T-3" classification.

Airport Services - Monroe Custer Airport is a general aviation airport, offering the services listed in Exhibit 1:

### Exhibit 1

#### SERVICES OFFERED AT CUSTER AIRPORT

General Aviation	Jet Fuel Sales
Hangar Rental	Avgas Fuel Sales
Tie Down	Aircraft Repair
Aircraft Rental	Flight Instruction
Aircraft Sales	

SOURCE: Surveys by MDOT, Bureau of Transportation Planning (BTP) study consultants, Wilbur Smith Associates.

All of these services have positive economic significance to the Monroe area. This is due to the creation of employment, generation of taxes and potential attraction and retention of businesses for the area.

Airport Facilities - The airport is an all-season facility capable of handling virtually all general aviation aircraft types. It has one runway, a rotating beacon, segmented circle, lighted wind indicator, small passenger terminal, and one Fixed-Base Operator (FBO) who provides aviation support services. Additional facilities are listed in Exhibit 2.

### Exhibit 2

#### FACILITIES AT CUSTER AIRPORT

	RUNWAYS		DESCRIPTION				
	Lgth.	Surf.	Taxi Sys.	Edge Lts.	REIL	VASI	Instr. Appr.
Primary	5,000	PV	PP	MIRL	Y	N	NP

NOTES: PV denotes paved surface; Taxi system definitions are: FP = full parallel; PP = part parallel; and TN = turnaround area at runway ends. Runway lighting systems (Edge Lights) are designated HIRL = high intensity runway lights. MIRL medium intensity; or LIRL, low intensity. Column heading REIL denotes Runway End Indicator Lights; VASI denotes Visual Approach Slope Indicator; column entries refer to presence of the equipment (Y denotes "yes"; N, "no"). Instrument approach facilities are: PR, Precision; NP, Non-Precision; or VIS, visual.

SOURCE: MDOT, BTP.

Airport Use - Monroe, Custer Airport has substantial general aviation activity. A total of 24 general aviation aircraft are based at the airport, as itemized in Exhibit 3.

## Exhibit 3

**NUMBERS OF BASED AIRCRAFT  
CUSTER AIRPORT**

<u>AIRCRAFT TYPE</u>	<u>1988</u>
Single Engine	21
Multi-Engine	<u>3</u>
<b>Total Aircraft</b>	<b>24</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Estimated aircraft operations for 1987 are given in Exhibit 4.

## Exhibit 4

**AIRCRAFT OPERATIONS  
CUSTER AIRPORT**

<u>TYPE OPERATION</u>	<u>1987</u>
Itinerant:	
General Aviation	5,200
Local:	
General Aviation	<u>5,200</u>
<b>Total</b>	<b>10,400</b>

SOURCE: MDOT, BTP.

Aircraft operations at the airport have generally declined in recent years and generally show an emphasis on local operations, associated with flight training activity. Itinerant operations, often business-related, have made up a significant minority of the total. There has been some variability in local operations, presumably related to the availability of flight instruction. With a new FBO in operation as of mid-1988, it can be expected that local operations will increase. Itinerant operations will still account for a significant portion of activity -- perhaps roughly 35 percent, as was the case in 1986.

## Exhibit 5

**OPERATIONS TREND  
CUSTER AIRPORT**

<u>OPERATIONS</u>	<u>1984</u>	<u>1986</u>	<u>1987</u>
Itinerant	3,160	6,230	5,200
Local	<u>5,990</u>	<u>11,790</u>	<u>5,200</u>
<b>Totals</b>	<b>9,150</b>	<b>18,020</b>	<b>10,400</b>

SOURCE: MDOT, BTP.

Airport Economic Roles

Monroe, Custer Airport accommodates a significant volume of business-oriented aviation activity which generates economic impacts.

Retention of Private Business - Monroe, Custer Airport is considered valuable to the competitive position of a number of local firms and plants, some of which might choose to locate elsewhere if the facility were not present. These organizations use the general aviation services made possible by the airport's existence. However, the facility was not found to be directly responsible for any significant economic development in the service area.

**Business-Oriented General Aviation** - An estimated 30-40 percent of general aviation use at the airport is "business-oriented," but few local industries base aircraft at the airport. However, a number depend on the airport, for various services, such as air taxi/charter service, air freight etc. Local survey respondents estimate that the Ford Motor Company ships roughly eight tons per year of small parts from Monroe Custer. General aviation services are important for sales, management and production activities at such firms as Aronov Realty; Cafaro (real property development); Elder Beerman (retailing); La-Z-Boy Chair Co. (furniture manufacturer); Leggett & Platt Mfg. and Monroe Auto Equipment.

**Airport Economic Impact**

The Monroe Custer Airport aviation-related economic impact of \$1.0 million annually comprises the impact types listed in Exhibit 6.

The total impacts, by type, are summarized in Exhibit 7. This study assesses only the aviation-related impacts.

Exhibit 6

**ANNUAL AVIATION-RELATED ECONOMIC IMPACT OF CUSTER AIRPORT**

<u>IMPACT TYPE</u>	<u>AMOUNT</u>
Direct	\$ 177,300
Indirect	460,100
Induced	<u>391,600</u>
<b>Total</b>	<b>\$1,029,000</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

**Direct Economic Impact** - The "direct" impacts comprise the value of those activities involved in providing aviation services at the airport. Exhibit 8 lists the airport tenants and others included in the impact estimates. Direct impacts are listed in Exhibit 9.

Exhibit 7

**ESTIMATED ANNUAL ECONOMIC IMPACTS  
Custer Airport  
1987**

<u>IMPACT TYPE AND SOURCE</u>	<u>AVIATION RELATED</u>	<u>NON-AVIATION RELATED (1)</u>	<u>TOTAL(1)</u>
	(-----thousands-----)		
<b>Direct Impacts:</b>			
Local Gov't./Aviation Services	177.3	0	177.3
<b>Indirect Impacts:</b>			
Visitor Expenditures	165.0	0	165.0
Regional Expenditure	1.1	0	1.1
Dependent Firms	<u>294.0</u>	<u>0</u>	<u>294.0</u>
Subtotal	\$ 460.1	\$ 0	\$ 460.1
<b>Induced Impacts:</b>	391.6		
<b>Total Annual Impacts</b>	<b>\$1,029.0</b>		

(1) Only aviation-related impacts are considered in this study.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

Exhibit 9

ESTIMATED "DIRECT" ANNUAL IMPACTS  
CUSTER AIRPORT

<u>DIRECT IMPACT</u>	<u>AMOUNT</u>
Direct Payroll	\$ 60,400
Operating Expenses	84,900
Refueling Service	<u>32,000</u>
<b>Total</b>	<b>\$177,300</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

"Direct" payroll comprises payments to those people who work at the airport and are employed by the airport operator (City of Monroe). "Capital expenditures" include improvements to on-site facilities. "Operating expenses" are local expenditures by the airport operator.

Indirect Economic Impacts - Monroe, Custer Airport "indirect" impacts are caused by airport use in the form of expenditures by air travelers and by those firms that depend on the airport for their business.

It is estimated that approximately 5,200 visitors to the Monroe area arrived via general aviation at Monroe Custer Airport in 1987. Based on approximate proportions of those staying overnight (more than one day) it is estimated that the average visitor spent approximately \$35 per trip at off-airport locations in the Monroe area. Local residents using the airport also spend money -- some \$1,100 per year locally.

Exhibit 8

ORGANIZATIONS AND FIRMS CREATING ECONOMIC IMPACTS  
Custer Airport  
1988

<u>ORGANIZATION</u>	<u>ATTRIBUTION OF ACTIVITY</u>			<u>ECONOMIC ACTIVITY</u>
	<u>Aviation-Related</u>			
	<u>On-Site</u> <sup>(1)</sup>	<u>Off-Site</u> <sup>(2)</sup>	<u>Non-Aviation</u> <sup>(3)</sup>	
Local Government/ Aviation Services: City Airport	X			Airport Operations
Other: Dependent Firms		X		Air charter, air cargo, air activity (Based Elsewhere)

- (1) Economic activity on airport property, by an airport tenant, treated as "direct" economic impact.
- (2) Economic activity not taking place on airport property, but which is directly aviation-related to this airport. Treated as an "indirect" economic impact.
- (3) Activity which is not related to or dependent on aviation activities. Not included in the impact estimates.

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.



The aviation-related indirect economic impacts attributable to Monroe, Custer Airport total \$460,100 million, as shown in Exhibit 10. The visitor expenditures breakdown by expenditure type is based on a mix of tourist, business and personal travel derived from the results of surveys made at other airports. Since no Michigan surveys were available, these were adjusted to reflect a range of values judged to be appropriate for local conditions. All visitor expenditures are at the actual cost outlay except retail sales which, since it is a margin industry, is shown at 20 percent of the actual expenditures. Expenditures by airport-dependent firms consist of those costs attributable to airport-related activity.

Exhibit 10

**INDIRECT IMPACTS OF CUSTER AIRPORT**

<u>REGIONAL EXPENDITURES BY SOURCE</u>	<u>ANNUAL IMPACT</u>
Visitor Expenditures:	
Lodging	\$ 55,700
Food & Beverage	47,000
Retail Sales	4,200
Entertainment	14,400
Ground Transport	12,600
Business	10,200
Other	<u>20,900</u>
Subtotal	\$ 165,000
Resident Expenditures	1,100
Dependent Firm Expenditures	<u>294,000</u>
Total	\$ 460,100

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Induced Economic Impact - "Direct" economic impacts of about \$177,300 and "indirect" impacts of \$460,100, represent increases in final demand for goods and services in the Monroe region. To these must be added a "multiplier" effect produced by circulation of the money through the regional economy. To determine this "induced" impact, the U.S. Department of Commerce "Regional Input-Output Modeling System" (RIMS-II) was used. It was found that the induced impact produced by Monroe, Custer Airport in 1987 was approximately \$391,600.

Industries Which Benefit

The economic activities at Monroe, Custer Airport produce expenditures for a wide variety of goods and services. Many types of industry benefit, whether or not they are themselves airport users. Exhibit 11 lists impacted industry groups, and shows the extent to which each benefits from Monroe Custer Airport in terms of total economic activity earnings and employment.

Airport Derived Employment

An important element in the Monroe, Custer Airport economic impact total is the employment which the airport creates. People are employed in airport-related activities at the airport and at other off-airport sites (hotels, manufacturing concerns, etc.). Furthermore, the direct and indirect expenditures attributable to the airport continue to flow through the region's economy creating additional employment (the "multiplier" effect). A summary of the jobs estimated to be attributable to Monroe, Custer Airport is given in Exhibit 12.

Exhibit 12

**JOBS ATTRIBUTABLE TO CUSTER AIRPORT**

<u>JOB SOURCE</u>	<u>Full Time</u>	<u>Part Time</u>	<u>Total FEQ</u>
Direct On-Site Jobs	2	1	2
Indirect Off-Site Jobs at Surveyed Firms	0	0	0
Induced and Other Indirect Jobs			<u>12</u>
		<b>Total Jobs</b>	<b>14</b>

NOTE: FEQ denotes "full-time equivalent" jobs, calculated as two part-time jobs equal one full-time job.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

Exhibit 11  
ECONOMIC IMPACTS OF CUSTER AIRPORT  
1987

<u>IMPACTED INDUSTRY GROUPS</u>	<u>TOTAL ANNUAL IMPACT (Output)</u> (.....Thousands.....)	<u>TOTAL ANNUAL PAYROLL (Earnings)(1)</u>	<u>EMPLOYMENT (Jobs)</u>
Ag. Prod., Forestry Svcs.	\$1	\$0	0
Maint. and Repair Const.	17	8	0
Food, Kindred Prd.	23	3	0
Paper, Allied Products	1	0	0
Printing, Publishing	8	2	0
Chemicals, Refined Petrol.	14	1	0
Rubber, Leather Prod.	4	0	0
Stone, Clay, Glass Prod.	1	0	0
Primary Metals	2	0	0
Fabricated Metals	4	1	0
Non-electrical Machinery	1	1	0
Electrical Machinery	1	0	0
Motor Vehicles, Equipment	12	1	0
Other Transportation Equip.	3	1	0
Miscellaneous Mfg.	1	0	0
Transportation	510	165	6
Communications	14	4	0
Utilities	30	2	0
Wholesale Trade	27	11	0
Retail Trade	35	19	1
Finance	10	2	0
Insurance	13	4	0
Real Estate	45	1	0
Lodging, Amusements	74	26	3
Personal Services	7	3	0
Business Services	65	28	1
Eating, Drinking Estab.	71	22	3
Health Services	17	10	0
Other Services	18	6	0
Households	--	1	0
<b>TOTALS</b>	<b>\$1,029</b>	<b>\$322</b>	<b>14</b>

(1) The portion of the "output" column that is payroll to employed persons.

SOURCE: Rims II Multipliers, MDOT, BTP study consultant, Wilbur Smith Associates.

The RIMS model treats jobs as full-time-equivalents (FEQ). Consequently, the split between full-time and part-time for induced employment is not shown. The Exhibit shows that there are two FEQ jobs at the airport, and another 12 located elsewhere in the greater Southwest Michigan region that are attributable to the airport.

#### Non-Economic Values

Not all values a community derives from an airport are quantifiable in dollar terms. Custer Airport provides residents of the Monroe area with essential linkages to Michigan and beyond.

The airport provides access to the latest medical diagnosis and treatment procedures. For example, blood and tissue samples can be sent to specialist locations for analysis; medical supplies not available locally (such as serums, antitoxins,

or isotopes) can be shipped by air; and patients moved by air for treatment procedures not available in the Monroe area.

A Civil Air Patrol unit is located at Custer Airport and the facility has served as a base of operations for search and rescue missions conducted jointly by the CAP and USCG over nearby portions of Lake Erie.

In recent years, general aviation has become a major training ground for rewarding careers in the airline and aeronautical fields. The presence of an airport gives residents the option of flight instruction and ground service training. Custer airport recently hosted a historic aircraft exhibit and is planning a 1989 fly-in static aircraft show which will offer the public opportunities to inspect private aircraft and learn about general aviation flying and career opportunities.

# VALUE OF MOUNT PLEASANT MUNICIPAL AIRPORT TO THE MOUNT PLEASANT AREA

## Economic Values

Mount Pleasant Municipal Airport is estimated to have an economic impact on its service area of approximately \$2.7 million annually in total economic activity, \$837,000 of which is household earnings. This impact is due principally to the provision and use of general aviation services at the airport.

## Airport Characteristics

Owned and operated by the City of Mount Pleasant, the airport is open to the public and has a "T-4" classification.

Airport Services - Mount Pleasant Municipal Airport is a general aviation airport, offering the services listed in Exhibit 1.

### Exhibit 1

#### SERVICES OFFERED AT MOUNT PLEASANT MUNICIPAL AIRPORT

Air Taxi	Avgas Fuel Sales
General Aviation	Aircraft Repair
Hangar Rental	Flight Instruction
Tie Down	Vending
Aircraft Rental	Aircraft Sales
	Jet Fuel Sales

SOURCE: Surveys by MDOT, Bureau of Transportation Planning (BTP) study consultants, Wilbur Smith Associates.

All of these services have positive economic significance to the Mount Pleasant area. This is

due to the creation of employment, generation of taxes and potential attraction and retention of businesses for the area.

Airport Facilities - The airport has one Fixed-Base Operator (FBO) who provides aviation support services. Additional airport facilities are listed in Exhibit 2.

### Exhibit 2

#### FACILITIES AT MOUNT PLEASANT MUNICIPAL AIRPORT

	RUNWAYS		DESCRIPTION					Instr.
	Lgth.	Surf.	Taxi Sys.	Edge Lts.	REIL	VASI	Appr.	
Primary	5,000	PV	NO	MIRL	N	N	NP	
Crosswind	2,405	TF	NO	None	N	N	VIS	

NOTES: PV denotes paved surface; Taxi system definitions are: FP = full parallel; PP = part parallel; and TN = turnaround area at runway ends. Runway lighting systems (Edge Lights) are designated HIRL = high intensity runway lights. MIRL medium intensity; or LIRL, low intensity. Column heading REIL denotes Runway End Indicator Lights; VASI denotes Visual Approach Slope Indicator; column entries refer to presence of the equipment (Y denotes "yes"; N, "no"). Instrument approach facilities are: PR, Precision; NP, Non-Precision; or VIS, visual.

SOURCE: MDOT, BTP.

Airport Use - Mount Pleasant Municipal Airport has substantial general aviation activity. A total of 38 general aviation aircraft are based at the airport, as itemized in Exhibit 3.

## Exhibit 3

**NUMBERS OF BASED AIRCRAFT  
MOUNT PLEASANT MUNICIPAL  
AIRPORT**

<u>AIRCRAFT TYPE</u>	<u>1988</u>
Single Engine	28
Multi-Engine	9
Helicopters	<u>1</u>
<b>Total Aircraft</b>	<b>38</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Estimated aircraft operations for 1987 are given in Exhibit 4.

## Exhibit 4

**AIRCRAFT OPERATIONS  
MOUNT PLEASANT MUNICIPAL  
AIRPORT**

<u>TYPE OPERATION</u>	<u>1987</u>
Itinerant:	
Air Taxi	3,000
General Aviation	<u>14,170</u>
Subtotal Itinerant	17,170
Local:	
General Aviation	<u>11,450</u>
<b>Total</b>	<b>28,620</b>

SOURCE: MDOT, BTP and FAA.

Aircraft operations at the airport have increased in recent years, and the majority of operations have become itinerant in nature. This reflects growing use of the airport as a transportation facility rather than principally as a recreation and training airport.

## Exhibit 5

**OPERATIONS TREND  
MOUNT PLEASANT MUNICIPAL  
AIRPORT**

<u>OPERATIONS</u>	<u>1983</u>	<u>1986</u>	<u>1987</u>
Itinerant	6,360	7,110	17,170
Local	<u>12,020</u>	<u>13,440</u>	<u>11,450</u>
<b>Totals</b>	<b>18,380</b>	<b>20,550</b>	<b>28,620</b>

SOURCE: MDOT, BTP.

Airport Economic Roles

Mount Pleasant Municipal Airport is an increasingly business-oriented airport, with the following comprising the airport's principal economic impact types.

Support of Private Business - Mount Pleasant Municipal Airport is considered valuable to the competitive position of a number of local firms and plants, some of which might choose to locate elsewhere if the facility were not present. These organizations use the air taxi and general aviation services made possible by the airport's existence. However, the facility was not found to be directly responsible for any significant economic development in the service area.

Business-Oriented General Aviation - An estimated 55-65 percent of general aviation use at the airport is "business-oriented," and a number of the region's businesses have aircraft at the airport including those listed in Exhibit 6.

**Exhibit 6**

**A SAMPLE OF FIRMS  
WHICH BASE AIRCRAFT  
AT MOUNT PLEASANT MUNICIPAL  
AIRPORT**

Beard Oil	Hubscher & Son
Randall Manufacturing	Central Michigan Inns
Marary Trucking	Cooling Components,
Aviation Services	Inc.
Bradley-Dunn Aviation	CF&S Company
TMI Services, Inc.	Gateway Air Services

**SOURCE:** Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

In addition to firms with general aviation aircraft based at the airport, there are many others that depend on the airport, for various services, such as air taxi/charter service, air freight etc. These are important for sales, management and production activities at such companies as: Central Concrete; Warlbro Co.; Independent Paper Craft; Schulumberger; Omega Cable Systems; and First National Bank of St. Louis, MO.

**Airport Economic Impact**

The Mount Pleasant Municipal Airport aviation-related economic impact of more than \$2.7 million annually comprises the impact types given in Exhibit 7.

**Exhibit 7**

**ANNUAL AVIATION-RELATED  
ECONOMIC IMPACT OF  
MOUNT PLEASANT MUNICIPAL  
AIRPORT**

<u>IMPACT TYPE</u>	<u>AMOUNT</u>
Direct	\$ 695,000
Indirect	1,121,000
Induced	<u>902,000</u>
<b>Total</b>	<b>\$2,718,000</b>

**SOURCE:** Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

The total impacts, by type, are summarized in Exhibit 8. These include \$30,000 in capital aid funds from MDOT. This study assesses only the aviation-related impacts.

**Exhibit 8**

**ESTIMATED ANNUAL ECONOMIC IMPACTS  
MOUNT PLEASANT MUNICIPAL AIRPORT  
1987**

<u>IMPACT TYPE AND SOURCE</u>	<u>AVIATION RELATED</u>	<u>NON-AVIATION RELATED (1)</u>	<u>TOTAL(1)</u>
	-----thousands-----		
<b>Direct Impacts:</b>			
Local Governments	37	0	37
Aviation Services	<u>658</u>	<u>0</u>	<u>658</u>
<b>Subtotal</b>	<b>\$ 695</b>	<b>\$ 0</b>	<b>\$ 695</b>
<b>Indirect Impacts:</b>			
Visitor Expenditures	\$ 938	\$ 0	\$ 938
Regional Expenditure	3	0	3
Corporate Operations & Other	<u>180</u>	<u>180</u>	<u>360</u>
<b>Subtotal</b>	<b>\$ 1,121</b>	<b>\$ 180</b>	<b>\$ 1,301</b>
<b>Induced Impacts:</b>	<b>902</b>		
<b>Total Annual Impacts</b>	<b><u>\$2,718</u></b>		

(1) Only aviation-related impacts are considered in this study.

Direct Economic Impact - The "direct" impacts comprise the value of those activities involved in providing aviation services at the airport. Exhibit 9 lists the airport tenants and

others included in the impact estimates. The makeup of direct impacts is given in Exhibit 10. "Direct" payroll comprises payments to those people who work at the airport, are employed by the FBO, corporate users, or other tenants. "Capital expenditures" include improvements to on-site facilities of tenants as well as to the airport itself. "Operating expenses" are local expenditures by the tenants or airport operator.

Exhibit 10

**ESTIMATED "DIRECT" ANNUAL IMPACTS  
MOUNT PLEASANT MUNICIPAL  
AIRPORT**

<u>DIRECT IMPACT</u>	<u>AMOUNT</u>
Direct Payroll	\$454,000
Capital Expenditures	150,000
Operating Expenses	46,000
Refueling Service	<u>45,000</u>
<b>Total</b>	<b>\$695,000</b>

Indirect Economic Impacts - Mount Pleasant Municipal Airport "indirect" impacts are caused by airport use in the form of expenditures by air travelers and by those firms that depend on the airport for their business.

It is estimated that over 16,000 visitors to the Mount Pleasant area arrive via Mount Pleasant Municipal Airport annually (approximately 14,200 by personal or corporate aircraft, and 2,200 by air taxi in 1987). Based on approximate proportions of those staying overnight (more than one day) it is

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Exhibit 9

**ORGANIZATIONS AND FIRMS CREATING ECONOMIC IMPACTS  
MOUNT PLEASANT MUNICIPAL AIRPORT**

1987

<u>ORGANIZATION</u>	<u>ATTRIBUTION OF ACTIVITY</u>			<u>ECONOMIC ACTIVITY</u>
	<u>On- Site</u> <sup>(1)</sup>	<u>Off- Site</u> <sup>(2)</sup>	<u>Non- Aviation</u> <sup>(3)</sup>	
Local Government: Municipal Airport	X			Airport Operations
Aviation Services: Bradley-Dunn Aviation, Inc.	X			Fixed-Base Operator
Aviation Services, Inc.	X			Air Charter, Air Operations Management Services
Air Service, Inc.	X			Air Inspection of Utility Lines
Gateway Air Services, Inc <sup>(4)</sup>	X			Freight Charter Service
Other: Corporate Air Operations	X			Hangar Leases, Company Aircraft Activity

- (1) Economic activity on airport property, by an airport tenant, treated as "direct" economic impact.
- (2) Economic activity not taking place on airport property, but which is directly aviation-related to this airport. Treated as an "indirect" economic impact.
- (3) Activity which is not related to or dependent on aviation activities. Not included in the impact estimates.
- (4) Currently operating at Clare Airport.

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

estimated that the average visitor spends approximately \$63 per trip at off-airport locations in the Mount Pleasant area. Local residents using the airport also spend money -- some \$3,000 per year locally.

The aviation-related indirect economic impacts attributable to Mount Pleasant Municipal Airport total \$1.1 million, as shown in Exhibit 11. The visitor expenditures breakdown by expenditure type is based on a mix of tourist, business and personal travel derived from the results of surveys made at other airports. Since no Michigan surveys were available, these were adjusted to reflect a range of values judged to be appropriate for local conditions. All visitor expenditures are at the actual cost outlay except retail sales which, since it is a margin industry, is shown at 20 percent of the actual expenditures. Expenditures by airport-dependent firms consist of those costs attributable to airport-related activity.

**Exhibit 11**

**INDIRECT IMPACTS OF  
MOUNT PLEASANT MUNICIPAL  
AIRPORT**

<u>REGIONAL EXPENDITURES BY SOURCE</u>	<u>ANNUAL IMPACT</u>
Visitor Expenditures:	
Lodging	\$ 317,000
Food & Beverage	267,000
Retail Sales	24,000
Entertainment	82,000
Ground Transport	71,000
Business	58,000
Other	<u>119,000</u>
Subtotal	\$ 938,000
Resident Expenditures	3,000
Corporate Air Opns.	<u>180,000</u>
<b>Total</b>	<b>\$1,121,000</b>

**SOURCE:** Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

**Induced Economic Impact** - "Direct" economic impacts of about \$695,000 and "indirect" impacts of \$1,121,000 represent increases in final demand for goods and services in the Mt. Pleasant region. To these must be added a "multiplier" effect produced by circulation of the money through the regional economy. To determine this "induced" impact, the U.S. Department of Commerce "Regional Input-Output Modeling System" (RIMS-II) was used. It was found that the induced impact produced by Mount Pleasant Municipal Airport in 1987 was approximately \$902,000.

**Industries Which Benefit**

The economic activities at Mount Pleasant Municipal Airport produce expenditures for a wide variety of goods and services. Many types of industry benefit, whether or not they are themselves airport users. Exhibit 12 lists impacted industry groups, and shows the extent to which each benefits from Mount Pleasant Municipal Airport in terms of total economic activity, earnings and employment.

**Airport Derived Employment**

An important element in the Mount Pleasant Municipal Airport economic impact total is the employment which the airport creates. People are employed in airport-related activities at the airport (the FBO, the City, etc.) and at other off-airport sites (hotels, manufacturing concerns, etc.). Furthermore, the direct and indirect expenditures attributable to the airport continue to flow through the region's economy creating additional employment (the "multiplier" effect). A summary of the jobs estimated to be attributable to Mount Pleasant Municipal Airport is given in Exhibit 13.

The RIMS model treats jobs as full-time-equivalents (FEQ). Consequently, the split between full-time and part-time for induced employment is not shown. The Exhibit shows that there are 21 FEQ jobs at the airport, and another 31 located elsewhere in the greater Central Michigan region that are attributable to the airport.



Exhibit 12  
**ECONOMIC IMPACT OF MT. PLEASANT MUNICIPAL AIRPORT  
 BY IMPACTED INDUSTRY TYPE  
 1987**

<u>IMPACTED INDUSTRY GROUPS</u>	<u>TOTAL ANNUAL IMPACT (Output)</u> (.....Thousands.....)	<u>TOTAL ANNUAL PAYROLL (Earnings)(1)</u>	<u>EMPLOYMENT (Jobs)</u>
Ag. Prod., Forestry Svcs.	\$32	\$6	1
Forestry Products	1	0	0
Crude Petrol.	7	0	0
New Construction	150	54	2
Maint. and Repair Const.	34	16	1
Food, Kindred Prd.	37	5	0
Apparel	1	0	0
Printing, Publishing	16	4	0
Chemicals, Refined Petrol.	4	0	0
Rubber, Leather Prod.	9	2	0
Lumber, Furniture Prod.	2	0	0
Stone, Clay, Glass Prod.	7	1	0
Primary Metals	1	0	0
Fabricated Metals	17	4	0
Non-electrical Machinery	3	0	0
Motor Vehicles, Equipment	3	0	0
Other Transportation Equip.	10	0	0
Miscellaneous Mfg.	1	0	0
Transportation	964	302	11
Communications	53	13	0
Utilities	61	4	0
Wholesale Trade	48	18	1
Retail Trade	125	59	4
Finance	24	7	0
Insurance	15	3	0
Real Estate	98	1	0
Lodging, Amusements	411	136	13
Personal Services	14	4	1
Business Services	145	59	3
Eating, Drinking Estab.	335	98	12
Health Services	50	25	1
Other Services	40	14	1
Households	--	2	1
<b>Total</b>	<b>\$2,718</b>	<b>\$837</b>	<b>52</b>

(1) The portion of the "output" column that is payroll to employed persons.

SOURCE: Rims II Multipliers, MDOT, BTP study consultant, Wilbur Smith Associates.

Exhibit 13

**JOBS ATTRIBUTABLE TO  
MOUNT PLEASANT MUNICIPAL  
AIRPORT**

<u>JOB SOURCE</u>	<u>Full Time</u>	<u>Part Time</u>	<u>Total FEQ</u>
Direct On-Site Jobs	20	2	21
Indirect Off-Site Jobs at Surveyed Firms	0	0	0
Induced and Other Indirect Jobs			<u>31</u>
		<b>Total Jobs</b>	<b>52</b>

NOTE: FEQ denotes "full-time equivalent" jobs, calculated as two part-time jobs equal one full-time job.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

Non-Economic Values

Not all values a community derives from an airport are quantifiable in dollar terms. Mount Pleasant Municipal Airport provides local residents with alternative linkages to Michigan and beyond.

The airport provides access to the latest medical diagnosis and treatment procedures. For example, blood and tissue samples are sent to medical centers and specialist locations, for analysis; medical supplies not available locally (such as serums, antitoxins, isotopes, and organs for transplant operations) are shipped by air; and patients are moved by air for treatment procedures not available in their community.

Airports also support the maintenance of essential community services and security. They are used to help locate and combat forest fires or chemical spills; to patrol pipelines and power lines, to support police, Civil Air Patrol and National Guard Activities. In case of natural disasters (fire, flood or blizzards) the airport is a resource for supply and evacuation.

In recent years, general aviation has evolved into a major training ground for aviation services careers. Mount Pleasant Airport supports and supplements local school programs to train students for aviation careers. In cooperation with Central Michigan University's Department of Industrial and Engineering Technology, the airport's FBO flight instruction program is recognized for academic credit. The University is studying possible further course offerings, to prepare students for aviation career paths.

# VALUE OF MUSKEGON COUNTY AIRPORT TO THE MUSKEGON AREA

## Economic Values

Muskegon County Airport is estimated to have an economic impact on its service area of approximately \$22 million annually in total economic activity, \$7.1 million of which is household earnings. This impact is due principally to the provision and use of scheduled air carrier services, general aviation services, and the sizeable federal government operations at the airport.

## Airport Characteristics

Owned and operated by Muskegon County, the airport is open to the public, has a "T-5" classification, and is the eighth largest airport in Michigan in terms of annual scheduled passenger usage.

Airport Services - Muskegon County Airport is a full-service scheduled air carrier and general aviation airport, offering nearly everything desired of such airports, including:

### Exhibit 1

#### SERVICES OFFERED AT MUSKEGON COUNTY AIRPORT

Scheduled Air Carrier	Avgas Fuel Sales
Commuter Air	Aircraft Repair
Air Taxi	Avionics
General Aviation	Flight Instruction
Hangar Rental	Car Rental
Tie Down	Restaurant
Aircraft Rental	Vending
Aircraft Sales	Control Tower
Jet Fuel Sales	Fire Station

SOURCE: Surveys by MDOT, Bureau of Transportation Planning (BTP) study consultants, Wilbur Smith Associates.

All of these services have positive economic significance to the Muskegon area. This is due to the creation of employment, generation of taxes and potential attraction and retention of businesses for the area.

Airport Facilities - The airport is an all-weather facility capable of handling up to turbojet aircraft. It has three runways, is towered, has a passenger terminal, recently constructed additional hangar space, and has one Fixed-Base Operator (FBO) who provides aviation support services.

### Exhibit 2

#### FACILITIES AT MUSKEGON COUNTY AIRPORT

	RUNWAYS		DESCRIPTION				
	Lgth.	Surf.	Taxi Sys.	Edge Lts.	REIL	VASI	Instr. Appr.
Primary	6,500	PV	FP	HIRL	Y	Y	PR
Crosswind	5,000	PV	PP	HIRL	Y	Y	NP
Crosswind	3,200	PV	PP	MIRL	N	N	VIS

NOTES: PV denotes paved surface; Taxi system definitions are: FP = full parallel; PP = part parallel; and TN = turnaround area at runway ends. Runway lighting systems (Edge Lights) are designated HIRL = high intensity runway lights. MIRL medium intensity; or LIRL, low intensity. Column heading REIL denotes Runway End Indicator Lights; VASI denotes Visual Approach Slope Indicator; column entries refer to presence of the equipment (Y denotes "yes"; N, "no"). Instrument approach facilities are: PR, Precision; NP, Non-Precision; or VIS, visual.

SOURCE: MDOT, BTP.

**Airport Use** - Muskegon County Airport currently is served by two scheduled air carriers (American Eagle and Midway Connection) and has substantial general aviation activity. A total of 60 general aviation aircraft are based at the airport, as itemized in Exhibit 3.

## Exhibit 3

**NUMBERS OF BASED AIRCRAFT  
MUSKEGON COUNTY AIRPORT**

<u>AIRCRAFT TYPE</u>	<u>1988</u>
Single Engine	44
Multi-Engine	12
Jet	<u>4</u>
<b>Total Aircraft</b>	<b>60</b>

**SOURCE:** Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Estimated aircraft operations for 1986 and 1987 are given in Exhibit 4. Military operations are normally training for military aircraft based elsewhere.

## Exhibit 4

**AIRCRAFT OPERATIONS  
MUSKEGON COUNTY AIRPORT**

<u>TYPE OPERATION</u>	<u>1986</u>	<u>1987</u>
<b>Itinerant:</b>		
Air Carrier	6,902	4,542
Air Taxi	5,799	2,047
General Aviation	27,057	29,528
Military	<u>2,318</u>	<u>1,916</u>
Subtotal Itinerant	42,076	38,033
<b>Local:</b>		
General Aviation	16,875	20,842
Military	<u>1,642</u>	<u>1,732</u>
Subtotal Local	18,517	22,574
<b>Total</b>	<b>60,593</b>	<b>60,607</b>

**SOURCE:** MDOT, BTP.

Aircraft operations at the airport have generally declined in recent years, and are largely itinerant in nature reflecting the use of the airport as a transportation facility rather than a training airport.

## Exhibit 5

**OPERATIONS TREND  
MUSKEGON COUNTY AIRPORT**

<u>OPERATIONS</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>
Itinerant	45,938	42,076	38,033
Local	<u>19,860</u>	<u>18,517</u>	<u>22,574</u>
<b>Totals</b>	<b>65,798</b>	<b>60,593</b>	<b>60,607</b>

**SOURCE:** MDOT, BTP.

Air passenger use has fluctuated with the level of services provided by the air carriers. Currently an average of 210 people use the air carrier services daily. Scheduled flights number ten per day.

## Exhibit 6

**AIR CARRIER PASSENGERS  
MUSKEGON COUNTY AIRPORT**

<u>PASSENGERS</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>
Deplaned	42,314	46,921	38,737
Enplaned	<u>44,468</u>	<u>48,751</u>	<u>38,773</u>
<b>Totals</b>	<b>86,782</b>	<b>95,672</b>	<b>77,510</b>

**SOURCE:** MDOT, BTP.

Although air cargo tonnage has declined in recent years, it continues to be an important activity at Muskegon County Airport, as shown in Exhibit 7.

## Exhibit 7

**AIR CARGO HANDLED AT  
MUSKEGON COUNTY AIRPORT**

<u>CARGO MOVEMENT</u>	<u>CARGO TONS</u>		
	<u>1985</u>	<u>1986</u>	<u>1987</u>
Deplaned	26.1	21.9	9.0
Enplaned	<u>25.1</u>	<u>16.5</u>	<u>7.1</u>
<b>Totals</b>	<b>51.2</b>	<b>38.4</b>	<b>16.1</b>

**SOURCE:** MDOT, BTP.

**Airport Economic Roles**

Muskegon County Airport is a business-oriented airport, with the following comprising the airport's principal economic impact types.

**Retention of Private Business** - Muskegon County Airport is considered valuable to the competitive position of a number of local firms and plants, some of which might choose to locate elsewhere if the facility were not present. These organizations use the commuter air, air taxi, and general aviation services made possible by the airport's existence. However, the facility was not found to be directly responsible for any significant economic development in the service area.

**Business-Oriented General Aviation** - An estimated 70-80 percent of general aviation use at the airport is "business-oriented," and many of the region's businesses have aircraft at the airport including those listed in Exhibit 8.

**Exhibit 8**

**A SAMPLE OF FIRMS  
WHICH BASE AIRCRAFT  
AT MUSKEGON COUNTY AIRPORT**

American Actuaries	Sealed Power Corp.
Bilmar Farms	SeaWay Insurance
Executive Air Transport	Shane Steel
General Telephone Co.	Teledyne Cont'l Mtrs.
Howmet Corp.	W. Mich. Flying Club
Jetaway Air Service	Zilincka Nurseries
School Zone Publishing	Many Others

**SOURCE:** Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

In addition to firms with general aviation aircraft based at the airport, there are many others that depend on the airport, for various services, such as scheduled passenger service, air taxi/charter service, air freight etc. These are important for sales, management and production activities at firms like S.D. Warren Co.; Cannon-Muskegon Corp.; Keene Corp., Kaydon Bearing Division; Bennett Pump Co.; Muskegon Piston Ring Co.; Prince Corp.; and others.

**Airport Economic Impact**

The Muskegon County Airport aviation-related economic impact of nearly \$22 million annually comprises the impact types listed in Exhibit 9.

**Exhibit 9**

**ANNUAL AVIATION-RELATED  
ECONOMIC IMPACT OF  
MUSKEGON COUNTY AIRPORT**

<u>IMPACT TYPE</u>	<u>AMOUNT</u>
Direct	\$ 4,476,000
Indirect	8,018,000
Induced	<u>9,224,000</u>
<b>Total</b>	<b>\$21,718,000</b>

**SOURCE:** Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

The total impacts, by type, are summarized in Exhibit 10. The direct impacts include \$476,000 in capital aid funds which impact the local economy: \$456,000 in Federal funds and \$20,000 from MDOT. There are some impacts at the airport which are not necessarily attributable to aviation, e.g., a fire station and weather service that serve more than just the airport, etc. This study assesses only the aviation-related impacts.

**Direct Economic Impact** - The "direct" impacts comprise the value of those activities involved in providing aviation services at the airport. Exhibit 11 lists the airport tenants and others included in the impact estimates.

**Exhibit 12**

**ESTIMATED "DIRECT" ANNUAL IMPACTS  
MUSKEGON COUNTY AIRPORT**

<u>DIRECT IMPACT</u>	<u>AMOUNT</u>
Direct Payroll	\$2,527,000
Capital Expenditures	568,000
Operating Expenses	1,303,000
Refueling Service	<u>78,000</u>
<b>Total</b>	<b>\$4,476,000</b>

**SOURCE:** Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

## Exhibit 10

**ESTIMATED ANNUAL ECONOMIC IMPACTS**  
**Muskegon County Airport**  
**1987**

<u>IMPACT TYPE AND SOURCE</u>	<u>AVIATION RELATED</u>	<u>NON-AVIATION RELATED (1)</u>	<u>TOTAL(1)</u>
	(-----thousands-----)		
<b>Direct Impacts:</b>			
Air Carrier Operations	\$ 557	\$ 0	\$ 557
Federal Government	2,038	150	2,188
Local Governments	411	180	591
Air Passenger Services	788	44	832
Aviation Services	<u>682</u>	<u>0</u>	<u>682</u>
Subtotal	\$ 4,476	\$ 374	\$ 4,850
<b>Indirect Impacts:</b>			
Visitor Expenditures	\$ 7,162	\$ 0	\$ 7,162
Regional Expenditure	31	0	31
Corporate Operations & Other	495	50	545
Dependent Firms	<u>330</u>	<u>0</u>	<u>330</u>
Subtotal	\$ 8,018	\$ 50	\$ 8,068
<b>Induced Impacts:</b>	9,224		
<b>Total Annual Impacts</b>	<u>\$21,718</u>		

(1) Only aviation-related impacts are considered in this study.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

Exhibit 11  
**ORGANIZATIONS AND FIRMS CREATING ECONOMIC IMPACTS**  
**Muskegon County Airport**  
**1988**

<u>ORGANIZATION</u>	<u>ATTRIBUTION OF ACTIVITY</u>			<u>ECONOMIC ACTIVITY</u>
	<u>Aviation-Related</u>		<u>Non-Aviation</u> <sup>(3)</sup>	
	<u>On-Site</u> <sup>(1)</sup>	<u>Off-Site</u> <sup>(2)</sup>		
<b>Air Carrier Operations:</b>				
American Eagle	X			Airline
Midway Airlines	X			Airline
<b>Federal Government:</b>				
Federal Aviation Administration Air Traffic Control	X			Control Tower
Airways Facilities Services	X			Facility Maintenance Unit
National Oceanographic and Atmospheric Administration	X		X	National Weather Service
<b>Local Government:</b>				
County Airport	X			Airport Operations
Fire Station	X		X	Rescue and Fire Fighting
<b>Air Passenger Services:</b>				
Hertz	X			Car Rental
National	X			Car Rental
Budget	X			Car Rental
Brownstone	X		X	Restaurant
Goodwill Industries	X			Parking and Concessions
<b>Aviation Services:</b>				
Exec. Air Transport	X			Fixed Base Operator
Jetaway Air Service	X			Air Charter Service
W. Michigan Flying Club	X			Flying Club
J&J Security	X			Passenger Screening
Mayday Avionics	X			Avionics Servicing
<b>Other:</b>				
Shaw Walker			X	Shipping & Warehouse
Corporate Air Operations <sup>4</sup>	X	X		Hangar Leases, Company Aircraft Activity
Travel Agencies		X	X	Travel Arrangements

(1) Economic activity on airport property, by an airport tenant, treated as "direct" economic impact.

(2) Economic activity not taking place on airport property, but which is directly aviation-related to this airport. Treated as an "indirect" economic impact.

(3) Activity which is not related to or dependent on aviation activities. Not included in the impact estimates.

(4) Treated as indirect impact.

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

"Direct" payroll comprises payments to those people who work at the airport, are employed by the airlines, FBO, corporate users, restaurant, or other tenants. "Capital expenditures" include improvements to on-site facilities of tenants as well as to the airport itself. "Operating expenses" are local expenditures by the tenants or airport operator.

**Indirect Economic Impacts** - Muskegon County Airport "indirect" impacts are caused by airport use in the form of expenditures by air travelers and by those firms that depend on the airport for their business.

It is estimated that over 55,000 visitors to the Muskegon area arrive via Muskegon County Airport annually (24,375 by scheduled air carrier, 29,500 by general aviation, and 1,536 by air taxi in 1987). Based on approximate proportions of those staying overnight (more than one day) it is estimated that the average visitor spends approximately \$142.59 per trip at off-airport locations in the Muskegon area. Local residents using the airport also spend money -- some \$31,000 per year locally (in addition to moneys spent at the airport). Furthermore, there are 13 travel agencies in the region. Surveys indicate that, taken together, about 90 percent of their economic activity (e.g. ticket sales) is related to aviation. Of this, about 40 percent is related to Muskegon County Airport.

The aviation-related indirect economic impacts attributable to Muskegon County Airport total \$8.0 million, as shown in Exhibit 13. The visitor expenditures breakdown by expenditure type is based on a mix of tourist, business and personal travel derived from the results of surveys made at other airports. Since no Michigan surveys were available, these were adjusted to reflect a range of values judged to be appropriate for local conditions. All visitor expenditures are at the actual cost outlay except retail sales which, since it is a margin industry, is shown at 20 percent of the actual expenditures. Expenditures by airport--dependent firms consist of those costs attributable to airport-related activity.

## Exhibit 13

**INDIRECT IMPACTS OF  
MUSKEGON COUNTY AIRPORT**

<u>REGIONAL EXPENDITURES BY SOURCE</u>	<u>ANNUAL IMPACT</u>
Visitor Expenditures:	
Lodging	\$2,418,000
Food & Beverage	2,038,000
Retail Sales	185,000
Entertainment	624,000
Ground Transport	545,000
Business	443,000
Other	<u>909,000</u>
Subtotal	\$7,162,000
Resident Expenditures	31,000
Corporate Air Opns.	495,000
Dependent Firm Expenditures	<u>330,000</u>
Total	\$8,018,000

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

**Induced Economic Impact** - "Direct" economic" impacts of about \$4.5 million, and "indirect" impacts of \$8.0 million, represent increases in final demand for goods and services in the Muskegon region. To these must be added a "multiplier" effect produced by circulation of the money through the regional economy. To determine this "induced" impact, the U.S. Department of Commerce "Regional Input-Output Modeling System" (RIMS-II) was used. It was found that the induced impact produced by Muskegon County Airport in 1987 was approximately \$9,224,000.

**Industries Which Benefit**

The economic activities at Muskegon County Airport produce expenditures for a wide variety of goods and services. Many types of industry benefit, whether or not they are themselves airport



Exhibit 14  
**TOTAL ANNUAL ECONOMIC IMPACTS**  
 Muskegon County International Airport  
 1987

<u>IMPACTED INDUSTRY GROUPS</u>	<u>TOTAL ANNUAL IMPACT (Output)</u> <small>(.....Thousands.....)</small>	<u>TOTAL ANNUAL PAYROLL (Earnings) (1)</u>	<u>EMPLOYMENT (Jobs)</u>
Ag. Prod., Forestry Svcs.	\$42	\$16	2
Other Mining	9	2	0
New Construction	568	188	7
Maint. and Repair Const.	223	104	4
Food, Kindred Prd.	657	91	3
Textile Mill Products	2	0	0
Apparel	18	4	0
Paper, Allied Products	39	8	0
Printing, Publishing	173	60	3
Chemicals, Refined Petrol.	259	22	1
Rubber, Leather Prod.	109	24	1
Lumber, Furniture Prod.	20	4	0
Stone, Clay, Glass Prod.	86	22	1
Primary Metals	107	24	1
Fabricated Metals	158	44	1
Non-electrical Machinery	60	20	1
Electrical Machinery	44	14	0
Motor Vehicles, Equipment	290	48	1
Other Transportation Equip.	39	14	0
Instruments	6	2	0
Miscellaneous Mfg.	42	13	1
Transportation	6,362	2,331	85
Communications	321	84	2
Utilities	565	56	1
Wholesale Trade	636	247	8
Retail Trade	898	444	33
Finance	237	68	3
Insurance	309	100	4
Real Estate	1,014	28	7
Lodging, Amusements	3,301	1,167	113
Personal Services	190	85	9
Business Services	1,241	576	27
Eating, Drinking Estab.	2,663	830	104
Health Services	400	232	10
Other Services	630	149	9
Households	26	6	0
<b>TOTALS</b>	<b>\$21,718</b>	<b>\$7,147</b>	<b>448</b>

(1) The portion of the "output" column that is payroll to employed persons.

SOURCE: Rims II Multipliers, MDOT, BTP study consultant, Wilbur Smith Associates.

users. Exhibit 14 lists impacted industry groups, and shows the extent to which each benefits from Muskegon County Airport in terms of total economic activity, earnings and employment.

### Airport Derived Employment

An important element in the Muskegon County Airport economic impact total is the employment which the airport creates. People are employed in airport-related activities at the airport (the FBO, the airlines, the federal government, the County, etc.) and at other off-airport sites (hotels, manufacturing concerns, etc.). Furthermore, the direct and indirect expenditures attributable to the airport continue to flow through the region's economy creating additional employment (the "multiplier" effect). A summary of the jobs estimated to be attributable to Muskegon County Airport is given in Exhibit 15.

#### Exhibit 15

### JOB SOURCE ATTRIBUTABLE TO MUSKEGON COUNTY AIRPORT

<u>JOB SOURCE</u>	<u>Full Time</u>	<u>Part Time</u>	<u>Total FEQ</u>
On-Site Jobs	115	41	135
Off-Site Jobs at Surveyed Firms	21	2	22
Induced Jobs			<u>291</u>
		<b>Total Jobs</b>	<b>448</b>

NOTE: FEQ denotes "full-time equivalent" jobs, calculated as two part-time jobs equal one full-time job.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

The RIMS model treats jobs as full-time-equivalents (FEQ). Consequently, the split between full-time and part-time for induced employment is not shown. The Exhibit shows that there are 157 FEQ jobs at or near the airport, and another 291 located elsewhere in the region that are attributable to the airport.

### Non-Economic Values

Not all values a community derives from an airport are quantifiable in dollar terms. Muskegon County Airport provides local residents with alternative linkages to Michigan and beyond.

The airport provides access to the latest medical diagnosis and treatment procedures. For example, blood and tissue samples are sent to medical centers and other specialist locations for analysis; medical supplies not available locally (such as serums, antitoxins, isotopes, and organs for transplant operations) are shipped by air; and patients are moved by air for treatment procedures not available in their community.

Muskegon County Airport also supports the maintenance of essential community services and security. It is routinely used as a refueling base for U.S. Coast Guard Patrols of the nearby Lake Michigan area, as well as for military aircraft, as needed. It is also used to help locate and combat forest fires or chemical spills; to patrol pipelines and power lines, to support police, Civil Air Patrol and National Guard Activities. In case of natural disasters (fire, flood or blizzards) it is a resource for supply and evacuation.

Periodic special events such as "air fairs" are held at the airport. These aid in maintaining public awareness of aviation and interesting young people in career opportunities in the field. A flight training school is run by the airport's Fixed-Base Operator.

In recent years, general aviation has become a major training ground for rewarding careers in the airline and aeronautical fields. The presence of an airport gives residents the option of flight instruction and ground service training.

# VALUE OF METTETAL CANTON AIRPORT TO THE PLYMOUTH AREA

**Economic Values**

Mettetal Canton Airport is estimated to have an economic impact on its service area of approximately \$3.5 million annually in total economic activity, of which \$1.1 million is household earnings. This impact is due principally to the provision and use of general aviation services.

**Airport Characteristics**

Privately owned and operated, the airport is open to the public and has a "U-3" classification.

**Airport Services** - Mettetal Canton Airport is a general aviation airport, offering the services listed in Exhibit 1.

**Exhibit 1**

**SERVICES OFFERED AT  
METTETAL CANTON AIRPORT**

- |                  |                    |
|------------------|--------------------|
| Air Taxi         | Aircraft Repair    |
| General Aviation | Jet Fuel Sales     |
| Hangar Rental    | Avgas Fuel Sales   |
| Tie Down         | Flight Instruction |
| Aircraft Rental  | Vending            |

**SOURCE:** Surveys by MDOT, Bureau of Transportation Planning (BTP) study consultants, Wilbur Smith Associates.

All of these services have positive economic significance to the Plymouth area. This is due to the creation of employment, generation of taxes and potential attraction and retention of businesses for the area.

**Airport Facilities** - The airport is an all season facility, capable of handling approximately 95 percent of general aviation aircraft types. It has one runway, a segmented circle, small passenger terminal, hangar space and one Fixed-Base Operator (FBO) who provides aviation support services. The facility is not towered. Additional facilities are listed in Exhibit 2.

**Exhibit 2**

**FACILITIES AT  
METTETAL CANTON AIRPORT**

RUNWAYS	DESCRIPTION						
	<u>Lgth.</u>	<u>Surf.</u>	<u>Sys.</u>	<u>Taxi Edge Lts.</u>	<u>REIL</u>	<u>VASI</u>	<u>Instr. Appr.</u>
Primary	2,550	PV	FP	LIRL	N	N	NP

**NOTES:** PV denotes paved surface; Taxi system definitions are: FP = full parallel; PP = part parallel; and TN = turnaround area at runway ends. Runway lighting systems (Edge Lights) are designated HIRL = high intensity runway lights. MIRL medium intensity; or LIRL, low intensity. Column heading REIL denotes Runway End Indicator Lights; VASI denotes Visual Approach Slope Indicator; column entries refer to presence of the equipment (Y denotes "yes"; N, "no"). Instrument approach facilities are: PR, Precision; NP, Non-Precision; or VIS, visual.

**SOURCE:** MDOT, BTP.

Airport Use - Mettetal Canton Airport has substantial general aviation activity. A total of 140 general aviation aircraft are based at the airport, as itemized in Exhibit 3.

## Exhibit 3

**NUMBERS OF BASED AIRCRAFT  
METTETAL CANTON AIRPORT**

<u>AIRCRAFT TYPE</u>	<u>1988</u>
Single Engine	133
Multi-Engine	5
Helicopters	<u>2</u>
<b>Total Aircraft</b>	<b>140</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Estimated aircraft operations for 1987 are given in Exhibit 4.

## Exhibit 4

**AIRCRAFT OPERATIONS  
METTETAL CANTON AIRPORT**

<u>TYPE OPERATION</u>	<u>1987</u>
Itinerant:	16,080
Local:	<u>16,080</u>
<b>Total</b>	<b>32,160</b>

SOURCE: MDOT, BTO.

Aircraft operations at the airport have generally increased in recent years, though stable between 1986 and 1987, and are both itinerant and

local in nature, reflecting the use of the airport as both a transportation facility and a training airport.

## Exhibit 5

**OPERATIONS TREND  
METTETAL CANTON AIRPORT**

<u>OPERATIONS</u>	<u>1982</u>	<u>1983</u> <sup>1</sup>	<u>1986</u>	<u>1987</u>
Itinerant	15,825	17,120	18,080	16,080
Local	<u>13,925</u>	<u>15,060</u>	<u>15,910</u>	<u>16,080</u>
<b>Totals</b>	<b>29,750</b>	<b>32,180</b>	<b>33,990</b>	<b>32,160</b>

(1) No count survey was conducted at this airport for the indicated years. Estimate is based on factor derived from representative airports, adjusted to recognize that "Touch-and-Go" operations are not allowed at Mettetal Canton Airport.

SOURCE: MDOT, BTP.

Airport Economic Roles

Mettetal Canton Airport has considerable business-oriented aviation activity, as well as flight instruction and recreational flying. The following comprises the airport's principal economic impact types.

Retention of Private Business - Plymouth, Mettetal Canton Airport is considered valuable to the competitive position of a number of local firms and plants, some of which might choose to locate elsewhere if the facility were not present. These organizations use the general aviation services made possible by the airport's existence. However, the facility was not found to be directly responsible for any significant economic development in the service area.

Business-Oriented General Aviation - An estimated 40 percent of general aviation use at the airport is "business-oriented," and a number of the region's businesses have aircraft at the airport including those listed on Exhibit 6.

Airport Economic Impact

The Mettetal Canton Airport aviation-related economic impact of nearly \$3.5 million annually comprises the impact types listed in Exhibit 7.

**Exhibit 6**

**A SAMPLE OF FIRMS  
WHICH BASE AIRCRAFT  
AT METTETAL CANTON AIRPORT**

Advance Architecture	Lapham Devel. Co.
Advance Stamping	Mills Products
Aero Marine Inc.	Nat'l Concrete Prds.
Gov't'l Risk Mngt.	Triss Corp.

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

In addition to firms with general aviation aircraft based at the airport, there are many others that depend on the airport, for various services, such as air taxi/charter service, air freight etc.

**Exhibit 7**

**ANNUAL AVIATION-RELATED  
ECONOMIC IMPACT OF  
METTETAL CANTON AIRPORT**

<u>IMPACT TYPE</u>	<u>AMOUNT</u>
Direct	\$ 748,200
Indirect	1,243,800
Induced	<u>1,460,000</u>
<b>Total</b>	<b>\$ 3,452,000</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

The total impacts, by type, are summarized in Exhibit 8. This study assesses only the aviation-related impacts.

**Exhibit 8**

**ESTIMATED ANNUAL ECONOMIC IMPACTS  
Mettetal Canton Airport  
1987**

<u>IMPACT TYPE AND SOURCE</u>	<u>AVIATION RELATED</u>	<u>NON-AVIATION RELATED (1)</u>	<u>TOTAL (1)</u>
	(-----thousands-----)		
<b>Direct Impacts:</b>			
Aviation Services	<u>748.2</u>	<u>0.0</u>	<u>748.2</u>
Subtotal	\$ 748.2	\$ 0.0	\$ 748.2
<b>Indirect Impacts:</b>			
Visitor Expenditures	\$ 1,190.0	\$ 0.0	\$ 1,190.0
Regional Expenditure	3.5	0.0	3.5
Corporate Operations & Other	<u>50.3</u>	<u>0.0</u>	<u>50.3</u>
Subtotal	\$ 1,243.8	\$ 0.0	\$ 1,243.8
<b>Induced Impacts:</b>	1,460.0		
<b>Total Annual Impacts</b>	<u>\$3,452.0</u>		

(1) Only aviation-related impacts are considered in this study.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

Direct Economic Impact - The "direct" impacts comprise the value of those activities involved in providing aviation services at the airport. Exhibit 9 lists the airport tenants and others included in the impact estimates. The makeup of the direct impacts is given in Exhibit 10.

"Direct" payroll comprises payments to those people who work at the airport, are employed by the FBO, corporate users or other tenants. "Capital expenditures" include improvements to on-site facilities of tenants as well as to the airport itself. "Operating expenses" are local expenditures by the tenants or airport operator.

Exhibit 10

ESTIMATED "DIRECT" ANNUAL IMPACTS  
METTETAL CANTON AIRPORT

<u>DIRECT IMPACT</u>	<u>AMOUNT</u>
Direct Payroll	\$220,800
Capital Expenditures	68,300
Operating Expenses	429,800
Refueling Service	29,300
<b>Total</b>	<b>\$748,200</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Exhibit 9

ORGANIZATIONS AND FIRMS CREATING ECONOMIC IMPACTS  
Mettetal Canton Airport  
1988

ATTRIBUTION OF ACTIVITY

<u>ORGANIZATION</u>	<u>Aviation-Related</u>		<u>Non-Aviation</u> <sup>(3)</sup>	<u>ECONOMIC ACTIVITY</u>
	<u>On-Site</u> <sup>(1)</sup>	<u>Off-Site</u> <sup>(2)</sup>		
Aviation Services:				
Jet Services	X			Fixed-Base Operator
Amos Aviation	X	X		Charter, Instr.
Colt Airways	X	X		Charter, Instr.
Craft Air	X	X		Charter, Instr.
Gt. Lakes Air	X	X		Charter, Instr.
Gump Inc.	X	X		Charter, Instr.
LBW Avn.	X	X		Charter, Instr.
Morosky Avn.	X	X		Charter, Instr.
Plymouth Flt. Trng. Inc.	X	X		Flight Instr.
Dawn Patrol	X	X		Flying Club
Dearborn Flyg. Club	X	X		Flying Club
Falcon Flyg. Club	X	X		Flying Club
Ford Eagles, Inc.	X	X		Flying Club
Plymouth Hawks, Inc.	X	X		Flying Club
Skyhawks	X	X		Flying Club
Other:				
Corporate Air Operations	X	X		Hangar Leases, Company Aircraft Activity

- (1) Economic activity on airport property, by an airport tenant, treated as "direct" economic impact.
- (2) Economic activity not taking place on airport property, but which is directly aviation-related to this airport. Treated as an "indirect" economic impact.
- (3) Activity which is not related to or dependent on aviation activities. Not included in the impact estimates.

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

**Indirect Economic Impacts** - Mettetal Canton Airport "indirect" impacts are caused by airport use in the form of expenditures by air travelers and by those firms that depend on the airport for their business.

It is estimated that some 22,500 visitors to the Plymouth area arrive via Mettetal Canton Airport annually (18,000 by individually owned or corporate aircraft and 4,500 by air taxi in 1987). Based on approximate proportions of those staying overnight (more than one day) it is estimated that the average visitor spends approximately \$58.35 per trip at off-airport locations in the Plymouth area. Local residents using the airport also spend money -- some \$35,000 per year locally.

The aviation-related indirect economic impacts attributable to Mettetal Canton Airport total \$1.2 million, as shown in Exhibit 11. The visitor expenditures breakdown by expenditure type is based on a mix of tourist, business and personal travel derived from the results of surveys made at other

airports. Since no Michigan surveys were available, these were adjusted to reflect a range of values judged to be appropriate for local conditions. All visitor expenditures are at the actual cost outlay except retail sales which, since it is a margin industry, is shown at 20 percent of the actual expenditures. Expenditures by airport-dependent firms consist of those costs attributable to airport-related activity.

**Induced Economic Impact** - "Direct" economic impacts of about \$748,200, and "indirect" impacts of \$1.2 million, represent increases in final demand for goods and services in the Plymouth region. To these must be added a "multiplier" effect produced by circulation of the money through the regional economy. To determine this "induced" impact, the U.S. Department of Commerce "Regional Input-Output Modeling System" (RIMS-II) was used. It was found that the induced impact produced by Mettetal Canton Airport in 1987 was approximately \$1,460,000.

#### Exhibit 11

#### INDIRECT IMPACTS OF METTETAL CANTON AIRPORT

<u>REGIONAL EXPENDITURES BY SOURCE</u>	<u>ANNUAL IMPACT</u>
Visitor Expenditures:	
Lodging	\$ 401,800
Food & Beverage	338,700
Retail Sales	30,600
Entertainment	103,800
Ground Transport	90,600
Business	73,500
Other	<u>151,000</u>
Subtotal	\$1,190,000
Resident Expenditures	3,500
Corporate Air Opns.	<u>50,300</u>
Total	\$1,243,800

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

#### Industries Which Benefit

The economic activities at Mettetal Canton Airport produce expenditures for a wide variety of goods and services. Many types of industry benefit, whether or not they are themselves airport users. Exhibit 12 lists impacted industry groups, and shows the extent to which each benefits from Mettetal Canton Airport in terms of total economic activity earnings and employment.

#### Airport Derived Employment

An important element in the Mettetal Canton Airport economic impact total is the employment which the airport creates. People are employed in airport-related activities at the airport (the FBO, etc.) and at other off-airport sites (hotels, manufacturing concerns, etc.). Furthermore, the direct and indirect expenditures attributable to the airport continue to flow through the region's economy creating additional employment (the "multiplier" effect). A summary of the jobs estimated to be attributable to Mettetal Canton Airport is given in Exhibit 13.

Exhibit 12  
ECONOMIC IMPACTS OF METTATAL CANTON AIRPORT  
1987

<u>IMPACTED INDUSTRY GROUPS</u>	<u>TOTAL ANNUAL IMPACT (Output)</u> (.....Thousands.....)	<u>TOTAL ANNUAL PAYROLL (Earnings)(1)</u> (.....Thousands.....)	<u>EMPLOYMENT (Jobs)</u>
Ag. Prod., Forestry Svcs.	\$6	\$1	0
New Construction	68	27	1
Maint. and Repair Const.	51	24	1
Food, Kindred Prd.	103	14	1
Apparel	1	0	0
Paper, Allied Products	7	1	0
Printing, Publishing	28	9	0
Chemicals, Refined Petrol.	37	3	0
Rubber, Leather Prod.	18	3	0
Lumber, Furniture Prod.	2	0	0
Stone, Clay, Glass Prod.	11	2	0
Primary Metals	17	4	0
Fabricated Metals	30	8	0
Non-electrical Machinery	9	3	0
Electrical Machinery	7	1	0
Motor Vehicles, Equipment	48	5	0
Other Transportation Equip.	4	1	0
Miscellaneous Mfg.	6	2	0
Transportation	716	266	10
Communications	64	18	0
Utilities	183	19	0
Wholesale Trade	102	40	1
Retail Trade	149	74	5
Finance	37	11	0
Insurance	49	16	1
Real Estate	163	4	1
Lodging, Amusements	520	184	18
Personal Services	30	13	1
Business Services	451	197	9
Eating, Drinking Estab.	403	124	16
Health Services	64	37	2
Other Services	68	24	1
Households	--	4	1
<b>TOTALS</b>	<b>\$3,452</b>	<b>\$1,139</b>	<b>69</b>

(1) The portion of the "output" column that is payroll to employed persons.

SOURCE: Rims II Multipliers, MDOT, BTP study consultant, Wilbur Smith Associates.



## Exhibit 13

**JOBS ATTRIBUTABLE TO  
METTETAL CANTON AIRPORT**

<u>JOB SOURCE</u>	<u>Full Time</u>	<u>Part Time</u>	<u>Total FEQ</u>
Direct On-Site Jobs	6	2	7
Indirect Off-Site Jobs at Surveyed Firms	0	12	6
Induced and Other Indirect Jobs			<u>56</u>
	<b>Total Jobs</b>		<b>69</b>

NOTE: FEQ denotes "full-time equivalent" jobs, calculated as two part-time jobs equal one full-time job.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

The RIMS model treats jobs as full-time-equivalents (FEQ). Consequently, the split between full-time and part-time for induced employment is not shown. The Exhibit shows that there are 13 jobs at and near the airport, and another 56 located elsewhere in the greater Southeastern

Michigan region that are attributable to the airport.

Non-Economic Values

Not all values a community derives from an airport are quantifiable in dollar terms. Mettetal Canton Airport provides Plymouth area residents with alternative linkages to Michigan and beyond. It provides access to the latest medical diagnosis and treatment procedures. For example, blood and tissue samples can be sent to medical centers and specialist locations for analysis; medical supplies not available locally (such as serums, antitoxins, or isotopes, can be shipped by air; and patients moved by air for treatment procedures not available in their community.

In case of natural disasters (fire, flood or blizzard) it is a resource for supply and evacuation.

The airport periodically hosts visiting groups of young people from community schools, scout troops, or other organizations, for airport tours. This acts to promote awareness of potential career opportunities in aviation and possibly sparks interest. In recent years, general aviation has become a major training ground for rewarding careers in the airline and aeronautical fields. The presence of an airport gives residents the option of flight instruction and ground service training.

# VALUE OF THE OAKLAND-PONTIAC AIRPORT TO THE PONTIAC AREA

## Economic Values

Oakland-Pontiac Airport is estimated to have an economic impact on its service area of approximately \$85 million annually in total economic activity \$28.6 million of which is household earnings. This impact is due principally to the provision and use of general aviation services, and the sizeable federal government operations at the airport.

## Airport Characteristics

Owned and operated by Oakland County, the airport is open to the public and has a "T-5" classification. It is the fourth largest general aviation airport in the United States in terms of annual flight operations according to FAA statistics.

Airport Services - Oakland-Pontiac Airport is a full-service general aviation airport, offering nearly everything desired of such airports, including the services listed in Exhibit 1.

### Exhibit 1

#### SERVICES OFFERED AT OAKLAND-PONTIAC AIRPORT

Air Taxi	Avgas Fuel Sales
General Aviation	Aircraft Repair
Hangar Rental	Avionics
Tie Down	Flight Instruction
Aircraft Rental	Car Rental
Aircraft Sales	Restaurant
Jet Fuel Sales	Control Tower

SOURCE: Surveys by MDOT, Bureau of Transportation Planning (BTP) study consultants, Wilbur Smith Associates.

All of these services have positive economic significance to the Pontiac area. This is due to the creation of employment, generation of taxes and potential attraction and retention of businesses for the area.

Airport Facilities - The airport is an all-weather facility capable of handling up to jet aircraft. It has four runways, is towered, has a passenger terminal, hangar space, and a total of 19 Fixed-Base Operators (FBOs), four of whom provide full aviation support services, while the remaining 15 furnish speciality services.

### Exhibit 2

#### FACILITIES AT OAKLAND-PONTIAC AIRPORT

RUNWAYS	DESCRIPTION						
	Lgth.	Surf.	Taxi Sys.	Edge Lts.	REIL	VASI	Instr. Appr.
Primary	6,250	PV FP	FP	HIRL	Y	N	PR
Secondary	3,250	PV FP	FP	MIRL	Y	Y	NP
Crosswind	2,350	PV PP	PP	None	N	N	NP
Crosswind	1,843	PV PP	PP	None	N	N	VIS

NOTES: PV denotes paved surface; Taxi system definitions are: FP = full parallel; PP = part parallel; and TN = turnaround area at runway ends. Runway lighting systems (Edge Lights) are designated HIRL = high intensity runway lights. MIRL medium intensity; or LIRL, low intensity. Column heading REIL denotes Runway End Indicator Lights; VASI denotes Visual Approach Slope Indicator; column entries refer to presence of the equipment (Y denotes "yes"; N, "no"). Instrument approach facilities are: PR, Precision; NP, Non-Precision; or VIS, visual.

SOURCE: MDOT, BTP.

Airport Use - Oakland-Pontiac Airport has no scheduled air carrier service, but has a large amount of general aviation activity. A total of 785 general aviation aircraft are based at the airport, as itemized in Exhibit 3.

## Exhibit 3

NUMBERS OF BASED AIRCRAFT  
OAKLAND-PONTIAC AIRPORT

<u>AIRCRAFT TYPE</u>	<u>1988</u>
Single Engine	509
Multi-Engine	226
Jet	47
Helicopters	2
Military	<u>1</u>
<b>Total Aircraft</b>	<b>785</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Estimated aircraft operations for 1987 are given in Exhibit 4. Of the more than 170,000 itinerant general aviation operations recorded by the tower in 1987, some 318 involved large aircraft, with capacities of 60 or more passengers. Military operations reflect use by a locally based tank command as well as refueling on training missions for military aircraft based elsewhere.

## Exhibit 4

AIRCRAFT OPERATIONS  
OAKLAND-PONTIAC AIRPORT

<u>TYPE OPERATION</u>	<u>1987</u>
Itinerant:	
Air Taxi	5,977
General Aviation	170,337
Military	<u>492</u>
Subtotal Itinerant	176,806
Local:	
General Aviation	204,635
Military	<u>226</u>
Subtotal Local	204,861
<b>Total</b>	<b>381,667</b>

SOURCE: MDOT, BTP.

Total aircraft operations at Oakland-Pontiac Airport have increased substantially in recent years, from some 288,754 in 1983, to 381,667 in 1987. A slight decline of 2.8 percent in 1987 followed a sharp increase of 33.1 percent in 1986, as shown in Exhibit 5. Currently, local aircraft operations make up about 54 percent of the total, indicating that both business-oriented travel and training/recreational flying are important purposes for aircraft activity at the airport.

## Exhibit 5

OPERATIONS TREND  
OAKLAND-PONTIAC AIRPORT

<u>OPERATIONS</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>
Itinerant	149,652	180,116	176,806
Local	<u>145,460</u>	<u>212,635</u>	<u>204,861</u>
<b>Totals</b>	<b>295,112</b>	<b>392,751</b>	<b>381,667</b>

SOURCE: MDOT, BTP.

Air cargo handling is an important activity at Oakland-Pontiac Airport, and growing rapidly, as shown in Exhibit 6. The 1987 total of 2,760 tons was the fourth-highest in the State. The growth in tonnage reflects activity in the local economy.

## Exhibit 6

AIR CARGO HANDLED AT  
OAKLAND-PONTIAC AIRPORT

<u>CARGO MOVEMENT</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>
Deplaned	1,052	1,354	1,656
Enplaned	<u>702</u>	<u>903</u>	<u>1,104</u>
<b>Totals</b>	<b>1,754</b>	<b>2,257</b>	<b>2,760</b>

SOURCE: MDOT, BTP.

**Airport Economic Roles**

Oakland-Pontiac Airport activity has an important business-oriented component, with the following comprising the airport's principal economic impact types.

**Business-Oriented General Aviation** - There has been significant economic development near the airport, much of which is high-tech industrial activity generating significant airport use. In addition, the airport serves a large number of private firms located throughout the service area. Air cargo and general aviation services are viewed by local firms and plants as essential to their efficient operation. "Just-in-Time" cargo delivery to the area's plants is seen as an important service made possible by the airport's existence.

An estimated 40-50 percent of general aviation use at the airport is "business-oriented," and many of the region's businesses have aircraft at the airport including those listed in Exhibit 7.

**Exhibit 7**

**A SAMPLE OF FIRMS  
WHICH BASE AIRCRAFT  
AT OAKLAND-PONTIAC AIRPORT**

Air-Land Surveys	Marketing Corp. of
Borg-Warner Automotive	America
Budd Co.	Packer Corp.
Financial Air Express	R. L. Polk & Co.
Gen. Elec. Credit	Rockwell Int'l.
Ind'l. Magnetics	Wickes Mfg. Co.
	K-Mart Corp.

**SOURCE:** Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

In addition to firms with general aviation aircraft based at the airport, there are more than 120 that depend on the airport, for various services, such as general aviation, passenger service, air taxi/charter service, air freight etc. These are important for sales, management and production activities at such firms as: The Budd Co.; Dearborn Steel Erection Services; Fayette Tubular Products; Ferro Manufacturing Corporation; Gulf and Western; Huron Forge Machine; and others, including many automobile industry firms.

**Airport Economic Impact**

The Oakland-Pontiac Airport aviation-related economic impact of nearly \$85 million annually comprises the impact types listed in Exhibit 8.

**Exhibit 8**

**ANNUAL AVIATION-RELATED  
ECONOMIC IMPACT OF  
OAKLAND-PONTIAC AIRPORT**

<u>IMPACT TYPE</u>	<u>AMOUNT</u>
Direct	\$32,782,000
Indirect	17,204,000
Induced	<u>34,889,000</u>
<b>Total</b>	<b>\$84,875,000</b>

**SOURCE:** Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

The total impacts, by type, are summarized in Exhibit 9. These include \$378,818 in capital aid, (\$358,880 in federal funds and \$19,938 from MDOT). There are some impacts at the airport which are not necessarily attributable to aviation, e.g., a restaurant and businesses that serve more than just the airport, etc. This study assesses only the aviation-related impacts.

**Direct Economic Impact** - The "direct" impacts comprise the value of those activities involved in providing aviation services at the airport. Exhibit 10 lists the airport tenants and others included in the impact estimates. Direct impacts are given in Exhibit 11.

**Exhibit 11**

**ESTIMATED "DIRECT" ANNUAL IMPACTS  
OAKLAND-PONTIAC AIRPORT**

<u>DIRECT IMPACT</u>	<u>AMOUNT</u>
Direct Payroll	\$12,225,000
Capital Expenditures	1,082,000
Operating Expenses	18,380,000
Refueling Service	<u>1,095,000</u>
<b>Total</b>	<b>\$32,782,000</b>

**SOURCE:** Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

## Exhibit 9

**ESTIMATED ANNUAL ECONOMIC IMPACTS**  
**Oakland-Pontiac Airport**  
**1987**

<u>IMPACT TYPE AND SOURCE</u>	<u>AVIATION RELATED</u>	<u>NON-AVIATION RELATED (1)</u>	<u>TOTAL(1)</u>
	(-----thousands-----)		
<b>Direct Impacts:</b>			
Federal Government	1,292	0	1,292
Local Governments	1,473	0	1,473
Air Passenger Services	125	280	405
Aviation Services	<u>29,892</u>	<u>0</u>	<u>29,592</u>
Subtotal	\$32,782	\$280	\$33,062
<b>Indirect Impacts:</b>			
Visitor Expenditures	\$11,039	\$ 0	\$11,039
Regional Expenditure	207	0	207
Corporate Operations & Other	<u>5,958</u>	<u>2,076</u>	<u>8,034</u>
Subtotal	\$17,204	\$2,076	\$19,280
<b>Induced Impacts:</b>	34,889		
<b>Total Annual Impacts</b>	<u>\$84,875</u>		

(1) Only aviation-related impacts are considered in this study.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

Exhibit 10  
**ORGANIZATIONS AND FIRMS CREATING ECONOMIC IMPACTS**  
**Oakland-Pontiac Airport**  
**1988**

<u>ORGANIZATION</u>	<u>ATtribution OF ACTIVITY</u>			<u>ECONOMIC ACTIVITY</u>
	<u>On- Site</u> <sup>(1)</sup>	<u>Off- Site</u> <sup>(2)</sup>	<u>Non- Aviation</u> <sup>(3)</sup>	
<b>Federal Government:</b>				
Federal Aviation Administration				
Air Traffic Cntl.	X			Control Tower
Airways Facilities Services	X			Facility Maintenance Unit
U.S. Army TACOM	X			Military
<b>Local Government:</b>				
County Airport	X			Airport Operations
<b>Air Passenger Services:</b>				
Hertz	X			Car Rental
Adams Landing	X		X	Restaurant
<b>Aviation Services:</b>				
Aerodynamics	X			Full-Service Fixed-Base Operator
Aviation Group	X			Full-Service Fixed-Base Operator
Michigan Aviation	X			Full-Service Fixed-Base Operator
PDQ Air Service	X			Full-Service Fixed-Base Operator
Alternative Avionics	X			Specialty Fixed-Base Operator
Anna's Airways	X			Aircraft Sales
Avantgarde	X			Fixed-Base Operator
Aviall	X	X		Aircraft Parts Distribution
Century Air	X			Air Cargo Handler/Shipper
Duncan Avionics	X			Avionics
Gulf Sierra	X			Aircraft Leasing
Hall Aviation	X			Aircraft Maint. & Repair
HB Aircraft	X			Aircraft Hardware & Fittings Distribution
H&S Propellers	X			Maintenance & Repair
IFL	X			Air Charter
Ly-Con	X			Engine Overhaul
Metro Instrument	X			Sales and Repair
Pifer's Airmotive	X	X		Aircraft Accessories
Royal Air				Maintenance, Pilot Supply
Superior Instruments				Sales and Repair
Taubman Air				Fixed-Base Operator
Waterford Aviation				Aircraft Maint. & Repair
Wyman's Aviation	X		X	Aircraft Supply, Trucking

**Exhibit 10**  
**ORGANIZATIONS AND FIRMS CREATING ECONOMIC IMPACTS**  
**Oakland-Pontiac Airport**  
**1988**  
**(Continued)**

<u>ORGANIZATION</u>	<u>ATtribution OF ACTIVITY</u>			<u>ECONOMIC ACTIVITY</u>
	<u>On- Site</u> <sup>(1)</sup>	<u>Off- Site</u> <sup>(2)</sup>	<u>Non- Aviation</u> <sup>(3)</sup>	
<b>Aviation Services:</b>				
Airnet	X			Aircraft Charter Service
Avia Tech	X			Aviation Services
Lafayette Av. Pontiac Flight Service	X	X		Freight Charter Service
	X			Aircraft Charter
<b>Amer: Christian Aviation Inst.</b>				
	X			Flight Instruction
Drake Flt. Training	X			Flight Training, Pilot Svc.
<b>Flight Training Resources</b>				
	X			Flight Instruction
Omni Av. & Assocs.	X			Flight Training Aircraft
Tradewinds	X			Sales, Rentals
<b>Other:</b>				
Corporate Air Operations		X	X	Hangar Leases, Company Aircraft Activity

- 
- (1) Economic activity on airport property, by an airport tenant, treated as "direct" economic impact.
  - (2) Economic activity not taking place on airport property, but which is directly aviation-related to this airport. Treated as an "indirect" economic impact.
  - (3) Activity which is not related to or dependent on aviation activities. Not included in the impact estimates.

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

"Direct" payroll comprises payments to those people who work at the airport, are employed by the FBOs, corporate users, restaurant, or other tenants. "Capital expenditures" include improvements to on-site facilities of tenants as well as to the airport itself. "Operating expenses" are local expenditures by the tenants or airport operator.

**Indirect Economic Impacts** - Oakland-Pontiac Airport "indirect" impacts are caused by airport use in the form of expenditures by air travelers and by those firms that depend on the airport for their business.

It is estimated that nearly 175,000 visitors to the Pontiac area arrive via Oakland-Pontiac Airport annually, (170,300 by individual-owned or corporate aircraft and 4,500 by air taxi in 1987). Based on approximate proportions of those staying overnight (more than one day) it is estimated that the average visitor spends approximately \$69.70 per trip at off-airport locations in the Pontiac area. Local residents using the airport also spend money -- some \$707,000 per year locally (in addition to moneys spent at the airport).

The aviation-related indirect economic impacts attributable to Oakland-Pontiac Airport total \$17 million, as shown in Exhibit 12. The visitor expenditures breakdown by expenditure type is based on a mix of tourist, business and personal travel derived from the results of surveys made at other airports. Since no Michigan surveys were available, these were adjusted to reflect a range of values judged to be appropriate for local conditions. All visitor expenditures are at the actual cost outlay except retail sales which, since it is a margin industry, is shown at 20 percent of the actual expenditures. Expenditures by airport-dependent firms consist of those costs attributable to airport-related activity.

**Induced Economic Impact** - "Direct" economic impacts of about \$33 million, and "indirect" impacts of \$17 million, represent increases in final demand for goods and services in

## Exhibit 12

**INDIRECT IMPACTS OF  
OAKLAND-PONTIAC AIRPORT**

<u>REGIONAL EXPENDITURES BY SOURCE</u>	<u>ANNUAL IMPACT</u>
Visitor Expenditures:	
Lodging	\$ 3,727,000
Food & Beverage	3,142,000
Retail Sales	285,000
Entertainment	962,000
Ground Transport	840,000
Business	682,000
Other	<u>1,401,000</u>
Subtotal	\$11,039,000
Resident Expenditures	207,000
Corporate Air Opns.	<u>5,958,000</u>
<b>Total</b>	<b>\$17,204,000</b>

**SOURCE:** Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

the Pontiac region. To these must be added a "multiplier" effect produced by circulation of the money through the regional economy. To determine this "induced" impact, the U.S. Department of Commerce "Regional Input-Output Modeling System" (RIMS-II) was used. It was found that the induced impact produced by Oakland-Pontiac Airport in 1987 was approximately \$34,889,000.

**Industries Which Benefit**

The economic activities at Oakland-Pontiac Airport produce expenditures for a wide variety of goods and services. Many types of industry benefit, whether or not they are themselves airport users. Exhibit 13 lists impacted industry groups, and shows the extent to which each benefits from Oakland-Pontiac Airport in terms of total economic activity, earnings and employment.



Exhibit 13  
ANNUAL ECONOMIC IMPACTS OF OAKLAND - PONTIAC AIRPORT  
1987

<u>IMPACTED INDUSTRY GROUPS</u>	<u>TOTAL ANNUAL IMPACT (Output)</u> (.....Thousands.....)	<u>TOTAL ANNUAL PAYROLL (Earnings)(1)</u> (.....Thousands.....)	<u>EMPLOYMENT (Jobs)</u>
Ag. Prod., Forestry Svcs.	\$108	\$43	5
Crude Petrol.	4	0	0
Other Mining	5	1	0
New Construction	1,082	429	16
Maint. and Repair Const.	1,571	733	27
Food, Kindred Prd.	1,749	242	9
Textile Mill Products	8	0	0
Apparel	62	18	1
Paper, Allied Products	191	49	1
Printing, Publishing	668	227	10
Chemicals, Refined Petrol.	1,070	88	2
Rubber, Leather Prod.	404	98	4
Lumber, Furniture Prod.	72	20	1
Stone, Clay, Glass Prod.	193	58	2
Primary Metals	400	92	2
Fabricated Metals	634	173	5
Non-electrical Machinery	243	80	2
Electrical Machinery	219	62	2
Motor Vehicles, Equipment	1,160	192	4
Other Transportation Equip.	170	57	2
Instruments	31	12	0
Miscellaneous Mfg.	167	47	2
Transportation	28,315	9,921	361
Communications	1,781	470	13
Utilities	3,627	369	10
Wholesale Trade	2,301	899	31
Retail Trade	3,222	1,594	119
Finance	854	260	11
Insurance	1,145	375	14
Real Estate	3,848	97	24
Lodging, Amusements	5,029	1,772	172
Personal Services	641	287	29
Business Services	15,738	6,700	308
Eating, Drinking Estab.	4,832	1,507	189
Health Services	1,587	921	41
Other Services	1,744	619	36
Households	--	107	23
<b>TOTALS</b>	<b>\$84,875</b>	<b>\$28,619</b>	<b>1,478</b>

(1) The portion of the "output" column that is payroll to employed persons.

SOURCE: Rims II Multipliers, MDOT, BTP study consultants, Wilbur Smith Associates.

Airport Derived Employment

An important element in the Oakland-Pontiac Airport economic impact total is the employment which the airport creates. People are employed in airport-related activities at the airport (the FBO, the airlines, the federal government, the county, etc.) and at other off-airport sites (hotels, manufacturing concerns, etc.). Furthermore, the direct and indirect expenditures attributable to the airport continue to flow through the region's economy creating additional employment (the "multiplier" effect). A summary of the jobs estimated to be attributable to Oakland-Pontiac Airport is given in Exhibit 14.

Exhibit 14

**JOB SOURCE**  
**JOB ATTRIBUTABLE TO**  
**OAKLAND-PONTIAC AIRPORT**

<u>JOB SOURCE</u>	<u>Full Time</u>	<u>Part Time</u>	<u>Total FEQ</u>
Direct On-Site Jobs	607	50	632
Indirect Off-Site Jobs at Surveyed Firms	5	0	5
Induced and Other Indirect Jobs			841
	<b>Total Jobs</b>		<b>1,478</b>

NOTE: FEQ denotes "full-time equivalent" jobs, calculated as two part-time jobs equal one full-time job.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

The RIMS model treats jobs as full-time-equivalents (FEQ). Consequently, the split between full-time and part-time for induced employment is not shown. The Exhibit shows that there are 637 FEQ jobs at or near the airport, and another 841 located elsewhere in the greater Southern Michigan region that are attributable to the airport.

Non-Economic Values

Not all values a community derives from an airport are quantifiable in dollar terms. Oakland-Pontiac Airport provides local residents with alternative linkages to Michigan and beyond.

The local airport provides access to the latest medical diagnosis and treatment procedures. For example, blood and tissue samples are sent to medical centers and specialist locations, for analysis; medical supplies not available locally (such as serums, antitoxins, isotopes, and organs for transplant operations) are shipped by air and patients are moved by air for treatment procedures not available in their community. Airport management reported several based charter operators equipped to undertake air ambulance services. Others fly in from remote bases. It is estimated that air ambulance flights occur at the Oakland-Pontiac Airport four to five times per week.

Oakland-Pontiac Airport also supports the maintenance of essential community services and security. It is a refueling resource available to support police, Civil Air Patrol and National Guard activities. In case of natural disasters (fire, flood or blizzard) it is a resource for supply and evacuation. Oakland-Pontiac Airport is a frequent refueling base for military aircraft in transit, in the course of operations or exercises. The airport also disseminates available unofficial weather information, especially wind chill data, of importance to local school systems and others.

In recent years, general aviation has become a major training ground for rewarding careers in the airline and aeronautical fields. The presence of an airport gives residents the option of flight instruction and ground service training. Oakland-Pontiac Airport supports and supplements local school programs to interest students in aviation careers. Oakland-Pontiac management and tenants sponsor an annual open-house as part of a public information program and periodically welcome groups to tour the air traffic control facilities and FBO operations.

# VALUE OF HARRY W. BROWNE INTERNATIONAL AIRPORT TO THE SAGINAW AREA

## Economic Values

Harry W. Browne International Airport is estimated to have an economic impact on its service area of approximately \$3.2 million annually in total economic activity, of which \$1.0 million is household earnings. This impact is due principally to the provision and use of general aviation services at the airport.

## Airport Characteristics

Owned and operated by Saginaw County, the airport is open to the public, has a "U-5" classification.

Airport Services - Harry W. Browne International Airport is a general aviation airport, offering the services listed in Exhibit 1.

### Exhibit 1

#### SERVICES OFFERED AT HARRY W. BROWNE INTERNATIONAL AIRPORT

General Aviation	Avgas Fuel Sales
Hangar Rental	Aircraft Repair
Tie Down	Flight Instruction
Aircraft Rental	Vending
	Jet Fuel Sales

SOURCE: Surveys by MDOT, Bureau of Transportation Planning (BTP) study consultants, Wilbur Smith Associates.

All of these services have positive economic significance to the Saginaw area. This is due to the creation of employment, generation of taxes and potential attraction and retention of businesses for the area.

Airport Facilities - The airport is equipped for non-precision instrument approaches and is capable of handling approximately 98 percent of general aviation aircraft types. It has two runways, a modest passenger terminal, hangar space, a rotating beacon; segmented circle; lighted wind direction indicator; and three Fixed-Base Operators (FBOs) who provide aviation support services. Additional facilities are listed in Exhibit 2.

### Exhibit 2

#### FACILITIES AT HARRY W. BROWNE INTERNATIONAL AIRPORT

	RUNWAYS		DESCRIPTION				
	Lgth.	Surf.	Taxi Sys.	Edge Lts.	REIL	VASI	Instr. Appr.
Primary	3,500	PV FP	MIRL	Y	Y	NP	
Crosswind	3,100	PV N	MIRL	Y	Y	NP	

NOTES: PV denotes paved surface; Taxi system definitions are: FP = full parallel; PP = part parallel; and TN = turnaround area at runway ends. Runway lighting systems (Edge Lights) are designated HIRL = high intensity runway lights. MIRL medium intensity; or LIRL, low intensity. Column heading REIL denotes Runway End Indicator Lights; VASI denotes Visual Approach Slope Indicator; column entries refer to presence of the equipment (Y denotes "yes"; N, "no"). Instrument approach facilities are: PR, Precision; NP, Non-Precision; or VIS, visual.

SOURCE: MDOT, BTP.

Airport Use - Harry W. Browne International Airport has substantial general aviation activity. A total of 66 general aviation aircraft are based at the airport, as itemized in Exhibit 3.

Exhibit 3

NUMBERS OF BASED AIRCRAFT  
HARRY W. BROWNE  
INTERNATIONAL AIRPORT

<u>AIRCRAFT TYPE</u>	<u>1988</u>
Single Engine	55
Multi-Engine	10
Helicopter	<u>1</u>
<b>Total Aircraft</b>	<b>66</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Estimated aircraft operations for 1987 are given in Exhibit 4. Air taxi operations are included in the total for itinerant operations.

Exhibit 4

AIRCRAFT OPERATIONS  
HARRY W. BROWNE  
INTERNATIONAL AIRPORT

<u>TYPE OPERATION</u>	<u>1987</u>
Itinerant:	
General Aviation	10,490
Local:	
General Aviation	<u>24,480</u>
<b>Total</b>	<b>34,970</b>

SOURCE: MDOT, BTP.

Aircraft operations at the airport have increased in recent years, and are largely local in nature, reflecting the use of the airport as an instruction

/training facility rather than as a transportation airport.

Exhibit 5

OPERATIONS TREND  
HARRY W. BROWNE  
INTERNATIONAL AIRPORT

<u>OPERATIONS</u>	<u>1983<sup>1</sup></u>	<u>1986</u>	<u>1987</u>
Itinerant	10,220	9,290	10,490
Local	<u>19,330</u>	<u>17,570</u>	<u>24,480</u>
<b>Totals</b>	<b>29,550</b>	<b>26,860</b>	<b>34,970</b>

(1) No count survey was conducted at this airport for the indicated year. Estimate is based on factor derived from representative airports.

SOURCE: MDOT, BTP.

Airport Economic Roles

Harry W. Browne International Airport is a training/recreation oriented airport, with an important business component of activity. The following comprise the airport's principal economic impact types.

Retention of Private Business - Harry W. Browne International Airport is considered valuable to the competitive position of a number of local firms and plants, some of which might choose to locate elsewhere if the facility were not present. These organizations use the general aviation services made possible by the airport's existence. However, the facility was not found to be directly responsible for any significant economic development in the service area.

Business-Oriented General Aviation - An estimated 25-30 percent of general aviation use at the airport is "business-oriented," and a number of area businesses have aircraft at the airport including those listed in Exhibit 6.

**Exhibit 6**

**A SAMPLE OF FIRMS  
WHICH BASE AIRCRAFT AT  
HARRY W. BROWNE  
INTERNATIONAL AIRPORT**

Aeroplex, Inc.	McDonald & Assocs.
B&K Corp.	Walbro Corp.
David Oeming Assocs.	Warrior Aircraft Corp.
Duro-Last Roofing, Inc.	Wolpert Refrig. Inc.

**SOURCE:** Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

In addition to firms with general aviation aircraft based at the airport, there are many others that depend on the airport, for various services, such as air taxi/charter service, air freight etc. These are important for sales, management and production activities at such firms as: General Motors; Peninsular Diesel, Inc; Briggs & Stratton Die Makers, Inc.; Grede Foundries; Controls Div. Singer Corp. and St. Mary's Hospital Flight Care.

**Airport Economic Impact**

The Harry W. Browne International Airport aviation-related economic impact of approximately \$3.2 million annually comprises impact types listed in Exhibit 7.

**Exhibit 7**

**ANNUAL AVIATION-RELATED  
ECONOMIC IMPACT OF  
HARRY W. BROWN  
INTERNATIONAL AIRPORT**

<u>IMPACT TYPE</u>	<u>AMOUNT</u>
Direct	\$1,350,000
Indirect	379,000
Induced	<u>1,486,000</u>
<b>Total</b>	<b>\$3,215,000</b>

**SOURCE:** Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

The total impacts, by type, are summarized in Exhibit 8. These include some \$661,555 in capital aid: \$627,210 in federal funds and \$34,345 from MDOT. This study assesses only the aviation-related impacts.

**Direct Economic Impact** - The "direct" impacts comprise the value of those activities involved in providing aviation services at the airport. Exhibit 9 lists the airport tenants and others included in the impact estimates. The makeup of the estimated direct impacts is given in Exhibit 10.

**Exhibit 10**

**ESTIMATED "DIRECT" ANNUAL IMPACTS  
HARRY W. BROWNE  
INTERNATIONAL AIRPORT**

<u>DIRECT IMPACT</u>	<u>AMOUNT</u>
Direct Payroll	\$391,000
Operating Expenses	288,000
Refueling Service	9,000
Capital Expenditures	<u>662,000</u>
<b>Total</b>	<b>\$1,350,000</b>

**SOURCE:** Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

"Direct" payroll comprises payments to those people who work at the airport, are employed by the County, or the FBOs. "Capital expenditures" include improvements to on-site facilities of tenants as well as to the airport itself. "Operating expenses" are local expenditures by the tenants or airport operator.

**Indirect Economic Impacts** - Harry W. Browne International Airport "indirect" impacts are caused by airport use in the form of expenditures by air travelers and by those firms that depend on the airport for their business.

It is estimated that over 10,000 visitors to the Saginaw area arrived via Harry W. Browne International Airport annually in 1987, by individually owned or corporate aircraft, or by air

## Exhibit 8

**ESTIMATED ANNUAL ECONOMIC IMPACTS**  
**Harry W. Browne International Airport**  
**1987**

<u>IMPACT TYPE AND SOURCE</u>	<u>AVIATION RELATED</u>	<u>NON-AVIATION RELATED (1)</u>	<u>TOTAL(1)</u>
	(-----thousands-----)		
<b>Direct Impacts:</b>			
Local Governments	\$ 911	0	\$ 911
Aviation Services	<u>439</u>	<u>0</u>	<u>439</u>
Subtotal	\$ 1,350	\$ 0	\$ 1,350
<b>Indirect Impacts:</b>			
Visitor Expenditures	\$ 333	\$ 0	\$ 333
Regional Expenditure	6	0	6
Dependent Firms	<u>40</u>	<u>0</u>	<u>40</u>
Subtotal	\$ 379	\$ 0	\$ 379
<b>Induced Impacts:</b>	1,486		
<b>Total Annual Impacts</b>	<u>\$ 3,215</u>		

(1) Only aviation-related impacts are considered in this study.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

Exhibit 9  
**ORGANIZATIONS AND FIRMS CREATING ECONOMIC IMPACTS**  
 Harry W. Browne International Airport  
 1987

<u>ORGANIZATION</u>	<u>ATtribution OF ACTIVITY</u>			<u>ECONOMIC ACTIVITY</u>
	<u>Aviation-Related</u>			
	<u>On-Site</u> <sup>(1)</sup>	<u>Off-Site</u> <sup>(2)</sup>	<u>Non-Aviation</u> <sup>(3)</sup>	
Local Government: County Airport	X			Airport Operations
Aviation Services:				
Seeley Aircraft Svcs.	X			Fixed-Base Operator
Hoffman Flying Svc.	X			Fixed-Base Operator, Freight Charter Service
Reinbold Flying Svc.	X			Fixed-Base Operator
Other:				
Flight Instructors	X	X		

- 
- (1) Economic activity on airport property, by an airport tenant, treated as "direct" economic impact.
  - (2) Economic activity not taking place on airport property, but which is directly aviation-related to this airport. Treated as an "indirect" economic impact.
  - (3) Activity which is not related to or dependent on aviation activities. Not included in the impact estimates.

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

taxi. Based on approximate proportions of those staying overnight (more than one day) it is estimated that the average visitor spends approximately \$35 per trip at off-airport locations in the Saginaw area. Local residents using the airport also spend money -- some \$6,000 per year locally.

The aviation-related indirect economic impacts attributable to Harry W. Browne International Airport total \$379,000, as shown in Exhibit 11. The visitor expenditures breakdown by expenditure type is based on a mix of tourist, business and personal travel derived from the results of surveys made at other airports. Since no Michigan surveys were available, these were adjusted to reflect a range of values judged to be appropriate for local conditions. All visitor expenditures are at the actual cost outlay except retail sales which, since it is a margin industry, is shown at 20 percent of the actual expenditures. Expenditures by airport-dependent firms consist of those costs attributable to airport-related activity.

Exhibit 11

**INDIRECT IMPACTS OF  
HARRY W. BROWNE  
INTERNATIONAL AIRPORT**

<u>REGIONAL EXPENDITURES BY SOURCE</u>	<u>ANNUAL IMPACT</u>
Visitor Expenditures:	
Lodging	\$112,000
Food & Beverage	95,000
Retail Sales	9,000
Entertainment	29,000
Ground Transport	25,000
Business	21,000
Other	<u>42,000</u>
Subtotal	\$333,000
Resident Expenditures	6,000
Dependent Firm Expenditures	<u>40,000</u>
Total	\$379,000

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

**Induced Economic Impact** - "Direct" economic impacts of about \$1,350,000, and "indirect" impacts of \$379,000, represent increases in final demand for goods and services in the Saginaw region. To these must be added a "multiplier" effect produced by circulation of the money through the regional economy. To determine this "induced" impact, the U.S. Department of Commerce "Regional Input-Output Modeling System" (RIMS-II) was used. It was found that the induced impact produced by Harry W. Browne International Airport in 1987 was approximately \$1,486,000.

**Industries Which Benefit**

The economic activities at Harry W. Browne International Airport produce expenditures for a wide variety of goods and services. Many types of industry benefit, whether or not they are themselves airport users. Exhibit 12 lists impacted industry groups, and shows the extent to which each benefits from Harry W. Browne International Airport in terms of economic activity earnings and employment.

**Airport Derived Employment**

An important element in the Harry W. Browne International Airport economic impact total is the employment which the airport creates. People are employed in airport-related activities at the airport (the FBO, the county, etc.) and at other off-airport sites (hotels, manufacturing concerns, etc.). Furthermore, the direct and indirect expenditures attributable to the airport continue to flow through the region's economy creating additional employment (the "multiplier" effect). A summary of the jobs estimated to be attributable to Harry W. Browne International Airport is given in Exhibit 13.

The RIMS model treats jobs as full-time-equivalents (FEQ). Consequently, the split between full-time and part-time for induced employment is not shown. The Exhibit shows that there are 21 FEQ jobs at or near the airport, and another 28 located elsewhere in the Saginaw area that are attributable to the airport.



Exhibit 12  
**TOTAL ANNUAL ECONOMIC IMPACT**  
 Harry W. Browne International Airport  
 1987

<u>IMPACTED INDUSTRY GROUPS</u>	<u>TOTAL ANNUAL IMPACT (Output)</u> <small>(.....Thousands.....)</small>	<u>TOTAL ANNUAL PAYROLL (Earnings)(1)</u> <small>(.....Thousands.....)</small>	<u>EMPLOYMENT (Jobs)</u>
Ag. Prod., Forestry Svcs.	\$7	\$3	0
Other Mining	11	3	0
New Construction	662	211	8
Maint. and Repair Const.	36	19	1
Food, Kindred Prd.	58	8	0
Apparel	1	0	0
Paper, Allied Products	6	0	0
Printing, Publishing	19	6	0
Chemicals, Refined Petrol.	72	6	0
Rubber, Leather Prod.	12	1	0
Lumber, Furniture Prod.	2	0	0
Stone, Clay, Glass Prod.	50	12	0
Primary Metals	43	9	0
Fabricated Metals	68	16	1
Non-electrical Machinery	9	3	0
Electrical Machinery	10	2	0
Motor Vehicles, Equipment	43	6	0
Other Transportation Equip.	4	1	0
Instruments	1	0	0
Miscellaneous Mfg.	8	2	0
Transportation	684	243	9
Communications	46	12	0
Utilities	101	10	0
Wholesale Trade	96	37	1
Retail Trade	118	58	4
Finance	31	8	0
Insurance	42	14	1
Real Estate	137	2	1
Lodging, Amusements	154	53	5
Personal Services	21	10	1
Business Services	367	168	8
Eating, Drinking Estab.	151	47	6
Health Services	59	34	1
Other Services	86	21	1
Households	--	3	1
<b>TOTALS</b>	<b>\$3,215</b>	<b>\$1,028</b>	<b>49</b>

(1) The portion of the "output" column inputs that is payroll to employed persons.

SOURCE: Rims II Multipliers, Wilbur Smith Associates.

## Exhibit 13

**JOBS ATTRIBUTABLE TO  
HARRY W. BROWNE  
INTERNATIONAL AIRPORT**

<u>JOB SOURCE</u>	<u>Full Time</u>	<u>Part Time</u>	<u>Total FEQ</u>
Direct On-Site Jobs	16	5	19
Indirect Off-Site Jobs at Surveyed Firms			2
Induced and Other Indirect Jobs			<u>28</u>
		<b>Total Jobs</b>	<b>49</b>

NOTE: FEQ denotes "full-time equivalent" jobs, calculated as two part-time jobs equal one full-time job.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

**Non-Economic Values**

Not all values a community derives from an airport are quantifiable in dollar terms. Harry W. Browne International Airport provides Saginaw residents with alternative linkages to Michigan and

beyond. The airport provides access to the latest medical diagnosis and treatment procedures. For example, blood and tissue samples are sent to larger medical centers, and other specialist locations, for analysis. Medical supplies not available locally (such as serums, antitoxins, isotopes, and organs for transplant operations) are shipped by air; and patients are moved by air for treatment procedures not available in their community. The management at Harry W. Browne Airport noted that the airport supports the Flight Care Helicopter, based at Saginaw's St. Mary's Hospital. Also, air ambulances come in from time to time, to carry patients for treatment at remote specialist centers, such as Cleveland and Texas.

Browne Airport also supports the maintenance of essential community services and security. It acts in support of the Saginaw County Sheriff's Aero Department to help provide surveillance of area highways during holiday peak traffic periods and/or participate in search and rescue missions, as may be necessary. In case of natural disasters (fire, flood or blizzard) it is a resource for supply and evacuation.

In recent years, general aviation has become a major training ground for rewarding careers in the airline and aeronautical fields. The presence of an airport gives residents the option of flight instruction and ground service training.

# VALUE OF TRI-CITY INTERNATIONAL AIRPORT TO THE MIDLAND, BAY CITY, SAGINAW AREA

## Economic Values

Midland, Bay City, Saginaw, Tri-City International Airport is estimated to have an economic impact on its service area of approximately \$79.3 million annually in total economic activity, of which \$26.9 million is household earnings. This impact is due principally to the provision and use of scheduled air carrier services, general aviation services, and the sizeable federal government operations at the airport.

## Airport Characteristics

Owned by Bay County and the Cities of Midland and Saginaw, and operated by the Tri-City Airport Commission, the airport is open to the public, has a "T-5" classification, and is the third largest airport in Michigan in terms of annual scheduled passenger usage.

Airport Services - Tri-City International Airport is a full-service scheduled air carrier and general aviation airport, offering nearly everything desired of such airports, including the services listed in Exhibit 1.

### Exhibit 1

#### SERVICES OFFERED AT TRI-CITY INTERNATIONAL AIRPORT

Scheduled Air Carrier	Avgas Fuel Sales
Commuter Air	Aircraft Repair
Air Taxi	Avionics
General Aviation	Flight Instruction
Hangar Rental	Car Rental
Tie Down	Restaurant
Aircraft Rental	Vending
Aircraft Sales	Control Tower
	Jet Fuel Sales

SOURCE: Surveys by MDOT, Bureau of Transportation Planning (BTP) study consultants, Wilbur Smith Associates.

All of these services have positive economic significance to the Tri-City. This is due to the creation of employment, generation of taxes and potential attraction and retention of businesses for the area.

Airport Facilities - The airport is an all-weather facility capable of handling virtually all general aviation aircraft types and commercial jets. It has two runways, is towered, has a fine passenger terminal, hangar space, rotating beacon and has one Fixed-Base Operator (FBO) who provides aviation support services.

### Exhibit 2

#### FACILITIES AT TRI-CITY INTERNATIONAL AIRPORT

	RUNWAYS		DESCRIPTION					Instr. Appr.
	Lgth.	Surf.	Taxi Sys.	Edge Lts.	REIL	VASI		
Primary	8,000	PV FP	FP	HIRL	N	Y	PR	
Crosswind	5,475	PV PP	PP	MIRL	N	Y	NP	

NOTES: PV denotes paved surface; Taxi system definitions are: FP = full parallel; PP = part parallel; and TN = turnaround area at runway ends. Runway lighting systems (Edge Lights) are designated HIRL = high intensity runway lights. MIRL medium intensity; or LIRL, low intensity. Column heading REIL denotes Runway End Indicator Lights; VASI denotes Visual Approach Slope Indicator; column entries refer to presence of the equipment (Y denotes "yes"; N, "no"). Instrument approach facilities are: PR, Precision; NP, Non-Precision; or VIS, visual.

SOURCE: MDOT, BTP.

**Airport Use** - Tri-City International Airport currently is served by five scheduled air carriers (United and Northwest Airlines, Northwest AirlinK and American Eagle (both operated by Simmons Airlines), and Air Canada (operated by Commuter Express). It also has substantial general aviation activity. A total of 26 general aviation aircraft are based at the airport, as itemized in Exhibit 3.

## Exhibit 3

**NUMBERS OF BASED AIRCRAFT  
TRI-CITY INTERNATIONAL  
AIRPORT**

<u>AIRCRAFT TYPE</u>	<u>1988</u>
Single Engine	12
Multi-Engine	6
Jet	<u>8</u>
<b>Total Aircraft</b>	<b>26</b>

**SOURCE:** Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Estimated aircraft operations for 1987 are given in Exhibit 4. Military operations are normally training for military aircraft based elsewhere.

## Exhibit 4

**AIRCRAFT OPERATIONS  
TRI-CITY INTERNATIONAL  
AIRPORT**

<u>TYPE OPERATION</u>	<u>1987</u>
<b>Itinerant:</b>	
Air Carrier	8,144
Air Taxi	6,279
General Aviation	26,365
Military	<u>807</u>
<b>Subtotal Itinerant</b>	<b>41,595</b>
<b>Local:</b>	
General Aviation	12,773
Military	<u>1,464</u>
<b>Subtotal Local</b>	<b>14,237</b>
<b>Total</b>	<b>55,832</b>

**SOURCE:** MDOT, BTP.

Aircraft operations at the airport have generally remained in the magnitude of 55,000-56,000 between 1983 and 1987, except for a dip to 51,000 in 1985, and are largely itinerant in nature reflecting the use of the airport as a transportation facility rather than a training airport.

## Exhibit 5

**OPERATIONS TREND  
TRI-CITY AIRPORT**

<u>OPERATIONS TYPE</u>	<u>1983</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>
Itinerant	42,317	38,593	42,298	41,595
Local	<u>12,814</u>	<u>12,478</u>	<u>13,466</u>	<u>14,237</u>
<b>Totals</b>	<b>55,131</b>	<b>51,071</b>	<b>55,764</b>	<b>55,832</b>

**SOURCE:** MDOT, BTP.

Currently, an average of almost 1,200 people use the air carrier services daily. Scheduled flights number 14 to 15 per weekday (Monday through Friday) and 13 on Saturdays and Sundays.

## Exhibit 6

**AIR CARRIER PASSENGERS  
TRI-CITY INTERNATIONAL  
AIRPORT**

<u>PASSENGERS</u>	<u>1983</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>
	(-----Thousands-----)			
Deplaned	156.8	188.7	199.3	215.3
Enplaned	<u>163.5</u>	<u>192.0</u>	<u>206.1</u>	<u>220.8</u>
<b>Totals</b>	<b>320.3</b>	<b>380.7</b>	<b>405.4</b>	<b>436.1</b>

**SOURCE:** MDOT, BTP.

Air cargo tonnage at Tri-City Airport jumped sharply in 1987, reflecting consolidation moves by package freight shippers. This occurred on top of a 2.5 percent increase between 1985 and 1986. Annual tonnages for the past three years are shown in Exhibit 7.

## Exhibit 7

**AIR CARGO HANDLED AT  
TRI-CITY INTERNATIONAL  
AIRPORT**

CARGO MOVEMENT	CARGO TONS		
	1985	1986	1987
Deplaned	329.9	334.7	866.4
Enplaned	157.7	165.2	159.4
Totals	487.6	499.9	1,025.8

SOURCE: MDOT, BTP.

Airport Economic Roles

Aviation activity at Tri-City International Airport is business-oriented. The following comprise the airport's principal economic impact types.

Retention of Private Business - Tri-City International Airport is considered valuable to the competitive position of a number of local firms and plants, some of which might choose to locate elsewhere if the facility were not present. These organizations use the air carrier, commuter air, air taxi and general aviation services made possible by the airport. "Just-in-Time" cargo delivery to the area's industries is seen as a valuable service made possible by the airport's existence. However, the facility was not found to be directly responsible for any significant economic development in the service area.

Business-Oriented General Aviation - An estimated 70-80 percent of general aviation use at the airport is "business-oriented," and many of the region's businesses have aircraft at the airport including those listed in Exhibit 8.

## Exhibit 8

**A SAMPLE OF FIRMS  
WHICH BASE AIRCRAFT  
AT TRI-CITY INTERNATIONAL  
AIRPORT**

Aero Club Inc.	Dow Chemical
Aero Services	Dow Corning
Consumers Power	General Motors
Michigan Sugar	

SOURCE: Surveys by MDOT, BTP study

In addition to firms with general aviation aircraft based at the airport, there are many others that depend on the airport, for various services, such as scheduled passenger service, air taxi/charter service, air freight etc. These are important for sales, management and production activities at such firms as: Allied Corp.; Airborne Express; Banks-several; Federal Express; Hemlock Semiconductor; Hospitals-several; Meijers, Inc.; Michigan Bell Telephone; Pillsbury Corporation; United Parcel Service; United Technologies; and many others.

Airport Economic Impact

The Tri-City International Airport aviation-related economic impact of nearly \$79.3 million annually comprises the impact types listed in Exhibit 9.

## Exhibit 9

**ANNUAL AVIATION-RELATED  
ECONOMIC IMPACT OF  
TRI-CITY INTERNATIONAL  
AIRPORT**

IMPACT TYPE	AMOUNT
Direct	\$ 9,934,600
Indirect	34,988,700
Induced	34,340,700
<b>Total</b>	<b>\$ 79,264,000</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

The total impacts, by type, are summarized in Exhibit 10. There are some impacts at the airport which are not attributable entirely to aviation, e.g., rental car companies and package express services that serve more than just the airport. This study assesses only the aviation-related impacts.

Direct Economic Impact - The "direct" impacts comprise the value of those activities involved in providing aviation services at the airport. Exhibit 11 lists the airport tenants and others included in the impact estimates. The makeup of the direct impacts is shown in Exhibit 12. The Capital expenditures include 1988 aid grants totalling \$2,553,840, of which \$2,419,450 is

## Exhibit 10

**ESTIMATED ANNUAL ECONOMIC IMPACTS**  
**Tri-City International Airport**  
**1987**

<u>IMPACT TYPE AND SOURCE</u>	<u>AVIATION RELATED</u>	<u>NON-AVIATION RELATED (1)</u>	<u>TOTAL(1)</u>
	(-----thousands-----)		
<b>Direct Impacts:</b>			
Air Carrier Operations	\$ 1,787.3	\$ 0.0	\$ 1,787.3
Federal Government	1,311.8	0.0	1,311.8
Local Governments	3,915.5	0.0	3,915.5
Air Passenger Services	1,416.5	301.4	1,717.9
Aviation Services	<u>1,503.5</u>	<u>897.3</u>	<u>2,400.8</u>
Subtotal	\$ 9,934.6	\$ 1,198.7	\$11,133.3
<b>Indirect Impacts:</b>			
Visitor Expenditures	\$ 29,878.7	\$ 0.0	\$29,878.7
Regional Expenditure	181.7	0.0	181.7
Corporate Operations & Other	1,687.0	0.0	1,687.0
Dependent Firms	<u>3,241.3</u>	<u>833.2</u>	<u>4,074.5</u>
Subtotal	\$ 34,988.7	\$ 833.2	\$35,821.9
Induced Impacts:	34,340.7		
<b>Total Annual Impacts</b>	<u>\$ 79,264.0</u>		

(1) Only aviation-related impacts are considered in this study.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

Exhibit 11  
**ORGANIZATIONS AND FIRMS CREATING ECONOMIC IMPACTS**  
 Tri-City Airport  
 1988

<u>ORGANIZATION</u>	<u>ATTRIBUTION OF ACTIVITY</u>			<u>ECONOMIC ACTIVITY</u>
	<u>Aviation-Related</u>		<u>Non-Aviation</u>	
	<u>On-Site</u> <sup>(1)</sup>	<u>Off-Site</u> <sup>(2)</sup>	<u>Aviation</u> <sup>(3)</sup>	
<b>Air Carrier Operations:</b>				
United Airlines	X			Airline
Northwest Airlines	X			Airline
Northwest Link Airlines	X			Airline (operator-Simmons)
American Eagle Airlines	X			Airline (operator-Simmons)
Air Canada	X			Airline (operator-Commuter Express)
<b>Federal Government:</b>				
Federal Aviation Administration				
Air Traffic Control	X			Control Tower
Airways Facilities Services	X			Facility Maintenance Unit
<b>Local Government:</b>				
Tri-City Airport Comm.	X			Airport Operations
<b>Air Passenger Services:</b>				
Hertz	X			Car Rental
Avis	X			Car Rental
National	X			Car Rental
Budget	X			Car Rental
Thrifty	X			Car Rental
Golden Triangle Dev.	X		X	Restaurant, lunch room, gift shop
APCOA	X			Parking Service
MTI	X			Limousine Service
<b>Aviation Services:</b>				
Aero Services	X			Fixed Base Operator
Federal Express	X			Express Package Service
J&J Security	X			Passenger Screening
<b>Other:</b>				
Corporate Air Operations	X	X		Hangar Leases, Company Aircraft Activity
Travel Agencies	X	X	X	Travel Arrangements

- (1) Economic activity on airport property, by an airport tenant, treated as "direct" economic impact.  
 (2) Economic activity not taking place on airport property, but which is directly aviation-related to this airport. Treated as an "indirect" economic impact.  
 (3) Activity which is not related to or dependent on aviation activities. Not included in the impact estimates.

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates. \*

## Exhibit 12

**ESTIMATED "DIRECT" ANNUAL IMPACTS  
TRI-CITY INTERNATIONAL  
AIRPORT**

<u>DIRECT IMPACT</u>	<u>AMOUNT</u>
Direct Payroll	\$5,429,400
Capital Expenditures	2,748,300
Operating Expenses	1,596,300
Refueling Service	<u>160,600</u>
<b>Total</b>	<b>\$9,934,600</b>

**SOURCE:** Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

"Direct" payroll comprises payments to those people who work at the airport, are employed by the airlines, FBO, corporate users, restaurant, or other tenants. "Capital expenditures" include improvements to on-site facilities of tenants as well as to the airport itself. "Operating expenses" are local expenditures by the tenants or airport operator.

Indirect Economic Impacts - Tri-City International Airport "indirect" impacts are caused by airport use in the form of expenditures by air travelers and by those firms that depend on the airport for their business.

It is estimated that over 141,000 visitors to the Tri-City area arrive via Tri-City International Airport annually (110,394 by scheduled air carrier, 26,365 by personal or corporate aircraft, and 4,709 by air taxi in 1987). Based on approximate proportions of those staying overnight (more than one day) it is estimated that the average visitor spends approximately \$233 per trip at off-airport locations in the Tri-City area. Local residents using the airport also spend money -- some \$181,650 per year locally (in addition to moneys spent at the airport). Furthermore, there are 35 travel agencies in the region. Surveys indicate that,

taken together, about 90 percent of their economic activity (e.g. ticket sales) is related to aviation. Of this, just over 70 percent is related to Tri-City International Airport.

The aviation-related indirect economic impacts attributable to Tri-City International Airport total nearly \$35 million, as shown in Exhibit 13. The visitor expenditures breakdown by expenditure type is based on a mix of tourist, business and personal travel derived from the results of surveys made at other airports. Since no Michigan surveys were available, these were adjusted to reflect a range of values judged to be appropriate for local conditions. All visitor expenditures are at the actual cost outlay except retail sales which, since it is a margin industry, is shown at 20 percent of the actual expenditures. Expenditures by airport-dependent firms consist of those costs attributable to airport-related activity.

## Exhibit 13

**INDIRECT IMPACTS OF  
TRI-CITY INTERNATIONAL  
AIRPORT**

<u>REGIONAL EXPENDITURES BY SOURCE</u>	<u>ANNUAL IMPACT</u>
<b>Visitor Expenditures:</b>	
Lodging	\$10,087,000
Food & Beverage	8,504,700
Retail Sales	771,400
Entertainment	2,604,200
Ground Transport	2,274,400
Business	1,846,000
Other	<u>3,791,000</u>
Subtotal	\$29,878,700
Resident Expenditures	181,700
Corporate Air Opns.	1,687,000
Dependent Firm Expenditures	<u>3,241,300</u>
<b>Total</b>	<b>\$34,988,700</b>

**SOURCE:** Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.



**Induced Economic Impact** - "Direct" economic impacts of about \$9.9 million, and "indirect" impacts of \$35.0 million, represent increases in final demand for goods and services in the Tri-City region. To these must be added a "multiplier" effect produced by circulation of the money through the regional economy. To determine this "induced" impact, the U.S. Department of Commerce "Regional Input-Output Modeling System" (RIMS-II) was used. It was found that the induced impact produced by Tri-City International Airport in 1987 was approximately \$34,340,700.

**Industries Which Benefit**

The economic activities at Tri-City International Airport produce expenditures for a wide variety of goods and services. Many types of industry benefit, whether or not they are themselves airport users. Exhibit 14 lists impacted industry groups, and shows the extent to which each benefits from Tri-City International Airport in terms of total economic activity earnings and employment.

**Airport Derived Employment**

An important element in the Tri-City International Airport economic impact total is the employment which the airport creates. People are employed in airport-related activities at the airport (the FBO, the airlines, the federal government, the county, etc.) and at other off-airport sites (hotels, manufacturing concerns, etc.). Furthermore, the direct and indirect expenditures attributable to the airport continue to flow through the region's economy creating additional employment (the "multiplier" effect). A summary of the jobs estimated to be attributable to Tri-City International Airport is given in Exhibit 15.

The RIMS model treats jobs as full-time-equivalents (FEQ). Consequently, the split between full-time and part-time for induced employment is not shown. The Exhibit shows that there are 476 FEQ jobs at and near the airport, and another 1,232

Exhibit 15

**JOBS ATTRIBUTABLE TO TRI-CITY INTERNATIONAL AIRPORT**

<u>JOB SOURCE</u>	<u>Full Time</u>	<u>Part Time</u>	<u>Total FEQ</u>
Direct On-Site Jobs	303	64	335
Indirect Off-Site Jobs at Surveyed Firms	0	0	141
Induced and Other Indirect Jobs			<u>1,232</u>
		<b>Total Jobs</b>	<b>1,708</b>

NOTE: FEQ denotes "full-time equivalent" jobs, calculated as two part-time jobs equal one full-time job.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

located elsewhere in the greater Saginaw, Tri-City region that are attributable to the airport.

**Non-Economic Values**

Not all values a community derives from an airport are quantifiable in dollar terms. Tri-City International provides local residents with alternative linkages to Michigan and beyond.

The airport provides access to the latest medical diagnosis and treatment procedures. For example, blood and tissue samples are sent to medical centers and specialist locations for analysis; medical supplies not available locally (such as serums, antitoxins, isotopes, and organs for transplant operations) are shipped by air; and patients are moved by air for treatment procedures not available in their community.

Exhibit 14  
**ECONOMIC IMPACT OF TRI-CITY INT'L AIRPORT  
 BY IMPACTED INDUSTRY TYPE  
 1987**

<b>IMPACTED INDUSTRY GROUPS</b>	<b>TOTAL ANNUAL IMPACT (Output) (.....Thousands.....)</b>	<b>TOTAL ANNUAL PAYROLL (Earnings)(1) (.....Thousands.....)</b>	<b>EMPLOYMENT (Jobs)</b>
Ag. Prod., Forestry Svcs.	\$164	\$67	8
Crude Petrol.	2	0	0
Other Mining	50	15	1
New Construction	2,748	880	33
Maint. and Repair Const.	875	400	15
Food, Kindred Prd.	2,497	343	12
Textile Mill Products	13	1	0
Apparel	69	18	1
Paper, Allied Products	156	35	1
Printing, Publishing	677	231	10
Chemicals, Refined Petrol.	933	90	2
Rubber, Leather Prod.	418	100	4
Lumber, Furniture Prod.	79	20	1
Stone, Clay, Glass Prod.	375	108	3
Primary Metals	417	97	2
Fabricated Metals	625	169	5
on-electrical Machinery	207	68	2
Electrical Machinery	168	48	2
Motor Vehicles, Equipment	1,079	177	4
Other Transportation Equip.	121	41	1
Instruments	27	11	0
Miscellaneous Mfg.	169	51	3
Transportation	19,237	7,691	280
Communications	1,270	336	9
Utilities	2,482	251	6
Wholesale Trade	2,337	913	31
Retail Trade	3,434	1,702	127
Finance	917	260	11
Insurance	1,158	378	14
Real Estate	3,864	107	27
Lodging, Amusements	13,142	4,655	451
Personal Services	708	321	32
Business Services	5,648	2,597	120
Eating, Drinking Estab.	10,193	3,177	398
Health Services	1,494	867	38
Other Services	1,511	559	32
Households	--	98	22
<b>TOTALS</b>	<b>\$79,264</b>	<b>\$26,882</b>	<b>1,708</b>

(1) The portion of the "output" column that is payroll to employed persons.

Locally, St. Mary's Hospital in Saginaw operates an Emergency Medical Services helicopter, which is maintained at Tri-City Airport. Air ambulance services regularly use the Airport and both Dow Chemical and Dow Coming participate in "Corporate Angel" programs, through which humanitarian medical transportation and other aid is provided to needy recipients.

Tri-City Airport also supports the maintenance of essential community services and security by providing a refueling base. It can be used to help locate and combat forest fires or chemical spills; to patrol pipelines and power lines, and supports police, Civil Air Patrol and National Guard Activities. In case of natural disasters (fire, flood or blizzard) it is a resource for supply and evacuation. Tri-City is a designated alternate airport for military flights, accomodates military

aircraft for "touch-and-go" operations during off-peak times and serves routinely as a refueling resource for USCG aircraft in the course of their operations.

In recent years, general aviation has become a major training ground for rewarding careers in the airline and aeronautical fields. The presence of an airport gives residents the option of flight instruction and ground service training. The Airport supports the efforts of local schools and colleges in pursuit of this, as well as providing access to the Tri-City area for visiting facility and for team sport travel. As an additional community service, the Airport shares ownership of an automobile "dragstrip", used both for recreation and for research conducted for a major auto manufacturer.

# VALUE OF COWLEY FIELD TO THE SANDUSKY AREA

## Economic Values

Cowley Field is estimated to have an economic impact on its service area of approximately \$3,200 annually in total economic activity, of which \$1,000 is household earnings. This impact is due to the provision and use of general aviation services at the airport.

## Airport Characteristics

Owned and operated by Dale Cowley, the airport is open to the public and has a "U-1" classification.

Airport Services - Cowley Field Airport is a small general aviation airport, with no on-site staff or services, other than aircraft tie-downs and a general hangar.

The airport currently has very modest economic significance, due to the limited activity taking place there.

Airport Facilities - The airport is a small utility airport with a single turf runway, a general hangar and aircraft tie-downs. Additional facilities are listed in Exhibit 1.

Airport Use - One single engine general aviation aircraft is based at the airport.

Aircraft operations data for 1987, estimated by the airport owner, are given in Exhibit 2. No MDOT operations data is available.

It is understood that the number of aircraft operations has remained generally steady over recent years, with about a 50-50 split of traffic between local and itinerant operations.

## Airport Economic Roles

Cowley Field generates very modest economic activity. According to the airport owner-operator, activity is about 20 percent business-oriented and

## Exhibit 1

### FACILITIES AT COWLEY FIELD

RUNWAYS	DESCRIPTION						Instr. Appr.
	Lgth.	Surf.	Taxi Sys.	Edge Lts.	REIL	VASI	
Primary	1,578	TF	N	N	N	N	VIS

NOTES: TF denotes turf surface; Column heading REIL denotes Runway End Indicator Lights; VASI denotes Visual Approach Slope Indicator; column entries refer to presence of the equipment (Y denotes "yes"; N, "no"). Instrument approach facilities are: VIS, visual.

SOURCE: MDOT, BTP.

## Exhibit 2

### AIRCRAFT OPERATIONS COWLEY FIELD

<u>TYPE OPERATION</u>	<u>1986</u>
Itinerant:	
General Aviation	150
Local:	
General Aviation	<u>150</u>
<b>Total</b>	<b>300</b>

SOURCE: Airport Owner.

80 percent recreational. There has been no significant nearby economic development directly attributable to the airport, and no local employers were identified as frequent users of airport facilities.

**Airport Economic Impact**

The Cowley Field aviation-related economic impact of \$3,200 annually comprises the impact types listed in Exhibit 3.

The total impacts, by type, are summarized in Exhibit 4. This study assesses only the aviation-related impacts.

**Direct Economic Impact** - The airport owner-operator reports that no staff is employed, there are no airport tenants, and there is no expenditure budget for local purchases related to airport operation and maintenance. Accordingly, there are no direct economic impacts generated.

**Indirect Economic Impacts** - Cowley Field "indirect" impacts are caused by airport use in the form of expenditures by air travelers and by those firms that depend on the airport for their business.

Exhibit 3

**ANNUAL AVIATION-RELATED ECONOMIC IMPACT OF COWLEY FIELD**

<u>IMPACT TYPE</u>	<u>AMOUNT</u>
Direct	\$ 0
Indirect	3,200
Induced	<u>700</u>
<b>Total</b>	<b>\$3,900</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

It is estimated that some 150 visitors to the Sandusky region arrive annually at Cowley Field in general aviation aircraft. The airport operator advises that all are day visitors (none remain in the area overnight). It is estimated that the average day visitor spends \$21.00 in the Sandusky region. In addition, it is estimated that local residents using the airport spend about \$400 locally, per year.

Exhibit 4

**ESTIMATED ANNUAL ECONOMIC IMPACTS  
Cowley Field  
1987**

<u>IMPACT TYPE AND SOURCE</u>	<u>AVIATION RELATED</u>	<u>NON-AVIATION RELATED (1)</u>	<u>TOTAL(1)</u>
Direct Impacts:	0	0	0
Indirect Impacts:			
Visitor Expenditures	\$ 2,800	\$ 0	\$ 2,800
Regional Expenditure	<u>400</u>	<u>0</u>	<u>400</u>
Subtotal	\$ 3,200	\$ 0	\$ 3,200
Induced Impacts:	700		
<b>Total Annual Impacts</b>	<b>\$3,900</b>		

(1) Only aviation-related impacts are considered in this study.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

The aviation-related indirect economic impacts attributable to Cowley Field total \$3,200, as shown in Exhibit 5. The visitor expenditures breakdown by expenditure type is based on a mix of tourist, business and personal travel derived from the results of surveys made at other airports. Since no Michigan surveys were available, these were adjusted to reflect a range of values judged to be appropriate for local conditions. All visitor expenditures are at the actual cost outlay except retail sales which, since it is a margin industry, is shown at 20 percent of the actual expenditures. Expenditures by airport-dependent firms consist of those costs attributable to airport-related activity.

#### Exhibit 5

#### INDIRECT IMPACTS OF COWLEY FIELD

<u>REGIONAL EXPENDITURES BY SOURCE</u>	<u>ANNUAL IMPACT</u>
Visitor Expenditures:	
Lodging	\$ 0
Food & Beverage	1,700
Retail Sales	100
Entertainment	200
Ground Transport	200
Business	200
Other	<u>400</u>
Subtotal	\$ 2,800
Resident Expenditures	<u>400</u>
Total	<b>\$3,200</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Induced Economic Impact - "Indirect" impacts of \$3,200, represent increases in final demand for goods and services in the Sandusky region. To these must be added a "multiplier" effect produced by circulation of the money through the regional economy. To determine this "induced" impact, the U.S. Department of Commerce "Regional Input-Output Modeling System" (RIMS-II) was used. It was found that the induced impact produced by Cowley Field in 1987 was approximately \$700.

#### Industries Which Benefit

The economic activities at Cowley Field produce expenditures for a limited variety of goods and services and few types of industry benefit. Exhibit 6 lists impacted industry groups, and shows the extent to which each benefits from economic activity related to Cowley Field.

#### Airport Derived Employment

There are no on-site jobs at Cowley Field and none reported at off-site locations. The modest level of economic activity generated by the airport is insufficient to induce additional employment elsewhere in the vicinity.

#### Non-Economic Values

Not all values a community derives from an airport are quantifiable in dollar terms. Cowley Field provides Sandusky residents with alternative linkages to Michigan and beyond.

Exhibit 6  
ECONOMIC IMPACT OF COWLEY FIELD AIRPORT  
1987

<u>IMPACTED INDUSTRY GROUPS</u>	<u>TOTAL ANNUAL IMPACT (Output)</u> (.....Thousands.....)	<u>TOTAL ANNUAL PAYROLL (Earnings)(1)</u> (.....Thousands.....)	<u>EMPLOYMENT (Jobs)</u>
Transportation	1.3	0	0
Eating, Drinking Estab.	<u>2.6</u>	<u>1</u>	<u>0</u>
<b>TOTALS</b>	<b>\$3.9</b>	<b>\$1</b>	<b>0</b>

(1) The portion of the "output" column that is payroll to employed persons.

SOURCE: Rims II Multipliers, MDOT, BTP study consultant, Wilbur Smith Associates.

# VALUE OF THE SANDUSKY CITY AIRPORT TO THE SANDUSKY AREA

## Economic Values

Sandusky City Airport is estimated to have an economic impact on its service area of approximately \$105,000 annually in total economic activity, of which \$30,000 is household earnings. This impact is due principally to the provision of general aviation services at the airport.

## Airport Characteristics

Owned and operated by City of Sandusky, the airport is open to the public and has a "U-4" classification.

Airport Services - Sandusky City Airport is a general aviation airport, offering the services listed in Exhibit 1.

### Exhibit 1

#### SERVICES OFFERED AT SANDUSKY CITY AIRPORT

General Aviation	Avgas Fuel Sales
Hangar Rental	Aircraft Repair
Tie Down	Flight Instruction
	Vending

SOURCE: Surveys by MDOT, Bureau of Transportation Planning (BTP) study consultants, Wilbur Smith Associates.

All of these services have positive economic significance to the Sandusky area. This is due to the creation of employment, generation of taxes and potential attraction and retention of businesses for the area.

Airport Facilities - The airport is an all season facility capable of handling 95 percent of general aviation aircraft types. It has two runways, a small passenger terminal, rotating beacon, lighted wind indicator, and one Fixed-Base Operator (FBO) who provides aviation support services. Additional facilities are listed in Exhibit 2.

### Exhibit 2

#### FACILITIES AT SANDUSKY CITY AIRPORT

RUNWAYS	DESCRIPTION						
	Lgth.	Surf.	Taxi Sys.	Edge Lts.	REIL	VASI	Instr. Appr.
Primary	3,000	PV	TN	MIRL	N	N	VIS
Crosswind	2,180	TF	NO	None	N	N	VIS

NOTES: PV denotes paved surface; Taxi system definitions are: FP = full parallel; PP = part parallel; and TN = turnaround area at runway ends. Runway lighting systems (Edge Lights) are designated HIRL = high intensity runway lights. MIRL medium intensity; or LIRL, low intensity. Column heading REIL denotes Runway End Indicator Lights; VASI denotes Visual Approach Slope Indicator; column entries refer to presence of the equipment (Y denotes "yes"; N, "no"). Instrument approach facilities are: PR, Precision; NP, Non-Precision; or VIS, visual.

SOURCE: MDOT, BTP.



**Airport Use** - Sandusky City Airport has substantial general aviation activity. A total of 14 single engine, general aviation aircraft are based at the airport.

Estimated aircraft operations for 1987 are given in Exhibit 3.

**Exhibit 3**

**AIRCRAFT OPERATIONS  
SANDUSKY CITY AIRPORT**

<u>TYPE OPERATION</u>	<u>1987</u>
Itinerant:	
General Aviation	2,550
Local:	
General Aviation	<u>2,550</u>
<b>Total</b>	<b>5,100</b>

**SOURCE:** MDOT, BTP.

Aircraft operations at the airport are estimated to have declined slightly in recent years, as shown in Exhibit 4. The airport manager estimates that roughly 80 percent of operations involve recreational flying and 20 percent, business.

**Exhibit 4**

**OPERATIONS TREND  
SANDUSKY CITY AIRPORT**

<u>OPERATIONS</u>	<u>1985</u>	<u>1986</u> <sup>1</sup>	<u>1987</u> <sup>1</sup>
Itinerant	1,900	1,400	2,550
Local	<u>3,590</u>	<u>4,300</u>	<u>2,550</u>
<b>Totals</b>	<b>5,490</b>	<b>5,700</b>	<b>5,100</b>

(1) No survey count was conducted at this airport for the indicated year. Estimated is based on factor derived from representative airports.

**SOURCE:** MDOT, BTP.

**Airport Economic Roles**

Sandusky City Airport is a recreation-oriented airport. The following comprise the airport's principal economic impact types.

**Retention of Private Business** - Sandusky City Airport is considered valuable to the competitive position of a number of local firms and plants, some of which might choose to locate elsewhere if the facility were not present. These organizations use the and general aviation services made possible by the airport's existence. However, the facility was not found to be directly responsible for any significant economic development in the service area.

**Business-Oriented General Aviation** - An estimated 20 percent of general aviation use at the airport is "business-oriented."

No corporate aircraft are based at Sandusky City Airport. However some local firms report that the general aviation services at the airport support their operations by speeding selected critical inbound materials from suppliers and outbound shipments to customers. Midwest Rubber Division of Sudbury Corp. and Yale Rubber Company are among local firms reporting support of this type from the Airport.

**Airport Economic Impact**

The Sandusky City Airport aviation-related economic impact of \$105,000 annually comprises the impact types listed in Exhibit 5.

**Exhibit 5**

**ANNUAL AVIATION-RELATED  
ECONOMIC IMPACT OF  
SANDUSKY CITY AIRPORT**

<u>IMPACT TYPE</u>	<u>AMOUNT</u>
Direct	\$ 50,000
Indirect	30,600
Induced	<u>24,400</u>
<b>Total</b>	<b>\$105,000</b>

**SOURCE:** Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

The total impacts, by type, are summarized in Exhibit 6. This study assesses only the aviation-related impacts.

**Direct Economic Impact** - The "direct" impacts comprise the value of those activities involved in providing aviation services at the airport. Exhibit 7 lists the airport tenants and others included in the impact estimates. The makeup of the direct impact is given in Exhibit 8.

**Exhibit 8**

**ESTIMATED "DIRECT" ANNUAL IMPACTS  
SANDUSKY CITY AIRPORT**

<u>DIRECT IMPACT</u>	<u>AMOUNT</u>
Direct Payroll	\$ 44,400
Operating Expenses	3,400
Refueling Service	<u>2,200</u>
<b>Total</b>	<b>\$ 50,000</b>

**SOURCE:** Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

"Direct" payroll comprises payments to those people who work at the airport, are employed by the FBO or Airport owner. "Capital expenditures" include improvements to on-site facilities of tenants as well as to the airport itself. "Operating expenses" are local expenditures by the tenants or airport operator.

**Indirect Economic Impacts** - Sandusky City Airport "indirect" impacts are caused by airport use in the form of expenditures by air travelers.

It is estimated that some 1,300 visitors to the Sandusky area arrived via Sandusky City Airport by general aviation in 1987). Based on approximate proportions of those staying overnight (more than one day) it is estimated that the average visitor

spends approximately \$25.40 per trip at off-airport locations in the Sandusky area. Local residents using the airport also spend money -- some \$700 per year locally.

The aviation-related indirect economic impacts attributable to Sandusky City Airport total \$30,600, as shown in Exhibit 9. The visitor expenditures breakdown by expenditure type is based on a mix of tourist, business and personal travel derived from the results of surveys made at other airports. Since no Michigan surveys were available, these were adjusted to reflect a range of values judged to be appropriate for local conditions. All visitor expenditures are at the actual cost outlay except retail sales which, since it is a margin industry, is shown at 20 percent of the actual expenditures. Expenditures by airport-dependent firms consist of those costs attributable to airport-related activity.

**Exhibit 9**

**INDIRECT IMPACTS OF  
SANDUSKY CITY AIRPORT**

<u>REGIONAL EXPENDITURES BY SOURCE</u>	<u>ANNUAL IMPACT</u>
Visitor Expenditures:	
Lodging	\$ 10,100
Food & Beverage	8,500
Retail Sales	800
Entertainment	2,600
Ground Transport	2,300
Business	1,800
Other	<u>3,800</u>
Subtotal	\$ 29,900
Resident Expenditures	<u>700</u>
<b>Total</b>	<b>\$ 30,600</b>

**SOURCE:** Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

## Exhibit 6

**ESTIMATED ANNUAL ECONOMIC IMPACTS**  
Sandusky City Airport  
1987

<u>IMPACT TYPE AND SOURCE</u>	<u>AVIATION</u>	<u>NON-AVIATION</u>	<u>TOTAL(1)</u>
	<u>RELATED</u>	<u>RELATED (1)</u>	
	-----thousands-----		
<b>Direct Impacts:</b>			
Local Governments	23.8	0.0	23.8
Aviation Services	<u>26.2</u>	<u>0.0</u>	<u>26.2</u>
Subtotal	\$ 50.0	\$ 0.0	\$ 50.0
<b>Indirect Impacts:</b>			
Visitor Expenditures	\$ 29.9	\$ 0.0	\$ 29.9
Regional Expenditure	<u>0.7</u>	<u>0.0</u>	<u>0.7</u>
Subtotal	\$ 30.6	\$ 0.0	\$ 30.6
<b>Induced Impacts:</b>	24.4		
<b>Total Annual Impacts</b>	<u>\$105.0</u>		

(1) Only aviation-related impacts are considered in this study.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

## Exhibit 7

**ORGANIZATIONS AND FIRMS CREATING ECONOMIC IMPACTS**  
Sandusky City Airport  
1988

<u>ORGANIZATION</u>	<u>ATTRIBUTION OF ACTIVITY</u>			<u>ECONOMIC ACTIVITY</u>
	<u>Aviation-Related</u>			
	<u>On-Site</u> (1)	<u>Off-Site</u> (2)	<u>Non-Aviation</u> (3)	
<b>Local Government:</b>				
City of Sandusky	X			Airport Operations
<b>Aviation Services:</b>				
Sanilac Aircraft Maint.	X			Fixed-Base Operator

(1) Economic activity on airport property, by an airport tenant, treated as "direct" economic impact.

(2) Economic activity not taking place on airport property, but which is directly aviation-related to this airport. Treated as an "indirect" economic impact.

(3) Activity which is not related to or dependent on aviation activities. Not included in the impact estimates.

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

**Induced Economic Impact** - "Direct" economic impacts of about \$50,000, and "indirect" impacts of \$30,600, represent increases in final demand for goods and services in the Sandusky region. To these must be added a "multiplier" effect produced by circulation of the money through the regional economy. To determine this "induced" impact, the U.S. Department of Commerce "Regional Input-Output Modeling System" (RIMS-II) was used. It was found that the induced impact produced by Sandusky City Airport in 1987 was approximately \$24,400.

#### Industries Which Benefit

The economic activities at Sandusky City Airport produce expenditures for a wide variety of

goods and services. Many types of industry benefit, whether or not they are themselves airport users. Exhibit 10 lists impacted industry groups, and shows the extent to which each benefits from Sandusky City Airport in terms of total economic activity earnings and employment.

#### Airport Derived Employment

One element in an airport economic impact total is the employment which the airport creates. People are employed in airport-related activities at the airport. A summary of the jobs estimated to be attributable to Sandusky City Airport is given in Exhibit 11.

Exhibit 10  
ECONOMIC IMPACTS OF COWLEY FIELD AIRPORT  
1987

<u>IMPACTED INDUSTRY GROUPS</u>	<u>TOTAL ANNUAL IMPACT (Output)</u> (.....Thousands.....)	<u>TOTAL ANNUAL PAYROLL (Earnings)(1)</u>	<u>EMPLOYMENT (Jobs)</u>
Maint. and Repair Const.	1	0	0
Food, Kindred Prd.	2	0	0
Transportation	57	18	1
Communications	1	0	0
Utilities	4	0	0
Wholesale Trade	1	0	0
Retail Trade	4	1	0
Finance	1	0	0
Real Estate	3	0	0
Lodging, Amusements	13	4	0
Business Services	5	2	0
Eating, Drinking Estab.	11	4	0
Health Services	1	1	0
Other Services	1	0	0
Households	--	0	0
<b>TOTALS</b>	<b>\$105</b>	<b>\$30</b>	<b>1</b>

(1) The portion of the "output" column that is payroll to employed persons.

SOURCE: Rims II Multipliers, MDOT, BTP study consultant, Wilbur Smith Associates.

## Exhibit 11

JOBS ATTRIBUTABLE TO  
SANDUSKY CITY AIRPORT

<u>JOB SOURCE</u>	<u>Full Time</u>	<u>Part Time</u>	<u>Total FEQ</u>
Direct On-Site Jobs	0	2	1
Indirect Off-Site Jobs at Surveyed Firms	0	0	0
Induced and Other Indirect Jobs			<u>0</u>
	<b>Total Jobs</b>		<b>1</b>

NOTE: FEQ denotes "full-time equivalent" jobs, calculated as two part-time jobs equal one full-time job.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

The RIMS model treats jobs as full-time-equivalents (FEQ). Consequently, the split between full-time and part-time for induced employment is not shown. The Exhibit shows that there is one FEQ job at the airport, but no others located elsewhere in the greater east-central Michigan region that are attributable to the airport.

Non-Economic Values

Not all values a community derives from an airport are quantifiable in dollar terms. Sandusky City Airport, provides local residents with alternative linkages to Michigan and beyond.

In case of natural disasters (fire, flood or blizzard) it is a resource for supply and evacuation. A civil air patrol squadron is based at the airport and frequently participates in search and rescue operations in the area.

In recent years, general aviation has become a major training ground for rewarding careers in the airline and aeronautical fields. The presence of an airport gives residents the option of flight instruction and ground service training.

# VALUE OF SPARTA AIRPORT TO THE SPARTA AREA

## Economic Values

Sparta Airport is estimated to have an economic impact on its service area of approximately \$618,000 annually in total economic activity, of which \$185,000 is household earnings. This impact is due to the provision and use of general aviation services at the airport.

## Airport Characteristics

Owned by the village of Sparta, the airport is open to the public and has a "U-3" classification.

Airport Services - Sparta is a general aviation airport, offering a wide range of services for private flying. Services available are listed in Exhibit 1.

### Exhibit 1

#### SERVICES OFFERED AT SPARTA AIRPORT

Air Taxi	Avgas Fuel Sales
General Aviation	Aircraft Repair
Hangar Rental	Flight Instruction
Tie Down	Car Rental
Aircraft Rental	Vending
	Aircraft Sales

SOURCE: Surveys by MDOT, Bureau of Transportation Planning (BTP) study consultants, Wilbur Smith Associates.

All of these services have positive economic significance to the Sparta area. This is due to the creation of employment, generation of taxes and potential attraction and retention of businesses for the area.

Airport Facilities - The airport is equipped with a non-precision instrument approach system, though it has no tower or visual approach slope indicator (VASI). Other facilities listed in Exhibit 2 include a paved runway, with turnarounds for taxiing aircraft, low-intensity runway edge lights (but no runway end indicator lights), a segmented circle and an unlighted wind indicator. There are aircraft storage hangars and a Fixed-Base Operator who provides aviation support services.

### Exhibit 2

#### FACILITIES AT SPARTA AIRPORT

	RUNWAYS		DESCRIPTION					Instr.
	Lgth.	Surf.	Taxi Svs.	Edge Lts.	REIL	VASI	Appr.	
Primary	3,215	PV	TN	LIRL	N	N	NP	

NOTES: PV denotes paved surface; Taxi system definitions are: FP = full parallel; PP = part parallel; and TN = turnaround area at runway ends. Runway lighting systems (Edge Lights) are designated HIRL = high intensity runway lights. MIRL medium intensity; or LIRL, low intensity. Column heading REIL denotes Runway End Indicator Lights; VASI denotes Visual Approach Slope Indicator; column entries refer to presence of the equipment (Y denotes "yes"; N, "no"). Instrument approach facilities are: PR, Precision; NP, Non-Precision; or VIS, visual.

SOURCE: MDOT, BTP.

Airport Use - Aircraft based at Sparta are predominately single-engine planes and include no jets, as listed in Exhibit 3.

## Exhibit 3

NUMBERS OF BASED AIRCRAFT  
SPARTA AIRPORT

<u>AIRCRAFT TYPE</u>	<u>1988</u>
Single Engine	27
Multi-Engine	1
Ultralight	<u>1</u>
<b>Total Aircraft</b>	<b>29</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Sparta has no commercial or commuter air service, but does have significant general aviation activity, as indicated by the current operating statistics given in Exhibit 4.

## Exhibit 4

AIRCRAFT OPERATIONS  
SPARTA AIRPORT

<u>TYPE OPERATION</u>	<u>1987</u>
Itinerant:	
Air Taxi	755
General Aviation	<u>6,795</u>
Subtotal Itinerant	7,550
Local:	
General Aviation	<u>840</u>
<b>Total</b>	<b>8,390</b>

SOURCE: MDOT, BTP.

Available operations count data indicate that the proportion of local flights has decreased significantly since the period 1983-1986, from about 65 percent of total operations, to 10

percent. At the same time, itinerant operations have increased from an estimated 2,790 in 1983, to 7,550 in 1987. As shown in Exhibit 5, total operations in 1987 are estimated at 8,390, slightly higher than in 1983, after reaching 12,690 in 1986.

## Exhibit 5

OPERATIONS TREND  
SPARTA AIRPORT

<u>OPERATIONS</u>	<u>1983</u>	<u>1986</u>	<u>1987</u>
Itinerant	2,790	4,390	7,550
Local	<u>5,280</u>	<u>8,300</u>	<u>840</u>
<b>Totals</b>	<b>8,070</b>	<b>12,690</b>	<b>8,390</b>

SOURCE: MDOT, BTP.

Airport Economic Roles

Sparta is oriented towards private flying with some business use. As yet, there has been no significant nearby economic development that is directly attributable to the airport.

Business-Oriented General Aviation - Many organizations have aircraft at the airport, including those listed in Exhibit 6.

## Exhibit 6

A SAMPLE OF FIRMS  
WHICH BASE AIRCRAFT  
AT SPARTA AIRPORT

Classic Airplanes, Inc.	Lanco, Inc.
Country Air	Maghielse Tool & Die Co.
EN Pitsch Produce Inc.	Co.
Extrusions Division, Inc.	Norman, Navan, Moore & Baird, Inc.
Forrest Bag Inc.	

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

In addition to firms with general aviation aircraft based at the airport, there are others that use the airport to varying degrees. These include: Thunder Bay Manufacturing Company; Omni Metal; and Fletcher Paper Company.

Airport Economic Impact

The Sparta Airport aviation-related economic impact of \$618,000 annually comprises the impact types listed in Exhibit 7.

Exhibit 7

ANNUAL AVIATION-RELATED  
ECONOMIC IMPACT OF  
SPARTA AIRPORT

<u>IMPACT TYPE</u>	<u>AMOUNT</u>
Direct	\$ 150,800
Indirect	265,500
Induced	<u>201,700</u>
<b>Total</b>	<b>\$618,000</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

The total impacts, by type, are summarized in Exhibit 8. Since this study assesses only the aviation-related impacts, Exhibit 8 provides for identifying those which are not attributable to aviation. At Sparta Airport, all reported activity is aviation-related.

Direct Economic Impact - The "direct" impacts comprise the value of those activities involved in providing aviation services at the airport. Exhibit 9 lists the airport tenants included in the impact estimates. Exhibit 10 lists the makeup of direct impacts.

Exhibit 10

ESTIMATED "DIRECT" ANNUAL IMPACTS  
SPARTA AIRPORT

<u>DIRECT IMPACT</u>	<u>AMOUNT</u>
Direct Payroll	\$ 70,000
Operating Expenses	50,800
Refueling Service	<u>30,000</u>
<b>Total</b>	<b>\$ 150,800</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

"Direct" payroll comprises payments to those people who work at the airport and are employed by the FBO. "Operating expenses" are local expenditures by the FBO.

Indirect Economic Impacts - Sparta Airport "indirect" impacts are caused by airport use in the form of expenditures by air travelers and by those firms that depend on the airport for their business.

It is estimated that approximately 9,623 visitors to the Sparta area arrive via Sparta Airport annually (8,492 by individually owned or corporate aircraft, and 1,131 by air taxi in 1987). Based on approximate proportions of those staying overnight (more than one day) it is estimated that the average visitor spends approximately \$30.33 per trip at off-airport locations in the Sparta area. Local residents using the airport also spend money -- some \$1,000 per year locally.



Exhibit 8

ESTIMATED ANNUAL ECONOMIC IMPACTS  
Sparta Airport  
1987

IMPACT TYPE AND SOURCE	AVIATION	NON-AVIATION	TOTAL(1)
	RELATED	RELATED (1)	
	-----thousands-----		
Direct Impacts:			
Aviation Services	\$ 150.8	\$ 0	\$ 150.8
Indirect Impacts:			
Visitor Expenditures	\$ 264.5	\$ 0	\$ 264.5
Regional Expenditure	1.0	0	1.0
Subtotal	\$ 265.5	\$ 0	\$ 265.5
Induced Impacts:	201.7		
<b>Total Annual Impacts</b>	<b>\$618.0</b>		

(1) Only aviation-related impacts are considered in this study.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

Exhibit 9

ORGANIZATIONS AND FIRMS CREATING ECONOMIC IMPACTS  
Sparta Airport  
1988

ORGANIZATION	ATtribution OF ACTIVITY			ECONOMIC ACTIVITY
	Aviation-Related			
	On-Site(1)	Off-Site(2)	Non-Aviation(3)	
Aviation Services:				
Grand Rapids Aviation	X			Fixed Base Operator

- (1) Economic activity on airport property, by an airport tenant, treated as "direct" economic impact.
- (2) Economic activity not taking place on airport property, but which is directly aviation-related to this airport. Treated as an "indirect" economic impact.
- (3) Activity which is not related to or dependent on aviation activities. Not included in the impact estimates.

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

The aviation-related indirect economic impacts attributable to Sparta Airport total approximately \$265,500, as shown in Exhibit 11. The visitor expenditures breakdown by expenditure type is based on a mix of tourist, business and personal travel derived from the results of surveys made at other airports. Since no Michigan surveys were available, these were adjusted to reflect a range of values judged to be appropriate for local conditions. All visitor expenditures are at the actual cost outlay except retail sales which, since it is a margin industry, is shown at 20 percent of the actual expenditures. Expenditures by airport-dependent firms consist of those costs attributable to airport-related activity.

Exhibit 11

**INDIRECT IMPACTS OF  
SPARTA AIRPORT**

<u>REGIONAL EXPENDITURES BY SOURCE</u>	<u>ANNUAL IMPACT</u>
Visitor Expenditures:	
Lodging	\$ 89,300
Food & Beverage	75,290
Retail Sales	6,830
Entertainment	23,050
Ground Transport	20,130
Business	16,340
Other	<u>33,560</u>
Subtotal	\$ 264,500
Resident Expenditures	<u>1,000</u>
Total	\$ 265,500

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Induced Economic Impact - "Direct" economic impacts of about \$150,800, and "indirect" impacts of \$265,500, represent increases in final demand for goods and services in the

Sparta region. To these must be added a "multiplier" effect produced by circulation of the money through the regional economy. To determine this "induced" impact, the U.S. Department of Commerce "Regional Input-Output Modeling System" (RIMS-II) was used. It was found that the induced impact produced by Sparta Airport in 1987 was approximately \$201,700.

Industries Which Benefit

The economic activities at Sparta Airport produce expenditures for a wide variety of goods and services. Many types of industry benefit, whether or not they are themselves airport users. Exhibit 12 lists impacted industry groups, and shows the extent to which each benefits from Sparta Airport in terms of total economic activity earnings and employment.

Airport Derived Employment

One element in the Sparta Airport economic impact total is the employment which the airport creates. People are employed in airport-related activities at the airport by the FBO and at other off-airport sites (hotels, manufacturing concerns, etc.). Furthermore, the direct and indirect expenditures attributable to the airport continue to flow through the region's economy creating additional employment (the "multiplier" effect). A summary of the jobs estimated to be attributable to Sparta Airport is given in Exhibit 13.

The RIMS model treats jobs as full-time-equivalents (FEQ). Consequently, the split between full-time and part-time for induced employment is not shown. The Exhibit shows that there are ten FEQ jobs at the airport, and two others located elsewhere in the greater Sparta area that are attributable to the airport.

Exhibit 12  
ECONOMIC IMPACTS OF SPARTA AIRPORT  
1987

<u>IMPACTED INDUSTRY GROUPS</u>	<u>TOTAL ANNUAL IMPACT (Output)</u> (.....Thousands.....)	<u>TOTAL ANNUAL PAYROLL (Earnings)(1)</u> (.....Thousands.....)	<u>EMPLOYMENT (Jobs)</u>
Ag. Prod., Forestry Svcs.	\$8	\$1	0
Crude Petrol.	1	0	0
Maint. and Repair Const.	33	14	1
Food, Kindred Prd.	8	1	0
Printing, Publishing	3	0	0
Rubber, Leather Prod.	3	0	0
Fabricated Metals	1	0	0
Transportation	173	55	2
Communications	15	3	0
Utilities	16	1	0
Wholesale Trade	13	3	0
Retail Trade	31	14	1
Finance	6	0	0
Insurance	3	0	0
Real Estate	24	0	0
Lodging, Amusements	114	38	4
Personal Services	2	0	0
Business Services	53	21	1
Eating, Drinking Estab.	90	26	3
Health Services	12	5	0
Other Services	9	3	0
Households	--	0	0
<b>TOTALS</b>	<b>\$618</b>	<b>\$185</b>	<b>12</b>

(1) The portion of the "output" column that is payroll to employed persons.

SOURCE: Rims II Multipliers, MDOT, BTP study consultants, Wilbur Smith Associates.

## Exhibit 13

JOBS ATTRIBUTABLE TO  
SPARTA AIRPORT

<u>JOB SOURCE</u>	<u>Full Time</u>	<u>Part Time</u>	<u>Total FEQ</u>
Direct On-Site Jobs	10	0	10
Indirect Off-Site Jobs at Surveyed Firms	0	0	0
Induced and Other Indirect Jobs			<u>2</u>
	<b>Total Jobs</b>		<b>12</b>

NOTE: FEQ denotes "full-time equivalent" jobs, calculated as two part-time jobs equal one full-time job.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

Non-Economic Values

Not all values a community derives from an airport are quantifiable in dollar terms. Sparta Airport provides residents with alternative

linkages to Michigan and beyond. Airport authorities in Sparta suggest that the airports' location, on the north side of Grand Rapids' busy and expanding region, positions it well to serve as an alternative to busy Kent County International Airport, as a base for many local business flights.

Sparta Airport provides access to the latest medical diagnosis and treatment procedures. For example, blood and tissue samples can be sent to medical centers or specialist locations for analysis, medical supplies not available locally (such as serums, antitoxins or isotopes) can be shipped by air and patients moved by air for treatment procedures not available in Sparta.

Sparta Airport also supports the maintenance of essential community services and security. It is available as a refueling base to support police, Civil Air Patrol and National Guard Activities. In case of natural disasters (fire, flood or blizzard) it is a resource for supply and evacuation.

In recent years, general aviation has become a major training ground for rewarding careers in the airline and aeronautical fields. The presence of an airport gives residents the option of flight instruction and ground service training.

# VALUE OF KIRSCH MUNICIPAL AIRPORT TO THE STURGIS AREA

## Economic Values

Kirsch Municipal Airport is estimated to have an economic impact on its service area of approximately \$948,000 annually in total economic activity, of which \$272,000 is household earnings. This impact is due principally to the provision and use of general aviation services at the airport.

## Airport Characteristics

Owned and operated by the City of Sturgis, the airport is open to the public, has a "T-5" classification.

Airport Services - Kirsch Municipal is a general aviation airport, offering a wide range of services for private flying. Services available are listed in Exhibit 1.

### Exhibit 1

#### SERVICES OFFERED AT KIRSCH MUNICIPAL AIRPORT

General Aviation	Avgas Fuel Sales
Hangar Rental	Aircraft Repair
Tie Down	Flight Instruction
Aircraft Rental	Car Rental
Aircraft Sales	Restaurant
Jet Fuel Sales	Vending

SOURCE: Surveys by MDOT, Bureau of Transportation Planning (BTP) study consultants, Wilbur Smith Associates.

All of these services have positive economic significance to the Sturgis area. This is due to the creation of employment, generation of taxes and potential attraction and retention of businesses for the area.

Airport Facilities - The airport is equipped with a non-precision instrument approach system, although it has no tower or rotating beacon. Other facilities, listed in Exhibit 2, include two paved runways with edge and end lighting and visual approach slope indicators, a lighted wind indicator and segmented circle. There are aircraft storage hangars and a Fixed-Base Operator (FBO) who provides aviation support services.

### Exhibit 2

#### FACILITIES AT KIRSCH MUNICIPAL AIRPORT

	RUNWAYS		DESCRIPTION					Instr. Appr.
	Lgth.	Surf.	Taxi Sys.	Edge Lts.	REIL	VASI		
Primary	5,700	PV	N	MIRL	Y	Y	NP	
Crosswind	3,418	PV	N	MIRL	Y	Y	NP	

NOTES: PV denotes paved surface; Taxi system definitions are: FP = full parallel; PP = part parallel; and TN = turnaround area at runway ends. Runway lighting systems (Edge Lights) are designated HIRL = high intensity runway lights. MIRL medium intensity; or LIRL, low intensity. Column heading REIL denotes Runway End Indicator Lights; VASI denotes Visual Approach Slope Indicator; column entries refer to presence of the equipment (Y denotes "yes"; N, "no"). Instrument approach facilities are: PR, Precision; NP, Non-Precision; or VIS, visual.

SOURCE: MDOT, BTP.

Airport Use - Kirsch Municipal has no commercial or commuter air service, but does have significant general aviation activity. A total of 24 general aviation aircraft are based at the airport, as itemized in Exhibit 3. The fleet mix is predominantly single-engine, and includes no jets.

**Exhibit 3**

**NUMBERS OF BASED AIRCRAFT  
KIRSCH MUNICIPAL AIRPORT**

<u>AIRCRAFT TYPE</u>	<u>1988</u>
Single Engine	18
Multi-Engine	5
Ultralight	<u>1</u>
<b>Total Aircraft</b>	<b>24</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Estimated aircraft operations for 1987 are given in Exhibit 4.

**Exhibit 4**

**AIRCRAFT OPERATIONS  
KIRSCH MUNICIPAL AIRPORT**

<u>TYPE OPERATION</u>	<u>1987</u>
Itinerant:	
Air Taxi	300
General Aviation	<u>9,920</u>
Subtotal Itinerant	10,220
Local:	
General Aviation	<u>2,560</u>
<b>Total</b>	<b>12,780</b>

SOURCE: MDOT, BTP.

Available operations count data indicate that activity at Kirsch Municipal has resumed an overall level in the magnitude of 12,000 to 13,000 operations per year, after several years in the 7-8,000 range. As shown in Exhibit 5, the 1987 count indicates a significant increase in the proportion of itinerant traffic. Airport management suggests that the increase reflects recent growth in aviation oriented area business activity.

**Exhibit 5**

**OPERATIONS TREND  
KIRSCH MUNICIPAL AIRPORT**

<u>OPERATIONS</u>	<u>1982</u>	<u>1983<sup>1</sup></u>	<u>1986<sup>1</sup></u>	<u>1987</u>
Itinerant	2,400	2,600	2,740	10,220
Local	<u>4,550</u>	<u>4,920</u>	<u>5,200</u>	<u>2,560</u>
<b>Totals</b>	<b>6,950</b>	<b>7,520</b>	<b>7,940</b>	<b>12,780</b>

(1) No survey was conducted for the indicated years. Estimate is based on factor derived from representative airports.

SOURCE: MDOT, BTP.

Airport Economic Roles

Kirsch Municipal Airport is a private flying-oriented airport, with business use. To-date, there has been no significant nearby economic development that is directly attributable to the airport, although the city is encouraging plans for development of a light industry/office park near the airport.

Business-Oriented General Aviation - Several local businesses generate considerable airport traffic. Exhibit 6 lists firms which base planes at Kirsch Airport.

## Exhibit 6

**A SAMPLE OF FIRMS  
WHICH BASE AIRCRAFT  
AT KIRSCH MUNICIPAL AIRPORT**

Bartelt Aviation, Inc.  
Carter Associates, Inc.  
Midwest Aviation Leasing, Inc.  
Riley Aviation, Inc.  
Western Frontiers

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Riley Aviation flies regularly in connection with a related construction business and Bartelt Aviation generates air traffic in connection with its sales of used aircraft. Principals of Bartelt fly to other locations for inspections or sales, while potential customers also fly into Kirsch. Some stay overnight in Sturgis and/or take meals in town. The business also generates inspection and repair work for another airport tenant, Sturgis Airmotive. Although not basing aircraft at Kirsch, Ross Laboratories and the Kirsch Company division of Cooper Industries, both attract flying visits from customers and/or corporate management.

Airport Economic Impact

The Kirsch Municipal Airport aviation-related economic impact of \$948,000 annually comprises the impact types listed in Exhibit 7.

## Exhibit 7

**ANNUAL AVIATION-RELATED  
ECONOMIC IMPACT OF  
KIRSCH MUNICIPAL AIRPORT**

<u>IMPACT TYPE</u>	<u>AMOUNT</u>
Direct	\$ 342,600
Indirect	323,300
Induced	<u>282,100</u>
<b>Total</b>	<b>\$948,000</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

The total impacts, by type, are summarized in Exhibit 8. There are some impacts at the airport which are not necessarily attributable to aviation, e.g., the Prop Shop Restaurant estimates that only about 20 percent of its trade is aviation-related. This study assesses only the aviation-related impacts.

Direct Economic Impact - The "direct" impacts comprise the value of those activities involved in providing aviation services at the airport. Exhibit 9 lists the airport tenants and others included in the impact estimates. Direct impacts are summarized in Exhibit 10.

## Exhibit 10

**ESTIMATED "DIRECT" ANNUAL IMPACTS  
KIRSCH MUNICIPAL AIRPORT**

<u>DIRECT IMPACT</u>	<u>AMOUNT</u>
Direct Payroll	\$230,900
Capital Expenditures	1,000
Operating Expenses	85,700
Refueling Service	<u>25,000</u>
<b>Total</b>	<b>\$342,600</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

"Direct" payroll comprises payments to those people who work at the airport, are employed by the FBO, corporate users, restaurant, or other tenants. "Capital expenditures" include improvements to on-site facilities of tenants as well as to the airport itself. "Operating expenses" are local expenditures by the tenants or airport operator.

Indirect Economic Impacts - Kirsch Municipal Airport "indirect" impacts are caused by airport use in the form of expenditures by air travelers and by those firms that depend on the airport for their business.

It is estimated that over 10,000 visitors to the Sturgis area arrive via Kirsch Municipal Airport annually (9,920 by general aviation, and 450 by air taxi in 1987). Based on approximate

## Exhibit 8

**ESTIMATED ANNUAL ECONOMIC IMPACTS**  
**Kirsch Municipal Airport**  
**1987**

<u>IMPACT TYPE AND SOURCE</u>	<u>AVIATION RELATED</u>	<u>NON-AVIATION RELATED (1)</u>	<u>TOTAL(1)</u>
	(-----thousands-----)		
<b>Direct Impacts:</b>			
Local Governments	\$ 60.4	\$ 0.0	\$ 60.4
Air Passenger Services	13.2	28.8	42.0
Aviation Services	<u>269.0</u>	<u>0.0</u>	<u>269.0</u>
Subtotal	\$342.6	\$28.8	\$371.4
<b>Indirect Impacts:</b>			
Visitor Expenditures	\$322.8	\$ 0.0	\$322.8
Regional Expenditure	0.5	0.0	0.5
Dependent Firms	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Subtotal	\$323.3	\$ 0.0	\$323.3
<b>Induced Impacts:</b>	282.1		
<b>Total Annual Impacts</b>	<u>\$ 948.0</u>		

(1) Only aviation-related impacts are considered in this study.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.



Exhibit 9  
**ORGANIZATIONS AND FIRMS CREATING ECONOMIC IMPACTS**  
**Kirsch Municipal Airport**  
**1988**

<u>ORGANIZATION</u>	<u>ATTRIBUTION OF ACTIVITY</u>			<u>ECONOMIC ACTIVITY</u>
	<u>On-Site</u> <sup>(1)</sup>	<u>Off-Site</u> <sup>(2)</sup>	<u>Non-Aviation</u> <sup>(3)</sup>	
Local Government: City of Sturgis	X			Airport Owner
Air Passenger Services: Hertz	X			Car Rental
Prop Stop	X		X	Restaurant
Aviation Services: Riley Aviation	X			Fixed Base Operator
Sturgis Airmotive	X			Aircraft Maintenance
Bartelt Aviation	X			Aircraft Sales
Other: Ross Laboratories		X	X	Pharmaceutical Mfg.
Cooper Industries, Kirsch Division		X	X	Drapery Hardware Mfg.
Burr Oak Tool & Gage		X	X	Heat Exchange Equipt. Mfg.

- 
- (1) Economic activity on airport property, by an airport tenant, treated as "direct" economic impact.
  - (2) Economic activity not taking place on airport property, but which is directly aviation-related to this airport. Treated as an "indirect" economic impact.
  - (3) Activity which is not related to or dependent on aviation activities. Not included in the impact estimates.

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

proportions of those staying overnight (more than one day) it is estimated that the average visitor spends approximately \$34.34 per trip at off-airport locations in the Sturgis area. Local residents using the airport also spend money -- some \$500 per year locally.

The aviation-related indirect economic impacts attributable to Kirsch Municipal Airport total \$323,300, as shown in Exhibit 11. The visitor expenditures breakdown by expenditure type is based on a mix of tourist, business and personal travel derived from the results of surveys made at other airports. Since no Michigan surveys were available, these were adjusted to reflect a range of values judged to be appropriate for local conditions. All visitor expenditures are at the actual cost outlay except retail sales which, since it is a margin industry, is shown at 20 percent of the actual expenditures.

#### Exhibit 11

#### INDIRECT IMPACTS OF KIRSCH MUNICIPAL AIRPORT

<u>REGIONAL EXPENDITURES BY SOURCE</u>	<u>ANNUAL IMPACT</u>
Visitor Expenditures:	
Lodging	\$109,000
Food & Beverage	91,900
Retail Sales	8,300
Entertainment	28,100
Ground Transport	24,600
Business	19,900
Other	<u>41,000</u>
Subtotal	\$322,800
Resident Expenditures	<u>500</u>
Total	\$323,300

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Induced Economic Impact - "Direct" economic impacts of about \$342,600, and "indirect" impacts of \$323,300, represent increases in final demand for goods and services in the Sturgis region. To these must be added a "multiplier" effect produced by circulation of the money through the regional economy. To determine this "induced" impact, the U.S. Department of Commerce "Regional Input-Output Modeling System" (RIMS-II) was used. It was found that the induced impact produced by Kirsch Municipal Airport in 1987 was approximately \$282,100.

#### Industries Which Benefit

The economic activities at Kirsch Municipal Airport produce expenditures for a wide variety of goods and services. Many types of industry benefit, whether or not they are themselves airport users. Exhibit 12 lists impacted industry groups, and shows the extent to which each benefits from Kirsch Municipal Airport in terms of total economic activity earnings and employment.

#### Airport Derived Employment

An important element in the Kirsch Municipal Airport economic impact total is the employment which the airport creates. People are employed in airport-related activities at the airport (the FBO, the City, the tenants, etc.) and at other off-airport sites (hotels, manufacturing concerns, etc.). Furthermore, the direct and indirect expenditures attributable to the airport continue to flow through the region's economy creating additional employment (the "multiplier" effect). A summary of the jobs estimated to be attributable to Kirsch Municipal Airport is given in Exhibit 13.

The RIMS model treats jobs as full-time-equivalents (FEQ). Consequently, the split between full-time and part-time for induced employment is not shown. The Exhibit shows that there are 15 FEQ jobs at or near the airport and another one

Exhibit 12  
ANNUAL ECONOMIC IMPACTS OF KIRSCH MUNICIPAL AIRPORT  
1987

<u>IMPACTED INDUSTRY GROUPS</u>	<u>TOTAL ANNUAL IMPACT (Output)</u> (.....Thousands.....)	<u>TOTAL ANNUAL PAYROLL (Earnings)(1)</u>	<u>EMPLOYMENT (Jobs)</u>
Ag. Prod., Forestry Svcs.	\$9	\$2	0
Crude Petrol.	2	0	0
New Construction	1	0	0
Maint. and Repair Const.	37	15	1
Food, Kindred Prd.	10	1	0
Printing, Publishing	4	1	0
Chemicals, Refined Petrol.	1	0	0
Rubber, Leather Prod.	3	0	0
Fabricated Metals	2	0	0
Other Transportation Equip.	44	0	0
Transportation	351	109	4
Communications	18	3	0
Utilities	36	4	0
Wholesale Trade	15	5	0
Retail Trade	42	20	1
Finance	6	2	0
Insurance	4	1	0
Real Estate	34	0	0
Lodging, Amusements	140	46	5
Personal Services	4	2	0
Business Services	39	16	1
Eating, Drinking Estab.	116	33	4
Health Services	16	8	0
Other Services	14	4	0
Households	---	0	0
<b>Totals</b>	<b>\$948</b>	<b>\$272</b>	<b>16</b>

(1) The portion of the "output" column that is payroll to employed persons.

SOURCE:Rims II Multipliers, MDOT, BTP study consultants, Wilbur Smith Associates

## Exhibit 13

JOBS ATTRIBUTABLE TO  
KIRSCH MUNICIPAL AIRPORT

<u>JOB SOURCE</u>	<u>Full Time</u>	<u>Part Time</u>	<u>Total FEQ</u>
Direct On-Site Jobs	8	13	14
Indirect Off-Site Jobs at Surveyed Firms	0	1	1
Induced and Other Indirect Jobs			<u>1</u>
	<b>Total Jobs</b>		<b>16</b>

NOTE: FEQ denotes "full-time equivalent" jobs, calculated as two part-time jobs equal one full-time job.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

elsewhere in the greater southern Michigan area, which are attributable to activity at Kirsch Municipal Airport.

Non-Economic Values

Not all values a community derives from an airport are quantifiable in dollar terms. Kirsch Memorial provides Sturgis residents with alternative linkages to Michigan and beyond.

The airport provides access to the latest medical diagnosis and treatment procedures. For example, blood and tissue samples are sent to medical centers or specialist locations for analysis, medical supplies not available locally (such as serums, antitoxins, isotopes, and organs for transplant operations) are shipped by air; and patients are moved by air for treatment procedures not available in their community.

Kirsch Municipal Airport also supports the maintenance of essential community services and security. It is used as a refueling resource by police, Civil Air Patrol and National Guard. In case of natural disasters (fire, flood or blizzard) it is a resource for supply and evacuation.

In recent years, general aviation has become a major training ground for rewarding careers in the airline and aeronautical fields. The presence of an airport gives residents the option of flight instruction and ground service training. Sturgis Municipal Airport often supports and supplements local school career programs by hosting airport visits by community groups.

Kirsch Municipal Airport represents a resource for the Sturgis Community that goes beyond the economic impacts discussed above. For example, the airport is serving as a catalyst in an effort to develop a nearby office/light industrial park. It is anticipated that the effort will attract new firms to the Sturgis area, resulting in the creation of future economic growth -- new jobs, broadened tax base and additional buying power in the local market.

# VALUE OF CHERRY CAPITAL AIRPORT TO THE TRAVERSE CITY AREA

## Economic Values

Cherry Capital Airport is estimated to have an economic impact on its service area of approximately \$33 million annually in total economic activity, of which approximately \$11 million is household earnings. This impact is due principally to the provision and use of scheduled air carrier services, general aviation services, and the federal government operations at the airport.

## Airport Characteristics

Owned by the City of Traverse City and operated by the Northwest Regional Airport Commission, the airport is open to the public, has a "T-5" classification, and is the seventh largest airport in Michigan in terms of annual scheduled passenger usage.

Airport Services - Cherry Capital Airport is a full-service scheduled air carrier and general aviation airport, offering nearly everything desired of such airports, including those items listed in Exhibit 1.

### Exhibit 1

#### SERVICES OFFERED AT CHERRY CAPITAL AIRPORT

Scheduled Air Carrier	Avgas Fuel Sales
Commuter Air	Aircraft Repair
Air Taxi	Avionics
General Aviation	Flight Instruction
Hangar Rental	Car Rental
Tie Down	Restaurant
Aircraft Rental	Vending
Aircraft Sales	Control Tower
	Jet Fuel Sales

SOURCE: Surveys by MDOT, Bureau of Transportation Planning (BTP) study consultants, Wilbur Smith Associates.

All of these services have positive economic significance to the Traverse City area. This is

due to the creation of employment, generation of taxes and potential attraction and retention of businesses for the area.

Airport Facilities - The airport is an all-weather facility capable of handling virtually all general aviation aircraft types. It has two all-season runways, and a third for which snow clearance is not provided; a rotating beacon; segmented circle and wind direction indicator. The facility is towered, has a passenger terminal, hangar space and one Fixed-Base Operator (FBO) who provides aviation support services. Additional facilities are listed in Exhibit 2.

### Exhibit 2

#### FACILITIES AT CHERRY CAPITAL AIRPORT

RUNWAYS	DESCRIPTION						
	<u>Lgth.</u>	<u>Surf.</u>	<u>Taxi Sys.</u>	<u>Edge Lts.</u>	<u>REIL</u>	<u>VASI</u>	<u>Instr. Appr.</u>
Primary	6,500	PV	FP	HIRL	N	Y	PR
Crosswind	5,108	PV	PP	HIRL	Y	Y	NP
Crosswind	3,203	PV	PP	None	N	N	VIS

NOTES: PV denotes paved surface; Taxi system definitions are: FP = full parallel; PP = part parallel; and TN = turnaround area at runway ends. Runway lighting systems (Edge Lights) are designated HIRL = high intensity runway lights. MIRL medium intensity; or LIRL, low intensity. Column heading REIL denotes Runway End Indicator Lights; VASI denotes Visual Approach Slope Indicator; column entries refer to presence of the equipment (Y denotes "yes"; N, "no"). Instrument approach facilities are: PR, Precision; NP, Non-Precision; or VIS, visual.

SOURCE: MDOT, BTP.

**Airport Use** - Cherry Capital Airport currently is served by four scheduled air carriers (American Eagle, Midway Connection, Northwest Airlink, and Trans North Aviation) and has substantial activity by general aviation, air taxis and other flights. A total of 86 aircraft of all types are based at the airport, of which, 79 are general aviation types, as itemized in Exhibit 3.

## Exhibit 3

**NUMBERS OF BASED AIRCRAFT  
CHERRY CAPITAL AIRPORT**

<u>AIRCRAFT TYPE</u>	<u>1987</u>
General Aviation	
Single Engine	69
Multi-Engine	10
Other	<u>0</u>
Subtotal	79
Other	
Helicopters	2
Gliders	1
Military	<u>4</u>
Total Aircraft	86

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Estimated aircraft operations for 1987 are given in Exhibit 4. Military operations are normally USCG patrol operations and training for military aircraft based elsewhere. The distribution of operations between air carrier and air taxi was adjusted from the reported figure because in 1987, the FAA changed their definition of an air carrier operation from 30 seats to 60 seats. To do this, the consultant used scheduled carrier operations.

## Exhibit 4

**AIRCRAFT OPERATIONS  
CHERRY CAPITAL AIRPORT**

<u>TYPE OPERATION</u>	<u>1987</u>
Itinerant:	
Air Carrier	5,518
Air Taxi	8,765
General Aviation	41,955
Military	<u>2,294</u>
Subtotal Itinerant	58,532
Local:	
General Aviation	57,768
Military	<u>6,258</u>
Subtotal Local	64,026
<b>Total</b>	<b>122,558</b>

SOURCE: MDOT, BTP, and study consultant, Wilbur Smith Associates.

Aircraft operations at the airport have generally increased in recent years, as indicated in Exhibit 5, and are comprised of nearly equal proportions of itinerant and local flights, reflecting the use of the airport for both transportation and training/recreational activity.

## Exhibit 5

**OPERATIONS TREND  
CHERRY CAPITAL AIRPORT**

<u>OPERATIONS</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>
Itinerant	48,909	53,812	58,532
Local	<u>39,799</u>	<u>46,263</u>	<u>64,026</u>
<b>Totals</b>	<b>88,708</b>	<b>100,075</b>	<b>122,558</b>

SOURCE: MDOT, BTP.

Air passenger use increased significantly between 1985 and 1986, as shown in Exhibit 6, but fell back much of the way, in 1987. The fluctuation was in response to the level of services provided by the air carriers. Currently, an average of about 415 people use the air carrier services daily. Scheduled flights average 15 per day, Monday through Friday. Recent surveys of area business travel, conducted by the Chamber of Commerce, found that: many passengers prefer to use Detroit or Grand Rapids Airports, rather than Cherry Capital, for reasons of service and fares; nearly 40 percent of business visitors reported arriving via ground transportation, when they would have preferred to use air, had appropriate service been available; some 86 percent of respondents reported that their business travel was not seasonal.

Exhibit 6

**AIR CARRIER PASSENGERS  
CHERRY CAPITAL AIRPORT**

<u>PASSENGERS</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>
Deplaned	75,748	81,037	75,794
Enplaned	<u>74,540</u>	<u>83,710</u>	<u>75,721</u>
Totals	149,998	164,747	151,515

SOURCE: MDOT, BTP.

Air cargo has become even more important to Cherry Capital Airport in recent years, as shown in Exhibit 7.

Exhibit 7

**AIR CARGO HANDLED AT  
CHERRY CAPITAL AIRPORT**

<u>CARGO MOVEMENT</u>	<u>CARGO TONS</u>		
	<u>1985</u>	<u>1986</u>	<u>1987</u>
Deplaned	184.3	91.9	358.9
Enplaned	<u>57.4</u>	<u>24.5</u>	<u>205.6</u>
Totals	241.7	116.4	564.5

SOURCE: MDOT, BTP.

Airport Economic Roles

Cherry Capital Airport accomodates substantial business-oriented aviation activity, with the following comprising the airport's principal economic impact types.

Retention of Private Business - There has been significant economic development nearby that contributes significantly to flight activity at the airport. The following firms have located in the adjacent Traverse City Airport Industrial Park. Some have direct access for corporate planes while others are frequent users of airport aviation services.

Exhibit 8

**TENANT FIRMS AT  
AIRPORT INDUSTRIAL PARK  
CHERRY CAPITAL AIRPORT**

Alcotec	Northwestern MI
Benson Optical Laboratory	College Avia. Ctr.
Borgen Brunswig	Olmstead Eng. Co.
Boride	Peninsula Construct.
Century Sun	Quality Circle Corp.
Helfrecht	Tool Technology
Jacklin Steel Supply Co.	Traverse City Grey
Morrison Industrial Equip.	Iron
Nish-Nah-Bee	Village Press
Industries, Inc.	

Also, the airport serves quite a large number of private firms located throughout the service area. Air passenger, air cargo and general aviation services are viewed by local firms and plants as contributing importantly to their efficiency and competitiveness. "Just-in-Time" cargo delivery to the area's plants is seen as an important service made possible by the airport's existence.

Business-Oriented General Aviation - An estimated 50-60 percent of general aviation use at the airport is "business-oriented," and many of the region's businesses have aircraft at the airport including those listed in Exhibit 9.

## Exhibit 9

**A SAMPLE OF FIRMS  
WHICH BASE AIRCRAFT  
AT CHERRY CAPITAL AIRPORT**

Delta-Duke Corp.	Morrison Orchards
Great Lakes Optical	Northwest MI College
H&H Star Energy	Reffit, Inc.
	Whitaker & Sons, Inc.

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

In addition to firms with general aviation aircraft based at the airport, there are many others that depend on the airport, for various services, such as scheduled passenger service, air taxi/charter service, air freight etc. These are important for sales, management and production activities at such firms as: Alcotec; Borgen Brunswig, Boride; Nish-Nah-Bee Industries; Olmstead Engineering; Amoco Oil; Shell Oil; Federated Oil Exploration and Wickes Mechanical Components, as well as major area banks, such as Old Kent; Empire National and NBD Northwest. Area resorts and institutions, such as Interlochen Music Academy, also depend heavily on the aviation services for clients, customers and patrons of special events.

Airport Economic Impact

The Cherry Capital Airport aviation-related economic impact of over \$33 million annually comprises the impact types listed in Exhibit 10.

## Exhibit 10

**ANNUAL AVIATION-RELATED  
ECONOMIC IMPACT OF  
CHERRY CAPITAL AIRPORT**

<u>IMPACT TYPE</u>	<u>AMOUNT</u>
Direct	\$ 8,722,500
Indirect	13,488,000
Induced	<u>11,128,500</u>
<b>Total</b>	<b>\$33,339,000</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

The total impacts, by type, are summarized in Exhibit 11. There are some impacts at the airport which are not necessarily attributable to aviation, e.g., tenant activities that serve more than just the airport, etc. This study assesses only the aviation-related impacts.

Direct Economic Impact - The "direct" impacts comprise the value of those activities involved in providing aviation services at the airport. Exhibit 12 lists the airport tenants and others included in the impact estimates. Direct impacts are listed in Exhibit 13.

## Exhibit 13

**ESTIMATED "DIRECT" ANNUAL IMPACTS  
CHERRY CAPITAL AIRPORT**

<u>DIRECT IMPACT</u>	<u>AMOUNT</u>
Direct Payroll	\$6,493,400
Operating Expenses	1,808,100
Refueling Service	<u>421,000</u>
<b>Total</b>	<b>\$8,722,500</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

"Direct" payroll comprises payments to those people who work at the airport, are employed by the airlines, FBOs, restaurant, or other tenants. "Capital expenditures" include improvements to on-site facilities of tenants as well as to the airport itself. "Operating expenses" are local expenditures by the tenants or airport operator.

Indirect Economic Impacts - Cherry Capital Airport "indirect" impacts are caused by airport use in the form of expenditures by air travelers and by those firms that depend on the airport for their business.

It is estimated that over 86,000 visitors to the Traverse City area arrive via Cherry Capital Airport annually (37,860 by scheduled air carrier, 41,955 by personal or corporate aircraft, and 6,574 by air taxi in 1987). Based on approximate proportions of those staying overnight (more than one day) it is estimated that the average visitor spends approximately \$156 per trip at off-airport



## Exhibit 11

**ESTIMATED ANNUAL ECONOMIC IMPACTS**  
**Cherry Capital Airport**  
**1987**

<u>IMPACT TYPE AND SOURCE</u>	<u>AVIATION RELATED</u>	<u>NON-AVIATION RELATED (1)</u>	<u>TOTAL(1)</u>
	(-----thousands-----)		
<b>Direct Impacts:</b>			
Air Carrier Operations	\$ 411.6	\$ 0	\$ 411.6
Federal Government	4,634.6	0	4,634.6
Local Governments	609.7	0	609.7
Air Passenger Services	740.3	0	740.3
Aviation Services	<u>2,326.3</u>	<u>0</u>	<u>2,326.3</u>
Subtotal	\$ 8,722.5	\$ 0	\$ 8,722.5
<b>Indirect Impacts:</b>			
Visitor Expenditures	\$ 12,236.7	\$ 0	\$ 12,236.7
Regional Expenditure	20.7	0	20.7
Dependent Firms	<u>1,230.6</u>	<u>317.0</u>	<u>1,547.6</u>
Subtotal	\$ 13,488.0	\$ 317.0	\$ 13,805.0
Induced Impacts:	11,128.5		
<b>Total Annual Impacts</b>	<b><u>\$33,339.0</u></b>		

(1) Only aviation-related impacts are considered in this study.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

locations in the Traverse City area. Local residents using the airport also spend money -- some \$20,700 per year locally (in addition to moneys spent at the airport). Furthermore, there are 14 travel agencies in the region. Surveys indicate that, taken together, about 90 percent of their economic activity (e.g. ticket sales) is related to aviation. Of this, about 45 percent is related to Cherry Capital Airport.

The aviation-related indirect economic impacts attributable to Cherry Capital Airport total approx

imately \$13.5 million, as shown in Exhibit 13. The visitor expenditures breakdown by expenditure type is based on a mix of tourist, business and personal travel derived from the results of surveys made at other airports. Since no Michigan surveys were available, these were adjusted to reflect a range of values judged to be appropriate for local conditions. All visitor expenditures are at the actual cost outlay except retail sales which, since it is a margin industry, is shown at 20 percent of the actual expenditures. Expenditures by airport-dependent firms consist of those costs attributable to airport-related activity.

Exhibit 12  
**ORGANIZATIONS AND FIRMS CREATING ECONOMIC IMPACTS**  
 Cherry Capital Airport  
 1988

<u>ORGANIZATION</u>	<u>ATtribution OF ACTIVITY</u>			<u>ECONOMIC ACTIVITY</u>
	Aviation- Related			
	<u>On- Site</u> <sup>(1)</sup>	<u>Off- Site</u> <sup>(2)</sup>	<u>Non- Aviation</u> <sup>(3)</sup>	
<b>Air Carrier Operations:</b>				
American Eagle	X			Airline
Midway Connection	X			Airline
Northwest Link	X			Airline
Trans North Aviation	X			Airline
Michigan Airways	X			Airline
<b>Federal Government:</b>				
Federal Aviation Administration				
Air Traffic Control	X			Control Tower
Airways Facilities Services	X			Facility Maintenance Unit
USCG	X			Search and Rescue Unit
<b>Local Government:</b>				
NW Reg'l. Airpt. Comm.	X			Airport Operations
<b>Air Passenger Services:</b>				
Hertz	X			Car Rental
National	X			Car Rental
Budget	X			Car Rental
Suncatcher	X		X	Restaurant
Grand Traverse Limo Svc.	X			Ground Transportation
Cherry Capital Cab Co.	X			Ground Transportation
No. 1 Cab Co.	X			Ground Transportation
Airport Gift Shop	X			Retail Sales
<b>Aviation Services:</b>				
Cherry Capital Avn.	X			Fixed-Base Operator (FBO)
Harbour Air Svcs.	X			FBO, Air Charter Service
Cherry Cap. Flt. Svcs.	X			Instruction/Charter
Double Tee Aviation	X			FBO, Maintenance
Winchester Avn.	X			FBO
<b>Other:</b>				
NW Michigan College		X		Aviation Career Preparation
Federal Express, UPS		X	X	Express Package Services
Travel Agencies		X	X	Travel Arrangements

- (1) Economic activity on airport property, by an airport tenant, treated as "direct" economic impact.
- (2) Economic activity not taking place on airport property, but which is directly aviation-related to this airport. Treated as an "indirect" economic impact.
- (3) Activity which is not related to or dependent on aviation activities. Not included in the impact estimates.

**Induced Economic Impact** - "Direct" economic impacts of about \$8.7 million, and "indirect" impacts of \$13.5 million, represent increases in final demand for goods and services in the Traverse City region. To these must be added a "multiplier" effect produced by circulation of the money through the regional economy. To determine this "induced" impact, the U.S. Department of Commerce "Regional Input-Output Modeling System" (RIMS-II) was used. It was found that the induced impact produced by Cherry Capital Airport in 1987 was approximately \$11,128,500.

**Industries Which Benefit**

The economic activities at Cherry Capital Airport produce expenditures for a wide variety of goods and services. Many types of industry benefit, whether or not they are themselves airport users. Exhibit 15 lists impacted industry groups, and shows the extent to which each benefits from

Cherry Capital Airport in terms of total economic activity earnings and employment.

**Airport Derived Employment**

An important element in the Cherry Capital Airport economic impact total is the employment which the airport creates. People are employed in airport-related activities at the airport (the FBO, the airlines, the federal government, the Airport Commission etc.) and at other off-airport sites (hotels, manufacturing concerns, etc.). Furthermore, the direct and indirect expenditures attributable to the airport continue to flow through the region's economy creating additional employment (the "multiplier" effect). A summary of the jobs estimated to be attributable to Cherry Capital Airport is given in Exhibit 16.

Exhibit 14

**INDIRECT IMPACTS OF  
CHERRY CAPITAL AIRPORT**

<u>REGIONAL EXPENDITURES BY SOURCE</u>	<u>ANNUAL IMPACT</u>
Visitor Expenditures:	
Lodging	\$ 4,131,000
Food & Beverage	3,483,100
Retail Sales	315,900
Entertainment	1,066,500
Ground Transport	931,500
Business	756,000
Other	<u>1,552,600</u>
Subtotal	\$12,236,700
Resident Expenditures	20,700
Dependent Firm Expenditures	<u>1,230,600</u>
Total	\$13,488,000

**SOURCE:** Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Exhibit 16

**JOBS ATTRIBUTABLE TO  
CHERRY CAPITAL AIRPORT**

<u>JOB SOURCE</u>	<u>Full Time</u>	<u>Part Time</u>	<u>Total FEQ</u>
Direct On-Site Jobs	260	50	285
Indirect Off-Site Jobs at Surveyed Firms	46	40	66
Induced and Other Indirect Jobs			<u>316</u>
		<b>Total Jobs</b>	<b>667</b>

**NOTE:** FEQ denotes "full-time equivalent" jobs, calculated as two part-time jobs equal one full-time job.

**SOURCE:** MDOT, BTP study consultants, Wilbur Smith Associates.

Exhibit 15  
**ECONOMIC IMPACT OF CHERRY CAPITAL AIRPORT  
 BY IMPACTED INDUSTRY TYPE  
 1987**

<u>IMPACTED INDUSTRY GROUPS</u>	<u>TOTAL ANNUAL IMPACT (Output)</u> (.....Thousands.....)	<u>TOTAL ANNUAL PAYROLL (Earnings)(1)</u> (.....Thousands.....)	<u>EMPLOYMENT (Jobs)</u>
Ag. Prod., Forestry Svcs.	\$397	\$75	9
Forestry Products	19	7	1
Crude Petrol.	99	9	0
Maint. and Repair Const.	629	274	10
Food, Kindred Prd.	472	65	2
Apparel	21	5	0
Paper, Allied Products	2	0	0
Printing, Publishing	212	69	3
Chemicals, Refined Petrol.	45	6	0
Rubber, Leather Prod.	122	26	1
Lumber, Furniture Prod.	18	3	0
Stone, Clay, Glass Prod.	28	8	0
Primary Metals	15	3	0
Fabricated Metals	96	25	1
Non-electrical Machinery	32	9	0
Electrical Machinery	7	1	0
Motor Vehicles, Equipment	65	14	0
Other Transportation Equip.	1	0	0
Instruments	1	0	0
Miscellaneous Mfg.	27	4	0
Transportation	11,872	3,977	145
Communications	729	180	5
Utilities	1,203	118	3
Wholesale Trade	574	211	7
Retail Trade	1,559	725	54
Finance	338	101	4
Insurance	192	56	2
Real Estate	1,247	21	6
Lodging, Amusements	5,334	1,776	172
Personal Services	153	61	6
Business Services	2,397	957	44
Eating, Drinking Estab.	4,319	1,265	158
Health Services	607	331	15
Other Services	507	186	11
Households	--	35	8
<b>TOTALS</b>	<b>\$33,339</b>	<b>\$10,603</b>	<b>667</b>

(1) The portion of the "output" column that is payroll to employed persons.

SOURCE: Rims II Multipliers, MDOT, BTP study consultant, Wilbur Smith Associates.

The RIMS model treats jobs as full-time-equivalents (FEQ). Consequently, the split between full-time and part-time for induced employment is not shown. The Exhibit shows that there are 351 FEQ jobs at and near the airport, (including the USCG) and another 316 located elsewhere in the region that are attributable to the airport.

#### Non-Economic Values

Not all values a community derives from an airport are quantifiable in dollar terms. Cherry Capital Airport provides the citizens in the Traverse City area with essential linkages to Michigan and beyond.

It provides access to the latest medical diagnosis and treatment procedures. For example, blood and tissue samples are sent to downstate medical centers and specialist locations for analysis; medical supplies not available locally (such as serums, antitoxins, isotopes, and organs for transplant operations) are shipped by air; and patients are moved by air for treatment procedures not available in their community. Munson Hospital's "Life Flight" helicopter, while based at the hospital, is maintained at Cherry Capital

Airport. The airport also supports medical flights by fixed-wing aircraft.

Cherry Capital Airport also supports the maintenance of essential community services and security. It is used as a refueling base to help locate and combat forest fires or chemical spills; to patrol pipelines and power lines, to support police, Civil Air Patrol and National Guard Activities. In case of natural disasters (fire, flood or blizzard) it is a resource for supply and evacuation.

The USCG aviation unit based at Cherry Capital Airport, has patrol responsibilities which cover the entire Great Lakes area. Its missions include search and rescue, surveillance of marine and environmental pollution, and fisheries protection.

In recent years, general aviation has become a major training ground for rewarding careers in the airline and aeronautical fields. The presence of an airport gives residents the option of flight instruction and ground service training. Northwestern Michigan College offers a career pilot training program which maintains facilities at the airport industrial park and uses the airport for flight training.

# VALUE OF BERZ-MACOMB AIRPORT TO THE UTICA AREA

## Economic Values

Berz-Macomb Airport is estimated to have an economic impact on its service area of approximately \$2.8 million annually in total economic activity, of which \$920,000 is household earnings. This impact is due principally to the provision and use of general aviation service operations at the airport.

## Airport Characteristics

Privately owned and operated, the airport is open to the public and has a "U-3" classification.

Airport Services - Berz-Macomb Airport is a general aviation airport, offering a wide range of services as shown in Exhibit 1.

### Exhibit 1

#### SERVICES OFFERED AT BERZ-MACOMB AIRPORT

Air Taxi	Avgas Fuel Sales
General Aviation	Aircraft Repair
Hangar Rental	Flight Instruction
Tie Down	Car Rental
Aircraft Rental	Vending
Aircraft Sales	Control Tower
Jet Fuel Sales	

SOURCE: Surveys by MDOT, Bureau of Transportation Planning (BTP) study consultants, Wilbur Smith Associates.

All of these services have positive economic significance to the Utica area. This is due to the creation of employment, generation of taxes and potential attraction and retention of businesses for the area.

Airport Facilities - The airport is an all-weather facility capable of handling up to turbojet aircraft. It has a single runway, is not towered and has a rotating beacon, segmented circle and lighted wind indicator. There is one Fixed-Base Operator (FBO) who provides aviation support services. Airport facilities are listed in Exhibit 2, below.

### Exhibit 2

#### FACILITIES AT BERZ-MACOMB AIRPORT

	RUNWAYS		DESCRIPTION				Instr.
	Lgth.	Surf.	Taxi Sys.	Edge Lts.	REIL	VASI	
Primary	4,220	PV	FP	MIRL	Y	N	NP

NOTES: PV denotes paved surface; Taxi system definitions are: FP = full parallel; PP = part parallel; and TN = turnaround area at runway ends. Runway lighting systems (Edge Lights) are designated HIRL = high intensity runway lights. MIRL medium intensity; or LIRL, low intensity. Column heading REIL denotes Runway End Indicator Lights; VASI denotes Visual Approach Slope Indicator; column entries refer to presence of the equipment (Y denotes "yes"; N, "no"). Instrument approach facilities are: PR, Precision; NP, Non-Precision; or VIS, visual.

SOURCE: MDOT, BTP.

Airport Use - Berz-Macomb Airport has substantial general aviation activity. A total of 85 general aviation aircraft are based at the airport, as itemized in Exhibit 3.

**Exhibit 3**

**NUMBERS OF BASED AIRCRAFT  
BERZ-MACOMB AIRPORT**

<u>AIRCRAFT TYPE</u>	<u>1988</u>
Single Engine	65
Multi-Engine	<u>20</u>
<b>Total Aircraft</b>	<b>85</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Estimated aircraft operations and 1987 are given in Exhibit 4.

**Exhibit 4**

**AIRCRAFT OPERATIONS  
BERZ-MACOMB AIRPORT**

<u>TYPE OPERATION</u>	<u>1987</u>
Itinerant:	
General Aviation	<u>13,820</u>
Local:	
General Aviation	<u>20,730</u>
<b>Total</b>	<b>34,550</b>

SOURCE: MDOT, BTP.

Aircraft operations at the airport have fluctuated over recent years, primarily due to swings in the local economy. Local flying made up the majority

of operations in 1987, indicating the importance of instructional/recreational activity. Itinerant operations, however, reflected considerable business-oriented flight activity. Operations statistics for both 1986 and 1987, given in Exhibit 5, indicate the potential for a continuation of this relationship.

**Exhibit 5**

**OPERATIONS TREND  
BERZ-MACOMB AIRPORT**

<u>OPERATIONS</u>	<u>1986</u>	<u>1987</u>
Itinerant	18,970	13,820
Local	<u>35,880</u>	<u>20,730</u>
<b>Totals</b>	<b>54,850</b>	<b>34,550</b>

SOURCE: MDOT, BTP.

Airport Economic Roles

Berz-Macomb Airport is a recreation and business-oriented airport, with the following comprising the airport's principal economic impact types.

Retention of Private Business - Berz-Macomb Airport is considered valuable to the competitive position of a number of local firms and plants, some of which might choose to locate elsewhere if the facility were not present. These organizations use the air taxi and general aviation services made possible by the airport's existence. However, the facility was not found to be directly responsible for any significant economic development in the service area. Airport management considers the service area to be the region within a 15-mile radius. The impacts of community value extend well beyond this.

**Business-Oriented General Aviation** - An estimated 35-40 percent of general aviation use at the airport is "business-oriented," and many of the region's businesses have aircraft at the airport including those listed in Exhibit 6.

**Exhibit 6**

**A SAMPLE OF FIRMS  
WHICH BASE AIRCRAFT  
AT BERZ-MACOMB AIRPORT**

Acme Precision Prods.	Prange Enterprises
Safari Aviation	Peter Zigarac, Inc.
Star Gasket & Rubber Co.	Hunn Co.
Nova Tool & Die	Michigan Seat Co.
Deed Realty	Great Lakes Contr.

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

In addition to firms with general aviation aircraft based at the airport, there are many others that depend on the airport, for various services, such as air taxi/charter service, air freight etc. These are important for sales, management and production activities. Firms in this category include Ford Motor Co.; Chrysler Corp.; and General Motors.

**Airport Economic Impact**

The Berz-Macomb Airport aviation-related economic impact of \$2.8 million annually comprises the impact types listed in Exhibit 7. The total impacts, by type, are summarized in Exhibit 8. This study assesses only the aviation-related impacts.

**Exhibit 8**

**ESTIMATED ANNUAL ECONOMIC IMPACTS  
Berz-Macomb Airport  
1987**

<u>IMPACT TYPE AND SOURCE</u>	<u>AVIATION RELATED</u>	<u>NON-AVIATION RELATED (1)</u>	<u>TOTAL(1)</u>
	(-----thousands-----)		
<b>Direct Impacts:</b>			
Air Passenger Services	7	0	7
Aviation Services	<u>1,003</u>	<u>0</u>	<u>1,003</u>
Subtotal	\$1,010	\$ 0	\$1,010
<b>Indirect Impacts:</b>			
Visitor Expenditures	\$ 579	\$ 0	\$ 579
Regional Expenditure	10	0	10
Corporate Air Operations	<u>80</u>	<u>0</u>	<u>80</u>
Subtotal	\$ 669	\$ 0	\$ 669
<b>Induced Impacts:</b>	1,163		
<b>Total Annual Impacts</b>	<u>\$2,842</u>		

(1) Only aviation-related impacts are considered in this study.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.



## Exhibit 7

ANNUAL AVIATION-RELATED ECONOMIC  
IMPACT OF BERZ-MACOMB AIRPORT

<u>IMPACT TYPE</u>	<u>AMOUNT</u>
Direct	\$1,010,000
Indirect	669,000
Induced	<u>1,163,000</u>
<b>Total</b>	<b>\$2,842,000</b>

SOURCE: Surveys by MDOT, BTP study consultants,  
Wilbur Smith Associates.

Direct Economic Impact - The "direct" impacts comprise the value of those activities involved in providing aviation services at the airport. Exhibit 9 lists the airport tenants and others included in the impact estimates. Direct impacts are given in Exhibit 10.

"Direct" payroll comprises payments to those people who work at the airport, are employed by the FBO, corporate users, or other tenants. "Capital expenditures" include improvements to on-site facilities of tenants as well as to the airport itself. "Operating expenses" are local expenditures by the tenants or airport operator.

## Exhibit 9

ORGANIZATIONS AND FIRMS CREATING ECONOMIC IMPACTS  
Berz-Macomb Airport  
1988

<u>ORGANIZATION</u>	<u>ATTRIBUTION OF ACTIVITY</u>			<u>ECONOMIC ACTIVITY</u>
	<u>On- Site</u> <sup>(1)</sup>	<u>Off- Site</u> <sup>(2)</sup>	<u>Non- Aviation</u> <sup>(3)</sup>	
Air Passenger Services:				
Tri-Action Auto	X			Car Rental
Aviation Services:				
Berz Flying Service	X			Fixed-Base Operator
Bond Air	X			Air Charter Service
Zeke's Flying Service	X			Air Charter Service
Al-Bob Flyers, Inc.	X			Air Charter Service
DEC Air	X			Air Charter Service
Garlam Aviation, Inc.	X			Air Charter Service
Tartan Air, Inc.	X			Air Charter Service
Morgan Aviation, Inc.	X			Air Charter Service
APP Flight, Inc.	X			Air Charter Service
Phoenix Air Ltd.	X			Air Charter Service
WCB Flying Club, Inc.	X			Flying Club
K&E Flying Club	X			Flying Club
Other:				
Corporate Air Operations		X	X	Hangar Leases, Company Aircraft Activity

- (1) Economic activity on airport property, by an airport tenant, treated as "direct" economic impact.
- (2) Economic activity not taking place on airport property, but which is directly aviation-related to this airport. Treated as an "indirect" economic impact.
- (3) Activity which is not related to or dependent on aviation activities. Not included in the impact estimates.

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Exhibit 10

ESTIMATED "DIRECT" ANNUAL IMPACTS  
BERZ-MACOMB AIRPORT

<u>DIRECT IMPACT</u>	<u>AMOUNT</u>
Direct Payroll	\$ 572,000
Capital Expenditures	20,000
Operating Expenses	331,000
Refueling Service	<u>87,000</u>
Total	\$ 1,010,000

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Indirect Economic Impacts - Berz-Macomb Airport "indirect" impacts are caused by airport use in the form of expenditures by air travelers and by those firms that depend on the airport for their business.

It is estimated that over 14,000 visitors to the Utica and Metro Detroit area arrive via Berz-Macomb Airport annually (13,400 by personal or corporate aircraft, and 1,500 by air taxi in 1987). Based on approximate proportions of those staying overnight (more than one day) it is estimated that the average visitor spends approximately \$44.05 per trip at off-airport locations in the Utica area. Local residents using the airport also spend money -- some \$10,000 per year locally.

The aviation-related indirect economic impacts attributable to Berz-Macomb Airport total \$669,000, as shown in Exhibit 11. The visitor expenditures breakdown by expenditure type is based on a mix of tourist, business and personal travel derived from the results of surveys made at other airports. Since no Michigan surveys were available, these were adjusted to reflect a range of values judged to be appropriate for local conditions. All visitor expenditures are at the actual cost outlay except retail sales which, since it is a margin industry, is shown at 20 percent of the actual expenditures. Expenditures by airport-dependent firms consist of those costs attributable to airport-related activity.

Induced Economic Impact - "Direct" economic impacts of about \$1,010,000, and "indirect" impacts of \$669,000, represent increases in final demand for goods and services in the Utica region. To these must be added a "multiplier" effect produced by circulation of the money through the regional economy. To determine this "induced" impact, the U.S. Department of Commerce "Regional Input-Output Modeling System" (RIMS-II) was used. It was found that the induced impact produced by Berz-Macomb Airport in 1987 was approximately \$1,163,000.

Industries Which Benefit

The economic activities at Berz-Macomb Airport produce expenditures for a wide variety of goods and services. Many types of industry benefit, whether or not they are themselves airport users. Exhibit 12 lists impacted industry groups, and shows the extent to which each benefits from Berz-Macomb Airport in terms of total economic activity earnings and employment.

Exhibit 11

INDIRECT IMPACTS OF  
BERZ-MACOMB AIRPORT

<u>REGIONAL EXPENDITURES BY SOURCE</u>	<u>ANNUAL IMPACT</u>
Visitor Expenditures:	
Lodging	\$195,000
Food & Beverage	165,000
Retail Sales	15,000
Entertainment	50,000
Ground Transport	44,000
Business	36,000
Other	<u>74,000</u>
Subtotal	\$579,000
Resident Expenditures	10,000
Corporate Air Operations	<u>80,000</u>
Total	\$669,000

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

Exhibit 12  
ECONOMIC IMPACTS OF BERZ-MACOMB AIRPORT  
1987

<u>IMPACTED INDUSTRY GROUPS</u>	<u>TOTAL ANNUAL IMPACT (Output)</u> (.....Thousands.....)	<u>TOTAL ANNUAL PAYROLL (Earnings)(1)</u> (.....Thousands.....)	<u>EMPLOYMENT (Jobs)</u>
Ag. Prod., Forestry Svcs.	\$4	\$0	0
New Construction	20	6	0
Maint. and Repair Const.	41	20	1
Food, Kindred Prd.	69	9	0
Apparel	1	0	0
Paper, Allied Products	5	1	0
Printing, Publishing	22	6	0
Chemicals, Refined Petrol.	38	1	0
Rubber, Leather Prod.	14	3	0
Lumber, Furniture Prod.	2	0	0
Stone, Clay, Glass Prod.	7	1	0
Primary Metals	12	1	0
Fabricated Metals	18	3	0
Non-electrical Machinery	7	1	0
Electrical Machinery	6	0	0
Motor Vehicles, Equipment	39	6	0
Other Transportation Equip.	5	2	0
Miscellaneous Mfg.	4	0	0
Transportation	1,044	358	13
Communications	50	13	0
Utilities	88	9	0
Wholesale Trade	79	30	1
Retail Trade	109	54	4
Finance	27	9	0
Insurance	38	12	0
Real Estate	131	3	1
Lodging, Amusements	257	90	9
Personal Services	22	9	1
Business Services	352	151	7
Eating, Drinking Estab.	225	70	9
Health Services	52	29	1
Other Services	54	20	1
Households	--	3	1
<b>TOTALS</b>	<b>\$2,842</b>	<b>\$920</b>	<b>49</b>

(1) The portion of the "output" column that is payroll to employed persons.

SOURCE: Rims II Multipliers, MDOT, BTP study consultant, Wilbur Smith Associates.

**Airport Derived Employment**

An important element in the Berz-Macomb Airport economic impact total is the employment which the airport creates. People are employed in airport-related activities at the airport and at other off-airport sites (hotels, manufacturing concerns, etc.). Furthermore, the direct and indirect expenditures attributable to the airport continue to flow through the region's economy creating additional employment (the "multiplier" effect). A summary of the jobs estimated to be attributable to Berz-Macomb Airport is given in Exhibit 13.

**Exhibit 13**

**JOBS ATTRIBUTABLE TO  
BERZ-MACOMB AIRPORT**

<u>JOB SOURCE</u>	<u>Full Time</u>	<u>Part Time</u>	<u>Total FEQ</u>
Direct On-Site Jobs	29	4	31
Indirect Off-Site Jobs at Surveyed Firms	0	0	0
Induced and Other Indirect Jobs			<u>18</u>
		<b>Total Jobs</b>	<b>49</b>

NOTE: FEQ denotes "full-time equivalent" jobs, calculated as two part-time jobs equal one full-time job.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

The RIMS model treats jobs as full-time-equivalents (FEQ). Consequently, the split between full-time and part-time for induced employment is

not shown. The Exhibit shows that there are 31 FEQ jobs at the airport, and another 18 located elsewhere in the greater southeast Michigan region that are attributable to the airport.

**Non-Economic Values**

Not all values a community derives from an airport are quantifiable in dollar terms. Berz-Macomb Airport provides area residents with alternative linkages Michigan and beyond and also provides access to the latest medical diagnosis and treatment procedures.

Berz-Macomb Airport also supports the maintenance of essential community services and security. It serves as a base for pipeline patrols and to support police, Civil Air Patrol and National Guard Activities. In case of natural disasters (fire, flood or blizzard) it is a resource for supply and evacuation. Recently, Berz-Macomb participated in environmental survey work conducted by the Department of National Resources relative to the interaction of shipping with fishing in the Lake St. Clair - Lake Huron water system.

In recent years, general aviation has become a major training ground for rewarding careers in the airline and aeronautical fields. The presence of an airport gives residents the option of flight instruction and ground service training. Flight training, some of which is career oriented, is a main activity at Berz-Macomb Airport. The airport also hosts several visits per year by school and scouting groups. These serve as introductory career information experiences.

Berz-Macomb Airport is a Federal Aviation Administration designated reliever for Detroit-Metro Airport.

# VALUE OF WAYLAND MUNICIPAL AIRPORT TO THE WAYLAND AREA

## Economic Values

Wayland Municipal Airport is estimated to have an economic impact on its service area of approximately \$40,000 annually in total economic activity, of which \$12,000 is household earnings. This impact is due principally to the provision and use of general aviation services.

## Airport Characteristics

Owned and operated by the City of Wayland, the airport is open to the public and has a "U-2" classification.

Airport Services - Wayland Municipal Airport is a small general aviation airport, offering minimal services limited to hangar and tie down rentals, as indicated in Exhibit 1.

### Exhibit 1

#### SERVICES OFFERED AT WAYLAND MUNICIPAL AIRPORT

General Aviation	Hangar Rental
	Tie Down

SOURCE: Surveys by MDOT, Bureau of Transportation Planning (BTP) study consultants, Wilbur Smith Associates.

Although limited in scope, these services have positive economic significance to the Wayland area. This is due to the creation of employment, generation of taxes and potential attraction and retention of business for the area.

Airport Facilities - The airport is a small utility facility. Lacking snow removal equipment, it is closed during the winter. Both turf runways may become soft when wet. Since there are no

instrument approach aids, operations are limited to visual flight rule conditions. As shown in Exhibit 2, there are unlighted runway markings. Also, there is a segmented circle and an unlighted wind indicator, but no rotating beacon. Fuel is not available.

### Exhibit 2

#### FACILITIES AT WAYLAND MUNICIPAL AIRPORT

	<u>RUNWAYS</u>		<u>DESCRIPTION</u>				
	<u>Lgth.</u>	<u>Surf.</u>	<u>Taxi Sys.</u>	<u>Edge Lts.</u>	<u>REIL</u>	<u>VASI</u>	<u>Instr. Appr.</u>
Primary	2,200	TF	N	ULMK	N	N	VIS
Crosswind	1,875	TF	N	ULMK	N	N	VIS

NOTES: PV denotes paved surface; Taxi system definitions are: FP = full parallel; PP = part parallel; and TN = turnaround area at runway ends. Runway lighting systems (Edge Lights) are designated HIRL = high intensity runway lights. MIRL medium intensity; or LIRL, low intensity. ULMK denotes unlighted markers. Column heading REIL denotes Runway End Indicator Lights; VASI denotes Visual Approach Slope Indicator; column entries refer to presence of the equipment (Y denotes "yes"; N, "no"). Instrument approach facilities are: PR, Precision; NP, Non-Precision; or VIS, visual.

SOURCE: MDOT, BTP.

Airport Use - Wayland Municipal Airport has modest, seasonal general aviation activity, much of it by local pilots and flying clubs. A total of seven single-engine general aviation aircraft are based at the airport.

Estimated aircraft operations for 1986 and 1987 are given in Exhibit 3.

## Exhibit 3

**AIRCRAFT OPERATIONS  
WAYLAND MUNICIPAL AIRPORT**

<u>TYPE OPERATION</u>	<u>1986<sup>1</sup></u>	<u>1987<sup>1</sup></u>
Itinerant:		
Air Taxi	46	54
General Aviation	<u>874</u>	<u>1,026</u>
Subtotal Itinerant	920	1,080
Local:		
General Aviation	<u>1,730</u>	<u>1,080</u>
<b>Total</b>	<b>2,650</b>	<b>2,160</b>

(1) No survey was conducted at this airport for the indicated years. Estimate is based on factor derived from representative airports.

SOURCE:MDOT, BTP.

Aircraft operations at the airport have generally declined in recent years as shown in Exhibit 4. The substantial proportion of local traffic reflects the sports/recreational nature of the airports use.

**Airport Economic Role and Impact**

Wayland Municipal Airport is a recreation-oriented airport. There has been no nearby economic development which is directly attributable to the airport. The aviation-related economic impact of \$40,000 annually comprises the impact types shown in Exhibit 5.

## Exhibit 4

**OPERATIONS TREND  
WAYLAND MUNICIPAL AIRPORT**

<u>OPERATIONS</u>	<u>1983</u>	<u>1986<sup>1</sup></u>	<u>1987<sup>1</sup></u>
Itinerant	710	920	1,080
Local	<u>1,330</u>	<u>1,730</u>	<u>1,080</u>
<b>Totals</b>	<b>2,040</b>	<b>2,650</b>	<b>2,160</b>

(1) Estimated by factor method.

SOURCE: MDOT, BTP.

## Exhibit 5

**ANNUAL AVIATION-RELATED  
ECONOMIC IMPACT OF  
WAYLAND MUNICIPAL AIRPORT**

<u>IMPACT TYPE</u>	<u>AMOUNT</u>
Direct	\$ 800
Indirect	33,290
Induced	<u>5,910</u>
<b>Total</b>	<b>\$ 40,000</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

The total impacts, by type, are summarized in Exhibit 6. This study assesses only aviation-related impacts.

**Direct Economic Impact** - The "direct" impacts comprise the value of those activities involved in maintaining the airport property. As shown in Exhibit 7, direct economic impacts created by Wayland Municipal Airport are limited to

## Exhibit 6

**ESTIMATED ANNUAL ECONOMIC IMPACTS**  
**Wayland Municipal Airport**  
**1987**

<u>IMPACT TYPE AND SOURCE</u>	<u>AVIATION RELATED</u>	<u>NON-AVIATION RELATED (1)</u>	<u>TOTAL(1)</u>
<b>Direct Impacts:</b>			
Local Government	800	0	800
<b>Indirect Impacts:</b>			
Visitor Expenditures	\$ 33,170	\$ 0	\$ 33,170
Regional Expenditures	<u>120</u>	<u>0</u>	<u>120</u>
Subtotal	\$ 33,290	\$ 0	\$ 33,290
<b>Induced Impacts:</b>			
	5,910		
<b>Total Annual Impacts</b>	<u>\$40,000</u>		

(1) Only aviation-related impacts are considered in this study.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

## Exhibit 7

**ORGANIZATIONS AND FIRMS CREATING ECONOMIC IMPACTS**  
**Wayland Municipal Airport**  
**1988**

<u>ORGANIZATION</u>	<u>ATTRIBUTION OF ACTIVITY</u>			<u>ECONOMIC ACTIVITY</u>
	<u>Aviation- Related</u>			
	<u>On- Site(1)</u>	<u>Off- Site(2)</u>	<u>Non- Aviation(3)</u>	
Local Government:				
City of Wayland	X			Airport Maintenance

(1) Economic activity on airport property, by an airport tenant, treated as "direct" economic impact.

(2) Economic activity not taking place on airport property, but which is directly aviation-related to this airport. Treated as an "indirect" economic impact.

(3) Activity which is not related to or dependent on aviation activities. Not included in the impact estimates.

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

expenditures on airport maintenance by the City of Wayland, which are funded from hangar rental revenues. The estimated breakdown of the direct impacts is shown in Exhibit 8.

**Exhibit 8**

**ESTIMATED "DIRECT" ANNUAL IMPACTS  
WAYLAND MUNICIPAL AIRPORT**

<u>DIRECT IMPACT</u>	<u>AMOUNT</u>
Direct Payroll	\$ 700
Operating Expenses	<u>100</u>
<b>Total</b>	<b>\$ 800</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.

"Direct" payroll comprises payments to those people who work at the airport. "Operating expenses" are local expenditures by the airport owner (City of Wayland).

Indirect Economic Impacts - Wayland Municipal Airport "indirect" impacts are caused by airport use in the form of expenditures by air travelers.

It is estimated that about 1,060 visitors to the Wayland area arrive via Wayland Municipal Airport annually (1,026 by private aircraft, and 36 by air taxi in 1987). Based on approximate proportions of those staying overnight (more than one day) it is estimated that the average visitor spends approximately \$34.46 per trip at off-airport locations in the Wayland area. Local residents using the airport also spend money -- some \$120 per year locally.

The aviation-related indirect economic impacts attributable to Wayland Municipal Airport total \$33,290, as shown in Exhibit 9. The visitor expenditures breakdown by expenditure type is based on a mix of tourist, business and personal travel derived from the results of surveys made at other airports. Since no Michigan surveys were available, these were adjusted to reflect a range of values judged to be appropriate for local conditions. All visitor expenditures are at the actual cost outlay except retail sales which, since it is a margin industry, is shown at 20% of the actual expenditures. Expenditures by airport-dependent firms consist of those costs attributable to airport-related activity.

**Exhibit 9**

**INDIRECT IMPACTS OF  
WAYLAND MUNICIPAL AIRPORT**

<u>REGIONAL EXPENDITURES BY SOURCE</u>	<u>ANNUAL IMPACT</u>
Visitor Expenditures:	
Lodging	\$11,200
Food & Beverage	9,440
Retail Sales	860
Entertainment	2,890
Ground Transport	2,520
Business	2,050
Other	<u>4,210</u>
Subtotal	\$33,170
Resident Expenditures	120
Dependent Firm Expenditures	<u>0</u>
<b>Total</b>	<b>\$33,290</b>

SOURCE: Surveys by MDOT, BTP study consultants, Wilbur Smith Associates.



**Induced Economic Impact** - "Direct" economic impacts of about \$800, and "indirect" impacts of \$33,290, represent increases in final demand for goods and services in the Wayland region. To these must be added a "multiplier" effect produced by circulation of the money through the regional economy. To determine this "induced" impact, the U.S. Department of Commerce "Regional Input-Output Modeling System" (RIMS-II) was used. It was found that the induced impact produced by Wayland Municipal Airport in 1987 was approximately \$5,910.

**Industries Which Benefit**

The economic activities at Wayland Municipal Airport produce expenditures for a wide variety of goods and services. Many types of industry benefit, whether or not they are themselves airport

users. Exhibit 10 lists impacted industry groups, and shows the extent to which each benefits from Wayland Municipal Airport in terms of total economic activity, earnings and employment.

**Airport Derived Employment**

An important element in the Wayland Municipal Airport economic impact total is the employment which the airport creates. People are employed in airport-related activities at the airport by the City and at other off-airport sites (hotels, manufacturing concerns, etc.). Furthermore, the direct and indirect expenditures attributable to the airport continue to flow through the region's economy creating additional employment (the "multiplier" effect). A summary of the jobs estimated to be attributable to Wayland Municipal Airport is given in Exhibit 11.

**Exhibit 10  
ECONOMIC IMPACTS OF WAYLAND MUNICIPAL AIRPORT  
(1987)**

<b><u>IMPACTED INDUSTRY GROUPS</u></b>	<b><u>TOTAL ANNUAL IMPACT (Output) (.....Thousands.....)</u></b>	<b><u>TOTAL ANNUAL PAYROLL (Earnings)(1) (.....)</u></b>	<b><u>EMPLOYMENT (Jobs)</u></b>
Food, Kindred Prd.	1	0	0
Transportation	8	3	1
Utilities	1	0	0
Retail Trade	2	0	0
Real Estate	2	0	0
Lodging, Amusements	14	5	0
Business Services	2	1	0
Eating, Drinking Estab.	<u>10</u>	<u>3</u>	<u>0</u>
<b>TOTALS</b>	<b>\$40</b>	<b>\$12</b>	<b>1</b>

(1) The portion of the "output" column that is payroll to employed persons.

SOURCE: Rims II Multipliers, MDOT, BTP study consultant, Wilbur Smith Associates.

Exhibit 11

**JOBS ATTRIBUTABLE TO  
WAYLAND MUNICIPAL AIRPORT**

<u>JOB SOURCE</u>	<u>Full Time</u>	<u>Part Time</u>	<u>Total FEQ</u>
Direct On-Site Jobs		2	1 <sup>1</sup>
Indirect Off-Site Jobs at Surveyed Firms			0
Induced and Other Indirect Jobs			<u>0</u>
		<b>Total Jobs</b>	<u>1</u>

(1) Value actually represents a fractional FEQ.

NOTE: FEQ denotes "full-time equivalent" jobs, calculated as two part-time jobs equal one full-time job.

SOURCE: MDOT, BTP study consultants, Wilbur Smith Associates.

The RIMS model treats jobs as full-time-equivalents (FEQ). Consequently, the split between full-time and part-time for induced employment is not shown. The Exhibit shows that there is less than one FEQ job at the airport, and no others located elsewhere in the greater Southern Michigan region that are attributable to the airport.

Non-Economic Values

Not all values a community derives from an airport are quantifiable in dollar terms. Wayland Municipal Airport provides residents with alternative linkages to Michigan and beyond. The airport provides access to the latest medical diagnosis and treatment procedures. For example, patients can be moved by air for treatment procedures not available locally.