

2010 ECONOMIC SIGNIFICANCE OF THE

Aviation Industry in Wisconsin





La Crosse Municipal Airport

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The Wisconsin State Airport System is a gateway to the world that responsibly and effectively meets the business, passenger, freight and recreational air transportation needs, while enhancing the economic vitality of Wisconsin communities.

Overview

THE WISCONSIN DEPARTMENT OF TRANSPORTATION'S Bureau of Aeronautics supports a network of eight commercial service airports and 90 diverse general aviation public-use airports in the state. These airports provide a global gateway to Wisconsin's communities for personal travel, business, tourism, emergency responders, agricultural spraying, and flight training. In addition, U.S. military aviation contributes a significant economic impact in the state through the employment of civilian and military personnel.

In 2010, the economic impact of these Wisconsin aviation facilities supported \$6.9 billion in output (sales), nearly 91,000 jobs, and provided \$3.5 billion in personal income to the state. The aviation industry plays a vital role in both Wisconsin's economy and quality of life.

Wisconsin Department of Transportation's (WisDOT) Bureau of Aeronautics periodically researches the economic impact of the aviation industry in Wisconsin. In addition to providing information on the significance of this industry to the economy, the results of the study assist policymakers in evaluating airport operations and improvements.

This report summarizes the findings of the 2010 Wisconsin Aviation Economic Impact Study.

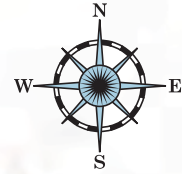
Total Aviation Impact

Output
\$6.9 billion

Jobs
90,900

Personal income
\$3.5 billion



Wisconsin State Airport System



Airport Type

-  Commercial Service
-  Large General Aviation
-  Medium General Aviation
-  Small General Aviation

Major Roads

-  Interstates
-  Highways



Source: WisDOT, ESRI, WisDNR

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In 2010, Wisconsin airports served 6.46 million air travelers.



Shell Lake Municipal Airport

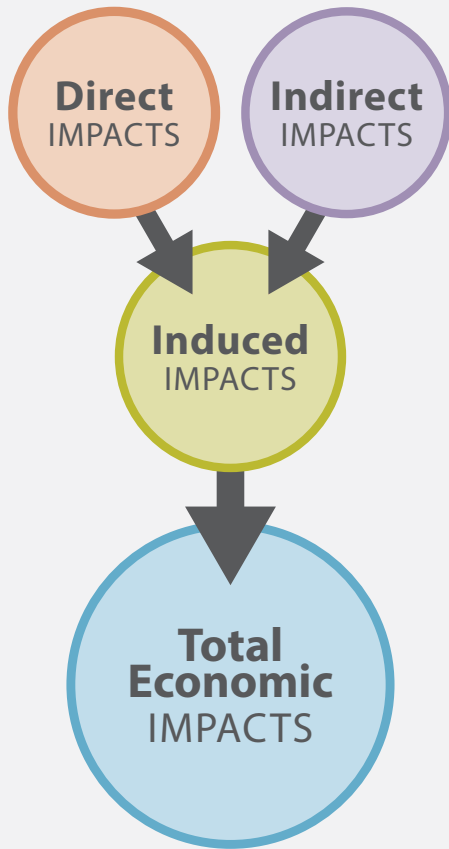
Profile: Wisconsin aviation network

THE WISCONSIN STATE AIRPORT SYSTEM is a network of 98 public-use airports. This system, which includes eight commercial service airports and 90 general aviation airports, links Wisconsin residents and businesses to the rest of the nation and the world. These airports are eligible for federal and/or state airport improvement funds, and are the focus of this economic impact study. In addition to this airport system, Wisconsin currently has 423 privately-owned airports, 149 heliports and 29 seaplane bases that serve important aviation needs; however, they are outside the scope of this aviation impact study.

Wisconsin's 90 general aviation airports provide facilities for corporate travel, pilot training and pleasure flyers, and are the centers for aviation-related businesses and industries. In 2010, there were more than 3,000 general aviation aircraft based at these airports. The state's eight commercial service airports provided bases for more than 600 additional general aviation aircraft and experienced more than 200,000 general aviation operations.

Wisconsin residents have access to regularly scheduled commercial airline service at these eight airports:

- ✈ Austin Straubel International (Green Bay)
- ✈ Central Wisconsin (Mosinee)
- ✈ Chippewa Valley Regional (Eau Claire)
- ✈ Dane County Regional (Madison)
- ✈ General Mitchell International (Milwaukee)
- ✈ Outagamie County (Appleton)
- ✈ La Crosse Municipal (La Crosse)
- ✈ Rhinelander-Oneida County (Rhinelander)



Spending ripples through the state economy, providing business directly or indirectly for nearly every Wisconsin industry.

The study approach

THE STUDY'S ANALYTICAL APPROACH FOLLOWED guidelines suggested by the Federal Aviation Administration (FAA) to facilitate comparability between similar studies in other states. Data for the analysis of the economic impacts of aviation was taken from a variety of sources. First, survey questionnaires were mailed to airport managers, commercial airport operations personnel, airport tenants, fixed base operators (FBOs), and military flight unit commanders in Wisconsin. Then, the information collected from the survey was supplemented by Wisconsin-specific data from the U.S. Bureau of Labor Statistics, the U.S. Bureau of Economic Analysis and the U.S. Bureau of the Census. Other publicly-available information came from Wisconsin state agencies. Finally, the study incorporated data purchased from private data vendors.

The first step in measuring the economic impact of aviation in Wisconsin was to identify the spending on payroll, operating expenditures, capital expenditures (business investments or facility improvements) and traveling expenses of the key groups that contribute to the economy through aviation-related activity.

Because it is impossible to identify every expenditure in a state economy as complex as Wisconsin's, the study focused on these major groups:

- ▶ Commercial airport tenants (airlines, concessions such as gift shops and restaurants and auto rentals, freight operators, etc.)
- ▶ General aviation airports
- ▶ FBOs and other tenants at general aviation airports
- ▶ Military flight groups (Air National Guard, U.S. Army National Guard, U.S. Air Force) and employees of the FAA and Transportation Security Administration
- ▶ Air travelers



Rusk County Airport

Spending by these groups ripples through the state economy, providing business directly or indirectly for nearly every Wisconsin industry.

Three categories of economic effects were described to assess the economic benefits associated with both aviation activity itself and with spending by air travelers—direct impacts, indirect impacts and induced impacts.

Both indirect and induced impacts are secondary impacts produced by the initial direct aviation activity. These categories are defined according to FAA guidelines and are described in the next section of this report.

An economic model of all 72 Wisconsin counties, based upon input-output matrices, was used to measure the multiplier effects related to indirect and induced impacts in this study. This model, the Impact Analysis for Planning (IMPLAN) economic model, was produced by the Minnesota IMPLAN Group, Inc. It is a computer-based model that estimates purchases and sales between the various sectors of the Wisconsin economy. It can yield statewide results or focus on specific Wisconsin counties and groups of counties.

As aviation expenditures directly enter the economy, they create successive waves of additional spending, multiplying the initial impacts.

Direct impacts

Direct impacts, as the term is defined for this analysis, are consequences of economic activities carried out at the airport by airlines, airport management, FBOs, and other tenants with a direct involvement in aviation.

Employing labor and purchasing locally-produced goods and services are examples of airport activities that generate direct impacts.

Some direct impacts, like airport employment, occur on site; others, like local production of goods and services for use at the airport, may occur off site. The distinguishing feature of a direct impact is that it is an immediate consequence of airport economic activity.

Through a survey questionnaire and follow-up phone calls, information was gathered on the sales, operating expenditures and capital improvement expenditures generated directly by aviation activity. Questionnaires were mailed to airport managers, FBOs and other airport tenants, and military aviation unit commanders in Wisconsin. These questionnaires requested information necessary to generate estimates of secondary economic impacts using the IMPLAN modeling process, including:

► EMPLOYMENT

Information on full-time and part-time employment was converted to full-time equivalent positions

► PAYROLLS

Annual salaries paid to all workers

► SALES, OPERATING EXPENSES AND CAPITAL IMPROVEMENTS

Economic activity for airport tenants is typically assumed to be the sum of annual gross sales and average annual capital expenditures. While this assumption works

Watertown Municipal Airport



well for most profit-oriented tenants, it must be modified for government tenants such as military groups, airport administration and operation, and airlines. Although airlines generate sales, the ticket revenue is usually transferred outside the state. In order to estimate the statewide impact of these important aviation activities, government and airport output is equated with the sum of operating expenditures and average annual capital improvement costs.

The survey questionnaires provided data on the actual economic activity at the airport itself. As these expenditures enter the economy, they create successive waves of additional spending: airport businesses and administration purchase goods and services from outside suppliers and those purchases multiply the initial effects of activity at the airport. The IMPLAN model was used to estimate the second wave of activity generated by outside suppliers to the airport businesses, personnel and tenants. These waves of spending were then summed to produce an estimate of total direct economic impact on employment, sales and incomes. (The direct and indirect impact columns of the IMPLAN simulations were combined to produce the estimate of direct economic impact using this FAA definition of direct impact. The induced economic impacts were modeled separately using information from the returned survey questionnaires.)

The modeling process used in this analysis accounted for the proportion of that spending that “leaks” out of the local economy. The leakage occurs because of the regional import components of the goods and services purchased. The economic model used in this analysis employs separate multiplier factors for each of the industries that comprise the Wisconsin economy and is specific to the state.

Aviation fuel sales comprise a significant portion of FBO sales in Wisconsin. To account for the sizable regional import component of those fuel sales, aviation fuel sales were modeled separately. From U.S. Energy Information Administration publications, Wisconsin Bureau of Aeronautics surveys, and phone interviews with fuel resellers, an average wholesale price for the fuel was determined. Similarly, an average retail fuel price was determined, and the difference between the two (the margin) was modeled as retail fuel sales, rather than as economic activity in the air transportation sector.





General Mitchell International Airport

Indirect impacts

In this analysis, these impacts derive primarily from off-site economic activities attributable to the airport.

For example, air travelers spend money in their destination communities on such things as hotel rooms, meals, retail shopping, rental cars and recreation. The businesses that provide these things employ workers, purchase supplies from other businesses and invest in business improvements. These waves of spending are known as the indirect economic impact.

Information was gathered on the number of air travelers and on their average expenditures. As with the other two types of impacts, this spending was modeled to account for successive rounds of spending and for specific regional import components of the goods and services purchased.

► **COMMERCIAL SERVICE VISITORS**

This category includes estimated non-local passengers (visitors) arriving via commercial airlines at Wisconsin's scheduled service airports. The total number of enplanements in 2010, for each commercial service airport, was reduced to net out transfer passengers and arriving local residents. This produced an estimate of the arriving visitors at each airport. The sum of spending by these visitors initiated the indirect economic impacts attributable to commercial service air travelers.

► **GENERAL AVIATION VISITORS**

This category includes estimated non-local passengers arriving via private and corporate aircraft. For this analysis, general aviation visitors were assumed to be that portion of each airport's itinerant general aviation operations which is non-local, or visiting, in nature. The number of non-based itinerant operations (take-offs and landings) in 2010, for each general aviation airport, was drawn from the FAA airport inspection (FAA 5010) records. This data was combined with the average number of passengers per plane for each airport. The product of these two numbers for each airport was then halved to produce an estimate of the number of non-local general aviation arriving visitors at each airport in 2010.

Information on air traveler spending in Wisconsin came from two sources: the report, *The Economic Impact of Expenditures By Travelers In Wisconsin Calendar Year 1995*, which was prepared by Davidson-Peterson Associates, Inc. for the Wisconsin Department of Tourism; and a 1995 survey of air travelers in Wisconsin by D.K. Shifflet & Associates Ltd. These figures were updated by the Consumer Price Index (CPI) to account for inflation since 1995. Air traveler spending on five separate categories was assumed to exert the initial indirect economic impact, which then spurred subsequent rounds of spending in the Wisconsin economy. Those categories were Food & Drink; Retail Shopping; Recreation & Entertainment; Lodging; and

Daily Air Traveler Spending in Wisconsin

Food and Drink IMPLAN 413	Shopping IMPLAN 330	Recreation IMPLAN 410	Lodging IMPLAN 411	Ground Transportation IMPLAN 336
\$67.70	\$57.30	\$59.90	\$57.30	\$18.20

Ground Transportation. The table above lists the amounts spent by each visitor per day on these items, as well as the IMPLAN model sectors into which the spending was entered.

Induced impacts

These are the multiplier effects of the direct impacts. They are the increases in employment and incomes created by successive rounds of spending occasioned by the household expenditures of aviation and aviation-related workers.

For example, part of an aviation employee's pay is spent for food, housing and other expenses within a community. This money is income for the recipient businesses and their employees, and part of these second-round incomes are also spent locally, creating a multiplier effect as successive waves of spending occur. This is known as induced economic impact.

Survey information was gathered on all aviation employee payrolls in Wisconsin. This includes military and civilian employees, airport administration employees, airline employees, airport concession employees and aviation business employees. The sum of these wages was then reduced to account for direct and indirect taxes and for savings. The remainder was modeled as spending in the local economy by the households of aviation employees. The modeling process not only accounted for these subsequent

rounds of local spending, but for the portion of that spending that leaks from the regional economy; again, as a result of the regional import components of the goods and services purchased.

Total economic impacts are the sum of the direct, indirect and induced impacts. The study estimates direct, indirect, induced and total impacts in terms of three key economic variables: employment, personal income and output (sales).

Estimates are provided for the direct, indirect and induced effects of general aviation, commercial aviation, military aviation and the annual Experimental Aircraft Association (EAA) AirVenture on those three variables. The total economic impacts of this aviation activity are then summed and expressed on a statewide basis.

Total economic impacts are the sum of the direct, indirect and induced impacts. The study estimates direct, indirect, induced and total impacts in terms of three key economic variables: employment, personal income and output (sales).



Richland Airport

General Aviation
Total Impact

Output
\$694.5 million

Jobs
9,390

Personal income
\$259 million

General aviation airport impacts

THE RESULTS REPORTED FROM THIS SURVEY constitute an underestimate of the impacts of Wisconsin's general aviation airports, due to a low return rate of the survey questionnaires upon which the estimates are based. Less than 50 percent of businesses at general aviation airports responded.

Wisconsin's 90 general aviation airports in the state airport system, and the responding businesses they support, generated a total of more than \$54 million in direct expenditures and sales in 2010.

The airports and responding businesses at the airports supplied a total of 715 jobs. In addition, the community businesses that supplied these airports and airport businesses generated nearly \$15 million dollars in sales and provided 117 more jobs.

Consequently, the **TOTAL DIRECT ECONOMIC IMPACT**

of Wisconsin's State Airport System general aviation airports included:

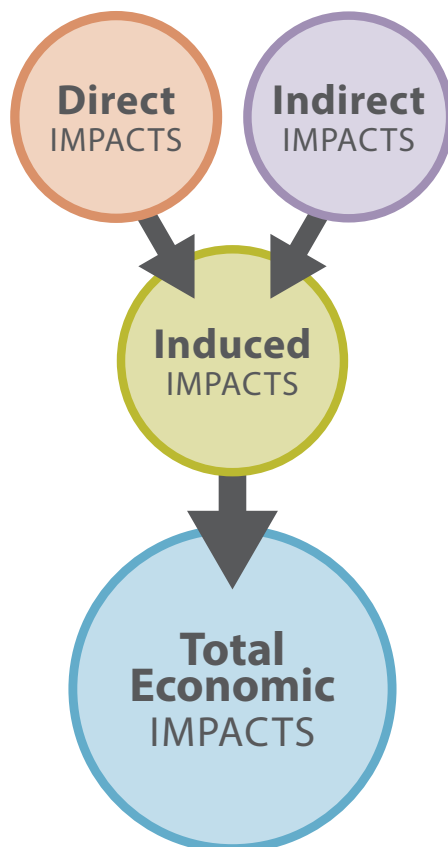
- ▶ \$69 million in output (sales)
- ▶ 832 jobs
- ▶ Nearly \$38 million in personal income to Wisconsin workers

The **ECONOMIC IMPACT**

of these airports and businesses is not limited to those direct effects, but **INCLUDES INDUCED EFFECTS** as well.

As general aviation and aviation-related workers spent their wages, they supported:

- ▶ More than \$33.5 million in additional output (sales)
- ▶ 290 jobs
- ▶ \$11.4 million in personal income for the grocers, service station owners, barbers, etc. in their communities throughout the state



In addition, air travelers using these general aviation airports spent money in the communities they visited.

This **TOTAL INDIRECT ECONOMIC EFFECT** contributed:

- ▶ More than \$592 million in output (sales) to Wisconsin's economy
- ▶ 8,270 jobs
- ▶ Nearly \$210 million in personal income

The **TOTAL ECONOMIC IMPACT**

of responding Wisconsin State System general aviation airports in 2010 included:

- ▶ \$694.5 million in output
- ▶ 9,390 jobs
- ▶ More than \$259 million in personal income

General aviation-related businesses

The largest part of the direct economic impact of general aviation comes from such businesses as air taxi operators, aircraft mechanics and dealers, and FBOs. Most of these businesses are located on or near public-use airports. These components of the air

transportation sector are an integral part of the aviation network, providing such services as refueling, flight instruction, avionics, and aircraft sales and service.

Hundreds of businesses use general aviation airports

to conduct their everyday business, further stimulating Wisconsin's economy. The \$446 million in general aviation air traveler spending is enabled by the activities of these FBOs and other general aviation airport businesses.



Military Aviation
Total Impact

Output
\$245 million

Jobs
7,970

Personal income
\$345 million

Military aviation in Wisconsin

MILITARY AVIATION ACTIVITY is a significant force to Wisconsin's economy. There are Air National Guard units in Milwaukee, Madison and at Camp Douglas in Juneau County. U.S. Army National Guard flight units are located in Madison, Milwaukee, and Fort McCoy near Sparta. All of these units employ both military and civilian personnel, purchase local goods and services for their day-to-day operations, and contract with local businesses for construction projects as well as for operations.

In 2010, the military flight units that responded to this study survey employed a total of 5,823 workers, both military and civilian. Their total payroll was nearly \$259 million.

As these service members and civilian employees spent their wages, they supported:

- ▶ *More than \$229 million in output (sales)*
- ▶ *1,990 jobs*
- ▶ *Nearly \$78 million in personal income*

The responding units reported they spent more than \$9.4 million on various operating expenses, which resulted in a total effect on state output of \$16 million. This also contributed more than \$8 million in wage income to the economy and supported 160 jobs.

Volk Field Air National Guard Base, Camp Douglas





General Mitchell International Airport, Milwaukee

Commercial service airport impacts

AIRPORTS IN EIGHT CITIES IN Wisconsin offer regularly scheduled commercial airline service to the rest of the nation and the world. In addition to their vital air service roles, these airports are centers of economic activity that generate a large share of aviation's total economic impact in Wisconsin.

Beside employing personnel to manage the day-to-day operations at the airport, commercial service airports are centers for airline operations, air freight operations, car rental outlets, restaurants, gift shops, customs brokerages and travel agencies.

Commercial Aviation
Total Impact

Output
\$5.9 billion

Jobs
73,310

Personal income
\$2.9 billion

These airports are centers of economic activity that generate a large share of aviation's total economic impact in Wisconsin.

The **DIRECT ECONOMIC IMPACT** of these activities (including the activity of firms supplying those businesses) in 2010 was:

- ▶ More than \$1.7 billion in output (sales)
- ▶ 9,280 jobs
- ▶ Nearly \$385 million in personal income to Wisconsin residents

The full- and part-time employees of these airports, of concessions at the airports, and of scheduled air carriers exerted these **INDUCED IMPACTS** in 2010 as they spent their wages:

- ▶ 2,400 jobs
- ▶ \$199 million in personal income

Air travelers who use the commercial service airports spend money on restaurants, retail shopping, lodging, recreation, and car rentals in Wisconsin. In 2010, these expenditures had **INDIRECT (VISITOR) ECONOMIC IMPACTS** of:

- ▶ \$4.2 billion in output (sales)
- ▶ \$61,630 jobs
- ▶ More than 2.3 billion in personal income for Wisconsin residents

The **TOTAL ECONOMIC IMPACT** of Wisconsin State System commercial airports in 2010 included:

- ▶ \$5.9 billion in output (sales)
- ▶ 73,310 jobs
- ▶ \$2.9 billion in personal income

Wisconsin businesses rely on aviation



Freight Runners Express

Wisconsin businesses ship and receive products by air freight every day. This streamlines their production, aids in “just in time” manufacturing processes and

expands their market. Regular air cargo services are available at six commercial service airports and express carriers also use feeder services at other public general aviation airports. In 2010, Wisconsin businesses shipped nearly 120 million pounds of air freight through these facilities.

Businesses use aviation in other ways as well. Many of the nearly 4,000 general aviation aircraft, based at Wisconsin airports in 2010, were owned by corporations doing business in the state. Aviation allows businesses to quickly move key personnel from one site to another, increasing their productivity.

Experimental Aircraft Association (EAA) AirVenture

EVERY YEAR, THE EAA HOSTS a fly-in convention at its aviation center in Oshkosh. Hundreds of thousands of aircraft enthusiasts from across the country and around the world visit for this week-long event, many flying their own aircraft. Thousands of visiting aircraft land at Wittman Regional Airport in Oshkosh and at reliever airports in Appleton and Fond du Lac during the convention. Attendees spend money on food, lodging, retail shopping, entertainment and recreation—not only in the Oshkosh area, but around the state as they visit other communities.

Visitor spending from this seven-day event generates nearly \$110 million in output (sales) each year.

EAA operates year-round with a staff of approximately 100 employees and contributes \$29.5 million in output, 240 jobs, and more than \$9 million in personal income to the state economy. (That includes operations and employment, along with the associated indirect and induced effects.)



Wisconsin's 90 general aviation airports in the state airport system, and the responding businesses they support, generated a total of more than \$54 million in direct expenditures and sales in 2010.





Sheboygan County Memorial Airport

Airports and their associated activities are economic assets to communities, providing employment, purchasing goods and services from other businesses, and generating income as aviation-related spending circulates through the economy.

The bottom line

THE STATE'S AIRPORT SYSTEM links Wisconsin businesses and residents to the rest of the nation and the world. Both commercial service airports and general aviation airports are important resources for corporations seeking to expand or locate in the state. In addition to commercial service and general aviation facilities, Wisconsin aviation provides such "quality of life" amenities as emergency medical services, flight training and environmental management.

Airports and their associated activities are economic assets to communities, providing employment, purchasing goods and services from other businesses, and generating income as aviation-related spending circulates through the economy. This study focused on the importance of aviation as an industry to the Wisconsin economy, examining its economic significance in terms of jobs, personal income and output. The total economic significance is presented in the adjacent table. (Dollar amounts are in billions of 2010 dollars.) These totals represent general aviation, commercial aviation, EAA, military and federal government impacts.

Total Aviation Impact

Output
\$6.9 billion

Jobs
90,900

Personal income
\$3.5 billion

Note: Totals may not add exactly due to numerical rounding of results.



WisDOT Bureau of Aeronautics
www.dot.wisconsin.gov/modes/air.htm

