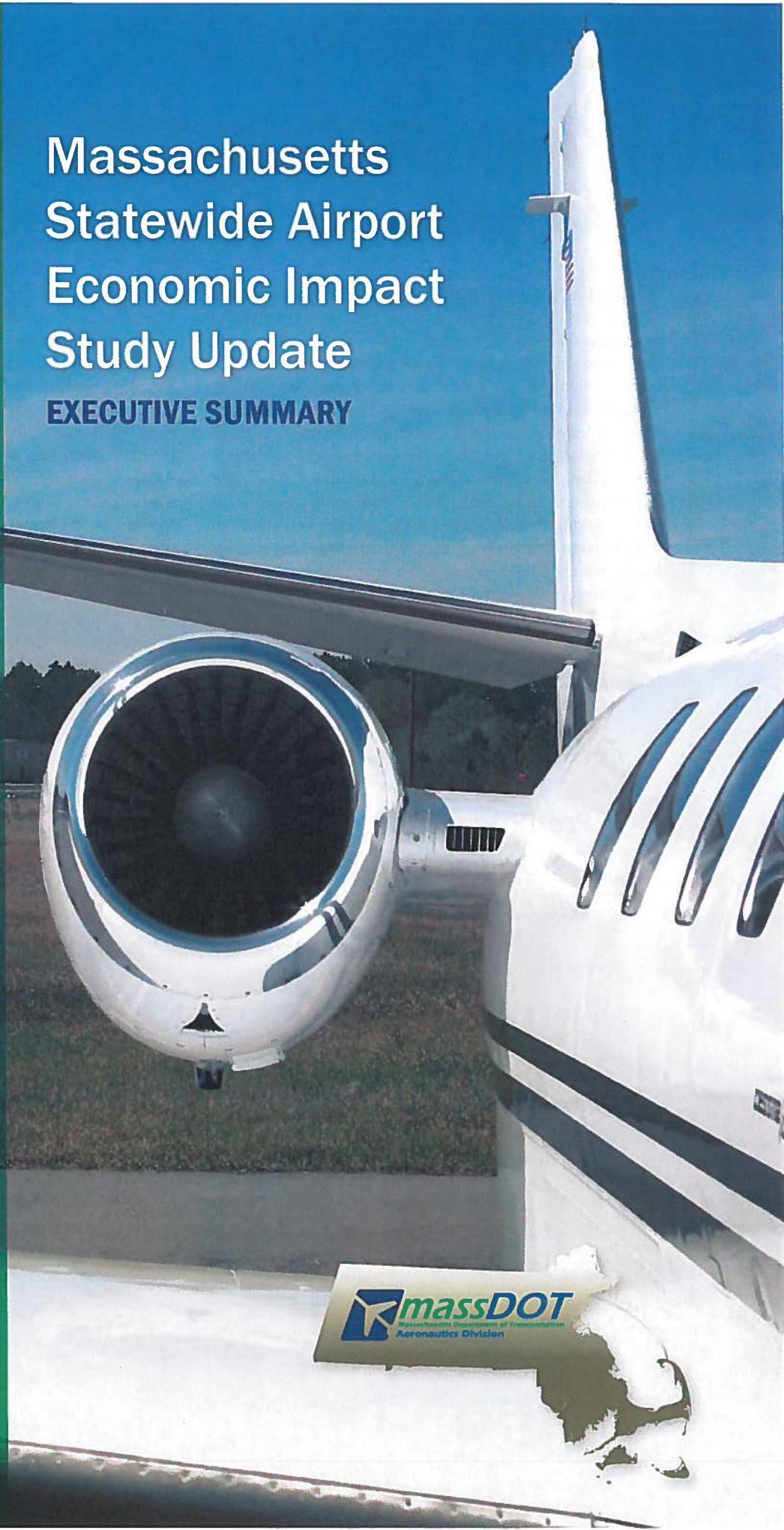
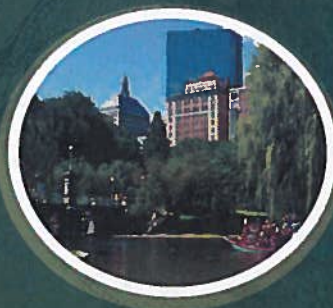


Massachusetts

Massachusetts Statewide Airport Economic Impact Study Update

EXECUTIVE SUMMARY



Massachusetts Airports: A Connection to Economic Growth

For the Commonwealth of Massachusetts, airports and aviation are a significant part of the state's emerging economy. Aviation has helped transform the way people and goods move across the globe, sustaining the Bay State's rapidly expanding business community and its world renowned tourist destinations. It has brought distant markets together and made a global economy possible. Businesses rely on aviation to deliver enhanced products and services to global markets in distant locations that would otherwise be difficult to reach or inaccessible. At both the state and regional levels, airports and the links they provide help to drive the economies in those states by generating billions of dollars in economic benefits that in turn support thousands of related jobs.

From 2011 to 2013, the Federal Aviation Administration (FAA), Massachusetts Department of Transportation (MassDOT), and airport sponsors have strategically

invested in airport infrastructure to improve and enhance economic development opportunities. These investments have already seen substantial return in the Commonwealth. As an update to the 2011 Massachusetts Statewide Airport Economic Impact Study, this 2014 study summarizes the significant economic benefit that Massachusetts derives each year from its 39 public-use airports. Sponsored by the Massachusetts Department of Transportation Aeronautics Division, this study is a continuation of an overall planning effort initiated by the Aeronautics Division in 2009 with the Massachusetts Statewide Airport System Plan (MSASP). While the MSASP examined the structure and long-term development of the statewide airport system as a whole, the goal of the Massachusetts Statewide Airport Economic Impact Study Update is to show how aviation serves as an economic engine for the Commonwealth, as well as documenting some of the many other benefits that air transportation brings to its host communities.

MassDOT Aeronautics Division Mission Statement

Promote aviation throughout the Commonwealth, while providing an efficient, integrated airport system that will enhance airport safety, economic development, and environmental stewardship.



Study Overview

Aviation is a significant economic catalyst in Massachusetts. From the airlines that serve the Commonwealth's commercial service airports and the variety of general aviation services found throughout the state to the military air facilities on the front lines of national defense, the aviation industry supports thousands of jobs and billions of dollars in economic activity. Commercial airlines in Massachusetts boarded more than 15 million passengers in 2013 while general aviation aircraft conducted an estimated 1.4 million operations.

When all of the impacts of Massachusetts' 39 public-use airports and associated military air facilities are added together, more than 162,000 jobs can be traced to the aviation industry. These employees receive \$6.1 billion in total annual payroll and generate \$16.6 billion in total economic activity. Since the 2011 Massachusetts Statewide Airport Economic Impact Study, these impacts have increased by approximately 38,000 jobs, \$1.2 billion in payroll, and \$4.7 billion in output.

On top of the economic impacts that can be measured quantitatively, airports in Massachusetts provide numerous health, welfare, and safety benefits that defy conventional measurement. Such services include medical transport and evacuation, flight training, law enforcement flights, wildlife management, search and rescue operations, and military exercises, all of which contribute directly to the quality of life

of those who live and work in the Commonwealth. Further case study analysis of aviation education and air charter provide examples of how Massachusetts airports improve the quality of life for Commonwealth residents, over and above the jobs, payroll, and economic activity that they generate.

Massachusetts Public-Use Airport System

Massachusetts' system of public-use airports is comprised of nine commercial service and 30 general aviation airports. While most of the system's 39 airports are publicly-owned, 11 are privately-owned and operated.

The **MassDOT Aeronautics Division** supports the operation and development of 36 of these airports through:

- Grant funding
- Airport inspections
- Technical guidance
- Statewide planning initiative
- Aviation education outreach
- Communication with local, state and federal officials

The **Massachusetts Port Authority (Massport)** owns and operates the remaining three airports: Boston Logan International Airport, Laurence G. Hanscom Field, and Worcester Regional Airport.

TOTAL ECONOMIC IMPACTS OF MASSACHUSETTS' PUBLIC-USE AIRPORTS



Study Process

The economic impacts associated with aviation in Massachusetts were estimated using a standard econometric modeling process that has been approved by the FAA. This input-output model estimates economic impacts in terms of jobs, payroll and economic output. This methodology has been used to successfully quantify the value of airports and airport systems throughout the United States.

The input for this model came from numerous data gathering efforts for each Massachusetts airport. Airport managers, aviation-related businesses, and government organizations were surveyed to collect the data necessary to estimate the on-airport employment, payroll, and output each airport supports. This included data pertaining to construction expenditures associated with on-airport capital projects. Visitors to Massachusetts using general aviation aircraft were surveyed to estimate the economic impacts their expenditures support. The economic

impacts produced by visitors arriving in Massachusetts via commercial airlines were estimated by updating the expenditure patterns of those visitors from the 2011 Massachusetts Statewide Airport Economic Impact Study.

The induced and indirect impacts of these airport activities were calculated using multipliers that are specific to Massachusetts. For example, when an airport employee uses their salary to buy groceries at a local store, their spending helps to support that store and its employees. That spending then circulates or multiplies through the local economy by supporting the jobs and payroll of other businesses and thereby generates additional economic activity in the region. In general, for every \$100 spent by aviation-related businesses, an additional multiplier impact of \$56 is created within Massachusetts. The total economic impact is the sum of all on-airport, construction, military aviation, visitor, and multiplier impacts.

“ Our fleet has grown to over a dozen aircraft and our business aviation department manages aircraft all over the world. While we began with a staff of one, we now currently employ 26 people. ”

— Alpha One Flight Service, Plymouth Municipal Airport



Quantifying Aviation Benefits

Economic Impact Types

Direct Impacts

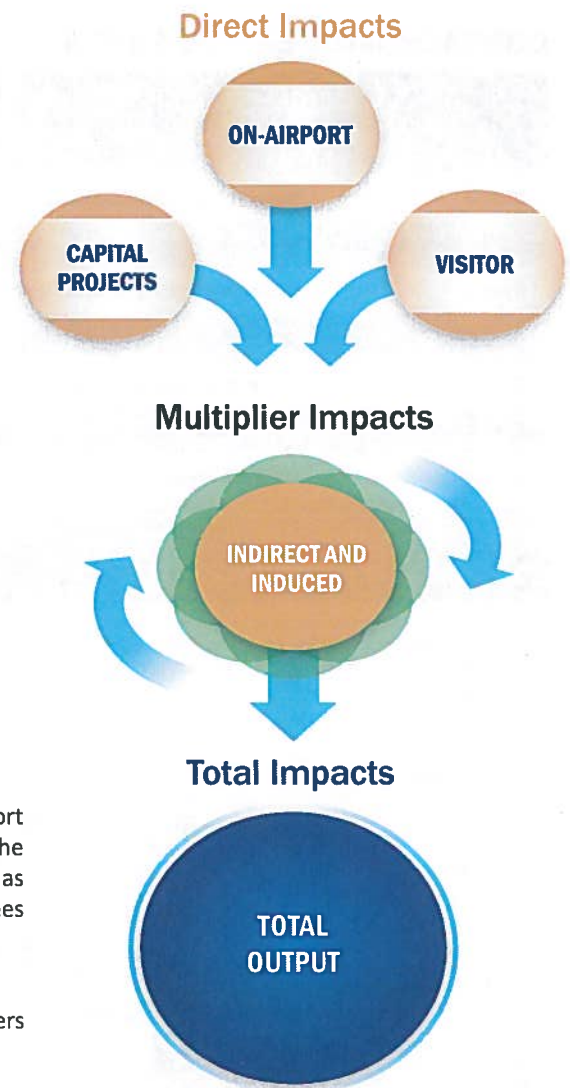
include both on-airport and visitor impacts. On-airport impacts are those benefits associated with on-airport businesses, government tenants, military aviation, and capital construction projects. Visitor impacts generally take place off-airport and are attributable to visitor spending.

Multiplier Impacts

consist of indirect and induced impacts. Indirect impacts are related to the recirculation of monies spent locally by on-airport businesses. Induced impacts are those impacts resulting from the recirculation of employee payroll within the economy.

Total Economic Impacts

are the combination of all direct and multiplier impacts.



Impact Measures

Employment

measures the number of full-time equivalent (FTE) jobs related to airport activity. Two part-time employees count as one full-time employee. In the case of seasonal employment, two seasonal full-time employees count as one year-round full-time employee and four seasonal part-time employees count as one year-round full-time employee.

Payroll

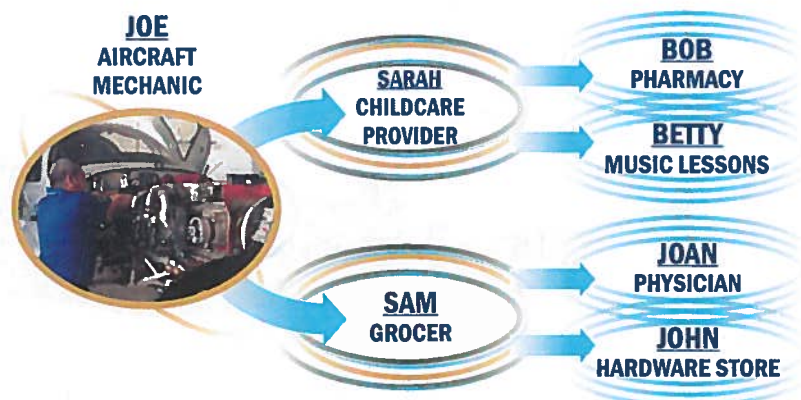
measures the total annual wages, salary, and benefits paid to all workers whose employment is directly attributable to airport activity.

Economic Activity (Output)

measures the value of goods and services related to airports in Massachusetts. The output of on-airport businesses is typically assumed to be the sum of annual gross sales and average annual capital expenditures. For those organizations where gross sales is not applicable (such as a government agency), output is estimated as the sum of annual payroll, annual expenses, and average annual capital expenditures.

Ripple Effect

Multiplier impacts result from the recirculation and re-spending of direct impacts within the economy. For example, as airport employees spend their salary for housing, food, and services, those expenditures circulate, or ripple, through the economy resulting in increased spending, payroll, and employment throughout Massachusetts.



Massachusetts Annual Economic Impacts

COMMERCIAL SERVICE AIRPORTS

Associated City	Airport Name	Total Employment ²	Total Payroll ²	Total Output ²
Bedford	Laurence G. Hanscom Field ¹	12,355	\$1,162,158,000	\$1,604,078,000
Boston	Boston Logan International Airport	131,991	\$4,290,597,000	\$13,359,865,000
Chicopee/Springfield	Westover Air Reserve Base/Metropolitan Airport ¹	5,241	\$195,081,000	\$255,691,000
Hyannis	Barnstable Municipal Airport-Boardman/Polando Field	2,135	\$85,358,000	\$208,023,000
Nantucket	Nantucket Memorial Airport	3,802	\$116,648,000	\$378,531,000
New Bedford	New Bedford Regional Airport	297	\$10,625,000	\$32,434,000
Provincetown	Provincetown Municipal Airport	379	\$11,336,000	\$33,945,000
Vineyard Haven	Martha's Vineyard Airport	1,232	\$38,170,000	\$120,049,000
Worcester	Worcester Regional Airport ³	358	\$14,925,000	\$46,433,000
COMMERCIAL SERVICE AIRPORTS TOTAL		157,790	\$5,924,898,000	\$16,039,049,000

¹ Includes economic impacts associated with military operations located on the airport. See page 8 for specific military totals.

² Total impacts include all on-airport business, construction, visitor, and multiplier impacts.

³ Impacts for 2013 only include two months of JetBlue service. In 2014, Worcester Regional's JetBlue service surpassed 110,000 enplanements.



Massachusetts Annual Economic Impacts

GENERAL AVIATION AIRPORTS

Associated City	Airport Name	Total Employment ²	Total Payroll ²	Total Output ²
Barre/Barre Plains	Tanner-Hiller Airport	5	\$94,000	\$548,000
Berkley	Myricks Airport	3	\$34,000	\$74,000
Beverly	Beverly Municipal Airport	245	\$10,122,000	\$32,502,000
Chatnam	Chatham Municipal Airport	149	\$4,347,000	\$12,518,000
Edgartown	Katama Airpark	17	\$520,000	\$1,895,000
Falmouth	Falmouth Airpark	7	\$271,000	\$621,000
Fitchburg	Fitchburg Municipal Airport	129	\$4,752,000	\$14,619,000
Gardner	Gardner Municipal Airport	8	\$237,000	\$800,000
Great Barrington	Walter J. Koladza Airport	43	\$1,164,000	\$3,321,000
Hanson	Cranland Airport	9	\$291,000	\$972,000
Hopedale	Hopedale Industrial Park Airport	14	\$408,000	\$899,000
Lawrence	Lawrence Municipal Airport	267	\$10,212,000	\$30,147,000
Mansfield	Mansfield Municipal Airport	54	\$1,804,000	\$9,392,000
Marlborough	Marlboro Airport	5	\$144,000	\$468,000
Marshfield	Marshfield Municipal Airport - George Harlow Field	74	\$3,627,000	\$9,154,000
Marstons Mills	Cape Cod Airport	8	\$213,000	\$876,000
Montague	Turners Falls Airport	14	\$498,000	\$1,801,000
Newburyport	Plum Island Airport	2	\$35,000	\$121,000
North Adams	Harriman-and-West Airport	97	\$3,557,000	\$11,259,000
Northampton	Northampton Airport	25	\$480,000	\$2,000,000
Norwood	Norwood Memorial Airport	394	\$16,863,000	\$52,232,000
Orange	Orange Municipal Airport	147	\$4,849,000	\$13,992,000
Pittsfield	Pittsfield Municipal Airport	226	\$10,260,000	\$35,387,000
Plymouth	Plymouth Municipal Airport	319	\$13,669,000	\$47,867,000
Southbridge	Southbridge Municipal Airport	20	\$556,000	\$1,712,000
Spencer	Spencer Airport	3	\$63,000	\$141,000
Sterling	Sterling Airport	21	\$426,000	\$1,546,000
Stow	Minute Man Air Field	141	\$4,563,000	\$12,315,000
Taunton	Taunton Municipal Airport - King Field	31	\$978,000	\$3,261,000
Westfield/Springfield	Westfield-Barnes Regional Airport ¹	1,989	\$74,067,000	\$213,628,000
GENERAL AVIATION AIRPORTS TOTAL		4,466	\$169,104,000	\$516,068,000

ALL AIRPORT TOTALS

Total Employment	162,256
Total Payroll	\$6,094,002,000
TOTAL OUTPUT	\$16,555,117,000



¹ Includes economic impacts associated with military operations located on the airport. See page 8 for specific military totals.

² Total Impacts Include all on-airport business, construction, visitor, and multiplier impacts.

Massport Airports



The Massachusetts Port Authority (Massport) plays a critical role in supporting the movement of people and goods in New England. Whether by boat or plane, Massport helps to connect the region to the national and global marketplace. Massport is focused on promoting safe, efficient, and cost-effective travel and transportation with an eye toward simultaneously enhancing economic prosperity and minimizing the impact of transportation services on surrounding communities and the environment.

Massport is the owner and operator of Massachusetts' premier airports: Boston Logan International Airport, Laurence G. Hanscom Field, and Worcester Regional Airport. Boston Logan International is the largest airport in New England, with over 40 airlines serving more than

30 million passengers each year. Focusing on general aviation activity, Laurence G. Hanscom Field boasts outstanding facilities for corporate and private users and a convenient location that is just minutes from Boston's major highways and the Route 128 Technology Corridor. Meanwhile, Worcester Regional Airport serves Central Massachusetts' residents and businesses by supporting a mix of commercial service and general aviation activity. In 2014, Worcester Regional's enplanements increased by more than 110,000 as a result of JetBlue service.

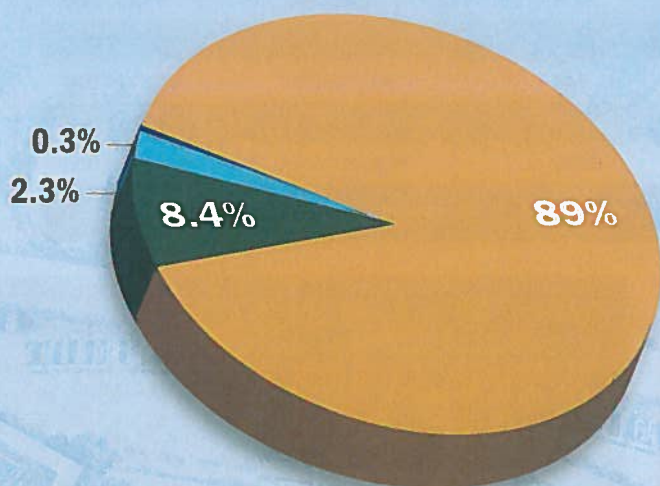
Massport's airports generate approximately \$15.1 billion in total output, which is 91 percent of the state airport system's total annual economic activity. This impact includes nearly 145,000 Massachusetts jobs and a total annual payroll estimated at \$5.5 billion.







ECONOMIC IMPACT OF MASSPORT AIRPORTS

TOTAL ECONOMIC IMPACT

\$15.1 BILLION



	Boston Logan Int'l (BOS)	\$13.4 billion
	Laurence G. Hanscom Field Air Force Base	\$1.3 billion
	Laurence G. Hanscom Field (BED) Civilian Airport Facilities	\$348.9 million
	Worcester Regional Airport (ORH)	\$46.4 million

Note: Massport numbers and percentages are rounded.

Additional Areas of Analysis

Qualitative Benefits

Beyond the quantitative aspects of aviation benefits, there are also qualitative benefits that deserve consideration when the total value of an airport system is analyzed. Qualitative benefits are those activities which take place at an airport on a regular basis that add to the quality of life, but are difficult to assign a dollar value. Qualitative benefits typically enhance the health, welfare, or safety of individuals in the airport's market area. While it may be difficult to place a dollar value on such impacts, these benefits, which vary throughout the Massachusetts airport system, improve the quality of life of the Commonwealth's residents in a variety of ways. Examples of qualitative benefits of aviation at Massachusetts' airports include facilitating emergency medical transport; providing police support; supporting forest and wildlands firefighting operations; serving as a staging area for community events; conducting search-and-rescue operations; supporting aerial surveying, photography, and inspection operations; providing youth outreach activities; and supporting the U.S. military and other government organizations.

Military

Massachusetts has a long and distinguished military tradition dating back to colonial America. In addition to its many military bases and research facilities, Massachusetts is home to four active military air facilities that support multiple service branches: Hanscom AFB, Westover ARB, Barnes ANGB, and Joint Base Cape Cod. Along with the strategic military value that these facilities provide to the nation, Massachusetts realizes notable economic benefits from military aviation activities. The economic impacts attributed to these facilities are estimated at approximately 18,000 total jobs, \$1.4 billion in total annual payroll, and \$1.7 billion in total annual output.

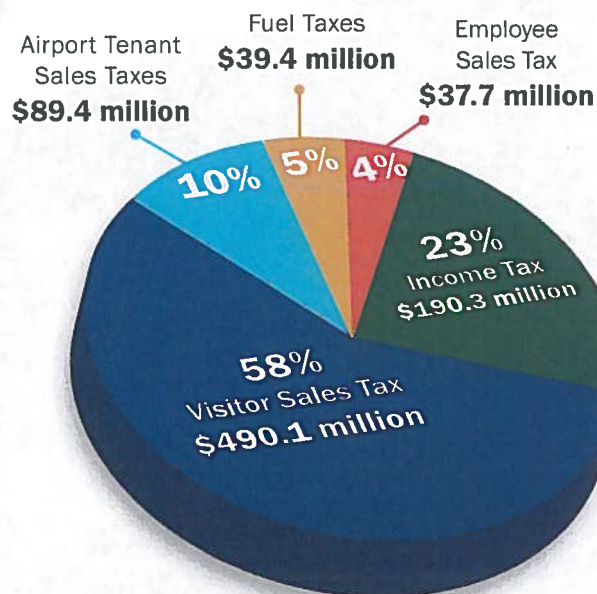
Airport Name	Employment	Payroll	Output
Hanscom AFB	10,610	\$1,066,163,000	\$1,255,196,000
Westover ARB	5,083	\$188,105,000	\$233,482,000
Barnes ANGB	1,302	\$32,685,000	\$106,359,000
Joint Base Cape Cod	1,192	\$92,990,000	\$134,571,000
TOTAL	18,187	\$1,379,943,000	\$1,729,608,000



Tax Impacts

Aviation in the Commonwealth plays an important role in generating tax revenues for Massachusetts and local municipalities for the provision of community services and protection of the public's health, safety, and welfare. A tax analysis was conducted for this study that estimated the revenues generated through the state sales tax, local sales taxes, lodging/restaurant taxes, rental car taxes, state income taxes, and aviation fuel taxes. The analysis also estimated the taxes paid by on-airport businesses, visitors arriving by both commercial airlines and general aviation aircraft, and employees supported by airport-related activity. These employees included those working on the airport for businesses and government organizations and those found off-airport that are supported by visitor spending. The analysis found that Massachusetts' airports annually generate an estimated \$846.9 million in tax revenues from aviation-related activities.

TOTAL ECONOMIC IMPACT \$846.9 MILLION



Aviation's Unique Aspects

Aviation Education

With aviation passenger traffic climbing globally and a record number of new aircraft orders, the time for training highly qualified aircraft operators, technicians, and engineers is now – and Massachusetts is positioning itself to fill that need. Here in Massachusetts, we see this as an opportunity! The Massachusetts airport system is currently home to 37 airport-based flight schools that provide flight training certifications from private pilot to airline transport pilot, as well as specialty training in aircraft such as helicopters, sport aircraft, and taildraggers. Beyond this, through a variety of independent but related initiatives - individuals, groups, schools, airports, and businesses are working together to create a “pathway” for the citizens of the Commonwealth to lucrative careers in aviation.

Early Education

Passion for aviation is typically born at an early age and is often fostered by those aviation enthusiasts that can be found at the local airport. Through airport open houses, air shows, airport tours and other events, kids are exposed to the world of aviation. Established airport programs like the Experimental Aircraft Association (EAA), Young Eagles, and the Civil Air Patrol provide children with their first opportunity to fly in a small plane and to be part of the aviation community.

Other outreach efforts such as the Wright Flight program establish working partnerships between airports and the local schools to extend aviation education into the curriculum.

Secondary Education

In recent years, a renewed emphasis is being placed on STEM (Science, Technology, Engineering and Math) education within Massachusetts as a means of preparing its youth for the career demands of today and tomorrow – and aviation is a primary beneficiary of that effort. The Wright Flight program, which provides students with ground school training, is part of an outreach effort that establishes working partnerships between airports and the local schools to extend aviation education into the curriculum. Westfield Vocational Technical High School is in the process of starting a FAA Part 147 maintenance program that will enable students to graduate from high school with an airframe and powerplant license, which is critical to supply tomorrow's workforce for companies like Gulfstream at Westfield-Barnes Regional Airport.



Post-Secondary Education

Massachusetts is home to a world-renowned college educational system – and this extends directly to the aviation industry. Bridgewater State University is the preeminent aviation program in New England, boasting its own flight academy and offering degrees that enable graduates to pursue careers as pilots, airport managers, flight planners, systems engineers, flight instructors, and air traffic controllers. Cape Cod Community College is initiating the development of a unique FAA-certified aircraft maintenance training program for meeting the critical need for highly skilled technicians in airframe and powerplant repair and certification for airlines like Cape Air. Other schools like North Shore Community College and Westfield State University partner with local flight schools to offer opportunities to integrate flight training with an aviation degree program. Finally, at the heart of the country's epicenter for technology education, the Massachusetts Institute of Technology, Worcester Polytechnic Institute, and Boston University continue to develop the nation's leading aerospace scientists and engineers that will shape the future of aviation.

Education activities located on Massachusetts airports result in 487 jobs earning nearly \$14.3 million in payroll. Total output from on-airport education surpasses \$45.2 million.

ON-AIRPORT EDUCATION IMPACTS

Total Employment	487
Total Payroll	\$14,275,000
Total Output	\$45,223,000





Corporate charter allows Massachusetts companies to efficiently move people and products to and from thousands of cities and towns not serviced by commercial airlines. Companies that utilize charter have a better bottom line. They are more competitive, more efficient, more productive and more profitable.

— Shoreline Aviation, Marshfield Municipal Airport

Air Charter

Time is a finite resource – and whether it is spent for professional or personal purposes, there is no getting around the fact that we cannot create more time. However, we can use it more wisely and more efficiently, such as when we utilize charter aircraft. Air charter refers to a variety of services available that allow individuals, corporations, or groups to move people and cargo in the fastest, most efficient manner available today. It can include the transporting of business people to open new markets, the transfer of patients during medical emergencies, the shipping of time-sensitive cargo to restart a production line that is down, as well as any other use where time and convenience are of the essence.

Air charter can eliminate logistical ineffectiveness by providing immediate point-to-point travel services that are fast and reliable. Moreover, flight time itself is much more productive as charter aircraft have the capability to allow their passengers to operate much as they would in a professional office. Air charter operators board passengers closer to their points of origin and deliver them closer to their final destination by effectively utilizing the country's vast general aviation airport network. This not only makes travel more convenient, it also allows businesses to operate in, or develop markets outside of major metropolitan areas due to the speed and accessibility provided by air charter.

Massachusetts realizes and benefits from significant air charter operations throughout its airport system. With 21 companies providing air charter services based within the Commonwealth, in addition to multiple companies operating as brokers for other air charter companies both inside of and outside of the Commonwealth, air charter is a driving force within Massachusetts. As evidenced by the pronounced use

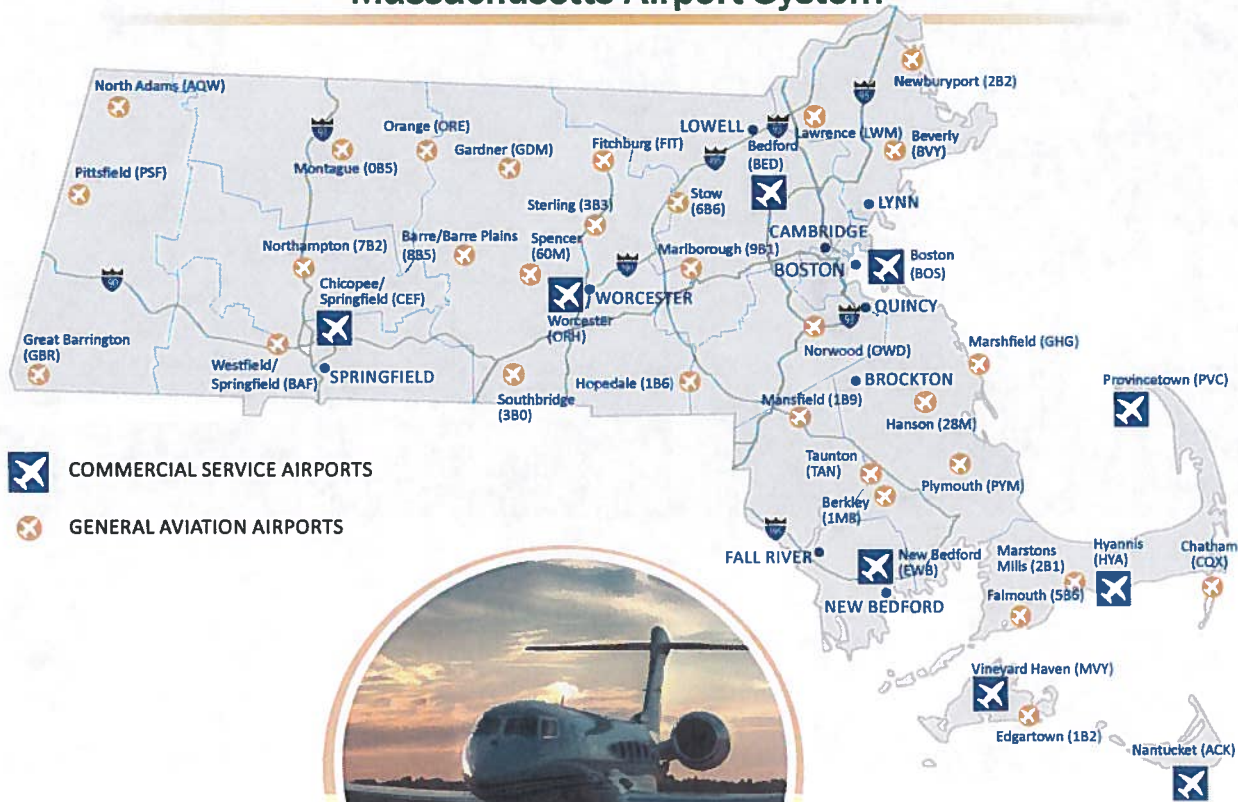
of Massachusetts airports by NetJets, Flight Options, Rectrix, PlaneSense, and other operators and air charter brokerages that service Fortune 500 companies, air charter is an important tool that helps businesses to continue to operate, while also serving as a potential incentive for new businesses to locate to the Commonwealth. This important segment of the aviation industry is responsible for an estimated 408 jobs, \$22.1 million in payroll, and \$99.6 million in economic output.

Air charter operations are also critical to support Massachusetts' world class educational system, as students from around the world frequently travel via charter aircraft. Professional and collegiate sports teams regularly utilize air charter as they travel to and from the area for games and tournaments, as do thousands of fans in support of their teams. As an internationally recognized vacation destination, charter aircraft operations have proven to be a critical asset in moving tourists to and from distant destinations. For those who want to live in Massachusetts but have business interests elsewhere, air charter also allows those individuals the flexibility to be full-time or part-time citizens of our state. For many of Massachusetts' renowned festivals and events, air charter is one of the most important tools for allowing national and international access and participation. Additionally, an important component of air charter is that it can serve as a lifeline during emergency medical events where immediacy and accessibility save lives.

AIR CHARTER IMPACTS

Total Employment	408
Total Payroll	\$22,089,000
Total Output	\$99,621,000

Massachusetts Airport System



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- Massachusetts Office of Business Development (MOBD)
- Massachusetts Port Authority (Massport)
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Massachusetts' 39 public-use airports offer a competitive business advantage. Overall, for every \$100 spent by aviation related businesses, an additional \$56 is created as a multiplier impact that boosts spending, payroll and employment benefits improving the quality of life in Massachusetts for all its residents.