



North Texas Aviation Education Initiative

NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS

Aviation Employment Data

July 2009



North Texas Aviation Education Initiative

NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS

AVIATION EMPLOYMENT DATA

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A. GLOSSARY

This section defines acronyms and abbreviations used throughout the document.

Term	Description
BLS	U.S. Bureau of Labor Statistics
BTS	U.S. Bureau of Transportation Statistics
FSS	Flight Service Stations
MSA	Metropolitan Statistical Area
NAICS	North American Industry Classification System
U.S.	United States



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B. INTRODUCTION

The aviation industry encompasses a vast and varied range of activities and ownership sectors. Employment in the aviation industry also is diverse and is represented by many different disciplines and skills. Appendix A contains a detailed discussion regarding employment in air transportation prepared by the U.S. (United States) Bureau of Labor Statistics (BLS).

Aviation employment data has been obtained from a variety of sources for study and inclusion in the North Texas Aviation Education Initiative. The primary and most up-to-date data came from BLS, which publishes detailed annual and quarterly national, state and regional employment data. Data is current up through the third quarter of calendar 2008.

C. INDUSTRY CLASSIFICATIONS

Data for the period 2004 through 2007, and including the first three quarters, has been downloaded from the BLS website and analyzed to extract relevant data on historical aviation employment. The North American Industry Classification System (NAICS) codes specific to aviation-oriented employment are listed in Exhibit 1. Data sets included aviation NAICS codes for the entire U.S., the state of Texas, and the Dallas-Fort Worth-Arlington Metropolitan Statistical Area (MSA) which serves as a regional subset representing North Central Texas.

Exhibit 1: NAICS Codes Relevant to Aviation Employment

336	Transportation Equipment Manufacturing
3364	Aerospace Product and Parts Manufacturing
33641	Aerospace Product and Parts Manufacturing This industry comprises establishments primarily engaged in one or more of the following: (1) manufacturing complete aircraft, missiles, or space vehicles; (2) manufacturing aerospace engines, propulsion units, auxiliary equipment or parts; (3) developing and making prototypes of aerospace products; (4) aircraft conversion (i.e., major modifications to systems); and (5) complete aircraft or propulsion systems overhaul and rebuilding (i.e., periodic restoration of aircraft to original design specifications).
336411	Aircraft Manufacturing This U.S. industry comprises establishment primarily engaged in (1) manufacturing aircraft parts or auxiliary equipment (except engines and aircraft fluid power subassemblies) and/or (2) developing and making prototypes of aircraft parts and auxiliary equipment. Auxiliary equipment includes such items as crop dusting apparatus, armament racks, inflight refueling equipment, and external fuel tanks.
336412	Aircraft Engine and Engine Parts Manufacturing This U.S. industry comprises establishments primarily engaged in one or more of the following: (1) manufacturing aircraft engines and engine parts; (2) developing and making prototypes of aircraft engines and engine parts; (3) aircraft propulsion system conversion (i.e., major modifications to systems); and (4) aircraft propulsion systems overhaul and rebuilding (i.e., periodic restoration of aircraft propulsion system to original design specifications).
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing This U.S. industry comprises establishment primarily engaged in (1) manufacturing aircraft parts or auxiliary equipment (except engines and aircraft fluid power subassemblies) and/or (2) developing and making prototypes of aircraft parts and auxiliary equipment. Auxiliary equipment includes such items as crop dusting apparatus, armament racks, inflight refueling equipment, and external fuel tanks.



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Exhibit 1: NAICS Codes Relevant to Aviation Employment (continued)

481	Air Transportation
4811	Scheduled Air Transportation
48111	Scheduled Air Transportation
481111	Scheduled Passenger Air Transportation This U.S. industry comprises establishments primarily engaged in providing air transportation of passengers or passengers and freight over regular routes and on regular schedules. Establishments in this industry operate flights even if partially loaded. Scheduled air passenger carriers including commuter and helicopter carriers (except scenic and sightseeing) are included in this industry.
481112	Scheduled Freight Air Transportation This U.S. industry comprises establishments primarily engaged in providing air transportation of cargo without transporting passengers over regular routes and on regular schedules. Establishments in this industry operate flights even if partially loaded. Establishments primarily engaged in providing scheduled air transportation of mail on a contract basis are included in this industry.
4812	Nonscheduled Air Transportation
48121	Nonscheduled Air Transportation
481211	Nonscheduled Chartered Passenger Air Transportation This U.S. industry comprises establishments primarily engaged in providing air transportation of passengers or passengers and cargo with no regular routes and regular schedules.
481212	Nonscheduled Chartered Freight Air Transportation This U.S. industry comprises establishments primarily engaged in providing air transportation of cargo without transporting passengers with no regular routes and regular schedules.
481219	Other Nonscheduled Air Transportation This U.S. industry comprises establishments primarily engaged in providing air transportation with no regular routes and regular schedules (except nonscheduled chartered passenger and/or cargo air transportation). These establishments provide a variety of specialty air transportation or flying services based on individual customer needs using general purpose aircraft.
488	Support Activities for Transportation
4881	Support Activities for Air Transportation
48811	Airport Operations
488111	Air Traffic Control This U.S. industry comprises establishments primarily engaged in providing air traffic control services to regulate the flow of air traffic.
488119	Other Airport Operations This U.S. industry comprises establishments primarily engaged in (1) operating international, national, or civil airports, or public flying fields or (2) supporting airport operations, such as rental of hangar space, and providing baggage handling and/or cargo handling services.
48819	Other Support Activities for Air Transportation
488190	Other Support Activities for Air Transportation This industry comprises establishments primarily engaged in providing specialized services for air transportation (except air traffic control and other airport operations).

Source: www.bls.gov/data



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D. EMPLOYMENT DATA

Exhibits 2, 3, and 4 contain the annual tabulation of detailed aviation employment for 2007 and comparative data with among the U.S., Texas and North Central Texas regions. Data for years 2004 through 2007 is included in Appendix B, C and D. Besides employment, the data includes the number of employers, and total wages for each NAICS category. Average weekly and annual wages were derived from the employment and total wage data.

Exhibit 2 presents national aviation employment by NAICS codes. On average, employment in the aviation industry represents 0.83 percent of the total U.S. employment, whereas aviation employers represent only 0.18 percent of the country's total employers. Average annual wages for aviation employment is consistently 17 percent higher than average U.S. wages, an indication that aviation employment involves higher paying jobs.

Exhibit 2: National Aviation Employment Characteristics

2007 U.S. Employment						
NAICS Code	Description	Employers	Employment	Total Wages	Avg/Week	Avg/Annual
336411	Aircraft Manufacturing	706	232,919	19,325,635,799	1,596	82,971
336412	Aircraft Engine and Engine Parts Manufacturing	621	85,024	6,309,642,615	1,427	74,210
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing	1,366	97,343	5,924,571,200	1,170	60,863
481111	Scheduled Passenger Air Transportation	2,277	432,449	25,789,230,086	1,147	59,635
481112	Scheduled Freight Air Transportation	726	12,225	690,610,954	1,086	56,492
481211	Nonscheduled Chartered Passenger Air Transportation	2,314	35,450	2,254,683,779	1,223	63,602
481212	Nonscheduled Chartered Freight Air Transportation	583	7,835	448,952,230	1,102	57,301
481219	Other Nonscheduled Air Transportation	423	3,366	166,184,391	949	49,371
488111	Air Traffic Control	718	25,403	1,997,113,945	1,512	78,617
488119	Other Airport Operations	2,056	93,071	3,178,939,303	657	34,156
488190	Other Support Activities for Air Transportation	4,466	91,832	4,453,147,668	933	48,492
Total U.S. Aviation		16,256	1,116,917	70,538,711,970	1,164	60,519
Total U.S. Employment		8,971,897	135,366,106	6,018,089,108,081	855	44,458
AvJobs as % of U.S. Total		0.18%	0.83%	1.17%		1.17%

Source: www.bls.gov/data



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Texas employment characteristics are presented in Exhibit 3. Aviation employment represents a significant higher percentage of total Texas employment (1.34 percent) while only 0.24 percent of employers fall within the aviation employment categories. Average annual wages for aviation employment are 34 percent higher than average total wages, and are slightly higher than U.S. employment (2.2 percent). Over 8 percent of aviation employers are located in Texas and include 12.2 percent of U.S. aviation jobs.

Exhibit 3: Texas Aviation Employment Characteristics

2007 TX Employment						
NAICS Code	Description	Employers	Employment	Total Wages	Avg/Week	Avg/Annual
336411	Aircraft Manufacturing	105	34,973	2,822,967,882	1,552	80,718
336412	Aircraft Engine and Engine Parts Manufacturing	48	5,213	277,482,045	1,024	53,229
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing	95	9,034	674,969,295	1,437	74,714
481111	Scheduled Passenger Air Transportation	130	56,528	3,786,825,609	1,288	66,990
481112	Scheduled Freight Air Transportation	59	740	40,261,091	1,046	54,407
481211	Nonscheduled Chartered Passenger Air Transportation	168	5,224	309,072,055	1,138	59,164
481212	Nonscheduled Chartered Freight Air Transportation	104	1,766	89,204,825	971	50,512
481219	Other Nonscheduled Air Transportation	38	1,033	21,990,239	409	21,288
488111	Air Traffic Control	26	1,843	253,329,532	2,643	137,455
488119	Other Airport Operations	123	5,000	120,637,869	464	24,128
488190	Other Support Activities for Air Transportation	480	15,248	883,701,208	1,115	57,955
Total TX Aviation		1,376	136,602	9,280,441,650	1,190	61,869
Total TX Employment		569,541	10,231,906	457,310,432,773	860	44,695
AvJobs as % of TX Total		0.24%	1.34%	2.03%	138.43%	138.43%
TX Total as % of U.S. Total		6.35%	7.56%	7.60%	100.53%	100.53%
TX Avjobs as % of U.S. Avjobs		8.46%	12.23%	13.16%	102.23%	102.23%

Source: www.bls.gov/data



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The BLS data for regional aviation employment characteristics is inconsistent and incomplete, but Exhibit 4 still provides some meaningful information regarding certain North Central Texas aviation employment categories. For NAICS Code “33641 - Aerospace Product and Parts Manufacturing”, the data is complete and demonstrates that employment is significant (nearly 35,000 jobs) with commensurately higher annual wages than U.S. and state wages. Regional employment data for NAICS Code “481111 - Scheduled Passenger Air Transportation” is only available for 2007; this, however, shows 42 employers with employment at nearly 31,600 positions.

Exhibit 4: North Central Texas Regional Aviation Employment Characteristics

2007 Regional Employment						
NAICS Code	Description	Employers	Employment	Total Wages	Avg/Week	Avg/Annual
336411	Aircraft Manufacturing	50	25,138	2,170,950,153	1,661	86,361
336412	Aircraft Engine and Engine Parts Manufacturing	20	1,453	96,193,166	1,273	66,203
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing	60	7,968	631,535,420	1,524	79,259
481111	Scheduled Passenger Air Transportation	42	31,598	2,219,118,782	1,351	70,230
481112	Scheduled Freight Air Transportation	14	311	17,314,061	1,071	55,672
481211	Nonscheduled Chartered Passenger Air Transportation	53	1,138	77,841,922	1,315	68,402
481212	Nonscheduled Chartered Freight Air Transportation	25	-	-		
481219	Other Nonscheduled Air Transportation	13	-	-		
488111	Air Traffic Control	1	-	-		
488119	Other Airport Operations	34	-	-		
488190	Other Support Activities for Air Transportation	170	4,412	273,993,838	1,194	62,102
Total Regional Aviation		482	72,018	5,486,947,342	1,341	69,747
Total Regional Employment		148,221	2,882,016	143,026,185,616	954	49,627
AvJobs as % of Regional Total		0.33%	2.50%	3.84%	140.54%	140.54%
Regional Total as % of TX Total		26.02%	28.17%	31.28%	111.04%	111.04%
Regional Avjobs as % of U.S. Avjobs		2.97%	6.45%	7.78%	115.25%	115.25%

Source: www.bls.gov/data

Exhibit 5 presents comparative data on national, state and regional aviation employment growth. U.S. aviation employment has risen 3 percent during the 2004-2007 period, with the greatest gains in aircraft manufacturing (11%), other parts and equipment manufacturing (18.8 %) and other support activities for air transportation (19.3%). The greatest declines were in air traffic control (32.3%), and scheduled passenger air transportation (5.5%). The significant decline in air traffic control may be partially explained by the completion in the transition in staffing Flight Service Stations (FSS) with contractors instead of federal employees.



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Exhibit 5: Regional/State/National Aviation Employment Growth Characteristics

Regional Aviation Employment Growth						2004-2007	
NAICS	Description	2004	2005	2006	2007	Employees	Net Change
336411	Aircraft Manufacturing	25,367	25,975	26,009	25,138	(229)	-0.9%
336412	Aircraft Engine and Engine Parts Manufacturing	1,422	1,470	1,354	1,453	31	2.2%
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing	7,606	7,957	8,327	7,968	362	4.8%
481111	Scheduled Passenger Air Transportation	-	-	-	31,598		
481112	Scheduled Freight Air Transportation	589	-	-	311		-47.2%
481211	Nonscheduled Chartered Passenger Air Transportation	1,024	1,040	1,033	1,138	114	11.1%
481212	Nonscheduled Chartered Freight Air Transportation	864	-	-	-		n/m
481219	Other Nonscheduled Air Transportation	-	-	25	-		n/m
488111	Air Traffic Control	-	-	-	-		
488119	Other Airport Operations	-	-	-	-		
488190	Other Support Activities for Air Transportation	3,467	3,858	4,319	4,412	945	27.3%
Total		40,339	40,300	41,067	72,018	1,223	n/m
Texas Aviation Employment Growth						2004-2007	
NAICS	Description	2004	2005	2006	2007	Employees	Net Change
336411	Aircraft Manufacturing	33,903	34,940	35,499	34,973	1,070	3.2%
336412	Aircraft Engine and Engine Parts Manufacturing	4,030	5,055	5,067	5,213	1,183	29.4%
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing	8,505	8,954	9,388	9,034	529	6.2%
481111	Scheduled Passenger Air Transportation	58,809	55,444	55,493	56,528	(2,281)	-3.9%
481112	Scheduled Freight Air Transportation	882	736	709	740	(142)	-16.1%
481211	Nonscheduled Chartered Passenger Air Transportation	4,532	4,777	4,964	5,224	692	15.3%
481212	Nonscheduled Chartered Freight Air Transportation	1,663	1,729	1,734	1,766	103	6.2%
481219	Other Nonscheduled Air Transportation	1,051	1,030	1,027	1,033	(18)	-1.7%
488111	Air Traffic Control	1,972	1,837	1,836	1,843	(129)	-6.5%
488119	Other Airport Operations	5,275	4,859	5,280	5,000	(275)	-5.2%
488190	Other Support Activities for Air Transportation	12,393	13,938	14,696	15,248	2,855	23.0%
Total		133,015	133,299	135,693	136,602	3,587	2.7%



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Exhibit 5: Regional/State/National Aviation Employment Growth Characteristics (continued)

US Aviation Employment Growth						2004-2007	
NAICS	Description	2004	2005	2006	2007	Employees	Net Change
336411	Aircraft Manufacturing	209,884	214,096	224,509	232,919	23,035	11.0%
336412	Aircraft Engine and Engine Parts Manufacturing	78,354	81,607	83,783	85,024	6,670	8.5%
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing	81,929	86,845	91,194	97,343	15,414	18.8%
481111	Scheduled Passenger Air Transportation	457,848	441,992	424,712	432,449	(25,399)	-5.5%
481112	Scheduled Freight Air Transportation	12,315	12,946	12,452	12,225	(90)	-0.7%
481211	Nonscheduled Chartered Passenger Air Transportation	33,750	34,865	34,065	35,450	1,700	5.0%
481212	Nonscheduled Chartered Freight Air Transportation	7,182	7,601	7,695	7,835	653	9.1%
481219	Other Nonscheduled Air Transportation	3,127	3,054	3,215	3,366	239	7.6%
488111	Air Traffic Control	37,506	36,293	28,680	25,403	(12,103)	-32.3%
488119	Other Airport Operations	85,425	86,879	90,884	93,071	7,646	9.0%
488190	Other Support Activities for Air Transportation	76,985	84,236	88,262	91,832	14,847	19.3%
Total		1,084,305	1,090,414	1,089,451	1,116,917	32,612	3.0%

Notes: n/m - not meaningful
Source: www.bls.gov/data

Texas aviation employment has also increased in the 2004-2007 period. With a net increase of nearly 3,600 employees, the greatest gains were in aircraft and parts manufacturing and support activities for air transportation. The most significant decrease was in scheduled passenger transportation.

Again, the lack of complete regional data prevents a detailed evaluation on growth though employment growth appears to reflect the trends of both the U.S. and Texas. While aircraft manufacturing is down (0.9%), the “other” categories for manufacturing and air transportation have grown during the 2004-2007 period. The region received an additional 1,223 employees for those categories, according to reporting data.

Additional data, specific to the airline industry, is available to the public from the U.S. Bureau of Transportation Statistics (BTS). Airlines are required to report employment levels by area of responsibility. Exhibit 6 presents historical airline employment for the 2004-2008 period and demonstrates that employment has declined 4.5 percent over the past five years. In the last two years (2007-2008), employment declined 3.1 percent which is indicative of current economic conditions.



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Exhibit 6: Airline Employment

						Period Growth Rate	Current Growth Rate
Description	2004	2005	2006	2007	2008	(2004-2008)	(2007-2008)
General Manager	7,332	7,787	7,198	7,479	7,783	6.2%	3.9%
Pilots & Co-Pilots	73,395	76,078	75,737	74,812	75,715	3.2%	1.2%
Other Flight Personnel	1,794	2,309	2,081	1,742	1,344	-25.1%	-29.6%
Passenger/General Services & Administration	95,079	93,904	94,466	96,057	92,772	-2.4%	-3.5%
Maintenance	57,689	52,894	52,538	52,616	54,036	-6.3%	2.6%
Aircraft & Traffic Handling	1,193	1,369	3,253	487	729	-38.9%	33.2%
General Aircraft & Traffic Handling	65,539	62,255	37,408	35,466	42,789	-34.7%	17.1%
Aircraft Control	6,409	4,897	5,046	6,532	6,610	3.1%	1.2%
Passenger Handling	77,916	70,645	92,795	101,491	93,865	20.5%	-8.1%
Cargo Handling	40,526	42,012	37,499	37,651	36,636	-9.6%	-2.8%
Trainees & Instructor	4,234	3,721	3,590	4,655	3,528	-16.7%	-31.9%
Statistical	22,152	20,889	19,803	20,749	19,580	-11.6%	-6.0%
Traffic Solicitors	8,887	8,567	8,032	7,879	7,328	-17.5%	-7.5%
Other	38,322	36,120	34,012	35,425	34,436	-10.1%	-2.9%
Transport Related	84,434	92,746	91,672	92,960	89,345	5.8%	-4.0%
Total	584,819	576,194	565,134	576,005	558,491	-4.5%	-3.1%

Source: U.S. Bureau of Transportation Statistics

Aviation Job Descriptions

Because of the dynamic nature of the aviation industry, there is a plethora of aviation jobs that the task of collecting descriptions could be overwhelming. At the same time, the industry is distinctly divided into public and private sectors which presents challenges, particularly regarding private sector industry (i.e, aircraft manufacturing) which does not generally provide public access to detailed employment practices. On the other hand, public sector jobs (i.e, airport management, air traffic control) are transparent, both with description of various jobs and typical wage information.

In addition, typical career paths followed by those employed in the public/private sectors appear to be significantly different. Public sector aviation employment tends to provide entry level positions specifically targeted for technical knowledge and an identifiable path for advancement to the next level of responsibility. Private sector employment is more diverse and subject to unpredictable business decisions of individual businesses. For example, airline management (other than for pilots) tend to have entry level positions starting with basic operational responsibilities (e.g., ramp operations, customer service representative, etc.). One rationale for this approach is how the culture of an organization holds that management level staff must understand the “business” by starting at the bottom and working upwards into increasing levels of responsibilities. (See Appendix E for airline career path examples).



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Openly advertised airline positions generally require a graduate level education such as a Master's of Business Administration, combined with a specific level of experience. Aircraft manufacturing appears to have a similar approach toward entry level employment although skilled labor (e.g., aircraft mechanics, avionics technicians, etc.) can be observed moving upwards through the ranks into management positions.

While these are not absolutes, the situation presents a difficulty in identifying detailed job descriptions relevant to college graduate entry level career positions. For the descriptions that could be identified, Appendix F contains a list of typical positions that illustrate the general responsibilities, required knowledge and skills and other information. It is important to note that many of these job descriptions may require some specific knowledge about aviation but do not appear to require an aviation-specific education.

The diversity among aviation sectors and jobs is also reflected in relative pay ranges, Appendix G illustrates the range of annual salaries and hourly wages for a variety of different jobs currently available on the market. A cursory review of data tends to corroborate the BLS data suggesting aviation jobs enjoy a higher level of compensation compared to jobs in non-aviation sectors.



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APPENDIX A

Career Guide to Industries - Air Transportation

Source: Bureau of Labor Statistics, U.S. Department of Labor, Career Guide to Industries, 2008-09 Edition, Air Transportation, www.bls.gov/oco/cg/cgs016.htm (visited July 06, 2009).

CAREER GUIDE TO INDUSTRIES - AIR TRANSPORTATION

U.S. Bureau of Labor Statistics

Significant Points

- * Although flight crews-pilots and flight attendants-are the most visible occupations, the vast majority of the industry's employees work in ground occupations.
- * Senior pilots for major airlines are among the highest paid workers in the Nation.
- * A bachelor's degree is increasingly required or preferred for most pilot and flight attendant jobs.
- * Job prospects generally are better in regional and low-cost carriers than in major airlines, where competition for many jobs is keen; a unique benefit-free or reduced-fare transportation for airline employees and their immediate families-attracts many jobseekers.

Nature of the Industry

Goods and services. From 2001 to 2004, a series of major global and economic events resulted in air transportation industry employment remaining below its 2001 level. During this period, the industry endured a recession, terror attacks, and concerns about pandemics. The impact of these events was especially devastating to the major airlines. However, air travel remains one of the most popular modes of transportation, expanding from 172 million passengers in 1970 to 741 million in 2006, an average growth of 4 percent per year.

Industry organization. Airlines transport passengers and freight over regularly scheduled routes or on routes, called "charters," specifically designed for a group of travelers or a particular cargo. Several classes of airlines function in the United States. As of 2006, there were 33 mainline air carriers that use large passenger jets (more than 90 seats); 81 regional carriers that use smaller piston, turboprop, and regional aircraft (up to 90 seats); and 25 all-cargo carriers.

Seven of the mainline carriers are known as network carriers, which have a "hub" and also fly internationally. A hub is a centrally located airport designated by an airline to receive a large number of its flights from many locations, and where passengers can transfer to flights destined for points served by the airline's system. In this way, the airline serves the greatest number of passengers, from as many locations as possible, in the most efficient manner.

The mainline group also includes seven low-cost carriers. These carriers generally don't have a hub and only offer flights between a limited numbers of cities. In the past, low-cost carriers focused primarily on transporting leisure passengers on routes less than 400 miles and had a reputation for "no frills" service. At present, low-cost carriers are expanding their routes to

include longer transcontinental and nonstop flights with in-flight service that parallels their competition. These moves have helped low-cost carriers expand their customer base to include more business travelers. Low-cost carriers are the fastest growing segment of commercial aviation, flying one out of every four domestic passengers.

Another type of passenger airline carrier is the regional carrier. In 2006, there were approximately 81 of these carriers. Regional airlines operate short-haul and medium-haul scheduled airline service with an emphasis on connecting smaller communities with larger cities and hubs. Some of the largest regional carriers are subsidiaries of the major airlines, but most are independently owned, often contracting their services to the majors.

Air cargo is another segment of the airline industry. As of 2006, there were 25 of these carriers. Cargo can be carried in cargo holds of passenger airlines or on aircraft designed exclusively to carry freight. Cargo carriers in the air transportation industry do not provide door-to-door service. Instead, they provide only air transport from an airport near the cargo's origin to an airport near the cargo's destination. Companies that provide door-to-door delivery of parcels, either across town or across the continent, are classified in the couriers and messengers industry.

Recent developments. After the tragic events of September 11, 2001, passenger traffic dropped sharply, causing airlines to slash flights, lay off employees, and park surplus aircraft. During the ensuing years, most of the network carriers restructured operations, with four out of seven seeking bankruptcy protection. At the end of 2006, only two of the network carriers remained in bankruptcy. Since 2000, network carriers have reduced domestic capacity by 21 percent, while low-cost and regional carriers have increased capacity by 57 and 141 percent, respectively. While the industry as a whole was on track to post an operating profit in 2006, record-high fuel prices made this target elusive for the sixth consecutive year.

Demand for air travel is expected to continue into the future. Growth in the more mature domestic markets is expected to be moderate, while travel between the U.S. and foreign points is expected to be moderate to strong. International travel will be spurred by the emerging economies in and around Asia, and by liberal regulations that allow U.S. carriers to fly to more foreign destinations.

The airline industry faces many challenges in the future. Airlines must focus on cost control, cash preservation, and cautious growth. In the long run, a strong national economy, inexpensive tickets, and increasing demand for seats aboard aircraft should bode well for the industry and consumers.

Working Conditions

Hours. Airlines operate flights at all hours of the day and night. As a result, many workers have irregular hours or variable work schedules. Flight and ground personnel, including mechanics and reservation and transportation ticket agents, may have to work at night or on weekends or holidays. Flight personnel may be away from their home bases frequently. When they are away from home, the airlines provide them with hotel accommodations, transportation between the hotel and airport, and an allowance for meals and expenses. Flight attendants typically fly from 65 to 85 hours a month. In addition to flight time, they have about 50 hours a month of duty time between flights.

Work environment. Working conditions in air transportation vary widely, depending on the occupation. Most employees work in fairly comfortable surroundings, such as offices, terminals, or airplanes. However, mechanics and others who service aircraft are subject to excessive noise, dirt, and grease and sometimes work outside in bad weather.

In 2006, the air transportation industry had 9.9 injuries and illnesses per 100 full-time workers, compared with 4.4 throughout private industry. Virtually all work-related fatalities resulted from transportation accidents.

Flight crews, especially those on international routes, often suffer jet lag-disorientation and fatigue caused by flying into different time zones. Because employees must report for duty well rested, they must allow ample time to rest during their layovers.

Employment

The air transportation industry provided 487,000 wage and salary jobs in 2006.

Most employment is found in larger establishments-nearly 2 out of 3 jobs are in establishments with 1,000 or more workers. However, 93 percent of all establishments in the industry employ fewer than 100 workers.

Employment in air transportation is heavily concentrated in establishments with 1,000 or more employees, which provide nearly two-thirds of all jobs.

Most air transportation jobs are at large airports that are located close to cities and that serve as hubs for major airlines.

Occupations in the Industry

Office and administrative support occupations and installation, maintenance, and repair occupations. Although pilots and flight attendants are the most visible occupations in this industry, nearly 44 percent of all employees in air transportation work in office and administrative support occupations and installation, maintenance, and repair occupations (table 1). The two largest occupations in these occupational groups are reservation and transportation ticket agents and travel clerks and aircraft mechanics and service technicians.

Aircraft mechanics and service technicians service, inspect, and repair planes. They may work on several different types of aircraft, such as jet transports, small propeller-driven airplanes, or helicopters. Many mechanics and technicians specialize, working on the airframe (the body of the aircraft) or the powerplant (the engines) or avionics (the parts of an aircraft that depend on electronics, such as navigation and communication equipment). In small, independent repair shops, they usually inspect and repair many different types of aircraft.

Some mechanics and technicians specialize in scheduled maintenance required by the Federal Aviation Administration (FAA). Following a schedule based on the number of hours flown, calendar days, cycles of operation, or a combination of these factors, mechanics inspect the engines, landing gear, instruments, and other parts of aircraft and perform necessary maintenance and repairs.

A reservation and transportation ticket agent is most often the first employee that passengers meet after entering the airport. Ticket agents work at airport ticket counters and boarding gates and use computers to provide customer service to incoming passengers. They make and confirm reservations, sell tickets, and issue boarding passes. They also may work in call centers, answering phone inquiries about flight schedules and fares, verifying reservations, issuing tickets, and handling payments. Customer service representatives assist passengers, check tickets when passengers board or disembark from an airplane, and check luggage at the reception area and ensure that it is placed on the proper carrier. They assist elderly or handicapped persons and unaccompanied children in claiming personal belongings and baggage, and in getting on and off the plane. They also may provide assistance to passengers who become ill or injured.

Other ground occupations include airplane cargo agents, baggage handlers, and aircraft cleaners. Airplane cargo agents take orders from shippers and arrange for transportation of their goods. Baggage handlers, classified under laborers and freight, stock, and material movers, hand, are responsible for loading and unloading passengers' baggage. They stack baggage on specified carts or conveyors to see that it gets to the proper destination and also return baggage to passengers at airline terminals. Aircraft cleaners clean aircraft interiors after each flight.

Transportation and material moving occupations and service occupations. Flight crewmembers make up 36 percent of air transportation employment, and include pilots and flight attendants. Airline pilots, copilots, and flight engineers are highly trained professionals who fly and navigate jet and turboprop airplanes. Generally, the most experienced pilot, or captain, is in command and supervises all other crewmembers. The pilot and copilot split flying and other duties, such as communicating with air traffic controllers and monitoring the instruments. Some aircraft have a third pilot in the cockpit-the flight engineer or second officer-who assists the other pilots by monitoring and operating many of the instruments and systems and watching for other aircraft. Most new aircraft are designed to be flown without a flight engineer. Small aircraft and helicopters that transport passengers and cargo and perform activities such as crop-dusting, monitoring traffic, firefighting, and rescue missions are flown and navigated by commercial pilots.

Airline flights must have one or more flight attendants on board, depending on the number of passengers. The attendants' most important function is assisting passengers in the event of an emergency. This may range from reassuring passengers during occasional encounters with strong turbulence to opening emergency exits and inflating escape chutes. More routinely, flight attendants instruct passengers in the use of safety and emergency equipment. Once in the air, they serve meals and snacks, answer questions about the flight, distribute magazines and pillows, and help care for small children and elderly and disabled persons. They also may administer first aid to passengers who become ill.

Other occupations. The airline industry also relies on many management, professional, and administrative support workers to keep operations running smoothly.

Training and Advancement

The skills and experience needed by workers in the air transportation industry differ by occupation. Some jobs may be entered directly from high school, while others require specialized training. Most positions in the airline industry involve extensive customer service contact, requiring strong interpersonal and communication skills. Mechanics and pilots require specialized formal training and must be certified by the FAA. A bachelor's degree is increasingly required or preferred for most pilot and flight attendant jobs. Skills for many other air transportation occupations can be learned on the job or through company-sponsored training.

Office and administrative support occupations and installation, maintenance, and repair occupations. When hiring aircraft mechanics, employers prefer graduates of aircraft mechanic trade schools, particularly those who gained experience in the military and are certified. Additionally, employers prefer mechanics who are in good physical condition and able to perform a variety of tasks. After being hired, aircraft mechanics must keep up to date on the latest technical changes and improvements in aircraft and associated systems. Most mechanics

remain in the maintenance field, but they may advance to lead mechanic and, sometimes, to crew chief or shop supervisor.

A good speaking voice and a pleasant personality are essential for reservation and transportation ticket agents and customer service representatives. Airlines prefer applicants with experience in sales or in dealing with the public, and most require a high school education, although some college is preferred. Formal company training is required to learn how to operate airline computer systems, issue tickets, and plan trips. Agents and service representatives usually are promoted through the ranks. For example, an experienced ticket agent may advance to lead worker on the shift. Agents who obtain additional skills, experience, and training improve their chances for advancement, although a college degree may be required for some administrative positions.

Some entry-level jobs in this industry, such as baggage handler and aircraft cleaner, require little or no previous training. The basic tasks associated with many of these jobs are learned in less than a week, and most newly hired workers are trained on the job under the guidance of an experienced employee or a manager. However, advancement opportunities for many ground occupations are limited because of the narrow scope of duties and specialized skills necessary for other occupations. Some may advance to supervisor or to another administrative position.

Transportation and material moving occupations and service occupations. Pilots must have a commercial pilot's license with an instrument rating, a medical certificate, and certification to fly the types of aircraft that their employer operates. For example, helicopter pilots must hold a commercial pilot's certificate with a helicopter rating. Pilots receive their flight training from the military or from civilian flying schools. Physical requirements are strict. A medical exam, from an FAA-designated physician, must be taken to get a medical certificate. With or without glasses, pilots must have 20/20 vision and good hearing and be in excellent health. In addition, airlines generally require 2 years of college and increasingly prefer or require a college degree. Pilots who work for smaller airlines may advance to flying for larger companies. They also can advance from flight engineer to copilot to captain and, by becoming certified, to flying larger planes.

Applicants for flight attendant jobs must be in excellent health. Employers increasingly prefer applicants who have a college degree and experience in dealing with the public. Speaking a foreign language also is an asset. Airlines operate flight attendant training programs on a continuing basis. Training usually lasts from 4 to 8 weeks, depending on the size and the type of carrier, and may include crew resource management, which emphasizes teamwork and safety. Courses also are provided in personal grooming and weight control. After completing initial training, flight attendants must go through additional training, where they obtain certification, and pass an FAA safety exam each year in order to continue flying. Advancement opportunities are limited, although some attendants become customer service directors, instructors, or recruiting representatives.

Outlook

Job prospects generally are better in regional and low-cost carriers than in major airlines, where competition for many jobs is keen; a unique benefit-free or reduced-fare transportation for airline employees and their immediate families-attracts many jobseekers.

Employment change. Wage and salary jobs in the air transportation industry are projected to increase by 7 percent over the 2006-16 period, compared with 11 percent for all industries combined. However, the number of job openings may vary from year to year, because the demand for air travel-particularly pleasure travel, a discretionary expense-fluctuates with ups and downs in the economy. In the long run, passenger and cargo traffic is expected to continue expanding in response to increases in population, income, and business activity. Job prospects will continue to be better in regional and low-cost carriers than in major airlines, where competition for many jobs is keen.

Demographic and income trends indicate favorable conditions for leisure travel in the United States and abroad over the next decade. The aging of the population, in combination with growth of disposable income among older people, should continue to increase the demand for air transportation services. Also, business travel has and will continue to improve as the U.S. economy and world trade expand, companies continue to go global, and the economies in many foreign countries become more robust. However, as businesses also try to reduce costs, they are resorting to cheaper alternatives to flying and finding new ways to communicate. Many business travelers are using other means of transportation-for example, automobile or train-and are conducting more business by phone, e-mail, and better and lower-cost videoconferencing technologies.

International cargo traffic is expected to continue to increase with the economy and growing world trade. It also should be stimulated by the development of global electronic commerce and manufacturing trends such as just-in-time delivery, which requires materials to be shipped rapidly. Other factors contributing to growth include the increase in international trade from open skies agreements-which set ground rules for international aviation markets and minimize government intervention-and the expanded use of all-cargo carriers by the U.S. Postal Service to transport mail. Growth of domestic air cargo traffic is not expected to increase as much as international cargo, primarily because of the increased use of mail and the rise of time-definite trucking. Increasingly, shipments will be sent via trucks, as opposed to aircraft, because trucks are reliable, can be monitored through Global Positioning System (GPS) technology, and are more cost-effective.

Employment growth will differ among the various occupations in the air transportation industry. Employment of aircraft pilots and flight engineers will continue to grow primarily because of increasing demand for leisure and business air travel, population growth, and an expanding economy.

Employment of flight attendants is expected to grow as an improving economy and population growth boost the number of airline passengers, and as airlines expand their capacity to meet rising demand by increasing the number and size of planes in operation.

Similar to other air transportation occupations, aircraft and avionics equipment mechanics and service technicians should have their best chance for landing a job at smaller commuter and regional airlines, primarily because of the relatively lower wages. However, advances in technology are increasing productivity of mechanics, limiting job growth. Employment growth also will be sporadic and follow closely with changes in the economy. When the economy is slow, airlines reduce the number of flights, resulting in less demand for aircraft maintenance and, thus, less demand for mechanics.

The number of reservation and transportation ticket agents will grow more slowly than the overall industry as airlines outsource jobs to lower-wage countries, such as India, in order to cut costs, and as more airlines phase out paper tickets and allow passengers to purchase electronic tickets over the Internet. However, the safety and security responsibilities of these jobs will continue to increase, thereby preventing job declines.

Job prospects. Job opportunities in the air transportation industry are expected to vary depending on the occupation. Opportunities for aircraft pilots and flight engineers are expected to be best with the faster growing regional and low-cost carriers. College graduates and former military pilots can expect to have the best job prospects. Opportunities will continue to exist for those pilots who choose to work for air-cargo carriers because of the increase in global freight demand.

Job opportunities for flight attendants will vary by setting. Competition for job opportunities at major airlines is expected to be keen because of the few jobs that are available. Opportunities are expected to be best with the faster growing regional and commuter, low-cost, and charter airlines. Job opportunities for flight attendants also will arise in the corporate jet sector, where flight attendants cater to a high-end clientele. Finally, turnover among flight attendants will produce additional job opportunities as many workers leave for occupations that offer more stable work schedules or better salaries.

Opportunities should be excellent for aircraft and avionics equipment mechanics and service technicians, reflecting the likelihood of fewer entrants from the military and a large number of retirements. Job opportunities at smaller airports are expected to be best as experienced mechanics transfer to positions at major airlines. Meanwhile, competition for mechanic jobs is expected to be keen at major airlines because of their relatively higher wages and travel benefits. Applicants who have experience and who keep abreast of the latest technological advances in electronics and composite materials should have the best opportunities.

Competition for reservation and transportation ticket agent jobs will continue to be keen as the number of applicants continues to exceed the number of job openings. Entry requirements are few, and many people seeking to enter the travel business start in these types of jobs. Also,

people are attracted to this occupation because it provides excellent travel benefits. Some job opportunities will occur as agents transfer to other occupations or retire.

Opportunities also are expected to be good for those seeking lesser skilled, entry-level positions, such as baggage handler and aircraft cleaner, because many workers leave these jobs and need to be replaced.

Earnings

Benefits and union membership. Most employees in the air transportation industry receive standard benefits, such as paid vacation and sick leave; life and health insurance; and often profit-sharing and retirement plans. Some airlines provide allowances to employees for purchasing and cleaning their company uniforms. A unique benefit-free or reduced-fare transportation for airline employees and their immediate families-attracts many jobseekers.

In 2006, more than half of all workers in the air transportation industry were union members or were covered by union contracts, compared with 13 percent of workers throughout the economy.



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Appendix B: National Aviation Employment Characteristics 2004-2007

2007 U.S. Employment						
NAICS Code	Description	Employers	Employment	Total Wages	Avg/Week	Avg/Annual
336411	Aircraft Manufacturing	706	232,919	19,325,635,799	1,596	82,971
336412	Aircraft Engine and Engine Parts Manufacturing	621	85,024	6,309,642,615	1,427	74,210
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing	1,366	97,343	5,924,571,200	1,170	60,863
481111	Scheduled Passenger Air Transportation	2,277	432,449	25,789,230,086	1,147	59,635
481112	Scheduled Freight Air Transportation	726	12,225	690,610,954	1,086	56,492
481211	Nonscheduled Chartered Passenger Air Transportation	2,314	35,450	2,254,683,779	1,223	63,602
481212	Nonscheduled Chartered Freight Air Transportation	583	7,835	448,952,230	1,102	57,301
481219	Other Nonscheduled Air Transportation	423	3,366	166,184,391	949	49,371
488111	Air Traffic Control	718	25,403	1,997,113,945	1,512	78,617
488119	Other Airport Operations	2,056	93,071	3,178,939,303	657	34,156
488190	Other Support Activities for Air Transportation	4,466	91,832	4,453,147,668	933	48,492
Total U.S. Aviation		16,256	1,116,917	70,538,711,970	1,164	60,519
Total U.S. Employment		8,971,897	135,366,106	6,018,089,108,081	855	44,458
AvJobs as % of U.S. Total		0.18%	0.83%	1.17%		1.17%
2006 U.S. Employment						
NAICS Code	Description	Employers	Employment	Total Wages	Avg/Week	Avg/Annual
336411	Aircraft Manufacturing	659	224,509	18,910,590,331	1,620	84,231
336412	Aircraft Engine and Engine Parts Manufacturing	615	83,783	5,971,063,986	1,371	71,268
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing	1,356	91,194	5,289,947,163	1,116	58,008
481111	Scheduled Passenger Air Transportation	2,280	424,712	23,059,926,241	1,044	54,295
481112	Scheduled Freight Air Transportation	691	12,452	667,824,108	1,031	53,632
481211	Nonscheduled Chartered Passenger Air Transportation	2,203	34,065	2,057,734,071	1,162	60,406
481212	Nonscheduled Chartered Freight Air Transportation	588	7,695	406,881,825	1,017	52,876
481219	Other Nonscheduled Air Transportation	385	3,215	134,018,124	802	41,685
488111	Air Traffic Control	780	28,680	2,280,510,947	1,529	79,516
488119	Other Airport Operations	2,032	90,884	2,991,636,791	633	32,917
488190	Other Support Activities for Air Transportation	4,314	88,262	4,106,891,506	895	46,531
Total U.S. Aviation		15,903	1,089,451	65,877,025,093	1,111	57,760
Total U.S. Employment		8,784,027	133,833,834	5,692,569,465,496	818	42,535
AvJobs as % of U.S. Total		0.18%	0.81%	1.16%		1.17%



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Appendix B: National Aviation Employment Characteristics 2004-2007 (continued)

2005 U.S. Employment						
NAICS Code	Description	Employers	Employment	Total Wages	Avg/Week	Avg/Annual
336411	Aircraft Manufacturing	630	214,096	16,463,414,816	1,479	76,897
336412	Aircraft Engine and Engine Parts Manufacturing	600	81,607	5,537,510,791	1,305	67,856
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing	1,383	86,845	4,919,984,087	1,089	56,652
481111	Scheduled Passenger Air Transportation	2,320	441,992	23,169,093,311	1,008	52,420
481112	Scheduled Freight Air Transportation	669	12,946	646,472,770	960	49,936
481211	Nonscheduled Chartered Passenger Air Transportation	2,137	34,865	1,894,545,004	1,045	54,339
481212	Nonscheduled Chartered Freight Air Transportation	585	7,601	389,121,516	984	51,193
481219	Other Nonscheduled Air Transportation	355	3,054	125,439,004	790	41,074
488111	Air Traffic Control	875	36,293	3,319,514,587	1,759	91,464
488119	Other Airport Operations	2,005	86,879	2,786,784,960	617	32,077
488190	Other Support Activities for Air Transportation	4,130	84,236	3,782,660,326	864	44,906
Total U.S. Aviation		15,689	1,090,414	63,034,541,172	1,082	56,256
Total U.S. Employment		8,571,144	131,571,623	5,351,949,496,382	782	40,677
AvJobs as % of U.S. Total		0.18%	0.83%	1.18%		1.17%
2004 U.S. Employment						
NAICS Code	Description	Employers	Employment	Total Wages	Avg/Week	Avg/Annual
336411	Aircraft Manufacturing	568	209,884	15,401,010,006	1,411	73,379
336412	Aircraft Engine and Engine Parts Manufacturing	590	78,354	5,244,763,352	1,287	66,937
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing	1,420	81,929	4,576,370,480	1,074	55,858
481111	Scheduled Passenger Air Transportation	2,326	457,848	25,063,987,677	1,053	54,743
481112	Scheduled Freight Air Transportation	653	12,315	600,907,168	938	48,795
481211	Nonscheduled Chartered Passenger Air Transportation	2,073	33,750	1,748,015,398	996	51,793
481212	Nonscheduled Chartered Freight Air Transportation	570	7,182	353,473,393	946	49,217
481219	Other Nonscheduled Air Transportation	347	3,127	117,046,179	720	37,431
488111	Air Traffic Control	868	37,506	3,348,991,016	1,717	89,292
488119	Other Airport Operations	2,008	85,425	2,709,600,691	610	31,719
488190	Other Support Activities for Air Transportation	4,022	76,985	3,273,670,649	818	42,523
Total U.S. Aviation		15,445	1,084,305	62,437,836,009	1,052	54,699
Total U.S. Employment		8,364,795	129,278,176	5,087,561,796,262	757	39,354
AvJobs as % of U.S. Total		0.18%	0.84%	1.23%		1.17%



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Appendix C: Texas Aviation Employment Characteristics 2004-2007

2007 TX Employment						
NAICS Code	Description	Employers	Employment	Total Wages	Avg/Week	Avg/Annual
336411	Aircraft Manufacturing	105	34,973	2,822,967,882	1,552	80,718
336412	Aircraft Engine and Engine Parts Manufacturing	48	5,213	277,482,045	1,024	53,229
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing	95	9,034	674,969,295	1,437	74,714
481111	Scheduled Passenger Air Transportation	130	56,528	3,786,825,609	1,288	66,990
481112	Scheduled Freight Air Transportation	59	740	40,261,091	1,046	54,407
481211	Nonscheduled Chartered Passenger Air Transportation	168	5,224	309,072,055	1,138	59,164
481212	Nonscheduled Chartered Freight Air Transportation	104	1,766	89,204,825	971	50,512
481219	Other Nonscheduled Air Transportation	38	1,033	21,990,239	409	21,288
488111	Air Traffic Control	26	1,843	253,329,532	2,643	137,455
488119	Other Airport Operations	123	5,000	120,637,869	464	24,128
488190	Other Support Activities for Air Transportation	480	15,248	883,701,208	1,115	57,955
Total TX Aviation		1,376	136,602	9,280,441,650	1,190	61,869
Total TX Employment		569,541	10,231,906	457,310,432,773	860	44,695
AvJobs as % of TX Total		0.24%	1.34%	2.03%	138.43%	138.43%
TX Total as % of U.S. Total		6.35%	7.56%	7.60%	100.53%	100.53%
TX Avjobs as % of U.S. Avjobs		8.46%	12.23%	13.16%	102.23%	102.23%
2006 TX Employment						
NAICS Code	Description	Employers	Employment	Total Wages	Avg/Week	Avg/Annual
336411	Aircraft Manufacturing	87	35,499	2,784,547,414	1,508	78,440
336412	Aircraft Engine and Engine Parts Manufacturing	47	5,067	265,566,390	1,008	52,411
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing	89	9,388	651,230,630	1,334	69,368
481111	Scheduled Passenger Air Transportation	124	55,493	3,531,408,718	1,224	63,637
481112	Scheduled Freight Air Transportation	52	709	39,667,013	1,076	55,948
481211	Nonscheduled Chartered Passenger Air Transportation	154	4,964	284,312,401	1,101	57,275
481212	Nonscheduled Chartered Freight Air Transportation	97	1,734	75,946,442	842	43,798
481219	Other Nonscheduled Air Transportation	27	1,027	19,260,566	361	18,754
488111	Air Traffic Control	27	1,836	236,984,229	2,482	129,076
488119	Other Airport Operations	118	5,280	121,269,273	442	22,968
488190	Other Support Activities for Air Transportation	442	14,696	843,288,400	1,104	57,382
Total TX Aviation		1,264	135,693	8,853,481,476	1,135	59,005
Total TX Employment		537,258	9,922,313	421,280,669,552	816	42,458
AvJobs as % of TX Total		0.24%	1.37%	2.10%	138.97%	138.97%
TX Total as % of U.S. Total		6.12%	7.41%	7.40%	99.82%	99.82%
TX Avjobs as % of U.S. Avjobs		7.95%	12.46%	13.44%	102.16%	102.16%



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Appendix C: Texas Aviation Employment Characteristics 2004-2007 (continued)

2005 TX Employment						
NAICS Code	Description	Employers	Employment	Total Wages	Avg/Week	Avg/Annual
336411	Aircraft Manufacturing	93	34,940	2,571,841,254	1,416	73,607
336412	Aircraft Engine and Engine Parts Manufacturing	45	5,055	243,211,769	925	48,113
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing	97	8,954	642,966,381	1,381	71,808
481111	Scheduled Passenger Air Transportation	131	55,444	3,257,718,395	1,130	58,757
481112	Scheduled Freight Air Transportation	58	736	39,679,557	1,037	53,912
481211	Nonscheduled Chartered Passenger Air Transportation	151	4,777	247,932,316	998	51,901
481212	Nonscheduled Chartered Freight Air Transportation	101	1,729	74,519,428	829	43,100
481219	Other Nonscheduled Air Transportation	26	1,030	18,284,680	341	17,752
488111	Air Traffic Control	19	1,837	245,433,206	2,569	133,605
488119	Other Airport Operations	121	4,859	110,156,934	436	22,671
488190	Other Support Activities for Air Transportation	431	13,938	762,401,367	1,052	54,699
Total TX Aviation		1,273	133,299	8,214,145,287	1,101	57,266
Total TX Employment		523,346	9,583,457	384,777,368,136	772	40,150
AvJobs as % of TX Total		0.24%	1.39%	2.13%	142.63%	142.63%
TX Total as % of U.S. Total		6.11%	7.28%	7.19%	98.70%	98.70%
TX Avjobs as % of U.S. Avjobs		8.11%	12.22%	13.03%	101.80%	101.80%
2004 TX Employment						
NAICS Code	Description	Employers	Employment	Total Wages	Avg/Week	Avg/Annual
336411	Aircraft Manufacturing	79	33,903	2,409,639,597	1,367	71,075
336412	Aircraft Engine and Engine Parts Manufacturing	43	4,030	196,034,195	935	48,644
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing	100	8,505	582,198,244	1,316	68,454
481111	Scheduled Passenger Air Transportation	137	58,809	3,441,331,644	1,125	58,517
481112	Scheduled Freight Air Transportation	51	882	43,883,840	957	49,755
481211	Nonscheduled Chartered Passenger Air Transportation	139	4,532	223,817,215	950	49,386
481212	Nonscheduled Chartered Freight Air Transportation	100	1,663	67,155,862	777	40,382
481219	Other Nonscheduled Air Transportation	23	1,051	18,068,748	331	17,192
488111	Air Traffic Control	24	1,972	247,153,008	2,410	125,331
488119	Other Airport Operations	121	5,275	140,465,371	512	26,629
488190	Other Support Activities for Air Transportation	473	12,393	619,313,379	961	49,973
Total TX Aviation		1,290	133,015	7,989,061,103	1,058	55,031
Total TX Employment		513,374	9,323,537	359,059,453,248	741	38,511
AvJobs as % of TX Total		0.25%	1.43%	2.22%	142.90%	142.90%
TX Total as % of U.S. Total		6.14%	7.21%	7.06%	97.86%	97.86%
TX Avjobs as % of U.S. Avjobs		8.35%	12.27%	12.80%	100.61%	100.61%

Source: www.bls.gov/data



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Appendix D: North Central Texas Regional Aviation Employment Characteristics 2004-2007

2007 Regional Employment						
NAICS Code	Description	Employers	Employment	Total Wages	Avg/Week	Avg/Annual
336411	Aircraft Manufacturing	50	25,138	2,170,950,153	1,661	86,361
336412	Aircraft Engine and Engine Parts Manufacturing	20	1,453	96,193,166	1,273	66,203
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing	60	7,968	631,535,420	1,524	79,259
481111	Scheduled Passenger Air Transportation	42	31,598	2,219,118,782	1,351	70,230
481112	Scheduled Freight Air Transportation	14	311	17,314,061	1,071	55,672
481211	Nonscheduled Chartered Passenger Air Transportation	53	1,138	77,841,922	1,315	68,402
481212	Nonscheduled Chartered Freight Air Transportation	25	-	-	-	-
481219	Other Nonscheduled Air Transportation	13	-	-	-	-
488111	Air Traffic Control	1	-	-	-	-
488119	Other Airport Operations	34	-	-	-	-
488190	Other Support Activities for Air Transportation	170	4,412	273,993,838	1,194	62,102
Total Regional Aviation		482	72,018	5,486,947,342	1,341	69,747
Total Regional Employment		148,221	2,882,016	143,026,185,616	954	49,627
AvJobs as % of Regional Total		0.33%	2.50%	3.84%	140.54%	140.54%
Regional Total as % of TX Total		26.02%	28.17%	31.28%	111.04%	111.04%
Regional Avjobs as % of U.S. Avjobs		2.97%	6.45%	7.78%	115.25%	115.25%
2006 Regional Employment						
NAICS Code	Description	Employers	Employment	Total Wages	Avg/Week	Avg/Annual
336411	Aircraft Manufacturing	34	26,009	2,180,123,408	1,612	83,822
336412	Aircraft Engine and Engine Parts Manufacturing	22	1,354	96,046,584	1,364	70,935
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing	56	8,327	608,234,927	1,405	73,044
481111	Scheduled Passenger Air Transportation	43	-	-	-	-
481112	Scheduled Freight Air Transportation	12	-	-	-	-
481211	Nonscheduled Chartered Passenger Air Transportation	52	1,033	69,159,121	1,287	66,950
481212	Nonscheduled Chartered Freight Air Transportation	22	-	-	-	-
481219	Other Nonscheduled Air Transportation	10	25	1,039,638	800	41,586
488111	Air Traffic Control	1	-	-	-	-
488119	Other Airport Operations	34	-	-	-	-
488190	Other Support Activities for Air Transportation	159	4,319	273,755,526	1,219	63,384
Total Regional Aviation		445	41,067	3,228,359,204	1,281	66,620
Total Regional Employment		139,901	2,804,657	133,291,269,950	914	47,525
AvJobs as % of Regional Total		0.32%	1.46%	2.42%	140.18%	140.18%
Regional Total as % of TX Total		26.04%	28.27%	31.64%	111.93%	111.93%
Regional Avjobs as % of U.S. Avjobs		2.80%	3.77%	4.90%	115.34%	115.34%



North Texas Aviation Education Initiative

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Appendix D: North Central Texas Regional Aviation Employment Characteristics 2004-2007 (continued)

2005 Regional Employment						
NAICS Code	Description	Employers	Employment	Total Wages	Avg/Week	Avg/Annual
336411	Aircraft Manufacturing	35	25,975	2,031,456,306	1,504	78,208
336412	Aircraft Engine and Engine Parts Manufacturing	22	1,470	81,243,503	1,063	55,268
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing	62	7,957	603,728,729	1,459	75,874
481111	Scheduled Passenger Air Transportation	49	-	-	-	-
481112	Scheduled Freight Air Transportation	12	-	-	-	-
481211	Nonscheduled Chartered Passenger Air Transportation	51	1,040	65,887,193	1,218	63,353
481212	Nonscheduled Chartered Freight Air Transportation	23	-	-	-	-
481219	Other Nonscheduled Air Transportation	11	-	-	-	-
488111	Air Traffic Control	2	-	-	-	-
488119	Other Airport Operations	37	-	-	-	-
488190	Other Support Activities for Air Transportation	153	3,858	236,376,658	1,178	61,269
Total Regional Aviation		457	40,300	3,018,692,389	1,285	66,794
Total Regional Employment		136,780	2,708,771	122,808,175,163	872	45,337
AvJobs as % of Regional Total		0.33%	1.49%	2.46%	147.33%	147.33%
Regional Total as % of TX Total		26.14%	28.27%	31.92%	112.92%	112.92%
Regional Avjobs as % of U.S. Avjobs		2.91%	3.70%	4.79%	118.73%	118.73%
2004 Regional Employment						
NAICS Code	Description	Employers	Employment	Total Wages	Avg/Week	Avg/Annual
336411	Aircraft Manufacturing	32	25,367	1,902,292,246	1,442	74,991
336412	Aircraft Engine and Engine Parts Manufacturing	22	1,422	80,280,794	1,086	56,456
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing	64	7,606	548,362,102	1,386	72,096
481111	Scheduled Passenger Air Transportation	47	-	-	-	-
481112	Scheduled Freight Air Transportation	13	589	28,940,741	945	49,135
481211	Nonscheduled Chartered Passenger Air Transportation	45	1,024	63,469,004	1,192	61,981
481212	Nonscheduled Chartered Freight Air Transportation	24	864	38,090,670	848	44,086
481219	Other Nonscheduled Air Transportation	10	-	-	-	-
488111	Air Traffic Control	2	-	-	-	-
488119	Other Airport Operations	39	-	-	-	-
488190	Other Support Activities for Air Transportation	155	3,467	190,605,888	1,057	54,977
Total Regional Aviation		453	40,339	2,852,041,445	1,137	59,103
Total Regional Employment		135,068	2,642,189	116,058,142,234	845	43,925
AvJobs as % of Regional Total		0.34%	1.53%	2.46%	134.56%	134.56%
Regional Total as % of TX Total		26.31%	28.34%	32.32%	114.06%	114.06%
Regional Avjobs as % of U.S. Avjobs		2.93%	3.72%	4.57%	108.05%	108.05%

Source: www.bls.gov/data



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AVIATION EMPLOYMENT DATA

APPENDIX E

Typical Senior Airline Management Career Experience Tracks

TITLE: Vice President – Schedule Planning

DESCRIPTION: Oversees the department that produces the aircraft schedule for the airline. Department also is responsible for constructing and developing aircraft flows, which are defined as market frequencies and "aircraft through routings."

EXPERIENCE: Ramp agent, ticket agent, station service manager, reservations control analyst, manager of revenue management, and manager of planning.

EDUCATION: Degree in general management/air transportation.

TITLE: Vice President – Properties

DESCRIPTION: Oversees the department that handles all real estate requirements to support the operation of the airline

EXPERIENCE: Ramp Agent (both part-time and full-time), Operations Agent, Ticket Agent, Staff Accountant in Payroll and Employee Benefits, Assistant Manager of Customer Service, Manager of Customer Service, Assistant Manager of Ramp and Operations, Manager of Ramp and Operations, Manager of Properties, Director of Properties, Senior Director of Properties and Facilities

EDUCATION: Degree of Business Administration in Finance

TITLE: Vice President – Ground Operations

DESCRIPTION: Oversees all station operations including Ground Support Equipment; Ground Operations Employee Resources, Staff Planning, and Airport Performance Improvement.

EXPERIENCE: Ramp Agent, Customer Service Manager, Station Manager, Regional Director Ground Operations, Sr. Director Ground Operations, Vice President-Station Operations.



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AVIATION EMPLOYMENT DATA

APPENDIX F

Representative Aviation Related Job Descriptions

Air Traffic Controller	1
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Airport Manager	12
Aircraft Pilots.....	16

AIR TRAFFIC CONTROLLERS

Significant Points

- Nearly all air traffic controllers are employed by the Federal Aviation Administration (FAA), an agency of the Federal Government.
- Replacement needs will continue to account for most job openings, reflecting the large number of air traffic controllers who will be eligible to retire over the next decade.
- Competition to get into FAA training programs is expected to remain keen; however, graduates of these programs have good job prospects.
- Air traffic controllers earn relatively high pay and have good benefits.

Nature of the Work

The air traffic control system is a vast network of people and equipment that ensures the safe operation of commercial and private aircraft. Air traffic controllers coordinate the movement of air traffic to make certain that planes stay a safe distance apart. Their immediate concern is safety, but controllers also must direct planes efficiently to minimize delays. Some regulate airport traffic through designated airspaces; others regulate airport arrivals and departures.

Although airport tower controllers or terminal controllers watch over all planes traveling through the airport's airspace, their main responsibility is to organize the flow of aircraft into and out of the airport. Relying on radar and visual observation, they closely monitor each plane to ensure a safe distance between all aircraft and to guide pilots between the hangar or ramp and the end of the airport's airspace. In addition, controllers keep pilots informed about changes in weather conditions such as wind shear, a sudden change in the velocity or direction of the wind that can cause the pilot to lose control of the aircraft.

During arrival or departure, several controllers direct each plane. As a plane approaches an airport, the pilot radios ahead to inform the terminal of the plane's presence. The controller in the radar room, just beneath the control tower, has a copy of the plane's flight plan and already has observed the plane on radar. If the path is clear, the controller directs the pilot to a runway; if the airport is busy, the plane is fitted into a traffic pattern with other aircraft waiting to land. As the plane nears the runway, the pilot is asked to contact the tower. There, another controller, who also is watching the plane on radar, monitors the aircraft the last mile or so to the runway, delaying any departures that would interfere with the plane's landing. Once the plane has landed, a ground controller in the tower directs it along the taxiways to its assigned gate. The ground controller usually works entirely by sight, but may use radar if visibility is very poor.

The procedure is reversed for departures. The ground controller directs the plane to the proper runway. The local controller then informs the pilot about conditions at the airport, such as weather, speed and direction of wind, and visibility. The local controller also issues runway clearance for the pilot to take off. Once in the air, the plane is guided out of the airport's airspace by the departure controller.

After each plane departs, airport tower controllers notify enroute controllers who will next take charge. There are 21 air route traffic control centers located around the country, each employing 300 to 700 controllers, with more than 150 on duty during peak hours at the busiest facilities.

Airplanes usually fly along designated routes; each center is assigned a certain airspace containing many different routes. Enroute controllers work in teams of up to three members, depending on how heavy traffic is; each team is responsible for a section of the center's airspace. A team, for example, might be responsible for all planes that are between 30 and 100 miles north of an airport and flying at an altitude between 6,000 and 18,000 feet.

To prepare for planes about to enter the team's airspace, the radar associate controller organizes flight plans coming off a printer. If two planes are scheduled to enter the team's airspace at nearly the same time, location, and altitude, this controller may arrange with the preceding control unit for one plane to change its flight path. The previous unit may have been another team at the same or an adjacent center, or a departure controller at a neighboring terminal. As a plane approaches a team's airspace, the radar controller accepts responsibility for the plane from the previous controlling unit. The controller also delegates responsibility for the plane to the next controlling unit when the plane leaves the team's airspace.

The radar controller, who is the senior team member, observes the planes in the team's airspace on radar and communicates with the pilots when necessary. Radar controllers warn pilots about nearby planes, bad weather conditions, and other potential hazards. Two planes on a collision course will be directed around each other. If a pilot wants to change altitude in search of better flying conditions, the controller will check to determine that no other planes will be along the proposed path. The team responsible for the aircraft notifies the next team in charge of the airspace ahead as the flight progresses. Through team coordination, the plane arrives safely at its destination.

Both airport tower and enroute controllers usually control several planes at a time; often, they have to make quick decisions about completely different activities. For example, a controller might direct a plane on its landing approach and at the same time provide pilots entering the airport's airspace with information about conditions at the airport. While instructing these pilots, the controller also might observe other planes in the vicinity, such as those in a holding pattern waiting for permission to land, to ensure that they remain well separated.

The FAA has implemented an automated air traffic control system, called the National Airspace System (NAS) Architecture. The NAS Architecture is a long-term strategic plan that will allow controllers to more efficiently deal with the demands of increased air traffic. It encompasses the replacement of aging equipment and the introduction of new systems, technologies, and procedures to enhance safety and security and support future aviation growth. The NAS Architecture facilitates continuing discussion of modernization between the FAA and the aviation community.

In addition to airport towers and enroute centers, air traffic controllers also work in flight service stations at more than 35 locations, including 17 locations in Alaska. These flight service specialists provide pilots with preflight and inflight weather information, suggested routes, and other aeronautical information important to the safety of a flight. Flight service specialists relay air traffic control clearances to pilots not in direct communications with a tower or center, assist pilots in emergency situations, and initiate and coordinate searches for missing or overdue aircraft. At certain locations where there is no airport tower or the tower has closed for the day, flight service specialists provide airport advisory services to landing and departing aircraft. However, they are not involved in actively managing and separating air traffic.

Some air traffic controllers work at the FAA's Air Traffic Control Systems Command Center in Herndon, VA, where they oversee the entire system. They look for situations that will create bottlenecks or other problems in the system and then respond with a management plan for traffic into and out of the troubled sector. The objective is to keep traffic levels in the trouble spots manageable for the controllers working at enroute centers.

Work environment. During busy times, controllers must work rapidly and efficiently. Total concentration is required to keep track of several planes at the same time and to make certain that all pilots receive correct instructions. The mental stress of being responsible for the safety of several aircraft and their passengers can be exhausting. Unlike tower controllers, radar controllers also have the extra stress of having to work in semi-darkness, never seeing the actual aircraft they control except as a small "bleep" on the radarscope. Controllers who work in flight service stations work in offices close to the communications and computer equipment.

Controllers work a basic 40-hour week; however, they may work additional hours, for which they receive overtime, or premium pay, or equal time off. Because most control towers and centers operate 24 hours a day, 7 days a week, controllers rotate night and weekend shifts. Contract flight service station working conditions may vary somewhat from the FAA.

Training, Other Qualifications, and Advancement

To become an air traffic controller, a person must complete an FAA-approved education program; pass a pre-employment test; receive a school recommendation; meet the basic qualification requirements in accordance with Federal law; and achieve a qualifying score on the FAA-authorized pre-employment test. Candidates also must pass a medical exam, undergo drug screening, and obtain a security clearance before they can be hired.

Education and training. Individuals must enroll in an FAA-approved education program and pass a pre-employment test that measures the applicant's ability to learn the controller's duties. Exceptions are air traffic controllers with prior experience and military veterans. The pre-employment test is currently offered only to students in the FAA Air Traffic Collegiate Training Initiative Program or the Minneapolis Community and Technical College, Air Traffic Control Training Program. The test is administered by computer and takes about 8 hours to complete. To take the test, an applicant must apply under an open advertisement for air traffic control positions and be chosen to take the examination. When there are many more applicants than available positions, applicants are selected to take the test through random selection. In addition to the pre-employment test, applicants must have 3 years of full-time work experience, have completed a full 4 years of college, or a combination of both. In combining education and experience, 1 year of undergraduate study-30 semester or 45 quarter hours-is equivalent to 9 months of work experience. Certain kinds of aviation experience also may be substituted for these requirements.

Upon successful completion of an FAA-approved program, individuals who receive school recommendation, meet the basic qualification requirements (including being less than 31 years of age) in accordance with Federal law, and achieve a qualifying score on the FAA-authorized pre-employment test become eligible for employment as an air traffic controller.

Upon selection, employees attend the FAA Academy in Oklahoma City, OK, for 12 weeks of training, during which they learn the fundamentals of the airway system, FAA regulations, controller equipment, and aircraft performance characteristics, as well as more specialized tasks.

After graduation from the FAA Academy in Oklahoma City, candidates are assigned to an air traffic control facility and are classified as "developmental controllers" until they complete all requirements to be certified for all of the air traffic control positions within a defined area of a given facility. Generally, it takes new controllers with only initial controller training between 2 and 4 years, depending on the facility and the availability of facility staff or contractors to provide on-the-job training, to complete all the certification requirements to become certified professional controllers. Individuals who have had prior controller experience normally take less time to become fully certified. Controllers who fail to complete either the academy or the on-the-job portions of the training usually are dismissed. Controllers must pass a physical examination each year and a job performance examination twice each year. Failure to become certified in any position at a facility within a specified time also may result in dismissal. Controllers also are subject to drug screening as a condition of continuing employment.

Other qualifications. Air traffic controllers must be articulate to give pilots directions quickly and clearly. Intelligence and a good memory also are important because controllers constantly receive information that they must immediately grasp, interpret, and remember. Decisiveness also is required because controllers often have to make quick decisions. The ability to concentrate is crucial because controllers must make these decisions in the midst of noise and other distractions.

Advancement. At airports, new controllers begin by supplying pilots with basic flight data and airport information. They then advance to the position of ground controller, then local controller, departure controller, and, finally, arrival controller. At an air route traffic control center, new controllers first deliver printed flight plans to teams, gradually advancing to radar associate controller and then to radar controller.

Controllers can transfer to jobs at different locations or advance to supervisory positions, including management or staff jobs-such as air traffic control data systems computer specialist-in air traffic control, and top administrative jobs in the FAA. However, there are only limited opportunities for a controller to switch from a position in an enroute center to a tower. Contract flight service station working conditions may vary somewhat from the FAA.

Employment

Air traffic controllers held about 25,000 jobs in 2006. The vast majority were employed by the FAA. Air traffic controllers work at airports-in towers and flight service stations-and in air route traffic control centers. Some professional controllers conduct research at the FAA's national experimental center near Atlantic City, NJ. Others serve as instructors at the FAA Academy in Oklahoma City. A small number of civilian controllers work for the U.S. Department of Defense. In addition to controllers employed by the Federal Government, some work for private air traffic control companies providing service to non-FAA towers and contract flight service stations.

Job Outlook

Most employment opportunities are expected to result from the need to replace workers who retire or leave the occupation for other reasons; graduates of an FAA training program have good prospects.

Employment change. Employment of air traffic controllers is projected to grow 10 percent from 2006 to 2016, about as fast as the average for all occupations. Increasing air traffic will require more controllers to handle the additional work. Job growth, however, is not expected to keep

pace with the increasing number of aircraft flying. New computerized systems will assist the controller by automatically making many of the routine decisions. This will allow controllers to handle more traffic, thus increasing their productivity. In addition, Federal budget constraints may limit hiring of air traffic controllers.

Job prospects. Most job opportunities are expected as the result of replacement needs from workers leaving the occupation. The majority of today's air traffic controllers will be eligible to retire over the next decade, although not all are expected to do so. Nevertheless, replacement needs will result in job opportunities each year for those graduating from the FAA training programs. Despite the increasing number of jobs coming open, competition to get into the FAA training programs is expected to remain keen, as there generally are many more applicants to get into the schools than there are openings, but those who graduate have good prospects of getting a job as a controller.

Air traffic controllers who continue to meet the proficiency and medical requirements enjoy more job security than do most workers. The demand for air travel and the workloads of air traffic controllers decline during recessions, but controllers seldom are laid off.

Earnings

Air traffic controllers earn relatively high pay and have good benefits. Median annual earnings of air traffic controllers in May 2006 were \$117,240. The middle 50 percent earned between \$86,860 and \$142,210. The lowest 10 percent earned less than \$59,410, and the highest 10 percent earned more than \$145,600. The average annual salary, excluding overtime earnings, for air traffic controllers in the Federal Government-which employs 90 percent of all controllers-was \$122,220 in May 2006.

The Air Traffic Control pay system classifies each air traffic facility into one of eight levels with corresponding pay bands. Under this pay system, controllers' salaries are determined by the rating of the facility. Higher ratings usually mean higher controller salaries and greater demands on the controller's judgment, skill, and decision-making ability.

Depending on length of service, air traffic controllers receive 13 to 26 days of paid vacation and 13 days of paid sick leave each year, in addition to life insurance and health benefits. Controllers also can retire at an earlier age and with fewer years of service than other Federal employees. Air traffic controllers are eligible to retire at age 50 with 20 years of service as an active air traffic controller or after 25 years of active service at any age. There is a mandatory retirement age of 56 for controllers who manage air traffic. However, Federal law provides for exemptions to the mandatory age of 56, up to age 61, for controllers having exceptional skills and experience. Earnings and benefits for controllers working in contract towers or flight service stations may vary.

Related Occupations

Airfield operations specialists also are involved in the direction and control of traffic in air transportation.

Source: Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, 2008-09 Edition, Air Traffic Controllers, on the Internet at <http://www.bls.gov/oco/ocos108.htm> (visited July 7, 2009).

AIRFIELD OPERATIONS SPECIALIST

Overview

Ensures the safe takeoff and landing of commercial and military aircraft. Duties include coordination between air-traffic control and maintenance personnel; dispatching; using airfield landing and navigational aids; implementing airfield safety procedures; monitoring and maintaining flight records; and applying knowledge of weather information.

Sample of reported job titles: Airport Operations Specialist, Airport Operations Officer, Airport Operations Supervisor, Airport Operations Manager, Airport Operations Coordinator, Operations Manager, Air Field Operations Superintendent, Airport Manager, Flight Follower, Operations Agent

- Implement airfield safety procedures to ensure a safe operating environment for personnel and aircraft operation.
- Plan and coordinate airfield construction.
- Coordinate with agencies such as air traffic control, civil engineers, and command posts to ensure support of airfield management activities.
- Monitor the arrival, parking, refueling, loading, and departure of all aircraft.
- Maintain air-to-ground and point-to-point radio contact with aircraft commanders.
- Train operations staff.
- Relay departure, arrival, delay, aircraft and airfield status, and other pertinent information to upline controlling agencies.
- Procure, produce, and provide information on the safe operation of aircraft, such as flight planning publications, operations publications, charts and maps, and weather information.
- Coordinate communications between air traffic control and maintenance personnel.
- Perform and supervise airfield management activities, including mobile airfield management functions.

Knowledge

Customer and Personal Service - Knowledge of principles and processes for providing customer and personal services. This includes customer needs assessment, meeting quality standards for services, and evaluation of customer satisfaction.

English Language - Knowledge of the structure and content of the English language including the meaning and spelling of words, rules of composition, and grammar.

Transportation - Knowledge of principles and methods for moving people or goods by air, rail, sea, or road, including the relative costs and benefits.

Public Safety and Security - Knowledge of relevant equipment, policies, procedures, and strategies to promote effective local, state, or national security operations for the protection of people, data, property, and institutions.

Education and Training - Knowledge of principles and methods for curriculum and training design, teaching and instruction for individuals and groups, and the measurement of training effects.

Computers and Electronics - Knowledge of circuit boards, processors, chips, electronic equipment, and computer hardware and software, including applications and programming.

Administration and Management - Knowledge of business and management principles involved in strategic planning, resource allocation, human resources modeling, leadership technique, production methods, and coordination of people and resources.

Clerical - Knowledge of administrative and clerical procedures and systems such as word processing, managing files and records, stenography and transcription, designing forms, and other office procedures and terminology.

Geography - Knowledge of principles and methods for describing the features of land, sea, and air masses, including their physical characteristics, locations, interrelationships, and distribution of plant, animal, and human life.

Law and Government - Knowledge of laws, legal codes, court procedures, precedents, government regulations, executive orders, agency rules, and the democratic political process.

Skills

Active Listening - Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.

Reading Comprehension - Understanding written sentences and paragraphs in work related documents.

Speaking - Talking to others to convey information effectively.

Critical Thinking - Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems.

Active Learning - Understanding the implications of new information for both current and future problem-solving and decision-making.

Monitoring - Monitoring/Assessing performance of yourself, other individuals, or organizations to make improvements or take corrective action.

Writing - Communicating effectively in writing as appropriate for the needs of the audience.

Instructing - Teaching others how to do something.

Judgment and Decision Making - Considering the relative costs and benefits of potential actions to choose the most appropriate one.

Complex Problem Solving - Identifying complex problems and reviewing related information to develop and evaluate options and implement solutions.

Abilities

Oral Comprehension - The ability to listen to and understand information and ideas presented through spoken words and sentences.

Oral Expression - The ability to communicate information and ideas in speaking so others will understand.

Problem Sensitivity - The ability to tell when something is wrong or is likely to go wrong. It does not involve solving the problem, only recognizing there is a problem.

Deductive Reasoning - The ability to apply general rules to specific problems to produce answers that make sense.

Speech Clarity - The ability to speak clearly so others can understand you.

Written Comprehension - The ability to read and understand information and ideas presented in writing.

Inductive Reasoning - The ability to combine pieces of information to form general rules or conclusions (includes finding a relationship among seemingly unrelated events).

Near Vision - The ability to see details at close range (within a few feet of the observer).

Written Expression - The ability to communicate information and ideas in writing so others will understand.

Information Ordering - The ability to arrange things or actions in a certain order or pattern according to a specific rule or set of rules (e.g., patterns of numbers, letters, words, pictures, mathematical operations).

Work Activities

Evaluating Information to Determine Compliance with Standards - Using relevant information and individual judgment to determine whether events or processes comply with laws, regulations, or standards.

Getting Information - Observing, receiving, and otherwise obtaining information from all relevant sources.

Identifying Objects, Actions, and Events - Identifying information by categorizing, estimating, recognizing differences or similarities, and detecting changes in circumstances or events.

Performing for or Working Directly with the Public - Performing for people or dealing directly with the public. This includes serving customers in restaurants and stores, and receiving clients or guests.

Establishing and Maintaining Interpersonal Relationships - Developing constructive and cooperative working relationships with others, and maintaining them over time.

Communicating with Persons Outside Organization - Communicating with people outside the organization, representing the organization to customers, the public, government, and other external sources. This information can be exchanged in person, in writing, or by telephone or e-mail.

Communicating with Supervisors, Peers, or Subordinates - Providing information to supervisors, co-workers, and subordinates by telephone, in written form, e-mail, or in person.

Documenting/Recording Information - Entering, transcribing, recording, storing, or maintaining information in written or electronic/magnetic form.

Making Decisions and Solving Problems - Analyzing information and evaluating results to choose the best solution and solve problems.

Monitor Processes, Materials, or Surroundings - Monitoring and reviewing information from materials, events, or the environment, to detect or assess problems.

Preparation Needed

Overall Experience - Previous work-related skill, knowledge, or experience is required for these occupations. For example, an electrician must have completed three or four years of apprenticeship or several years of vocational training, and often must have passed a licensing exam, in order to perform the job.

Job Training Employees in these occupations usually need one or two years of training involving both on-the-job experience and informal training with experienced workers.

Job Zone Examples – These occupations usually involve using communication and organizational skills to coordinate, supervise, manage, or train others to accomplish goals. Examples include funeral directors, electricians, forest and conservation technicians, legal secretaries, interviewers, and insurance sales agents.

Education – Most occupations in this zone require training in vocational schools, related on-the-job experience, or an associate's degree. Some may require a bachelor's degree.

Interests

Enterprising - Enterprising occupations frequently involve starting up and carrying out projects. These occupations can involve leading people and making many decisions. Sometimes they require risk taking and often deal with business.

Conventional - Conventional occupations frequently involve following set procedures and routines. These occupations can include working with data and details more than with ideas. Usually there is a clear line of authority to follow.

Realistic - Realistic occupations frequently involve work activities that include practical, hands-on problems and solutions. They often deal with plants, animals, and real-world materials like wood, tools, and machinery. Many of the occupations require working outside, and do not involve a lot of paperwork or working closely with others.

Work Styles

Self Control - Job requires maintaining composure, keeping emotions in check, controlling anger, and avoiding aggressive behavior, even in very difficult situations.

Attention to Detail - Job requires being careful about detail and thorough in completing work tasks.

Dependability - Job requires being reliable, responsible, and dependable, and fulfilling obligations.

Cooperation - Job requires being pleasant with others on the job and displaying a good-natured, cooperative attitude.

Integrity - Job requires being honest and ethical.

Stress Tolerance - Job requires accepting criticism and dealing calmly and effectively with high stress situations.

Adaptability/Flexibility - Job requires being open to change (positive or negative) and to considerable variety in the workplace.

Initiative - Job requires a willingness to take on responsibilities and challenges.

Achievement/Effort - Job requires establishing and maintaining personally challenging achievement goals and exerting effort toward mastering tasks.

Leadership - Job requires a willingness to lead, take charge, and offer opinions and direction.

Work Values

Support - Occupations that satisfy this work value offer supportive management that stands behind employees. Corresponding needs are Company Policies, Supervision: Human Relations and Supervision: Technical.

Independence - Occupations that satisfy this work value allow employs to work on their own and make decisions. Corresponding needs are Creativity, Responsibility and Autonomy.

Working Conditions - Occupations that satisfy this work value offer job security and good working conditions. Corresponding needs are Activity, Compensation, Independence, Security, Variety and Working Conditions.

Wages & Employment Trends (National)

Median wages	(2008)	\$19.88 hourly, \$41,360 annual
Employment	(2006)	5,000 employees
Projected growth	(2006-2016)	Average (7% to 13%)
Projected need	(2006-2016)	2,000 additional employees

Source: Occupational Information Network. <http://online.onetcenter.org/link/summary/53-2022.00>

AIRLINE BUSINESS PLANNING ANALYST

TYPICAL DUTIES

- Responsibility for preparing and monitoring of the operational and capital budgets for assigned cities throughout the US.
- Determining station manpower and expense requirements based on flight schedules and passenger volume forecasts.
- Advises and assists airline's local airport management personnel in developing functional solutions to operational and cost-related problems, emphasizing reduced cost through improved management.
- Performing feasibility studies on outsourcing to provide upper management with recommendations.
- Coordinating and providing justification for appropriation requests for capital projects using ROI, NPV and cash flow analysis.
- Reviewing spending during the month end close and performing variance analysis following the close.

QUALIFICATIONS:

- College graduates with a concentration in finance and/or accounting or equivalent
- A minimum of five years work experience in that field
- Corporate Finance and/or Accounting experience preferred
- MBA graduates or CPAs are preferred
- Strong problem solving aptitude
- Excellent interpersonal skills
- Ability to concisely present work
- Effective organization and planning skills
- May require travel
- Must be able to read, write, fluently speak and understand the English language
- Very good working knowledge of PC spreadsheet and database applications is required

AIRPORT MANAGER

GENERAL SUMMARY

To direct, manage, supervise, and coordinate the programs and services of the Airport; to coordinate assigned activities with other City departments, divisions, and outside agencies; and to provide highly responsible and complex administrative support to the Council.

SUPERVISION

General supervision is provided by the Deputy City Manager.

ESSENTIAL DUTIES AND RESPONSIBILITIES

1. All behaviors comply with the Code of Conduct and Rules of Behavior outlined in Chapter 8 of the General Government Policies and Procedures Manual.
2. Provide timely, accurate and thorough Performance Reviews for supervised employees.
3. Assume management responsibility for all services and activities of the Airport.
4. Manage and participate in the development and implementation of goals, objectives, policies, and priorities for assigned programs including customer service, maintenance of airport equipment and aircraft, and grounds security; recommend, within Departmental policy, appropriate service and staffing levels; recommend and administer policies and procedures.
5. Continuously monitor and evaluate the efficiency and effectiveness of service delivery methods and procedures; assess and monitor work load, administrative and support systems, and internal reporting relationships; identify opportunities for improvement and review with the City Manager; implement improvements.
6. Develop and implement strategies for maintaining airport customer bases; design marketing outreach efforts; solicit suggestions from customers.
7. Select, train, motivate and evaluate airport personnel; provide or coordinate staff training; work with employees to correct deficiencies; implement discipline and termination procedures.
8. Plan, direct, coordinate, and review the work plan for the airport; meet with staff to identify and resolve problems; assign work activities, projects and programs; monitor work flow; review and evaluate work products, methods and procedures.
9. Manage and participate in the development and administration of the Airport annual budget; direct the forecast of funds needed for staffing, equipment, materials, and supplies; direct the monitoring of and approve expenditures; direct and implement adjustments as necessary.
10. Provide responsible staff assistance to the City Council; prepare and present staff reports and other necessary correspondence.

11. Develop and implement airport capital improvement plans; coordinate all capital improvement planning with FAA; prepare federal grant requests for airport capital improvements; coordinate major expansion projects with contract engineers and City engineering staff.
12. Develop an effective liaison with airport tenant businesses to foster business growth; market the airport for enhanced business potential and ensure the development of a positive business climate for the airport.

OTHER DUTIES AND RESPONSIBILITIES

1. Serve as liaison for the Airport with other City departments, divisions and outside agencies; negotiate and resolve significant and controversial issues.
2. Conduct a variety of organizational studies, investigations, and operational studies; recommend modifications to airport programs, policies, and procedures as appropriate.
3. Provide staff support on a variety of boards and commissions; attend and participate in professional group meetings; stay abreast of new trends and innovations in the field of aviation.
4. Respond to and resolve difficult and sensitive customer inquiries and complaints.
5. Perform other duties as assigned.

MINIMUM JOB REQUIREMENTS

Education

Bachelor's degree from an accredited college or university with major coursework in aviation or other related field.

Experience

Four years of increasingly responsible experience overseeing airport operations including two years of supervisory or administrative responsibility.

Licenses and Certificates

Possession of a valid State driver's license.

Competencies

A supervisor's performance will be evaluated based on five employee competencies and five supervisor competencies.

The five employee competencies are:

- 1) Job Knowledge; 2) Teamwork; 3) Customer Service; 4) Flexibility; 5) Work Ethic

The five supervisor competencies are:

- 1) Leadership & Results Orientation; 2) Coaching, Mentoring and Developing Employees; 3) Communications and Maintaining and Open Mind; 4) Vision & Innovation; and 5) Empathy.

KNOWLEDGE, SKILLS AND ABILITIES

Knowledge of:

- Operational characteristics, services and activities of a commuter airport.
- Aviation policies, procedures, rules and regulations.
- Organizational and management practices as applied to the analysis and evaluation of programs, policies and operational needs.
- Modern and complex principles and practices of program development and administration.
- Advanced principles and practices of municipal budget preparation and administration.
- Principles of supervision, training and performance evaluation.
- Pertinent federal, state, and local laws, codes and regulations.

Skill in:

- Operating and maintaining a variety of aircraft and airport equipment.
- Preparing clear and concise administrative and financial reports.
- Researching, analyzing, and evaluating new service delivery methods, procedures and techniques.

Ability to:

- Manage, direct and coordinate the work of supervisory, professional and technical personnel.
- Select, supervise, train and evaluate staff.
- Provide administrative and professional leadership and direction for the Airport.
- Recommend and implement goals, objectives, and practices for providing effective and efficient airport services.
- Prepare and administer large and complex budgets.
- Analyze problems, identify alternative solutions, project consequences of proposed actions and implement recommendations in support of goals.
- Interpret and apply federal, state and local policies, procedures, laws and regulations.
- Communicate clearly and concisely, both orally and in writing.
- Establish and maintain effective working relationships with those contacted in the course of work including City and other government officials, community groups, and the general public.
- Pass a medical physical examination and drug screen.
- Meet the City's driving standards.

PHYSICAL REQUIREMENTS/ WORK ENVIRONMENT

Maintain effective audio-visual discrimination and perception needed for:

- making observations
- reading and writing
- communicating with others
- operating assigned equipment

Maintain physical condition appropriate to the performance of assigned duties and responsibilities, which may include the following:

- sitting for extended periods of time

AIRCRAFT PILOTS

Significant Points

- Regional and low-cost airlines offer the best opportunities; pilots attempting to get jobs at the major airlines will face strong competition.
- Pilots usually start with smaller commuter and regional airlines to acquire the experience needed to qualify for higher paying jobs with national or major airlines.
- Many pilots have learned to fly in the military, but growing numbers have college degrees with flight training from civilian flying schools that are certified by the Federal Aviation Administration (FAA).

Nature of the Work

Pilots are highly trained professionals who either fly airplanes or helicopters to carry out a wide variety of tasks. Most are airline pilots, copilots, and flight engineers who transport passengers and cargo. However, 1 out of 5 pilots is a commercial pilot involved in dusting crops, spreading seed for reforestation, testing aircraft, flying passengers and cargo to areas not served by regular airlines, directing firefighting efforts, tracking criminals, monitoring traffic, and rescuing and evacuating injured persons.

Before departure, pilots plan their flights carefully. They thoroughly check their aircraft to make sure that the engines, controls, instruments, and other systems are functioning properly. They also make sure that baggage or cargo has been loaded correctly. They confer with flight dispatchers and aviation weather forecasters to find out about weather conditions en route and at their destination. Based on this information, they choose a route, altitude, and speed that will provide the safest, most economical, and smoothest flight. When flying under instrument flight rules-procedures governing the operation of the aircraft when there is poor visibility-the pilot in command, or the company dispatcher, normally files an instrument flight plan with air traffic control so that the flight can be coordinated with other air traffic.

Takeoff and landing are the most difficult parts of the flight, and require close coordination between the two pilots. For example, as the plane accelerates for takeoff, the pilot who is flying the take off concentrates on the runway while the other pilot scans the instrument panel. To calculate the speed they must attain to become airborne, pilots consider the altitude of the airport, outside temperature, weight of the plane, and speed and direction of the wind. The moment the plane reaches takeoff speed, the nonflying pilot informs the flying pilot, who then pulls back on the controls to raise the nose of the plane. Captains and first officers usually alternate flying each leg from takeoff to landing.

Unless the weather is bad, the flight itself is relatively routine. Airplane pilots, with the assistance of autopilot and the flight management computer, steer the plane along their planned route and are monitored by the air traffic control stations they pass along the way. They regularly scan the instrument panel to check their fuel supply; the condition of their engines; and the air-conditioning, hydraulic, and other systems. Pilots may request a change in altitude or route if circumstances dictate. For example, if the ride is rougher than expected, pilots may ask air traffic control if pilots flying at other altitudes have reported better conditions; if so, they may request an altitude change. This procedure also may be used to find a stronger tailwind or a weaker headwind to save fuel and increase speed. In contrast, because helicopters are used for

short trips at relatively low altitude, helicopter pilots must be constantly on the lookout for trees, bridges, power lines, transmission towers, and other dangerous obstacles as well as low-flying general aviation aircraft. Regardless of the type of aircraft, all pilots must monitor warning devices designed to help detect sudden shifts in wind conditions that can cause crashes.

Pilots must rely completely on their instruments when visibility is poor. On the basis of altimeter readings, they know how high above ground they are and whether they can fly safely over mountains and other obstacles. Special navigation radios give pilots precise information that, with the help of special charts, tells them their exact position. Other very sophisticated equipment provides directions to a point just above the end of a runway and enables pilots to land completely without an outside visual reference. Once on the ground, pilots must complete records on their flight and the aircraft maintenance status for their company and the FAA.

The number of nonflying duties that pilots have depends on the employment setting. Airline pilots have the services of large support staffs and, consequently, perform few nonflying duties. However, because of the large numbers of passengers, airline pilots may be called upon to coordinate handling of disgruntled or disruptive passengers. Also, under the Federal Flight Deck Officer program airline pilots who undergo rigorous training and screening are deputized as Federal law enforcement officers and are issued firearms to protect the cockpit against intruders and hijackers. Pilots employed by other organizations, such as charter operators or businesses, have many other duties. They may load the aircraft, handle all passenger luggage to ensure a balanced load, and supervise refueling; other nonflying responsibilities include keeping records, scheduling flights, arranging for major maintenance, and performing minor aircraft maintenance and repairs.

Except on small aircraft, two pilots usually make up the cockpit crew. Generally, the most experienced pilot, the captain, is in command and supervises all other crew members. The pilot and the copilot, often called the first officer, share flying and other duties, such as communicating with air traffic controllers and monitoring the instruments. Some large aircraft have a third crewmember, the flight engineer, who assists the pilots by monitoring and operating many of the instruments and systems, making minor in-flight repairs, and watching for other aircraft. The flight engineer also assists the pilots with the company, air traffic control, and cabin crew communications. New technology can perform many flight tasks, however, and virtually all new aircraft now fly with only two pilots, who rely more heavily on computerized controls.

Some pilots are flight instructors. They teach their students in ground-school classes, in simulators, and in dual-controlled planes and helicopters. A few specially trained pilots are examiners or check pilots. They periodically fly with other pilots or pilot's license applicants to make sure that they are proficient.

Work environment. Most pilots spend a considerable amount of time away from home because the majority of flights involve overnight layovers. When pilots are away from home, the airlines provide hotel accommodations, transportation between the hotel and airport, and an allowance for meals and other expenses.

Airline pilots, especially those on international routes, often experience jet lag-fatigue caused by many hours of flying through different time zones. To guard against pilot fatigue, which could result in unsafe flying conditions, the FAA requires airlines to allow pilots at least 8 hours of uninterrupted rest in the 24 hours before finishing their flight duty.

Commercial pilots face other types of job hazards. The work of test pilots, who check the flight performance of new and experimental planes, may be dangerous. Pilots who are crop-dusters may be exposed to toxic chemicals and seldom have the benefit of a regular landing strip. Helicopter pilots involved in rescue and police work may be subject to personal injury.

Although flying does not involve much physical effort, the mental stress of being responsible for a safe flight, regardless of the weather, can be tiring. Pilots must be alert and quick to react if something goes wrong, particularly during takeoff and landing.

FAA regulations limit flying time of airline pilots of large aircraft to a maximum of 100 hours a month or 1,000 hours a year. Most airline pilots fly an average of 65 to 75 hours a month and work at least an additional 65 to 75 hours a month performing nonflying duties. Most pilots have variable work schedules, working several days on, then several days off. Airlines operate flights at all hours of the day and night, so work schedules often are irregular. Flight assignments are based on seniority; the sooner pilots are hired, the stronger their bidding power is for preferred assignments.

Commercial pilots also may have irregular schedules, flying 30 hours one month and 90 hours the next. Because these pilots frequently have many nonflying responsibilities, they have much less free time than do airline pilots. Except for corporate flight department pilots, most commercial pilots do not remain away from home overnight. But, they may work odd hours. However, if the company owns a fleet of planes, pilots may fly a regular schedule.

Flight instructors may have irregular and seasonal work schedules, depending on their students' available time and the weather. Instructors frequently work in the evening or on weekends.

Training, Other Qualifications, and Advancement

All pilots who are paid to transport passengers or cargo must have a commercial pilot's license with an instrument rating issued by the FAA. Helicopter pilots also must hold a commercial pilot's license with a helicopter rating.

Education and training. Although some small airlines hire high school graduates, most airlines require at least 2 years of college and prefer to hire college graduates. In fact, most entrants to this occupation have a college degree. Because the number of college-educated applicants continues to increase, many employers are making a college degree an educational requirement. For example, test pilots often are required to have an engineering degree.

Pilots also need flight experience to qualify for a license. Completing classes at a flight school approved by the FAA can reduce the amount of flight experience required for a pilot's license. In 2006, the FAA certified about 600 civilian flying schools, including some colleges and universities that offer degree credit for pilot training. Initial training for airline pilots typically includes a week of company indoctrination; 3 to 6 weeks of ground school and simulator training; and 25 hours of initial operating experience, including a check-ride with an FAA aviation safety inspector. Once trained, pilots are required to attend recurrent training and simulator checks once or twice a year throughout their career.

Licensure. To qualify for FAA licensure, applicants must be at least 18 years old and have at least 250 hours of flight experience.

The U.S. Armed Forces have always been an important source of experienced pilots because of the extensive flying time and experience on jet aircraft and helicopters. Those without Armed Forces training may become pilots by attending flight schools or by taking lessons from FAA-certified flight instructors. Applicants also must pass a strict physical examination to make sure that they are in good health and have 20/20 vision with or without glasses, good hearing, and no physical handicaps that could impair their performance. They must pass a written test that includes questions on the principles of safe flight, navigation techniques, and FAA regulations, and must demonstrate their flying ability to FAA or designated examiners.

To fly during periods of low visibility, pilots must be rated by the FAA to fly by instruments. Pilots may qualify for this rating by having the required hours of flight experience, including 40 hours of experience in flying by instruments; they also must pass a written examination on procedures and FAA regulations covering instrument flying and demonstrate to an examiner their ability to fly by instruments. Requirements for the instrument rating vary depending on the certification level of flight school.

Airline pilots must fulfill additional requirements. Captains must have an airline transport pilot's license. Applicants for this license must be at least 23 years old and have a minimum of 1,500 hours of flying experience, including night and instrument flying, and must pass FAA written and flight examinations. Usually, they also have one or more advanced ratings depending on the requirements of their particular job. Because pilots must be able to make quick decisions and accurate judgments under pressure, many airline companies reject applicants who do not pass required psychological and aptitude tests. All licenses are valid so long as a pilot can pass the periodic physical and eye examinations and tests of flying skills required by the FAA and company regulations.

Other qualifications. Depending on the type of aircraft, new airline pilots start as first officers or flight engineers. Although some airlines favor applicants who already have a flight engineer's license, they may provide flight engineer training for those who have only the commercial license. Many pilots begin with smaller regional or commuter airlines, where they obtain experience flying passengers on scheduled flights into busy airports in all weather conditions. These jobs often lead to higher paying jobs with bigger, national or major airlines.

Companies other than airlines usually require less flying experience. However, a commercial pilot's license is a minimum requirement, and employers prefer applicants who have experience in the type of craft they will be flying. New employees usually start as first officers, or fly less sophisticated equipment.

Advancement. Advancement for pilots usually is limited to other flying jobs. Many pilots start as flight instructors, building up their flying hours while they earn money teaching. As they become more experienced, these pilots occasionally fly charter planes or perhaps get jobs with small air transportation firms, such as air-taxi companies. Some advance to flying corporate planes. A small number get flight engineer jobs with the airlines.

In the airlines, advancement usually depends on seniority provisions of union contracts. After 1 to 5 years, flight engineers advance according to seniority to first officer and, after 5 to 15 years, to captain. Seniority also determines which pilots get the more desirable routes. In a nonairline job, a first officer may advance to captain and, in large companies, to chief pilot or director of aviation in charge of aircraft scheduling, maintenance, and flight procedures.

Employment

Civilian aircraft pilots and flight engineers held about 107,000 jobs in 2006. About 79,000 worked as airline pilots, copilots, and flight engineers. The rest were commercial pilots who worked as flight instructors at local airports or for large businesses that fly company cargo and executives in their own airplanes or helicopters. Some commercial pilots flew small planes for air-taxi companies, usually to or from lightly traveled airports not served by major airlines. Others worked for a variety of businesses, performing tasks such as dusting crops, inspecting pipelines, or conducting sightseeing trips.

Pilots are located across the country, but airline pilots usually are based near major metropolitan airports or airports operating as hubs for the major airlines.

Federal, State, and local governments employed pilots. A few pilots were self-employed.

Job Outlook

Regional airlines and low-cost carriers will present the best opportunities; pilots attempting to get jobs at the major airlines will face strong competition.

Employment change. Employment of aircraft pilots and flight engineers is projected to grow 13 percent from 2006 to 2016, about as fast as the average for all occupations. Population growth and an expanding economy are expected to boost the demand for air travel, contributing to job growth. New jobs will be created as airlines expand their capacity to meet this rising demand by increasing the number of planes in operation. However, employment growth will be limited by productivity improvements as airlines switch to larger planes and adopt the low-cost carrier model that emphasizes faster turnaround times for flights, keeping more pilots in the air rather than waiting on the ground. Also, fewer flight engineers will be needed as new planes requiring only two pilots replace older planes that require flight engineers.

Job prospects. Job opportunities are expected to continue to be better with the regional airlines and low-cost carriers, which are growing faster than the major airlines. Opportunities with air cargo carriers also should arise because of increasing security requirements for shipping freight on passenger airlines, growth in electronic commerce, and increased demand for global freight. Business, corporate, and on-demand air taxi travel also should provide some new jobs for pilots. Pilots attempting to get jobs at the major airlines will face strong competition, as those firms tend to attract many more applicants than the number of job openings. Applicants also will have to compete with laid-off pilots for any available jobs. Pilots who have logged the greatest number of flying hours using sophisticated equipment typically have the best prospects. For this reason, military pilots often have an advantage over other applicants.

In the long run, demand for air travel is expected to grow along with the population and the economy. In the short run, however, employment opportunities of pilots generally are sensitive to cyclical swings in the economy. During recessions, when a decline in the demand for air travel forces airlines to curtail the number of flights, airlines may temporarily furlough some pilots.

Earnings

Earnings of aircraft pilots and flight engineers vary greatly depending whether they work as airline or commercial pilots. Earnings depend on factors such as the type, size, and maximum speed of the plane and the number of hours and miles flown. For example, pilots who fly jet aircraft usually earn higher salaries than pilots who fly turboprops. Airline pilots and flight engineers may earn extra pay for night and international flights.

Airline pilots usually are eligible for life and health insurance plans. They also receive retirement benefits and, if they fail the FAA physical examination at some point in their careers, they get disability payments. In addition, pilots receive an expense allowance, or "per diem," for every hour they are away from home. Some airlines also provide allowances to pilots for purchasing and cleaning their uniforms. As an additional benefit, pilots and their immediate families usually are entitled to free or reduced-fare transportation on their own and other airlines.

More than half of all aircraft pilots are members of unions. Most of the pilots who fly for the major airlines are members of the Air Line Pilots Association, International, but those employed by one major airline are members of the Allied Pilots Association.

Related Occupations

Although they are not in the cockpit, air traffic controllers and airfield operations specialists also play an important role in making sure flights are safe and on schedule, and participate in many of the decisions that pilots must make.

Source: Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, 2008-09 Edition, Aircraft Pilots and Flight Engineers, on the Internet at <http://www.bls.gov/oco/ocos107.htm>



North Texas Aviation Education Initiative

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AVIATION EMPLOYMENT DATA

APPENDIX G

Aviation Career Salaries

Aviation Career Salary Ranges by AvJobs, Inc.	1
Current Salary and Hourly "New Hire" Rates as reported by Participating Aviation Employers.	2

Source: © 1988-2009 Avjobs.com All Rights Reserved.
<http://www.avjobs.com/salaries-wages-pay/index.asp> (Permission on request)



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Aviation Career Salary Ranges by AvJobs, Inc.

Overview of Salaried Aviation Positions as of 7/13/2009			
Career/Industry Group	Minimum	Average	Maximum
Airport	30,821	46,789	91,563
AP Mechanic	26,000	49,125	65,000
Avionics	26,000	53,700	100,000
Dispatch	35,000	57,225	81,000
Engineering and Aerospace	10,000	72,734	125,000
Ground-Ramp	32,954	41,512	48,092
Helicopter	60,000	75,000	90,000
Management	35,000	67,686	125,000
Office and Administrative	70,000	85,000	100,000
Other	32,400	35,700	40,000
Pilot	32,760	49,363	85,000
Sales-Marketing	10,000	74,688	250,000
Overview of Hourly Aviation Positions as of 7/13/2009			
Career/Industry Group	Minimum	Average	Maximum
Airport	5.85	12.10	25.00
AP Mechanic	5.85	833.24	42,000.00
Avionics	5.85	22.80	45.00
Cargo	12.48	13.57	15.00
Dispatch	10.00	14.40	18.00
Engineering and Aerospace	18.00	42.53	70.00
Flight Attendant	15.59	15.59	15.59
Ground-Ramp	5.85	10.15	25.00
Helicopter	19.31	20.35	21.39
Internships	15.34	17.06	25.00
Management	24.00	36.33	60.00
Office and Administrative	18.00	33.00	60.00
Other	5.85	17.41	25.00
Pilot	25.00	35.00	45.00
Sales-Marketing	5.85	12.93	25.00
Supplemental	11.50	11.50	11.50
Temporary or Seasonal	5.85	17.71	25.00



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Current Salary and Hourly "New Hire" Rates as reported by Participating Aviation Employers.

Airport		
Career Title	Min. Reported	Max. Reported
Aircraft Cabin Cleaners	\$8.50 hr	\$8.50 hr
Airline Cabin Service Cleaner	\$9.00 hr	\$9.00 hr
Airport Business Development Coordinator	\$50,492.00 yr	\$92,872.00 yr
Aviation Station Manager - Supervisor	\$42,500.00 yr	\$49,500.00 yr
Carpet Cleaners	\$8.50 hr	\$12.00 hr
Deputy Manager DIA	\$102,184.00 yr	\$163,062.00 yr
Dispatchers	\$12.50 hr	\$12.50 hr
Equipment Operator DIA Snow Removal 2008-2	\$30,821.00 yr	\$44,989.00 yr
Glazier - DIA	\$36,021.00 yr	\$52,552.00 yr
Graphic Tech - DIA Signage Production	\$36,724.00 yr	\$53,595.00 yr
Heavy Equipment Service Technician - DIA	\$32,628.00 yr	\$48,092.00 yr
Line Service Mechanic	\$14.00 hr	\$15.00 hr
Manager Business Development	\$55,494.00 yr	\$91,563.00 yr
PASSENGER SERVICE AGENTS	\$11.00 hr	\$12.00 hr
Professional Occupations Intern II DIA	\$15.34 hr	\$15.34 hr
Ramp Agents	\$8.00 hr	\$8.00 hr
Ramp-Baggage Handler Customer Service Agent (CSA)	\$9.50 hr	\$10.18 hr
Sheetmetal Mechanic	\$18.00 hr	\$23.00 hr
Sky Caps	\$5.85 hr	\$25.00 hr
AP Mechanic		
Career Title	Min. Reported	Max. Reported
A&P Mechanic - Wilmington, OH	\$22.00 hr	\$22.00 hr
A-P Mechanic for FAA Repair Station	\$18.00 hr	\$28.00 hr
Aircraft Composite Technician	\$18.00 hr	\$25.00 hr
Aircraft Interior Fitters	\$13.00 hr	\$16.00 hr
Aircraft Interior Mechanic	\$12.00 hr	\$26.00 hr
Aircraft Maintenance Technician	\$15.00 hr	\$25.00 hr
Aircraft Mechanic	\$20.00 hr	\$35.00 hr
Aircraft Mechanic I	\$46,500.00 yr	\$50,000.00 yr
Aircraft Sheet Metal Mechanic	\$10.00 hr	\$17.91 hr
Aircraft Sheetmetal Mechanic	\$15.00 hr	\$28.00 hr
Aircraft Technician	\$16.00 hr	\$24.00 hr
Aircraft Technician-Mechanic II	\$21.77 hr	\$21.77 hr
AP Maintenance	\$16.00 hr	\$17.75 hr
AP Mechanic	\$14.42 hr	\$46,000.00 yr
AP Mechanic - Bellingham WA	\$20.05 hr	\$20.05 hr
AP Mechanic - MX	\$20.05 hr	\$20.05 hr
AP Mechanic Seattle, WA	\$18.00 hr	\$30.00 hr
AP Mechanic-MX Bellingham Wa	\$20.05 hr	\$20.05 hr
AP Mechanics	\$12.00 hr	\$26.00 hr
Aviation Machinists Mate-Subject Matter Expert	\$22.00 hr	\$24.00 hr
Aviation Structural Mechanic-Subject Matter Expert	\$24.00 hr	\$24.00 hr
Aviation Technicians	\$15.00 hr	\$18.00 hr
Commercial A&P	\$21.75 hr	\$22.50 hr



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Current Salary and Hourly "New Hire" Rates (continued)

Composite Technicians	\$13.00 hr	\$16.00 hr
Flightline Mechanic	\$21.75 hr	\$22.50 hr
Galley Builder	\$13.00 hr	\$16.00 hr
mechanic - pilot	\$48,000.00 yr	\$48,000.00 yr
Night Shift Lead-Maintenance Coordinator	\$55,000.00 yr	\$65,000.00 yr
Planner Maintenance (Aircraft Router)	\$50,000.00 yr	\$60,000.00 yr
Quality Control Inspector	\$26.00 hr	\$28.00 hr
Quality Control Technician	\$45,000.00 yr	\$50,000.00 yr
Sheetmetal Technicians	\$13.00 hr	\$16.00 hr
Shop Manager - I.A. Certified Current DOM	\$18.00 hr	\$35.00 hr
Technician	\$29,500.00 yr	\$42,000.00 yr
Technician Maintenance	\$23.00 hr	\$34.47 hr
Turbine Aircraft Mechanic	\$18.00 hr	\$30.00 hr
TWU MECHANIC	\$5.85 hr	\$5.85 hr
Avionics		
Career Title	Min. Reported	Max. Reported
Aviation Electricians Mate-Subject Matter Expert	\$22.00 hr	\$24.00 hr
Aviation Electronics Mate-Subject Matter Expert	\$24.00 hr	\$24.00 hr
Aviation Ordnanceman-Subject Matter Expert	\$22.00 hr	\$24.00 hr
Avionic Aircraft Engineer	\$20.00 hr	\$45.00 hr
Avionic Manager	\$28.00 hr	\$32.00 hr
Avionic Technican	\$26,000.00 yr	\$46,000.00 yr
Avionic Technicians	\$13.00 hr	\$25.00 hr
Avionics Dept Manager - Technician	\$40,000.00 yr	\$65,000.00 yr
Avionics Installer	\$15.00 hr	\$65,000.00 yr
Avionics Shop Manager-Technician	\$60,000.00 yr	\$100,000.00 yr
Avionics Technician	\$15.00 hr	\$28.00 hr
Avionics Technician - Denver CO	\$23.00 hr	\$23.00 hr
Business Intelligence Specialist (2009163)	\$5.85 hr	\$15.00 hr
Corporate Avionics	\$23.81 hr	\$24.24 hr
Electronic Technician I (MH-60 Avionics)	\$19.31 hr	\$19.88 hr
Lead Avionics Aircraft Engineer	\$20.00 hr	\$45.00 hr
Level 2 Avionics Technician	\$20.00 hr	\$30.00 hr
Level 3 Avionics Technician	\$22.00 hr	\$33.00 hr
Night Avionics Technician	\$20.00 hr	\$28.00 hr
Technical Operations Assistant Manager	\$50,000.00 yr	\$55,000.00 yr
Cargo		
Career Title	Min. Reported	Max. Reported
Cargo Agent	\$12.48 hr	\$13.73 hr
Line Service Mechanic	\$14.00 hr	\$15.00 hr
Ramp Agent	\$12.48 hr	\$13.73 hr



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Current Salary and Hourly "New Hire" Rates (continued)

Dispatch		
Career Title	Min. Reported	Max. Reported
Crew Scheduler	\$14.00 hr	\$14.00 hr
Dispatch	\$15.00 hr	\$15.00 hr
Dispatcher	\$10.00 hr	\$15.00 hr
Dispatchers	\$12.50 hr	\$12.50 hr
Duty Engineer	\$62,900.00 yr	\$81,000.00 yr
Flight Coordination-Dispatch-Sales	\$35,000.00 yr	\$50,000.00 yr
Radio Relay Field Service Technician	\$18.00 hr	\$18.00 hr
Engineering and Aerospace		
Career Title	Min. Reported	Max. Reported
Auditor Quality Assurance	\$55,000.00 yr	\$70,000.00 yr
Avionics Design	\$45.00 hr	\$50.00 hr
BSME or SR Designer	\$45.00 hr	\$50.00 hr
Certification Engineer	\$50.00 hr	\$65,000.00 yr
Design Engineer I	\$19.00 hr	\$28.00 hr
Electrical Liaison Engineer	\$50.00 hr	\$55.00 hr
Engine Inspectors-Workshop Engineers	\$24,000.00 yr	\$31,200.00 yr
Engineer - Stress-Aircraft	\$60.00 hr	\$60.00 hr
Flight Controls Designer	\$50.00 hr	\$60.00 hr
Licensed Aircraft Engineers	\$30.00 hr	\$38.00 hr
Line Maintenance Technician	\$18.00 hr	\$22.10 hr
Loads Engineer	\$60.00 hr	\$70.00 hr
Mechanical Design Engineers	\$60,000.00 yr	\$80,000.00 yr
Mechanical Engineer	\$65,000.00 yr	\$80,000.00 yr
Program Engineer	\$50,000.00 yr	\$90,000.00 yr
Project Engineer	\$70,000.00 yr	\$75,000.00 yr
Quality Assurance Engineers	\$60,000.00 yr	\$80,000.00 yr
Senior Airfield Design Engineer	\$80,000.00 yr	\$110,000.00 yr
Senior Airport Planner	\$30.00 hr	\$50.00 hr
Senior Engineer Civil- Airport DIA	\$75,956.00 yr	\$121,176.00 yr
Senior Mechanical Structures Engineer	\$85,000.00 yr	\$95,000.00 yr
Sr Sheetmetal Technician	\$21.33 hr	\$21.33 hr
Technical representative	\$41,000.00 yr	\$53,700.00 yr
VP of Engineering	\$100,000.00 yr	\$105,000.00 yr
VP of Quality and Operations	\$10,000.00 yr	\$125,000.00 yr
Welder-Production Technician	\$24.00 hr	\$26.00 hr
Ground-Ramp		
Career Title	Min. Reported	Max. Reported
Aircraft Cabin Cleaners	\$8.50 hr	\$8.50 hr
Airline Cabin Service Cleaner	\$9.00 hr	\$9.00 hr
Airline Ramp Agents	\$8.00 hr	\$8.00 hr
Carpet Cleaners	\$8.50 hr	\$12.00 hr
Heavy Equipment Service Technician	\$32,954.00 yr	\$48,092.00 yr
Line Service Technician	\$10.00 hr	\$13.25 hr
Ramp Service Agent	\$10.12 hr	\$10.12 hr
RAMP SERVICE AGENTS	\$10.13 hr	\$10.13 hr



North Texas Aviation Education Initiative

NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS

Current Salary and Hourly "New Hire" Rates (continued)

Ramp Service Employees	\$9.88 hr	\$10.39 hr
Sky Caps	\$5.85 hr	\$25.00 hr
Station Manager	\$40,000.00 yr	\$45,000.00 yr
TWU PSTL RAMP CLERK	\$5.85 hr	\$5.85 hr
Management		
Career Title	Min. Reported	Max. Reported
Airport Facilities Manager	\$52,900.00 yr	\$89,930.00 yr
Airport Operations Manager	\$40,000.00 yr	\$40,000.00 yr
Aviation Ops Mgr-DIA (Snow Removal-Airfield NIMS)	\$59,897.00 yr	\$95,590.00 yr
Deputy Manager DIA	\$102,184.00 yr	\$163,062.00 yr
Director of Business Development	\$125,000.00 yr	\$125,000.00 yr
Director of Quality Assurance	\$75,000.00 yr	\$100,000.00 yr
Director of Supply Chain	\$95,000.00 yr	\$95,000.00 yr
General Manager	\$40,000.00 yr	\$45,000.00 yr
Learjet Program Manager	\$50,000.00 yr	\$60,000.00 yr
Line Service Manager	\$35,000.00 yr	\$45,000.00 yr
Maintenance Shift Manager	\$50.00 hr	\$60.00 hr
Manager of Planning and Development	\$50,902.00 yr	\$70,245.00 yr
Manager of Technical Support	\$29.00 hr	\$29.00 hr
Ontario, CA Station Maintenance Manager	\$25.00 hr	\$27.00 hr
Operations Manager	\$35,000.00 yr	\$40,000.00 yr
Product Support Manager (MRO) Aerospace	\$70,000.00 yr	\$90,000.00 yr
Station Maintenance Manager	\$24.00 hr	\$26.00 hr
Office and Administrative		
Career Title	Min. Reported	Max. Reported
Analyst	\$50.00 hr	\$60.00 hr
Contracts Administrator	\$70,000.00 yr	\$100,000.00 yr
Deputy Manager DIA	\$102,184.00 yr	\$163,062.00 yr
Parts Coordinator	\$20.00 hr	\$30.00 hr
QC Specialist	\$18.00 hr	\$20.00 hr
Other Positions		
Career Title	Min. Reported	Max. Reported
Aircraft Cabin Cleaners	\$8.50 hr	\$8.50 hr
Airline Cabin Service Cleaner	\$9.00 hr	\$9.00 hr
Assembly-Test B	\$12.00 hr	\$15.00 hr
Aviation Egress Mechanic-Subject Matter Expert	\$22.00 hr	\$24.00 hr
Aviation Materials Buyer	\$38,000.00 yr	\$40,000.00 yr
Aviation Upholstery Specialists	\$15.00 hr	\$25.00 hr
Cabinetmaker	\$18.00 hr	\$20.00 hr
Carpet Cleaners	\$8.50 hr	\$12.00 hr
Commercial Sheet Metal	\$21.75 hr	\$22.50 hr
Corporate Interiors	\$20.00 hr	\$24.56 hr
Manual Lathe - Mill Operator	\$16.00 hr	\$17.00 hr
Primer Prepper and Sprayer	\$10.00 hr	\$18.00 hr
Quality Control Inspector	\$32,400.00 yr	\$32,400.00 yr
Sheet Metal Direct Hires	\$21.98 hr	\$23.08 hr
Sheetmetal - Wilmington, OH	\$22.00 hr	\$22.00 hr



North Texas Aviation Education Initiative

NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS

Current Salary and Hourly "New Hire" Rates (continued)

Sheetmetal Mechanics - Tampa FL	\$23.50 hr	\$23.50 hr
Shipping - Receiving Coordinator	\$10.00 hr	\$12.00 hr
Sky Caps	\$5.85 hr	\$25.00 hr
Structures Technician- Rockford, IL	\$22.00 hr	\$22.00 hr
Upholsterer	\$20.00 hr	\$20.00 hr
Upholstery Technician	\$20.00 hr	\$20.00 hr
Pilots		
Career Title	Min. Reported	Max. Reported
ATR42 and ATR72 Pilots	\$600.00 hr	\$675.00 hr
Flight Instructor	\$25.00 hr	\$57,000.00 yr
Geophysical Survey Pilots	\$60,000.00 yr	\$85,000.00 yr
PA31-350	\$54,000.00 yr	\$54,000.00 yr
Pilatus PC12 PIC	\$66,000.00 yr	\$66,000.00 yr
Pilot - Beech 99	\$32,760.00 yr	\$32,760.00 yr
Pilot - Cessna 208	\$32,760.00 yr	\$32,760.00 yr
SIC - EMS	\$35,000.00 yr	\$50,000.00 yr
Sales-Marketing		
Career Title	Min. Reported	Max. Reported
Account Manager	\$15.00 hr	\$25.00 hr
Aviations Communicatons Sales Rep	\$50,000.00 yr	\$100,000.00 yr
Commercial aircraft coordinator	\$55,000.00 yr	\$65,000.00 yr
Director of Sales	\$125,000.00 yr	\$250,000.00 yr
Marketing Managers-Sales Engineers	\$65,000.00 yr	\$85,000.00 yr
Outside Sales Representative	\$10,000.00 yr	\$40,000.00 yr
Regional Marketing-Sales Engineers	\$65,000.00 yr	\$75,000.00 yr
Regional Sales Manager	\$50,000.00 yr	\$50,000.00 yr
Sales Producer	\$5.85 hr	\$5.85 hr
Vice President - Sales and Marketing	\$55,000.00 yr	\$55,000.00 yr

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