



# **North Texas Aviation Education Initiative**

NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS

## **An Analysis of the Gap Existing Between Aviation Workforce Needs and Supply for North Central Texas**

September 2009



# North Texas Aviation Education Initiative

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## AN ANALYSIS OF THE GAP EXISTING BETWEEN AVIATION WORKFORCE NEEDS AND SUPPLY FOR NORTH CENTRAL TEXAS

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## AN ANALYSIS OF THE GAP EXISTING BETWEEN AVIATION WORKFORCE NEEDS AND SUPPLY FOR NORTH CENTRAL TEXAS

### A. GLOSSARY

This section defines acronyms and abbreviations used throughout the document.

<b>Term</b>	<b>Description</b>
A&P	Airframe & Powerplant
ATC	Air Traffic Control
AT-CTI	Air Traffic Collegiate Training Initiative
BLS	U.S. Bureau of Labor Statistics
CIP	Classification of Instructional Programs
FAA	Federal Aviation Administration
FY	Fiscal Year
NAICS	North American Industry Classification System
NCTCOG	North Central Texas Council of Governments
SOC	Standard Occupational Classification
THECB	Texas Higher Education Coordinating Board
TWC	Texas Workforce Commission



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## **B. INTRODUCTION**

The North Texas Aviation Education Initiative under development by the North Central Texas Council of Governments (NCTCOG) requires, as an integral part of its foundation, an analysis of the existing gap between the current and projected aviation workforce needs and supply for North Central Texas, the 16-county area of Collin, Dallas, Denton, Ellis, Erath, Hood, Hun, Johnson, Kaufman, Navarro, Palo Pinto, Parker, Rockwall, Somervell, Tarrant, and Wise counties. Utilizing the extensive research and databases developed early in this project, two matrices have been created; one reflects the industry's future needs and supply for the State of Texas and one addresses these same projections for the region. This analysis will, in turn, be used to support the development and implementation of a public education program, geared toward a four-year degree plan with a flight component.

## **C. MATRIX DEVELOPMENT**

The primary source for the matrix data is the Texas Workforce Commission (TWC) which, in addition to collecting its own, utilizes data secured from the U.S. Bureau of Labor Statistics (BLS) and the Texas Higher Education Coordinating Board (THECB). Stratifications according to the North American Industry Classification System (NAICS) allowed for the study of primary job classifications found in the aviation industry today. Ultimately, eight job titles were selected that were identified as being aviation specific and readily available in the employment data. In order to focus even more clearly on aviation, it was determined that these jobs are, or can be, supplied by graduates of aviation-specific academic programs. The academic programs, according to their Classification of Instructional Programs (CIP) code, are shown in Exhibit 1.



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## Exhibit 1: Aviation Academic Programs by CIP Code

- 15 Engineering Technologies/Technicians
  - 15.0801 Aeronautical/Aerospace Engineering Technology/Technician
  
- 47 Mechanic and Repair Technologies/Technician
  - 47.0607 Airframe Mechanics and Aircraft Maintenance Technology/Technician
  
  - 47.0608 Aircraft Powerplant Technology/Technician
  
  - 47.0609 Avionics Maintenance Technology/Technician
  
- 49 Transportation and Materials Moving
  - 49.01 Air Transportation
    - 49.0101 Aeronautics/Aviation/Aerospace Science and Technology, General
    - 49.0102 Airline/Commercial/Professional Pilot and Flight Crew
    - 49.0104 Aviation/Airway Management and Operations
    - 49.0105 Air Traffic Controller
    - 49.0106 Airline Flight Attendant
    - 49.0108 Flight Instructor
    - 49.0199 Air Transportation, Other
  
- 52 Business, Management, Marketing, and Related Support Services
  - 52.0209 Transportation/Transportation Management

Source: U.S. Department of Education, Classification of Instructional Programs – 2010



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The selection of job titles was further clarified by reviewing the occupational crosswalk that links academic programs with job titles/Standard Occupational Classification (SOC) codes. Exhibit 2 shows the link between the academic programs in aviation and the specific jobs that they are intended to supply as defined by their SOC code and job title.

## Exhibit 2: Classification of Instructional Programs – Standard Occupational Classification Crosswalk

15.0801 Aeronautical/Aerospace Engineering Technology/Technician 17-3021.00 Aerospace Engineering and Operations Technicians
47.0607 Airframe Mechanics & Aircraft Maintenance Technology/Technician 49-2091.00 Avionics Technicians 49-3011.00 Aircraft Mechanics and Service Technicians 51-2011.00 Aircraft Structure, Surfaces, Rigging, and Systems Assemblers
47.0608 Aircraft Powerplant Technology/Technician 49-3011.00 Aircraft Mechanics and Service Technicians 51-2011.00 Aircraft Structure, Surfaces, Rigging, and Systems Assemblers
47.0609 Avionics Maintenance Technology/Technician 49-2091.00 Avionics Technicians 51-2011.00 Aircraft Structure, Surfaces, Rigging, and Systems Assemblers 53-6051.01 Aviation Inspectors
49.0101 Aeronautics/Aviation/Aerospace Science & Technology, General 11-3071.01 Transportation Managers 11-3071.02 Storage and Distribution Managers
49.0102 Airline/Commercial/Professional Pilot and Flight Crew 53-2011.00 Airline Pilots, Copilots, and Flight Engineers 53-2012.00 Commercial Pilots
49.0104 Aviation/Airway Management and Operations 11-3071.01 Transportation Managers 11-3071.02 Storage and Distribution Managers 53-1011.00 Aircraft Cargo Handling Supervisors
49.0105 Air Traffic Controller 53-2021.00 Air Traffic Controllers 53-2022.00 Airfield Operations Specialists
49.0106 Airline Flight Attendant 39-6031.00 Flight Attendants
49.0108 Flight Instructor 53-2011.00 Airline Pilots, Copilots, and Flight Engineers 53-2012.00 Commercial Pilots
49.0199 Air Transportation, Other No CIP titles match
52.0209 Transportation/Transportation Management 11-3011.00 Administrative Services Managers 11-3071.01 Transportation Managers 11-3071.02 Storage and Distribution Managers 11-9199.99 Managers, All Other 13-1081.00 Logisticians

Source: Occupational Information Network ([www.onetcenter.org](http://www.onetcenter.org)) / U.S. Department of Education, Classification of Instructional Programs - 2010



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The primary jobs selected for inclusion in the matrices are those that represent most of the main functions and largest number of employees in the aviation industry. This grouping, by design, is not an exhaustive list of the available supply of primary jobs. An analysis of additional aviation professions that have high public profiles but have no related academic programs in the state is also included in this report. These are flight attendants and aerospace engineering and operations technicians. Air traffic controllers (SOC 53-2021) are not included in this matrix design for reasons discussed in a following section of this report.

## **Matrix Description**

Two matrices were developed for a snap-shot look at education needs and supplies; one for the State of Texas and one for North Central Texas. The matrix configuration is described in this section. Please refer to Exhibit 3 while reading this discussion.



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## Exhibit 3: Aviation Education Needs/Supply Matrix – Texas

SOC/Title	Employment Levels		10-yr Change	Annual Need = Growth + Replacement	Recent Graduates Academic Year 2005	Future Outlook of Academic Supply
	2006	2016				
17-3021 Aerospace Engineering and Operations Technicians	691	818	127	18	n/a	n/a
39-6031 Flight Attendants	10,550	13,050	2,500	435	n/a	n/a
49-2091 Avionics Technicians	2,350*	2,800*	450	70	296	Sufficient
49-3011 Aircraft Mechanics and Service Technicians	17,150*	21,250*	4,100	580	457	Deficient
51-2011 Aircraft Structure, Surfaces, Rigging, and Systems assemblers	3,454	4,064	610	129	457	Sufficient
53-2011 Airline Pilots, Copilots, and Flight Engineers	7,800	9,900	2,100	440	83	Deficient
53-2012 Commercial Pilots	2,350	3,050	700	140	83	Deficient
53-2022 Airfield Operations Specialists	400	550	150	20	5	Deficient

Source: Texas Workforce Commission. Note: Employment Data for 17-3021 and 51-2011 are for 2004/2014. n/a => No academic programs available/No determination made.

### Notes for reviewing the matrix.

1. Standard Occupational Classification is abbreviated SOC.
2. \*Employment data for 17-3021 (avionics technicians) and 51-2011 (aircraft mechanics, service technicians) is for 2004/2014.
3. No academic programs are available (na).
4. No determination is made (na).
5. If the "Supply" number is between the numbers of "Recent Graduates" and "Need", projected academic supply for the future is considered "Sufficient."
6. If the "Need" number exceeds the "Recent Graduates" by more than 10 percent, the projected academic supply for the future is considered "Deficient."





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Eight job titles with their SOC codes are utilized because they are identified by TWC data as being the most closely associated with the air transportation industry. They are the job titles linked to academic programs in aviation, and they are the aviation-specific titles that have emerged from the four NAICS areas examined. For each of these job titles, a corresponding baseline (2006) level of employment is included along with a projected level of employment (2016). The difference between these two employment levels is shown in the “Change” column and represents the 10-year need. A “Need” column exists to show what the project need is going forward from 2006 to 2016 on an annual basis. This “Need” represents the change in employment due to growth and the need to replace existing workers due to retirement/attrition. These are represented in one column and are on an annual basis.

Additionally, recent graduate information is provided as linked by the CIP/SOC crosswalk. Data provided by the TWC incorporates data from other sources. “Recent Graduates” is the academic supply number and is the metric viewed vis-a-vis the “Need.” These recent graduates are from academic institutions in their respective areas, Texas (Exhibit 3) and North Central Texas (Exhibit 4). Additional academic supply numbers are discussed in another section.

From the current and projected levels of employment and a measure of the recent graduates that pertain to each of the specific job titles/classifications, their relationships are characterized by the assignment of a qualitative description of the academic supply.

## Supply Descriptor

The terms “Sufficient” and “Deficient” are used to characterize the need/supply relationship. If the number of “Recent Graduates” and the “Need” are within 10 percent of each other on either side or if the “Recent Graduates” exceed the “Need” by more than 10 percent, the supply is considered “Sufficient.” If the “Need” exceeds the “Recent Graduates” by more than 10 percent, the supply is considered “Deficient.” The greater the deficit, obviously, the greater the need to consider how the region might structure an aviation education program that best serves both the state and the region.

These primary professions do not account for a significant number of jobs that are available at aviation-related employers which are not necessarily aviation-specific in terms of their function. These include a variety of engineering, environmental, business, administrative, and technical functions that are applied in an aviation setting. While an education or training from an aviation program may not be required, it may be seen as an asset from an employer perspective. A new employee that already has a background and familiarity in the industry in which they are working is a benefit to the employer who does not have to expend resources to train the employee.

Two of the included job titles/SOCs require additional explanation. These two are:

- 39-6031 Flight Attendants; and
- 17-3021 Aerospace Engineering and Operations Technicians.

As can be seen on the matrix, there is missing data and no subsequent supply descriptor because there are no academic programs in the state tied to these two job titles. A review of THECB data shows no current academic program linked to the job title 17-3021 Aerospace Engineering and Operations Technicians. It exists under CIP 15.0801 Aeronautical/Aerospace

Engineering Technology/Technician. The same is true for the flight attendant job title. Its job title/SOC is 39-6031 is linked to the CIP 49.0106 Airline Flight Attendant, and there is no academic program in the state. Again, these linkages are made via the crosswalk discussed earlier.

While it is likely that aeronautical technicians could be supplied through related academic programs (CIP codes 47.0607/47.0608/47.0609), the same cannot be said about flight attendants. While the academic program code exists, it is not likely such a program exists or would be developed. The primary reason for this is the lack of a requirement of a four-year degree for employment. While it would not be unusual for two years of college to be required, there exists no overarching need for the education to be in an aviation-related field.

#### **D. MATRIX ANALYSIS: STATE AND REGIONAL AVIATION WORKFORCE NEED AND SUPPLY**

The two matrices provide a picture of the aviation workforce needs and academic supply for both Texas and North Central Texas. As noted earlier, it includes employment levels for 2006 and 2016, the projected need over the time period, and a measure of academic supply for each of the aviation-specific job titles. Additionally, a descriptor for each of the included job titles is based on the need and supply relationship. Resulting conclusions are not necessarily the same for the state and region.

In Texas, there is sufficient supply of avionics technicians and aircraft structure, surfaces, rigging, and systems assemblers. There is a deficit, however, for four categories: aircraft mechanics and service technicians; airline pilots, copilots, and flight engineers; commercial pilots; and airfield operations specialists. The deficit among the airline pilots, copilots, and flight engineers category is the most dramatic as supply is only 19 percent of need. While approximately the same percentage held for airfield operations specialists, the overall numbers are significantly less. The supply of commercial pilots is also particularly low. The supply is 60 percent of need. The other job categories showing a deficit have more of a balanced picture but a need beyond 10 percent nonetheless.

Noteworthy among avionics technicians is the seemingly oversupply at more than 400 percent of need. This is on the state-level and not the regional level as need exists in the region. These avionics technicians may be succeeding in finding work in other industries as noted later in this report. The avionics education program appears to be serving as a successful training ground for other industries.



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## Exhibit 4: Aviation Education Needs/Supply Matrix – North Central Texas

SOC/Title	Employment Levels		10-yr Change	Annual Need = Growth + Replacement (annual)	Recent Graduates Academic Year 2005	Future Outlook of Academic Supply
	2006	2016				
17-3021 Aerospace Engineering and Operations Technicians	426	508	82	10	n/a	n/a
39-6031 Flight Attendants	5,650	6,500	850	185	n/a	n/a
49-2091 Avionics Technicians	1,350*	1,600*	250	40	3	Deficient
49-3011 Aircraft Mechanics and Service Technicians	7,800*	9,650*	1,850	270	89	Deficient
51-2011 Aircraft Structure, Surfaces, Rigging, and Systems assemblers	2,496	2,972	476	92	89	Sufficient
53-2011 Airline Pilots, Copilots, and Flight Engineers	4,050	4,800	750	190	32	Deficient
53-2012 Commercial Pilots	650	800	150	30	32	Sufficient
53-2022 Airfield Operations Specialists	150	200	50	0	5	Sufficient

Source: Texas Workforce Commission. Note: Employment Data for 17-3021 and 51-2011 are for 2004/2014. n/a => No academic programs available/No determination made.

### Notes for reviewing the matrix.

1. Standard Occupational Classification is abbreviated SOC.
2. \*Employment data for 17-3021 (avionics technicians) and 51-2011 (aircraft mechanics, service technicians) is for 2004/2014.
3. No academic programs are available (na).
4. No determination is made (na).
5. If the "Supply" number is between the numbers of "Recent Graduates" and "Need", projected academic supply for the future is considered "Sufficient."
6. If the "Need" number exceeds the "Recent Graduates" by more than 10 percent, the projected academic supply for the future is considered "Deficient."



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In North Central Texas, there is sufficient academic supply of three job title categories: aircraft structure, surfaces, rigging, and systems assemblers; commercial pilots; and airfield operations specialists. All have a supply that is within 10 percent of the need. There are, however, deficits for three job title categories: avionics technicians; aircraft mechanics and service technicians; and airline pilots, copilots, and flight engineers.

There is a need for avionics technicians in the region that far outpaces its ability to produce them in the academic setting. The matrix shows only three being produced when 40 are needed annually (7.5 percent). Additionally, the imbalance in the airline pilot category is significant in that while only 17 percent of the need is met; however, this is not true of the commercial pilot category. (A commercial pilot is defined as the holder of a certificate that permits him/her to pilot an aircraft for hire.) This seems to indicate that the airline pilot category is likely to be filled with those holding four-year degrees, and the commercial pilot category includes professional flying jobs that do not have the same requirements as the airlines.

It should be noted that academic programs do not only supply one job title as defined by the SOC code. They may, in fact, supply several. The data appears to show that the job categories of aircraft mechanics and service technicians and aircraft structure, surfaces, rigging, and systems assemblers are supplied by the same academic programs. Additionally, the airline pilots, copilots, and flight engineers category and the commercial pilots category are served by the same academic programs. However, consolidating them may lead to incorrect assumptions because these two individual job titles may carry different requirements. When viewing the needs and supply, one should take into account that the supply for these is coming from the same source. This would appear to further underestimate the need as the supply that is used to meet the need of one category is not available to meet the need of the other. In short, the supply is being double counted when the need is not.

## **E. GAPS AT THE REGIONAL LEVEL**

An examination of the employment data and the supply of aviation education program graduates in the region reveals several gaps. First, the lack of a four-year aviation degree program is clear for two primary reasons. There is no option for students to become professional pilots as part of their degree plan. This is an important pipeline for airline pilots and no such opportunity exists in the region. Secondly, there are no aviation-related options for those skilled/technical workers in the two-year programs to continue on in their education, thus placing themselves in a position to assume supervisory or management positions within their field/company. The combination of a technical skill set and a college degree is an asset to the employer as the employee has a greater familiarity with the workplace and all of its demands as opposed to a supervisor who may not have the technical background or another employee who may not have the management background. Additionally, the four-year program is capable of training a workforce for a myriad of positions within and outside of aviation and transportation fields.

The region also needs additional aircraft mechanics and service technicians. While academic resources do exist in the region, the area is home to a significant number of aviation/aerospace manufacturing jobs and airports that need them. The need for avionics technicians in the region exists, despite the adequate supply statewide. The need for these additional technical workers is apparent as is the need for a four-year aviation program with close ties and interaction between itself and the industries it serves.

## **Description of National Aviation Workforce Supply and Need**

In summary, there appears to be a widening shortfall in the number of qualified personnel to meet the growing needs of the aviation industry. While objectively measured in terms of the number of skilled labor and professional flight personnel, the needs of the industry also include managerial and executive level aviation professionals which is difficult to quantify. The gap analysis reveals that as the nation emerges from the current economic distress, there should be a concern that the demand for entry level managerial and specialized knowledge workers will not be met by current sources and supply of graduates to fill the positions. As shortfalls materialize, there will be a commensurate impact on aviation employers in North Central Texas, who will be forced to compete for a dwindling pool of qualified personnel in the marketplace. One method for minimizing the effect on the region's aviation interests is to create and develop the resources and infrastructure to support the establishment of a "pipeline" for entry-level personnel within the industry.

### **F. OTHER RELEVANT EMPLOYMENT CATEGORIES/OPPORTUNITIES**

While the matrices show the gaps for the primary professions in the state and in the region, they do not provide a comprehensive picture of all aviation employment needs. Other job opportunities and employment needs in the aviation industry exist and are worthy of discussion. It should be noted that there is significant employment in the aviation industry and not all of the jobs require an education in an aviation-related field or from an aviation education program. With that said, there are some obvious and inherent benefits to hiring employees who do have this familiarity and background.

Whether it is filling a need in marketing, software development, or customer service, among the many others, having such a background and understanding of the industry certainly can enhance job performance, customer/client satisfaction, and employee/company productivity. Aviation program graduates are likely to be considered as qualified candidates for a variety of jobs both in and out of the aviation industry and not simply those primary professions described in the matrices. In some sense, the matrix design understates the overall need and benefit of an enhanced and coordinated academic supply of aviation program graduates. Additionally, it is difficult for the data sources to fully capture the need for aviation management positions in the myriad of workforces whether in the airlines, aviation manufacturing, or airport/public agency environments. The aviation workforce in the state and region is a large one; the number of graduates coming out of academic programs in the region and state is small. The academic program data that reveals the number of graduates the state is producing, in itself, reveals a worrisome gap.

Following is a discussion of additional high profile jobs that are not represented in the matrices. These include air traffic controller and dispatchers. Each of these was not included for different reasons. The air traffic controllers, while small in number, are a different type of job. With a significant number of them being employed by the Federal Aviation Administration (FAA), the employment pipeline and selection is performed at the national level. While one could prepare for such a career at a particular program in one state, they may very well end up being assigned to a job in another state. The dispatcher jobs, although important in function, are quite small in number. Both are addressed separately below with employment levels and growth data provided.

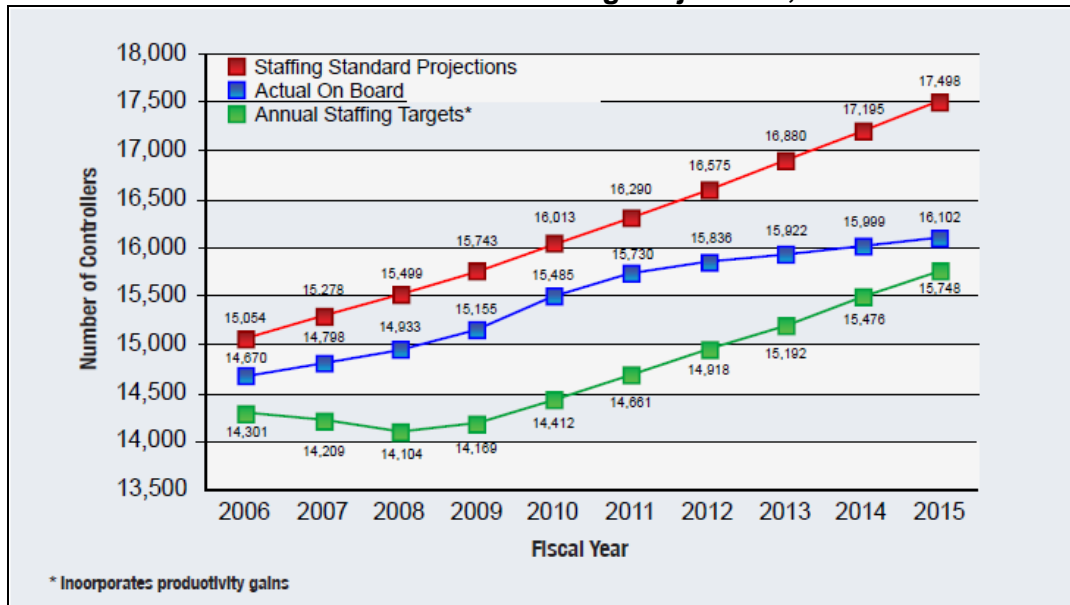
## Air Traffic Controllers

As an occupational category, Air Traffic Controllers have significantly different characteristics over the other aviation-oriented occupations. The FAA as the primary employer of air traffic controllers throughout the country has concentrated its training and certification activities at its training academy in Oklahoma City, OK. Graduates of the academy are dispatched to locations where staffing replacements are required.

Currently, the FAA is confronted by the fact that a substantial number of controllers, who were hired immediately after striking controllers were fired in 1981, are approaching the mandatory retirement age of 58. One initiative the FAA has implemented to streamline and speed up the integration of new controllers into the Air Traffic Control (ATC) system is the Air Traffic Collegiate Training Initiative (AT-CTI) program. This program is a partnership with colleges and universities that offer two- and four-year non-engineering aviation degrees that include basic courses in ATC. While graduates of the AT-CTI program must still successfully complete their qualifications training at the FAA academy, the program allows these college graduates to bypass the FAA's Air Traffic Basics Course, which is conducted during the first five weeks of qualification training.

On a national level, the FAA has projected a continuous staffing shortfall of controllers through Fiscal Year (FY) 2015. Exhibit 5 illustrates national FAA staffing projections FY 2006 - 2015.

**Exhibit 5: FAA Air Traffic Controller Staffing Projections, 2006-2015**



Source: A Plan for the Future, The Federal Aviation Administration's 10-Year Strategy for the Air Traffic Control Workforce (2006-2015).

The growth of aviation activity in North Central Texas will contribute to the shortfall of controller staffing in future years. However, in terms of the adequacy of qualified controllers for staffing the region's ATC needs, the responsibility and authority for responding lies solely within the FAA.

Exhibit 6 shows the projected need for air traffic controllers in Texas and the 16-county North Central Texas Region through 2016.

**Exhibit 6: Occupational Projections for Air Traffic Controllers in the North Central Texas Region and State, 2006-2016**

Area/Location	Estimated Employment 2006	Projected Employment 2016	Change	Annual Growth	Annual Openings Due To Replacement	Total Annual Openings
<b>North Central Texas</b>	1,150	1,450	300	30	35	65
<b>Texas</b>	2,700	3,400	700	70	75	145

Source: Texas Workforce Commission

**Dispatch Certificate Holders**

A flight dispatcher is a FAA licensed person who plans flights taken by the airlines. The dispatcher is responsible for a variety of activities. These include determining the best route, the payload, weather, available diversion fields, and ATC procedures along the way. A dispatcher can plan and monitor as many as three to five flights at a time. Airlines are the principal employer of flight dispatchers, and opportunities exist at airlines of all sizes. Being the headquarters for three major airlines, Texas has a disproportional number of flight dispatcher jobs located in the state. The number of available jobs, and possibly the subsequent need, may be relatively small compared to other disciplines. Exhibit 7 shows the number of dispatcher certificate holders in Texas and in the United States. It is important to note that not all of those who hold such a certificate are employed—or even seeking employment—in such a capacity.

**Exhibit 7: Number of FAA Dispatcher Certificate Holders in Texas and the Nation, 2004-2008**

Year	Dispatcher Certificate	
	Texas	U.S.
<b>2004</b>	2,066	14,499
<b>2005</b>	2,130	14,960
<b>2006</b>	2,196	15,304
<b>2007</b>	2,264	15,570
<b>2008</b>	2,328	15,896

Source: U.S. Civil Airmen Statistics, Federal Aviation Administration

Although a four-year college degree is not necessary for employment as a dispatcher, a degree in air transportation or meteorology is useful and preferred. According to the BLS, dispatchers, in general, are employed in a variety of industries. Those employed in air transportation-specific settings are shown in Exhibit 8 which includes employment levels and growth projections. The national employment picture does not show a growing employment base, but the situation may vary by location. Certainly, those regions with airlines based nearby would see more job-related activity whether it is replacement of existing workers or growth to include additional workers.

**Exhibit 8: National Dispatcher Employment Levels and Projections, 2006-2016**

Industry	NAICS Code	2006 Employment	2016 Employment	Growth Rate 2006-2016
Scheduled Air Transportation	4811	1,096	1,089	-0.63%
Nonscheduled Air Transportation	4812	458	467	1.90%
Support Activities for Air Transportation	4881	596	648	8.72%
<b>Total</b>		2,150	2,204	2.51%

Source: Bureau of Labor Statistics, 2006-2016 Occupational Matrix

### **Airframe and Powerplant and Repairmen Certificate Holders**

Additional data worth examining, because it provides an additional perspective, is the number of Airframe & Powerplant (A&P) certificate holders. As with the dispatcher certificates, some caveats exist regarding certificate holders and any desire to link them with employment levels and/or job seekers. Many people employed in a variety of technical, manufacturing, and professional jobs hold A&P certificates but have no interest or desire in seeking employment as an A&P mechanic. They earn their certification out of interest and a desire to enhance their skill set as well as their professional abilities and opportunities. This undoubtedly makes them more valued employees as they offer a wider skill set and increased capabilities to their employers.

An A&P mechanic is certificated to work on all aircraft components and does not have to be employed by an airline, certificated maintenance shop or other enterprise. A&P mechanics have substantial testing (written, oral, and practical exams) and experience requirements of 18-30 months. A repairman certificated to work on a specific aircraft type or component, must be employed by an airline, certificated repair shop or production manufacturer. A repairman works under the shop's certification, and privileges terminate after he leaves the employ of the enterprise. Repairmen undergo specific training requirements for their area of expertise and have an 18-month experience requirement. A&P certificate holders are also indentifying other uses of these skills. For example, A&P mechanics are being hired to work in the oil and gas industry.



In addition to the two-year programs that offer degrees in aviation maintenance-related fields in conjunction with FAA certification, a number of non-academic entities provide training for A&P classification. Exhibit 9 shows the number of airframe and/or powerplant certificate holders along with the number of repairman certificates held in the state of Texas and in the United States.

**Exhibit 9: Number of FAA Airframe and/or Powerplant and Repairman Certificate Holders, 2004-2008**

Year	FAA Airframe and/or Powerplant		FAA Repairman	
	Texas	U.S.	Texas	U.S.
<b>2004</b>	30,245	296,079	3,436	39,144
<b>2005</b>	30,523	298,799	3,532	39,937
<b>2006</b>	30,978	301,157	3,591	40,239
<b>2007</b>	31,007	300,484	3,633	40,198
<b>2008</b>	31,497	303,475	3,718	40,985

Source: U.S. Civil Airmen Statistics, Federal Aviation Administration

These numbers overstate the number of those actually working as mechanics/repairmen for the reasons mentioned above. The number of individuals working in Texas as aircraft mechanics and service technicians is on the order of half of those actually holding certificates. What is noteworthy, however, is the large number of certificate holders that appear not to be moving through academic programs. If this is, indeed, the case, there is the potential lack of A&P certificate holders capable of moving into management positions due to the lack of a college degree. Of course, this data does not readily indicate that that is the case as we have no way of knowing if the certificate holders also hold academic degrees that would make them qualified and eligible for management positions. Strengthening this connection going forward, however, through coordinated academic programs would alleviate the concern and generate graduates with both the technical and management skills to assume key roles in the air transportation sector. Today, the lack of comprehensive four-year programs in the state, both in terms of number, type, and location of program, precludes that option or opportunity for many A&P holders as well as those wishing to pursue such a combination.

**Pilot Data by Certificate Type**

Much like the A&P certificate data, certain pilot certificate data is provided here to give additional perspective on the numbers of certificate holders in Texas and the United States. This more-or-less “order of magnitude” perspective is useful because it provides an overview of the industry. The caveats that were given for the A&P certificate data are also relevant here. Some of these represented may be employed as professional pilots while many others are employed in other industries and/or professions. Holders of pilot certificates may make themselves more valuable to their employers or more marketable to prospective employers for non-flying jobs by having such background and capabilities.

Many of these certificates were achieved independent of an academic program setting. The observations made about the mechanics also hold for pilots. Not only does it make the individuals more valuable, attractive and marketable to employers, it offers individuals a track

leading to management positions in an industry that lacks a comprehensive and coordinated educational pipeline.

Exhibit 10 shows the number of holders of selected pilot certificates in both Texas and the United States. Commercial pilot, air transport pilot, and flight instructor certificate data was selected as it is possible that these holders could be considered as employable in a professional pilot capacity as opposed to a student or private pilot. While conceivable, data already provided in the matrix show the number of those employed in the state and region to be significantly lower than those provided here. Many of these represented in the table likely lack the experience/flight time minimums to be considered by employees for professional pilot employment.

**Exhibit 10: Selected Pilot Certificates Held by State and Nation, 2004-2008**

Year	Commercial Pilot		Air Transport Pilot		Flight Instructor	
	Texas	U.S.	Texas	U.S.	Texas	U.S.
<b>2004</b>	9,692	126,761	15,124	138,247	7,078	87,698
<b>2005</b>	9,535	125,437	14,910	138,139	7,135	88,723
<b>2006</b>	9,401	122,849	15,017	138,197	7,246	89,452
<b>2007</b>	9,451	120,068	15,267	139,903	7,496	90,218
<b>2008</b>	10,100	126,893	15,399	142,070	7,643	91,155

Source: U.S. Civil Airmen Statistics, Federal Aviation Administration.

While these numbers may seem to indicate a sufficient supply to accommodate future needs for pilots, one should not assume these numbers represent a fully qualified supply. As with the A&P registration data, a review of industry needs for airline pilots (SOC 53-2011) in Texas and the number of air transport pilot certificate holders shows the FAA pilot registration data overestimates the actual supply by a ratio of 2 to 1.

While providing an interesting comparison on a general level, the FAA registration data is not a proxy for industry supply for pilots or mechanics. The numbers are useful, however, in gauging an overall interest and ability of the aviation workforce.

### **Focus on Aviation “Knowledge Workers”**

While much of the discussion on gaps in between qualified aviation industry employees and industry needs is based on national and regional occupational classifications, the underlying premise of this study is to determine the need for professional and managerial employees for the regional aviation industry. As such, there is limited data specifically addressing these categories of aviation “knowledge workers”, both in terms of how they can be quantified by standard industry classifications and how they are integrated into regional aviation interests. In many cases, personnel who fall within generic categories that describe basic managerial or executive-level employment are those who would fill job vacancies or new positions as opposed to classic skilled labor descriptors.

The data suggests that as the need for skilled and professional labor in the regional aviation industry increases, there will be a concurrent need for more executive level employment to

manage the growth. This assumption is supported by the relative strength of the regional aviation industry in the midst of a severe economic downturn. This effort to assess the needs for entry-level aviation industry knowledge workers to supply the need for the professional, managerial and other executive-level personnel is actually supported by the employment data for the standard occupation categories and the attendant gaps between supply and demand.

### **Employment Opportunities in other NAICS Codes**

Earlier in this document, it was noted that a significant number of jobs exist in aviation businesses that are not classified in titles that are aviation-specific. Many of these jobs, whether it is in business, computer science, marketing, finance, engineering, information systems, administrative support, or others, are integral to their organizations. These areas could prove to be an important potential market for aviation education programs. The theory is that aviation businesses would benefit from having employees who have a certain background in, or familiarity with, aviation. The business and their customers could be better served by such employees despite the fact that they are not categorized in aviation-specific job titles. While it may not be a necessity for the job, it can certainly be of benefit to the employer while potentially providing advantages of upward mobility to the employee.

The other side of this issue is the employment opportunities that are available for aviation program graduates in areas outside of air transportation-specific industries. Much of the analysis thus far has centered on the air transportation industry as defined by the four aviation-specific NAICS codes. However, aviation program graduates are not limited in their options. Examining only those four NAICS codes tends to underestimate the employment opportunities and thus the need for such aviation programs.

Exhibit 11 shows the main aviation-specific jobs along with their 2006 employment levels and percentage of these jobs that are represented in the four aviation-specific NAICS codes as well as the percentage that fall outside of those codes. This data is more meaningful for some of the job titles as opposed to others.

For example, with dispatchers, those represented in air transportation are likely those trained specifically for aviation who hold the FAA certificate. These jobs are not likely to be easily transferable into other industries or have as much crossover appeal as the aviation component of the job is quite specific and requires specific training. Other jobs are dominated by aviation industries like flight attendants and air traffic controllers.

Of greater interest are those aviation specific jobs that have significant levels of employment outside of the four primary aviation industries. This is where the overall need can be underestimated and where further justification of higher educational programs in aviation can be found. Pilots, mechanics, and avionics technicians all have large percentages of employment outside of aviation-specific industries. While this data is national-level data, its applicability to our study region is still valid given the state's and region's diverse economy. The raw data for each of these job titles showing the industries where they are employed is in Appendix A.

**Exhibit 11: Percent of Selected Aviation Professions Employed in Aviation-Related Industries in 2006**

SOC/Job Title	SOC Code	Total Employment (National) 2006	Percent Employed in Air Transportation Related Industries	Percent Employed in Other Industries
Aerospace engineering and operations technicians	17-3021	8,512	49.07	50.93
Flight Attendants	39-6031	96,730	99.34	0.66
Dispatchers, except police, fire, and ambulance	43-5032	190,231	1.27	98.73
Avionics Technicians	49-2091	15,709	61.44	38.56
Aircraft mechanics and service technicians	49-3011	122,472	70.09	29.91
Aircraft structure, surfaces, rigging, and system assemblers	51-2011	28,083	87.14	12.86
Air cargo handling supervisors	53-1011	5,792	49.33	50.67
Airline pilots, copilots, and flight engineers	53-2011	79,444	88.42	11.58
Commercial pilots	53-2012	27,596	47.83	52.17
Air traffic controllers	53-2021	25,223	6.05*	93.95*
Airfield operations specialists	53-2022	4,891	54.18	45.82
Transportation Inspectors	53-6051	26,400	14.23	85.77

Source: U.S. Bureau of Labor Statistics, 2006-2016 Occupational Matrix.

Note: Air transportation related industries are considered to be the four primary ones used throughout this analysis: NAICS codes 3364, 4811, 4812, and 4881.

\* 90 percent of air traffic controllers are employed by the government with 89 percent working for the federal government.

## G. ADDITIONAL SUPPLY METRIC: DEGREES GRANTED FROM TEXAS AVIATION PROGRAMS

While the matrix design includes a measure of supply that coincides with employment data to give a picture of needs and supply, it is also useful to further examine the existing supply network of aviation graduates across the state. Using data from the THECB, Exhibits 12 through 14 show the number of degrees granted in aviation programs for both two- and four-year degrees.

**Exhibit 12: Degrees Granted in Two-Year Aviation-Related Mechanic and Repair Technologies/Technicians (CIP 47) Programs in Texas, 2003-2008**

Program Classification	CIP Code	Degrees Granted by School Year				
		2007-2008	2006-2007	2005-2006	2004-2005	2003-2004
Airframe Mechanics and Aircraft Maintenance Technology/Technician	47.0607	134	166	146	331	242
Aircraft Powerplant technology/Technician	47.0608	172	174	195	173	109
Avionics Maintenance Technology/Technician	47.0609	0	0	0	0	0

Source: Texas Higher Education Coordinating Board.

**Exhibit 13: Degrees Granted in Two-Year Aviation-Related Transportation and Materials Moving: Air Transportation (CIP 49.01) Programs in Texas, 2003-2008**

Program Classification	CIP Code	Degrees Granted by School Year				
		2007-2008	2006-2007	2005-2006	2004-2005	2003-2004
Aeronautics/Aviation/Aerospace Science and Technology, General	49.0101	0	0	0	0	0
Airline/Commercial/Professional Pilot and Flight Crew	49.0102	45	50	49	66	46
Aviation/Airway Management and Operations	49.0104	12	5	12	12	6
Air Traffic Controller	49.0105	0	0	2	10	4
Airline Flight Attendant	49.0106	0	0	0	0	0
Flight Instructor	49.0108	0	0	0	0	0
Air Transportation, Other	49.1099	0	0	0	0	0

Source: Texas Higher Education Coordinating Board.

**Exhibit 14: Degrees Granted in Four-Year Aviation-Related Transportation and Materials Moving: Air Transportation (CIP 49.01) Programs in Texas, 2003-2008**

Program Classification	CIP Code	Degrees Granted by School Year				
		2007-2008	2006-2007	2005-2006	2004-2005	2003-2004
<b>Aeronautics/Aviation/Aerospace Science and Technology, General</b>	<b>49.0101</b>	2	4	4	1	0
<b>Airline/Commercial/Professional Pilot and Flight Crew</b>	<b>49.0102</b>	22	22	19	26	23
<b>Aviation/Airway Management and Operations</b>	<b>49.0104</b>	4	5	5	9	5
<b>Air Traffic Controller</b>	<b>49.0105</b>	0	0	0	0	0
<b>Airline Flight Attendant</b>	<b>49.0106</b>	0	0	0	0	0
<b>Flight Instructor</b>	<b>49.0108</b>	0	0	0	0	0
<b>Air Transportation, Other</b>	<b>49.1099</b>	0	0	0	0	0

Source: Texas Higher Education Coordinating Board.

A zero in the cell indicates that either a program does not exist or that there are no graduates. This data is for a five-year period and provides some insight into the ongoing pipeline of aviation graduates. Available on an institutional level, it is reported here in the aggregate as a statewide supply metric.

One observation is the large number of graduates in the two-year programs compared to those in the four-year programs. There exists little ability or opportunity for these graduates to continue into four-year, aviation-specific programs in the state. The two programs that do exist are located outside of North Central Texas, leaving no opportunity for graduates to continue without relocating.

Not only are the educational opportunities nonexistent in the region at the four-year-level, they are entirely inadequate in the state in terms of providing educational opportunities for managers, supervisors, and other positions that would require a four-year degree. Individuals are undoubtedly pointed to other programs and forced into other disciplines, outside of aviation, in order to achieve a four-year degree.

In a region with a significant aviation industry where jobs are measured in the tens of thousands, aviation higher education programs are measured in the tens or hundreds, if at all. Given the documented need and interests of the aviation industry, the region should move forward to support its population and employment centers.

## H. CONCLUSIONS AND RECOMMENDATIONS

General findings of this study's analytical research are:

- The aviation industry is a diverse and growing field with needs ranging from technical and trade level skills to executive level managerial/professional knowledge workers.
- Aviation employment requirements drive the supply/demand cycle of qualified entry-level personnel. Significant shortfalls exist in the ability of the region's workforce to meet the industry's needs.
- Certification programs are successfully training skilled workers, especially on community college campuses at various locations in the region.
- North Texas continues to lose the ability to recruit and retain talented aviation professionals because there is no four-year baccalaureate program that offers multiple degree plans and provides for a flight component.

The analysis of the gap existing between aviation workforce needs and supply for North Central Texas is the basis for the following recommendations.

- An integrated aviation education program serving the region and building on the strengths of existing ones should be created immediately. A four-year baccalaureate degree program should be established that offers multiple degree plans and also provides for a flight component.
- The aviation industry in North Central Texas should support the implementation of the Aviation Education Initiative because of its long-term value in developing and retaining an educated workforce.
- The overall education program should be structured to meet the needs of the students. The program must be accessible, affordable, and results oriented in that students should be able to quickly secure employment positions in the aviation industry in North Central Texas upon graduation.
- NCTCOG should be positioned as the repository of information related to aviation education.
- Clear pipelines should be established that (1) make men and women aware of aviation career opportunities; (2) assure program graduates can be assimilated into well-paying, rewarding jobs.



# North Texas Aviation Education Initiative

NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS

## APPENDIX A

Job Title Data

Content appears as provided.

Source: Bureau of Labor Statistics, National Employment Matrix.



**National Employment Matrix, employment by industry, occupation, and percent distribution, 2006 and projected 2016.**

**17-3021 Aerospace engineering and operations technicians**

[Industries with fewer than 50 jobs, confidential data, or poor quality data are not displayed]

Industry	2006			2016			Percent change	Numeric change
	Number	Percent of ind	Percent of occ	Number	Percent of ind	Percent of occ		
000001 Total employment, all workers	8,512	0.01	100.00	9,400	0.01	100.00	10.43	887
000500 Total wage and salary employment	8,434	0.01	99.07	9,316	0.01	99.11	10.46	882
000520 Wage and salary employment, except agriculture, forestry, fishing, hunting, and private households	8,425	0.01	98.98	9,310	0.01	99.05	10.51	885
31-33 Manufacturing	4,893	0.03	57.48	4,897	0.04	52.10	0.09	5
334000 Computer and electronic product manufacturing	746	0.06	8.76	711	0.06	7.57	-4.62	-34
334200 Communications equipment manufacturing	58	0.04	0.68	58	0.04	0.62	0.80	0
334400 Semiconductor and other electronic component manufacturing	67	0.01	0.79	59	0.01	0.63	-12.59	-8
334500 Navigational, measuring, electromedical, and control instruments manufacturing	621	0.14	7.29	594	0.14	6.32	-4.26	-26
336000 Transportation equipment manufacturing	3,964	0.22	46.56	4,022	0.24	42.79	1.48	59
336300 Motor vehicle parts manufacturing	63	0.01	0.74	50	0.01	0.54	-20.39	-13
336400 Aerospace product and parts manufacturing	3,887	0.82	45.67	3,959	0.80	42.12	1.84	72
48-49 Transportation and warehousing	490	0.01	5.76	538	0.01	5.73	9.87	48
481000 Air transportation	289	0.06	3.40	319	0.06	3.40	10.44	30
481100 Scheduled air transportation	287	0.07	3.37	317	0.07	3.37	10.41	30
540000 Professional, scientific, and technical services	2,020	0.03	23.73	2,533	0.03	26.95	25.40	513
541000 Professional, scientific, and technical services	2,020	0.03	23.73	2,533	0.03	26.95	25.40	513
541300 Architectural, engineering, and related services	1,441	0.10	16.93	1,843	0.11	19.60	27.90	402
541700 Scientific research and development services	326	0.05	3.83	348	0.05	3.70	6.69	22
541710 Research and development in the physical, engineering, and life sciences	326	0.06	3.83	348	0.06	3.70	6.69	22
561300 Employment services	96	0.00	1.13	122	0.00	1.30	26.56	26
610000 Educational services, public and private	283	0.00	3.32	312	0.00	3.32	10.23	29
611000 Educational services, public and private	283	0.00	3.32	312	0.00	3.32	10.23	29
6112-3 Junior colleges, colleges, universities, and professional schools, public and private	140	0.00	1.65	157	0.00	1.67	11.85	17
611300 Colleges, universities, and professional schools, public and private	138	0.00	1.62	155	0.00	1.64	11.88	16
6114-7 Other educational services, public and private	142	0.02	1.67	155	0.02	1.65	8.64	12
006700 Self-employed and unpaid family workers, all jobs	79	0.00	0.93	84	0.00	0.89	6.53	5
006701 Total self-employed and unpaid family workers, primary job	79	0.00	0.93	84	0.00	0.89	6.53	5
000600 Self-employed workers, all jobs	79	0.00	0.93	84	0.00	0.89	6.53	5
000601 Self-employed workers, primary job	79	0.00	0.93	84	0.00	0.89	6.53	5

**National Employment Matrix, employment by industry, occupation, and percent distribution, 2006 and projected 2016.**

39-6031 Flight attendants

[Industries with fewer than 50 jobs, confidential data, or poor quality data are not displayed]

Industry	2006			2016			Percent change	Numeric change
	Number	Percent of ind	Percent of occ	Number	Percent of ind	Percent of occ		
000001 Total employment, all workers	96,730	0.06	100.00	106,949	0.06	100.00	10.57	10,220
000500 Total wage and salary employment	96,730	0.07	100.00	106,949	0.07	100.00	10.57	10,220
000520 Wage and salary employment, except agriculture, forestry, fishing, hunting, and private households	96,730	0.07	100.00	106,949	0.07	100.00	10.57	10,220
48-49 Transportation and warehousing	96,370	2.16	99.63	106,527	2.15	99.60	10.54	10,157
481000 Air transportation	96,091	19.75	99.34	106,197	20.35	99.30	10.52	10,105
481100 Scheduled air transportation	92,570	20.99	95.70	102,209	21.67	95.57	10.41	9,640
481200 Nonscheduled air transportation	3,522	7.76	3.64	3,988	7.96	3.73	13.22	466
550000 Management of companies and enterprises	73	0.00	0.07	84	0.00	0.08	15.28	11
551000 Management of companies and enterprises	73	0.00	0.07	84	0.00	0.08	15.28	11
551100 Management of companies and enterprises	73	0.00	0.07	84	0.00	0.08	15.28	11

**National Employment Matrix, employment by industry, occupation, and percent distribution, 2006 and projected 2016.**

43-5032 Dispatchers, except police, fire, and ambulance

[Industries with fewer than 50 jobs, confidential data, or poor quality data are not displayed]

Industry	2006			2016			Percent change	Numeric change
	Number	Percent of ind	Percent of occ	Number	Percent of ind	Percent of occ		
000001 Total employment, all workers	190,231	0.13	100.00	193,125	0.12	100.00	1.52	2,894
000500 Total wage and salary employment	188,060	0.14	98.86	191,043	0.12	98.92	1.59	2,983
000520 Wage and salary employment, except agriculture, forestry, fishing, hunting, and private households	188,060	0.14	98.86	191,043	0.13	98.92	1.59	2,983
210000 Mining	3,058	0.49	1.61	2,705	0.44	1.40	-11.57	-354
211000 Oil and gas extraction	87	0.06	0.05	77	0.06	0.04	-11.51	-10
211100 Oil and gas extraction	87	0.06	0.05	77	0.06	0.04	-11.51	-10
212000 Mining (except oil and gas)	1,001	0.45	0.53	960	0.42	0.50	-4.15	-42
212100 Coal mining	120	0.15	0.06	109	0.14	0.06	-9.11	-11
212200 Metal ore mining	100	0.31	0.05	96	0.27	0.05	-4.00	-4
212300 Nonmetallic mineral mining and quarrying	781	0.71	0.41	755	0.65	0.39	-3.41	-27
213000 Support activities for mining	1,970	0.75	1.04	1,668	0.68	0.86	-15.34	-302
213100 Support activities for mining	1,970	0.75	1.04	1,668	0.68	0.86	-15.34	-302
220000 Utilities	4,022	0.73	2.11	3,259	0.63	1.69	-18.97	-763
221000 Utilities	4,022	0.73	2.11	3,259	0.63	1.69	-18.97	-763
221100 Electric power generation, transmission and distribution	2,655	0.67	1.40	2,198	0.58	1.14	-17.22	-457
221200 Natural gas distribution	1,198	1.13	0.63	883	1.01	0.46	-26.34	-316
221300 Water, sewage and other systems	168	0.37	0.09	179	0.33	0.09	6.05	10
236000 Construction of buildings	357	0.02	0.19	361	0.02	0.19	1.10	4
236100 Residential building construction	183	0.02	0.10	186	0.02	0.10	1.35	2
236200 Nonresidential building construction	174	0.02	0.09	176	0.02	0.09	0.84	1
237000 Heavy and civil engineering construction	1,709	0.17	0.90	1,631	0.16	0.84	-4.61	-79
237100 Utility system construction	855	0.20	0.45	814	0.18	0.42	-4.73	-40
237130 Power and communication line and related structures construction	498	0.37	0.26	472	0.33	0.24	-5.32	-27
237300 Highway, street, and bridge construction	601	0.17	0.32	582	0.16	0.30	-3.10	-19
237900 Other heavy and civil engineering construction	88	0.08	0.05	85	0.07	0.04	-3.33	-3
238000 Specialty trade contractors	14,502	0.30	7.62	14,422	0.27	7.47	-0.55	-80
238100 Foundation, structure, and building exterior contractors	924	0.08	0.49	942	0.07	0.49	1.92	18
238110 Poured concrete foundation and structure contractors	421	0.17	0.22	428	0.15	0.22	1.46	6
238140 Masonry contractors	68	0.03	0.04	67	0.02	0.03	-0.30	0
238160 Roofing contractors	158	0.08	0.08	166	0.07	0.09	5.10	8
238210 Electrical contractors	3,293	0.36	1.73	3,107	0.32	1.61	-5.63	-185
238220 Plumbing, heating, and air-conditioning contractors	7,144	0.73	3.76	7,261	0.66	3.76	1.63	117
238290 Other building equipment contractors	673	0.56	0.35	656	0.50	0.34	-2.46	-17
238300 Building finishing contractors	936	0.09	0.49	932	0.08	0.48	-0.49	-5
238310 Drywall and insulation contractors	222	0.06	0.12	213	0.05	0.11	-4.00	-9
238900 Other specialty trade contractors	1,532	0.21	0.81	1,524	0.19	0.79	-0.53	-8
31-33 Manufacturing	7,045	0.05	3.70	6,566	0.05	3.40	-6.79	-478
311000 Food manufacturing	279	0.02	0.15	250	0.02	0.13	-10.16	-28
311100 Animal food manufacturing	73	0.14	0.04	57	0.13	0.03	-21.94	-16
311600 Animal slaughtering and processing	73	0.01	0.04	75	0.01	0.04	2.71	2
312000 Beverage and tobacco product manufacturing	207	0.11	0.11	174	0.10	0.09	-15.71	-32
312100 Beverage manufacturing	205	0.12	0.11	173	0.11	0.09	-15.48	-32
321000 Wood product manufacturing	78	0.01	0.04	69	0.01	0.04	-11.50	-9
324000 Petroleum and coal products manufacturing	106	0.09	0.06	72	0.08	0.04	-32.05	-34
324100 Petroleum and coal products manufacturing	106	0.09	0.06	72	0.08	0.04	-32.05	-34
325000 Chemical manufacturing	138	0.02	0.07	108	0.01	0.06	-21.63	-30
325100 Basic chemical manufacturing	74	0.05	0.04	56	0.05	0.03	-24.10	-18
327000 Nonmetallic mineral product manufacturing	5,048	0.99	2.65	4,910	0.97	2.54	-2.72	-137
327300 Cement and concrete product manufacturing	4,816	1.94	2.53	4,705	1.77	2.44	-2.31	-111
331000 Primary metal manufacturing	86	0.02	0.05	55	0.02	0.03	-35.94	-31
332000 Fabricated metal product manufacturing	89	0.01	0.05	75	0.01	0.04	-15.85	-14
333000 Machinery manufacturing	149	0.01	0.08	120	0.01	0.06	-19.26	-29
334000 Computer and electronic product manufacturing	80	0.01	0.04	67	0.01	0.03	-16.04	-13
336000 Transportation equipment manufacturing	462	0.03	0.24	409	0.02	0.21	-11.44	-53
336400 Aerospace product and parts manufacturing	268	0.06	0.14	246	0.05	0.13	-8.34	-22
339000 Miscellaneous manufacturing	125	0.02	0.07	101	0.02	0.05	-19.06	-24
420000 Wholesale trade	7,648	0.13	4.02	7,223	0.11	3.74	-5.56	-426
423000 Merchant wholesalers, durable goods	2,994	0.10	1.57	3,050	0.09	1.58	1.87	56
423100 Motor vehicle and motor vehicle parts and supplies merchant wholesalers	378	0.11	0.20	388	0.10	0.20	2.72	10
423200 Furniture and home furnishing merchant wholesalers	52	0.04	0.03	52	0.04	0.03	-1.22	-1
423300 Lumber and other construction materials merchant wholesalers	639	0.24	0.34	661	0.22	0.34	3.38	22
423400 Professional and commercial equipment and supplies merchant wholesalers	718	0.11	0.38	754	0.10	0.39	4.91	35
423500 Metal and mineral (except petroleum) merchant wholesalers	52	0.04	0.03	52	0.04	0.03	-1.16	-1
423600 Electrical and electronic goods merchant wholesalers	214	0.06	0.11	227	0.06	0.12	6.11	13
423700 Hardware, and plumbing and heating equipment and supplies merchant wholesalers	159	0.06	0.08	162	0.06	0.08	2.17	3
423800 Machinery, equipment, and supplies merchant wholesalers	587	0.09	0.31	554	0.08	0.29	-5.60	-33
423900 Miscellaneous durable goods merchant wholesalers	194	0.07	0.10	201	0.06	0.10	3.32	6
424000 Merchant wholesalers, nondurable goods	3,996	0.20	2.10	3,501	0.17	1.81	-12.40	-496
424200 Drugs and druggists' sundries merchant wholesalers	63	0.03	0.03	68	0.03	0.04	7.02	4
424400 Grocery and related product wholesalers	1,792	0.25	0.94	1,764	0.24	0.91	-1.59	-28

Industry	2006			2016			Percent change	Numeric change
	Number	Percent of ind	Percent of occ	Number	Percent of ind	Percent of occ		
424600 Chemical and allied products merchant wholesalers	280	0.21	0.15	286	0.20	0.15	1.87	5
424700 Petroleum and petroleum products merchant wholesalers	1,221	1.21	0.64	779	1.12	0.40	-36.18	-442
424800 Beer, wine, and distilled alcoholic beverage merchant wholesalers	195	0.13	0.10	194	0.12	0.10	-0.66	-1
424900 Miscellaneous nondurable goods merchant wholesalers	296	0.08	0.16	290	0.08	0.15	-2.15	-6
425000 Wholesale electronic markets and agents and brokers	658	0.08	0.35	672	0.08	0.35	2.13	14
425100 Wholesale electronic markets and agents and brokers	658	0.08	0.35	672	0.08	0.35	2.13	14
44-45 Retail trade	10,251	0.07	5.39	9,683	0.06	5.01	-5.55	-569
441000 Motor vehicle and parts dealers	4,270	0.22	2.24	4,314	0.21	2.23	1.05	45
441100 Automobile dealers	3,771	0.30	1.98	3,850	0.28	1.99	2.10	79
441200 Other motor vehicle dealers	81	0.05	0.04	97	0.04	0.05	20.60	17
441300 Automotive parts, accessories, and tire stores	418	0.08	0.22	367	0.07	0.19	-12.20	-51
442000 Furniture and home furnishings stores	545	0.09	0.29	523	0.08	0.27	-3.95	-22
442100 Furniture stores	353	0.12	0.19	324	0.11	0.17	-8.17	-29
442200 Home furnishings stores	192	0.07	0.10	199	0.06	0.10	3.79	7
443000 Electronics and appliance stores	835	0.16	0.44	715	0.13	0.37	-14.39	-120
443100 Electronics and appliance stores	835	0.16	0.44	715	0.13	0.37	-14.39	-120
444000 Building material and garden equipment and supplies dealers	1,891	0.14	0.99	2,159	0.13	1.12	14.23	269
444100 Building material and supplies dealers	1,847	0.16	0.97	2,124	0.14	1.10	15.01	277
445000 Food and beverage stores	64	0.00	0.03	59	0.00	0.03	-7.78	-5
446000 Health and personal care stores	55	0.01	0.03	55	0.01	0.03	-0.83	0
446100 Health and personal care stores	55	0.01	0.03	55	0.01	0.03	-0.83	0
447000 Gasoline stations	331	0.04	0.17	267	0.04	0.14	-19.43	-64
447100 Gasoline stations	331	0.04	0.17	267	0.04	0.14	-19.43	-64
453000 Miscellaneous store retailers	840	0.09	0.44	672	0.08	0.35	-19.98	-168
453200 Office supplies, stationery, and gift stores	560	0.15	0.29	415	0.14	0.22	-25.75	-144
453300 Used merchandise stores	94	0.08	0.05	96	0.08	0.05	1.45	1
453900 Other miscellaneous store retailers	129	0.04	0.07	124	0.04	0.06	-3.52	-5
454000 Nonstore retailers	1,385	0.32	0.73	881	0.21	0.46	-36.41	-504
454300 Direct selling establishments	1,316	0.92	0.69	821	0.86	0.43	-37.62	-495
48-49 Transportation and warehousing	79,552	1.78	41.82	80,825	1.63	41.85	1.60	1,273
481000 Air transportation	1,554	0.32	0.82	1,556	0.30	0.81	0.12	2
481100 Scheduled air transportation	1,096	0.25	0.58	1,089	0.23	0.56	-0.63	-7
481200 Nonscheduled air transportation	458	1.01	0.24	467	0.93	0.24	1.90	9
482000 Rail transportation	3,002	1.33	1.58	2,325	1.09	1.20	-22.54	-677
482100 Rail transportation	3,002	1.33	1.58	2,325	1.09	1.20	-22.54	-677
483000 Water transportation	480	0.75	0.25	497	0.65	0.26	3.55	17
483100 Deep sea, coastal, and great lakes water transportation	125	0.31	0.07	138	0.28	0.07	10.59	13
483200 Inland water transportation	355	1.52	0.19	359	1.37	0.19	1.06	4
484000 Truck transportation	36,255	2.52	19.06	36,868	2.31	19.09	1.69	614
484100 General freight trucking	27,194	2.71	14.30	27,683	2.48	14.33	1.80	489
484200 Specialized freight trucking	9,061	2.09	4.76	9,185	1.92	4.76	1.37	124
485000 Transit and ground passenger transportation	15,372	3.90	8.08	15,641	3.57	8.10	1.75	269
485100 Urban transit systems	934	2.34	0.49	957	2.12	0.50	2.39	22
485200 Interurban and rural bus transportation	309	1.58	0.16	293	1.44	0.15	-5.11	-16
485300 Taxi and limousine service	8,533	12.26	4.49	8,564	11.37	4.43	0.36	31
485400 School and employee bus transportation	2,132	1.26	1.12	2,113	1.13	1.09	-0.88	-19
485500 Charter bus industry	567	1.87	0.30	571	1.70	0.30	0.76	4
485900 Other transit and ground passenger transportation	2,897	4.44	1.52	3,143	4.07	1.63	8.49	246
486000 Pipeline transportation	161	0.41	0.08	91	0.34	0.05	-43.28	-70
487000 Scenic and sightseeing transportation	247	0.91	0.13	286	0.83	0.15	16.01	39
488000 Support activities for transportation	12,859	2.25	6.76	13,779	2.06	7.13	7.15	919
488100 Support activities for air transportation	596	0.38	0.31	648	0.34	0.34	8.72	52
488300 Support activities for water transportation	688	0.69	0.36	717	0.65	0.37	4.18	29
488400 Support activities for road transportation	5,124	6.33	2.69	5,071	5.81	2.63	-1.04	-53
488500 Freight transportation arrangement	6,306	3.50	3.31	7,194	3.22	3.73	14.08	888
492000 Couriers and messengers	8,088	1.38	4.25	7,937	1.32	4.11	-1.87	-152
492100 Couriers	5,093	0.95	2.68	4,925	0.90	2.55	-3.29	-167
492200 Local messengers and local delivery	2,996	5.84	1.57	3,012	5.54	1.56	0.53	16
493000 Warehousing and storage	1,535	0.24	0.81	1,845	0.23	0.96	20.21	310
493100 Warehousing and storage	1,535	0.24	0.81	1,845	0.23	0.96	20.21	310
510000 Information	7,973	0.26	4.19	8,570	0.26	4.44	7.50	598
511000 Publishing industries (except Internet)	197	0.02	0.10	154	0.02	0.08	-22.06	-44
511100 Newspaper, periodical, book, and directory publishers	197	0.03	0.10	153	0.03	0.08	-22.20	-44
511110 Newspaper publishers	188	0.05	0.10	145	0.05	0.07	-22.90	-43
515000 Broadcasting (except Internet)	2,277	0.69	1.20	2,459	0.68	1.27	8.00	182
515200 Cable and other subscription programming	2,228	2.47	1.17	2,412	2.19	1.25	8.24	184
517000 Telecommunications	5,326	0.55	2.80	5,829	0.57	3.02	9.43	503
517100 Wired telecommunications carriers	1,233	0.26	0.65	871	0.23	0.45	-29.34	-362
517200 Wireless telecommunications carriers (except satellite)	191	0.10	0.10	234	0.08	0.12	22.48	43
517300 Telecommunications resellers	116	0.09	0.06	107	0.08	0.06	-8.07	-9
517500 Cable and other program distribution	3,588	2.49	1.89	4,373	2.21	2.26	21.89	786
516890 Internet and other information services	166	0.04	0.09	123	0.02	0.06	-26.19	-43
524200 Agencies, brokerages, and other insurance related activities	72	0.01	0.04	74	0.01	0.04	3.26	2
524210 Insurance agencies and brokerages	54	0.01	0.03	55	0.01	0.03	1.79	1
530000 Real estate and rental and leasing	2,719	0.12	1.43	2,853	0.11	1.48	4.94	134
531000 Real estate	390	0.03	0.21	432	0.02	0.22	10.76	42
531100 Lessors of real estate	82	0.01	0.04	81	0.01	0.04	-0.83	-1
531200 Offices of real estate agents and brokers	53	0.01	0.03	58	0.01	0.03	9.64	5
531300 Activities related to real estate	256	0.05	0.13	293	0.04	0.15	14.69	38

Industry	2006			2016			Percent change	Numeric change
	Number	Percent of ind	Percent of occ	Number	Percent of ind	Percent of occ		
532000 Rental and leasing services	2,326	0.36	1.22	2,418	0.33	1.25	3.95	92
532100 Automotive equipment rental and leasing	1,144	0.57	0.60	1,168	0.51	0.60	2.12	24
5322-3 Consumer goods rental and general rental centers	442	0.14	0.23	436	0.12	0.23	-1.37	-6
532200 Consumer goods rental	226	0.08	0.12	222	0.07	0.11	-2.11	-5
532300 General rental centers	216	0.37	0.11	215	0.33	0.11	-0.58	-1
Commercial and industrial machinery and equipment rental and leasing	740	0.61	0.39	814	0.55	0.42	9.97	74
540000 Professional, scientific, and technical services	1,644	0.02	0.86	2,314	0.02	1.20	40.79	671
541000 Professional, scientific, and technical services	1,644	0.02	0.86	2,314	0.02	1.20	40.79	671
541100 Legal services	81	0.01	0.04	80	0.01	0.04	-1.16	-1
541300 Architectural, engineering, and related services	75	0.01	0.04	86	0.00	0.04	15.12	11
541500 Computer systems design and related services	191	0.01	0.10	232	0.01	0.12	21.51	41
541600 Management, scientific, and technical consulting services	995	0.11	0.52	1,599	0.10	0.83	60.67	604
541900 Other professional, scientific, and technical services	82	0.02	0.04	91	0.01	0.05	11.42	9
550000 Management of companies and enterprises	3,559	0.20	1.87	3,692	0.18	1.91	3.75	134
551000 Management of companies and enterprises	3,559	0.20	1.87	3,692	0.18	1.91	3.75	134
551100 Management of companies and enterprises	3,559	0.20	1.87	3,692	0.18	1.91	3.75	134
Administrative and support and waste management and remediation services	19,633	0.23	10.32	22,111	0.22	11.45	12.62	2,477
560000 Administrative and support services	16,931	0.21	8.90	19,017	0.20	9.85	12.32	2,086
561100 Office administrative services	778	0.21	0.41	888	0.19	0.46	14.11	110
561200 Facilities support services	461	0.38	0.24	614	0.34	0.32	33.25	153
561300 Employment services	2,765	0.08	1.45	3,150	0.07	1.63	13.91	385
561400 Business support services	993	0.13	0.52	1,041	0.11	0.54	4.82	48
561420 Telephone call centers	717	0.19	0.38	673	0.18	0.35	-6.14	-44
561500 Travel arrangement and reservation services	2,959	1.30	1.56	2,902	1.26	1.50	-1.92	-57
561600 Investigation and security services	7,558	0.99	3.97	8,843	0.96	4.58	17.00	1,285
561610 Investigation, guard, and armored car services	2,219	0.34	1.17	2,390	0.31	1.24	7.70	171
561620 Security systems services	5,339	4.79	2.81	6,453	4.38	3.34	20.87	1,114
561700 Services to buildings and dwellings	905	0.05	0.48	948	0.04	0.49	4.79	43
561710 Exterminating and pest control services	223	0.23	0.12	234	0.20	0.12	4.92	11
561730 Landscaping services	165	0.03	0.09	172	0.02	0.09	4.21	7
561900 Other support services	512	0.17	0.27	631	0.16	0.33	23.30	119
562000 Waste management and remediation services	2,702	0.78	1.42	3,094	0.73	1.60	14.48	391
562100 Waste collection	1,440	1.11	0.76	1,634	1.04	0.85	13.47	194
5622-9 Waste treatment and disposal and waste management services	1,262	0.58	0.66	1,459	0.55	0.76	15.62	197
562200 Waste treatment and disposal	719	0.70	0.38	813	0.66	0.42	13.05	94
562900 Remediation and other waste management services	543	0.47	0.29	647	0.45	0.33	19.02	103
610000 Educational services, public and private	2,573	0.02	1.35	2,534	0.02	1.31	-1.50	-39
611000 Educational services, public and private	2,573	0.02	1.35	2,534	0.02	1.31	-1.50	-39
611100 Elementary and secondary schools, public and private	906	0.01	0.48	859	0.01	0.44	-5.16	-47
Junior colleges, colleges, universities, and professional schools, public and private	1,582	0.04	0.83	1,591	0.03	0.82	0.56	9
611200 Junior colleges, public and private	159	0.02	0.08	158	0.02	0.08	-0.55	-1
Colleges, universities, and professional schools, public and private	1,423	0.04	0.75	1,433	0.04	0.74	0.69	10
6114-7 Other educational services, public and private	85	0.01	0.04	85	0.01	0.04	-0.80	-1
611500 Technical and trade schools, public and private	80	0.06	0.04	78	0.05	0.04	-2.23	-2
620000 Health care and social assistance	3,859	0.02	2.03	4,357	0.02	2.26	12.91	498
621-3 Health care	3,354	0.02	1.76	3,691	0.02	1.91	10.03	336
621000 Ambulatory health care services	1,971	0.04	1.04	2,313	0.03	1.20	17.38	342
6211-3 Offices of health practitioners	73	0.00	0.04	84	0.00	0.04	13.96	10
621100 Offices of physicians	67	0.00	0.04	76	0.00	0.04	13.38	9
621600 Home health care services	406	0.05	0.21	566	0.04	0.29	39.49	160
621459 Outpatient, laboratory, and other ambulatory care services	1,492	0.16	0.78	1,664	0.15	0.86	11.53	172
621500 Medical and diagnostic laboratories	472	0.23	0.25	488	0.21	0.25	3.33	16
621900 Other ambulatory health care services	986	0.46	0.52	1,140	0.40	0.59	15.59	154
621910 Ambulance services	917	0.71	0.48	1,052	0.64	0.54	14.77	135
621990 All other ambulatory health care services	70	0.08	0.04	88	0.07	0.05	26.44	18
622000 Hospitals, public and private	1,329	0.02	0.70	1,308	0.02	0.68	-1.59	-21
622100 General medical and surgical hospitals, public and private	1,237	0.02	0.65	1,232	0.02	0.64	-0.36	-4
623000 Nursing and residential care facilities	55	0.00	0.03	70	0.00	0.04	27.55	15
6232-9 Residential care facilities	53	0.00	0.03	68	0.00	0.04	28.80	15
624000 Social assistance	505	0.02	0.27	666	0.02	0.35	32.09	162
Individual, family, community, and vocational rehabilitation services	498	0.03	0.26	659	0.03	0.34	32.40	161
6241-3 Individual and family services	331	0.03	0.17	480	0.03	0.25	44.85	149
624120 Services for the elderly and persons with disabilities	214	0.04	0.11	304	0.04	0.16	42.17	90
Community food and housing, and emergency and other relief services	62	0.05	0.03	64	0.04	0.03	4.22	3
624300 Vocational rehabilitation services	105	0.03	0.05	115	0.02	0.06	9.64	10
710000 Arts, entertainment, and recreation	183	0.01	0.10	263	0.01	0.14	43.72	80
713000 Amusement, gambling, and recreation industries	164	0.01	0.09	241	0.01	0.12	46.77	77
713100 Amusement parks and arcades	55	0.04	0.03	65	0.03	0.03	18.94	10
713200 Gambling industries	95	0.07	0.05	159	0.07	0.08	67.44	64
720000 Accommodation and food services	1,235	0.01	0.65	1,307	0.01	0.68	5.90	73
721000 Accommodation, including hotels and motels	1,115	0.06	0.59	1,184	0.06	0.61	6.12	68
721100 Traveler accommodation, including hotels and motels	1,115	0.06	0.59	1,184	0.06	0.61	6.12	68
721120 Casino hotels	793	0.28	0.42	848	0.26	0.44	6.91	55

Industry	2006			2016			Percent change	Numeric change
	Number	Percent of ind	Percent of occ	Number	Percent of ind	Percent of occ		
722000 Food services and drinking places	119	0.00	0.06	124	0.00	0.06	3.89	5
722300 Special food services	115	0.02	0.06	120	0.02	0.06	4.05	5
<b>810000 Other services (except government and private households)</b>	<b>2,869</b>	<b>0.05</b>	<b>1.51</b>	<b>2,827</b>	<b>0.05</b>	<b>1.46</b>	<b>-1.46</b>	<b>-42</b>
811000 Repair and maintenance	2,395	0.19	1.26	2,365	0.16	1.22	-1.26	-30
811100 Automotive repair and maintenance	1,235	0.14	0.65	1,361	0.12	0.70	10.22	126
811110 Automotive mechanical and electrical repair and maintenance	880	0.22	0.46	941	0.20	0.49	6.86	60
811120 Automotive body, paint, interior, and glass repair	230	0.09	0.12	242	0.08	0.13	5.08	12
811190 Other automotive repair and maintenance	125	0.05	0.07	179	0.06	0.09	43.35	54
811200 Electronic and precision equipment repair and maintenance	572	0.55	0.30	468	0.50	0.24	-18.20	-104
811300 Commercial and industrial machinery and equipment (except automotive and electronic) repair and maintenance	381	0.21	0.20	363	0.19	0.19	-4.76	-18
811400 Personal and household goods repair and maintenance	207	0.27	0.11	173	0.24	0.09	-16.48	-34
812000 Personal and laundry services	140	0.01	0.07	147	0.01	0.08	4.81	7
813000 Religious, grantmaking, civic, professional, and similar organizations	334	0.01	0.18	316	0.01	0.16	-5.49	-18
8132-3 Grantmaking services and social advocacy organizations	81	0.03	0.04	84	0.02	0.04	3.40	3
813300 Social advocacy organizations	72	0.04	0.04	74	0.04	0.04	3.19	2
8134-9 Civic, social, professional, and similar organizations	226	0.02	0.12	202	0.02	0.10	-10.31	-23
813900 Business, professional, labor, political, and similar organizations	175	0.03	0.09	152	0.03	0.08	-13.16	-23
<b>990000 Government</b>	<b>13,196</b>	<b>0.12</b>	<b>6.94</b>	<b>13,077</b>	<b>0.12</b>	<b>6.77</b>	<b>-0.90</b>	<b>-119</b>
910000 Federal government	833	0.03	0.44	711	0.03	0.37	-14.68	-122
919999 Federal government, excluding postal service	803	0.04	0.42	683	0.04	0.35	-14.92	-120
940000 State and local government	12,363	0.15	6.50	12,366	0.14	6.40	0.03	4
949400 State and local government, excluding education and hospitals	12,363	0.15	6.50	12,366	0.14	6.40	0.03	4
920000 State government	1,039	0.04	0.55	918	0.04	0.48	-11.68	-121
929200 State government, excluding education and hospitals	1,039	0.04	0.55	918	0.04	0.48	-11.68	-121
930000 Local government	11,323	0.20	5.95	11,448	0.18	5.93	1.10	125
939300 Local government, excluding education and hospitals	11,323	0.20	5.95	11,448	0.18	5.93	1.10	125
006700 Self-employed and unpaid family workers, all jobs	2,171	0.02	1.14	2,081	0.02	1.08	-4.12	-89
006701 Total self-employed and unpaid family workers, primary job	2,171	0.02	1.14	2,081	0.02	1.08	-4.12	-89
000600 Self-employed workers, all jobs	2,171	0.02	1.14	2,081	0.02	1.08	-4.12	-89
000601 Self-employed workers, primary job	2,171	0.02	1.14	2,081	0.02	1.08	-4.12	-89

**National Employment Matrix, employment by industry, occupation, and percent distribution, 2006 and projected 2016.**

49-2091 Avionics technicians

[Industries with fewer than 50 jobs, confidential data, or poor quality data are not displayed]

Industry	2006			2016			Percent change	Numeric change
	Number	Percent of ind	Percent of occ	Number	Percent of ind	Percent of occ		
000001 Total employment, all workers	15,709	0.01	100.00	16,987	0.01	100.00	8.14	1,278
000500 Total wage and salary employment	15,709	0.01	100.00	16,987	0.01	100.00	8.14	1,278
000520 Wage and salary employment, except agriculture, forestry, fishing, hunting, and private households	15,709	0.01	100.00	16,987	0.01	100.00	8.14	1,278
31-33 Manufacturing	5,282	0.04	33.62	5,709	0.04	33.61	8.09	427
334000 Computer and electronic product manufacturing	1,132	0.09	7.21	1,086	0.09	6.39	-4.06	-46
334500 Navigational, measuring, electromedical, and control instruments manufacturing	1,073	0.25	6.83	1,027	0.25	6.05	-4.26	-46
336000 Transportation equipment manufacturing	4,070	0.23	25.91	4,557	0.28	26.83	11.97	487
336400 Aerospace product and parts manufacturing	4,062	0.86	25.86	4,551	0.92	26.79	12.03	489
420000 Wholesale trade	261	0.00	1.66	275	0.00	1.62	5.30	14
423000 Merchant wholesalers, durable goods	259	0.01	1.65	273	0.01	1.61	5.27	14
44-45 Retail trade	104	0.00	0.66	135	0.00	0.79	29.75	31
441000 Motor vehicle and parts dealers	89	0.00	0.56	119	0.01	0.70	34.01	30
441200 Other motor vehicle dealers	89	0.05	0.56	119	0.05	0.70	34.01	30
48-49 Transportation and warehousing	5,715	0.13	36.38	6,528	0.13	38.43	14.24	814
481000 Air transportation	1,886	0.39	12.01	1,920	0.37	11.30	1.81	34
481100 Scheduled air transportation	1,554	0.35	9.89	1,544	0.33	9.09	-0.63	-10
481200 Nonscheduled air transportation	332	0.73	2.11	376	0.75	2.21	13.22	44
488000 Support activities for transportation	3,702	0.65	23.57	4,472	0.67	26.33	20.80	770
488100 Support activities for air transportation	3,702	2.38	23.57	4,472	2.38	26.33	20.80	770
540000 Professional, scientific, and technical services	541	0.01	3.45	705	0.01	4.15	30.16	163
541000 Professional, scientific, and technical services	541	0.01	3.45	705	0.01	4.15	30.16	163
541300 Architectural, engineering, and related services	246	0.02	1.57	315	0.02	1.85	28.00	69
561300 Employment services	65	0.00	0.42	83	0.00	0.49	26.55	17
610000 Educational services, public and private	281	0.00	1.79	334	0.00	1.96	18.88	53
611000 Educational services, public and private	281	0.00	1.79	334	0.00	1.96	18.88	53
6114-7 Other educational services, public and private	253	0.04	1.61	303	0.04	1.78	19.64	50
611500 Technical and trade schools, public and private	145	0.11	0.92	157	0.10	0.93	8.65	13
810000 Other services (except government and private households)	738	0.01	4.70	675	0.01	3.98	-8.49	-63
811000 Repair and maintenance	738	0.06	4.70	675	0.05	3.98	-8.49	-63
811200 Electronic and precision equipment repair and maintenance	684	0.65	4.35	621	0.66	3.66	-9.11	-62
990000 Government	2,263	0.02	14.41	1,949	0.02	11.47	-13.90	-315
910000 Federal government	2,167	0.08	13.79	1,844	0.07	10.85	-14.92	-323
919999 Federal government, excluding postal service	2,167	0.11	13.79	1,844	0.10	10.85	-14.92	-323
940000 State and local government	96	0.00	0.61	105	0.00	0.62	9.00	9
949400 State and local government, excluding education and hospitals	96	0.00	0.61	105	0.00	0.62	9.00	9
930000 Local government	74	0.00	0.47	83	0.00	0.49	12.34	9
939300 Local government, excluding education and hospitals	74	0.00	0.47	83	0.00	0.49	12.34	9

National Employment Matrix, employment by industry, occupation, and percent distribution, 2006 and projected 2016.

49-3011 Aircraft mechanics and service technicians

[Industries with fewer than 50 jobs, confidential data, or poor quality data are not displayed]

Industry	2006			2016			Percent change	Numeric change
	Number	Percent of ind	Percent of occ	Number	Percent of ind	Percent of occ		
000001 Total employment, all workers	122,472	0.08	100.00	135,495	0.08	100.00	10.63	13,023
000500 Total wage and salary employment	121,951	0.09	99.57	134,940	0.09	99.59	10.65	12,989
000520 Wage and salary employment, except agriculture, forestry, fishing, hunting, and private households	120,876	0.09	98.70	133,788	0.09	98.74	10.68	12,913
210000 Mining	85	0.01	0.07	84	0.01	0.06	-1.67	-1
211000 Oil and gas extraction	85	0.06	0.07	84	0.06	0.06	-1.67	-1
211100 Oil and gas extraction	85	0.06	0.07	84	0.06	0.06	-1.67	-1
31-33 Manufacturing	21,477	0.15	17.54	26,023	0.20	19.21	21.17	4,546
334000 Computer and electronic product manufacturing	446	0.03	0.36	422	0.04	0.31	-5.31	-24
334500 Navigational, measuring, electromedical, and control instruments manufacturing	384	0.09	0.31	367	0.09	0.27	-4.26	-16
336000 Transportation equipment manufacturing	20,906	1.18	17.07	25,484	1.54	18.81	21.90	4,578
336200 Motor vehicle body and trailer manufacturing	134	0.07	0.11	131	0.07	0.10	-2.16	-3
336400 Aerospace product and parts manufacturing	20,664	4.38	16.87	25,254	5.08	18.64	22.21	4,590
420000 Wholesale trade	1,170	0.02	0.95	1,183	0.02	0.87	1.19	14
423000 Merchant wholesalers, durable goods	715	0.02	0.58	750	0.02	0.55	4.96	35
423800 Machinery, equipment, and supplies merchant wholesalers	710	0.11	0.58	745	0.11	0.55	4.89	35
424000 Merchant wholesalers, nondurable goods	200	0.01	0.16	145	0.01	0.11	-27.84	-56
424700 Petroleum and petroleum products merchant wholesalers	192	0.19	0.16	136	0.20	0.10	-29.09	-56
425000 Wholesale electronic markets and agents and brokers	254	0.03	0.21	288	0.03	0.21	13.48	34
425100 Wholesale electronic markets and agents and brokers	254	0.03	0.21	288	0.03	0.21	13.48	34
44-45 Retail trade	374	0.00	0.31	490	0.00	0.36	30.98	116
441000 Motor vehicle and parts dealers	365	0.02	0.30	480	0.02	0.35	31.49	115
441200 Other motor vehicle dealers	321	0.19	0.26	430	0.19	0.32	34.01	109
48-49 Transportation and warehousing	71,396	1.60	58.30	80,923	1.63	59.72	13.34	9,527
481000 Air transportation	37,644	7.74	30.74	37,575	7.20	27.73	-0.18	-69
481100 Scheduled air transportation	31,006	7.03	25.32	30,811	6.53	22.74	-0.63	-195
481200 Nonscheduled air transportation	6,638	14.62	5.42	6,764	13.50	4.99	1.90	126
487000 Scenic and sightseeing transportation	218	0.81	0.18	242	0.70	0.18	11.20	24
488000 Support activities for transportation	27,722	4.86	22.64	36,824	5.52	27.18	32.83	9,102
488100 Support activities for air transportation	27,527	17.73	22.48	36,577	19.47	27.00	32.88	9,050
492000 Couriers and messengers	5,653	0.97	4.62	6,075	1.01	4.48	7.46	422
492100 Couriers	5,653	1.06	4.62	6,075	1.11	4.48	7.46	422
520000 Finance and insurance	123	0.00	0.10	160	0.00	0.12	29.28	36
523000 Securities, commodity contracts, and other financial investments and related activities	74	0.01	0.06	106	0.01	0.08	43.43	32
523900 Other financial investment activities	51	0.02	0.04	72	0.02	0.05	40.93	21
530000 Real estate and rental and leasing	236	0.01	0.19	284	0.01	0.21	20.24	48
540000 Professional, scientific, and technical services	1,830	0.02	1.49	2,353	0.02	1.74	28.60	523
541000 Professional, scientific, and technical services	1,830	0.02	1.49	2,353	0.02	1.74	28.60	523
541500 Computer systems design and related services	227	0.02	0.19	306	0.02	0.23	35.01	79
560000 Administrative and support and waste management and remediation services	1,409	0.02	1.15	1,910	0.02	1.41	35.60	502
561000 Administrative and support services	1,409	0.02	1.15	1,910	0.02	1.41	35.60	502
561100 Office administrative services	55	0.02	0.05	70	0.02	0.05	26.80	15
561200 Facilities support services	664	0.54	0.54	983	0.55	0.73	48.06	319
561300 Employment services	467	0.01	0.38	591	0.01	0.44	26.56	124
610000 Educational services, public and private	1,194	0.01	0.98	1,310	0.01	0.97	9.71	116
611000 Educational services, public and private	1,194	0.01	0.98	1,310	0.01	0.97	9.71	116
6112-3 Junior colleges, colleges, universities, and professional schools, public and private	203	0.00	0.17	226	0.00	0.17	11.73	24
611300 Colleges, universities, and professional schools, public and private	182	0.01	0.15	204	0.01	0.15	11.87	22
6114-7 Other educational services, public and private	991	0.17	0.81	1,083	0.14	0.80	9.30	92
611500 Technical and trade schools, public and private	966	0.72	0.79	1,049	0.70	0.77	8.64	83
620000 Health care and social assistance	683	0.00	0.56	861	0.00	0.64	26.07	178
621-3 Health care	683	0.01	0.56	861	0.01	0.64	26.07	178
621000 Ambulatory health care services	629	0.01	0.51	801	0.01	0.59	27.32	172
621459 Outpatient, laboratory, and other ambulatory care services	629	0.07	0.51	801	0.07	0.59	27.32	172
621910 Ambulance services	605	0.47	0.49	772	0.47	0.57	27.52	167
622000 Hospitals, public and private	54	0.00	0.04	60	0.00	0.04	11.52	6
622100 General medical and surgical hospitals, public and private	52	0.00	0.04	57	0.00	0.04	10.71	6
710000 Arts, entertainment, and recreation	72	0.00	0.06	91	0.00	0.07	26.58	19
990000 Government	19,822	0.18	16.19	16,979	0.15	12.53	-14.34	-2,843
910000 Federal government	19,301	0.71	15.76	16,422	0.63	12.12	-14.92	-2,880
919999 Federal government, excluding postal service	19,301	0.99	15.76	16,422	0.88	12.12	-14.92	-2,880
940000 State and local government	521	0.01	0.43	558	0.01	0.41	7.06	37
949400 State and local government, excluding education and hospitals	521	0.01	0.43	558	0.01	0.41	7.06	37
920000 State government	193	0.01	0.16	190	0.01	0.14	-1.87	-4
929200 State government, excluding education and hospitals	193	0.01	0.16	190	0.01	0.14	-1.87	-4
930000 Local government	328	0.01	0.27	368	0.01	0.27	12.34	40
939300 Local government, excluding education and hospitals	328	0.01	0.27	368	0.01	0.27	12.34	40
000530 Wage and salary employment in agriculture, forestry, fishing, hunting, and private households	1,076	0.05	0.88	1,151	0.06	0.85	7.05	76
110000 Agriculture, forestry, fishing and hunting; primary job	1,051	0.09	0.86	1,126	0.11	0.83	7.12	75



Industry	2006			2016			Percent change	Numeric change
	Number	Percent of ind	Percent of occ	Number	Percent of ind	Percent of occ		
115000 Support activities for agriculture and forestry; primary job	1,051	0.89	0.86	1,126	0.86	0.83	7.12	75
006700 Self-employed and unpaid family workers, all jobs	521	0.00	0.43	555	0.00	0.41	6.54	34
006701 Total self-employed and unpaid family workers, primary job	521	0.00	0.43	555	0.00	0.41	6.54	34
000600 Self-employed workers, all jobs	521	0.00	0.43	555	0.00	0.41	6.54	34
000601 Self-employed workers, primary job	521	0.00	0.43	555	0.00	0.41	6.54	34

**National Employment Matrix, employment by industry, occupation, and percent distribution, 2006 and projected 2016.**

**51-2011 Aircraft structure, surfaces, rigging, and systems assemblers**

[Industries with fewer than 50 jobs, confidential data, or poor quality data are not displayed]

Industry	2006			2016			Percent change	Numeric change
	Number	Percent of ind	Percent of occ	Number	Percent of ind	Percent of occ		
000001 Total employment, all workers	28,083	0.02	100.00	31,681	0.02	100.00	12.81	3,599
000500 Total wage and salary employment	28,083	0.02	100.00	31,681	0.02	100.00	12.81	3,599
000520 Wage and salary employment, except agriculture, forestry, fishing, hunting, and private households	28,083	0.02	100.00	31,681	0.02	100.00	12.81	3,599
31-33 Manufacturing	25,355	0.18	90.29	28,241	0.22	89.14	11.38	2,886
333000 Machinery manufacturing	96	0.01	0.34	87	0.01	0.27	-9.58	-9
333900 Other general purpose machinery manufacturing	88	0.03	0.31	80	0.03	0.25	-9.73	-9
334000 Computer and electronic product manufacturing	619	0.05	2.20	580	0.05	1.83	-6.38	-39
334500 Navigational, measuring, electromedical, and control instruments manufacturing	390	0.09	1.39	374	0.09	1.18	-4.26	-17
336000 Transportation equipment manufacturing	24,576	1.39	87.51	27,518	1.67	86.86	11.97	2,943
336400 Aerospace product and parts manufacturing	24,472	5.19	87.14	27,415	5.52	86.54	12.03	2,943
540000 Professional, scientific, and technical services	279	0.00	0.99	317	0.00	1.00	13.72	38
541000 Professional, scientific, and technical services	279	0.00	0.99	317	0.00	1.00	13.72	38
6114-7 Other educational services, public and private	176	0.03	0.63	237	0.03	0.75	34.32	60

**National Employment Matrix, employment by industry, occupation, and percent distribution, 2006 and projected 2016.**

53-1011 Aircraft cargo handling supervisors

[Industries with fewer than 50 jobs, confidential data, or poor quality data are not displayed]

Industry	2006			2016			Percent change	Numeric change
	Number	Percent of ind	Percent of occ	Number	Percent of ind	Percent of occ		
000001 Total employment, all workers	5,792	0.00	100.00	7,140	0.00	100.00	23.26	1,347
000500 Total wage and salary employment	5,678	0.00	98.03	7,007	0.00	98.14	23.40	1,329
000520 Wage and salary employment, except agriculture, forestry, fishing, hunting, and private households	5,667	0.00	97.84	6,999	0.00	98.03	23.50	1,332
230000 Construction	131	0.00	2.25	155	0.00	2.17	18.65	24
31-33 Manufacturing	329	0.00	5.69	330	0.00	4.62	0.12	0
311000 Food manufacturing	79	0.01	1.36	84	0.01	1.18	6.77	5
420000 Wholesale trade	289	0.00	4.99	346	0.01	4.84	19.62	57
424000 Merchant wholesalers, nondurable goods	89	0.00	1.54	101	0.00	1.42	13.40	12
44-45 Retail trade	198	0.00	3.41	242	0.00	3.39	22.55	45
441000 Motor vehicle and parts dealers	64	0.00	1.11	88	0.00	1.24	37.32	24
445000 Food and beverage stores	89	0.00	1.53	106	0.00	1.49	19.89	18
445100 Grocery stores	88	0.00	1.52	106	0.00	1.48	20.01	18
48-49 Transportation and warehousing	4,009	0.09	69.20	5,024	0.10	70.36	25.32	1,015
481000 Air transportation	1,681	0.35	29.02	2,049	0.39	28.69	21.87	368
481100 Scheduled air transportation	1,456	0.33	25.14	1,769	0.37	24.77	21.45	312
481200 Nonscheduled air transportation	225	0.49	3.88	280	0.56	3.92	24.55	55
484000 Truck transportation	74	0.01	1.28	92	0.01	1.29	24.35	18
484100 General freight trucking	64	0.01	1.10	79	0.01	1.11	24.42	16
488000 Support activities for transportation	1,337	0.23	23.08	1,783	0.27	24.97	33.40	446
488100 Support activities for air transportation	1,177	0.76	20.31	1,564	0.83	21.90	32.88	387
488500 Freight transportation arrangement	136	0.08	2.36	190	0.09	2.66	39.44	54
493000 Warehousing and storage	56	0.01	0.96	82	0.01	1.15	46.93	26
493100 Warehousing and storage	56	0.01	0.96	82	0.01	1.15	46.93	26
562000 Waste management and remediation services	82	0.02	1.41	115	0.03	1.61	41.16	34
990000 Government	225	0.00	3.89	265	0.00	3.71	17.53	40
910000 Federal government	70	0.00	1.21	76	0.00	1.07	8.74	6
940000 State and local government	155	0.00	2.68	188	0.00	2.64	21.51	33
949400 State and local government, excluding education and hospitals	155	0.00	2.68	188	0.00	2.64	21.51	33
930000 Local government	135	0.00	2.32	166	0.00	2.33	23.58	32
939300 Local government, excluding education and hospitals	135	0.00	2.32	166	0.00	2.33	23.58	32
006700 Self-employed and unpaid family workers, all jobs	114	0.00	1.97	133	0.00	1.86	16.24	19
006701 Total self-employed and unpaid family workers, primary job	100	0.00	1.73	117	0.00	1.64	17.19	17
000600 Self-employed workers, all jobs	114	0.00	1.97	133	0.00	1.86	16.24	19
000601 Self-employed workers, primary job	100	0.00	1.73	117	0.00	1.64	17.19	17

**National Employment Matrix, employment by industry, occupation, and percent distribution, 2006 and projected 2016.**

53-2011 Airline pilots, copilots, and flight engineers

[Industries with fewer than 50 jobs, confidential data, or poor quality data are not displayed]

Industry	2006			2016			Percent change	Numeric change
	Number	Percent of ind	Percent of occ	Number	Percent of ind	Percent of occ		
000001 Total employment, all workers	79,444	0.05	100.00	89,678	0.05	100.00	12.88	10,234
000500 Total wage and salary employment	77,479	0.06	97.53	87,648	0.06	97.74	13.12	10,168
000520 Wage and salary employment, except agriculture, forestry, fishing, hunting, and private households	76,164	0.06	95.87	86,239	0.06	96.17	13.23	10,074
31-33 Manufacturing	248	0.00	0.31	247	0.00	0.28	-0.44	-1
420000 Wholesale trade	133	0.00	0.17	130	0.00	0.14	-2.62	-4
423000 Merchant wholesalers, durable goods	77	0.00	0.10	82	0.00	0.09	6.02	5
423800 Machinery, equipment, and supplies merchant wholesalers	67	0.01	0.08	71	0.01	0.08	4.89	3
48-49 Transportation and warehousing	71,249	1.60	89.68	81,080	1.63	90.41	13.80	9,830
481000 Air transportation	69,100	14.20	86.98	78,588	15.06	87.63	13.73	9,488
481100 Scheduled air transportation	64,258	14.57	80.88	73,106	15.50	81.52	13.77	8,848
481200 Nonscheduled air transportation	4,842	10.67	6.10	5,483	10.94	6.11	13.22	640
488000 Support activities for transportation	1,424	0.25	1.79	1,710	0.26	1.91	20.11	286
488100 Support activities for air transportation	1,227	0.79	1.54	1,482	0.79	1.65	20.80	255
492000 Couriers and messengers	705	0.12	0.89	757	0.13	0.84	7.46	53
492100 Couriers	705	0.13	0.89	757	0.14	0.84	7.46	53
520000 Finance and insurance	206	0.00	0.26	268	0.00	0.30	30.17	62
523000 Securities, commodity contracts, and other financial investments and related activities	105	0.01	0.13	152	0.01	0.17	44.93	47
5231-2 Securities and commodity contracts, brokerages, and exchanges	50	0.01	0.06	75	0.01	0.08	49.23	25
524000 Insurance carriers and related activities	50	0.00	0.06	52	0.00	0.06	4.26	2
524100 Insurance carriers	50	0.00	0.06	52	0.00	0.06	4.26	2
530000 Real estate and rental and leasing	80	0.00	0.10	92	0.00	0.10	15.87	13
550000 Management of companies and enterprises	241	0.01	0.30	278	0.01	0.31	15.28	37
551000 Management of companies and enterprises	241	0.01	0.30	278	0.01	0.31	15.28	37
551100 Management of companies and enterprises	241	0.01	0.30	278	0.01	0.31	15.28	37
560000 Administrative and support and waste management and remediation services	195	0.00	0.25	219	0.00	0.24	12.32	24
561000 Administrative and support services	195	0.00	0.25	219	0.00	0.24	12.32	24
6112-3 Junior colleges, colleges, universities, and professional schools, public and private	52	0.00	0.07	58	0.00	0.06	11.86	6
611300 Colleges, universities, and professional schools, public and private	52	0.00	0.07	58	0.00	0.06	11.86	6
6114-7 Other educational services, public and private	102	0.02	0.13	111	0.01	0.12	8.65	9
620000 Health care and social assistance	70	0.00	0.09	87	0.00	0.10	23.46	16
621-3 Health care	68	0.00	0.09	84	0.00	0.09	22.40	15
621000 Ambulatory health care services	64	0.00	0.08	79	0.00	0.09	23.12	15
621459 Outpatient, laboratory, and other ambulatory care services	64	0.01	0.08	79	0.01	0.09	23.12	15
710000 Arts, entertainment, and recreation	86	0.00	0.11	108	0.00	0.12	26.79	23
711000 Performing arts, spectator sports, and related industries	82	0.02	0.10	102	0.02	0.11	24.22	20
711200 Spectator sports	81	0.06	0.10	101	0.06	0.11	24.45	20
990000 Government	3,051	0.03	3.84	2,889	0.03	3.22	-5.31	-162
910000 Federal government	2,967	0.11	3.74	2,805	0.11	3.13	-5.47	-162
919999 Federal government, excluding postal service	2,967	0.15	3.74	2,805	0.15	3.13	-5.47	-162
940000 State and local government	83	0.00	0.10	83	0.00	0.09	0.06	0
949400 State and local government, excluding education and hospitals	83	0.00	0.10	83	0.00	0.09	0.06	0
920000 State government	72	0.00	0.09	71	0.00	0.08	-1.86	-1
929200 State government, excluding education and hospitals	72	0.00	0.09	71	0.00	0.08	-1.86	-1
000530 Wage and salary employment in agriculture, forestry, fishing, hunting, and private households	1,315	0.06	1.66	1,409	0.07	1.57	7.12	94
006700 Self-employed and unpaid family workers, all jobs	1,965	0.02	2.47	2,030	0.02	2.26	3.33	65
006701 Total self-employed and unpaid family workers, primary job	1,062	0.01	1.34	1,132	0.01	1.26	6.54	69
006702 Total self-employed and unpaid family workers, secondary job	903	0.06	1.14	898	0.05	1.00	-0.45	-4
000600 Self-employed workers, all jobs	1,965	0.02	2.47	2,030	0.02	2.26	3.33	65
000601 Self-employed workers, primary job	1,062	0.01	1.34	1,132	0.01	1.26	6.54	69
000602 Self-employed workers, secondary job	903	0.06	1.14	898	0.06	1.00	-0.45	-4

National Employment Matrix, employment by industry, occupation, and percent distribution, 2006 and projected 2016.

53-2012 Commercial pilots

[Industries with fewer than 50 jobs, confidential data, or poor quality data are not displayed]

Industry	2006			2016			Percent change	Numeric change
	Number	Percent of ind	Percent of occ	Number	Percent of ind	Percent of occ		
000001 Total employment, all workers	27,596	0.02	100.00	31,236	0.02	100.00	13.19	3,640
000500 Total wage and salary employment	27,080	0.02	98.13	30,703	0.02	98.29	13.38	3,623
000520 Wage and salary employment, except agriculture, forestry, fishing, hunting, and private households	26,735	0.02	96.88	30,333	0.02	97.11	13.46	3,598
210000 Mining	418	0.07	1.51	411	0.07	1.32	-1.61	-7
211000 Oil and gas extraction	383	0.28	1.39	377	0.28	1.21	-1.68	-6
211100 Oil and gas extraction	383	0.28	1.39	377	0.28	1.21	-1.68	-6
220000 Utilities	59	0.01	0.21	53	0.01	0.17	-10.48	-6
221000 Utilities	59	0.01	0.21	53	0.01	0.17	-10.48	-6
230000 Construction	203	0.00	0.74	217	0.00	0.70	7.00	14
236000 Construction of buildings	78	0.00	0.28	88	0.00	0.28	12.26	10
237000 Heavy and civil engineering construction	99	0.01	0.36	101	0.01	0.32	2.20	2
31-33 Manufacturing	1,030	0.01	3.73	1,014	0.01	3.25	-1.59	-16
311000 Food manufacturing	57	0.00	0.21	63	0.00	0.20	9.71	6
333000 Machinery manufacturing	76	0.01	0.27	66	0.01	0.21	-12.96	-10
334000 Computer and electronic product manufacturing	66	0.01	0.24	63	0.01	0.20	-4.89	-3
336000 Transportation equipment manufacturing	607	0.03	2.20	617	0.04	1.97	1.65	10
336400 Aerospace product and parts manufacturing	548	0.12	1.98	558	0.11	1.79	1.84	10
420000 Wholesale trade	344	0.01	1.25	338	0.01	1.08	-1.80	-6
423000 Merchant wholesalers, durable goods	171	0.01	0.62	185	0.01	0.59	7.89	14
424000 Merchant wholesalers, nondurable goods	144	0.01	0.52	120	0.01	0.38	-16.44	-24
424700 Petroleum and petroleum products merchant wholesalers	86	0.09	0.31	61	0.09	0.19	-29.09	-25
44-45 Retail trade	94	0.00	0.34	118	0.00	0.38	25.53	24
441000 Motor vehicle and parts dealers	76	0.00	0.28	96	0.00	0.31	26.47	20
48-49 Transportation and warehousing	14,693	0.33	53.24	16,768	0.34	53.68	14.12	2,075
481000 Air transportation	9,157	1.88	33.18	10,327	1.98	33.06	12.78	1,170
481100 Scheduled air transportation	1,445	0.33	5.23	1,595	0.34	5.11	10.41	150
481200 Nonscheduled air transportation	7,712	16.99	27.95	8,732	17.43	27.96	13.22	1,020
487000 Scenic and sightseeing transportation	613	2.27	2.22	679	1.96	2.17	10.72	66
488000 Support activities for transportation	3,535	0.62	12.81	4,269	0.64	13.67	20.77	734
488100 Support activities for air transportation	3,497	2.25	12.67	4,224	2.25	13.52	20.80	727
510000 Information	144	0.00	0.52	153	0.00	0.49	5.95	9
520000 Finance and insurance	359	0.01	1.30	436	0.01	1.40	21.71	78
523000 Securities, commodity contracts, and other financial investments and related activities	130	0.02	0.47	185	0.02	0.59	42.59	55
523900 Other financial investment activities	104	0.03	0.38	146	0.03	0.47	40.93	43
524000 Insurance carriers and related activities	172	0.01	0.62	187	0.01	0.60	8.43	15
524100 Insurance carriers	121	0.01	0.44	125	0.01	0.40	4.04	5
524120 Direct insurance (except life, health, and medical) carriers	60	0.01	0.22	63	0.01	0.20	4.52	3
530000 Real estate and rental and leasing	324	0.01	1.17	379	0.01	1.21	17.14	56
532000 Rental and leasing services	178	0.03	0.65	218	0.03	0.70	22.19	40
532400 Commercial and industrial machinery and equipment rental and leasing	178	0.15	0.65	218	0.15	0.70	22.19	40
540000 Professional, scientific, and technical services	536	0.01	1.94	701	0.01	2.24	30.89	165
541000 Professional, scientific, and technical services	536	0.01	1.94	701	0.01	2.24	30.89	165
541300 Architectural, engineering, and related services	159	0.01	0.58	201	0.01	0.64	26.68	42
541600 Management, scientific, and technical consulting services	109	0.01	0.40	195	0.01	0.62	78.52	86
541900 Other professional, scientific, and technical services	128	0.02	0.46	146	0.02	0.47	14.34	18
550000 Management of companies and enterprises	766	0.04	2.78	883	0.04	2.83	15.28	117
551000 Management of companies and enterprises	766	0.04	2.78	883	0.04	2.83	15.28	117
551100 Management of companies and enterprises	766	0.04	2.78	883	0.04	2.83	15.28	117
560000 Administrative and support and waste management and remediation services	437	0.01	1.58	559	0.01	1.79	27.97	122
561000 Administrative and support services	434	0.01	1.57	555	0.01	1.78	27.94	121
561100 Office administrative services	168	0.05	0.61	213	0.05	0.68	26.79	45
610000 Educational services, public and private	4,484	0.03	16.25	4,909	0.03	15.72	9.48	425
611000 Educational services, public and private	4,484	0.03	16.25	4,909	0.03	15.72	9.48	425
6112-3 Junior colleges, colleges, universities, and professional schools, public and private	510	0.01	1.85	570	0.01	1.83	11.74	60
611300 Colleges, universities, and professional schools, public and private	459	0.01	1.66	514	0.01	1.65	11.87	55
6114-7 Other educational services, public and private	3,972	0.67	14.39	4,338	0.58	13.89	9.20	365
611500 Technical and trade schools, public and private	3,888	2.89	14.09	4,224	2.80	13.52	8.64	336
620000 Health care and social assistance	1,914	0.01	6.94	2,418	0.01	7.74	26.34	504
621-3 Health care	1,914	0.01	6.94	2,418	0.01	7.74	26.34	504
621000 Ambulatory health care services	1,765	0.03	6.39	2,251	0.03	7.21	27.55	486
621459 Outpatient, laboratory, and other ambulatory care services	1,753	0.19	6.35	2,236	0.20	7.16	27.54	483
621900 Other ambulatory health care services	1,753	0.81	6.35	2,236	0.78	7.16	27.54	483
621910 Ambulance services	1,750	1.35	6.34	2,232	1.36	7.14	27.52	482
622000 Hospitals, public and private	148	0.00	0.54	166	0.00	0.53	12.12	18
622100 General medical and surgical hospitals, public and private	135	0.00	0.49	149	0.00	0.48	10.71	14
710000 Arts, entertainment, and recreation	92	0.00	0.33	115	0.00	0.37	24.74	23
711000 Performing arts, spectator sports, and related industries	81	0.02	0.29	99	0.02	0.32	21.93	18
711200 Spectator sports	60	0.05	0.22	75	0.05	0.24	24.45	15
990000 Government	773	0.01	2.80	798	0.01	2.56	3.33	26
940000 State and local government	773	0.01	2.80	798	0.01	2.56	3.33	26

Industry	2006			2016			Percent change	Numeric change
	Number	Percent of ind	Percent of occ	Number	Percent of ind	Percent of occ		
949400 State and local government, excluding education and hospitals	773	0.01	2.80	798	0.01	2.56	3.33	26
920000 State government	490	0.02	1.77	480	0.02	1.54	-1.87	-9
929200 State government, excluding education and hospitals	490	0.02	1.77	480	0.02	1.54	-1.87	-9
930000 Local government	283	0.01	1.03	318	0.01	1.02	12.34	35
939300 Local government, excluding education and hospitals	283	0.01	1.03	318	0.01	1.02	12.34	35
000530 Wage and salary employment in agriculture, forestry, fishing, hunting, and private households	345	0.02	1.25	370	0.02	1.18	7.12	25
110000 Agriculture, forestry, fishing and hunting; primary job	345	0.03	1.25	370	0.03	1.18	7.12	25
115000 Support activities for agriculture and forestry; primary job	345	0.29	1.25	370	0.28	1.18	7.12	25
006700 Self-employed and unpaid family workers, all jobs	516	0.00	1.87	533	0.00	1.71	3.33	17
006701 Total self-employed and unpaid family workers, primary job	279	0.00	1.01	297	0.00	0.95	6.54	18
006702 Total self-employed and unpaid family workers, secondary job	237	0.01	0.86	236	0.01	0.76	-0.45	-1
000600 Self-employed workers, all jobs	516	0.00	1.87	533	0.00	1.71	3.33	17
000601 Self-employed workers, primary job	279	0.00	1.01	297	0.00	0.95	6.54	18
000602 Self-employed workers, secondary job	237	0.01	0.86	236	0.01	0.76	-0.45	-1

**National Employment Matrix, employment by industry, occupation, and percent distribution, 2006 and projected 2016.**

53-2021 Air traffic controllers

[Industries with fewer than 50 jobs, confidential data, or poor quality data are not displayed]

Industry	2006			2016			Percent change	Numeric change
	Number	Percent of ind	Percent of occ	Number	Percent of ind	Percent of occ		
000001 Total employment, all workers	25,223	0.02	100.00	27,795	0.02	100.00	10.20	2,572
000500 Total wage and salary employment	25,223	0.02	100.00	27,795	0.02	100.00	10.20	2,572
000520 Wage and salary employment, except agriculture, forestry, fishing, hunting, and private households	25,223	0.02	100.00	27,795	0.02	100.00	10.20	2,572
48-49 Transportation and warehousing	2,049	0.05	8.12	2,417	0.05	8.70	17.98	368
481200 Nonscheduled air transportation	102	0.23	0.41	116	0.23	0.42	13.23	14
488000 Support activities for transportation	1,530	0.27	6.07	1,841	0.28	6.62	20.35	311
488100 Support activities for air transportation	1,422	0.92	5.64	1,718	0.91	6.18	20.80	296
560000 Administrative and support and waste management and remediation services	365	0.00	1.45	492	0.00	1.77	34.71	127
561000 Administrative and support services	365	0.00	1.45	492	0.01	1.77	34.71	127
990000 Government	22,678	0.21	89.91	24,730	0.22	88.97	9.05	2,052
910000 Federal government	22,383	0.82	88.74	24,418	0.93	87.85	9.09	2,035
919999 Federal government, excluding postal service	22,383	1.14	88.74	24,418	1.31	87.85	9.09	2,035
940000 State and local government	295	0.00	1.17	312	0.00	1.12	5.72	17
949400 State and local government, excluding education and hospitals	295	0.00	1.17	312	0.00	1.12	5.72	17
920000 State government	137	0.01	0.54	135	0.01	0.49	-1.88	-3
930000 Local government	158	0.00	0.63	177	0.00	0.64	12.34	19

National Employment Matrix, employment by industry, occupation, and percent distribution, 2006 and projected 2016.

53-2022 Airfield operations specialists

[Industries with fewer than 50 jobs, confidential data, or poor quality data are not displayed]

Industry	2006			2016			Percent change	Numeric change
	Number	Percent of ind	Percent of occ	Number	Percent of ind	Percent of occ		
000001 Total employment, all workers	4,891	0.00	100.00	5,469	0.00	100.00	11.81	577
000500 Total wage and salary employment	4,891	0.00	100.00	5,469	0.00	100.00	11.81	577
000520 Wage and salary employment, except agriculture, forestry, fishing, hunting, and private households	4,891	0.00	100.00	5,469	0.00	100.00	11.81	577
31-33 Manufacturing	256	0.00	5.24	262	0.00	4.79	2.09	5
336000 Transportation equipment manufacturing	241	0.01	4.92	245	0.01	4.48	1.85	4
336400 Aerospace product and parts manufacturing	241	0.05	4.92	245	0.05	4.48	1.85	4
48-49 Transportation and warehousing	2,575	0.06	52.64	2,971	0.06	54.33	15.40	396
481000 Air transportation	1,383	0.28	28.28	1,544	0.30	28.23	11.58	160
481100 Scheduled air transportation	811	0.18	16.58	896	0.19	16.38	10.41	84
481200 Nonscheduled air transportation	572	1.26	11.70	648	1.29	11.85	13.22	76
488000 Support activities for transportation	1,026	0.18	20.98	1,240	0.19	22.67	20.80	213
488100 Support activities for air transportation	1,026	0.66	20.98	1,240	0.66	22.67	20.80	213
492000 Couriers and messengers	75	0.01	1.53	81	0.01	1.48	7.46	6
492100 Couriers	75	0.01	1.53	81	0.01	1.48	7.46	6
540000 Professional, scientific, and technical services	86	0.00	1.76	109	0.00	2.00	26.79	23
541000 Professional, scientific, and technical services	86	0.00	1.76	109	0.00	2.00	26.79	23
610000 Educational services, public and private	259	0.00	5.29	280	0.00	5.12	8.37	22
611000 Educational services, public and private	259	0.00	5.29	280	0.00	5.12	8.37	22
611100 Elementary and secondary schools, public and private	88	0.00	1.80	93	0.00	1.69	5.38	5
6112-3 Junior colleges, colleges, universities, and professional schools, public and private	68	0.00	1.38	75	0.00	1.38	11.84	8
611300 Colleges, universities, and professional schools, public and private	66	0.00	1.36	74	0.00	1.36	11.87	8
6114-7 Other educational services, public and private	103	0.02	2.11	112	0.01	2.05	8.65	9
611500 Technical and trade schools, public and private	103	0.08	2.11	112	0.07	2.05	8.65	9
990000 Government	1,591	0.01	32.52	1,706	0.02	31.19	7.21	115
910000 Federal government	425	0.02	8.69	402	0.02	7.34	-5.47	-23
919999 Federal government, excluding postal service	425	0.02	8.69	402	0.02	7.34	-5.47	-23
940000 State and local government	1,166	0.01	23.84	1,304	0.02	23.84	11.83	138
949400 State and local government, excluding education and hospitals	1,166	0.01	23.84	1,304	0.02	23.84	11.83	138
930000 Local government	1,124	0.02	22.98	1,263	0.02	23.09	12.34	139
939300 Local government, excluding education and hospitals	1,124	0.02	22.98	1,263	0.02	23.09	12.34	139



National Employment Matrix, employment by industry, occupation, and percent distribution, 2006 and projected 2016.

53-6051 Transportation inspectors

[Industries with fewer than 50 jobs, confidential data, or poor quality data are not displayed]

Industry	2006			2016			Percent change	Numeric change
	Number	Percent of ind	Percent of occ	Number	Percent of ind	Percent of occ		
000001 Total employment, all workers	26,400	0.02	100.00	30,742	0.02	100.00	16.45	4,342
000500 Total wage and salary employment	24,850	0.02	94.13	29,008	0.02	94.36	16.73	4,158
000520 Wage and salary employment, except agriculture, forestry, fishing, hunting, and private households	24,850	0.02	94.13	29,008	0.02	94.36	16.73	4,158
31-33 Manufacturing	1,231	0.01	4.66	1,333	0.01	4.34	8.30	102
336000 Transportation equipment manufacturing	1,021	0.06	3.87	1,113	0.07	3.62	8.98	92
336400 Aerospace product and parts manufacturing	817	0.17	3.10	916	0.18	2.98	12.03	98
420000 Wholesale trade	258	0.00	0.98	303	0.00	0.99	17.57	45
423000 Merchant wholesalers, durable goods	148	0.00	0.56	178	0.01	0.58	19.81	29
44-45 Retail trade	91	0.00	0.34	97	0.00	0.32	6.57	6
48-49 Transportation and warehousing	9,804	0.22	37.14	11,370	0.23	36.98	15.98	1,566
481000 Air transportation	1,308	0.27	4.95	1,591	0.30	5.18	21.67	283
481100 Scheduled air transportation	1,217	0.28	4.61	1,478	0.31	4.81	21.45	261
481200 Nonscheduled air transportation	91	0.20	0.34	113	0.23	0.37	24.55	22
482000 Rail transportation	3,282	1.46	12.43	3,107	1.46	10.11	-5.33	-175
482100 Rail transportation	3,282	1.46	12.43	3,107	1.46	10.11	-5.33	-175
484000 Truck transportation	1,418	0.10	5.37	1,762	0.11	5.73	24.29	344
484100 General freight trucking	1,070	0.11	4.05	1,332	0.12	4.33	24.42	261
484200 Specialized freight trucking	347	0.08	1.32	430	0.09	1.40	23.90	83
485000 Transit and ground passenger transportation	183	0.05	0.69	227	0.05	0.74	24.17	44
487000 Scenic and sightseeing transportation	55	0.20	0.21	78	0.23	0.25	42.42	23
488000 Support activities for transportation	3,462	0.61	13.11	4,467	0.67	14.53	29.03	1,005
488100 Support activities for air transportation	1,632	1.05	6.18	2,168	1.15	7.05	32.88	536
488300 Support activities for water transportation	571	0.57	2.16	727	0.65	2.36	27.33	156
488400 Support activities for road transportation	491	0.61	1.86	594	0.68	1.93	20.95	103
488500 Freight transportation arrangement	141	0.08	0.54	197	0.09	0.64	39.44	56
493000 Warehousing and storage	78	0.01	0.29	114	0.01	0.37	46.93	37
493100 Warehousing and storage	78	0.01	0.29	114	0.01	0.37	46.93	37
530000 Real estate and rental and leasing	259	0.01	0.98	324	0.01	1.05	25.10	65
532000 Rental and leasing services	259	0.04	0.98	324	0.04	1.05	25.10	65
532100 Automotive equipment rental and leasing	251	0.13	0.95	314	0.14	1.02	24.81	62
540000 Professional, scientific, and technical services	463	0.01	1.75	636	0.01	2.07	37.38	173
541000 Professional, scientific, and technical services	463	0.01	1.75	636	0.01	2.07	37.38	173
541300 Architectural, engineering, and related services	255	0.02	0.97	353	0.02	1.15	38.28	98
560000 Administrative and support and waste management and remediation services	285	0.00	1.08	417	0.00	1.36	46.32	132
561000 Administrative and support services	264	0.00	1.00	388	0.00	1.26	46.96	124
610000 Educational services, public and private	69	0.00	0.26	93	0.00	0.30	33.84	23
611000 Educational services, public and private	69	0.00	0.26	93	0.00	0.30	33.84	23
810000 Other services (except government and private households)	1,013	0.02	3.84	1,644	0.03	5.35	62.31	631
811000 Repair and maintenance	1,002	0.08	3.80	1,631	0.11	5.30	62.70	628
811100 Automotive repair and maintenance	989	0.11	3.75	1,615	0.15	5.25	63.32	626
811110 Automotive mechanical and electrical repair and maintenance	264	0.07	1.00	344	0.07	1.12	30.60	81
811190 Other automotive repair and maintenance	726	0.32	2.75	1,271	0.39	4.13	75.20	546
990000 Government	11,219	0.10	42.50	12,588	0.11	40.95	12.20	1,369
910000 Federal government	4,399	0.16	16.66	4,574	0.17	14.88	3.99	175
919999 Federal government, excluding postal service	4,399	0.22	16.66	4,574	0.24	14.88	3.99	175
940000 State and local government	6,821	0.09	25.84	8,014	0.09	26.07	17.50	1,194
949400 State and local government, excluding education and hospitals	6,821	0.09	25.84	8,014	0.09	26.07	17.50	1,194
920000 State government	2,650	0.11	10.04	2,861	0.12	9.31	7.94	210
930000 Local government	4,171	0.07	15.80	5,154	0.08	16.76	23.57	983
006700 Self-employed and unpaid family workers, all jobs	1,549	0.01	5.87	1,734	0.01	5.64	11.89	184
006701 Total self-employed and unpaid family workers, primary job	481	0.00	1.82	564	0.00	1.83	17.19	83
006702 Total self-employed and unpaid family workers, secondary job	1,068	0.07	4.05	1,170	0.07	3.81	9.51	102
000600 Self-employed workers, all jobs	1,549	0.01	5.87	1,734	0.01	5.64	11.89	184
000601 Self-employed workers, primary job	481	0.00	1.82	564	0.01	1.83	17.19	83
000602 Self-employed workers, secondary job	1,068	0.07	4.05	1,170	0.07	3.81	9.51	102