Air traffic controllers

Alaska has the highest concentration in the nation

By **DAN STRONG**

Air traffic controllers play an outsized role in a state that relies heavily on air transportation and where pilots face a wide range of hazards. Alaska has more air traffic controllers per capita than any other state — seven times the national average and nearly twice that of the next-highest state, New Hampshire.

Alaska has about 500 civilian air traffic controllers — 2.2 percent of the U.S. total — and nearly all of them work for the Federal Aviation Administration or as federal contractors. An additional 117 controllers are military.

Shifting duties in tough conditions

Air traffic controllers coordinate the movements of aircraft and ground vehicles to maintain safe distances. About 55 to 60 percent of Alaska's massive airspace has limited radar visibility, and the job is further complicated by military operations, rocket launches, unmanned aircraft, inclement weather, and a system of 33 active North Pacific volcanoes.

They often switch quickly between duties, which include issuing instructions to pilots, monitoring the movement of aircraft on the ground and in the air, transferring control to other control centers, accepting control of incoming flights, providing information to pilots on weather and unusual conditions, and dealing with emergencies.

Alaska's massive airspace is served by 146 aviation weather reporting stations, 227 weather camera sites, eight FAA control towers, five military towers, two terminal radar approach facilities, 17 flight service stations, a commercial spaceport near Kodiak, UAF's land-based rocket and unmanned aircraft facility, and the Anchorage Air Route Traffic Control Center (ZAN).

Three types and their stations

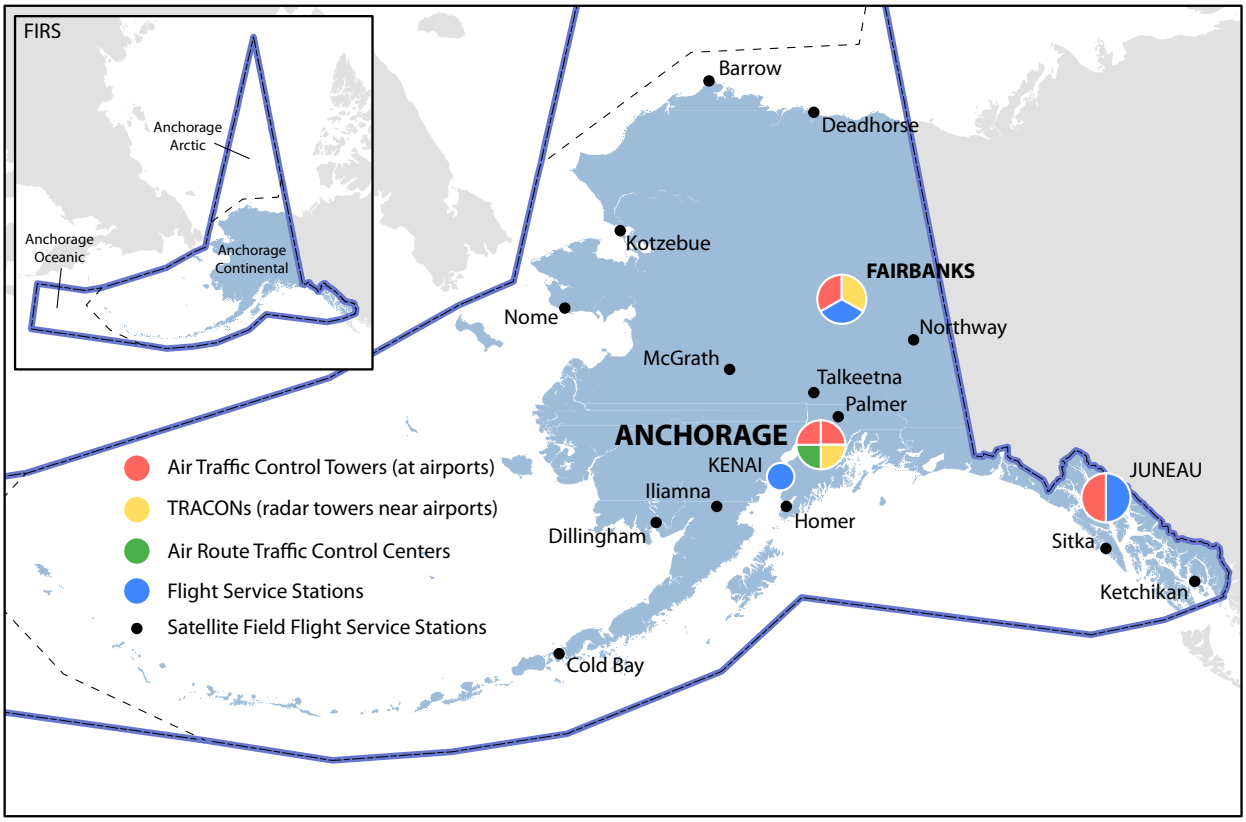
Although controllers rotate between different roles in the course of a shift, they fall into three main categories, depending on which phase of air travel they deal with: tower (ground and local), approach/departure, and en route.

Ground and local tower controllers work at airports in tower cabs, managing traffic within a few miles of the airport. Ground tower controllers instruct pilots during taxiing, then hand off control to local controllers for takeoff and landing. Local tower controllers grant clearance to fly while ensuring minimum distances between landing and departing aircraft.

Once planes leave airport airspace, responsibilities transfer to *approach and departure controllers*, who typically work in Terminal Radar Approach Control

1 Where Alaska's Air Traffic Control Services Are Located

2016



Sources: Federal Aviation Administration; and Alaska Department of Labor and Workforce Development, Research and Analysis Section

facilities, or TRACONs. They use radar and GPS to ensure minimum separation standards within a 40-mile radius of airports. They also communicate with pilots, providing weather information and clearance to enter controlled airspace.

Once flights are 40 miles away from airports, *en route controllers* take over, with responsibility for pilots transferring along successive en route centers as a flight progresses. These centers are called Air Route Traffic Control Centers, or ARTCCs, and they cover wide swaths of the country. En route controllers are responsible for monitoring aircraft over large sections of airspace and provide approach control services to small airports around the country where no terminal service is provided.

Anchorage center oversees airspace

Alaska's ARTCC, called ZAN,[1] is in Anchorage and serves as central command for Alaska's 24 million-plus square miles of airspace. The nation's largest military airspace, 60,780 square miles, is also under ZAN's purview.

ZAN handled 581,244 flights in 2015. These included 4.9 million passenger enplanements (getting on or off the plane), which was about 6.7 times Alaska's population and more than twice the per capita national average.

ZAN employed 108 of the state's roughly 500 air traffic controllers as of September 2015. For comparison, the Anchorage and Fairbanks TRACON facilities employed about 20 controllers each.

Highest concentration in U.S.

Anchorage is home to 290 of Alaska's 500 air traffic controllers. Alaska's top-ranking concentration of these workers is largely due to the high traffic through the Anchorage area, and among U.S. cities, Anchorage has the second-highest concentration of these workers.

[1]All ARTCCs have a three-letter FAA code: a "Z" followed by two letters for the city.

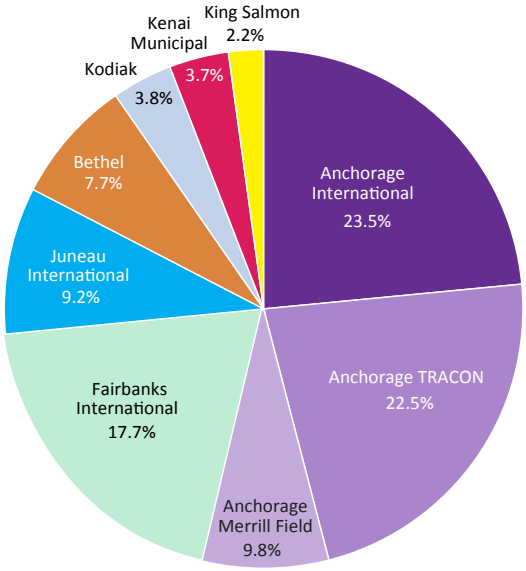
In 2015, more than half of takeoffs and landings in Alaska were in Anchorage facilities (55.8%), followed by Fairbanks (17.7%) and Juneau (9.2%). (See Exhibit 2.)

Ted Stevens Anchorage International Airport ranked as the fourth-busiest airport in the world by cargo traffic in 2015 after Hong Kong, Memphis, and Shanghai. Anchorage was also No. 2 among U.S. airports for landed weight, second only to FedEx's main terminal, Memphis International. Three other airports are also densely packed near downtown Anchorage: Merrill Field, Lake Hood Seaplane Base, and Joint Base Elmendorf-Richardson.

The Ted Stevens airport is a convenient refueling stopover for at least 30 international cargo airlines with destinations across Asia and the United States. Many passenger planes have the capability to fly over Anchorage, but most cargo planes stop and refuel, which allows them to carry less fuel and more cargo. The Anchorage and Fairbanks international airports also have special exemptions that allow airlines to co-mingle domestic and foreign cargo and transfer cargo between planes and carriers without being subject to federal regulations.

2 Share of Takeoffs and Landings by Facility

ALASKA, 2015



Source: Federal Aviation Administration

Among the highest-paying jobs

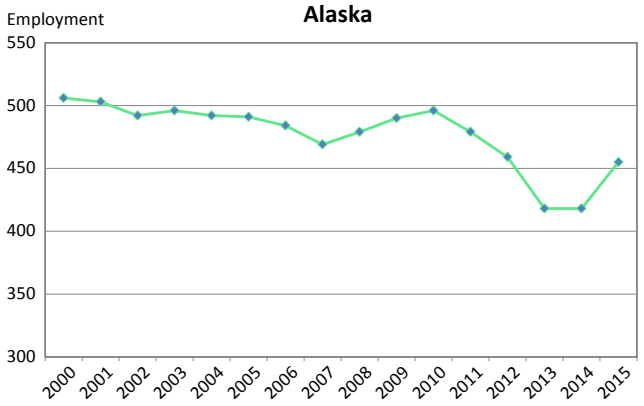
Air traffic controller is one of the state's highest-paying occupations, and since 2000, air traffic controllers' wages have risen 11 percent faster in Alaska than they have nationally.

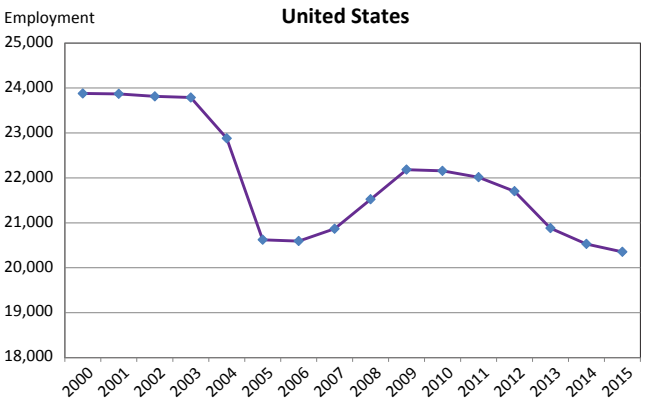
The median salary for Alaska's air traffic controllers was $103,750 in 2015, plus a nontaxable locality adjustment of 25 percent. The 58 percent who worked in Anchorage made 17.7 percent over the median. Controllers in Southeast Alaska and Alaska areas outside any community were also among the highest-paid and most concentrated in the United States.

The FAA allows early retirement at age 50 with 20 years of service and at any age after serving 25 years. Retirement is mandatory at age 56.

3 Alaska Federal Air Traffic Control Jobs Up While U.S. Declines

FEDERAL EMPLOYMENT ONLY, 2000 TO 2015





Note: The Alaska numbers shown here differ from the 500 total Alaska air traffic controllers reported in the article because that number includes those who work in other industries.
Source: U.S. Office of Personnel Management

History of Air Traffic Control in Alaska

On July 3, 1913, James Martin made the first successful powered flight in Alaska, flying a 60 horsepower biplane at low speed and low altitude over Exposition Park in Fairbanks, which is now Airport Way. That was less than 10 years after the first powered flight near Kitty Hawk, North Carolina.

Planes wouldn't replace dogsleds for quite some time, however, and aviation didn't become an important part of Alaska until after World War I, when war veterans and barnstormers often ended up flying people, mail, and supplies to bush communities in the 1920s.

Many former World War I pilots became airmail pilots, and the U.S. Post Office began operating airmail radio stations using the same technology the Army employed to direct and track aircraft movement.

This is a 1913 photo of James and Lilly Martin, aerial performers on the aviation demonstration circuit, in Fairbanks. This eight-cylinder Gage-Martin tractor biplane was designed and built by James Martin and was shipped from Seattle by steamboat as part of an aerial exhibition put on by local businessmen to bolster Fairbanks' status as a commercial hub. Photo courtesy of Alaska State Archives, Clemons Photo, D13 P281-082 [detail]

The nation's first air traffic control center opened in Newark, New Jersey, in 1935, and the following year the federal Bureau of Air Commerce took over air traffic control operations at the three extant centers at Newark, Chicago, and Cleveland.

Alaska wasn't far behind. World War II militarization was a driving force behind the development of the state's modern aviation infrastructure. Starting in the 1940s, the Civil Aeronautics Authority built airfields, navigation, and radio communication beacons and staffed field stations. By 1943, the CAA had commissioned an air traffic control system at Ladd Field in Fairbanks and similar facilities in Anchorage.

Since then, flight services and weather readings have become mostly automated, and many field stations have been decommissioned or are operated remotely.

Training requirements extensive

The FAA has relatively modest education requirements for hiring air traffic controllers. Applicants must be English-speaking U.S. citizens younger than 31 and have a bachelor's degree or three years of work experience, or a combination of the two. Before advancing to take the Air Traffic Standardized Aptitude Test, however, applicants must also go through a biographical assessment, psychological testing, medical screening, and an extensive background check.

After the initial screenings, successful candidates train for six to 12 weeks at the FAA Academy in Oklahoma City. Those who complete FAA Academy training are assigned a field location where they work alongside certified air traffic controllers and learn the specifics of that facility's airspace.

Historically, it's taken between one and four years to achieve Certified Professional Controller status, or CPC, but the training can take less than a year. As of 2016, nearly 84 percent of those who began training between 2007 and 2011 have become CPCs. Achieving a higher status means higher pay, and senior controllers have more choices of work location and hours.

The University of Alaska Anchorage is one of 36 colleges and universities nationwide approved by the FAA as participants in the Collegiate Training Initiative, an FAA program meant to prepare students for careers in aviation. UAA offers an associate degree and a minor in air traffic control, which allow graduates to bypass the introductory five-week Air Traffic Basics course at the FAA Academy.

Experienced controllers are in short supply nationwide

Federal air traffic controller employment in Alaska has declined by 10 percent since 2000 while nationwide employment has dropped by 14.8 percent. (See Exhibit 3.) Nationally, the FAA anticipates a loss of 11,943 controllers between 2016 and 2025, primarily due to retirements.

According to the U.S. Department of Transportation's

Alaska is at the forefront of air traffic control technology

Air traffic controllers depend on automation and other technology to keep up with their heavy workload, and Alaska has been at the forefront of implementing new technology.

In 2001, Anchorage's Air Route Traffic Control Center, called ZAN, was the first facility to implement a GPS-based surveillance system called Automatic Dependent Surveillance Broadcast.

ADS-B is part of a $2.7 billion FAA program to transition air traffic control from radar and radio communications to satellite-based technologies. All en route air traffic control and major terminal radar facilities now use ADS-B, and most aircraft in the U.S. will be required to have it by 2020.

ZAN was also the first center to integrate ADS-B with Advanced Technologies and Procedures Surveillance, a system that automates some procedures that were previously the responsibility of air traffic controllers.

Finally, in 2010, ZAN began using Wide Area Multilateration technology to track the difficult, mountainous approach into Juneau's airport. WAM uses mountaintop sensors to establish a precise location, allowing controllers to bring planes within five nautical miles of each other and also allowing landings in marginal visibility.

Office of the Inspector General, as of September 2015, the Anchorage TRACON was one of 13 critical facilities across the U.S. that had fewer certified air traffic controllers than the FAA mandates because a high percentage stationed there were still in training.

Although U.S. air traffic has dropped by 24 percent since its peak in 2000, the FAA anticipates a 2 percent yearly rise in passenger travel and 3.6 percent for air cargo over the next few decades. To accommodate these increases and attrition, the FAA plans to hire 6,300 air traffic controllers over the next five years. The FAA has also changed its hiring policies, improved its scheduling, and increased time off to mitigate fatigue.

In Alaska, air traffic controller is identified as a "top job" because of its high wages combined with high projected growth: 6.7 percent between 2014 and 2024. (See October 2016 *Trends* for more detail.) It's one of just nine occupations in the top jobs list that don't require a bachelor's degree or more and is the highest-paying occupation in that group.

Dan Strong is a research analyst in Juneau. Reach him at (907) 465-6036 or daniel.strong@alaska.gov.