A Plan for the Future

10 Year Strategy for the Air Traffic Control Workforce

2016
2017
2018
2019
2020
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2022
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2025

U.S. Department of
Transportation

**Federal Aviation
Administration**

This 2016 report is the FAA's eleventh annual update to the controller workforce plan. The FAA issued the first comprehensive controller workforce plan in December 2004. It provides staffing ranges for all of the FAA's air traffic control facilities and actual onboard controllers as of September 19, 2015.

Section (221) of Public Law (108-176) (updated by Public Law 111-117) requires the FAA Administrator to transmit a report to the Senate Committee on Commerce, Science and Transportation and the House of Representatives Committee on Transportation and Infrastructure that describes the overall air traffic controller workforce plan. It is due by March 31 of each fiscal year, otherwise the FAA's appropriation is reduced by $100,000 for each day it is late.

Table of Contents

Executive Summary

Safety is the top priority of the Federal Aviation Administration (FAA) as it manages America's National Airspace System (NAS). The NAS is the common network of U.S. airspace — air navigation facilities, equipment, and services; airports or landing areas; aeronautical charts, information and services; rules, regulations, and procedures; technical information; and manpower and material. Thanks to the expertise of people and the support of technology, tens of thousands of aircraft are guided safely and expeditiously every day through the NAS to their destinations.

WORKLOAD

An important part of managing the NAS involves actively aligning controller resources with demand. The FAA "staffs to traffic," matching the number of air traffic controllers at its facilities with traffic volume and workload. The FAA's staffing needs are dynamic due to the dynamic nature of the workload and traffic volume.

TRAFFIC

Air traffic demand has declined significantly since 2000, the peak year for traffic. For the purposes of this plan, air traffic includes aircraft that are controlled, separated and managed by air traffic controllers. This includes commercial passenger and cargo aircraft as well as general aviation and military aircraft. Since 2000 traffic volume has declined by 23 percent and is not expected to return to those levels in the near term.

New on the horizon, however, is the introduction of Unmanned Aircraft Systems (UAS). These are different from manned aircraft and introducing them safely into the nation's airspace is challenging for both the FAA and the aviation community. The FAA is taking an incremental approach to safe UAS integration; this is aided by the FAA's new compliance philosophy designed to help identify and correct potential hazards before they result in an incident or accident. The extent of UAS' impact on air traffic control will most certainly evolve.

HEADCOUNT

In many facilities, the current Actual on Board (AOB) number may exceed the facility's target staffing ranges. This is because many facilities' current AOB (all controllers at the facility) numbers include many developmental controllers in training to offset expected future attrition. While the FAA strives to keep Certified Professional Controllers (CPCs) and Certified Professional Controllers in Training (CPC-ITs) within the range, individual facilities can be above the range due to advance hiring. The FAA hires and staffs facilities so that trainees are fully prepared to take over responsibilities when senior controllers leave.

RETIREMENTS

Fiscal year 2015 retirements were slightly higher than projected, and almost equal to those in 2014. Annual retirements have increased since 2012 but are leveling off and still well below those experienced in 2007 when the long-anticipated wave of retirements peaked. Retirements are expected to continue to fall for the next decade. In the last five years, 3,213 controllers have retired. The FAA carefully tracks actual retirements and projects future losses to ensure its recruitment and training keep pace.

HIRING

In the last five years, the FAA has hired approximately 4,700 new air traffic controllers. We plan to hire more than 7,400 new controllers over the next five years to keep pace with expected attrition and traffic growth. The FAA has faced a number of hiring challenges in recent years and hired 1,345 controllers in 2015 compared to the previously reported plan of 1,772. We have renewed our focus on hiring efforts for FY 2016 – FY 2018 to restore the trainee pipeline.

TRAINING

As the FAA brings these new employees on board, training continues to be closely monitored at all facilities. We must carefully manage the process to ensure that our trainees are hired in the places we need them and progress in a timely manner to become certified professional controllers (CPC). The FAA will also continue to take action at the facility level should adjustments become necessary due to changes in traffic volume, retirements or other attrition.

In addition, the FAA has updated its training courses to support cumulative grading. This allows for student assessments at multiple points in training and allows for new training advancement decision points.

Ongoing hiring and training initiatives, as well as increased simulator use, are helping the FAA meet its goals. While the FAA is managing today's air traffic, we must also integrate new technologies into air traffic operations. From state-of-the-art simulators to satellite technology, air traffic is evolving into a more automated system. The FAA is working diligently to ensure well-trained controllers continue to uphold the highest safety standards as we plan for the future.

The FAA's goal is to ensure that the agency has the flexibility to match the number of controllers at each facility with traffic volume and workload. Staffing to traffic is just one of the ways we manage America's National Airspace System.

Chapter 1 | Introduction

Staffing to Traffic

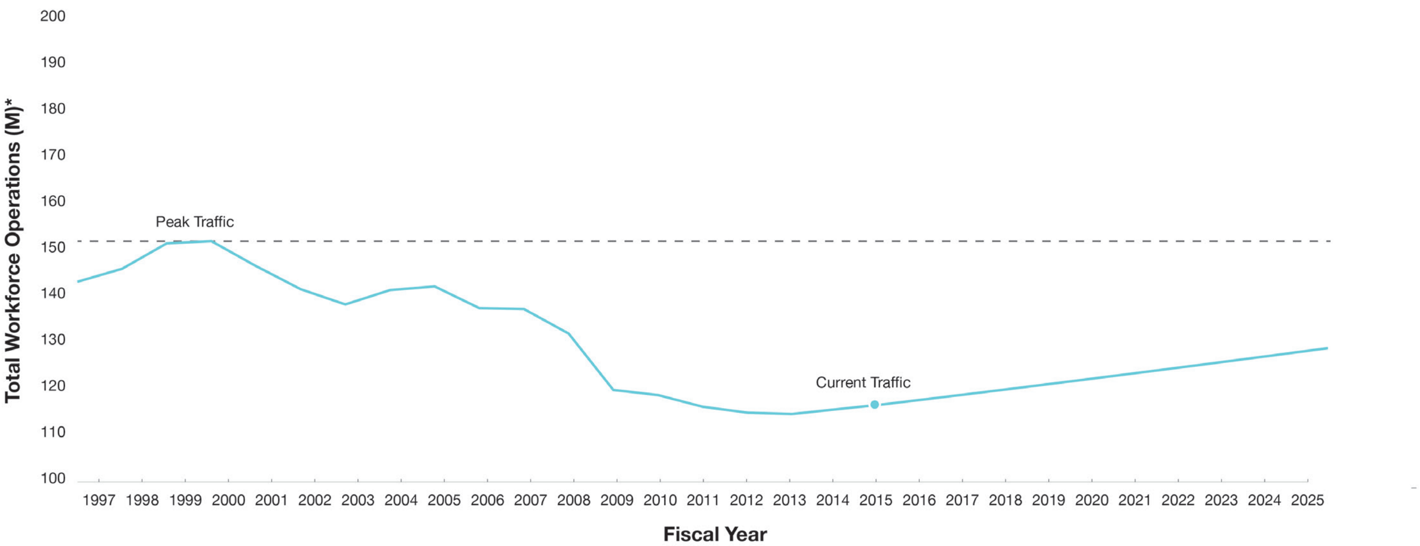
Air traffic controller workload and traffic volume are dynamic, and so are the FAA's staffing needs. A primary factor affecting controller workload is the demand created by air traffic, encompassing both commercial and non-commercial activity. Commercial activity includes air carrier and commuter/air taxi traffic. Non-commercial activity includes general aviation and military traffic.

Since the early 1990s, unmanned aircraft systems (UAS) have operated on a limited basis in the National Airspace System (NAS) and mainly supported public operations, such as military and border security operations. In recent years, UAS and operations have significantly increased in number, technical complexity, and application. The list of uses has rapidly expanded to encompass a broad range of activities, including aerial photography, surveying, communications and broadcast, as well as hobby and recreation. In December 2015, the FAA began registration of all Unmanned Aircraft Systems (UAS). As policy and technology updates allow widespread use of UAS for commercial applications, impact on Air Traffic Control workload will be incorporated into our models and forecasts. Oversight of UAS is aided by FAA's new compliance philosophy which is designed to help identify and correct potential hazards before they result in an incident or accident.

Adequate numbers of controllers must be available to cover the peaks in traffic caused by weather and daily, weekly or seasonal variations, so we continue to "staff to traffic." This practice gives us the flexibility throughout each day to match the number of controllers at each facility with traffic volume and workload.

System-wide, air traffic has declined by 23 percent since peak year 2000. The chart in Figure 1.1 shows that air traffic volume is not expected to return to peak levels in the near term.

FIGURE 1.1 TRAFFIC FORECAST



*Total Workforce Operations = Tower + TRACON + Aircraft Handled by En Route Centers

FIGURE 1.2 SYSTEM-WIDE TRAFFIC AND TOTAL CONTROLLER TRENDS

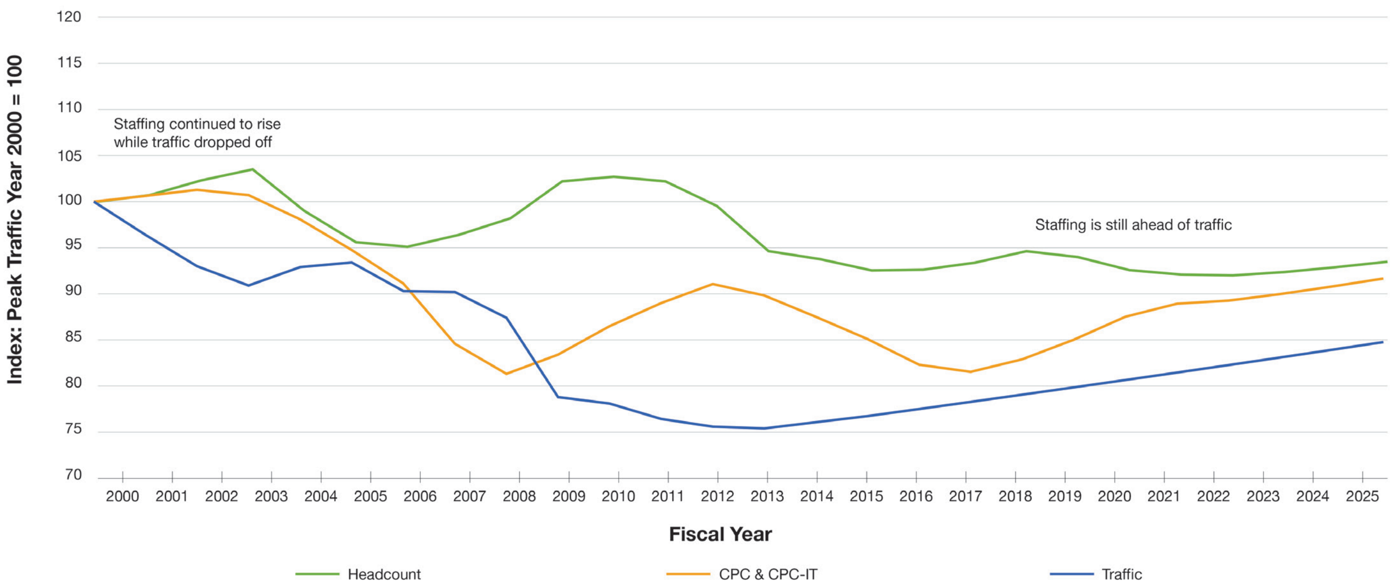


Figure 1.2 shows system-wide controller staffing and traffic, indexed from 2000 and projected through 2025. Indexing is a widely used technique which compares the change over time of two or more data series (in this case, total controller headcount, certified profession controllers (CPC) and certified professional controllers in training (CPC-IT) and traffic). The data series are set equal to each other (or indexed) at a particular point in time (in this case, the year 2000, a high mark for traffic) and measured relative to that index point in each successive year. This way we know how much growth or decline has occurred compared to the base value.

Staffing to traffic not only applies on a daily basis, but also means that we staff to satisfy expected needs two to three years in advance. We do this to ensure sufficient training time for new hires. Despite the decline in air traffic shown in Figure 1.2, “staffing to traffic” requires us to anticipate controller attrition, so that we plan and hire new controllers in advance of need. This is one reason that staffing remains well ahead of traffic. The gap between the green line (Headcount) and the orange line (CPC and CPC-IT staffing) is the advance hire trainee pipeline and is projected to close significantly by 2022. The headcount and CPC+CPCIT lines converge due to reduced retirements and other losses.

Meeting the Challenge

The FAA's hiring plan is designed to phase in new hires as needed over time. This will avoid creating another major spike in retirement eligibility in future years like the one resulting from the 1981 controller strike. Annual retirements are leveling off and still well below those experienced in 2007 when the long-anticipated wave of retirements peaked. Retirements are expected to continue to fall for the next decade.

The FAA hires to address all attrition, not just retirements.

We revised the hiring plan to increase FY 2016 through FY 2018 hiring to near-capacity levels so that we can catch up from a variety of challenges. They include: a nearly year-long hiring freeze resulting from sequestration in 2013 and effects from an Office of Personnel Management (OPM) security breach, which shut down the automated ability to process clearances to applicants for approximately one month. The combined impact of these issues disrupted the hiring pipeline and set us back in our staffing plans.

Hiring, however, is just one part of the challenge. Other challenges involve controller placement, controller training and controller scheduling. It is important that newly hired and transferring controllers are properly placed in the facilities where we will need them. Once they are placed, they need to be effectively and efficiently trained, and assigned to efficient work schedules.

To address these challenges, the FAA has:

- Implemented changes to its air traffic control hiring process. In December 2015, the FAA launched an extended announcement to attract applicants with previous experience and we are working to revamp the Air Traffic Selection and Training (AT-SAT) Battery that will enhance our screening tools for future all sources announcements.
- Revamped its placement process for Air Traffic Controller trainees allowing increased flexibility for the agency and improved efficiency in both hiring and initial training of air traffic controllers.
- Introduced a new collaborative and centralized process to balance the controller ranks by revamping the employee requests for reassignments, matching employee requests with the agency's needs and establishing a national release policy aimed at expediting requests into facilities with the greatest staffing needs.

Effective and efficient training, as well as properly placing new and transferring controllers, are two important factors in the agency's success.

Systematically replacing air traffic controllers where we need them, as well as ensuring the knowledge transfer required to maintain a safe NAS, is the focus of this plan.

Chapter 2 | Facilities and Services

America's National Airspace System (NAS) is a network of people, procedures and equipment. Pilots, controllers, technicians, engineers, inspectors and supervisors work together to make sure millions of passengers move through the airspace safely every day.

More than 14,000 federal air traffic controllers in airport traffic control towers, terminal radar approach control facilities and air route traffic control centers guide pilots through the system. An additional 1,292 civilian contract controllers and more than 10,000 military controllers also provide air traffic services for the NAS.

These controllers provide air navigation services to aircraft in domestic airspace, in addition to 24.6 million square miles of international oceanic airspace delegated to the United States by the International Civil Aviation Organization.

TERMINAL AND EN ROUTE AIR TRAFFIC SERVICES

Controller teams in airport towers and radar approach control facilities watch over all aircraft traveling through the Terminal airspace. Their main responsibility is to organize the flow of aircraft into and out of an airport. Relying on visual observation and radar, they closely monitor each aircraft to ensure a safe distance between all aircraft and to guide pilots during takeoff and landing. In addition, controllers keep pilots informed about changes in weather conditions.

Once airborne, the aircraft quickly departs the Terminal airspace surrounding the airport. At this point, controllers in the radar approach control notify En Route controllers, who take charge in the vast airspace between airports. There are 21 air route traffic control centers around the country. Each En Route center is assigned a block of airspace containing many defined routes. Aircraft fly along these designated routes to reach their destination.

En Route controllers use surveillance methods to maintain a safe distance between aircraft. En Route controllers also provide weather advisory and traffic information to aircraft under their control. As an aircraft nears its destination, En Route controllers transition it to the Terminal environment, where Terminal controllers guide it to a safe landing.

FAA AIR TRAFFIC CONTROL FACILITIES

As of October 1, 2015, the FAA operated 316 air traffic control facilities. Table 2.1 lists the type and number of these FAA facilities. More than one type of facility may be collocated in the same building.

Each type of FAA facility has several classification levels based on numerous factors, including traffic volume, complexity and sustainability of traffic. To account for changes in traffic and the effect of investments that reduce complexity, as well as to compensate controllers that work the highest and most complex volume of traffic, facilities are monitored for downward and upward trends.

TABLE 2.1 TYPES AND NUMBER OF FAA AIR TRAFFIC CONTROL FACILITIES

TYPE	NAME	NUMBER OF FACILITIES	DESCRIPTION
1	Tower without Radar	1	An airport traffic control terminal that provides service using direct observation primarily to aircraft operating under visual flight rules (VFR). This terminal is located at airports where the principal user category is low-performance aircraft.
2	Terminal Radar Approach Control (TRACON)	24	An air traffic control terminal that provides radar-control service to aircraft arriving or departing the primary airport and adjacent airports, and to aircraft transiting the terminal's airspace.
3	Combination Radar Approach Control and Tower with Radar	130	An air traffic control terminal that provides radar-control service to aircraft arriving or departing the primary airport and adjacent airports, and to aircraft transiting the terminal's airspace. This terminal is divided into two functional areas: radar approach control positions and tower positions. These two areas are located within the same facility, or in close proximity to one another, and controllers rotate between both areas.
4	Combination Non-Radar Approach Control and Tower without Radar	2	An air traffic control terminal that provides air traffic control services for the airport at which the tower is located and without the use of radar, approach and departure control services to aircraft operating under Instrument Flight Rules (IFR) to and from one or more adjacent airports.
6	Combined Control Facility	4	An air traffic control facility that provides approach control services for one or more airports as well as en route air traffic control (center control) for a large area of airspace. Some may provide tower services along with approach control and en route services. Also includes Combined Center Radar Approach (CERAP) facilities.
7	Tower with Radar	130	An airport traffic control terminal that provides traffic advisories, spacing, sequencing and separation services to VFR and IFR aircraft operating in the vicinity of the airport, using a combination of radar and direct observations.
8	Air Route Traffic Control Center (ARTCC)	21	An air traffic control facility that provides air traffic control service to aircraft operating on IFR flight plans within controlled airspace and principally during the en route phase of flight. When equipment capabilities and controller workload permit, certain advisory/assistance services may be provided to VFR aircraft.
9	Combined TRACON Facility	3	An air traffic control terminal that provides radar approach control services for two or more large hub airports, as well as other satellite airports, where no single airport accounts for more than 60 percent of the total Combined TRACON facility's air traffic count. This terminal requires such a large number of radar control positions that it precludes the rotation of controllers through all positions.
-	Air Traffic Control System Command Center	1	The Air Traffic Control System Command Center is responsible for the strategic aspects of the NAS. The Command Center modifies traffic flow and rates when congestion, weather, equipment outages, runway closures or other operational conditions affect the NAS.
	TOTAL	**316**	

Chapter 3 | Staffing Requirements

The FAA issued the first comprehensive controller workforce plan in December 2004. "A Plan for the Future: 10-Year Strategy for the Air Traffic Control Workforce" detailed the resources needed to keep the controller workforce sufficiently staffed. This report is updated each year to reflect changes in traffic forecasts, retirements and other factors.

"Staffing to traffic" requires the FAA to consider many facility-specific factors. They include traffic volumes based on FAA forecasts and hours of operation, as well as individualized forecasts of controller retirements and other non-retirement losses. In addition, staffing at each location can be affected by unique facility requirements such as temporary airport runway construction, seasonal activity and the number of controllers currently in training. Staffing numbers will vary as the requirements of the location dictate.

Proper staffing levels also depend on the efficient scheduling of employees, so the FAA tracks a number of indicators as part of its continuous staffing review. Some of these indicators are overtime, time on position, leave usage and the number of trainees. Time on position is defined as the amount of cumulative time controllers spend while "plugged in" to their position controlling live traffic. When not on position, controllers are on periodic breaks, in training, or performing other assigned duties.

In FY 2015, the system average for overtime was 2.6 percent, a slight increase from the FY 2014 level. Meanwhile, cumulative average time on position per 8 hour shift was 4 hours and 6 minutes, a four-minute reduction from FY 2014.

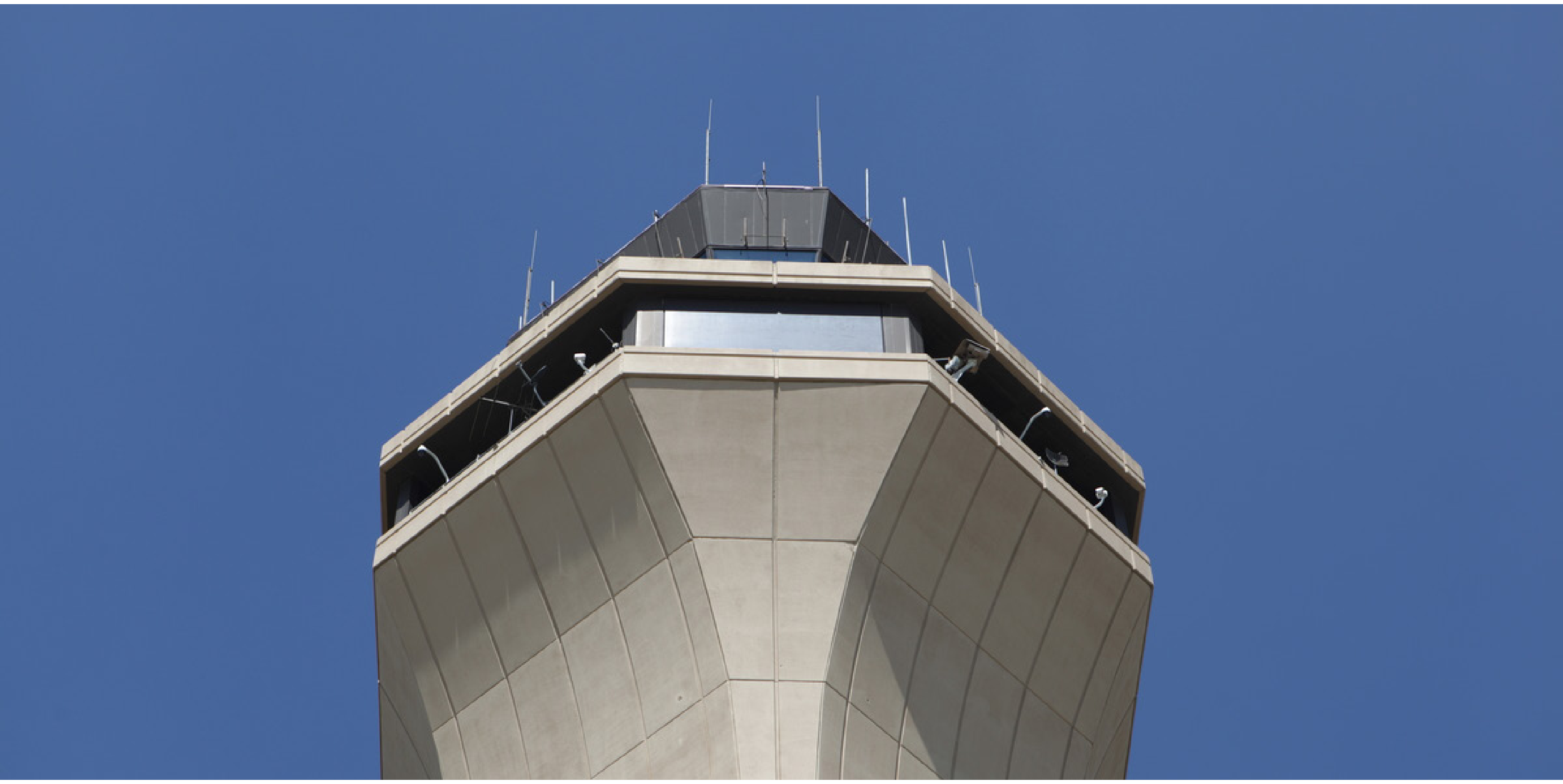
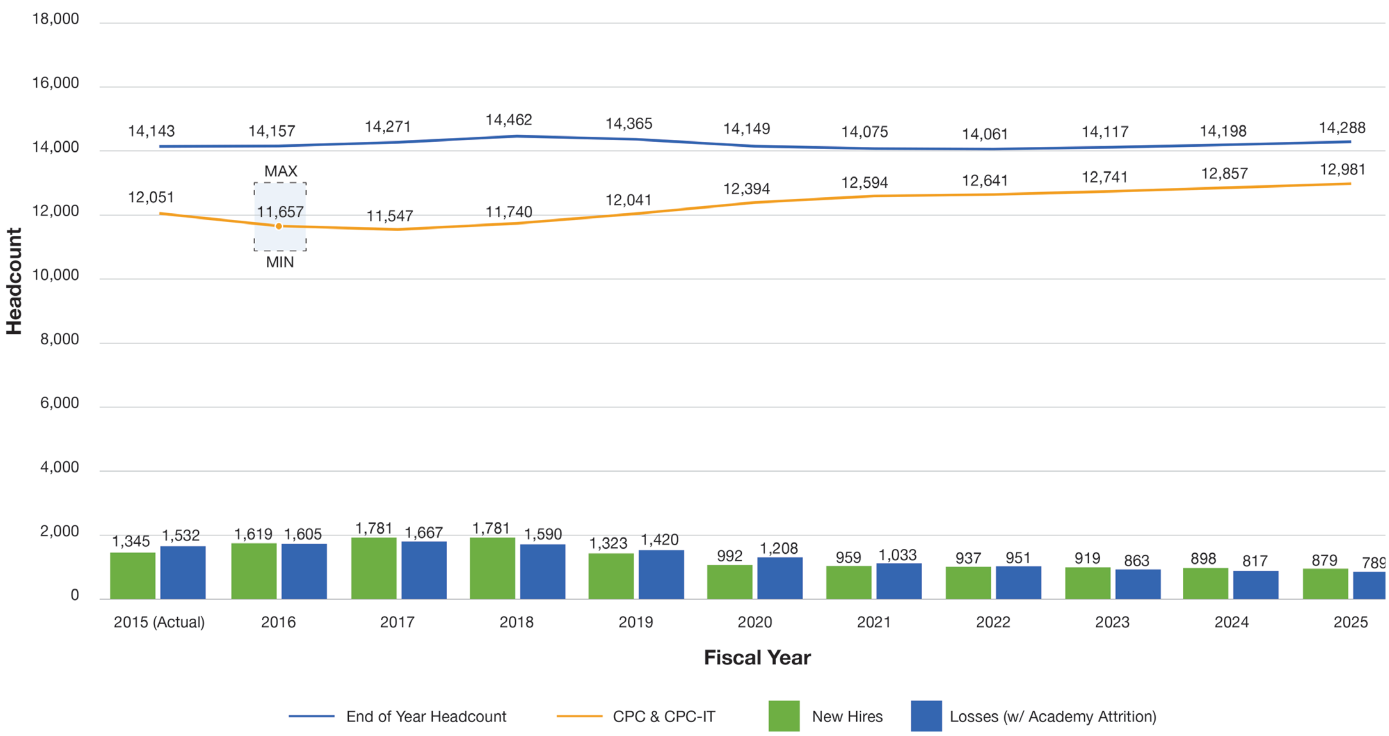


Figure 3.1 shows the expected end-of-year total headcount (blue line), CPC & CPC-IT headcount (orange line), new hires and losses (small bars) by year through FY 2025.

Figures for FY 2015 represent actual end-of-year headcount, losses and hires. Losses include retirements, promotions and transfers, resignations, removals, deaths, developmental attrition and academy attrition. Due to several challenges, the FAA ended ended FY 2015 more than 500 controllers below the FY 2015 headcount plan.

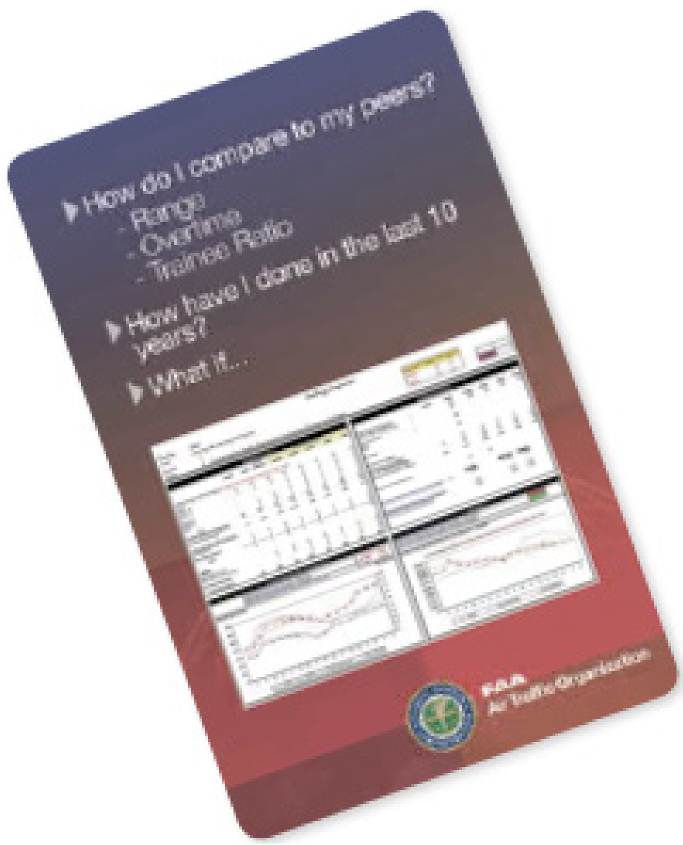
In general, the FAA strives to keep the number of CPCs and CPC-ITs near the middle of the calculated staffing range. Figure 3.1 shows that FY 2016 staffing values are within the calculated staffing range shown by the "min" and "max" bars. However, a facility's total staffing levels are often above the defined staffing range because new controllers are typically hired two to three years in advance of expected attrition to allow for sufficient training time. The total expected end-of-year staffing number shown in Figure 3.1 reflects this projected advanced hiring.

FIGURE 3.1 PROJECTED CONTROLLER TRENDS



The FAA hires and staffs facilities so that trainees are fully prepared to take over responsibilities when senior controllers retire.

The FAA uses many metrics to manage its facilities.



Staffing Ranges

Each of the FAA's 316 facilities typically staffs open positions with a combination of certified controllers who are proficient, or checked out, in specific sectors or positions. Because traffic and other factors are dynamic at these facilities, the FAA produces facility-level controller staffing ranges. These ranges are calculated to ensure that there are enough controllers to cover operating positions every day of the year.

Ensuring that we have enough controllers is not only important on a daily basis, but also means that we staff to satisfy expected needs two to three years in advance. We do this to ensure sufficient training time for new hires. The uptick caused by hiring two to three years ahead of time is one reason that staffing remains well ahead of traffic.

The FAA uses four data sources to calculate staffing ranges. Three are data driven; the other is based on field judgment. They are:

1. Staffing standards – output of mathematical models used to relate controller workload to air traffic activity.

2. Service unit input – the number of controllers required to staff the facility, typically based on past position utilization and other unique facility operational requirements. The service unit input is provided by field management.

3. Past productivity – the headcount required to match the historical best productivity for the facility. Productivity is defined as operations per controller. Facility productivity is calculated using operations and controller data from the 10 year period of 2006 to 2015. If any annual point falls outside +/- 5 percent of the 2006 to 2015 average, it is eliminated from the analysis. From the remaining data points, the highest productivity year is then used.

4. Peer productivity – the headcount required to match peer group productivity. Like facilities are grouped by type, level and part-time or full-time status, and their corresponding productivity is calculated. If the facility being considered is consistently above or below the peer group, the peer group figure is not used in the overall average and analysis.

The average of this data is calculated, multiplied by +/- 10 percent and then rounded to determine the high and low points in the staffing range.

Exceptional situations or outliers are removed from the averages (for example, if a change in the type or level of a facility occurred over the period of evaluation). By analyzing the remaining data points, staffing ranges are generated for each facility.

The 2016 staffing ranges for controllers are published by facility in the Appendix of this report. In general, the FAA strives to keep the number of CPCs and CPC-ITs near the middle of the range. In many facilities, the current Actual on Board (AOB) number may appropriately exceed the range. This is because many facilities' current AOB (all controllers at the facility) numbers include larger numbers of developmental controllers in training to offset expected future attrition. Individual facilities can be above the range due to advance hiring. Facilities may also be above the range based upon facility-specific training and attrition forecasts.

In the longer term, the number of new hires and total controllers will decline. This is because the surge of developmental controllers that were hired to replace the long-expected retirement wave over the past decade will have become CPCs. In the future, the vast majority of the controllers will be CPCs and CPC-ITs, and more facilities will routinely fall within the ranges.

FIGURE 3.2 CONTROLLER STAFFING

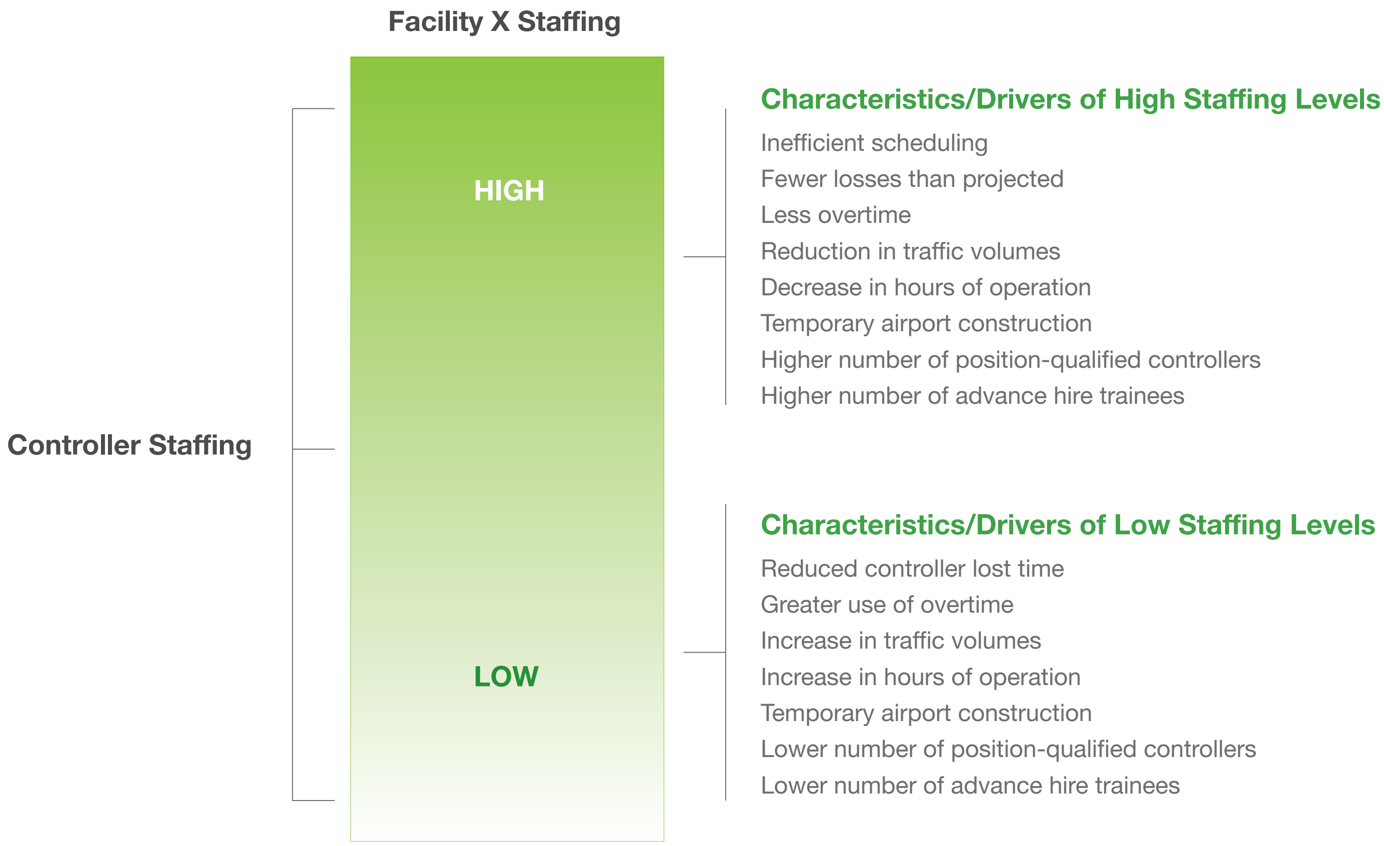
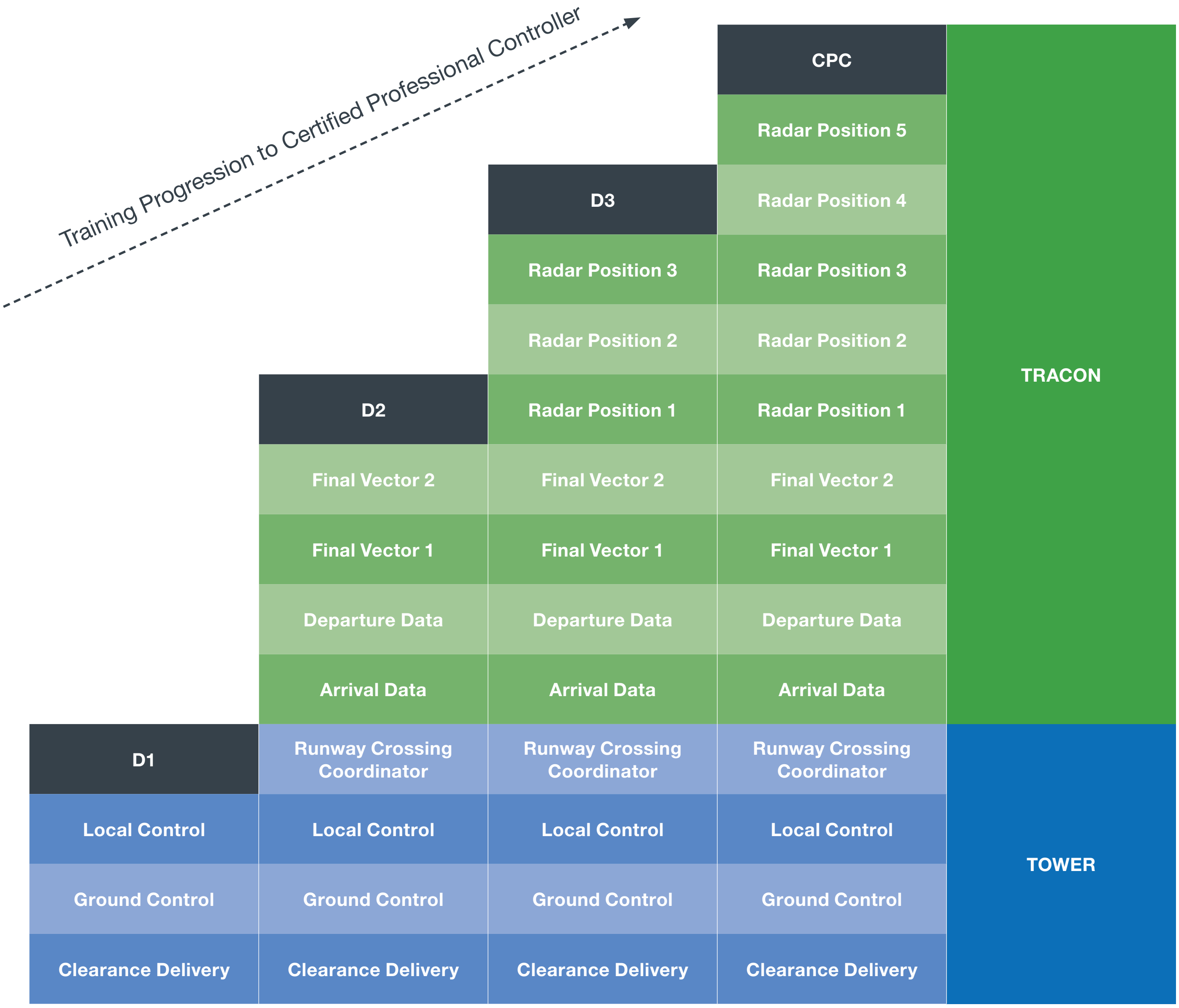


Figure 3.3 depicts an example of a large, Type 3 FAA facility. This Combination Radar Approach Control and Tower with Radar facility is one in which controllers work in the tower cab portion and in the radar room (also known as a TRACON). To be a CPC in these types of facilities, controllers must be checked out on all positions in both the tower and the TRACON.

Trainees are awarded "D1" status (and the corresponding increase in pay) after being checked out on several positions. The levels of responsibility (and pay) gradually increase as the trainees progress through training. Once developmental controllers are checked out at the D1 level, they can work several positions in the tower independently and without training supervision (Clearance Delivery, Ground Control and Local Control). Once checked out on the Runway Crossing Coordinator position, developmental controllers would be tower certified and able to work any position in the tower cab independently and without training supervision. They would still not be a "D2" however, as there are also several positions in the TRACON to be checked out on (Arrival Data, Departure Data, Final Vector 1 and Final Vector 2). A controller in Figure 3.3 must be certified on all positions in the tower and TRACON to become a CPC.

FIGURE 3.3 CONTROLLER TRAINING PROGRESSION



The levels of responsibility continue to increase as one progresses toward CPC status, but trainees can and do control traffic much earlier in the training process. Historically, the FAA has used these position-qualified controllers to staff operations and free up CPCs for more complex positions as well as to conduct training.

Having the majority of the workforce certified as CPCs makes the job of scheduling much easier at the facility. CPCs can cover all positions in their assigned area, whereas position-qualified developmentals require the manager to track who is qualified to work which positions independently. This task becomes much easier with a scheduling tool.

Trainees include both developmental controllers and certified professional controllers in training (CPC-IT). A CPC-IT is a controller who moves to another area within a facility or to a new facility and must be trained to the qualifications of that new environment. CPC-ITs are different from developmentals in that developmentals have never been fully checked out and certified as a CPC anywhere.

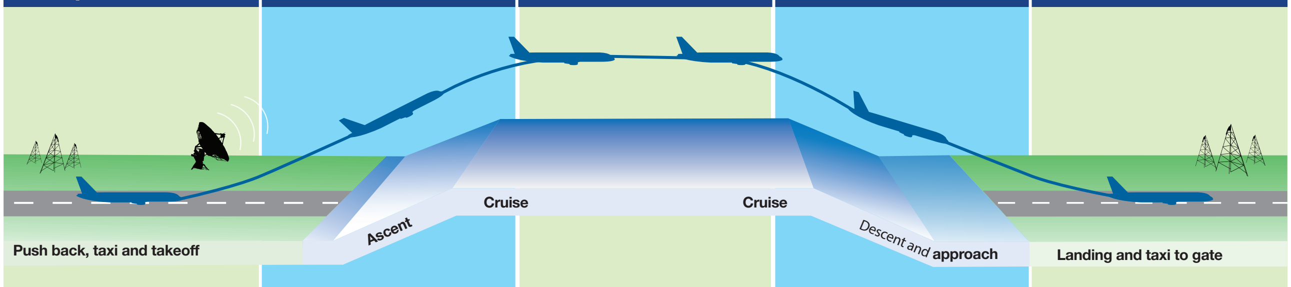
Air Traffic Staffing Standards Overview

The FAA has used air traffic staffing standards to help determine controller staffing levels since the 1970s.

FAA facilities are currently identified and managed as either Terminal facilities where airport traffic control services are provided, including the immediate airspace around an airport, or En Route facilities where high-altitude separation services are provided using computer systems and surveillance technologies. Terminal facilities are further designated as tower cabs or TRACONs. These Terminal facilities may be collocated in the same building, but because of differences in workload, their staffing requirements are modeled separately. Figure 3.4 provides an overview of FAA facilities and air traffic control positions.

FIGURE 3.4 AIR TRAFFIC CONTROL POSITION AND FACILITY OVERVIEW

Airport Surface	Terminal Departure	En Route/Oceanic	Terminal Arrival	Airport Surface



Airport Surface	Terminal Departure	En Route/Oceanic	Terminal Arrival	Airport Surface
Airport Traffic Control Tower (ATCT)	**Terminal Radar Approach Control (TRACON)**	**Air Route Traffic Control Center (ARTCC)**	**Terminal Radar Approach Control (TRACON)**	**Airport Traffic Control Tower (ATCT)**
Ground Controller Issues approval for push back from gate and issues taxi instructions and clearances. **Local Controller** Issues takeoff clearances, maintains prescribed separation between departure aircraft, provides departure aircraft with latest weather/field conditions. **Clearance Delivery** Issues IFR and VFR flight plan clearanc-es. **Flight Data** Receives and relays weather information and Notice to Airmen.	**Departure Controller** Assigns headings and altitudes to departure aircraft. Hands off aircraft to the En Route Radar Controller. **Flight Data - Radar** Issues IFR flight plan clearances to aircraft at satellite airports, coordinates releases of satellite depar-tures.	**Radar Controller** Ensures the safe separation and orderly flow of aircraft through En Route center airspace (includes oceanic airspace). **Radar Associate** Assists the Radar Controller. **Radar Associate** (Flight Data) Supports the Center Radar Controller by handling flight data.	**Arrival Controller** Assigns headings and altitudes to arrival aircraft to establish aircraft on final approach course.	**Local Controller** Issues landing clearances, maintains prescribed separation between arrivals, provides arrival aircraft with latest weather/field conditions. **Ground Controller** Issues taxi instructions and clearances to guide aircraft to the gate.

The dynamic nature of air traffic controller workload coupled with traffic volume and facility staffing needs are all taken into account during the development of FAA staffing models and standards.

All FAA staffing models incorporate similar elements:

- Controller activity data is collected and processed quarterly, commensurate with the type of work being performed in the facilities.
- Models are developed that relate controller workload to air traffic activity. These requirements are entered into a scheduling algorithm.
- The modeled workload/traffic activity relationship is forecast for the 90th percentile (or 37th busiest) day for future years for each facility. Staffing based on the demands for the 90th percentile day assures that there are adequate numbers of controllers to meet traffic demands throughout the year.
- Allowances are applied for off-position activities such as vacation, training and additional supporting activities that must be accomplished off the control floor.

All staffing models go through similar development processes. Some components of the model-development phase vary as a function of the work being performed by the controllers. For example, a crew-based approach was used to model tower staffing requirements because the number and type of positions in a tower cab vary considerably as traffic changes, compared to those of a single sector in a TRACON or En Route center. All staffing models reflect the dynamic nature of staffing and traffic. Controller staffing requirements can vary throughout the day and throughout the year.

Tower Cab Overview

Air traffic controllers working in tower cabs manage traffic within a radius of a few miles of the airport. They instruct pilots during taxiing, takeoff and landing, and they grant clearance for aircraft to fly. Tower controllers ensure that aircraft maintain minimum separation distances between landing and departing aircraft, transfer control of aircraft to TRACON controllers when the aircraft leave their airspace, and receive control of aircraft for flights coming into their airspace.

- There are a variety of positions in the tower cab, such as Local Control, Ground Control, Flight Data, Coordinator, etc. Depending on the airport layout and/or size of the tower cabs (some airports have more than one tower), there can be more than one of the same types of position on duty.
- As traffic, workload and complexity increase, more or different positions are opened; as traffic, workload and complexity decrease, positions are closed or combined with other positions. In practice, minimum staffing levels may be determined by hours of operation and work rules.

Important factors that surfaced during the tower staffing model development included the availability, accessibility and increased reliability of traffic data and controller on-position reporting systems. The FAA is now able to analyze much larger quantities of tower data at a level of granularity previously unattainable. Staffing data and traffic volumes are collected for every facility.

The revised tower cab staffing models were developed using regression analysis as the primary method for modeling the relationship between staffing and workload drivers. The models relate observed, on-position controllers to the type and amount of traffic they actually handle. Regression analysis allows us to relate modeled controller staffing requirements with traffic activity and then use this relationship to predict future staffing requirements (standards) based on traffic projections.

TRACON Overview

Air traffic controllers working in TRACONs typically manage traffic within a 40-mile radius of the primary airport; however, this radius varies by facility. They instruct departing and arriving flights, and they grant clearance for aircraft to fly through the TRACON's airspace. TRACON controllers ensure that aircraft maintain minimum separation distances between landing and departing aircraft, transfer control of aircraft to tower or En Route center controllers when the aircraft leave their airspace, and receive control of aircraft for flights coming into their airspace.

- TRACON airspace is divided into sectors that often provide services to multiple airports. Consolidated or large TRACONs in major metropolitan areas provide service to several primary airports. Their airspace is divided into areas of specialization, each of which contains groups of sectors.
- Controllers are assigned to various positions such as Radar, Final Vector, Departure Data, etc., to work traffic within each sector. These positions may be combined or de-combined based on changes in air traffic operations.
- As traffic, workload and complexity increase, the sectors may be subdivided (de-combined) and additional positions opened, or the sector sizes can be maintained with an additional controller assigned to an assistant position within the same sector.
- Similarly, when traffic, workload and complexity decline, the additional positions can be closed or the sectors recombined. In practice, minimum staffing levels may be determined by hours of operation and work rules.

Like the tower analysis, the FAA is able to analyze much larger quantities of TRACON data at a level of granularity previously unattainable. Important factors surfaced during the TRACON staffing model review including the availability, accessibility and increased reliability of traffic data and controller on-position reporting systems. Staffing data and traffic volumes were collected for every facility.

The TRACON staffing models were updated in early 2009. These revised TRACON models were developed using regression analysis as the primary method for modeling the relationship between staffing and workload drivers. The models relate observed, on-position controllers to the type and amount of traffic they actually handled. Regression allows us to relate modeled controller staffing requirements with traffic activity and then use this relationship to predict future staffing requirements (standards) based on traffic projections.

En Route Overview

Air traffic controllers assigned to En Route centers guide aircrafts flying outside of Terminal airspace. They also provide approach control services to small airports around the country where no Terminal service is provided. As aircraft fly across the country, pilots talk to controllers in successive En Route centers.

- En Route center airspace is divided into smaller, more manageable blocks of airspace called areas and sectors.
- Areas are distinct, and rarely change based on changes in traffic. Within those areas, sectors may be combined or de-combined based on changes in air traffic operations.
- Controllers are assigned to positions within the sectors (e.g., Radar, Radar Associate, Tracker). As traffic increases, sectors can be de-combined and additional positions opened, or the sector sizes can be maintained but additional controllers added to assistant positions within the sectors.
- Similarly, when traffic declines, the additional positions can be closed or the sectors recombined. In practice, minimum staffing levels may be determined by hours of operation and work rules.

The FAA's Federally Funded Research and Development Center, operated by the MITRE Corporation, developed a model to generate data needed for the FAA's staffing models. Like the tower and TRACON standards models, this approach incorporated actual traffic and more facility-specific data.

MITRE's modeling approach reflects the dynamic nature of the traffic characteristics in a sector. It estimates the number of controllers, in teams of one to three people, necessary to work the traffic for that sector in 15-minute intervals. Differences in traffic characteristics in a sector could require different numbers of controllers to handle the same volume of traffic. For example, at one time most traffic might be cruising through a sector toward another location requiring minimal controller intervention. At another time, traffic might be climbing and descending through the same sector, a more complex scenario requiring more controllers. The same modeling techniques were applied uniformly to all sectors, providing results based on a common methodology across the country.

During fiscal years 2013 and 2014, MITRE collaborated with the FAA and the National Air Traffic Controllers Association (NATCA) to conduct an evaluation of the En Route on position staffing model at the request of the National Academy of Sciences to validate its core assumptions and parameters via empirical data collection. The evaluation, completed in the field and in a controlled laboratory setting, established values for model parameters, identified additional controller tasks for coverage by the model, and informed other enhancements to the model. In FY 2015, these updates were made and the on position staffing model was recalibrated. The evaluation results were shared with the FAA, NATCA and the National Academy of Sciences. The next step is to incorporate them into the on position staffing model for future staffing standards calculations.

Summary

The FAA's staffing models incorporate output provided by the Tower, TRACON and En Route workload models which is run through a shift scheduling algorithm. Next, factors are applied to cover vacation time, break time, training, etc. Lastly, traffic growth forecasts are applied to provide the annual staffing standards that are incorporated into the staffing ranges presented in this plan for each facility.

Air Traffic Staffing Standards Review

For more than 50 years, the FAA has developed and applied staffing standard models to help establish staffing requirements for its air traffic control (ATC) facilities. Over this period, independent groups, including the Transportation Research Board (TRB), have scrutinized the data sources and methods used by the FAA. A 1997 report, for example, recommended an approach that combines formal modeled predictions with less formal methods based on expert judgment concerning staffing requirements at individual facilities (TRB 1997). That report noted that controller workforce planning is not a one-size-fits-all problem and observed that national planning needs to recognize features specific to individual ATC facilities. A more recent report reviewed the task load "complexity model" used in generating staffing standards for En Route facilities and offered advice on "ways to improve the modeling process going forward" (TRB 2010, 6).

In July 2014, the National Academy of Sciences completed its latest review of FAA staffing standards. The study committee consisted of academicians, consultants and a current NATCA controller as well as retired air traffic controllers. Overall, the committee found FAA's staffing standards for terminal ATC facilities to be reasonable for use in developing initial estimates of the number of controllers needed for managing traffic at each facility. However, it had concerns about the validity of the mathematical model used for En Route facilities and the resulting estimates of controller staffing needs. They also "felt the steps taken by FAA to create a controller staffing plan from the staffing standards and then execute such plan were obscure. As a result, the committee was unable to determine the extent to which FAA staffing imbalances are being corrected over time to help ensure cost-effective staffing."

In 2015, the FAA met with the National Academy of Sciences and NATCA to collaborate on controller staffing model review and validation. These meetings also provided an opportunity to review the July 2014 NAS report findings and recommendations, and to develop a path forward. The FAA is currently using this collaborative path forward by continuing to consult with the National Academy and NATCA regarding controller staffing models, scheduling practices, and the execution of hiring plans.

Air Traffic Controller Scheduling

Optimizing controller schedules is a critical aspect of efficient workforce planning, since inefficient facility schedules can lead to excess staffing and/or increased overtime. Currently, the FAA's air traffic facilities do not have access to a standardized, automated tool to assist them in developing optimal schedules and analyzing long-term workforce planning requirements. FAA facilities currently use a variety of non-standard methods that do not fully incorporate the complex resource management requirements that exist in today's environment.

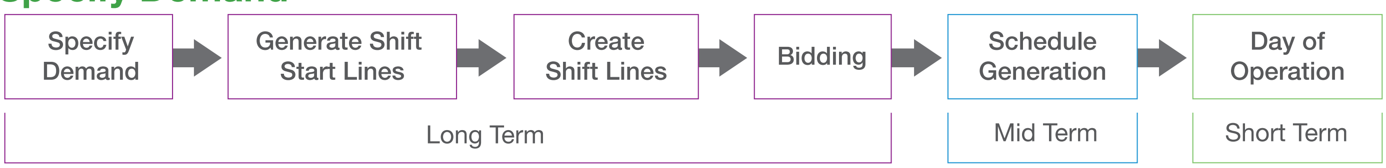
To address this need, the FAA has procured a widely used, commercially available "off-the-shelf" system that has been configured to FAA-specific requirements (e.g. national labor contract terms, FAA policy). The FAA's Operational Planning and Scheduling (OPAS) tool can provide a common toolset for FAA facilities to effectively develop and maintain optimal schedules based on traffic, staffing, work rules and employee qualifications. Similar systems are being used by air navigation service providers worldwide and are commonplace in best-practice companies.

More specifically, the FAA envisions the system can be used to create and analyze optimized schedules over variable time frames, with viewing capability in days, weeks, months, seasons and years. The system is able to:

- Generate optimal schedules for a given period (day, pay period, month and year) based on demand, business rule constraints, employee qualification requirements and available resources.
- Calculate optimal shift start times and associated demand in support of national and local bargaining.
- Propose various shifts in the most efficient way to cover demand while abiding by business and contractual rules.
- Calculate projected time on position (signed on and controlling traffic) to staff an area by shift, schedule segment and/or person.
- Run what-if analyses.
- Aid in the assignment of efficiently scheduled overtime.
- Automate shift requests, bid process and other scheduling-related tasks.

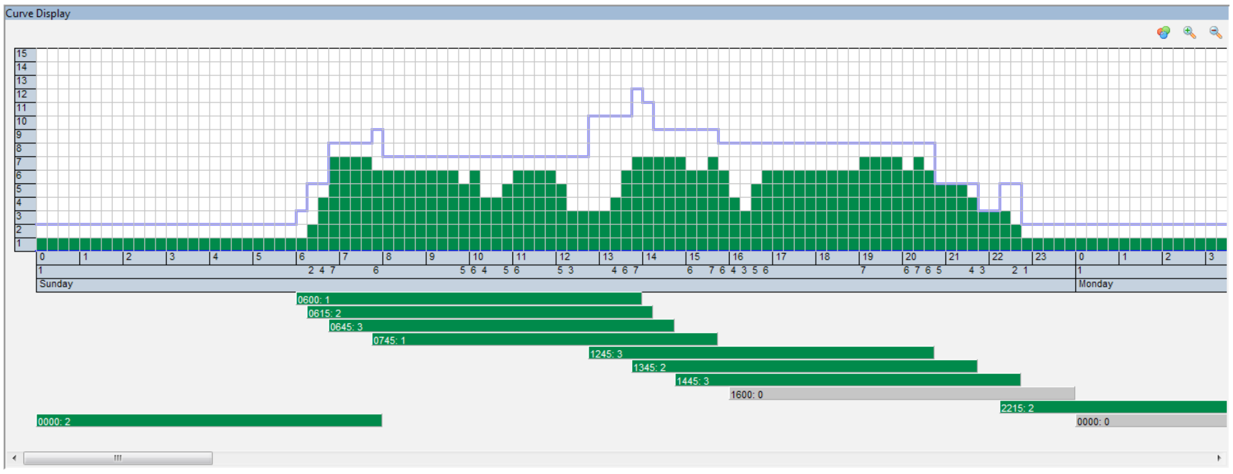
The major functionalities in the OPAS application are split into long-term (typically annually), mid-term (generating schedules), and short-term (day of operations). A typical workflow is shown below:

Specify Demand



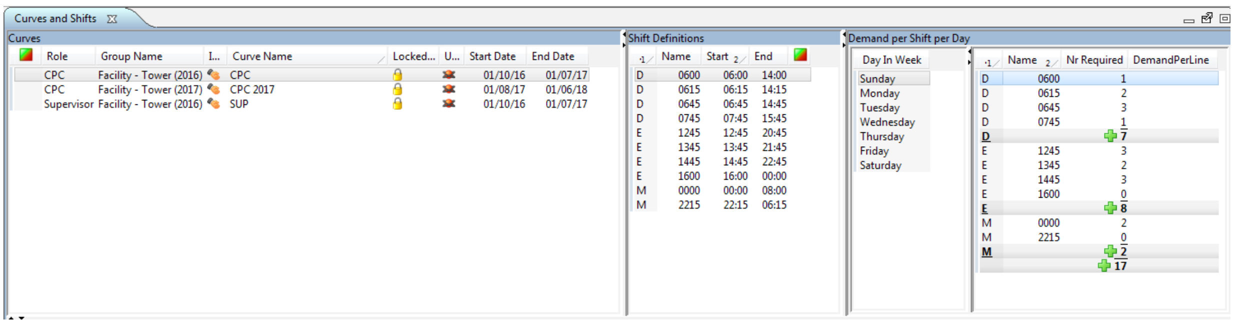
OPAS determines the minimum number of controllers required to manage traffic based on an inputted demand curve. The demand curve gives the raw staffing required per 15-minute interval in a series of one-week periods. The number of different curves used can vary from one to 52 one-week curves. For example, one demand curve may describe the period from January to February and another the period from February to May, etc. If the summer is a particularly busy time, two separate demand curves can be used (one for the summer and one for the winter). The number of demand curves used in the field is determined after a statistical analysis and consultation with the facility.

OPAS uses a mathematical algorithm to minimize the number of controllers needed to satisfy these demand periods. The first optimizer defines the shift start times and the demand associated with each shift on a daily basis. This minimum demand number helps the facility determine whether it is possible to approve leave, or whether someone needs to be moved from an evening shift to a day shift to adequately cover the traffic demand.



The previous diagram shows how OPAS uses the 15-minute demand (green blocks) to create the required shifts in the lower part of the diagram.

OPAS allows for a different demand curve for different roles (e.g., controller versus supervisor), thus allowing for optimal schedules to be made for all positions in a facility. The blue line above the green blocks shows how the staffing per shift generated by OPAS more than adequately covers the inputted green demand curve.



In the above diagram, the left pane gives the category, names, and start and end times for the optimal shifts. There are three core shifts (for the day shift, evening shift and midnight shift) and three ancillary shifts per shift category. The last two panes give the demand per shift per day. In this example, since “Sunday” is selected, the last pane gives the minimum demand per shift on Sunday.

Manage a Schedule/Day of Operation Views

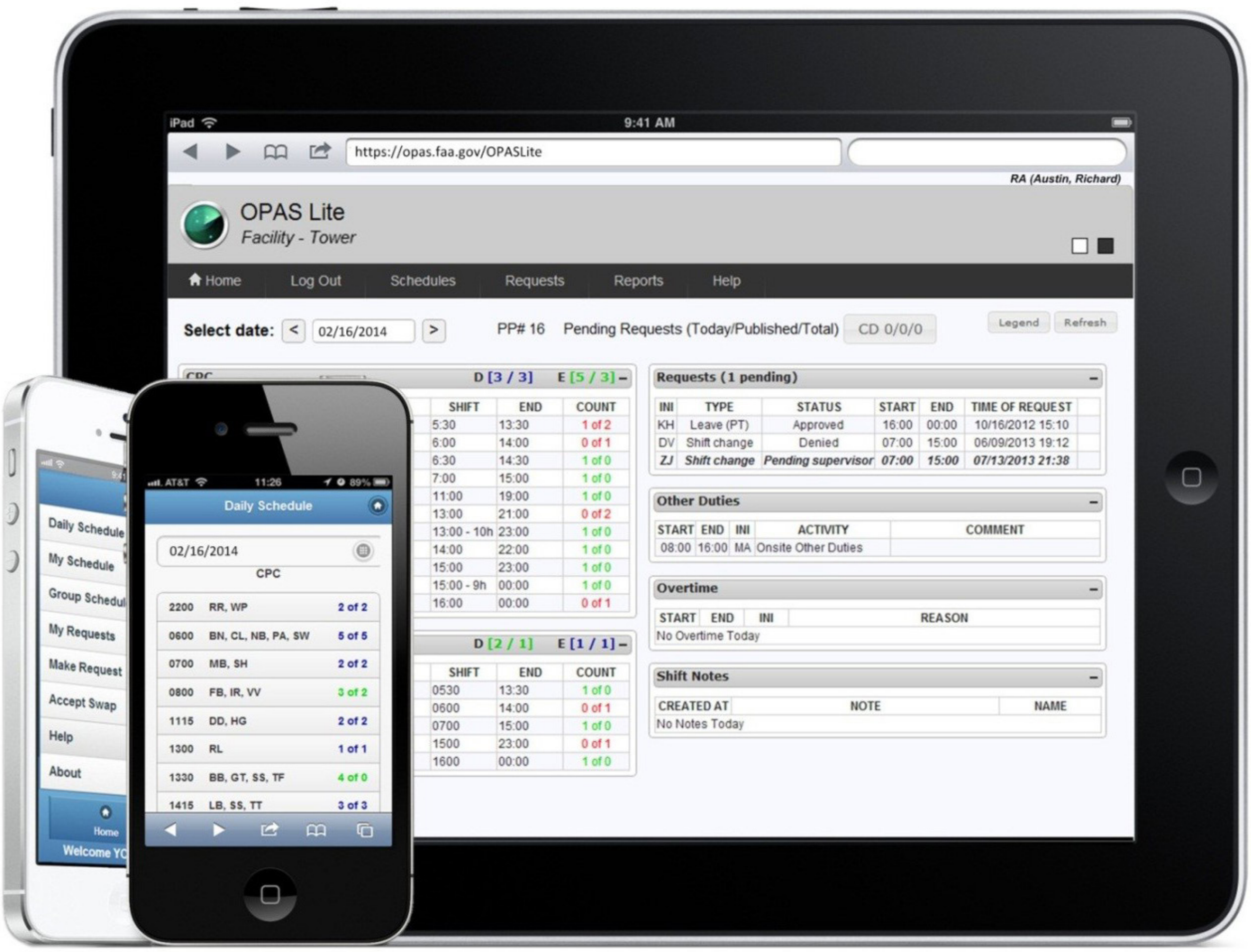
Other views drill down to show the details of a single day. They allow the user to get a quick overview of what is happening on a given day, including leave, overtime, briefing periods and other duties (like training or special assignments). These views are updated in real time for all viewers as employees enter requests, and changes are made to the schedule.

The views can also address questions such as:

- “Who is scheduled to work today and when?”
- “Who is scheduled to work overtime?”
- “Who has a leave request for today, pending or approved?”

OPAS Lite

OPAS Lite is a mobile Web application developed to provide access to many of the major functions within OPAS. It is accessible on modern browsers and devices such as smartphones and tablets. OPAS Lite allows users to view and interact with their schedule anywhere, anytime. Functionality in OPAS Lite also includes a desktop kiosk (view-only mode), quick changing of kiosk users, viewing schedules, submitting requests and proxy requests, and viewing and acting on requests.



Air Traffic Scheduling Software Review

The National Academy of Sciences listed in its 2014 report the following potential benefits of sophisticated scheduling software. The software:

- Provides a consistent basis for establishing work schedules that minimize or mitigate the safety risks associated with controller fatigue.
- Ensures that diverse facilities are all capable of generating efficient schedules, particularly at larger facilities where economies of scale may be possible.
- Provides a consistent basis for informing the development of staffing standards at FAA headquarters and the creation of work schedules at the facility level.

The report further stated, "Schedule changes significantly affect the controller workforce. FAA should, as a matter of priority, continue its efforts to develop an improved scheduling tool capable of creating efficient controller work schedules that incorporate fatigue mitigation strategies. The agency should collaborate closely with the National Air Traffic Controllers Association in implementing this improved scheduling capability, notably in adopting schedules that reflect science-based strategies for managing the risks associated with controller fatigue."

> Air Navigation Service Providers "in other countries including Australia, Canada, and Germany have replaced their legacy scheduling tools with sophisticated software capable of incorporating all constraints while generating efficient controller schedules." – National Academy of Sciences

Technological Advances

In 2015, the FAA made significant progress toward completing the foundational phase of the Next Generation Air Transportation System (NextGen).

Although there are many NextGen technologies, and foundational systems, in various stages of implementation, such as Terminal Automation Modernization and Replacement (TAMR), Automatic Dependent Surveillance-Broadcast (ADS-B), the NAS voice system, and Time Based Flow Management (TBFM), it is En Route Automation Modernization (ERAM) and Data Communications (Data Comm) that will have the most impact on air traffic controller productivity in the near term.

In early 2015, the FAA completed ERAM, arguably the most complex technology replacement program in the agency's history. The last of 20 planned ERAM sites achieved operational readiness, which signified the full commissioning of ERAM into the National Airspace System (NAS) and enabled the FAA to begin decommissioning the legacy HOST system.

With ERAM, radar coverage extends beyond facility boundaries, enabling controllers to handle additional traffic more efficiently. ERAM processes data from up to 64 radars instead of the legacy prior system's 24. ERAM enables a single air traffic control center to track up to 1,900 aircraft at a time, compared to HOST, which could track 1,100 aircraft.

Controllers can share and coordinate more seamlessly between centers, making increased use of 3-nautical-mile aircraft separation in more parts of the airspace – reduced from 5 nautical-miles. ERAM improves flight-plan processing by allowing automatic — rather than manual — handoffs when a flight is diverted, improving efficiency during bad weather and congestion.

ERAM gives controllers the ability to customize what they see. A controller can turn all of the airplanes in one sector to a single color on the display, such as blue, to distinguish them from other aircraft in nearby airspace.

Data Comm is a key transformational program in the NextGen portfolio that provides a digital data mode of communication between air traffic controllers and pilots. It enables controllers to send routine instructions, such as revised departure clearances and weather-avoiding reroutes, directly to the flight deck with the push of a button. Data Comm reduces the communication time between controllers and pilots, decreasing the potential for errors in voice communication while enabling controllers to handle more traffic.

Data Comm service is now operational at 10 airport towers: Salt Lake City, New Orleans, Austin, San Antonio, Indianapolis, Louisville, John F. Kennedy, Newark, Houston Hobby and Houston Bush. The program is 13 months ahead of schedule. While the program is required to deliver the system to more than 50 towers by 2019, the FAA has challenged itself to complete the waterfall by the end of this year.

In early fiscal year 2015, the FAA made the final investment decision and defined the technical scope, cost and schedule for Data Comm for initial En Route services.

The Terminal Automation Modernization and Replacement (TAMR) program upgrades multiple air traffic control technologies to a single, state-of-the-art platform: the Standard Terminal Automation Replacement System (STARS). STARS is a foundational NextGen technology that enables ADS-B and other NextGen programs, giving air traffic controllers a more complete airspace picture. Under TAMR, the FAA is upgrading air traffic control technology at the 54 sites where STARS is already operational, while older automation platforms are being replaced with STARS at 108 additional facilities.

ADS-B, which is mandated by January 1, 2020 for aircraft operating in most controlled U.S. airspace, has been integrated into automation platforms at all En Route air traffic control facilities and major terminal radar facilities, adding additional facilities with each new introduction of STARS. As of November 2015, more than 14,000 general aviation aircraft and 535 commercial aircraft have been equipped with ADS-B avionics. The FAA also completed the nationwide deployment of ADS-B ground stations in 2014, and ADS-B traffic and weather broadcasts are now available nationwide.

As part of the NextGen Advisory Committee (NAC) prioritization effort, the FAA agreed to concentrate on four NextGen priorities: increasing the use of Performance Based (satellite-based) Navigation, making multiple runway operations more efficient, improving surface operations and data sharing, and implementing Data Communications.

Increased productivity and efficiency, and their ultimate impact on the size and composition of the FAA's workforce, depend on many factors. The scope and precise impact of NextGen enhancements are still under development.

Over time, the relationship between pilots and air traffic controllers will evolve. The relationship between controller and automated systems will similarly evolve. These evolutions will occur gradually and require much testing and analysis to ensure the safety of the system.

Chapter 4 | Losses

In total, the FAA expects to lose over 1,600 controllers due to retirements, promotions and other losses this fiscal year. Other controller losses include transfers, resignations, removals, deaths, developmental attrition and academy attrition.

The FAA hires and staffs facilities so that trainees are fully prepared to take over responsibilities when senior controllers leave.

Controller Loss Summary

Table 4.1 shows the total estimated number of controllers that will be lost, by category, over the period FY 2016 through FY 2025.

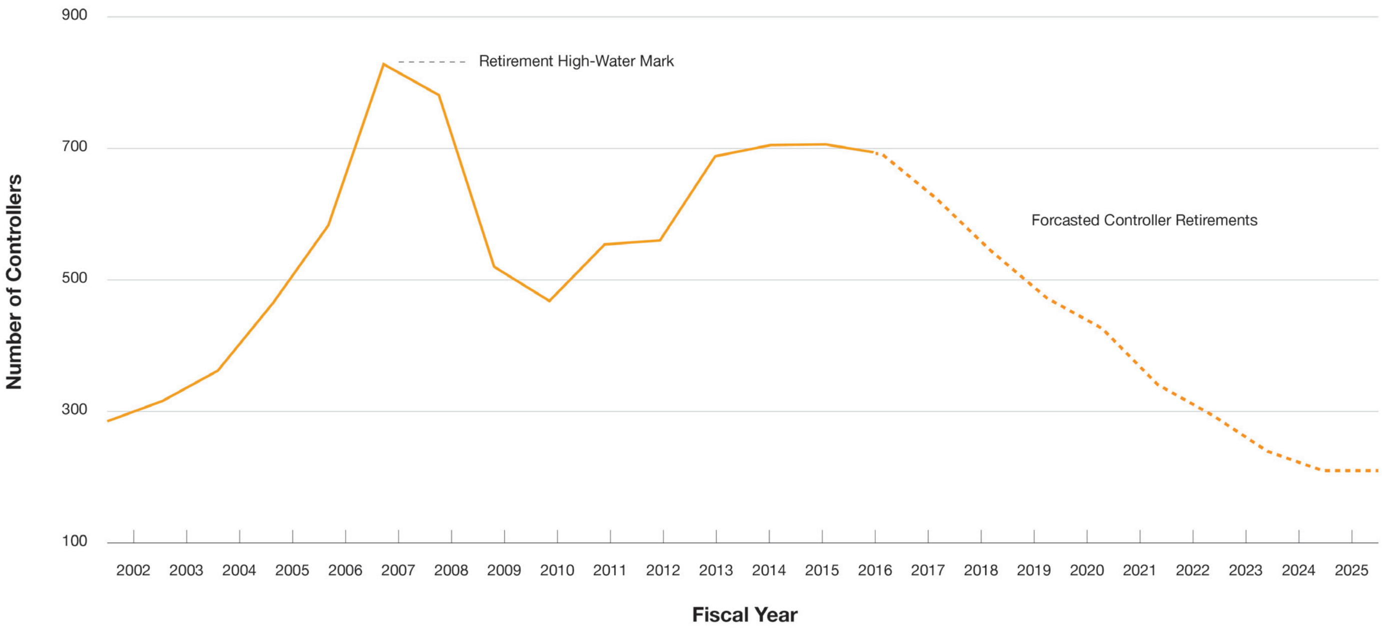
TABLE 4.1 CONTROLLER LOSS SUMMARY

LOSS CATEGORY	LOSSES: 2016 - 2025
Retirements	4,050
Resignations, Removals and Deaths	493
Developmental Attrition	1,590
Academy Attrition	3,101
Promotions/Transfers	2,709
TOTAL	**11,943**

Actual Controller Retirements

Fiscal year 2007 was correctly projected to be a peak year for retirements of controllers hired in the early 1980s. The long-anticipated retirement wave has passed, and annual retirements are expected to decline for the next ten years.

FIGURE 4.1 ACTUAL CONTROLLER RETIREMENTS

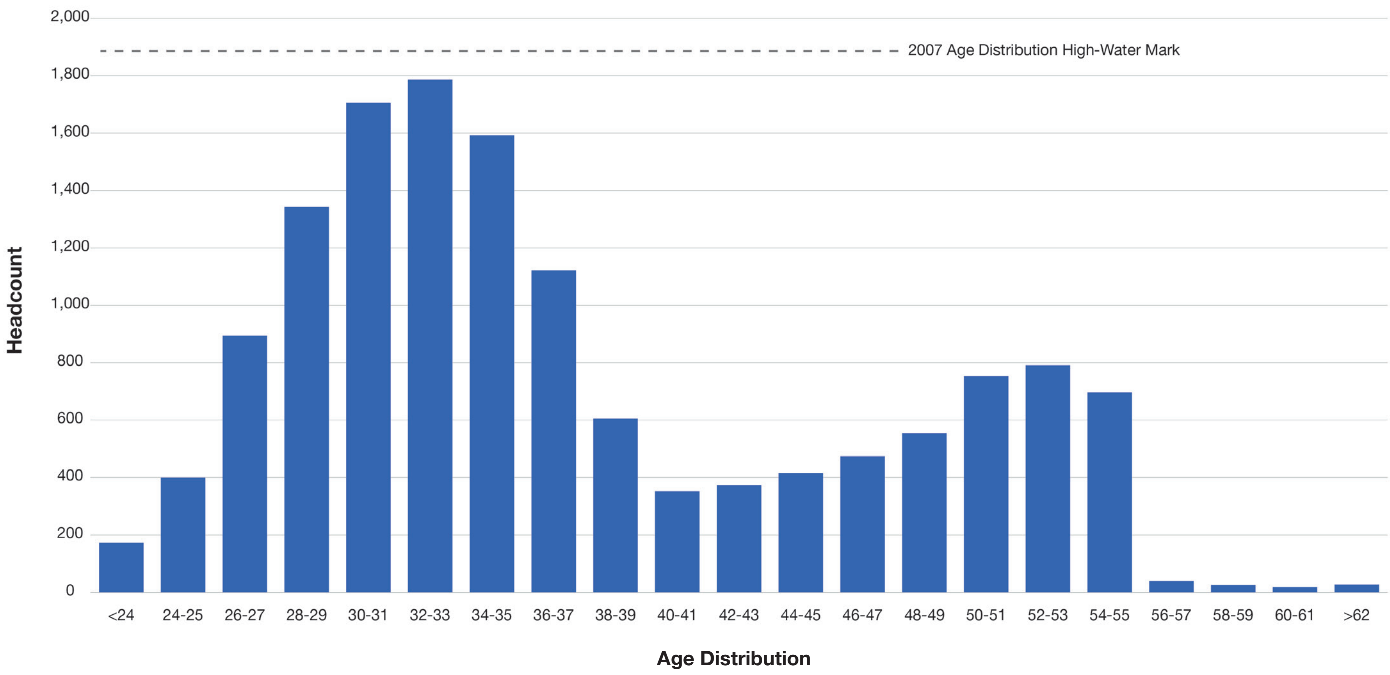


Controller Workforce Age Distribution

The agency hired a substantial number of controllers in the years immediately following the 1981 strike. This concentrated hiring wave meant a large portion of the controller workforce would reach retirement age in roughly the same time period. In September 2005, the age distribution peak on the right side of Figure 4.2 was greater than 1,900 controllers. Today, the magnitude of that remaining peak is down to less than 800 controllers because the majority of the controllers hired shortly after the 1981 strike have already retired and been replaced.

FAA's hiring plan is designed to phase in new hires as needed. Two distinct age bands can be seen in Figure 4.2. Controllers hired in the past several years can be seen in the 24 to 37 age band, which spans 14 years. The age band of those hired after the 1981 strike is shown in the 46-55 age band and covers only 10 years. By phasing in new hires, the age band of recent hires has become wider and is designed to avoid a spike in retirement eligibility in future years.

FIGURE 4.2 CONTROLLER WORKFORCE AGE DISTRIBUTION AS OF SEPTEMBER 19, 2015



The FAA's hiring plan is designed to phase in new hires as needed.

Controller Retirement Eligibility

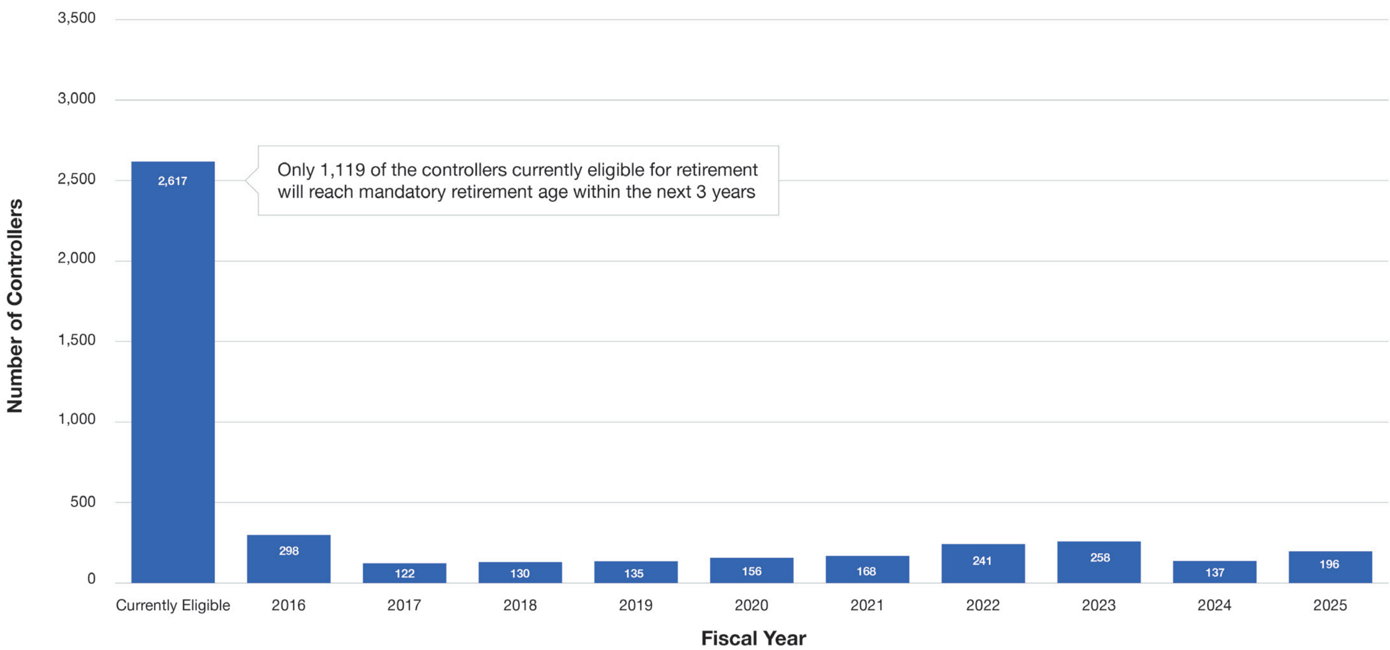
In addition to normal civil service retirement criteria, controllers can become eligible under special retirement criteria for air traffic controllers (age 50 with 20 years of "good time" service or any age with 25 years "good time" service). "Good time" is defined as service in a covered position, as defined in Public Law 92-297. Under Public Law 92-297, air traffic controllers are usually required to retire at age 56.

After computing eligibility dates using all criteria, the FAA assigns the earliest of the dates as the eligibility date. Eligibility dates are then aggregated into classes based on the fiscal year in which eligibility occurs.

Figure 4.3 shows the number of controllers who are currently retirement eligible as of September 2015 and those projected to become retirement eligible each fiscal year through FY 2025. Agency projections show that an additional 298 controllers will become eligible to retire in FY 2016. The number of retirement eligible controllers has been in decline in recent years from the peak, and should continue to do so for the next few years.

Because of advance hiring, we have already replaced many of the controllers currently eligible to retire. The FAA strives to minimize retirement, hiring and training spikes through the process of examining trends and proactively planning years in advance of expected activity.

FIGURE 4.3 RETIREMENT ELIGIBILITY



Controller Retirement Pattern

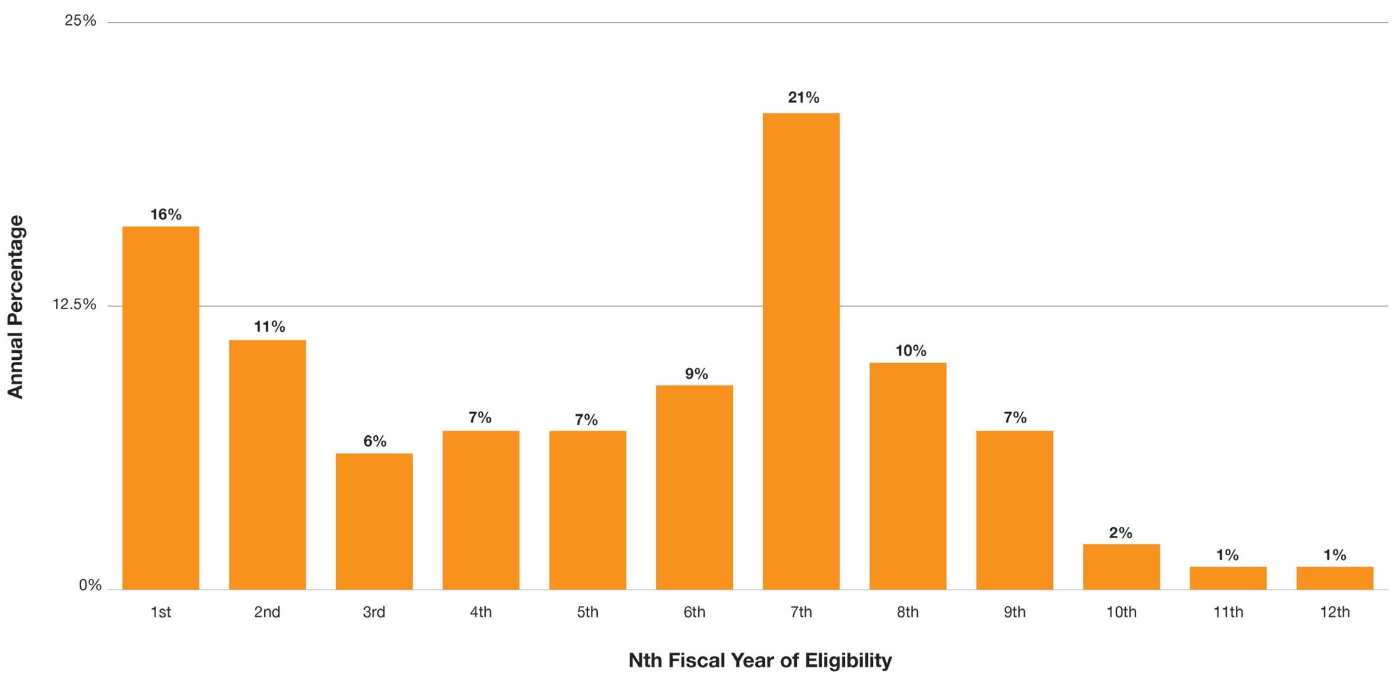
History shows that not all controllers retire when they first become eligible. In 2015, 15.9 percent of controllers who first became eligible actually retired.

Since the economic downturn began in 2008, the FAA has observed that many controllers are delaying retirement until they get closer to the mandatory retirement age of 56. Because most controllers are retirement eligible at the age of 50, they typically reach mandatory retirement age in their seventh year of eligibility.

These trends are seen in Figure 4.4 below, which shows fewer controllers are retiring earlier in their eligibility and are waiting until closer to their mandatory retirement age.

Despite the increased likelihood of delayed retirement, the majority of controllers still leave the controller workforce prior to reaching the mandatory age.

FIGURE 4.4 PERCENT OF CONTROLLERS RETIRING IN THE NTH FISCAL YEAR OF THEIR ELIGIBILITY



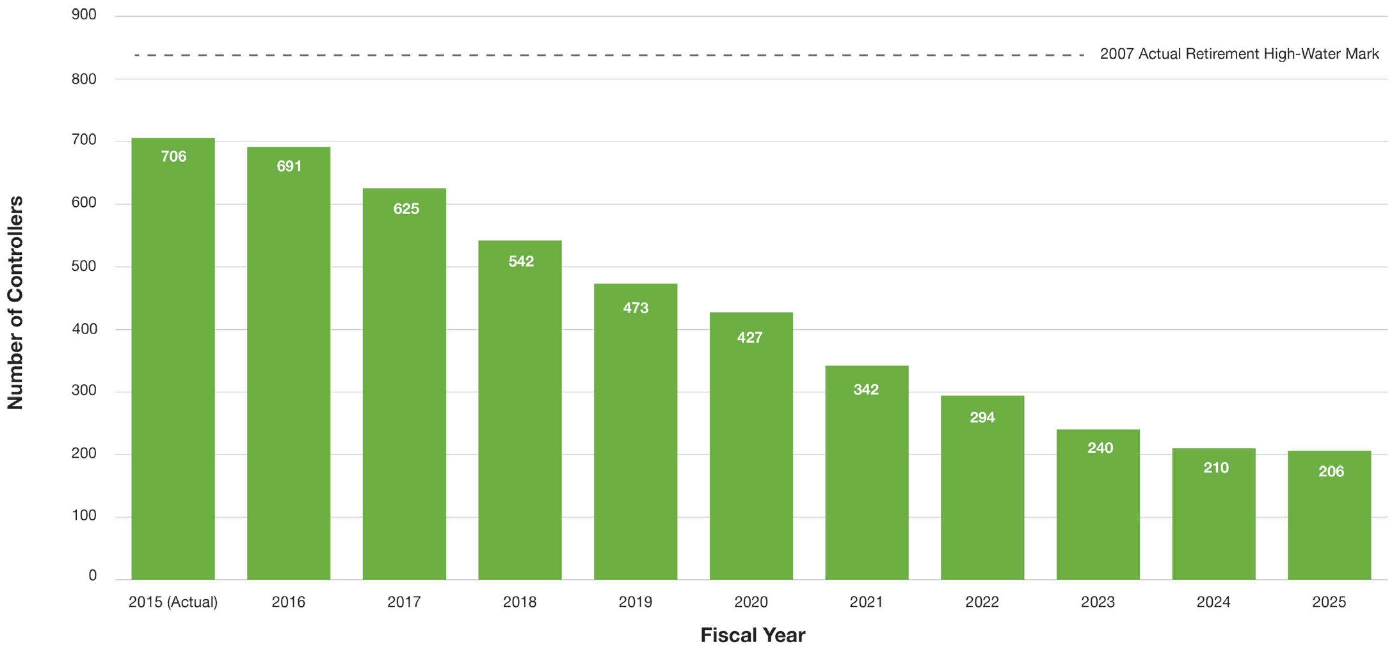
Controller Losses Due to Retirements

For the current plan, the agency incorporated FY 2015 retirement data into the retirement histogram used for future retirement.

As in prior years, the FAA projected future retirements by analyzing both the eligibility criteria of the workforce (Figure 4.3) and the pattern of retirement based on eligibility (Figure 4.4).

For each eligibility class (the fiscal year the controller first becomes eligible to retire), the agency applied the histogram percentage to estimate in Figure 4.5 the retirements for each class by year.

FIGURE 4.5 RETIREMENT PROJECTION



FY 2007 provided the high-water mark for controller retirements. Annual retirements are expected to continue to decline for the next decade.

Controller Losses Due to Resignations, Removals and Deaths

Estimated controller losses due to resignations, removals (excluding developmental attrition) and deaths are based on historical rates and shown in Table 4.2.

TABLE 4.2 CONTROLLER LOSSES DUE TO RESIGNATIONS, REMOVALS AND DEATHS

2015*	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
60	48	49	49	49	49	49	50	50	50	50

*** Actual**

Developmental Attrition

Estimated losses of trainees who terminate from the FAA while still in developmental status are shown in Table 4.3. Hiring during FY 2015 was lower than projected, which causes the need for increased hiring at near-capacity levels from FY 2016 through FY 2018. Correspondingly, this plan incorporates a projected increase in developmental attrition for FY 2016 through FY 2020 as hires from these years progress through their training program.

TABLE 4.3 DEVELOPMENTAL ATTRITION

2015*	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
85	136	238	226	211	170	134	121	120	118	116

*** Actual**

Academy Attrition

Estimates of losses from new hires that are not successful in the FAA Academy training program are based on both historical rates as well as projections and are shown in Table 4.4. The projected Academy attrition in this plan is higher than the projections in prior plans. This was driven by observed higher failure rates at the FAA Academy in FY14 and FY15. FAA will continue to monitor Academy failure rates moving forward for the impact of these changes and adjust future projections accordingly. In addition, hiring during FY 2015 was lower than projected, which causes the need for increased hiring at near-capacity levels from FY 2016 through FY 2018. Correspondingly, this plan incorporates a projected increase in Academy attrition for FY 2016 through FY 2019 as hires from these years progress through their training program.

TABLE 4.4 ACADEMY ATTRITION

2015*	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
359	408	428	454	384	285	244	233	227	221	217

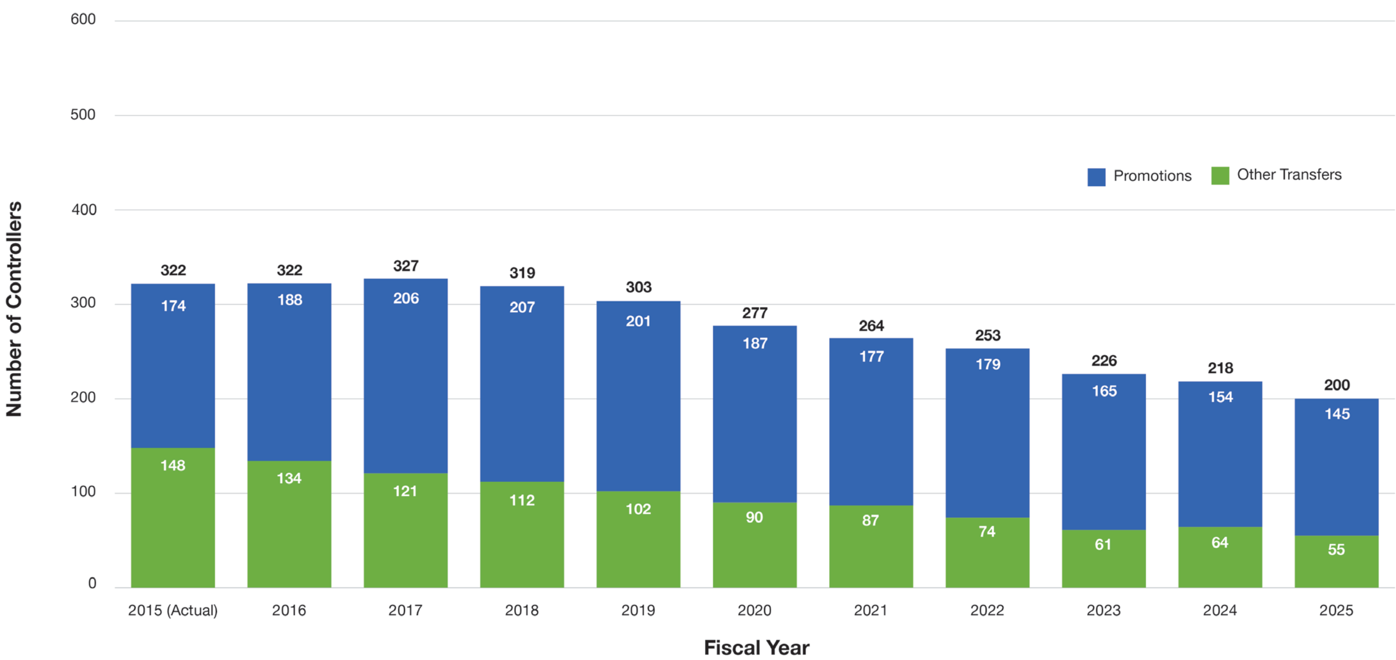
*** Actual**

Controller Losses Due to Promotions and Other Transfers

This section presents FAA estimates of controller losses due to internal transfers to other positions (staff support specialists, traffic management coordinators, etc.) and controller losses due to promotions to front line manager (FLM) or air traffic management/supervisory positions.

Over the past five years, we've observed an average of 163 net promotions each year from CPC to supervisory positions. The majority of these promotions replace retiring supervisors. We expect net transfers to promotions to increase slightly and to peak at 207 in FY 2018 and slightly fall in future years as seen in Figure 4.6.

FIGURE 4.6 CONTROLLER LOSSES DUE TO PROMOTIONS AND OTHER TRANSFERS

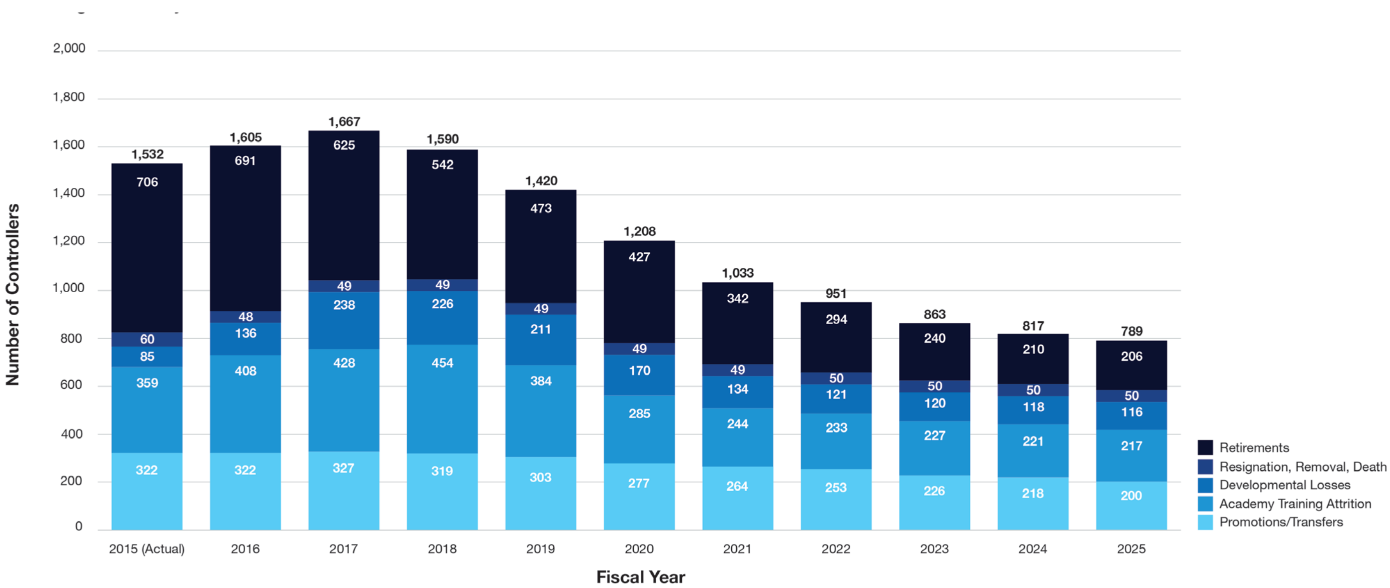


Total Controller Losses

The FAA projects a total loss of 11,943 controllers over the next 10 years.

Should losses outpace projections for FY 2016, the FAA will hire additional controllers to reach the end-of-year goal of 14,157 air traffic controllers on board.

FIGURE 4.7 PROJECTED TOTAL CONTROLLER LOSSES



Chapter 5 | Hiring Plan

The FAA safely operates and maintains the NAS because of the combined expertise of its people, the support of technology and the application of standardized procedures. Every day tens of thousands of aircraft are guided safely and expeditiously through the NAS to their destinations.

Deploying a well-trained and well-staffed air traffic control workforce plays an essential role in fulfilling this responsibility. The FAA's current hiring plan has been designed to phase in new hires as needed. To staff the right number of people in the right places at the right time, the FAA develops annual hiring plans that are responsive to changes in traffic and in the controller workforce.

The FAA hires new developmental controllers in advance of the agency's staffing needs in order to have ample time to train them to offset future attrition, including retirements, promotions, etc. Proper execution of the hiring plan, while flexibly adapting to the dynamic nature of traffic and attrition, is critical to the plan's success. If the new developmentals are not placed correctly or if CPCs are not transferred from other facilities, shortages could occur at individual facilities that may affect schedules, increase overtime usage or require the use of more developmentals on position.

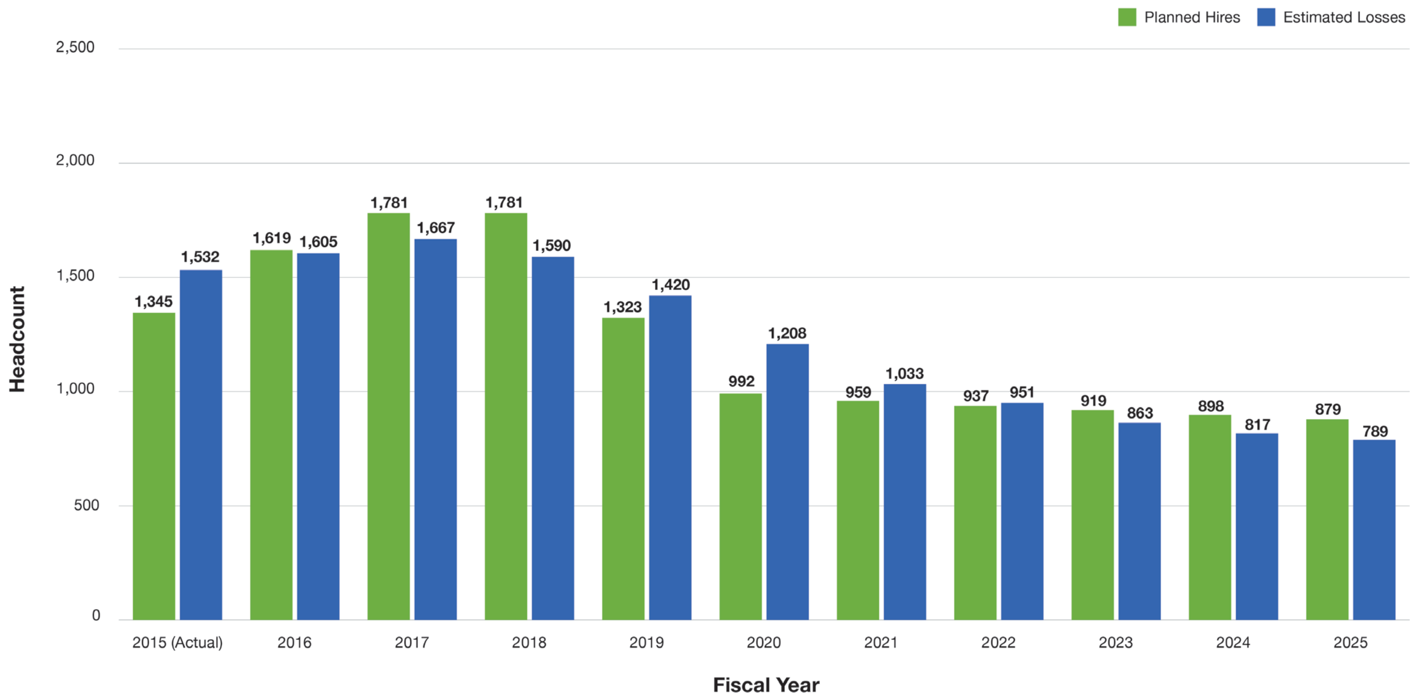
Staffing is and will continue to be monitored at all facilities throughout the year. The agency will continue to modify the hiring plan at the facility level should adjustments become necessary due to changes in traffic volume, retirements or other attrition.

There are thousands of qualified controller candidates eager to be hired. The FAA has again been able to attract large numbers of qualified controller candidates. Through a revised two-track controller hiring process, and use of the updated Employee Request Reassignment process, the FAA will attract and recruit a sufficient number of applicants to achieve this hiring plan.

Controller Hiring Profile

The controller hiring profile is shown in Figure 5.1. The FAA hired 1,345 controllers compared to the plan of 1,772 controllers in FY 2015. This created a significant backlog and subsequently increased the need for new controller hiring for several fiscal years into the future. We currently plan to spread hiring over FY 2016 to FY 2018, raising hiring projections in those years relative to last year's plan. We spread the hiring to support better predictability at the Academy and facilities, and to smooth out workload for our medical and security personnel. The number of controllers projected to be hired through FY 2025 is 12,088.

FIGURE 5.1 CONTROLLER HIRING PROFILE



The FAA hired 1,112 controllers in FY 2014 and 1,345 in FY 2015

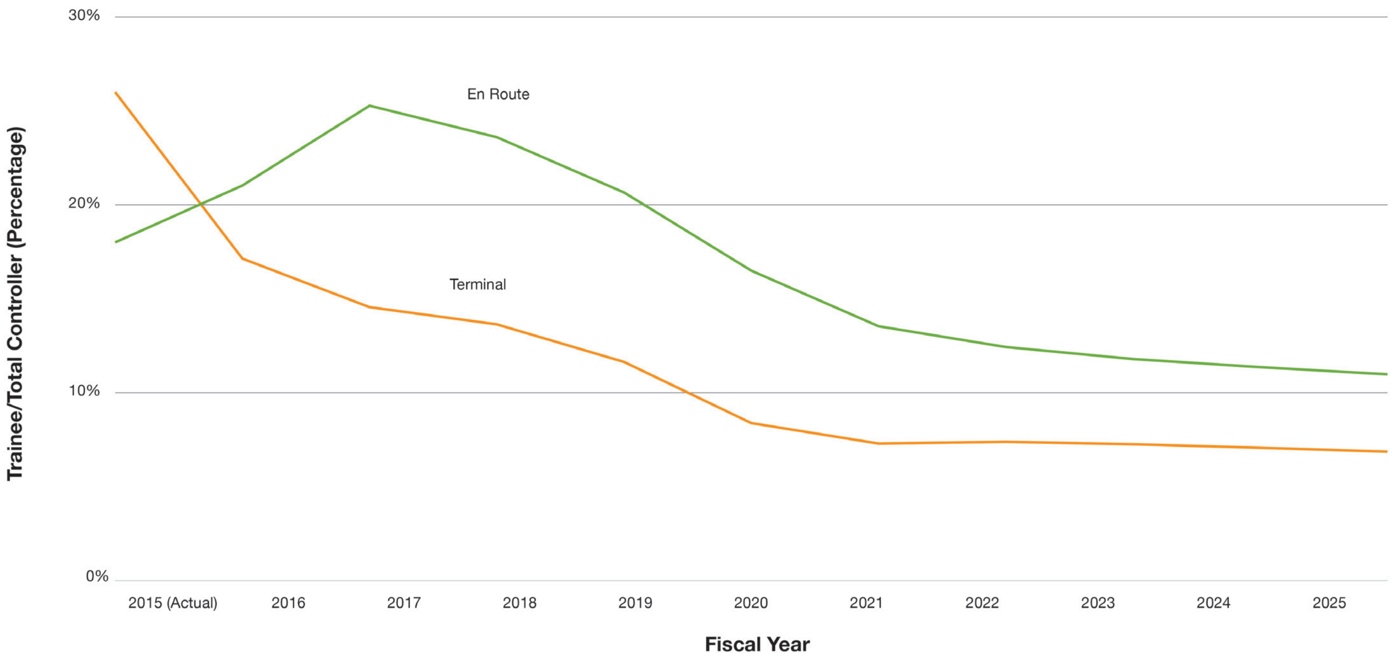
Trainee-to-Total-Controller Percentage

The hiring plan allows the FAA to maintain an appropriate number of trainees (developmental and CPC-IT) in the workforce. The percentage shown is calculated as the sum of CPC-ITs plus developmentals divided by all controllers. While the FAA strives to keep the trainee percentage below 35 percent for both Terminal and En Route controllers, it is not the only metric used by the agency to measure trainee progress.

Figure 5.2 shows the projected trainee-to-total-controller percentages for En Route and Terminal by year to 2025.

While Terminal facilities are showing a decline through 2025, there is a slight uptick in the En Route percentage for the next several years as controllers in the current developmental pipeline become fully certified. Note the trainee percentage for both En Route and Terminal is still well below 35 percent. In general, the En Route trainee ratio exceeds the Terminal ratio primarily because of the longer times to certify (on average) in En Route facilities.

FIGURE 5.2 TRAINEE-TO-TOTAL-CONTROLLER PERCENTAGE



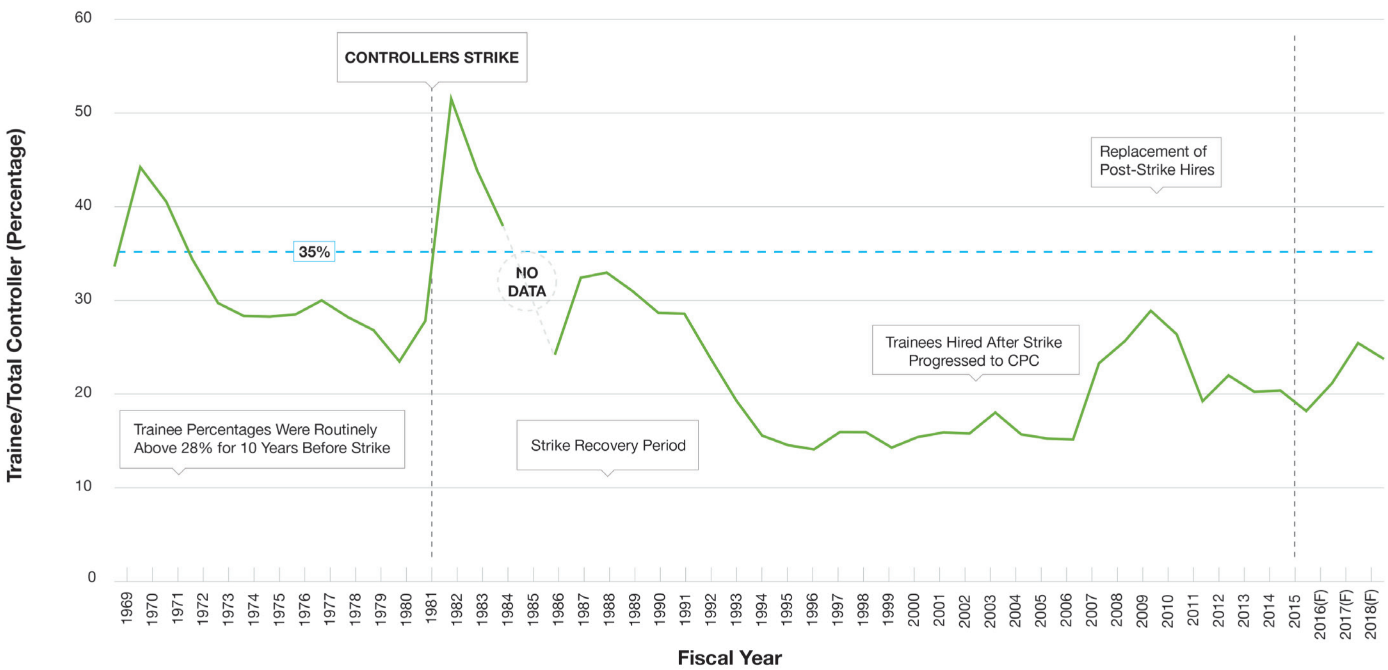
Before the 1981 strike, the FAA experienced trainee percentages ranging from 23 to 44 percent. Following the strike, through the end of the hiring wave in 1992, the trainee percentage ranged from 24 to 52 percent. When the post-strike hires became fully certified by the end of decade, the trainee percentage declined.

As the new controllers hired en masse in the early 1980s achieved full certification, the subsequent need for new hires dropped significantly from 1993 to 2006. This caused trainee percentages to reach unusually low levels. The FAA's current hiring plans return trainee percentages to their historical averages.

By phasing in new hires as needed, the FAA will level out the significant training spikes and troughs experienced over the last 40 years. Even though there was a long-expected trainee peak in 2009, the trainee percentage remains low as thousands of trainees hired over the past decade have become certified controllers.

Figure 5.3 shows historical trainee percentages from 1969 to the present.

FIGURE 5.3 HISTORICAL TRAINEE PERCENTAGE



The FAA uses many metrics (e.g., 35 percent trainee to total controllers) to manage the flow of trainees while accomplishing daily operations. Facilities meter training to coincide with a number of dynamic factors, including technology upgrades, new runway construction and recurrent proficiency training for existing CPCs. Facility training is enabled by many factors. Examples include the use of contract instructors, access to simulators, scheduled overtime, and the seasonality and complexity of operations.

In itself, the actual number of trainees does not indicate the progress of each individual in the training program or the additional utility they provide that can help to supplement other on-the-job training instruction and support operations. A key facility measure of training performance is measurement of trainee completion time against the goals. The goal ranges from one and one-half years at our lower-level Terminal facilities to three years at our En Route facilities.

The FAA is striving to meet these goals by improving training and scheduling processes through increased use of simulators and better tracking of controller training using the FAA's national training database.

The FAA will continue to closely monitor facilities to make sure trainees are progressing through each stage of training while also maintaining the safe and efficient operation of the NAS.

Chapter 6 | Hiring Process

Controller Hiring Sources

The FAA has two primary categories of controller hiring sources.

- Prior ATCS experience: These individuals have at least 52 weeks of certified air traffic control experience and may apply for vacancies announced by the FAA.
- No prior ATCS experience: These individuals are not required to have prior air traffic control experience and may apply for vacancies announced by the FAA.

Recruitment

The agency continues to attract and recruit high-quality applicants into the controller workforce to meet staffing requirements.

In FY 2014, the FAA instituted an interim change to the air traffic control hiring process. The changes allowed the FAA to more efficiently compare applicants across previous hiring sources to select those candidates most likely to succeed as air traffic control specialists. Key benefits of the new approach included: (1) a single vacancy announcement; (2) a single set of minimum qualifications/eligibility requirements; (3) a multi-hurdle selection process with increased validity and efficiency; and (4) eliminated the Centralized Selection Panel process and Interview.

In January 2015, the FAA modified the interim changes by establishing a two-track announcement process for hiring air traffic control specialists. The first track included an announcement targeting applicants who have at least 52 weeks of certified air traffic control experience in either civilian or military air traffic control facilities. The second track targeted candidates without operational air traffic control experience. In December 2015, the FAA launched an extended announcement for applicants with previous experience.

In FY 2016, the FAA will continue to recruit and hire air traffic control specialists to meet staffing requirements through the use of the two-track announcement process.

Chapter 7 | Training

The foundation of our nation's safe and efficient air traffic system is a workforce that is proficient in equipment, technology, systems and processes. New capabilities are being introduced into the National Airspace System and our professional air traffic controllers must learn these tools and develop new skills in order for the aviation community to maximize the full benefits of the Next Generation Air Transportation System. They must prepare for NextGen while they seamlessly continue to operate in the current environment.

The FAA's Office of Safety and Technical Training is helping the agency to firmly instill its safety mission in controllers from the start of their careers. The powerful combination of safety, training and quality assurance enhances the FAA's ability to identify, mitigate and manage risks, and integrate lessons learned into the technical training curriculum. The training program for air traffic controllers is governed by FAA Order 3120.4, Air Traffic Technical Training, and is reviewed annually to ensure its technical accuracy.

We are meeting the challenge of training both new and experienced controllers by streamlining the training process, refreshing course content, incorporating simulation, and investing in training technology so our controllers can continue to operate the safest, most efficient airspace system in the world.

The Training Process

New hires with no previous air traffic control experience begin their federal career training at the FAA Academy, where they learn foundational aviation knowledge through classroom lectures, team exercises and computer-based instruction, and practice basic air traffic control skills using low-, medium- and high-fidelity simulation devices. The academy lays the foundation for employee development by teaching common, fundamental air traffic control principles and procedures that are used at facilities throughout the country. After successfully completing training at the FAA Academy, developmental controllers are assigned to a field location, where they enter additional, site-specific qualification training and hone their technical abilities in the operational environment. This phase of training begins in the classroom, where students learn facility-specific equipment, rules and procedures. After students master initial learning objectives, the instruction transitions to simulators where learners can apply their knowledge and improve their skills in a hands-on, repetitive and safe environment. Finally, employees enter the on-the-job training phase working the control position, where their performance is carefully monitored by certified professional controllers who help trainees develop their techniques in a progressively difficult live-traffic environment.

New hires with previous air traffic experience are selected directly for a field facility and usually begin their federal service in an accelerated training program customized for their prior aviation experience. They are able to bypass certain phases of training, but they are required to meet the same certification standards for each control position as new hires with no previous experience.

The goal of all new employees is to become a certified professional controller (CPC), which is when they are finally considered to be at the full-performance level. Once developmental controllers are certified on control positions, they often work independently in those positions under the direction of a supervisor to gain experience and to supplement staffing.

All controllers are assigned periodic proficiency training and participate in both mandatory and optional supplemental training. For example, through the Flight Deck Training program, controllers experience air traffic control from the flight crew's perspective by observing a flight from the cockpit. The program, which logged more than 5,100 flights in 2015, provides a setting for pilots and controllers to dialog face-to-face on various operational topics, even as the crew is performing those maneuvers.

The recurrent training program is administered every six months as a combination of classroom and computer-based instruction for air traffic controllers. It delivers evidence-based topics derived from the Air Traffic Safety Action Program (ATSAP), Quality Assurance and Quality Control activities and data. As contrasted with annually required refresher training on static topics, recurrent training delivers timely and relevant training based on safety trends and lessons learned from our analysis. Recurrent training is developed in collaboration with subject matter experts from the National Air Traffic Controllers Association.

Designing and Delivering Effective Training

The FAA has adopted an outcomes-based approach to the design and development of training. This approach, implemented in FAA Order 3000.22, Air Traffic Organization Outcomes-Based Technical Training, refers to the strategy used to design individual courses and is based on the performance requirements found in the competency model. It uses the collection of job tasks, knowledge, skills and abilities to define the operational outcome required for the controller's job so that training can be designed accordingly. It is a newer approach to instructional systems design that involves mapping curriculum to job tasks, knowledge, skills and training methods. New training development will use the outcomes-based methodology.

The Agency has recently refreshed the introductory En Route, Tower and Terminal Radar training courses at the FAA Academy to support cumulative grading. In courses that use the cumulative grading system, students are assessed at multiple points in training, with many training advancement decision points, so that underperforming students are either provided remedial training or are released from the FAA.

The FAA is increasing the use of simulators – technology that allows instructors to duplicate and play back actual operating events to give students opportunities for improvement in a safe environment. Simulators enable students to not only see the cause and effect, but also to avoid mistakes in the future. Since live traffic is inconsistent and unpredictable due to weather and system delays, a controller may have to wait days or weeks for an opportunity to learn a particular procedure, and even longer to become proficient at it. The FAA builds simulation into its curriculum to help compress the training timeline while also improving the students' learning experience and reducing training costs. In 2015, the FAA mandated that facilities with access to simulation capabilities must use those training devices to complete locally identified, evidence-based refresher training.

Experienced instructors, certified professional controllers, and contractors provide both classroom and simulation training at the FAA Academy and at many field locations. In September 2015, the FAA successfully transitioned from the Air Traffic Control Optimum Training Solution, in use since 2007, to the FAA Controller Training Contract to supplement the agency's controller training requirements nationally. The FAA ensures everyone who instructs developmental controllers – whether they are federal employees or contractors – has the background and skills needed to train new employees. Most of the contract instructors are highly experienced former FAA controllers who retired after more than three decades of federal service.

The FAA initiated a multi-year, three-step program to revise and update its training courses for on-the-job-training field instructors. It is especially important for field instructors to maintain proficiency on all of the latest skills, new procedures and technologies coming into the system through NextGen improvements as well as prepare to instruct students who represent a new generation.

Infrastructure Investments

To improve access to training content delivered using the eLearning Management System (eLMS), especially at more remote locations with limited internet access and bandwidth, the FAA designed a Content Delivery Network (CDN) that replicates eLMS training content and makes it available at each facility on a local area network. Instead of downloading bandwidth-intensive content every time it is viewed, students are able to access the content with less buffering and interruptions. Sites with the CDN configuration have the ability to view more robust training typically associated with multimedia and simulation, which provides more of an interactive learning capability for students. At the end of 2015, all federal Airport Traffic Control Towers, Air Route Traffic Control Centers, and large Terminal Radar Approach Control facilities have the CDN capability. By end of 2016, the FAA expects all air traffic facilities to have a CDN.

The Office of Safety and Technical Training also invested in its high-fidelity Tower Simulator System (TSS), a highly effective training device that has provided an interactive, highly realistic environment for controller training for more than a decade. There are 50 simulators installed at 32 locations, and these systems support training for 155 airports using a “hub and spoke” arrangement where employees at remote facilities travel to central locations to use the simulator. Last year, the FAA awarded a five-year maintenance and sustainment contract for the TSS. This year, the FAA plans to make the final investment decision on a technical refresh program that will replace computer processors and bulb-based projectors with the TSS.

While access to simulators has improved the quality of training for the controller workforce, we still need to be able to design accurate training scenarios for those simulators. The FAA continues to expand Simfast, a home-grown scenario creation tool for terminal radar facilities, to more than 100 locations. Before Simfast, controllers spent about 40 hours designing one hour of simulation for a complex, realistic air traffic radar scenario; with an improved interface running on a standalone computer, designers using Simfast can create the same complex scenarios in under two hours.

Time to Certification

The FAA continues to meet its overall goals for time to certification and number of controllers certified. Implementation of foundational NextGen platforms, such as ERAM and TAMR, and new training requirements are factors that affect overall time to CPC. Depending on the type of facility, facility level (complexity) and the number of candidates to certify, controllers are expected to complete certification in one and one-half to three years.

Nearly 84% of those who began training in fiscal years 2007 through 2011 successfully completed training at their first facility or a subsequent facility. Completion means that employees achieved FAA CPC status. The remaining members of the hiring classes (16%) have been removed from the agency, resigned or are still in training. Developmental controllers who fail to certify at a facility may be removed from service or reassigned to a less complex facility in accordance with agency policies and directives.

Table 7.1 shows the FAA’s training targets and average training completion time by facility type for those who began training in fiscal year 2007 through 2011. Only those who achieved CPC status at their first facility assignment are included in the average training completion times displayed because incorporation of training times at additional facilities can skew the average. Additionally, training data for hiring classes after fiscal year 2012 are not reported here because greater than 10 percent of the class are still in active phases of training, resulting in continuously changing metrics as those students certify or fail.

TABLE 7.1 YEARS TO CERTIFY

	FAA GOAL	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Terminal 4-6	1.5	1.88	2.13	2.47	2.27	1.81
Terminal 7-9	2.0	1.92	2.26	2.50	2.36	2.04
Terminal 10-12	2.5	2.04	2.30	2.59	2.33	2.16
En Route	3.0	2.57	2.75	3.01	3.02	3.00

Note: More recent hiring classes (FY2012 forward) are not reported as there are still greater than 10 percent of the class in progress, resulting in continuously changing metrics as those students certify or fail.

Preparing for NextGen

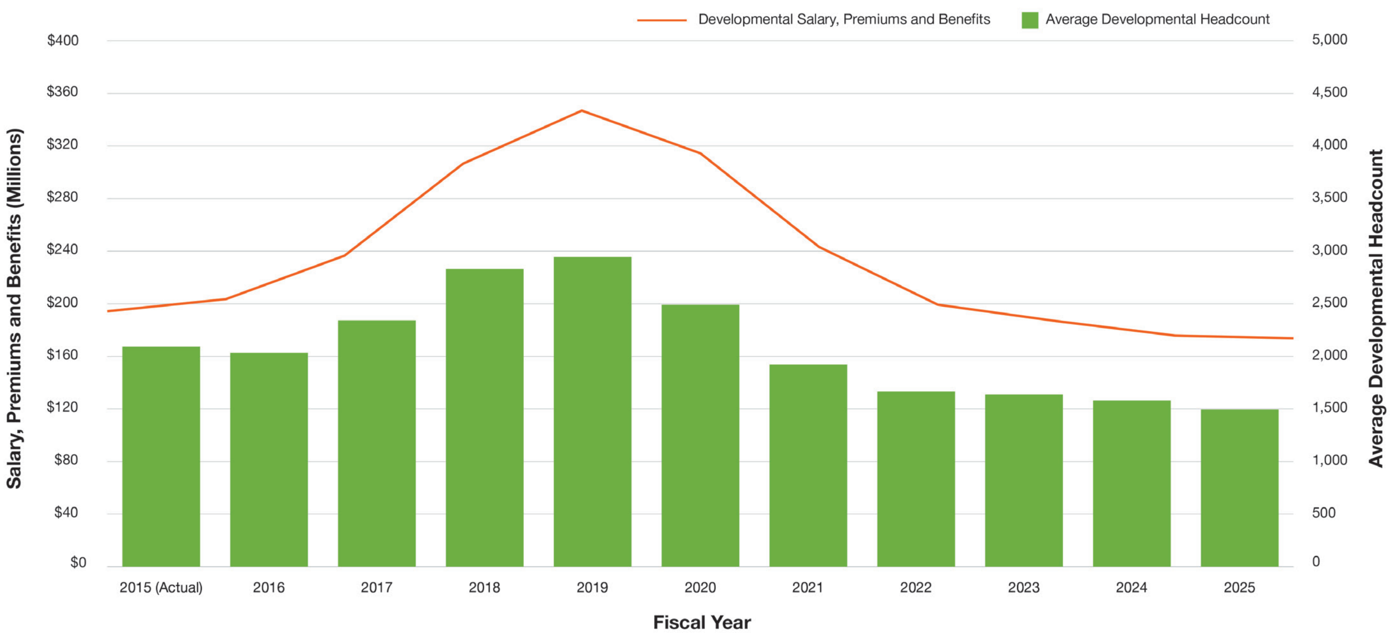
As the FAA transitions to the Next Generation Air Transportation System, the key to providing safe, reliable and efficient air traffic services remains the same: highly skilled, trained and certified professionals. The Office of Safety and Technical Training must maintain curricula to keep pace with the evolving NAS, modernize how the FAA trains employees, incorporate new techniques and technologies for learning, and improve data collection and sharing. Training professionals are part of an FAA team that evaluates how NextGen will change the air traffic work environment and what competencies will be required for the future workforce. The FAA is incorporating what it learns from this evolving and ongoing process into training programs as new systems are implemented. Outcomes-based training aligns NextGen functionality with job tasks as well, so that the training organization can make predictions on how programs will need to change with the advent of NextGen.

Chapter 8 | Funding Status

In addition to direct training costs, the FAA will incur salary and other costs for developmental controllers before they certify. The average compensation cost of a developmental in FY 2016 is projected to be $100,155.

Figure 8.1 depicts expected annual compensation costs of developmentals, as well as the expected number of developmentals by year through 2025. As training takes one and one-half to three years, the chart depicts a rolling total of hires and costs from the current and previous years. It also incorporates the effect of the controller contract.

FIGURE 8.1 ESTIMATED COST OF DEVELOPMENTALS BEFORE CERTIFICATION



Appendix | 2016 Facility Staffing Ranges

The Appendix below presents controller staffing ranges, by facility, for En Route and Terminal air traffic control facilities for FY 2016. Additional detail on how the staffing ranges are calculated is provided in Chapter 3.

In general, the FAA strives to keep the number of CPCs and CPC-ITs near the middle of the range. While most of the work is accomplished by CPCs, work is also being performed in facilities by CPC-IT and position-qualified developmental controllers who are proficient, or checked out, in specific sectors or positions and handle work independently. Accordingly, facilities can safely operate even with CPC staffing levels below the defined staffing range.

Conversely, a facility's total staffing levels are often above the defined staffing range because new controllers are typically hired two to three years in advance of expected attrition to allow for sufficient training time. The total expected end-of-year staffing number shown in Figure 3.1 reflects this projected advanced hiring.

		ACTUAL ON BOARD AS OF 09/19/15				STAFFING RANGES	
ID	FACILITY NAME	CPC	CPC-IT	DEVELOPMENTAL	TOTAL	LOW	HIGH
ZAB	Albuquerque ARTCC	154	2	30	186	165	202
ZAN	Anchorage ARTCC	67	9	32	108	85	103
ZAU	Chicago ARTCC	313	17	44	374	279	341
ZBW	Boston ARTCC	208	4	47	259	177	217
ZDC	Washington ARTCC	281	14	19	314	253	310
ZDV	Denver ARTCC	229	10	40	279	226	277
ZFW	Fort Worth ARTCC	248	21	43	312	261	319
ZHU	Houston ARTCC	225	12	32	269	237	289
ZID	Indianapolis ARTCC	257	15	52	324	248	303
ZJX	Jacksonville ARTCC	264	2	12	278	223	272
ZKC	Kansas City ARTCC	200	7	43	250	197	241
ZLA	Los Angeles ARTCC	228	18	38	284	216	265
ZLC	Salt Lake City ARTCC	145	2	30	177	141	172
ZMA	Miami ARTCC	222	4	45	271	219	268
ZME	Memphis ARTCC	241	6	35	282	221	270
ZMP	Minneapolis ARTCC	221	9	37	267	224	274
ZNY	New York ARTCC	225	10	73	308	236	288
ZOA	Oakland ARTCC	163	19	57	239	174	212
ZOB	Cleveland ARTCC	312	4	35	351	280	342
ZSE	Seattle ARTCC	133	10	44	187	134	164
ZSU	San Juan ARTCC	39	7	15	61	45	55
ZTL	Atlanta ARTCC	325	12	26	363	314	384
ZUA	Guam ARTCC	13	3	2	18	14	17
EN ROUTE TOTAL		4,713	217	831	5,761	4,569	5,585

NOTE: Facility numbers do not include new hires at the FAA Academy

		ACTUAL ON BOARD AS OF 09/19/15				STAFFING RANGES	
ID	**FACILITY NAME**	**CPC**	**CPC-IT**	**DEVELOPMENTAL**	**TOTAL**	**LOW**	**HIGH**
A11	Anchorage TRACON	18	9	7	34	20	25
A80	Atlanta TRACON	70	16	4	90	81	100
A90	Boston TRACON	52	2	1	55	50	61
ABE	Allentown Tower	18	5	5	28	21	26
ABI	Abilene Tower	12	0	11	23	16	19
ABQ	Albuquerque Tower	25	6	2	33	21	26
ACK	Nantucket Tower	8	1	3	12	9	10
ACT	Waco Tower	14	0	11	25	16	20
ACY	Atlantic City Tower	16	4	10	30	19	24
ADS	Addison Tower	12	1	1	14	9	12
ADW	Andrews Tower	10	0	4	14	11	13
AFW	Alliance Tower	13	2	3	18	14	17
AGC	Allegheny Tower	15	1	2	18	9	11
AGS	Augusta Tower	13	1	2	16	12	15
ALB	Albany Tower	17	2	7	26	20	24
ALO	Waterloo Tower	9	0	4	13	9	12
AMA	Amarillo Tower	12	0	13	25	15	18
ANC	Anchorage Tower	23	2	1	26	22	27
APA	Centennial Tower	18	3	2	23	19	23
APC	Napa Tower	8	0	5	13	6	8
ARB	Ann Arbor Tower	8	0	0	8	7	9
ARR	Aurora Tower	6	1	5	12	8	10
ASE	Aspen Tower	10	0	5	15	11	13
ATL	Atlanta Tower	44	6	0	50	42	51
AUS	Austin Tower	31	8	0	39	33	40
AVL	Asheville Tower	10	2	5	17	14	17
AVP	Wilkes-Barre Tower	15	0	5	20	16	20
AZO	Kalamazoo Tower	11	3	7	21	15	18
BDL	Bradley Tower	14	1	2	17	10	13
BED	Hanscom Tower	12	1	6	19	11	14
BFI	Boeing Tower	19	4	2	25	14	17
BFL	Bakersfield Tower	15	1	12	28	14	18
BGM	Binghamton Tower	13	1	4	18	10	12
BGR	Bangor Tower	16	0	5	21	16	19
BHM	Birmingham Tower	21	3	8	32	22	27
BIL	Billings Tower	13	1	9	23	17	21
BIS	Bismarck Tower	10	0	3	13	12	14
BJC	Broomfield Tower	12	1	0	13	9	12
BNA	Nashville Tower	32	8	3	43	32	40
BOI	Boise Tower	25	7	2	34	24	29
BOS	Boston Tower	33	0	0	33	28	34
BPT	Beaumont Tower	8	0	5	13	8	10
BTR	Baton Rouge Tower	14	5	5	24	17	20
BTV	Burlington Tower	16	0	11	27	16	19
BUF	Buffalo Tower	23	3	7	33	23	29

		ACTUAL ON BOARD AS OF 09/19/15				STAFFING RANGES	
ID	FACILITY NAME	CPC	CPC-IT	DEVELOPMENTAL	TOTAL	LOW	HIGH
BUR	Burbank Tower	15	5	3	23	14	17
BWI	Baltimore Tower	28	3	1	32	19	23
C90	Chicago TRACON	66	33	1	100	83	101
CAE	Columbia Tower	17	1	6	24	18	21
CAK	Akron-Canton Tower	20	2	2	24	15	18
CCR	Concord Tower	9	0	3	12	10	12
CDW	Caldwell Tower	9	0	3	12	8	9
CHA	Chattanooga Tower	17	1	3	21	16	19
CHS	Charleston Tower	21	0	9	30	20	24
CID	Cedar Rapids Tower	12	2	4	18	13	16
CKB	Clarksburg Tower	14	0	5	19	12	14
CLE	Cleveland Tower	44	3	4	51	30	37
CLT	Charlotte Tower	70	23	1	94	71	87
CMA	Camarillo Tower	5	1	9	15	9	11
CMH	Columbus Tower	43	6	1	50	37	45
CMI	Champaign Tower	12	0	9	21	12	14
CNO	Chino Tower	10	3	1	14	9	11
COS	Colorado Springs Tower	21	7	5	33	21	26
CPR	Casper Tower	9	0	10	19	10	12
CPS	Downtown Tower	10	0	0	10	9	11
CRP	Corpus Christi Tower	26	7	4	37	27	32
CRQ	Palomar Tower	16	0	0	16	9	11
CRW	Charleston Tower	21	3	2	26	16	20
CSG	Columbus Tower	7	0	1	8	4	5
CVG	Cincinnati Tower	37	3	5	45	36	43
D01	Denver TRACON	55	16	0	71	64	78
D10	Dallas-Fort Worth TRACON	54	27	11	92	78	95
D21	Detroit TRACON	35	16	0	51	45	56
DAB	Daytona Beach Tower	31	15	8	54	47	58
DAL	Dallas Love Tower	20	2	1	23	19	24
DAY	Dayton Tower	15	0	2	17	11	13
DCA	Washington National Tower	24	8	3	35	23	28
DEN	Denver Tower	37	3	0	40	32	40
DFW	DFW Tower	42	7	0	49	48	59
DLH	Duluth Tower	16	0	5	21	18	22
DPA	Dupage Tower	11	2	3	16	11	13
DSM	Des Moines Tower	15	2	5	22	16	20
DTW	Detroit Tower	30	5	0	35	28	34
DVT	Deer Valley Tower	17	2	1	20	16	19
DWH	Hooks Tower	13	1	2	16	10	12
ELM	Elmira Tower	13	0	5	18	9	11
ELP	El Paso Tower	14	2	7	23	20	24
EMT	El Monte Tower	8	2	1	11	9	11
ERI	Erie Tower	11	1	11	23	14	17

		ACTUAL ON BOARD AS OF 09/19/15				STAFFING RANGES	
ID	FACILITY NAME	CPC	CPC-IT	DEVELOPMENTAL	TOTAL	LOW	HIGH
EUG	Eugene Tower	19	2	4	25	16	20
EVV	Evansville Tower	13	1	6	20	12	15
EWR	Newark Tower	27	9	0	36	28	34
F11	Central Florida TRACON	38	13	0	51	42	51
FAI	Fairbanks Tower	18	0	14	32	18	22
FAR	Fargo Tower	18	1	0	19	15	18
FAT	Fresno Tower	16	7	5	28	21	25
FAY	Fayetteville Tower	14	4	8	26	17	21
FCM	Flying Cloud Tower	10	1	1	12	9	11
FFZ	Falcon Tower	13	0	1	14	12	14
FLL	Fort Lauderdale Tower	26	1	3	30	22	27
FLO	Florence Tower	9	1	5	15	10	12
FNT	Flint Tower	16	0	1	17	11	14
FPR	St Lucie Tower	9	0	2	11	11	13
FRG	Farmingdale Tower	11	2	6	19	11	13
FSD	Sioux Falls Tower	14	1	2	17	14	17
FSM	Fort Smith Tower	19	1	6	26	22	26
FTW	Meacham Tower	13	1	4	18	14	17
FWA	Fort Wayne Tower	16	0	8	24	16	20
FXE	Fort Lauderdale Tower	15	0	4	19	13	15
GCN	Grand Canyon Tower	7	2	2	11	8	10
GEG	Spokane Tower	22	5	2	29	20	25
GFK	Grand Forks Tower	24	1	0	25	17	21
GGG	Longview Tower	13	1	9	23	15	18
GPT	Gulfport Tower	11	3	4	18	13	16
GRB	Green Bay Tower	14	2	2	18	17	21
GRR	Grand Rapids Tower	14	3	4	21	17	21
GSO	Greensboro Tower	21	4	5	30	21	26
GSP	Greer Tower	13	0	10	23	17	20
GTF	Great Falls Tower	13	0	8	21	12	14
HCF	Honolulu Control Facility	64	4	14	82	86	105
HEF	Manassas Tower	13	0	1	14	9	10
HIO	Hillsboro Tower	16	2	0	18	12	14
HLN	Helena Tower	7	0	5	12	7	9
HOU	Hobby Tower	19	2	0	21	18	22
HPN	Westchester Tower	13	1	5	19	11	13
HSV	Huntsville Tower	16	1	3	20	14	17
HTS	Huntington Tower	15	0	6	21	13	15
HUF	Terre Haute Tower	12	0	6	18	15	18
HWD	Hayward Tower	11	0	3	14	8	10
I90	Houston TRACON	71	18	0	89	79	96
IAD	Dulles Tower	31	5	2	38	25	31
IAH	Houston Intercontinental Tower	32	7	0	39	29	35
ICT	Wichita Tower	23	5	3	31	25	30

		ACTUAL ON BOARD AS OF 09/19/15				STAFFING RANGES	
ID	FACILITY NAME	CPC	CPC-IT	DEVELOPMENTAL	TOTAL	LOW	HIGH
ILG	Wilmington Tower	10	2	1	13	8	10
ILM	Wilmington Tower	14	1	6	21	15	18
IND	Indianapolis Tower	33	11	5	49	34	42
ISP	Islip Tower	12	1	5	18	12	14
ITO	Hilo Tower	12	1	3	16	11	14
JAN	Jackson Tower	10	0	7	17	13	16
JAX	Jacksonville Tower	32	6	9	47	37	45
JCF	Chicago	20	5	4	29	20	25
JFK	Kennedy Tower	27	6	2	35	29	35
JNU	Juneau Tower	13	0	3	16	11	13
K90	Cape TRACON	24	0	4	28	18	21
L30	Las Vegas TRACON	38	17	1	56	40	48
LAF	Lafayette Tower	7	2	1	10	8	9
LAN	Lansing Tower	18	1	3	22	17	21
LAS	Las Vegas Tower	35	5	0	40	32	39
LAX	Los Angeles Tower	36	14	0	50	39	48
LBB	Lubbock Tower	14	0	6	20	15	18
LCH	Lake Charles Tower	11	0	7	18	12	14
LEX	Lexington Tower	20	3	0	23	19	23
LFT	Lafayette Tower Lafayette	13	2	7	22	14	18
LGA	La Guardia Tower	30	7	1	38	26	32
LGB	Long Beach Tower	20	3	0	23	18	21
LIT	Little Rock Tower	21	6	5	32	21	26
LNK	Lincoln Tower	9	0	3	12	9	11
LOU	Bowman Tower	10	0	2	12	8	10
LVK	Livermore Tower	9	2	1	12	8	10
M03	Memphis TRACON	24	3	5	32	25	31
M98	Minneapolis TRACON	45	9	0	54	48	59
MAF	Midland Tower	15	1	8	24	15	19
MBS	Saginaw Tower	13	0	3	16	10	12
MCI	Kansas City Tower	27	9	5	41	29	35
MCO	Orlando Tower	26	8	0	34	23	28
MDT	Harrisburg Tower	21	2	7	30	19	23
MDW	Midway Tower	17	8	0	25	21	25
MEM	Memphis Tower	21	5	6	32	20	25
MFD	Mansfield Tower	11	0	7	18	13	15
MGM	Montgomery Tower	14	4	6	24	16	19
MHT	Manchester Tower	13	0	0	13	10	12
MIA	Miami Tower	60	28	1	89	81	99
MIC	Crystal Tower	9	1	0	10	9	11
MKC	Downtown Tower	12	2	2	16	11	13
MKE	Milwaukee Tower	39	7	0	46	31	38
MKG	Muskegon Tower	10	0	9	19	13	16
MLI	Quad City Tower	9	0	11	20	14	18

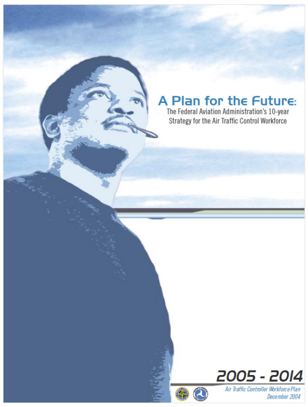
		ACTUAL ON BOARD AS OF 09/19/15				STAFFING RANGES	
ID	FACILITY NAME	CPC	CPC-IT	DEVELOPMENTAL	TOTAL	LOW	HIGH
MLU	Monroe Tower	11	0	8	19	11	14
MMU	Morristown Tower	12	0	2	14	8	10
MOB	Mobile Tower	18	2	2	22	18	22
MRI	Merrill Tower	12	0	0	12	9	10
MRY	Monterey Tower	7	0	1	8	7	9
MSN	Madison Tower	19	2	1	22	15	18
MSP	Minneapolis Tower	33	6	0	39	30	37
MSY	New Orleans Tower	24	7	3	34	30	37
MWH	Grant County Tower	9	0	10	19	12	15
MYF	Montgomery Tower	12	1	0	13	11	13
MYR	Myrtle Beach Tower	14	3	5	22	23	28
N90	New York TRACON	144	23	29	196	174	213
NCT	Northern California TRACON	141	18	6	165	151	184
NEW	Lakefront Tower	7	1	1	9	7	8
NMM	Meridian TRACON	4	0	0	4	10	12
OAK	Oakland Tower	24	4	0	28	18	22
OGG	Maui Tower	10	0	5	15	9	11
OKC	Oklahoma City Tower	26	0	4	30	26	32
OMA	Eppley Tower	13	1	4	18	11	13
ONT	Ontario Tower	16	1	2	19	11	13
ORD	Chicago O'Hare Tower	49	19	4	72	59	72
ORF	Norfolk Tower	24	5	11	40	23	29
ORL	Orlando Executive Tower	9	0	2	11	9	11
P31	Pensacola TRACON	27	6	3	36	29	36
P50	Phoenix TRACON	44	13	0	57	53	65
P80	Portland TRACON	22	6	4	32	25	30
PAE	Paine Tower	11	3	1	15	9	11
PAO	Palo Alto Tower	8	1	4	13	9	11
PBI	Palm Beach Tower	33	9	5	47	36	43
PCT	Potomac TRACON	141	19	5	165	136	166
PDK	DeKalb-Peachtree Tower	13	2	1	16	12	15
PDX	Portland Tower	22	5	3	30	20	24
PHF	Patrick Henry Tower	11	0	0	11	8	10
PHL	Philadelphia Tower	71	16	0	87	63	76
PHX	Phoenix Tower	28	9	0	37	25	30
PIA	Peoria Tower	11	0	11	22	15	19
PIE	St Petersburg Tower	11	1	4	16	8	10
PIT	Pittsburgh Tower	34	4	5	43	35	43
PNE	Northeast Philadelphia Tower	9	1	4	14	7	9
PNS	Pensacola Tower	8	0	5	13	9	11
POC	Brackett Tower	9	1	5	15	9	11
POU	Poughkeepsie Tower	9	1	1	11	8	10
PRC	Prescott Tower	11	2	3	16	13	16
PSC	Pasco Tower	13	3	5	21	14	17

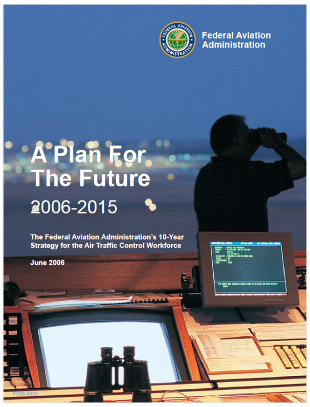
		ACTUAL ON BOARD AS OF 09/19/15				STAFFING RANGES	
ID	FACILITY NAME	CPC	CPC-IT	DEVELOPMENTAL	TOTAL	LOW	HIGH
PSP	Palm Springs Tower	9	0	4	13	8	10
PTK	Pontiac Tower	12	0	4	16	11	13
PUB	Pueblo Tower	10	1	3	14	12	15
PVD	Providence Tower	22	2	5	29	23	28
PWK	Chicago Executive Tower	8	2	1	11	9	11
PWM	Portland Tower	17	2	3	22	17	20
R90	Omaha TRACON	19	3	0	22	17	21
RDG	Reading Tower	12	1	8	21	14	17
RDU	Raleigh-Durham Tower	31	13	3	47	34	42
RFD	Rockford Tower	16	0	7	23	18	22
RHV	Reid-Hillview Tower	11	0	5	16	10	12
RIC	Richmond Tower	14	0	1	15	11	14
RNO	Reno Tower	13	0	4	17	11	14
ROA	Roanoke Tower	18	3	7	28	19	23
ROC	Rochester Tower	24	0	6	30	21	26
ROW	Roswell Tower	11	1	4	16	12	14
RST	Rochester Tower	13	1	3	17	10	13
RSW	Fort Myers Tower	18	7	10	35	25	30
RVS	Riverside Tower	12	1	3	16	11	13
S46	Seattle TRACON	42	5	0	47	43	53
S56	Salt Lake City TRACON	32	7	6	45	36	44
SAN	San Diego Tower	16	3	6	25	18	22
SAT	San Antonio Tower	37	11	1	49	37	45
SAV	Savannah Tower	21	2	5	28	19	23
SBA	Santa Barbara Tower	29	2	1	32	22	27
SBN	South Bend Tower	12	1	13	26	19	23
SCK	Stockton Tower	7	0	4	11	8	9
SCT	Southern California TRACON	204	32	7	243	193	235
SDF	Standiford Tower	35	8	5	48	34	42
SDL	Scottsdale Tower	11	3	0	14	10	12
SEA	Seattle Tower	28	1	0	29	26	32
SEE	Gillespie Tower	10	4	2	16	12	15
SFB	Sanford Tower	17	2	2	21	17	21
SFO	San Francisco Tower	29	2	0	31	28	34
SGF	Springfield Tower	22	1	3	26	22	27
SHV	Shreveport Tower	14	0	13	27	18	22
SJC	San Jose Tower	15	2	3	20	11	14
SJU	San Juan Tower	15	1	2	18	13	16
SLC	Salt Lake City Tower	26	4	0	30	24	29
SMF	Sacramento Tower	16	0	3	19	11	13
SMO	Santa Monica Tower	9	2	5	16	9	11
SNA	John Wayne Tower	23	3	2	28	20	24
SPI	Springfield Tower	8	0	5	13	10	13
SRQ	Sarasota Tower	11	0	3	14	10	12

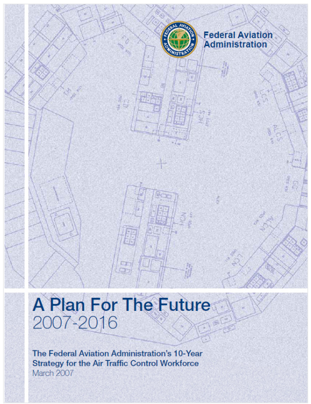
		ACTUAL ON BOARD AS OF 09/19/15				STAFFING RANGES	
ID	FACILITY NAME	CPC	CPC-IT	DEVELOPMENTAL	TOTAL	LOW	HIGH
STL	St Louis Tower	19	2	0	21	16	19
STP	St Paul Tower	12	0	0	12	8	10
STS	Sonoma Tower	7	0	5	12	7	9
STT	St Thomas Tower	9	0	2	11	8	9
SUS	Spirit Tower	10	0	5	15	10	13
SUX	Sioux Gateway Tower	10	0	6	16	9	11
SYR	Syracuse Tower	16	0	11	27	17	21
T75	St Louis TRACON	29	5	1	35	27	32
TEB	Teterboro Tower	16	6	5	27	15	19
TLH	Tallahassee Tower	17	1	2	20	14	17
TMB	Tamiami Tower	14	2	0	16	14	17
TOA	Torrance Tower	8	2	6	16	8	10
TOL	Toledo Tower	16	1	5	22	16	20
TPA	Tampa Tower	42	14	0	56	46	56
TRI	Tri-Cities Tower	13	2	5	20	13	16
TUL	Tulsa Tower	26	1	3	30	24	29
TUS	Tucson Tower	15	1	1	17	12	15
TVC	Traverse City Tower	6	0	3	9	8	10
TWF	Twin Falls Tower	6	0	4	10	7	9
TYS	Knoxville Tower	20	1	10	31	21	25
U90	Tucson TRACON	15	3	0	18	14	18
VGT	North Las Vegas Tower	6	5	2	13	10	12
VNY	Van Nuys Tower	18	4	0	22	15	19
VRB	Vero Beach Tower	8	0	4	12	11	13
Y90	Yankee TRACON	20	1	5	26	19	23
YIP	Willow Run Tower	12	1	4	17	10	12
YNG	Youngstown Tower	17	3	2	22	16	19
TERMINAL TOTAL		6,117	1,001	1,128	8,246	6,201	7,566

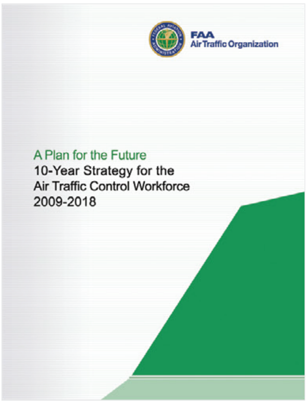
	CPC	CPC-IT	DEVELOPMENTAL	TOTAL	LOW	HIGH
EN ROUTE TOTAL	4,713	217	831	5,761	4,569	5,585
TERMINAL TOTAL	6,117	1,001	1,128	8,246	6,201	7,566
GRAND TOTAL	10,830	1,218	1,959	14,007	10,770	13,151

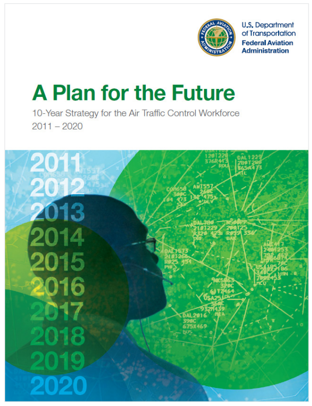
NOTE: Facility numbers do not include new hires at the FAA Academy

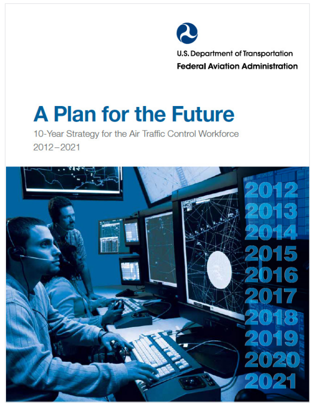


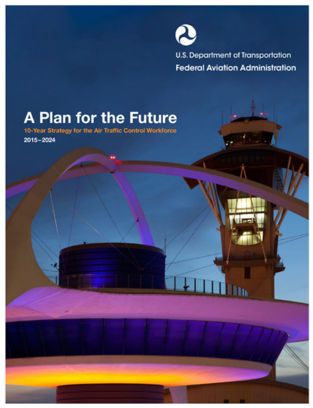












U.S. Department of Transportation

Federal Aviation Administration

800 Independence Avenue, SW

Washington, DC 20591

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