
Office of Inspector General

Audit Report

**THE SUCCESS OF FAA'S LONG-TERM PLAN FOR
AIR TRAFFIC FACILITY REALIGNMENTS AND
CONSOLIDATIONS DEPENDS ON ADDRESSING
KEY TECHNICAL, FINANCIAL, AND WORKFORCE
CHALLENGES**

Federal Aviation Administration

Report Number: AV-2012-151

Date Issued: July 17, 2012





Memorandum

U.S. Department of
Transportation

Office of the Secretary
of Transportation
Office of Inspector General

Subject: **ACTION:** The Success of FAA's Long-Term Plan for Air Traffic Facility Realignments and Consolidations Depends on Addressing Key Technical, Financial, and Workforce Challenges
Report No. AV-2012-151

Date: July 17, 2012

From: Jeffrey B. Guzzetti *Jeffrey B. Guzzetti*
Assistant Inspector General
for Aviation and Special Program Audits

Reply to
Attn. of: JA-10

To: Federal Aviation Administrator

The Federal Aviation Administration (FAA) currently maintains 561 manned air traffic control (ATC) facilities, many of which are outdated and deteriorating. The average age for an en-route center is 49 years, while the average age of a terminal radar approach control facility (TRACON) is 28 years.¹ This aging infrastructure, along with FAA's work to develop the Next Generation Air Transportation System (NextGen),² has prompted the Agency to consider large-scale realignments and consolidations of its air traffic facilities. In September 2010, FAA established the NextGen Future Facilities Special Program Management Office (SPMO) to develop plans for the transformation of FAA's air traffic facilities.

Given that FAA is embarking on NextGen, and that the Agency's vast network of aging facilities has become costly to maintain, the Chairmen of the House Transportation and Infrastructure Committee and House Subcommittee on Aviation requested we review FAA's current consolidation and realignment plans and assess the major cost drivers and technical challenges. Accordingly, we (1) evaluated FAA's plans for realigning and consolidating its air traffic facilities, and (2) identified the challenges that accompany these efforts.

¹ En-route centers guide airplanes flying at high altitudes through large sections of airspace, while TRACONs guide aircraft as they approach or leave airspace within 40 miles of an airport.

² NextGen involves a significant overhaul of the National Airspace System (NAS) from a ground-based to a satellite-based air traffic management system.

We conducted our work in accordance with generally accepted Government auditing standards prescribed by the Comptroller General of the United States. Exhibit A details our scope and methodology. Exhibit B lists the entities we visited or contacted.

RESULTS IN BRIEF

FAA recently approved an initial plan to consolidate en-route centers and TRACONs into large, integrated facilities over the next two decades. This is a considerable step since our 2008 review when the Agency's focus was on the short-term and primarily on sustaining the existing air traffic control system.³ FAA's current long-term plan would divide the National Airspace System (NAS) into six segments and realign and consolidate facilities based on operations, airspace responsibility, and geographic location. The plan would start with consolidating 49 facilities in the Northeast, at an estimated cost of \$2.3 billion, beginning with a new integrated facility for managing airspace in the New York/New Jersey/Philadelphia metropolitan areas. In November 2011, FAA's Joint Resources Council (JRC)⁴ approved these initial plans, and authorized the former SPMO to proceed with a final analysis for building the first facility. Yet, before construction can begin on the first facility, FAA must make several key operational and logistical decisions, including where to build the facility. Until FAA makes these decisions, construction of the first facility could be delayed and could have a cascading effect on FAA's schedule for consolidating other locations. Also, FAA has not developed metrics to measure the effectiveness of these activities, which will be important to determine whether expected cost and productivity benefits are achieved and to adjust future plans accordingly.

Although FAA's plans for large-scale realignments and consolidations are still evolving, the Agency must address key technical, financial, and workforce challenges to successfully implement the plan. First, FAA will need to align ongoing construction projects with the current plan since some projects overlap with the recently-approved consolidation plans, creating the potential for duplication of effort and waste of funds. Second, FAA will have to make key technical decisions related to areas such as airspace boundaries and automation platforms, which will have a significant impact on the costs and schedules of modernization programs. This will require coordination among FAA's various modernization programs, including NextGen, which FAA has begun but not yet completed. Third, FAA will need to finalize cost estimates for individual

³ OIG Report No. AV-2009-012, "FAA's Management and Maintenance of Air Traffic Control Facilities," December 15, 2008. OIG correspondence and reports are available on our Web site at <http://www.oig.dot.gov/>.

⁴ The JRC is an FAA executive governance board responsible for the approval and oversight of major systems acquisitions. These acquisition and investment review processes are intended to ensure that capital investments fulfill mission priorities and that investment decisions mitigate risks, make the best use of resources, and minimize duplication of investment efforts.

integrated facility projects, given that the initial business case only provided preliminary cost data. Finally, FAA will have to address the wide-ranging impacts that facility consolidations will have on its workforce and affected communities. While FAA is aware of these challenges, it is incumbent upon the Agency to mitigate them to the extent possible as its plans for large-scale consolidations evolve. As past consolidations have shown, not addressing these challenges poses risks to achieving expected benefits.

We are making recommendations to FAA to better assist the Agency in achieving a successful facility consolidation plan.

BACKGROUND

FAA operates thousands of manned and unmanned facilities that comprise the Nation's ATC system, including 21 en-route centers and 540 TRACONs and air traffic control towers. Many of these facilities are old, have outlived their useful life, and cannot take advantage of new technologies. In 2008, we reported that while the average air traffic facility has an expected useful life of approximately 25 to 30 years, 59 percent of FAA facilities were over 30 years old. During that audit we observed obvious structural deficiencies and maintenance-related issues, including water leaks, mold, tower cab window condensation, deterioration due to poor design, and general disrepair. At that time, FAA had developed processes focusing only sustaining the existing air traffic control system and had not made key decisions regarding facility consolidations and NextGen infrastructure needs.

In 2010, FAA conducted an infrastructure analysis that found 83 percent of its facilities were in either poor or fair condition, and that the infrastructure at some facilities would not be able to support NextGen and other modernization initiatives. For example, the New York TRACON, a facility that was built in 1978, has a control room floor that does not have removable panels to accommodate wiring for automation systems and other air traffic equipment, limiting FAA's ability to install new equipment or expand its operations at that facility.

On September 1, 2010, the FAA Administrator took an important step towards replacing this aging infrastructure by establishing the NextGen Future Facilities SPMO.⁵ The SPMO was established to plan large-scale facility realignments and consolidations, develop requirements for the facilities, conduct relevant analyses, and coordinate these efforts with the Agency's other modernization programs. In May 2012, FAA integrated the SPMO into the Air Traffic Organization (ATO) and reestablished it as the Future Facilities Group. According to FAA, this organizational realignment is expected to focus the Agency's efforts and consolidate management of all air traffic facility modernization, sustainment,

⁵ FAA National Policy Order 1110.154, "Establishment of Federal Aviation Administration Next Generation Facilities Special Program Management Office," September 1, 2010.

replacement, and transformation efforts under the leadership of a single organization.

Our past work has also shown that FAA can make improvements when justifying consolidations. In June 2010, we found that while FAA had a process to evaluate the estimated costs and savings for moving the Boise TRACON functions to the Salt Lake City TRACON, the business case supporting the move was flawed, lacked transparency, and did not reflect changes in key assumptions or include up-to-date facility-level information.⁶ FAA officials later cancelled the planned transfer of staff and service from Boise to Salt Lake City.

FAA HAS INITIAL PLANS FOR LARGE-SCALE REALIGNMENTS AND CONSOLIDATIONS, BUT KEY DECISIONS REMAIN AND METRICS HAVE NOT BEEN DEVELOPED

FAA has developed an initial plan to realign and consolidate en-route centers and TRACONs into large, integrated facilities over the next two decades, beginning with consolidating facilities managing the New York/New Jersey/Philadelphia airspace. While the JRC approved these initial plans last November, key decisions, such as where to build the first integrated facility, have yet to be made, and could impact future consolidation plans. Moreover, though FAA is still in the early stages of planning, the Agency has not developed metrics to measure whether expected cost and productivity benefits from large-scale realignments and consolidations are achieved. Considering that FAA's large-scale plans span a period of 20 years in 6 segments, measuring the success of early realignments and consolidations will be critical so that FAA can determine whether it is achieving its goals and whether the Agency needs to modify plans and expectations for future efforts.

FAA Has Initial Approval for Integrating Facilities in the Northeast

FAA has recently approved an initial plan to realign and consolidate en-route centers and TRACONs into large, integrated facilities over the next two decades. This long-term plan represents considerable progress since our 2008 review, when the Agency's focus was primarily on the short-term and on sustaining the existing infrastructure. This consolidation and realignment plan would divide the NAS into six geographic segments within the continuous United States (see figure 1).

⁶ OIG Correspondence No. CC-2009-099, "Letter to the Idaho Congressional Delegation Regarding the Review of FAA's Business Case for Moving Terminal Radar Approach Control Services from Boise, Idaho to Salt Lake City, Utah," June 30, 2010.

Figure 1. Large-Scale TRACON Consolidations



Source: FAA

Within each segment, TRACONs and en-route centers would be combined into two types of facilities—each of which could house over 1,200 employees—based on operational requirements, airspace responsibility, and geographic location. The two types of facilities are:

- **Integrated Control Facilities**—provide expanded terminal airspace functions by combining TRACON operations with some en-route center operations; and
- **High Altitude Control Facilities** (“High Ops”)—control high-altitude airspace currently monitored by en-route centers, with some facilities monitoring oceanic traffic.

Under the current plan, work on a new segment would begin every other year, with four to five facilities per segment, and all segments would be completed by 2034. FAA believes that these integrated facilities will maximize operations and realize the benefits of airspace redesigns, eliminate artificial airspace boundaries caused by the current air traffic facility network, and improve internal operations. The Agency also believes that the new buildings will reduce the number of facilities requiring new equipment or upgrades, avoid the cost of maintaining aging facilities, and facilitate NextGen capabilities. (See figure 2 for an artist’s rendition of an integrated facility.)

Figure 2. Artist Rendition of an Integrated Facility



On November 16, 2011, the JRC approved initial plans to move ahead with plans to realign and consolidate facilities in the Northeast. This segment will consolidate 45 TRACONs and 4 en-route centers stretching from Chicago to New England, New York, and Philadelphia into 4 integrated facilities (see table 1). The plan, with an estimated life-cycle cost of \$2.3 billion,⁷ calls for the four integrated facilities to be built with operations transferred from the individual TRACONs by 2023.

Table 1. Proposed Northeast Integrated Facilities*

Proposed Integrated Facility	Current Facilities and Airspace To Be Transferred
Liberty Integrated Control Facility	<ul style="list-style-type: none"> • TRACONs within the New York Center's airspace, including the New York and Philadelphia TRACONs • Airspace at or below 30,000 feet from the New York Center
Lincoln Integrated Control Facility	<ul style="list-style-type: none"> • TRACONs within the Chicago Center's airspace, including the Chicago and Milwaukee TRACONs • Airspace at or below 30,000 feet from the Chicago Center
Northeast Integrated Control and High Ops Facility	<ul style="list-style-type: none"> • TRACONs within the Boston Center's airspace • Airspace at or below 30,000 feet from the Boston Center. • The facility will be co-located with operations from the New York and Boston Centers that control airspace at or above 31,000 feet, along with oceanic operations.
Great Lakes Integrated Control and High Ops Facility	<ul style="list-style-type: none"> • TRACONs within the Cleveland Center's airspace, including the Pittsburgh, Cleveland, and Detroit TRACONs • Airspace at or below 30,000 feet from the Cleveland Center. • The facility will be co-located with operations from the Chicago and Cleveland Centers that control airspace at or above 31,000 feet.

* The names of the facilities are notional, and do not indicate where FAA plans to build these facilities. See Exhibit C for a list of TRACONs and en-route centers that could potentially be transferred to each of the four integrated facilities. Source: FAA

As part of the initial approval of the overall plan, the JRC also approved plans to move forward with a final investment analysis for the Liberty facility, which includes airspace over the New York, New Jersey, and Philadelphia metropolitan areas. Some FAA and union personnel expressed concerns with starting this effort in the New York area, citing the complexity of the airspace and the impact to the NAS if problems arise. FAA officials acknowledge this risk, but stated that the current New York facilities are in need of extensive maintenance repairs and have limited room for expansion. They also stated that resolving airspace issues around New York and in the Northeast has the greatest potential return in operational efficiencies for the NAS, and that starting in New York will better facilitate FAA's

⁷ This estimate is adjusted for inflation, is calculated over a 40-year life-cycle, and includes costs associated with the planning, construction, and equipage of the facilities. It does not include airspace redesign implementation, moving personnel via a permanent change of station (PCS), program management, and other indirect costs.

implementation of the ongoing New York/New Jersey/Philadelphia airspace redesign.

Key Decisions Regarding the First Site Have Been Delayed, and the Agency Has Not Developed Metrics To Measure the Success of Its First Facility

Key decisions remain before construction of the Liberty Integrated Control Facility can begin. First, FAA has not yet selected a site for the project, and is still examining potential sites for the facility. Recently, FAA postponed its decision to approve construction for the first facility from November 2012 to May 2013. This is primarily due to delays in selecting a site for the facility and tight funding limits called for in its recently passed reauthorization. FAA officials noted that the delay will affect FAA's schedule for consolidating other locations within the first segment, though the impact has not yet been determined.

FAA's decision will involve determining complex operational, logistical, and workforce aspects of the consolidation, including the following:

- the facility's airspace boundaries and total operating positions
- the size of the building
- the total number of controllers, technicians, and other employees working at the facility
- the automation and other equipment to be installed
- transition schedules for existing facilities to move to the new building
- workforce issues, including any incentives that may be offered to facilitate the move

FAA officials stated that plans for future projects could change based on experiences with the initial locations. These adjustments may include changing the number and size of integrated facilities built, or constructing two buildings on one site to account for differences in operations.

Also, FAA has not developed metrics that measure whether expected operational efficiencies and potential cost savings from future facility realignment and consolidation efforts are actually achieved. Considering that FAA's large-scale plans span a period of 20 years in 6 segments, measuring the success of early realignments and consolidations will be critical so that FAA can determine whether it is achieving its goals, and if it needs to modify plans and expectations for future efforts.

FAA FACES KEY TECHNICAL, FINANCIAL, AND WORKFORCE CHALLENGES THAT WILL NEED TO BE ADDRESSED TO SUCCESSFULLY IMPLEMENT THE PLAN

Successfully implementing FAA's plans for large-scale realignments and consolidations—and avoiding future risks—will require the Agency to address a number of technical, financial, and workforce challenges. First, FAA will have to align current construction projects with the large-scale plan since some projects overlap with the recently-approved large-scale realignment and consolidation plans, creating the potential for duplication of effort and waste of funds. Also, FAA will have to make key decisions related to automation platforms, airspace redesign, and other technical factors associated with realignments and consolidations, finalize cost estimates for the projects, and address associated workforce and community issues.

FAA Will Need To Align Existing Construction Projects With New Realignment and Consolidation Plans To Prevent Duplication

While FAA continues to develop plans for large-scale consolidations, the Agency has essentially halted its other realignment and consolidation activities except for one small TRACON consolidation.⁸ FAA does not plan to realign or consolidate any additional terminal facilities. It has cancelled plans for consolidating the West Palm Beach TRACON functions into the Miami TRACON and has deferred previously-approved TRACON consolidations in Michigan, Ohio, and Illinois until further decisions are made.⁹ In addition, FAA has no plans to consolidate any of its en-route centers, but will focus on sustaining these facilities while it analyzes future consolidations.

Although further consolidations are on hold, FAA is moving ahead with plans to maintain or replace its aging facilities. However, FAA has not yet aligned these construction projects with its large-scale consolidation effort. The ATO's Terminal Planning branch¹⁰ maintains a Facility Master Plan that ranks the condition and needs of over 500 TRACONs and air traffic control towers. Based on this list, along with Congressionally-directed earmarks, two new TRACONs, in Cleveland, OH, and Kalamazoo, MI, were approved for construction prior to the approval of SPMO's plan. These new facilities overlap with the plan for the Lincoln and Great Lakes integrated facilities, and may no longer be needed if FAA decides to consolidate those TRACONs' functions into larger, integrated facilities.

⁸ The Abilene, TX, TRACON functions will be transferred to the Dallas/Ft. Worth TRACON as early as this October, but more likely sometime next year.

⁹ The planned consolidations included combining the Cleveland, Youngstown, Mansfield, Toledo, Akron, and Toledo, OH, TRACON functions to a new TRACON in Cleveland; combining the Muskegon, Lansing, Grand Rapids, and Kalamazoo, MI, TRACON functions into a new TRACON in Kalamazoo; and transferring the Champaign, IL TRACON functions to the Chicago TRACON.

¹⁰ In May 2012 both the Terminal and En-Route Planning branches were transferred to the ATO's Technical Services branch.

FAA officials are aware of the potential overlap, and to better synchronize these efforts, expects to make a decision on whether to consolidate the two TRACONs into integrated facilities at a later date.

FAA Will Need To Make Key Technical Decisions Regarding Integrated Facilities That Impact Future Modernization Plans

Realigning and consolidating facilities is a complex, multi-faceted undertaking, and requires decisions such as what automation and other equipment will be installed, how airspace boundaries will change when facilities are consolidated, and when air traffic operations will be transferred to the new facility. FAA's initial plans include preliminary decisions and generic information regarding these technical requirements for the first four planned integrated facilities. For example, the initial plans propose using En Route Automation Modernization (ERAM) and Terminal Automation Modernization Replacement (TAMR) as automation systems, and would consolidate operations from incoming TRACONs into the first integrated facility over a 6-year period. However, these technical decisions will not be finalized for the first facility until next spring, and FAA officials noted that technical aspects for future sites could change based on their experiences with the first integrated facility.

These decisions will also have wide-ranging impacts on the Agency's future modernization plans and budgets, including NextGen. FAA's modernization plans were based on the current facility set-up of en-route centers and TRACONs. Depending on what is decided, the integrated facility plan will require cost and schedule changes to other modernization programs that already have established baselines. As shown in the table below, this will include automation efforts such as ERAM and TAMR,¹¹ en-route and terminal voice switch programs, and the Federal Telecommunications Infrastructure (FTI) program. However, the full extent of the changes will not be known until FAA solidifies its plans for integrated facilities.

¹¹ According to FAA officials, they have no plans to build a common automation platform for integrated facilities.

Table 2. Key Modernization Programs Impacted by Large-Scale Consolidations

Program	Description
ERAM	FAA has been developing the \$2.1 billion ERAM program to replace and significantly enhance the existing hardware and software at the 20 FAA Centers that manage high-altitude air traffic. ERAM is FAA's key platform for NextGen to process flight data across the NAS.
TAMR	The TAMR program is expected to modernize or replace the terminal automation systems (displays and processors) controllers rely on to manage takeoffs and landings at 158 operational sites. FAA plans to spend over \$1 billion on modernizing and sustaining terminal automation systems from 2012 to 2018.
NAS Voice System (NVS)	FAA is planning to develop a new voice switch to control data and voice communications paths that support both terminal and en-route operations, along with new NextGen activities (i.e., Unmanned Aircraft Systems). FAA is planning to spend approximately \$120 million from 2012 to 2016 on NVS development, and finalize cost, schedule, and performance parameters for NVS by August 2012.
FTI	FTI is a \$2.4 billion system through which FAA will route data and information for all of the NextGen programs and FAA initiatives. Without FTI, NVS will be unable to complete its mission as a networked backup voice communications system.

Source: OIG, based on FAA data

These decisions will require coordination among FAA's various modernization programs from a technical, cost, and schedule standpoint. FAA has begun coordinating these efforts, and is working to identify the requirements and interdependencies needed for the first four facilities. This includes coordinating with program offices responsible for airspace and procedure changes, automation platforms, traffic flow management, communications, and surveillance, and developing "Portfolio Level Agreements" (PFLAs) that define the roles, responsibilities, and critical interdependencies that are needed to support the transition to integrated facilities. However, these agreements are not expected to be completed until the final investment decision for the first facility has been made next year.

FAA Will Need To Finalize Cost Estimates and Funding Sources To Construct the Four Integrated Facilities

FAA will also have to finalize the estimated costs for constructing, staffing, and maintaining the first four planned integrated facilities, and will have to determine how to finance construction of these projects. Gathering and quantifying this information is critical to provide decision makers with accurate cost information regarding integrated facilities. FAA's Acquisition Management System (AMS) requires the Agency to complete a business case analysis outlining alternatives, estimated costs, and projected efficiencies for large acquisitions. As shown in the

table below, the initial business case estimated that FAA will spend \$1.8 billion from FY 2011 through FY 2017, and a total of \$5.3 billion over a 40-year timeframe, to construct and maintain the four planned facilities (see table 3). This estimate includes costs for constructing the buildings and equipment acquisition; airspace redesign implementation, facility modernization and sustainment, equipment refresh, and other indirect costs; movement of personnel via permanent change of station (PCS) costs; and the personnel salary and benefit (PC&B) costs for Agency staff tasked with overseeing the four projects.

Table 3. Initial Cost Estimates for Planned Northeast Facilities (\$ in Millions)¹²

Type of Costs	FY11–FY17	FY18–Beyond	Total
Facility Construction and Equipment Costs	\$1,556.9	\$751.2	\$2,308.1
Airspace Redesign, Modernization, Sustainment, and Other Indirect Costs	\$160.2	\$2,424.2	\$2,584.4
PCS Costs	\$35.8	\$303.4	\$339.1
Program PC&B Costs	\$29.8	\$42.1	\$71.9
Total	\$1,782.7	\$3,520.8	\$5,303.5

Source: OIG, based on FAA data. Figures may not add up due to rounding.

However, the initial business case only provides preliminary cost estimates, and a more detailed cost and benefit analysis for the first integrated facility will be completed prior to the investment decision scheduled for May 2013. Also, the business cases for the other three integrated facilities will be refined as decisions regarding the final size and configuration of those facilities are made. In addition, the initial business case does not include key assumptions that will be needed to fully estimate the projected costs of integrated facilities. For example, the initial business case is site neutral, and does not consider the cost differences of different metropolitan areas when calculating projected costs. The initial business case also assumes that the number of employees will remain the same and that there will not be a labor cost savings, and it does not fully quantify future productivity and efficiency enhancements. FAA officials stated that once decisions regarding individual facility locations are made, this information will be included in future analyses. However, these officials also stated that future business cases will continue to assume no reductions in facility staff, and that decisions regarding future staffing levels will be made based on operations.

¹² This estimate is adjusted for inflation.

FAA has made improvements to weaknesses we identified with previous business case analyses. During our review of the Boise TRACON consolidation, we found that the business case supporting the move was flawed, lacked transparency, and did not reflect changes in key assumptions or include up-to-date facility-level information. In response to our concerns, FAA and the National Air Traffic Controllers Association (NATCA) developed a supplemental questionnaire that captured facility-level information regarding potential consolidations. The questionnaire, which was provided to facility management and union representatives, included questions regarding the current state of buildings and equipment, potential risks due to natural disasters, backup systems, telecommunication, and redundancy. Additional questions included housing market, commuting, education and employment, and local and national political concerns regarding realignment. However, this information was not verified by FAA Headquarters officials.

Another challenge is determining how to pay for the projects. While FAA estimated that \$2.3 billion is needed to construct and equip the four integrated facilities, last year's Capital Investment Plan (CIP) only provides about \$700 million for the projects. In order to complete the projects, another \$1.6 billion in funding is needed, with nearly \$1 billion of that by FY 2017 (see table 4).¹³ FAA is considering alternative financing sources and other acquisition strategies to pay for the projects. This includes partnerships with local and other Government agencies, public-private partnerships, and using the proposed Federal infrastructure bank. However, no decisions have been made regarding these financing options.

Table 4. Funding Estimates for Constructing Northeast Integrated Facilities (\$ in Millions, adjusted for inflation)

	FY11–FY17	FY18–Beyond	Total
Projected Facility Construction and Equipage Costs	\$1,556.9	\$751.2	\$2,308.1
Previous CIP Funding Levels	<u>\$557.7</u>	<u>\$144.1</u>	<u>\$701.8</u>
Difference	\$999.2	\$607.1	\$1,606.3

Source: FAA

¹³ In its FY 2013 budget request, FAA is requesting \$225 million for FY 2012 and \$95 million for FY 2013 to plan and build the Liberty Integrated Control Facility.

FAA Will Need To Address the Impact of Large-Scale Realignment and Consolidations on Its Workforce, Requiring Collective Bargaining With Unions

The success of FAA's plans also depends on addressing significant workforce issues. Large-scale realignments and consolidations will require the movement of thousands of employees and their families, and will impact communities gaining or losing these facilities. FAA is working closely with its bargaining units to gain consensus regarding these issues.

While NATCA leadership at the national level has stated that it supports the integrated facility concept, there may be opposition from local facilities. For example, during our visits to the New York Center and New York TRACON, FAA and union officials indicated that they would oppose plans to build an integrated facility outside of Long Island. They stated that many employees are connected to the area as life residents, have spouses who work in the area, and would be unlikely to move from the area. In addition, FAA management from the New York TRACON estimates that approximately 30 percent of its controller workforce is eligible to retire, and if forced to move to a facility outside of Long Island, many may opt to retire instead.

Realignments and consolidations also represent a change in working conditions, and will require collective bargaining with unions, most notably with NATCA. A myriad of potentially contentious issues will be subject to negotiation, such as pay, employee bidding, relocation bonuses, training, and moving expenses. For example, last June the Dayton TRACON's operations realigned to the Columbus TRACON, requiring a large number of Dayton controllers to transfer in order to meet the operational needs of the Columbus TRACON and to prevent overstaffing of the Dayton Tower. It also required Columbus controllers to certify on Dayton's TRACON positions. To accomplish this, in January 2011, FAA and NATCA signed a memorandum of understanding (MOU) that provided a total of nearly half a million dollars in incentives for 27 controllers to transfer to other facilities, along with reimbursements for temporary duty travel and moving expenses.

For upcoming consolidations and realignments, FAA will face challenges in ensuring that future agreements are cost-effective and do not present opportunities for waste or abuse. For example, a March 2001 pay rule negotiated with NATCA provided controllers transferring to the Atlanta Consolidated TRACON with half of their pay increase when they were selected to transfer and the other half when they actually transferred to the facility. However, the consolidated facility saw a 94 percent training failure rate from controllers transferring from smaller facilities. These controllers could not handle the complexity of the traffic or the additional workload, but due to the negotiated pay rule, they received a significant pay

increase just for transferring to the facility. They ultimately transferred to lower level facilities, but the rule allowed them to maintain their higher salaries.

FAA Will Need To Address the Economic and Infrastructure Impacts on Local Communities

Realigning and consolidating air traffic facilities will likely have significant economic, infrastructure, and lifestyle impacts on local communities gaining and losing facilities, as it involves moving potentially hundreds of employees across State lines. To illustrate this point, a 2009 Department of Defense contracted study examined the impacts the Base Realignment and Closure (BRAC) Commission activities had on local communities in Maryland.¹⁴ The study found that the changes, which led to the relocation of thousands of jobs to the State, had a significant impact on local services and infrastructure, such as increased demands on local hospitals, police and fire services, and schools. The study also called for the development of a plan to identify funding sources for school improvements, as well as developing a plan to address transportation concerns such as increased traffic on local and State highways.

These impacts may result in challenges or potential roadblocks to FAA's consolidation and realignment efforts that will need to be addressed. As FAA is aware with past consolidations, communities losing their facilities have taken steps to delay or prevent the moves, often based on information obtained from impacted employees and local officials. For example, during the Palm Springs to Southern California TRACON consolidation in 2007, local communities expressed concerns with the ability of the Southern California TRACON to absorb an additional 220,000 air traffic operations, including controlling aircraft in mountainous terrain and complex airspace. These communities also expressed concerns regarding the adequacy of staffing levels at the facility to accommodate the additional workload. As a result, the consolidation was delayed by 1 month as local representatives raised these issues with FAA. Similarly, local communities expressed concerns about the planned consolidation between West Palm Beach TRACON and a new facility in Miami, FL. Specifically, the community was concerned that combining the facilities might limit the ability to bring in relief supplies to south Florida, an area that is vulnerable to hurricanes. After further internal evaluation, FAA decided against combining the facility with Miami.

Past Consolidations Underscore the Risk Posed By Not Addressing Key Technical, Financial, and Workforce Challenges

Addressing the technical, financial, and workforce challenges we have outlined will be critical to the success of FAA's overall efforts. The importance of

¹⁴ "APG Regional Workforce Analysis: Chesapeake Security & Security Corridor," New Economies Strategies and AKRF, Final Report, December 2009.

addressing these challenges is underscored by the fact that previous large-scale TRACON consolidations did not realize the financial and operational benefits FAA expected.

Consolidating air traffic facilities and operations is not new for FAA, and has been the Agency's policy for decades. FAA's last major consolidation efforts occurred in the 1990s, when the Agency built a series of consolidated TRACONs in major metropolitan areas to consolidate and improve air traffic operations (see table 5). Recently, FAA has focused on single TRACON consolidations where the operations of a smaller TRACON were transferred to a larger TRACON. The most recent small consolidation occurred last June, when the operations of the Dayton, OH, TRACON were transferred to Columbus, OH.

Table 5. Previous Large-Scale TRACON Consolidations

Facility	Date Facility Commissioned	TRACONs Transferred
Southern California TRACON	1995	Los Angeles, Coast, Burbank, Ontario, San Diego, and Palm Springs
Peachtree TRACON (Atlanta)	2001	Atlanta, Macon, and Columbus
Potomac TRACON (Baltimore-Washington DC)	2002	Dulles, National, Baltimore-Washington International, Richmond, and Andrews AFB
Northern California TRACON	2002	Bay Area, Monterey, Stockton, Sacramento, and Reno
Boston TRACON	2004	Boston and Manchester

Source: FAA

In 2004, FAA completed a study that compared the projected costs, schedules, and operational efficiencies of the Atlanta, Northern California, and Potomac Consolidated TRACONs against the actual results.¹⁵ The study, along with our interviews with facility personnel, showed that (1) the costs of these consolidations were higher than originally estimated, (2) facilities were delayed in opening, and (3) operational efficiencies were not achieved (see table 6).

¹⁵ "Evaluation of Large Terminal Radar Approach Control Facilities Consolidation Benefits;" Report No. 2003-23; Original Report Date December 31, 2003; Revised April 2004.

Table 6. Cost Increases, Schedule Delays, and Other Impacts of Past Large-Scale Consolidation Efforts

Consolidated Facility	Cost Increases	Schedule Delays	Other Impacts
Atlanta Consolidated TRACON	Operations and maintenance costs were 53 percent higher than estimated, mostly due to negotiated controller pay increases.	9 months due to the unavailability of the Standard Terminal Automation Replacement System (STARS)	Operational efficiencies were not achieved due to controllers transferred from smaller facilities being unable to certify at the facility, and because of a decision to change the configuration of a proposed runway at Atlanta Hartsfield Airport, delayed the runway's completion and invalidating user benefit assumptions made during the original cost-benefit analysis.
Northern California Consolidated TRACON	Construction costs were 45 percent higher than originally estimated. ATC staffing costs were 28 percent higher due to controller pay increases.	22 months due to the unavailability of STARS and two budget cuts during construction of the project.	Due to the delay in opening the TRACON, controllers received their negotiated pay increase well before actually transferring to the new site, and caused FAA to incur close to \$400,000 in reverse commute costs for six controllers who transferred to the new TRACON early and had to commute back to their old facility to work.
Potomac TRACON (Baltimore-Washington DC)	Construction and equipage costs were 46 percent higher than estimated, due to the subsequent inclusion of the Richmond TRACON into the new facility and a change in automation systems. Staffing costs were 24 percent above budget.	7 months due to the inclusion of the Richmond TRACON, requiring an increase to the size of the building, and the unavailability of STARS.	While the consolidation resulted in improved operational coordination within the facility, it did not result in extensive airspace redesign, staff reductions, or equalizing of work between operating sectors. Facility management noted a loss of about 25 percent of the originally anticipated user benefits. The consolidation also resulted in controllers monitoring the Richmond-area airspace, a slower and less complex sector, earning the same pay as controllers monitoring busier, more complex airspace.

Source: OIG, based on FAA data

As FAA's prior efforts have shown, FAA's consolidation efforts are at risk of not producing the desired outcomes. This is in part because, in the past, FAA fell victim to many of the same workforce, technical, and other challenges we emphasized above. With FAA's new large-scale consolidation plans, FAA has a unique opportunity to proactively prevent some of the problems that it experienced in the past by addressing some of its biggest challenges early on in the planning process.

CONCLUSION

FAA's efforts to modernize the NAS are critical for meeting the anticipated demand for air travel. The extent to which FAA realigns and consolidates the Nation's air traffic control facilities will be an important—and complex—component of these efforts. FAA's plans for large-scale integrated facilities represent significant steps on the path to achieving greater operational efficiencies. However, successfully implementing this plan will require the Agency to address significant challenges and make difficult decisions regarding the cost, schedule, and technical capabilities required for the effort. As FAA's plan evolves, addressing these issues early, including learning from the experiences of prior consolidation efforts, will better position the Agency to achieve airspace and operational efficiencies, potential cost savings, or more importantly, the benefits from NextGen.

RECOMMENDATIONS

To assist FAA in achieving a successful facility consolidation plan, we recommend that FAA:

1. Develop a process to regularly update stakeholders regarding decisions associated with large-scale facility realignments and consolidations, including decisions regarding where the first facility will be built.
2. Develop metrics that quantify the expected operational and cost efficiencies from future realignments and consolidations. At a minimum, these metrics should provide baseline data that can be used to measure whether these efficiencies are being achieved, and allow the Agency to adjust future plans and expected efficiencies in a timely manner as it moves forward with future realignments and consolidations.
3. Complete internal agreements between the Future Facilities Group, NextGen, and other ATO organizations to coordinate its large-scale realignments and consolidations efforts with other NextGen and modernization programs.
4. Develop comprehensive and regularly updated cost estimates that include, at a minimum, estimates for construction, equipment, increased salaries, relocation expenses, and training.
5. Further assess the cost, technical, operational, and workforce risks associated with individual realignments and consolidations, and develop risk mitigation plans for them.

AGENCY COMMENTS AND OFFICE OF INSPECTOR GENERAL RESPONSE

We provided FAA with our draft report on May 10, 2012, and received its formal response on June 15, 2012. FAA's response is included in its entirety as an appendix to this report. FAA concurred with all five of our recommendations and proposed appropriate action plans. Based on FAA's response, we believe the Agency met the intent of all five recommendations, which will remain open pending completion of the planned actions. However, we are requesting that FAA provide target completion dates for recommendations 4 and 5.

For recommendation 4, FAA stated that it has developed lifecycle program cost estimates, and is also refining the data to develop more accurate construction and equipment, personnel, and training costs. However, continued revision and refinement of cost estimates are critical for a long-term effort of this magnitude, especially given that the final investment decision for the first Integrated Control Facility is scheduled for May 2013. Therefore, we are requesting that the Agency provide specific target action dates for how often and when the cost information is expected to be updated.

For recommendation 5, FAA's proposed actions meet the intent of our recommendation. However, as our report states, the Agency's consolidation efforts are at risk of not producing desired outcomes, and addressing challenges early in the planning process—to mitigate risk—will position FAA to better manage the effort and realize the expected benefits. Therefore, to allow us to measure FAA's progress, we request that FAA provide our office with target completion dates for any future risk assessments of its efforts.

Additionally, since we issued our draft report, FAA has restructured its large scale consolidation planning and oversight office, which is cited in the Agency's response. We met with the Air Traffic Organization's Director of Technical Operations, Air Traffic Control Facilities, and the Director of Terminal Planning, who explained the purpose and intent of the reorganization. Accordingly, we have modified our final report to reflect the organizational changes where applicable.

ACTIONS REQUIRED

FAA's planned actions for all five recommendations are responsive, and its target action dates for recommendations 1, 2, and 3 are appropriate. However, in accordance with DOT Order 8001.C, we request that FAA provide our office, within 30 days of this report, with target action dates for recommendations 4 and 5. All five recommendations will remain open pending receipt of documentary evidence that appropriate corrective actions are complete.

We appreciate the courtesies and cooperation of FAA representatives during this audit. If you have any questions regarding this report, please contact me at (202) 366-1427, or Barry DeWeese, Program Director, at (415) 744-0420.

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cc: Pierre McLeod, AAE-100
Martin Gertel, M-1

EXHIBIT A. SCOPE AND METHODOLOGY

We conducted this performance audit between February 2011 and May 2012 in accordance with generally accepted Government auditing standards prescribed by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives. The following scope and methodology were used in conducting this review.

To determine FAA's plans for realigning and consolidating its air traffic facilities, we met with officials from the SPMO and the ATO's Terminal and En-Route Planning groups to determine FAA's near- and long-term realignment and consolidation efforts, as well as the Agency's continuing efforts to replace and modernize its facility infrastructure. We also reviewed the initial business case provided to the JRC justifying the initial consolidation plan, supporting documentation for the initial business case, as well as SPMO and other FAA briefing materials to identify preliminary milestones, projected cost, and the Agency's approach for implementing its large-scale realignment and consolidation plans.

To determine the challenges involved with realigning and consolidating air traffic facilities, we reviewed draft intra-Agency agreements and technical documents supporting the initial business case. We also met with FAA officials to determine the technical interdependencies needed for the SPMO's plan to be successful, and its impact on FAA's other modernization efforts. Also, we reviewed the initial business case and its underlying assumptions to determine the completeness of the cost and funding estimates for the first segment and the assumptions used in the business case, and we discussed these aspects with SPMO officials. In addition, to determine the lessons learned from previous realignments and consolidations, we interviewed FAA, NATCA, and PASS National officials at the national level and at 15 air traffic facilities that had either gone through a previous consolidation or are being considered for future realignments and consolidations. We reviewed collectively-bargained MOUs, pay rules, and other agreements made with NATCA, and an April 2003 ATO report on three previous large TRACON consolidations. Finally, we reviewed a December 2009 Department of Defense study on the impacts of previous BRAC realignments to illustrate potential infrastructure and other community issues that realignments and consolidations may have on local communities.

EXHIBIT B. ORGANIZATIONS VISITED OR CONTACTED

FAA Headquarters, Washington, DC

- NextGen Future Facilities Special Program Management Office (SPMO)
- Air Traffic Organization, Terminal Services, Terminal Planning
- Air Traffic Organization, Strategy and Performance
- Air Traffic Organization, En-Route Operations
- Air Traffic Organization, NextGen and Operations Planning

FAA Facilities (ATCT, TRACON and ARTCC)

- Potomac Consolidated TRACON
- Reno ATCT
- Northern California Consolidated TRACON
- Palm Springs ATCT
- Southern California Consolidated TRACON
- Dayton ATCT
- Columbus TRACON
- Mansfield ATCT/TRACON
- Canton-Akron ATCT/TRACON
- Cleveland TRACON
- New York TRACON
- New York En-Route Center
- Atlanta Consolidated TRACON
- West Palm Beach ATCT/TRACON
- Miami ATCT/TRACON

Industry Groups

- National Air Traffic Controllers Association (NATCA)
- Professional Aviation Safety Specialists (PASS) National
- Aviation Management Associates

EXHIBIT C. PLANNED SEGMENT 1 INTEGRATED FACILITIES*

Liberty Integrated Control Facility	Lincoln Integrated Control Facility
<p>Incoming Facilities: New York TRACON, New York En-Route Center (partial), Philadelphia TRACON, Allentown TRACON, Wilkes-Barre TRACON, Binghamton TRACON, Elmira TRACON, Harrisburg TRACON, Reading TRACON</p> <p>Radar Positions: 86</p> <p>Total ATC Positions: 169</p> <p>Certified Controllers: 625</p> <p>Technicians: 156</p> <p>Management/Other Staff: 57</p> <p>Total FTEs: 838</p>	<p>Incoming Facilities: Chicago TRACON, Chicago En-Route Center (partial), Milwaukee TRACON, Kalamazoo TRACON, Fort Wayne TRACON, Grand Rapids TRACON, Muskegon TRACON, South Bend TRACON, Waterloo TRACON, Cedar Rapids TRACON, Champaign TRACON, Quad City TRACON, Madison TRACON, Peoria TRACON, Rockford TRACON</p> <p>Radar Positions: 99</p> <p>Total ATC Positions: 174</p> <p>Certified Controllers: 730</p> <p>Technicians: 208</p> <p>Management/Other Staff: 42</p> <p>Total FTEs: 980</p>
Great Lakes Integrated Control and High Ops Facility	Northeast Integrated Control and High Ops Facility
<p>Facilities: Detroit TRACON, Cleveland TRACON, Cleveland En-Route Center (partial), Chicago En-Route Center (partial), Flint TRACON, Lansing TRACON, Saginaw TRACON, Mansfield TRACON, Toledo TRACON, Buffalo TRACON, Akron-Canton TRACON, Clarksburg TRACON, Erie TRACON, Rochester TRACON, Youngstown TRACON, Pittsburgh TRACON</p> <p>Radar Positions: 123</p> <p>Total ATC Positions: 241</p> <p>Certified Controllers: 920</p> <p>Technicians: 224</p> <p>Management/Other Staff: 139</p> <p>Total FTEs: 1,283</p>	<p>Facilities: Boston TRACON, Boston En-Route Center (partial), New York En-Route Center (partial), Albany TRACON, Cape TRACON, Yankee TRACON, Bangor TRACON, Burlington TRACON, Providence TRACON, Portland TRACON, Syracuse TRACON</p> <p>Radar Positions: 88</p> <p>Total ATC Positions: 201</p> <p>Certified Controllers: 716</p> <p>Technicians: 244</p> <p>Management/Other Staff: 67</p> <p>Total FTEs: 1,027</p>

* The names of the facilities are notional, and do not indicate where FAA plans to build these facilities.

EXHIBIT D. MAJOR CONTRIBUTORS TO THIS REPORT

<u>Name</u>	<u>Title</u>
Barry DeWeese	Program Director
Frank Danielski	Project Manager
Craig Owens	Senior Analyst
Andrew Sourlis	Analyst
Wayne Van De Walker	Auditor
Audre Azuolas	Writer/Editor



Federal Aviation Administration

Memorandum

Date: June 15, 2012

To: Jeffrey B. Guzzetti, Director, Assistant Inspector General for Aviation and Special Program Audits

From: H. Clayton Foushee, Director, Office of Audit and Evaluation, AAE-1 

Subject: FAA Response to OIG Draft report Air Traffic Facility Realignments and Consolidations

Managing an infrastructure as vast and complex as the Nation's air traffic control system requires constant focus on technology, methodology and physical facilities. FAA recognizes that the implementation of the Next Generation Air Transportation System (NextGen) set of technologies offers an important opportunity to reexamine its physical plant in terms of the nature and distribution of air traffic control facilities and its overall approach to air traffic management. We appreciate the Office of Inspector General (OIG) recognition of FAA's familiarity with the challenges involved and its constructive approach, which further validates FAA's efforts to achieve greater operational efficiencies leading to cost savings.

FAA continues to focus on improving and consolidating its air traffic facilities, though its approach has changed somewhat since the issuance of the draft report. Specifically, the NextGen Facilities Special Program Management Office (SPMO) has been integrated into the Air Traffic Organization (ATO), and reestablished as the Future Facilities Program. This organizational realignment more clearly focuses FAA's efforts and consolidates management of all air traffic facility modernization, sustainment, replacement, and transformation efforts under the leadership of a single organization.

Planning for the first Integrated Control Facility (ICF) – the ICF servicing New York area—is currently underway. FAA is working with all stakeholders, external and internal, to gain the fullest possible participation and complete the project successfully.

RECOMMENDATIONS AND RESPONSES

Recommendation 1: Develop a process to regularly update stakeholders regarding decisions associated with large-scale facility realignments and consolidations, including decisions regarding where the first facility will be built.

FAA Response: Concur. FAA's air traffic control facility realignments and consolidations will impact hundreds of employees and multiple communities. Communicating with these stakeholder groups will be crucial in order to develop support for facility realignment and consolidation decisions. The FAA has identified key internal and external stakeholders (e.g. employees, communities, industry groups, Congress) and is planning to regularly update these stakeholders on FAA's deliberations and progress. FAA recognizes the importance of communicating key benefits of these actions, helping employees understand why the changes are occurring and addressing questions and concerns of all stakeholder groups.

The communications plan for the facility realignment and consolidation effort is being drafted, and will be finalized once a Final Investment Decision (FID) is made for the first facilities transformation project (the ICF servicing New York), which is expected by May 31, 2013.

Recommendation 2: Develop metrics that quantify the expected operational and cost efficiencies from future realignments and consolidations. At a minimum, these metrics should provide baseline data that can be used to measure whether these efficiencies are being achieved, and allow the Agency to adjust future plans and expected efficiencies in a timely manner as it moves forward with future realignments and consolidations.

FAA Response 2: Concur. The FAA's NextGen Future Facilities Program is identifying operational and cost efficiency metrics that will provide a reliable baseline to measure the expected improvements following the completion of the planned ICF design for the New York area. These metrics will provide the basis for developing a cost/benefit analysis comparing the current facility mix versus a new ICF. Final metrics will be documented in the program's Acquisition Program Baseline (APB) and will conform to FAA's current Acquisition Management System (AMS) policy. The APB will be part of the ICF supporting the New York Final Investment Analysis package.

The metrics developed for the ICF servicing New York project will be reviewed and updated for subsequent large-scale realignments and consolidations, as they are planned, designed, and implemented. The metrics will be identified in the FID, which is expected by May 31, 2013.

Recommendation 3: Complete internal agreements between the SPMO, NextGen, and other ATO organizations to coordinate its large-scale realignments and consolidations efforts with other NextGen and modernization programs.

FAA Response 3: Concur. The NextGen Future Facilities Program is actively pursuing the establishment of Portfolio-level Agreements (PFLAs) with other critical acquisition programs across the FAA. The primary goal of these PFLAs is to inform FAA of other critical acquisition programs, formalize and coordinate the work required to deliver the first ICF servicing New York, and ensure successful project delivery. The PFLAs will define the critical dependencies, determine governance structure and authority and establish the processes to manage programmatic risk. PFLAs will be continuously developed throughout the process on an as needed basis. The FAA expects to complete the PFLA for the ICF servicing New York by May 31, 2013. Finally, the integration of the SPMO into ATO will also help to ensure full coordination and awareness of ICF requirements with other aspects of modernization.

Recommendation 4: Develop comprehensive and regularly updated cost estimates that include, at a minimum, estimates for construction, equipment, increased salaries, relocation expenses, and training.

FAA Response 4: Concur. The FAA developed comprehensive lifecycle program cost estimates to support its Initial Investment Decision (IID) business case analysis and budget requests. The FAA gathered and analyzed data, developed methodologies, and created the cost model to meet the Initial Investment Analysis cost estimating requirements. These requirements were based on the FAA's AMS guidelines and GAO cost estimating guidelines.

Following IID in November 2011, the program has begun a thorough and complete review and refinement of the cost data, methodologies, and tools. Further refinement of cost analysis methodologies and development of higher confidence cost estimates are underway. Specifically, the program is prioritizing construction and equipment costs, implementation costs including project management and logistics support, as well as personnel-related costs including compensation and benefits, permanent change of station and training costs. Methodologies and assumptions are systematically reviewed and revised based on portfolio member input, ensuring the most accurate and current lifecycle cost estimate through validation activities. The program recognizes that a high fidelity estimate is crucial for the program to establish an achievable APB at FID. The APB will become the basis for programmatic Earned Value Management throughout the implementation phase. Future project cost estimates will be generated at a higher level of fidelity as actual costs are incorporated from previous projects, as the realignment and consolidation effort matures.

Recommendation 5: Further assess the cost, technical, operational, and workforce risks associated with individual realignments and consolidations, and develop risk mitigations plans for them.

FAA Response 5: Concur. The business case processes for the individual/ongoing realignment and consolidation efforts have evolved to be more inclusive of stakeholder needs. The current business case process for individual realignments and consolidations

provides a framework that was developed by FAA to capture the initial cost, technical, operational, and workforce risks for each effort.

Supplementary questionnaires will be collaboratively developed by FAA and Labor to capture local management and union concerns – as a component of the future realignment efforts. The findings from these questionnaires will provide FAA leadership with a greater understanding of workforce perspective on risks, and the foundation for a targeted communications and risk mitigation approach. A Transition Management Plan will provide final risk mitigation strategies and plans, and will include controller training, staffing, backfill overtime and other considerations.

Additionally, the FAA will respond to the P.L. 112-95 Section 804, “Consolidation and Realignment of FAA Services and Facilities” requirement to develop a National Facilities Realignment and Consolidation Report. The plan will communicate the FAA’s long-term vision for facilities transformation. The plan will be submitted to the Committee on Transportation and Infrastructure of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate.