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# *Office of the Inspector General*

# *Audit Report*

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*Management Advisory Memorandum on Acquisitions  
for Automated Flight Services*

*Report Number: AS-FA-7-003*  
*Date: December 16, 1996*



ACTION: Management Advisory Memorandum  
on Acquisitions for Automated Flight Services  
Report No.

Raymond J. DeCarli  
Associate Deputy Inspector General

Stefani:x60500

Federal Aviation Administrator

Federal Aviation Administration (FAA) has been modernizing the flight service system since 1978 by providing pilots (primarily general aviation) with improved flight planning and filing, weather briefings, communications, and emergency services essential for safe and efficient flight. These improvements were accomplished through consolidation and automation. Flight service system modernization continues with FAA's planned procurement of the Operational and Supportability Implementation System (OASIS), a \$128 million program which will replace the existing flight service automation system (FSAS). The FSAS is now an outdated system with supportability and capacity problems as well as an inability to incorporate future enhancements.

As Federal budgets continue to decline, FAA needs to fully examine ways of reducing operations and acquisition costs. As noted in the Vice President's Third Report of the National Performance Review, "Common Sense Government: Works Better and Costs Less," Americans want a Government that is more businesslike and better managed. The reinvention of Government begins by focusing on core mission competencies and service requirements. Reinvention must consider a wide range of options, including the consolidation, restructuring or reengineering of activities, and privatization options. The objective of this review is to determine whether FAA's acquisitions for automated flight services will meet users' needs in a cost-effective manner.

FAA's operations costs for the contiguous United States (CONUS) Automated Flight Service Stations (AFSS) for Fiscal Years (FY) 1994 and 1995 were \$421 million and \$401 million, respectively. Flight service operations costs for those years amounted to approximately 9 percent of FAA's operations budget. In our opinion, FAA has an opportunity to substantially reduce costs by exploring consolidations of AFSSs and closure of the auxiliary (nonautomated) flight service stations (FSS) in CONUS. FAA should also explore innovative acquisition strategies to maximize the benefits of existing and emerging technologies, as well as providing flight services in other ways. While FAA recognized the cost reduction potential of closing the 16 designated auxiliary FSSs and has included this plan in its FY 1997 budget submission, additional cost savings can be realized.

**BACKGROUND**

In January 1978, FAA published its Flight Service Station Automation Master Plan (Master Plan) for modernizing the flight service system and in 1980 funding for the program was approved by Congress. The primary objective was to provide pilots with significantly improved access to flight planning, weather communications, and emergency services essential for safe and efficient flight. A secondary objective was to improve the efficiency and productivity of the increasingly expensive and labor intensive FSS network by consolidating 318 FSSs into 61 automated FSSs. FAA planned to modernize these facilities by replacing the two leased systems used by the FSSs (one for obtaining weather information from the National Weather Service for pilot briefings and the other for forwarding flight plans filed by pilots to various FAA air traffic control facilities) with a new automated system. FAA implemented the FSAS, which simplified filing of flight plans, and

consolidated, automated, and improved other FSS functions. Today there are 56 AFSSs located in CONUS; 3 in Alaska, 1 in Hawaii, and 1 in Puerto Rico.

Automating FSSs did not proceed smoothly. A contract was signed in 1981 for the development of both a Model 1 and Model 2 system. Between 1986 and 1987, 39 Model 1 systems were commissioned. In addition to the automated position equipment at the 39 FSSs, the Model 1 system also included flight service data processing systems (FSDPS) at 13 Air Route Traffic Control Centers (ARTCC). The Model 2 system, however, was never developed. Delays with Model 2, which was supposed to provide automated graphic weather data to the flight service specialists, resulted in FAA authorizing the regions to procure interim weather graphics systems until Model 2 or an approved alternative became available.

The planned Model 2 FSAS was replaced by 3 subsystems. The first of these subsystems was the Model 1 Full Capacity (M1FC), which includes enhanced hardware and software for the AFSS, aviation weather processors, and FSDPS at all 21 ARTCCs. The second subsystem was the interim graphic weather display system at AFSSs, for which there are at least 17 contracts with 3 separate vendors. The last subsystem was the Direct User Access Terminal Service (DUATS), which is a commercial service that allows pilots with an automated capability to file, amend, or cancel flight plans and to obtain pre-flight information, including weather and notices to airmen.

The existing flight service system has two major deficiencies: age and failure to satisfy future operational requirements (including the capability to display multiple sets and lists, highlight and transfer data displays, overlay weather displays, and integrate weather graphics with flight routes). In addition, the M1FC will not interface with systems FAA is developing and procuring such as the Weather and Radar Processor System. Although the FSDPS and aviation weather processor hardware can be maintained through the year 2000, the M1FC is at its capacity and performance limits, and is no longer supported by its manufacturer.

In response to the numerous equipment deficiencies (hardware and software) with the existing flight service system, FAA initiated the OASIS Program which will incorporate FSAS Computer Replacement (formerly referred to as the NEXTGEN), DUATS, and the National Graphic Weather Display System (GWDS) into one system. The OASIS Program will be one of the first systems to be procured using FAA's new acquisition management system.

## **SCOPE**

Our review was conducted from December 1995 through April 1996. We met with OASIS Program officials, attended monthly status briefings for tower/flight services, and reviewed documentation at FAA Headquarters in Washington, D.C. We also interviewed representatives of the National Association of Air Traffic Specialists for their perspective on the current and future roles and responsibilities of the flight service specialists. In addition, we visited one ARTCC and two AFSSs to gain an understanding of the existing flight service architecture and how it operates. We spoke with Air Traffic and Airway Facilities personnel at the facilities to identify problem areas with the current system that could be alleviated with the OASIS procurement. Also, we visited five vendors to view firsthand the weather capabilities currently available and discuss what future weather capabilities each vendor anticipated they would have to offer for the OASIS procurement.

## **OIG OBSERVATIONS**

FAA initiated the OASIS procurement on April 23, 1996, with a vendors' conference in Washington D.C. Vendors were informed of the number and locations of the AFSSs as well as the process leading toward source selection and award of the OASIS contract. We have two concerns with FAA's plan for acquiring automated flight services--consolidation of AFSSs and FAA's current acquisition strategy. In our opinion, FAA has an opportunity to substantially reduce flight service

operating and acquisition costs by consolidating AFSSs and evaluating additional alternatives to satisfy its mission need.

On June 12, 1996, FAA's Flight Service Future Architecture Working Group briefed the Associate Administrators for Air Traffic Services and Research and Acquisitions on the results of its evaluation. Their conclusions validated our observations that significant resources can be saved by consolidating AFSSs and exploring the potential of providing flight services in other ways. While this effort is an excellent first step, FAA needs to perform comprehensive analyses to determine the optimum number and location of AFSSs, as well as the most cost-effective manner to provide flight services. These analyses should be completed before an OASIS contract award. A more detailed discussion of these issues follows.

### **Consolidation**

In our opinion, FAA can realize substantial resource savings through further consolidation of AFSSs. Current technology provides FAA the ability to provide the same or increased level of flight services from fewer numbers of facilities without compromising safety. The following discussion summarizes FAA's prior efforts in modernizing the flight service system, examines current operating and cost efficiencies, and highlights potential benefits of further consolidation.

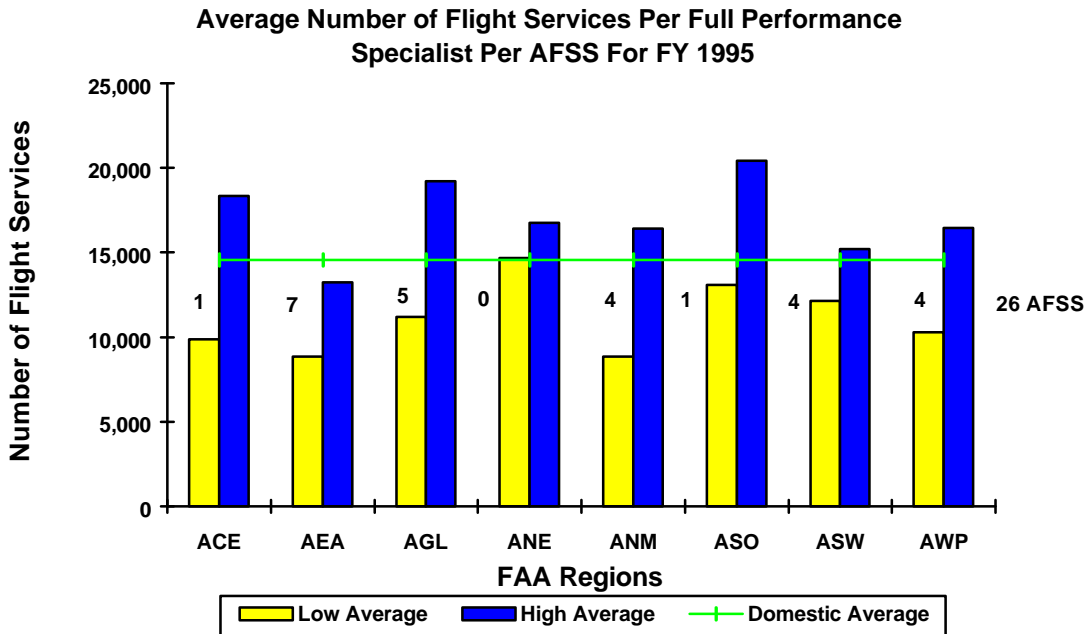
### Prior Modernization Efforts

In the 1980's, FAA planned to reduce costs of providing flight services to pilots through consolidation and automation of FSSs. FAA's 1978 Master Plan initially called for automating at least 43 of the most active FSSs followed by collocation and consolidation of the domestic FSSs into 20 new hub facilities at the ARTCCs. However, FAA later changed its plans. In the Addendum to the Master Plan, dated March 28, 1980, FAA decided on automating FSSs at 61 major centers of general aviation, eliminating the collocation of FSSs at ARTCCs, and providing for the consolidation of existing FSSs into the 61 new facilities.

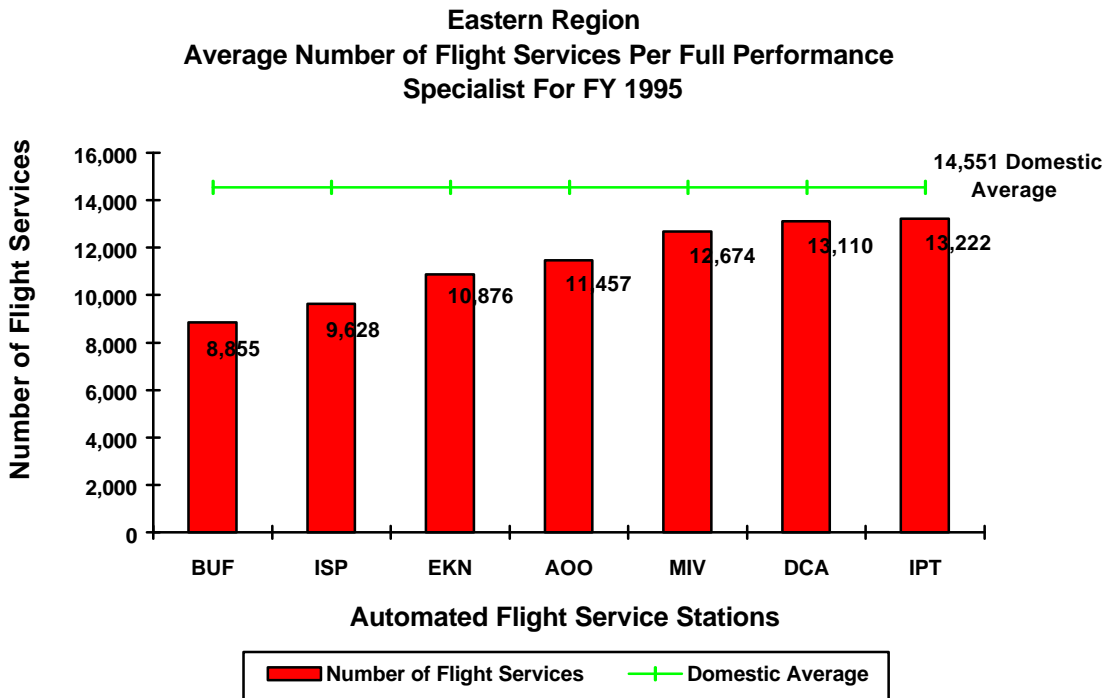
FAA considered a number of factors such as general aviation activity, equalizing workload distribution between facilities, and utilizing existing equipment and locations to the extent practical in arriving at the final number and tentative locations of the FSSs to receive automation. A significant factor in changing from the 20 hub facilities concept to 61 AFSSs was the outcome of operational tests at the Washington FSS, in Leesburg, Virginia. This project involved the collocation and consolidation of three FSSs to the Leesburg, Virginia, ARTCC. FAA concluded from the initial test project that there were no significant operational or cost advantages to be realized through collocation. Additionally, FAA expressed concern that collocation had the negative consequence of isolating the system from the principal users--General Aviation. We note, however, that FAA's same tests also demonstrated that significant benefits were attainable through consolidation, including increased capacity to provide service, more efficient staff utilization, more equitable workload distribution, and net decreases in administrative overhead costs.

### Current Operating and Cost Efficiencies

Today, following consolidation to 56 CONUS facilities, we found wide variations in operating and cost efficiencies among FAA regions. In analyzing the operating efficiency of the full-performance level flight service specialists, we calculated the overall domestic average (mean) number of flight services per specialist to be 14,121 and 14,551 during FYs 1994 and 1995, respectively. The average flight services per specialist ranged from 6,770 to 19,059 in FY 1994 and 8,855 to 20,423 in FY 1995. We also compared each AFSS facility's average number of flight services per specialist with the overall domestic average and concluded that 30 of the 56 AFSSs had a lower average for FY 1994 and 26 for FY 1995. The results for FY 1995 are illustrated in the following graph.

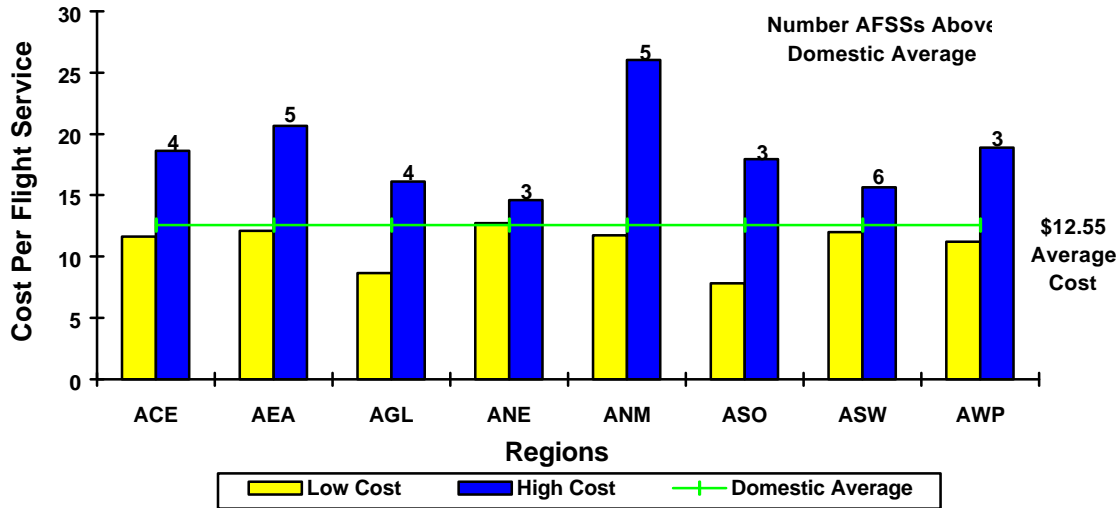


FAA's Eastern Region had the lowest average number of flight services per specialist. This region's specialists averaged 11,653 flight services or 20 percent below the domestic average. As shown in the graph below, not one of the Eastern Region's AFSSs performed up to the domestic average.



Additionally, we found that FAA's cost per flight service varied greatly among regions. The 56 AFSSs provided approximately 31.9 million flight services during FY 1995 at a domestic average cost per flight service of \$12.55. As shown in the graph below, the average AFSS cost per flight service in FY 1995 ranged from \$8 to \$26. Thirty-three AFSSs were higher than the domestic average with 13 averaging over \$15 per flight service transaction.

**Average Cost Per Flight Service By Region  
For FY 1995**



We note that at the time FAA's Master Plan was developed and approved, the extended forecasts predicted that total flight services would increase from 55 million in 1976 to 142 million by 1995. Currently, flight services are estimated at 33.8 million for FY 1996 decreasing to 32.5 million in FY 2000. FAA has been expending over \$400 million dollars annually to operate and maintain the CONUS AFSSs and can no longer afford to continue to do business as usual. In our opinion, the data clearly indicate a need for FAA to further evaluate its distribution of workload and alternatives for achieving greater operating and cost efficiencies in providing flight services to its users.

Potential Benefits of Consolidation

FAA can significantly reduce costs by performing comprehensive efficiency analyses of the 56 CONUS AFSSs and subsequently implementing further consolidations of AFSSs. As an example of potential savings that can be realized, in 1995, FAA's Western Pacific Region Air Traffic Division and facility management at Riverside, Hawthorne, and San Diego AFSSs (in partnership with the National Association of Air Traffic Specialists) initiated a study to determine the feasibility of further consolidating AFSSs. All three of the Southern California facilities are leased and are located within 100 miles of each other. The study evaluated four basic options: (1) consolidating the three facilities into two existing leased facilities, (2) consolidating the three facilities into one existing leased facility, (3) consolidating all three facilities into an existing federally owned structure, and (4) maintaining the status quo of operating three independent facilities. Items evaluated in the analysis include building leases, permanent change of station moves, salaries, utilities, telecommunications, GWDS costs, and janitorial services. Regional officials also considered other consolidation factors such as current and projected staffing requirements, traffic counts, and operating positions and equipment. Results of the study indicated that annual cost savings for the three consolidation options ranged from approximately \$1 million to \$2.67 million. Additionally, the study concluded that recurring administrative costs can be significantly reduced, although the analysis did not quantify the amounts. Option three, consolidating all three facilities into an existing federally owned structure, offered the greatest savings opportunity. Western Pacific Region projected a 10-year net savings of approximately \$19.1 million.

This initial regional effort to evaluate consolidation of the AFSSs could serve as a model for FAA to conduct similar analyses to identify ways of improving efficiency and reducing costs. Since most of the AFSSs are in leased space, FAA has the opportunity to easily move out. FAA should consider collocation of AFSSs at the new Metroplex Control Facilities, Terminal Radar Approach Controls,

and ARTCCs. For example, considerable space will become available beginning in 1998 at ARTCCs when the Display System Replacements (new controller workstations) are deployed in the new control rooms built for the Advanced Automation System Program and the old equipment is removed.

Current technology is not an impediment to consolidation. During our review, we spoke with potential OASIS vendors and determined that from a technological standpoint, it is possible to provide the entire flight service function from a single facility. However, these vendors recommended having at least two locations in case of a failure. Furthermore, FAA's Flight Service Future Architecture Working Group concluded that functional and/or facility consolidation will be required to match human resources with service demand. The working group recommended that a team determine the optimum number of facilities and their location and that the OASIS acquisition should reflect the optimization plan. Consequently, FAA should reevaluate consolidation and/or collocation of AFSSs before proceeding with the OASIS procurement.

### **Acquisition Strategy**

The OASIS Program has been designated a 'Pilot Acquisition' under the new FAA Acquisition Management System. With valuable resources steadily declining and increasing emphasis on fiscal responsibility, FAA must ensure that the acquisition strategy for the OASIS procurement is the most cost-beneficial means to continue modernizing and fulfilling the flight service mission. To do so, FAA should not only reexamine leasing versus buying the hardware and software for FAA to provide flight services but also consider having the private sector provide the full range of flight services from the pre-flight function to the entire flight service function (including air traffic specialists).

### **Alternatives Analysis**

FAA's alternatives analysis for OASIS did not evaluate all viable approaches to meeting the mission need. The OASIS cost-benefit analysis, dated October 1995, assessed three alternatives for acquiring hardware and software. The first was a phased approach which entailed the establishment of three separate acquisition programs for AFSS, total FSAS system replacement, and DUATS. The second alternative was a single acquisition with a three phase program, whereby phase one replaced the AFSSs, phase two replaced the aviation weather processors and FSDPSs, and phase three added DUAT service and pre-planned product improvements. The third alternative was a single acquisition program for total FSAS system replacement, including DUATS integration, with maximum utilization of commercial-off-the-shelf (COTS)/nondevelopmental items.

The cost-benefit analysis concluded that the COTS-based Alternative 3 was the most cost-beneficial alternative with a benefit to cost ratio of 3 to 1. In conjunction with the cost-benefit analysis, a lease versus buy analysis was also conducted in October 1995. Results of that analysis indicated that leasing the system was more expensive than purchasing the system. However, a significant portion (approximately 35 percent) of the leased system's life-cycle cost was for hardware maintenance support. Program officials indicated that FAA is reexamining the maintenance requirement and the lease versus buy issue and will request offerors to submit cost data for both leasing and purchasing the system.

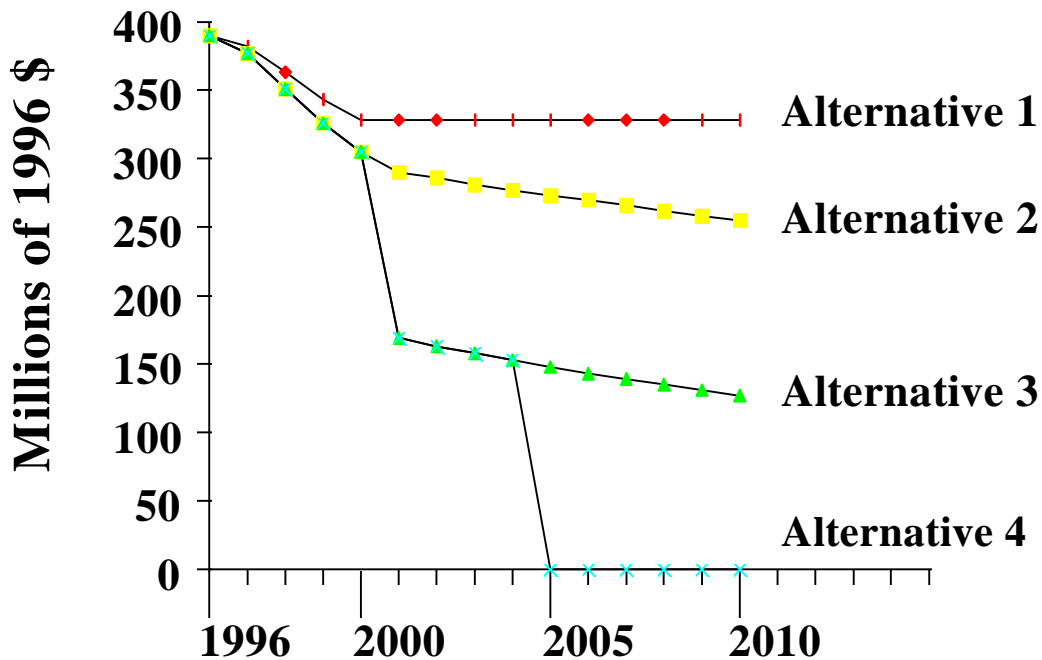
In our opinion, FAA also needs to include an alternatives analysis of the private sector providing the full range of flight services from the pre-flight function to the entire flight service function. We note that the flight service function could be provided similar to FAA's Contract Tower Program (Government owned/contractor operated). The objective of this program is to reduce costs to the Federal Government by contracting out the operation of low-activity air traffic control towers, while assuring that an efficient network of control towers is maintained to provide safe and effective service to users of the National Airspace System. By the end of FY 1996, FAA will have 134 towers operated under contract. In its FY 1997 budget submission, FAA stated that since the Contract



Tower conversion process started, in-house tower operations costs have been rising faster than contract tower costs and the Government will realize greater savings than planned. Besides the Government owned/contractor operated type program, the flight service function could also be provided as a contractor owned/contractor operated operation. For instance, the current DUATS service is owned and operated by a contractor. We visited two potential OASIS vendors who stated that providing the entire flight service was technologically feasible and were very willing to provide the service.

FAA's Flight Service Future Architecture Working Group evaluated four alternatives: (1) continue the service as currently provided; (2) encourage users to become more self-reliant taking advantage of direct access technology; (3) commercialization of pre-flight services; and (4) commercialization of all flight service functions. As illustrated in the following graph, FAA's preliminary analysis shows annual savings from about \$250 million if the pre-flight portion of the flight service function is commercialized to \$400 million if the entire service is commercialized with users paying for the services received.

## *Economic Analysis: Annual Costs As Shown In FAA's Preliminary Analysis*



In our opinion, FAA should be moving toward somewhere between Alternatives 3 and 4. All pre-flight and most in-flight services can be performed in the commercial sector. After extensive analysis, FAA may find that a few functions such as search and rescue, customs and law enforcement support, and emergency services may need to be kept in-house. However, these functions account for a very low volume of transactions and could be performed from a single site or possibly at other FAA facilities such as the ARTCCs. Notwithstanding the potential political and union pressure opposing the private sector providing the flight service function, FAA, before making an OASIS

contract award should perform an extensive evaluation of the full range of alternatives. As part of the alternatives evaluation, FAA should establish a detailed transition plan to map its course and realize benefits as early as possible.

### **Recommendations**

We recommend that FAA, before making an OASIS contract award:

1. Perform comprehensive cost and efficiency analyses of the CONUS AFSSs, and fully consider further consolidation and/or collocation.
2. Complete an extensive evaluation of the private sector providing the full range of flight services from the pre-flight function to entire flight service function. The evaluation should also include a transition plan to map its course and realize benefits as early as possible.

### **Management Response**

In the November 5, 1996, response to the July 9, 1996, draft advisory memorandum, FAA partially concurred with Recommendations 1 and 2. In response to Recommendation 1, FAA agreed to perform a comprehensive cost and efficiency analysis of the CONUS AFSSs to determine the implementation of future consolidations and/or collocations of AFSS facilities. The completion of the CONUS AFSS analyses is estimated to be within 6 months. Regarding Recommendation 2, FAA agreed to complete an extensive evaluation of a full range of alternatives for providing flight services. FAA did not, however, agree that the CONUS AFSS's analyses or extensive alternatives evaluation should be complete before contract award because the acquisition strategy for OASIS includes options that specify incremental numbers of systems for acquisition and deployment. In addition, this strategy gives FAA the flexibility to stop production of OASIS based on the results of these analyses. FAA's complete response is included as the appendix to this report.

### **Audit Comments**

Actions taken and planned meet the intent of Recommendations 1 and 2. While FAA did not agree to complete CONUS AFSS analyses or extensive alternatives evaluation before contract award, its acquisition strategy does provide the flexibility to stop production while meeting supportability and operational deficiencies. The formal acquisition strategy proposed in the FAA reply will be finalized following the Joint Resources Council meeting in December 1996. The Office of Inspector General requests that we be informed of major decisions concerning this procurement throughout the process. Also, we request you establish a target date for completion of the alternatives evaluation.

### **Action Required**

The recommendations are considered resolved. Your progress in implementing the corrective action is subject to the followup provisions of Department of Transportation Order 8000.1C. We appreciate the cooperation and assistance extended during our review. If I can answer any questions or be of any further assistance, please feel free to call me on X61964 or Alexis M. Stefani on X60500.

## ACRONYMS

ACE	FAA Central Region
AEA	FAA Eastern Region
AFSS	Automated Flight Service Station
AGL	FAA Great Lakes Region
ANE	FAA New England Region
ANM	FAA Northwest Mountain Region
AOO	Automated Flight Service Station Altoona, Pennsylvania
ARTCC	Air Route Traffic Control Center
ASO	FAA Southern Region
ASW	FAA Southwest Region
AWP	FAA Western Pacific Region
BUF	Automated Flight Service Station Buffalo, New York
CONUS	Contiguous United States
COTS	Commercial-Off-The-Shelf
DCA	Automated Flight Service Station Leesburg, Virginia
DUATS	Direct User Access Terminal Service
EKN	Automated Flight Service Station Elkins, West Virginia
FAA	Federal Aviation Administration
FSAS	Flight Service Automation System
FSDPS	Flight Service Data Processing System
FSS	Flight Service Station
FY	Fiscal Year
GWDS	National Graphic Weather Display System
IPT	Automated Flight Service Station Williamsport, Pennsylvania
ISP	Automated Flight Service Station Islip, New York
M1FC	Model 1 Full Capacity
MIV	Automated Flight Service Station Millville, New Jersey
OASIS	Operational and Supportability Implementation System

TEAM MEMBERS

The following is a listing of the major contributors on the Review of Acquisitions for Automated Flight Services, FAA.

Alexis M. Stefani	Office Director
Stuart A. Metzger	Program Director
Michael H. Shanker	Project Manager
Kevin Dorsey	Auditor
Sharon Trodden	Auditor

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U.S. Department  
of Transportation  
Federal Aviation  
Administration

# Memorandum

**Subject:** **INFORMATION:** Draft Advisory Memorandum  
on Acquisitions for Automated Flight Services

**Date:** NOV 5 1996

**From:** Administrator

**Reply to**  
**Attn. of:** AWilliams:  
267-9000

**To:** Assistant Inspector General for Auditing

As requested in your July 9 memorandum, we have reviewed the subject Office of Inspector General (OIG) draft advisory memorandum. The attached document provides comments to each recommendation contained in the report.

We appreciate the opportunity to comment on this draft and request that you incorporate our comments in any final report that you may issue.

Should you have any questions or need additional information, please call Anthony R. Williams, External Relations Branch, ABA-130, at (202) 267-9000.

A handwritten signature in cursive script that reads "David R. Hinson".

David R. Hinson

Attachment

**Federal Aviation Administration (FAA) Position on  
Recommendations Contained in the OIG Draft Advisory  
Memorandum on Acquisitions for Automated Flight Services**

**General Comment:** On page 9, the “Economic Analysis: Annual Costs:” is depicted as a factual data chart. This analysis has not been completed and the chart contains preliminary data only. The chart should be eliminated from the final report.

**Recommendation 1** Perform comprehensive cost and efficiency analyses of the CONUS AFSSs and implement further consolidation and/or collocation.

**FAA Response:** Partially Concur. We concur with the recommendation to perform a comprehensive cost and efficiency analysis of the CONUS AFSS’s to determine the implementation of future consolidation and/or collocation of AFSS facilities. However, we do not agree that the Operational and Support Ability Implementation System (OASIS) contract award should be delayed until after the analysis has been completed. Since there is a requirement to present the results of the Screening Information Request #1 and the Investment Analysis to the Joint Resources Council in December 1996, we anticipate a decision designating OASIS as a program and allowing full program funding. Additionally, our acquisition strategy includes options that specify incremental numbers of systems for acquisition and deployment. This strategy gives the Federal Aviation Administration (FAA) the flexibility to stop production of OASIS, thus avoiding the possibility of committing to 61 OASIS systems at the time of contract award. Furthermore, it supports the goal of Recommendations #1 without delaying the OASIS contract award. At the end of the CONUS AFSS’S analysis, estimated to be within 6 months, the OASIS Program would not have acquired any systems, but would be in a position to react to the conclusions derived from the analysis by stopping delivery of future systems if the analysis recommends that.

**Recommendation 2** Complete an extensive evaluation of the full range of alternatives for providing flight services. The evaluation should also include a transition plan to map the course and realize benefits as early as possible.

**Response:** Partially Concur. We need to complete an extensive evaluation of the full range of alternatives for providing flight services. However, because of the supportability and operational deficiencies of the current flight service systems (flight services automation system model 1 full capacity and integrated graphics weather display system), we do not agree that the ongoing OASIS acquisition can be delayed until the completion of the alternatives evaluation. Our acquisition strategy includes options that specify incremental numbers of system to be acquired and deployed. The first option would not be exercised until after successful completion of operational test and evaluation. This strategy gives the FAA the flexibility to stop production of OASIS based on the results of the alternatives evaluation. Furthermore,

at the completion of the alternatives evaluation, a **final transition plan** can be negotiated with the vendor that maps to the alternatives evaluation results. This will ensure the most feasible transition approach is taken that supports the alternatives evaluation results and does not impact ongoing **operational** needs while realizing user benefits.