

INDEPENDENT ASSESSMENT
OF THE
FEDERAL AVIATION ADMINISTRATION'S
ACQUISITION MANAGEMENT SYSTEM

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Prepared for the Federal Aviation Administration
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(ASD-200)

Booz·Allen & Hamilton

8283 Greensboro Drive
McLean, VA 22102

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EXECUTIVE SUMMARY

This document presents the results of Booz·Allen & Hamilton's independent evaluation of the Federal Aviation Administration's (FAA's) Acquisition Management System (AMS), which is in its third year of implementation. The FAA developed the AMS in response to Section 348 of the Department of Transportation and Related Appropriations Act of 1996, Public Law 104-50, enacted on November 15, 1996, which directed AMS development and implementation to provide for the unique needs of the Agency. The AMS became effective on April 1, 1996, with the issuance of the initial AMS policy.

As stated in the AMS policy:

It [the system] is intended to simplify, integrate, unify the elements of life cycle acquisition management into an efficient and effective system that increases the quality, reduces the time, and decreases the cost of delivering needed services to its customers.

The 1996 Appropriations Act also called for the AMS to be evaluated independently to assess progress after the first year and directed that assessments occur periodically for several years after AMS implementation to fully monitor the resultant effects on FAA acquisition management. To that end, Booz·Allen is conducting its second independent evaluation, which has afforded us the ability to build upon the data and findings of our first assessment.

This AMS assessment is based on the analysis of quantitative and qualitative data obtained from contract files, face-to-face interviews, electronic survey techniques, and numerous AMS documents. Survey samples were gathered from a cross-section of FAA senior managers, midlevel managers, and workers from various FAA divisions; Integrated Product Teams (IPTs); product sponsors; and other FAA organizations that participate in the life cycle acquisition process, as well as external stakeholders.

In evaluating the AMS, it is important to consider that AMS processes and procedures address the full acquisition life cycle, from cradle to grave, and are thus influenced by numerous external factors. AMS affects, and is affected by, various factors in the external environment that influence full life cycle acquisition management, such as organizational structure, organizational roles and responsibilities, and budgetary considerations. Although this assessment is focused primarily on the results of AMS implementation, external factors that significantly affect AMS implementation and overall success of FAA acquisition reform are also addressed in the findings.

Summary of Findings

Our independent assessment revealed that the AMS continues to improve along numerous dimensions as implementation proceeds. The areas of contracting and procurement continue to comprise the majority of progress since the system's inception. Specific achievements include the following:

- A 50 percent reduction in the time to award contracts has been maintained since AMS initiation.
- A greater percentage of contracts are being awarded competitively.
- The FAA is awarding more contracts based on best value.
- FAA centers and regions have adapted the AMS policy to their specific missions and are experiencing significant improvements in the timeliness and cost effectiveness of their acquisitions.

Notwithstanding the progress in the areas of contracting and procurement, we found that the FAA has yet to implement a seamless life cycle approach to acquisition management. The Agency's continued management attention and focus should include the following goals:

- AMS must be consistently implemented across all life cycle phases
- Standard cost accounting systems must be established to capture full life cycle costs and program affordability during investment analysis
- Sustainment requirements must be fully addressed in the Investment Analysis and Solution Implementation phases
- Organization barriers and "stovepipes" that hinder AMS success must be addressed.

Summary of Recommendations

Taking into account the initial improvements recognized in the early phases of AMS implementation, Booz·Allen's main recommendations are focused on continuing the implementation of AMS policies. In that context, we recommend that the FAA should-

- Implement AMS consistently across all life cycle phases and fully establish metrics to monitor performance against agency goals
- Provide enhanced AMS training for all life cycle phases
- Particularly emphasize the improvement of both mission and investment analysis processes
- Institute a leadership environment and corporate discipline to fully implement the Integrated Product Development System (IPDS) and support a seamless life cycle management approach.

Exhibit ES-1 presents a summary of our detailed recommendations and relates them to each of our findings.

RECOMMENDATIONS		FINDINGS																																																
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43						
1	Implement an explicit, systematic process for periodically reviewing, prioritizing and revalidating mission needs.		●					●								●	●																																	
2	Define and implement metrics for evaluating both the quality and timeliness (efficiency) of the mission analysis process and its results		●				●				●			●				●																																
3	Provide specialized training that focuses on how to perform Mission Analyses and prepare Mission Needs Statements.						●					●		●	●																																			
4	Increase stakeholder outreach efforts.						●						●																																					
5	Structure the IA documentation process.																						●																											
6	Standardize the O&M cost elements used in the IA.																																																	
7	Develop an affordability assessment process that fully addresses the Research and Development (R&D), F&E and O&M costs for each alternative during investment analysis.								●																																								●	
8	Enhance AMS processes to address the unique requirements associated with leased systems and services.																																																	
9	Increase Small Business Utilization Office outreach to IPTs and regional contracting officer technical representatives to encourage greater utilization of small businesses and small economically disadvantaged firms.																																																	
10	Establish thresholds for the preparation of acquisition strategy documents rather than leaving the decision to be made arbitrarily.																																																	
11	Reevaluate the ability of the Acquire system to meet operational needs. Develop and implement plans to close the gaps.																																																	
12	Fully implement the FAST past performance database and use it in source selections.																																																	
13	Give high priority to both operational and sustainment requirements during Investment Analysis and Solution Implementation.																																																	
14	Develop a standardized process for program management transition to enhance deployment.																																																	
15	Reestablish an independent organization to manage the In-Service Review process.																																																	
16	Continue AMS Implementation.	●	●		●	●	●	●	●	●	●	●	●	●																																				
17	The FAA must drive changes in its corporate culture to remove organizational roadblocks to AMS implementation and success.		●	●		●	●	●	●	●	●																																							
18	Establish metrics for major processes in each life cycle phase.						●																																											

Exhibit ES-1 Findings and Recommendations Cross Reference

1.0 INTRODUCTION

Background

The Federal Aviation Administration (FAA) developed the Acquisition Management System (AMS) in response to Section 348 of the Department of Transportation and Related Appropriations Act of 1996, Public Law 104-50, enacted on November 15, 1995. The AMS establishes policy and guidance for all aspects of the acquisition life cycle, from the determination of mission needs through the planning, procurement, and life cycle management of products and services to satisfy those mission needs. The Air Traffic Management System Performance Improvement Act of 1996, which is Title II of the Federal Aviation Reauthorization Act of 1996 (Public Law 104-264), grants the Administrator autonomy in carrying out the functions of the agency. The AMS became effective on April 1, 1996, with initial AMS policy was issued. The current policy, *Federal Aviation Administration Acquisition Management System*, dated June 1997, revised and clarified the initial policy.

The overarching goals for the AMS are to simplify, integrate, and unify the elements of life cycle acquisition management into an efficient and effective system that increases quality, reduces time, and decreases the cost of delivering needed services to FAA end customers. The AMS has defined the life cycle phases as follows:

- Mission Analysis
- Investment Analysis
- Solution Implementation
- In-Service Management
- Service Life Extension.

The FAA conducted an internal assessment of the AMS and reported the results in its document *Evaluation of FAA Acquisition Reform, The First Year: April 1996 - March 1997*, dated May 1997. As part of the 1997 FAA Appropriations Report 104-785, Congress directed the FAA to determine the Agency's effectiveness in terms of how fully the objectives in the AMS are being achieved. Under this legislation, the FAA was to provide for independent assessments of the AMS after the first and third years of implementation. Booz·Allen & Hamilton conducted the first independent AMS assessment in 1997 and was awarded the contract for the year 3 assessment, for which this report is submitted.

Assessment Objective

The independent assessment evaluated the effectiveness of the FAA's Acquisition Management System after the first 3 years of its implementation. The outcome of that evaluation is recommendations for improving effectiveness of the AMS.

Methodology

Our evaluation methodology was objective driven and based on the proven, systematic process that we used in the 1997 AMS independent assessment. Exhibit 1-1 illustrates Booz·Allen's assessment methodology.

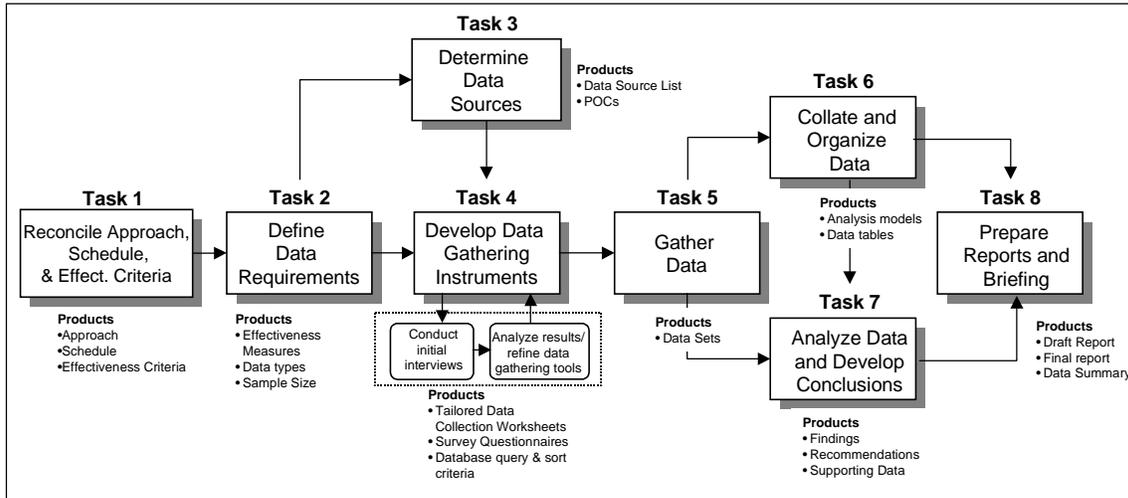


Exhibit 1-1 Booz·Allen's AMS Assessment Methodology

We measured AMS effectiveness by assessing how well AMS is achieving its stated goals. We also examined the processes that support its ability to achieve desired results. An important aspect that we considered is that AMS addresses the full acquisition life cycle, from cradle to grave. We conducted an overall quantitative and qualitative assessment of the system, with specific assessments of individual life cycle phases. Our experience has shown that a comprehensive, overall evaluation can be done only by decomposing the process into the individual life cycle phases, assessing effectiveness against evaluation factors appropriate for each phase, and then determining overall effectiveness based on the results from each phase. Our methodology employed the following criteria:

- **Mission Analysis**—Assess the degree to which this phase results in the definition of the proper set of needs for the FAA.
- **Investment Analysis**—Assess the degree to which this phase yields an achievable, cost-effective solution for meeting mission needs.
- **Solution Implementation**—Assess the degree to which solutions are delivered according to the established baselines in a cost-effective and timely manner.
- **In-Service Management and Service Life Extension**—Assess the degree to which the required service and strategic goals are achieved.

Booz-Allen's data sources included AMS policy and program documentation, Joint Resources Council (JRC) decision records and baseline parameter sheets, contract file audits, available infrastructure sustainment cost projections, survey questionnaires, and face-to-face interviews with a broad spectrum of employees across the majority of FAA organizations. We surveyed 106 survey respondents from more than 69 organizations, 92 of which were interviewed. Although our data collection activities were centered at the FAA headquarters, we also conducted data collection visits at four field locations and gathered representative contracting data electronically from the remaining FAA Regions to assess AMS implementation across the Agency. Site visits were made of the following locations:

- William J. Hughes Technical Center
- Mike Monroney Aeronautical Center
- Southern Region
- Northwest Mountain Region.

In developing our assessment methodology for each life cycle phase, we identified an initial set of effectiveness measures or metrics, based on the criteria described above, and applied these to guide our data collection tools and processes. We also looked at the interdependencies between phases and the extent to which results from one phase affect subsequent phases. The following paragraphs summarize specific analysis methodologies for each AMS life cycle phase.

Mission Analysis (MA)

The efficiency and effectiveness of the Mission Analysis phase was evaluated based on these factors:

- Structured, empirical analysis of Mission Needs Statements (MNSs) prepared under the *Federal Acquisition Regulations* (FAR) compared with those prepared under AMS
- Survey responses from FAA and external stakeholders, such as airlines)
- Face-to-face interviews with a subset of the survey respondents experienced in mission analysis, including members of the Mission Analysis Steering Group (MASG).

The findings of our independent assessment are presented in the context of the mission analysis objectives, and report on four specific aspects of the mission analysis process: the mission analysis policy and tools, stakeholder inputs and participation, the execution of the mission analysis, and resulting outputs (e.g., Mission Needs Statements).

Investment Analysis (IA)

Our assessment of the Investment Analysis (IA) phase included a comprehensive review of available IA documentation at FAA headquarters. A total of thirty-seven programs were

reviewed—26 originated under FAR and 11 under AMS. Our assessment also included extensive interviews with key participants in the AMS investment analysis process.

Solution Implementation

The method chosen to evaluate the contracting process effectiveness of AMS in the Solution Implementation phase was based on an analysis of selected contract files. The selected contract files represented all major awards at FAA Headquarters and all regional offices and centers from October 1996 to the present. This selection resulted in the audit of 213 contract files. To provide a more varied database, contracts exceeding the \$1 million range were included along with selected lower value contracts. The total value of the contracts audited exceeded \$3 billion.

The effectiveness of AMS was measured across the complete timeline from program authorization through contract award. Initial plans called for measuring the timeline from approval of a mission requirement document through contract award. During contract file audits, it became clear that this documentation was not generally available. In lieu of using mission requirement documents, the procurement request (PR) form (which was found in tab one of nearly all files reviewed) documented the starting point for the contracting process. PRs noted a start date in the coordination section; this was determined to be the best available measuring point on which to base the acquisition process timeline. Contract award documented the end of the process. We developed a worksheet that tracked significant milestones documenting development and award of a contract.

In-Service Management and Service Life Extension

AMS has not been in effect long enough for any major systems to progress through all of the life cycle phases. Therefore, our data gathering focused on interviews with individuals responsible for maintaining and sustaining National Airspace System (NAS) systems to prepare a qualitative assessment of In-Service Management and Service Life Extension effectiveness.

Report Organization

The remainder of this report is organized into major sections as follows:

- **FINDINGS**—describes the main findings of our analysis. This section also contains a matrix that summarizes our findings in the context of their source (e.g., based upon data/document analysis, surveys/interviews, or contract audits) and status (e.g., meeting expectations, requires more attention, or not meeting expectations).
- **RECOMMENDATIONS**—presents Booz·Allen’s recommendations based on the findings.
- **APPENDIX A: INVESTMENT ANALYSIS DOCUMENT CHECKLIST**—contains the document checklist used to assess document compliance with AMS policy.
- **APPENDIX B: ANALYSIS OF SELECTED ACQUISITION PROGRAM BASELINE COSTS**—contains data that was used in the analysis of original Facilities and Equipment (F&E) cost baselines with current F&E cost baselines.

- APPENDIX C: SOLUTION IMPLEMENTATION SUPPORTING DATA—describes the methodology and audit ground rules used in the AMS analysis, and a summary of contract file audits of pre- and post-AMS contract awards.
- APPENDIX D: SURVEY QUESTIONNAIRE RESULTS SUMMARY—contains the survey questionnaire and results.
- APPENDIX E: ANALYSIS OF PRE- AND POST-AMS PROGRAMS—provides an analysis of pre-and post-AMS programs in terms of percentage schedule slips.
- APPENDIX F: MISSION NEEDS STATEMENTS REVIEWED—lists the MNS documents that were reviewed.
- APPENDIX G: ACRONYMS—list the acronyms used in the document and appendices.

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2.0 FINDINGS

This section presents Booz·Allen's findings derived from analysis of the data collected from AMS documentation, contract files, surveys, and interviews. Exhibit 2-1 presents an overview of the findings. Subsequent sections detail the findings in the order shown in this exhibit.

Findings		Status			Source		
		Meeting Expectations	Requires More Attention	Not Meeting Expectations	Data and Document Analysis	Surveys/ Interviews	Contract Audit
General							
1	Analysis of all life cycle phases revealed that AMS continues to improve.	●			●	●	●
2	Results achieved under AMS are inconsistent across life cycle phases and FAA organizations.		●		●	●	
3	Factors external to the AMS environment are not fully supporting its successful implementation.		●			●	
4	Sampled Regions and Centers are fully implementing AMS and achieving better results.	●			●	●	●
5	The FAA Acquisition System Toolset (FAST) is effective and being used throughout the agency.	●			●	●	
6	FAA personnel desire continued AMS training.		●			●	
7	Metrics have yet to be fully implemented across all life cycle phases.			●	●	●	
8	A systematic mechanism for prioritizing all programs and needs has not been fully implemented.			●		●	
9	The budget process does not fully support the AMS life cycle management approach.		●		●	●	
10	Not all programs are being implemented in accordance with all aspects of the AMS policy.		●			●	
Mission Analysis							
11	The AMS promotes a systematic approach to conducting mission analysis.	●			●	●	
12	Improvements in Mission Analysis results are marginal.		●		●	●	
13	Stakeholder involvement in the mission analysis process is improving.		●		●	●	

Exhibit 2-1. Findings Overview

Findings		Status			Source		
		Meeting Expectations	Requires More Attention	Not Meeting Expectations	Data and Document Analysis	Surveys/ Interviews	Contract Audit
14	Execution of mission analysis produces inconsistent results.			●	●	●	
15	There is little substantive improvement in the quantification of mission needs.			●	●	●	
16	An explicit, structured approach for mission needs prioritization has not been fully implemented.			●	●	●	
17	There is no strong evidence of a systematic plan for periodic revalidation of mission needs.		●		●	●	
18	Metrics for measuring the effectiveness of the MA process are inadequate.		●		●	●	
Investment Analysis							
19	The investment analysis process has not demonstrated improvement in program cost/schedule stability.		●		●	●	
20	Most Acquisition Program Baseline (APB) changes are caused by requirements changes.			●	●	●	
21	There is no structured process to maintain IA documentation for review and audit.		●		●	●	
22	Operations & maintenance cost estimates used in investment analysis are unreliable.			●	●	●	
23	APB integrity is affected by changes in available financial resources.		●		●	●	
24	The IA process does not include a method of determining affordability of Agency programs beyond the F&E budget.			●	●	●	
25	The IA process does not sufficiently address the analysis of leased systems.		●		●	●	
26	IA Team leadership roles and responsibilities are not clear.		●		●	●	
27	Input to the IA process is not completely documented.		●		●	●	
28	Existing resources are insufficient to support IA activities.		●		●	●	
29	Investment Analysis Teams are not bringing multiple APBs to the JRC.			●	●	●	

Exhibit 2-1. Findings Overview (Continued)

Findings		Status			Source		
		Meeting Expectations	Requires More Attention	Not Meeting Expectations	Data and Document Analysis	Surveys/ Interviews	Contract Audit
Solution Implementation							
30	AMS has improved the award time for contracts by more than 50 percent compared with the FAR.	●					●
31	AMS cost reduction goals (20 percent) for contract awards may not be realized.		●		●		●
32	FAA is not meeting all of its small business goals.		●		●	●	●
33	A greater percentage of contracts are being awarded competitively than under the FAR.	●					●
34	The use of best value in source selections is nearly universal.	●				●	●
35	Acquisition planning documentation is inconsistently applied.		●			●	●
36	Contract dispute resolution has improved significantly under AMS.	●			●	●	
37	The Acquire system is not meeting expectations.			●	●	●	
38	A uniform process for collecting and applying past performance qualifications in source selections is not evident.		●		●	●	●
In-Service Management & Service Life Extension							
39	Support organizations are dissatisfied with the trends that are emerging for in-service management of new equipment.			●	●	●	
40	The preference for COTS/NDI solutions indicates an increase in sustainment costs.			●	●		
41	A systematic process to transition program management once systems are deployed and enter operational service has not been implemented.		●		●	●	
42	The In-Service Review process no longer enforces resolution of implementation issues prior to deployment decision.			●	●	●	
43	Operations and maintenance costs are not being tracked consistently and to the level needed to perform accurate life cycle cost estimates for new systems.		●		●	●	

Exhibit 2-1. Findings Overview (Continued)

GENERAL

1. Analysis of all life cycle phases reveals that AMS continues to improve.

The overriding comment we heard during our survey and interview process was that the AMS policy is an improvement even though some areas of its implementation have shortcomings. With AMS, the FAA can conduct its contracting and procurement activities in a more business-like fashion and apply a common sense management approach to its acquisitions. Survey participants consistently noted the increased flexibility in contracting methodologies, ability to limit competition to qualified vendors, and the provisions for more open communications with vendors as major contributors to the acquisition improvements that the FAA has realized. It is important to note that the FAR has undergone a significant evolution since the FAA was relieved of its requirements and implemented AMS. Many of the AMS features just noted can now be pursued under the FAR. Nevertheless, FAA personnel believe that the acquisition improvements that have been realized to date could not have been achieved under FAR. The implementation of a radically new AMS was the essential force that stimulated a cultural change in the FAA's acquisition approach.

2. Results achieved under AMS are inconsistent across life cycle phases and FAA organizations.

The primary feature of the AMS policy is to create a seamless life cycle acquisition management process that extends from mission analysis to product disposal. Our analysis shows that this seamless process has yet to be achieved. AMS policy identifies five life cycle phases: Mission Analysis, Investment Analysis, Solution Implementation, In-Service Management, and Service Life Extension. Since the inception of AMS, the Agency has focused on the area of solution implementation and has realized the most tangible improvement in the areas of contracting and procurement. When the entire life cycle was considered, we found little progress towards achieving the policy's stated goals of executing more timely and cost effective programs. We have not seen evidence of the same level of management emphasis on fully implementing mission analysis, investment analysis, and in-service management/service life extension processes according to AMS policy. High-priority programs like the Standard Terminal Automation Replacement System (STARS), Wide Area Augmentation System (WAAS), and Airport Surveillance Radar-11 (ASR-11) are still experiencing program delays in spite of operating under AMS policy and guidance. Reacting to pressure from Congress and the aviation community, FAA management has emphasized rapid procurement and deployment of new equipment as a top acquisition priority. Without consistent attention to all life cycle phases, the FAA will not fully realize the potential of AMS.

3. Factors external to the AMS environment are not fully supporting its successful implementation.

The structure of the FAA's budget management processes and the inconsistent implementation of its Integrated Product Development System (IPDS) are adversely affecting AMS implementation. The Agency's budget is divided among research and development, facilities and engineering, and operations and maintenance, with different organizations responsible for each. This lack of cohesion makes it difficult to allocate and manage funding across a program's life cycle. FAA employees also noted that IPDS has been inconsistently implemented. Product

Teams have yet to achieve their stated goal of cutting across organizational “stovepipes,” and a dichotomy still exists between the Office of Research and Acquisitions (ARA) product team leadership and the Office of Air Traffic Services (ATS) user and support organization team members. Representatives from operational and support organizations noted that they do not believe that they are fully empowered Product Team members with adequate participation in the product team decisions in the Mission Analysis and Investment Analysis phases. Without complete buy-in from operations and support organization early in the product development process that the IPDS is supposed to provide, the FAA cannot achieve its AMS goals of timely and cost-effective acquisitions under a life cycle management approach.

4. Sampled Regions and Centers are fully implementing AMS and achieving better results.

At the William J. Hughes Technical Center (WJHTC), Mike Monroney Aeronautical Center (MMAC), the Southern Region and the Northwest Mountain Region (ANM), AMS has been fully embraced. At each of these locations, senior management has established the corporate discipline to implement AMS and IPDS to more efficiently execute their particular missions. They transformed their corporate culture by effectively communicating the benefits of AMS to their customers, tailored the execution of AMS policies to meet the unique demands of their mission, and documented lessons learned to build on their successes and learn from their mistakes. The Acquisitions Management Branch at MMAC has become a de facto center of excellence for AMS implementation for the FAA Regions. The WJHTC has become a destination for headquarters organizations looking for quick and efficient contracting support. ANM is consistently cited as the FAA Region that has most fully implemented AMS and realized the most success.

5. The FAA Acquisition System Toolset (FAST) is effective and being used throughout the Agency.

The vast majority of personnel that we interviewed believe that the FAST is an effective and useful tool for AMS implementation. Contracting officers at each location we visited found the templates and guidelines very helpful, and many remarked that it was their primary source for the most current AMS information and guidance. Personnel we interviewed also expressed their satisfaction with the practice of sending global e-mail announcements of changes and updates to the FAST. Most respondents acknowledged the existence of the lessons learned database in the FAST, but few had access to the database because of its password protection.

6. FAA personnel desire continued AMS training.

Although most respondents to our survey noted that they were familiar with the AMS policy and processes, almost all acknowledged that they required additional training. Training requirements varied among organizations and life cycle activities. For mission analysis and investment analysis, participants desired more training on how to conduct these analyses instead of the current training that focuses on AMS policy requirements. For solution implementation, contracting officers wanted more local training. Personnel at the Centers and Regions noted that a comprehensive, 2-week AMS training course is available at FAA headquarters. The expense of traveling to Washington, DC, and the 2-week course length were identified as deterrents to participation given small travel budgets and demanding workloads.

7. Metrics have yet to be fully implemented across all life cycle phases.

The AMS policy requires the implementation of performance metrics and the setup of a system of checks and balances. We have seen little improvement in this area since the first independent AMS assessment. The only metrics we were able to identify were the Seven Executive Level Metrics used to monitor program management. In our review of JRC major acquisition reviews and program baseline parameter sheets, we found that these metrics were neither uniformly applied nor addressed across the major programs that we evaluated. Contracting officers noted that data on basic contracting processing times, which were captured under the old contracting activity database, are no longer maintained because the recently implemented Acquire system does not capture such data.

8. A systematic mechanism for prioritizing all programs and needs has not been fully implemented.

Through our interviews and analysis, we found that the Agency's top priorities are well understood, but we found little evidence that all development, procurement, and infrastructure improvement initiative priorities have been linked to establish an investment roadmap. Product leads we interviewed noted that there is little constancy in the Agency's priorities. In the past 3 years, the FAA's focus for major acquisitions and funding priorities has shifted from the WAAS program to the STARS program, and then to the Free Flight Phase 1 (FFP1) initiatives.

9. The budget process does not fully support the AMS life cycle management approach.

The FAA has no mechanism for determining whether systems or equipment are affordable based on life cycle costs. Acquisitions in the AMS focus on Facilities and Equipment (F&E) costs and do not adequately consider the continuing operations cost stream. Therefore, full life cycle affordability is not considered during system acquisitions. FAA personnel indicated that the operations and maintenance (O&M) budget is not well understood within the Agency. This lack of understanding and submission of unprioritized O&M funding to the JRC results in incomplete program prioritization. The JRC does not appear to have a comprehensive process for evaluating a program's full life cycle funding. No mechanism was evident for the JRC to use in comparing full life cycle funding requirements of programs under consideration against likely agency funding.

10. Not all programs are being implemented in accordance with all aspects of the AMS policy.

Many interviewees representing multiple lines of business (LOB) felt that some high visibility programs were not implemented in accordance with the full AMS policy. This perception was reinforced by our documentation review. For example, we found that when programs were consolidated (e.g., CTAS, URET, SMA) under the umbrella of the FFP1 Program, there was no evidence that a mission analysis and investment analysis were conducted that considered FFP1 as an integrated whole. These analyses may have been avoided or streamlined so that NAS users needs could be quickly addressed and airlines could reap near-term benefits. We could find no documented rationale for not adhering to the full AMS process, given that the policy is designed

to provide the flexibility to quickly develop and implement solutions to meet user needs. When such programs are managed outside of the AMS without explicit rationale or justification, senior management conveys the message that the policy is not suitable for high-priority initiatives.

MISSION ANALYSIS

11. The AMS promotes a systematic framework for conducting mission analysis.

A critical review of the mission analysis section of the AMS policy and the associated tools included in the FAST (e.g., mission analysis guidelines) indicates that a systematic framework for performing mission analysis has been clearly defined. A review of the MNS prepared under AMS shows that this framework is being used. Nevertheless, most improvements thus far have been superficial (e.g., document organization) rather than substantive (e.g., information content). Specifically, MNSs show greater uniformity since the inception of AMS. This is a positive effect since improved uniformity among MNSs should facilitate comparative analyses and integration of MNSs, and aid in prioritizing mission needs from a systems (i.e., NAS) perspective. The majority (53 percent) of respondents felt that mission analysis is now being conducted earlier and up front, rather than after-the-fact to justify a particular solution (only 6 percent disagreed). Similarly, 47 percent of the people we surveyed and interviewed believe that the mission analysis process is conducted within the framework of the NAS Architecture and FAA strategic goals (only 13 percent disagreed).

12. Improvements in Mission Analysis results are marginal.

A detailed evaluation of 15 MNSs representing documents prepared both before and after the inception of AMS, led to the conclusion that the *quality* of MA outputs has not improved. The basis or supporting evidence for mission needs still varies in both comprehensiveness and detail. In many cases, the nature of the potential benefits and risks (e.g., benefits to the Agency and aviation community, capability shortfalls, risk of not addressing the need) are identified but not well quantified. In instances where these variables are quantified, “point estimates” are typically provided (e.g., \$10 million savings in direct operating costs). These point estimates do not provide a gauge for determining the estimate’s reliability or confidence intervals. Very few MNSs reported a benefits “range” (e.g., the estimate’s standard deviation), which would be much more useful in evaluating the basis for the need, its merits, and relative priority. In summary, resource estimates—such as the benefits to the Agency/aviation community versus the quantifiable cost of infrastructure changes plus quantifiable cost/risk of not addressing the need—still lack the type and level of quantification necessary to reap significant strategic benefits from the mission analysis process.

13. Stakeholder involvement in the mission analysis process is improving.

Broader stakeholder involvement has been garnered primarily through the increased emphasis on developing operational concepts as an additional mechanism for capturing mission needs and the operational needs of the stakeholder community (e.g., airlines, unions). Whereas the MNSs are narrowly focused, the operational concepts (e.g., ATS Concept of Operations for the NAS in 2005, RTCA operational concepts) capture the broader needs of the operational community from a higher level NAS perspective. These two approaches appear to be effective complements and help ensure that needs are traceable to overarching strategic goals. Finally, 49 percent of those

surveyed and interviewed felt that the mission analysis process adequately considers external stakeholder needs and other driving forces, such as the Government Performance and Results Act (GPRA) and the National Performance Review (NPR) (only 6 percent disagreed). For example, RTCA provides a forum for NAS users to express their needs and concepts of operation, which are then considered in the mission analysis process. However, feedback from representatives at FAA support centers and external stakeholders (e.g., airlines and professional aviation organizations) indicates that they did not see a clear avenue for providing inputs into the Mission Analysis process (although one appears to exist).

14. Execution of mission analysis produces inconsistent results.

A systematic review of MNS, and qualitative feedback from interviews and surveys indicate that mission analysis is not performed consistently across the FAA's LOBs. Specifically, MA still lacks the "rigor" described in the AMS policy, which continues to constrain the reliability of the outputs from the mission analysis process (e.g., mission need prioritization, capability shortfall, operational benefits, risk) and the utility of this information in the subsequent Investment Analysis phase. In addition, there is little evidence that individual mission needs are being evaluated, revalidated, and prioritized from an NAS perspective that considers interdependencies and interactions.

Primary contributors to inconsistencies in the MA process appear to be a lack of applied training and a defined methodology for performing both top-down and bottom-up analyses of MNSs. Although familiarization training provides an education on the "mechanics" of the mission analysis process, a need exists for more intense training on the application of analytical techniques to boost overall competency. Only 22 percent of those surveyed and interviewed felt that mission analysis training was adequate. Interview feedback suggests that while the AMS does provide potentially useful mission analysis tools and guidelines (e.g., via the FAST), these tools are being applied in a mechanical fashion. The result is that while mission analysis training—and the associated tools and guidelines—has improved the uniformity of the mission analysis process and MNS, it has not substantially improved the content, quality, and utility of the MA outputs. Finally, some field staff in remote sites do not have adequate access to the FAST because they lack Internet access. This communications shortfall hinders the understanding and contributions of field personnel in the mission analysis process.

15. There is little substantive improvement in the quantification of mission needs.

A comparative review of six MNSs prepared under AMS and nine MNSs prepared under the FAR reveals no consistent improvements in capturing quantifiable and reliable information to substantiate needs. The information shortfall continues to hamper the effective prioritization of mission needs, as well as the ability to perform reliable investment analyses. Only 25 percent of those surveyed and interviewed felt that the mission analysis process generates quantifiable and realistic resource estimates regarding potential benefits to the FAA / aviation community, cost of infrastructure changes, cost/risk of not addressing the need, and the criticality and time frame of need. Only 34 percent believe that the mission analysis process adequately quantifies the capability shortfall (supply-demand) and/or the technological opportunity to increase operational safety, efficiency, and effectiveness. Additionally, interviews with FAA headquarters personnel, regional representatives, and personnel from FAA support centers indicate that the feedback loop between the In-Service Management and Service Life Extension phases and the Mission

Analysis phase is extremely weak. In fact, this feedback loop is ambiguously defined in the AMS policy, which depicts mission analysis as off the main life cycle path. Feedback from the In-Service Management phase should provide an operational check for how completely mission needs are actually being addressed (i.e., how well the objectives are being accomplished), and help ensure that mission needs prioritization is synchronized with evolving NAS operations and architecture. This feedback is an essential ingredient for continuous improvements in the mission analysis process.

16. An explicit, structured approach for mission needs prioritization has not been fully implemented.

According to the AMS policy, the Mission Analysis Steering Group (MASG) is charged with evaluating and prioritizing MNS within the broader context of the NAS architecture. But only 25 percent of those interviewed and surveyed felt that the MASG provides useful guidance in defining, validating, quantifying, and prioritizing mission needs. Furthermore, only 34 percent of the respondents believed that the mission analysis process applies a *systems engineering perspective* that considers individual mission needs in the broader context of the evolving NAS architecture. Feedback from interviews across the LOBs suggests that mission needs prioritization is largely subjective and based predominantly upon “expert” opinion. Related comments also suggest that there is a bias toward highly visible initiatives that involve new and intriguing technologies, versus mission needs that involve less exciting sustainment and infrastructure issues. As characterized by a few respondents, the bias is to give priority to the “silver bullets” while ignoring the rusting gun.

Possible reasons for the lack of a reliable mission needs prioritization process included a need for stronger leadership and cohesiveness within the MASG, a need for a better understanding of the NAS architecture among the majority of the participants, and a need for increased training. Although the Office of Plans and Performance (ARX) has recently developed a preliminary methodology for prioritizing mission needs and performing risk assessments, this methodology was largely unknown outside of ATS. Furthermore, there is no evidence that a consistent or standard methodology for prioritizing and revalidating Mission Needs Statements is currently being applied. ATS has recently briefed the JRC on a preliminary prioritization and risk assessment methodology and is promoting it to other FAA LOBs (e.g., ARA). An objective review of this high-level methodology indicates that it is aligned with the FAA’s strategic goals and objectives. For example, the methodology evaluates the impact, urgency, and strategic drivers of mission needs with respect to FAA performance goals (e.g., safety, security, capacity, environment, and productivity). Nonetheless, if the quality of the information captured in the mission analysis process is not improved, the benefits of this methodology will largely be superficial.

17. There is no strong evidence of a systematic plan for periodic revalidation of mission needs.

We found no strong evidence of an accepted methodology or plan for the periodically revalidating mission needs, nor a mechanism for capturing the interrelationships and interdependencies among mission needs. An MNS was considered to be “revalidated” if it had been reviewed or modified and brought to the JRC for re-approval. Fifty-five Mission Needs Statements in the FAA Document Control Center were examined to determine the frequency and

extent of MNS revalidation (a list of these MNS is provided in Appendix F). Five MNSs (or less than 10 percent) had been revalidated, including two that were originated since the inception of AMS. Additionally, the type of information and the criteria considered in the revalidation of these MNSs were not evident. Besides the five MNSs that were revalidated, an additional 15 MNSs had been “revised” (one of these mission needs statements had been revised seven times since 1992); however, there was no evidence that any of these revised MNSs had been revalidated. Furthermore, the nature and extent of the revisions (e.g., content changes, editorial changes) were not evident in the majority of cases. Finally, the origination date for MNSs that had been revalidated or revised was missing or not apparent in a few cases; therefore, it was impossible to determine how long these MNSs had been active. These data suggest that there is not a clearly defined, systematic process for reviewing and revalidating MNSs to provide the essential “checks and balances” to ensure that mission needs are properly addressed. In fact, interview feedback suggests that there is some resistance to revalidating MNSs. Several interviewees from different LOBs commented that—in the eyes of many—revalidation is perceived to be a potential “death sentence” for a need, rather than a means of checks and balances to keep tightly consistent with the evolving NAS. Unless a stronger systems engineering approach is applied in the mission analysis process, the strategic benefits of mission analysis, that is, being able to *anticipate* impending needs and confidently assess their relative priorities within the broader context of the NAS, will not be realized.

18. Metrics for measuring the effectiveness of the MA process are inadequate.

Our assessment identified only one explicit metric for assessing the effectiveness of the mission analysis process—“cycle time”—or the time from mission need identification to the time of mission need disposition (e.g., approval). Cycle time is a new metric that ARX is beginning to use to track the performance of mission analysis and the development of Mission Needs Statements. This metric is in line with the push within the Agency to reduce the time it takes to conduct mission analysis (and investment analysis), supporting downstream efforts to decrease the time to implement solutions. Subjective feedback from some of our interviews purports that the MNS review cycle has been reduced since AMS was implemented; objective, quantifiable information to support this statement was not available. Nevertheless, without complementary metrics for evaluating the quality and utility of the mission analysis outputs, the cycle-time metric merely creates the incentive to perform a quicker analysis, not a more rigorous or reliable analysis.

INVESTMENT ANALYSIS

19. The Investment analysis process has not demonstrated improvement in program cost/schedule stability.

It should be noted that the AMS programs are relatively new and more time is required to compare AMS program cost and schedule stability with these elements of programs originated under the FAR. We compared schedule and cost changes with the original IA baselines. The results, which are summarized in Exhibit 2-2, indicate that no significant improvements in cost or schedule stability have been achieved.

FAR			AMS		
Cost Performance (FAR System)			Cost Performance (AMS)		
Total Cost Baselines Analyzed	Cost Baselines Changed	Percent of Cost Baselines Changed	Total Cost Baselines Analyzed	Cost Baselines Changed	Percent of Cost Baselines Changed
26	11	42%	11	4	36%
Schedule Performance (FAR System)			Schedule Performance (AMS)		
Total Schedule Baselines Analyzed	Schedule Baselines Changed	Percent of Schedule Baselines Changed	Total Baselines Analyzed	Schedule Baselines Changed	Percent of Schedule Baselines Changed
26	14	54%	11	5	45%

Exhibit 2-2. Stability of Acquisition Program Baselines Under the FAR and AMS

20. Most Acquisition Program Baseline (APB) changes are caused by requirement changes.

Our review of AMS APBs indicated most baseline changes stemmed from changes to the requirements. As further detailed in Appendix B, Analysis of Selected Acquisition Program Baseline Costs, additional requirements relating to unmet human factors, design changes, underestimation of construction costs, additional development and testing costs, and other undefined requirements changes were the basis for most APB baseline changes. Specific AMS programs where baselines were amended (or are currently awaiting official amendment approvals) and where modifications were caused by requirements changes were Operational and Supportability Implementation System (OASIS), FFP1, NAS Infrastructure Management System (NIMS)–Phase I and Controller Pilot Data Link Communications (CPDLC). For programs begun under the FAR, APBs were changed for the Standard Terminal Automation Replacement System (STARS), Voice Switching and Control System (VSCS), Airport Surveillance Radar (ASR)-9, ASR-11, Display System Replacement (DSR), Oceanic–Build I, Wide Area Augmentation System (WAAS), Airport Movement Area Safety System (AMASS), Northern California Terminal Radar Approach Control (TRACON), and Facility Security Risk Management (FSRM) principally due to changes in requirements. (See Appendix B for complete details on a program-by-program basis.)

21. There is no structured process to maintain IA documentation for review and audit.

Our analysis indicates that there is no structured process to maintain IA documentation for review and audit. This finding is based on the observation that not all documentation required for the IA phase is traceable. Policies, procedures, or guidelines do not specify where a complete set of IA documentation should reside. Most of the IA documentation that was found was located in a contractor maintained documentation center. However, there were no consolidated IA files for any program. AMS policy specifies that three documents must be developed: the Requirements Document, Investment Analysis Report (IAR), and APB. Our review of program files indicated that other documents that support the IA process were not traceable, including Investment Analysis Plans (IAP), lists of alternatives, market survey documentation, and Affordability Assessment Reports. While AMS mandated Requirements Documents and IARs were traceable to 7 of the 10 programs audited, only 2 of the 10 programs audited had IAPs.

This finding may be related to insufficient resources for conducting IA activities, which is finding 28.

22. Operations and maintenance cost estimates used in investment analysis are unreliable.

On the basis of our interviews of FAA personnel and review of program documentation, we concluded that the Agency's cost accounting system does not have a standardized cost element structure that allows for detailed tracking of actual costs. This cost information is critical in the estimation of full life cycle program costs. The sponsoring organization is responsible for reliable O&M estimations. The IA team is responsible for gathering these data, including F&E costs from the IPT. Therefore, O&M data used in the IA process lacks sufficient detail to enable development of accurate APB O&M cost estimates. Although this finding does not cite any deficiencies in the IA process, it does indicate deficiencies in the FAA's process for accurately tracking, maintaining, and analyzing O&M data that are input to the IA process. Additionally, analysis reveals that the issue of reliable O&M cost estimates existed under the previous FAA acquisition system.

23. APB integrity is affected by changes in available financial resources.

Interviews and analysis indicate that the integrity of the original APB is difficult to maintain because available financial resources change. Respondents noted several reasons for those changes:

- Cost overruns—Program cost overruns may result from several factors, such as requirements creep, inability of a contractor to perform, or unforeseen problems with new technology. Cost overruns can result in three primary program impacts: sustaining current funding, increasing funding, or terminating the program. The option of sustaining current funding can impact the APB through actions such as scaling back the program, delaying implementation, or phasing in implementation in order to maintain funding profile stability. The option of increasing funding can impact the APB through actions such as immediate application of funding to maintain APB schedule integrity, or an incremental application of funding resulting in relatively minor increases in APB schedule. The option of terminating the program effectively ends the acquisition.
- Budget reductions—Budget reductions are caused by Congressional actions and impact the APB by reducing the amount of available program funding. Budget reductions can affect APBs similarly to program cost overruns (i.e., scaling back the program, delaying implementation, phasing in implementation, terminating the program)
- “Raiding”—Interviews indicated that JRC approved baselines are typically subjected to “raiding” by the Systems Engineering Operational Analysis Team (SEOAT), which attempts to address funding shortfalls that occur in various programs. Funding shortfalls usually occur due to F&E budget reductions or program cost overruns. Financial resources obtained through raiding are usually spread across a wide range of programs (a practice referred to in many of our interviews as “salami slicing”) and applied to fund other critical programs. Raiding can affect APB schedules or APB requirements

similarly to program cost overruns or budget reductions. Although existing APBs are raided to fund other critical programs, interviews and analysis did not indicate that any written prioritization scheme exists for taking financial resources from, or adding financial resources to, any specific programs.

Analysis indicates that the effects of program cost overruns, budget reductions, and raiding is a short-term program management approach that is polarized from the AMS life cycle management philosophy. Furthermore, FAA's lack of acquisition priorities and explicit criteria for program termination appears to be influenced by internal and external political pressure that limits the Agency's ability to conduct life cycle management as defined in the AMS.

24. The IA process does not include a method of determining affordability of Agency programs beyond the F&E budget.

Interviews and analysis reveal that a clear method of determining program affordability beyond the F&E budget does not exist. The SEOAT is tasked to conduct affordability assessments where the priorities and interdependencies of all programs in the Agency's financial baseline are supposed to be examined. It appears, however, that the SEOAT focuses almost exclusively on the short-term budget years for F&E programs. The O&M budget is not addressed in the affordability assessment. Therefore, the JRC cannot accurately determine whether a program is sustainable during in-service management. However, analysis of the FAA's organizational structure indicates that, based on organizational control of the F&E and O&M budget, full life cycle affordability could be addressed from a combined F&E and O&M position. Although affordability assessments could be improved significantly through analysis of the F&E and O&M budgets, the goal of basing that analysis on assumptions concerning a stable funding stream may be unrealistic.

25. The IA process does not sufficiently address the analysis of leased systems.

The IA process does not sufficiently address the analysis of leased systems. Costs for service contracts for items such as leased systems are usually determined only after receipt of proposals from various vendors. Estimates of leased system costs vary widely due to the nature of "bundled" service offerings from each vendor. Under AMS, an IA must be completed before the FAA can issue a screening information request (SIR). Therefore, IA cost estimates conducted before receiving vendor pricing information are difficult to develop and may be highly inaccurate. Additionally, no database exists that contains historical cost information related to leased systems.

26. IA Team leadership roles and responsibilities are not clear.

Interviews and analysis reveal that IA Team leadership roles and responsibilities are unclear. Currently, three organizations are involved in the IA process, including the LOB with the need (usually an ATS organization), the Office of System Architecture and Analysis (ASD) (provides the IA staff), and the IPT (provides the candidate solutions). AMS policy states that "each specific analysis is performed by an ad hoc Investment Analysis Team established by the investment analysis staff in conjunction with the sponsoring and providing organizations." Members from each of these organizations indicated that IA Team leadership roles are not

clearly defined, but are often driven by the composition of the team members. Analysis indicates that this issue may be related to competing organizational interests.

AMS policy states that “investment analysis generates the information used by the Joint Resources Council...” This suggests that the JRC is the real customer of the IA Team. Analysis shows that conflicts may arise in IA process because the IA staff (ASD) is tasked with developing unbiased alternative solutions for the JRC (the ultimate customer) while responding to the needs of the sponsoring organization and IPTs (who may believe that they are the ultimate customer). The sponsoring organization and IPTs may have special interests and different views related to IA inputs, such as costs, benefits, schedules, and performance. Therefore, the IA may be influenced by specific organizational interests. The position of ASD within the FAA organizational structure may form barriers to successful resolution of this finding. The clarification and understanding of IA Team leadership, team focus, and mechanisms to ensure development of objective analysis need to be addressed at the highest levels in the Agency in order to resolve this issue.

27. Input into the IA process is not completely documented.

Interviews and analysis reveal that IA documents do not fully address key acquisition aspects, including the following:

- Links to the NAS Architecture–The IA does not clearly document how investment alternatives relate to the NAS Architecture.
- Links to FAA Strategic Plan goals and objectives–The IA does not provide a description of how the alternatives meet FAA Strategic Plan goals and objectives.
- Life cycle assumptions for new technology and commercial off-the-Shelf/nondevelopmental item (COTS/NDI)–The FAA is updating its life cycle assumptions that were previously based on 20-year service life for most systems/equipment. However, the life cycle for COTS/NDI items, particularly software/firmware, is still difficult to define due to the rapidly changing nature and market acceptance of these types of systems. Standardized COTS/NDI system/equipment life cycle metrics do not exist.
- Human factors–The emphasis on increased use of COTS/NDI solutions has often given rise to a faulty assumption that human factors issues have already been addressed. However, the integration of individual COTS/NDI solutions does not, a priori, produce a COTS/NDI “system.” The scant attention to emerging human factors issues in the early acquisition phases (e.g., Mission Analysis, Investment Analysis) merely defers consolidation of these issues to later stages where they are much more costly and cumbersome to resolve. The Human Factors Division of the Office of Aviation Research (AAR-100) is in process of developing Human Factors Acquisition Requirements and Planning (HARP) guidelines that will eventually be incorporated into the FAST. The HARP guidelines are intended to describe the appropriate human factors activities to be performed during each AMS phase. Once completed, the implementation of these guidelines, including training on how to apply them, should be made a priority.

28. Existing resources are insufficient to support IA activities.

Interviews indicate that there is insufficient staffing and funding to fully address all investment analysis requirements as stated in the AMS policy. Specific concerns include:

- Too few qualified staff are available to support all the IAs that need to be conducted. Interviews indicated that IA is an additional duty. Requirements to conduct an IA exceed the availability of personnel who have the correct knowledge, skills, and ability. FAA personnel indicated that IAs range from very poor to very good, dependent on the availability of knowledgeable personnel. Analysis indicates that proficiency requirements for personnel with IA skills have not been established. Interviews and analysis indicate that some IAs have been outsourced, and that ASD validates the contractor-supplied data.
- Insufficient funding limits the depth of IA analysis by limiting the number of alternatives that can be analyzed. Additionally, insufficient funding hampers the ability to provide sufficient training or outsourcing to compensate for the lack of qualified staff.

29. Investment Analysis Teams are not bringing multiple APBs to the JRC.

AMS policy states that multiple APBs are to be brought to the JRC for an acquisition decision. Nevertheless, document review and interview results indicated that the investment analysis teams are, in most cases, bringing only the APB recommended by the SEOAT to the JRC. It is not clear whether the SEOAT and JRC have agreed to make an acquisition decision based on one alternative deemed “affordable” by the JRC. The SEOAT is supposed to conduct affordability assessments of alternative solutions but we found that their affordability assessments are often based primarily on the F&E budget. Making a decision that is not based on the full life cycle costs may result in higher overall program costs for the Agency. For example, the decision to support a program with low-to-moderate initial development costs, but with higher life cycle sustainment costs, may be driven by focusing on the short-term F&E budget. Therefore, the practice of forwarding the investment alternative recommended by the SEOAT to the JRC appears to be influenced primarily by the program's ability to fit within the F&E budget. Of the 10 programs reviewed, all had required APB documents but lacked evidence that multiple APBs were submitted to the JRC.

SOLUTION IMPLEMENTATION

30. AMS has improved the award time for contracts by more than 50 percent compared with the FAR.

Our analysis of data obtained from auditing 213 of the largest and most significant FAA contract files shows that contract awards times under AMS have improved by more than 50 percent compared with those made under FAR. The selected contract files represented all major awards at FAA headquarters and significant awards made at all regional offices between April 1994 and the present. Findings supplemented data collected in our 1997 AMS review. Audited contracts

included all available files whose value exceeded \$5 million, most awards with a value between \$1 million and \$5 million, and contracts under \$1 million. The total value of the contracts audited exceeded \$3 billion. Appendix C provides a detailed summary of our contract analysis methodology. Exhibit 2-3 shows the combined overall award time improvements. Average time is based upon the overall time from all contracts reviewed to process an award. Timeline starts when funding and/or program direction is received by the contracting office and concludes with contract award.

FAR Average time to award contract	347 days
AMS Average time to award contract	164 days
Savings in Days	183 days
Time Savings Percentage	53

Exhibit 2-3. Award Time Improvement for All Contracts Sampled

31. AMS cost reduction goals (20 percent) for contract awards may not be realized.

We were unable to document specific contract/program savings attributable to AMS. To undertake this, we would have had to analyze repetitive purchases under FAR and AMS for like supplies/services. Although focus on large value contracts in our audit sample did not support this type of analysis, savings derived from AMS can be discerned from the overall improvement in contract award times. Faster awards avoid inflationary trends. For example, the overall savings in time of approximately 183 days (or about one-half year) can avoid a 1.5 percent program inflation increase (based upon a 3 percent yearly inflation index).

32. FAA is not meeting all of its small business goals.

Overall awards to small business concerns have consistently exceeded goals set by the FAA and its Small Business Utilization (SBU) Office. However, awards to small and economically disadvantaged businesses (SB/SEDB) and women-owned businesses have decreased, primarily in the area of new contract awards to SB/SEDB firms. Although obligated funds to SB/SEDB firms in fiscal year 1998 reached 90 percent of their goal, 70 of that 90 percent reflect modifications to existing FAR (pre-AMS) contracts. The other 20 percent (only 2 percent overall) represent awards under new AMS contracts. This decrease is likely attributable to several factors. For example, the award time improvements under AMS offer contract solutions through competition in timelines that previously (under FAR) could be achieved only through sole source, small business awards. Another factor may be the lack of coordination between IPTs and the SBU Office during acquisition requirements development. IPTs and the SBU Office need to strengthen their relationships to ensure that the SBU Office participates in acquisition requirements development early enough to allow small business participation when appropriate.

33. A greater percentage of contracts are being awarded competitively than under FAR.

The FAA is awarding most of its large-value contracts competitively, so the percentage of noncompetitive awards has fallen. AMS policy encourages the use of competition, and survey findings indicate that its streamlined contracting processes have made it easier for product teams to compete contracts. In our contract file data analysis, we compared the number of FAR and AMS contracts. Exhibit 2-4 shows the increase in the percentage of competitive contract awards for our sample data set.

Type of Award	FAR	AMS
Competitive	44	115
Non-Competitive	38	16
Total	82	131
Percentage competitive	54%	88%

Exhibit 2-4. Percentage of Competitive to Noncompetitive Awards

34. The use of best value in source selections is nearly universal.

A stated goal of AMS is to obtain products and services from firms that offer the best value to satisfy the mission need. Results of our audit confirm that the FAA is utilizing best value in its source selections for significant awards. This has led to more successful procurements. For example, a review of construction contracts at the FAA Southern Region disclosed that under the FAR’s bidding process, the FAA had little choice but to award work to a habitually low bidder that proved to be a difficult contractor to work with. Recent awards under AMS have included an assessment of contractor past performance in conjunction with price evaluation and technical expertise. Although not consistently applied, past performance assessment has led to selection of contractors that perform their work with fewer performance issues and claims.

35. Acquisition planning documentation is inconsistently applied.

AMS requires that acquisition strategy papers be prepared to document the strategy for executing acquisition programs during the Solution Implementation and for managing fielded products and services during In-Service Management. For individual procurements not covered by an Acquisition Strategy Paper (ASP), procurement planning should be appropriate and proportionate to the complexity and dollar value of the requirement. For less complex procurements, procurement plans are not required if deemed unnecessary by the IPT.

Our review of 113 significant contract awards made under AMS revealed that very few contract files (less than 5 percent) contained procurement planning documents. Assuming these documents would be filed in the official contract file if they had been prepared, their consistent absence indicates the IPT prefer to avoid preparing them. This avoidance can be attributed to the leeway provided by permissive language in AMS which sanctions the avoidance of such plans for “less complex procurements.” Consideration should be given to either establishing explicit thresholds for preparing this planning documentation or eliminating the requirement in all cases.

36. Contract dispute resolution has improved significantly under AMS.

FAA contract disputes are normally resolved at the contracting officer's (CO) level. AMS allows the FAA to proceed with contract award while resolving a bid protest. This was not generally authorized under pre-AMS dispute processes. If resolution is not possible at the CO's level, the FAA's Office of Dispute Resolution (ODR) becomes involved and encourages the use of alternative dispute resolution techniques and in particular, mediation to settle matters. This innovative process has cleared up the case backlog that initially built up after introduction of AMS when the dispute process was being formulated. Statistics maintained by the ODR and available through access to the ODR Website attest to the improvement in both time and cost savings in dispute resolution. These statistics include the following:

- Of the 126 cases filed from June 1996 to the present, 120 have been completed.
- Alternate dispute resolution timeframes
 - Contract disputes—46 calendar days
 - Protests—32 calendar days.

37. The Acquire system is not meeting expectations.

The Acquire system is an integrated software program used by the FAA to track and process funding authority and contract documentation and provide program status information. Although this system is not mandated by AMS, its functionality is a necessary component of the Solution Implementation Phase. Our interviews at FAA Southern Region, Northwest Mountain Region, MMAC, and WJHTC, reveal there is clear dissatisfaction with certain aspects of its performance. Some of the user observations follow:

- The system is not “user friendly,” for example, it requires 13 to 15 key strokes to print a document; and the resulting print includes superfluous information.
- There is apparently no capacity to do a “negative adjustment” (cost reduction) to a previously entered PR amount—a necessary step.
- Individuals perceive the system changes from week to week. There is no agencywide understanding of what information is required to properly operate the system.
- Information seems to get lost or “stuck” in the system regularly. For example, one user reported that in a number of instances, complete reentry of a the data on a PR (15 pages) will be needed because the data apparently drops out of the system.
- Users felt the Acquire System is “10 times” more complex than it has to be, and that only about 20 percent of the program fields are utilized. Further, there are too many screens to process a PR and no flexibility to obtain “useful” PR information.
- Users reported that once a PR is entered into the system, the data “sits in an inbox” waiting for assignment to a contracting officer before the process continues.

During this time, the PR originators have great difficulty obtaining information on the project status and CO assignment.

38. A uniform process for collecting and applying past performance qualifications in source selections is not evident.

AMS requires that past performance be considered as an evaluation factor in all selection decisions for all complex and noncommercial source selections. In our review, we found this mandate was being followed; however, past performance was inconsistently used in the selection process, that is, as a discriminating or a qualifying factor. For example, in our review of contracts at the Southern Region, two contract files were reviewed for construction of identical facilities at separate locations. In the first file, the contracting officer had verified past performance of the chosen contractor with government representatives one day before contract award. In the other file, the contracting officer noted having performed a more intensive past performance evaluation by soliciting written past performance evaluation of each contractor being considered for award.

The FAA Acquisition System Toolset maintains a section on past performance information, however, based on our review of more than 200 large-value contract files, there was no evidence that these data are being used or that data are being collected from active contracts. Better utilization of the FAST past performance database would facilitate better decision making.

IN-SERVICE MANAGEMENT AND SERVICE LIFE EXTENSION

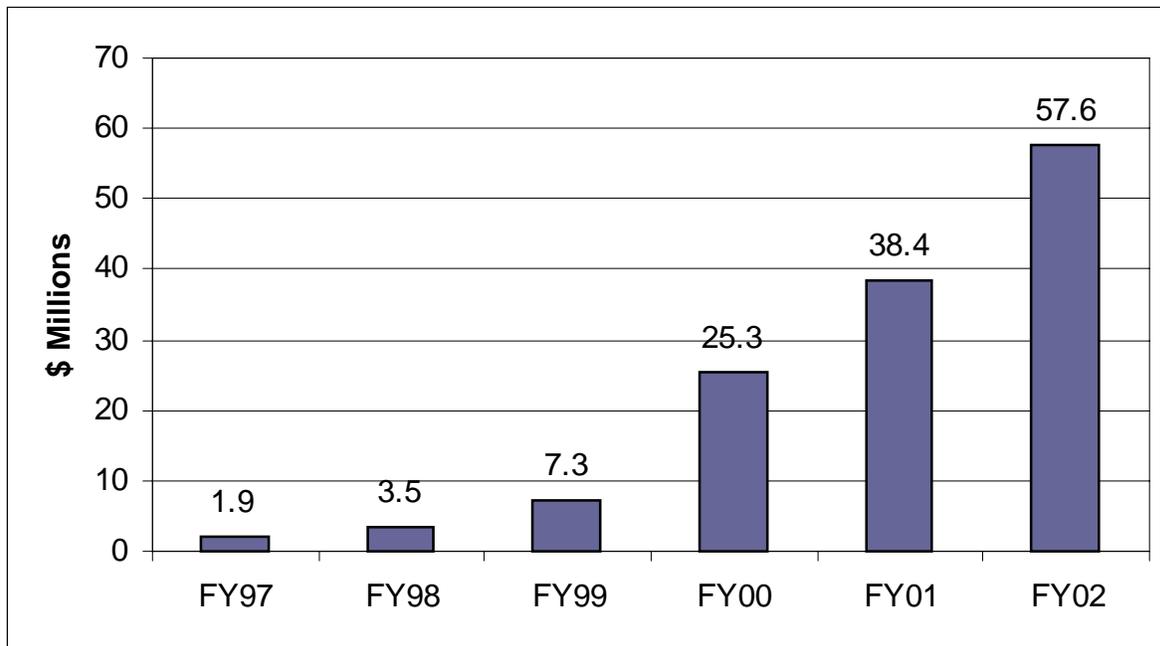
39. Support organizations are dissatisfied with the trends that are emerging for in-service management of new equipment.

During our interview process, operators and maintainers noted that Product Teams were reluctant to fully address their needs due to lack of an active voice in the decision-making process of the previous AMS phases. They believe that the Agency's priority has been to deploy systems as soon as possible and fix deficiencies in the field. Product Teams are pursuing system solutions using COTS/NDI hardware and software to reduce procurement cost and the time to deploy. The senior management emphasis on budget and schedule is hampering the Product Teams' ability to adequately address user needs and supportability requirements.

40. The preference for COTS/NDI solutions indicates an increase in sustainment costs.

Depot support managers at the FAA Logistics Center told us that the majority of COTS/NDI-based systems that are currently being deployed require sole-source contractor depot logistic support contracts. They are forced to issue sole-source contracts to equipment vendors for depot-level maintenance support because Product Teams do not procure adequate technical support documentation, adequate engineering drawings, and depot-level maintenance training. In our interviews with Product Team members and In-Service Management participants, we found a belief that pursuing this depot maintenance support concept will reduce procurement costs and speed system deployment by avoiding the purchase of detailed technical support documentation and depot-level maintenance training. This maintenance concept leaves the FAA Logistics Center with few alternatives in the pursuit of more cost-effective maintenance alternatives.

Contractor Depot Logistics Support (CDLS) costs are rising as more COTS/NDI-based systems are deployed. Exhibit 2-5 shows the FAA Logistics Center's projected costs for CDLS through fiscal year 2002.



Data extracted from ARS Briefing on NAS Infrastructure Sustainment Shortfalls, dated March 11, 1999

Exhibit 2-5 FAA Projected Contractor Depot Logistics Support Costs

These costs are an addition to the sustainment costs for equipment already in the field. Legacy systems such as older Air Traffic Control Beacon Interrogators (ATCBI-3/4) and ASR7/8 have reached the end of their serviceable life. These systems contain obsolete parts with no direct replacements available, and they must be supported through 2003 due to program delays for their replacement systems. Maintenance of these legacy systems coupled with the introduction of new COTS/NDI-based systems is causing a sustainment shortfall that is not being adequately addressed at the FAA headquarters level. Depot maintenance managers are now evaluating the projected impacts of shutting down obsolete systems that cannot be maintained without additional funding.

41. A systematic process to transition program management once systems are deployed and enter operational service has not been implemented.

This finding is based on interviews with representatives from ARA, The FAA Logistics Center (AML), The operational Support Directorate (AOS), and the Office of Test and Evaluation (ATQ). The AMS policy calls for a “seamless life cycle acquisition management process.” However, there is no lead organization to manage programs or systems at a national level after deployment. In-service management responsibility is split between the Logistics Center, AOS organizations at the MMAC and WJHTC, the Operations Program Directorate (AOP), and regional organizations. There is no consistency in the delineation of authority or responsibility.

The AMS policy states that “. . . team leadership typically shifts to an operating organization member when the primary focus of the team changes from acquisition to operations.” This vague guidance has led to an ad hoc product management approach for operational systems that deters AMS life cycle management. Consequently, there is no primary advocate for fielded systems to lead funding and budget battles for modifications, reengineering and service life extension efforts.

42. The In-Service Review process no longer enforces resolution of implementation issues prior to deployment decision.

Representatives of support organizations believe that the In-Service Review (ISR) process implemented under AMS is ineffective and it has neither the visibility nor the accountability necessary to ensure all implementation requirements are adequately addressed before system deployment. Under the old Deployment Readiness Review (DRR) process, there was an organization independent of product teams that maintained implementation checklists and provided them to all interested parties via an electronic bulletin board. Deployment decisions were made at the LOB level by AAF-1, the organization is responsible for maintaining all systems.

Under the AMS policy, the IPT is responsible for deployment decisions unless the JRC retains the authority. Support organizations do not believe that they have sufficient representation or empowerment on IPTs to influence deployment decisions. Representatives from support organizations consistently described the current ISR process as “the fox guarding the hen house.” This perception may indicate that Product Teams in general have yet to overcome organizational stovepipes and establish themselves with qualified and skilled members of all necessary functional disciplines.

43. Operations and maintenance costs are not being tracked consistently and to the level needed to perform accurate life cycle cost estimates for new systems.

We have been unable to determine whether actual O&M costs matched predictions because we found little evidence of detailed O&M cost estimates in the investment analysis reports that we evaluated. During our data gathering, we found that the FAA Logistics Center and the regional offices are establishing standardized processes to capture O&M costs in preparation for transition to a “fee for service” support structure. However, it is not evident that the FAA is fully addressing O&M costs when making investment decisions or evaluating the impact of new systems on the sustainment of systems currently in the NAS.

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3.0 RECOMMENDATIONS

This section presents Booz·Allen’s recommendations based on the analysis of our findings. Exhibit ES-1 from the executive summary cross reference our recommendations with findings described in the preceding section.

MISSION ANALYSIS

1. Implement an explicit, systematic process for periodically reviewing, prioritizing and revalidating mission needs.

Refine, validate, and institutionalize ARX’s preliminary methodology for mission needs prioritization and risk assessment. Recognizing that a project or program will likely address several different mission needs, incorporate a systems engineering model for reviewing MNS from both a top-down (NAS) and bottom-up perspective. A systems model would improve the quality of individual MNSs, help coordinate and unify mission needs across LOBs, and improve the capability to integrate MNSs (or identify logical groupings) so that the needs may be more efficiently addressed. Finally, include defined criteria or checkpoints to drive periodic MNS revalidation. These criteria should consider significant milestones in the NAS Modernization process, shifts in the agency’s priorities or strategic plan, and the length of time a MNS has been “active” (to mitigate obsolescence), and the nature of revisions that are made to active MNSs (e.g., content revisions vs. editorial or format changes). The execution of this methodology should produce the following:

- A priority ranking for each mission need that considers the Agency’s overarching strategic goals, as well as the goals of the broader aviation community served by the NAS
- A systems-level model that allows related mission needs to be identified, evaluated, and logically grouped or integrated across LOBs
- A traceability mechanism that describes the interactions and interdependencies among mission needs and the evolving NAS architecture
- The basis for the assigned priority or revalidation outcome (i.e., the criteria used, factors considered,)
- A tracking mechanism to provide a historical record of the evolution of mission needs. The record should document revisions and revalidations of the MNS from the date it was originated to the date that it was satisfied by the implementation of a solution(s). This record should include the basis and rationale for any revisions, and the criteria and basis for revalidation decisions.

It should be noted that ATS has begun to use a requirements management process tool—DOORS—to improve the traceability of requirements to mission needs and is working on making it an FAA “standard.

2. Define and implement metrics for evaluating both the quality and timeliness (efficiency) of the mission analysis process and its results.

Metrics that evaluate the quality and timeliness of the mission analysis process must be defined to create incentives for improving both the responsiveness and effectiveness of the MA process. Metrics for evaluating quality should focus on the reliability and validity of the information (quantitative and qualitative) included in the MNS. A mechanism for identifying Human Factors implications must also be defined and implemented. Finally, these metrics should be used to foster accountability for performing proper due diligence before approving an MNS. Because mission analysis represents the foundation for subsequent AMS life cycle activities, it is imperative that this foundation is built both quickly and solidly. As ARX leads the MASG and is the most proficient organization at performing these analysis, it appears incumbent upon the ATS LOB to provide the leadership and guidance for this reform.

3. Provide specialized training that focuses on how to perform Mission Analyses and prepare Mission Needs Statements.

Current MA training at the FAA focuses on familiarization with AMS policy requirements. FAA employees have indicated that they need additional instruction on identifying and quantifying capability shortfalls, developing cost/benefit estimates, and assessing potential risks. Applied MA training should help improve the reliability and rigor of Mission Analyses and Mission Needs Statements, and thus benefit subsequent investment analysis activities. Feedback from our interviews also included suggestions to more closely couple the MA and IA processes to bolster the utility of the quantitative information captured in the MA.

4. Increase stakeholder outreach efforts.

Increase the focus on disseminating AMS information to external stakeholders to better inform them on the existing avenues (e.g., RTCA forums, operational concepts) for providing inputs into the mission analysis process. Increased attention in this area will help reinforce efforts to improve collaboration with the aviation community at large, and clarify perceptions regarding their ability to effect change.

INVESTMENT ANALYSIS

5. Structure the IA documentation process.

All IA documentation should be located in a single repository so that rationale for proceeding with the acquisition is readily available to decision makers and auditors. A structured documentation process will facilitate the IA administration and allow the FAA to readily trace acquisition objectives with Agency goals and objectives, and streamline priority revalidation activities. We suggest evaluating and implementing automated enterprise information management tools that can support development, review, and maintenance of IA as well as all other required AMS documentation. At a minimum, we recommend that all documentation associated with a specific IA be maintained on an FAA intranet site. In that way, that all LOBs would have increased visibility into previous IA decisions/rationale. The site should limit access to designated user groups and provide the means to review the status of all IA documents.

6. Standardize the O&M cost elements used in the IA.

Standardize cost elements used to develop the APB O&M costs. The IA Team should be able to select from a standardized list of cost elements that can be selectively applied to the alternatives analysis, as appropriate. Standardizing cost elements will facilitate a comparison of like alternatives, increase the quality of cost estimates, and provide the JRC with better information to make an acquisition decision. We recommend coordinating with the FAA Regions and Centers that are involved in the current Clean Audit and Fee-for-Service initiatives to establish a baseline structure for operations and maintenance cost categories and collection processes.

7. Develop an affordability assessment process that fully addresses the Research and Development (R&D), F&E and O&M costs for each alternative during investment analysis.

The SEOAT needs to expand the focus of its affordability assessments to address full life cycle funding requirements. We recommend developing full life cycle affordability costs from a combined R&D, F&E, and O&M position. To accomplish this goal, we recommend that the FAA make full life cycle budgeting a top Agency priority. Next, we recommend that the FAA analyze mechanisms to facilitate combined R&D, F&E, and O&M costs. Mechanisms may include changing the organizational structure to enhance life cycle affordability analysis, implementing budget reform measures to focus on full life cycle affordability, and implementing personnel reform measures that include incentives to perform in the context of full life cycle management. Budget and personnel reforms are necessary if the FAA is to realize the full benefit of the AMS policy.

8. Enhance AMS processes to address the unique requirements associated with leased systems and services.

AMS processes should be enhanced to address the unique requirements of acquiring leased systems and services. Most vendors bundle various types of services and equipment to compete against their rivals. The inherent difficulty is that the IA process does not lend itself to estimating costs for leased systems and services, especially in the telecommunications industry. We recommend considering the use of market surveys as the primary basis for obtaining cost estimates used to develop the IA for leased systems/equipment. Additionally, we suggest developing a database that contains historical information related to market survey technology/service price data so that future cost estimating can be enhanced.

SOLUTION IMPLEMENTATION

9. Increase Small Business Utilization Office outreach to IPTs and regional contracting officer technical representatives to encourage greater utilization of small businesses and small economically disadvantaged firms.

AMS focuses on best-value solution for Agency needs. To meet the Agency's SB/SEDB goals, IPTs and all other acquisition managers need to understand those goals, the current progress toward meeting the goals, and the capabilities of local SBs/SEDBs. Only then can managers structure applicable acquisitions to use SBs/SEDBs to achieve both the Agency's small business

goals and best-value solutions. The FAA's SBU Office should establish a detailed AMS outreach program that addresses the following:

- Detailed coordination with acquisition managers during acquisition strategy development
- Inclusion in In-Service Review Checklist Templates of a requirement for IPTs to coordinate with the small business utilization staff before SIR issuance
- Periodic AMS seminars to familiarize SBs and SEDBs with the AMS contracting environment and the best-value source selection criteria.

10. Establish thresholds for the preparation of procurement strategy documents rather than leaving the decision to be made arbitrarily.

To ensure acquisition strategies are carefully developed and approved by appropriate managers, the FAA should establish appropriate thresholds for triggering preparation of Procurement Planning documents. Procurement planning should be proportionate to the complexity and dollar value of the requirement (for example, programs over \$10 million). For less complex procurements, procurement plans should be optional; but the contract file should contain rationale for the chosen acquisition planning approach.

11. Reevaluate the ability of the Acquire system to meet operational needs. Develop and implement plans to close the gaps.

Through our interview process, we found that the Acquire Product Team is implementing modifications to the Acquire system to address its shortcomings. Users at the Regions and Centers that we visited expressed extreme dissatisfaction with Acquire and noted that they had little or no input regarding required system capabilities. We recommend that the Acquire Product Team solicit requirement input from all Agency users and implement capabilities into the system that will allow users to tailor functions to their needs.

12. Fully implement the FAST past performance database and use it in source selections.

The FAST past performance database should be available to all source selection personnel to facilitate better source selection decision making. To make such a system effective, the following features should be addressed:

- Standardized formats for vendor-prepared past performance descriptions tailored to procurement categories (e.g., major systems, engineering services, commercial products, miscellaneous services)
- Standard evaluation form for completion by referenced clients using existing DOT and DoD forms as examples
- Resolution process for vendors that exhibit with poor performance so that mitigating circumstances can be addressed.

IN-SERVICE MANAGEMENT AND SERVICE LIFE EXTENSION

13. Give high priority to both operational and sustainment requirements during Investment Analysis and Solution Implementation.

If programs are to be managed from a life cycle perspective, the sustainment requirements must be given appropriate weight when making investment and program decisions. The SEOAT and investment analysis teams need to fully address program affordability from a sustainment standpoint, taking into account the impact of proposed maintenance concepts and likely out-year O&M funding.

14. Develop a standardized process for program management transition to enhance deployment.

Designate a lead organization within Airway Facilities to lead product teams after deployment of major systems. Appoint a life cycle manager from this lead organization for each major product team. This person would serve as deputy product lead for the product team during the Solution Implementation phase. When a system is fielded, the life cycle manager would assume leadership of the product team.

15. Reestablish an independent organization to manage the In-Service Review process.

The mistrust of the In-Service Review process by support organizations indicates that the IPDS has not achieved its goals of breaking down organizational stovepipes and fully empowering product teams to make key decisions. Consequently, an independent organization needs to be created to monitor and maintain the In-Service Review Checklist for the product teams. Although checklists could still be developed and tailored by the IPT, the independent organization would be the primary facilitator when communicating concerns and validating that all implementation actions and issues are satisfactorily completed prior to a deployment decision.

GENERAL

16. Continue AMS Implementation.

AMS calls for a seamless life cycle acquisition management process that extends from mission analysis to product disposal and is more than just a FAR replacement. To date the agency's primary focus has been in the areas of procurement and contract management. The key to achieving more timely and cost-effective acquisitions is to fully implement the Mission Analysis and Investment Analysis process as called for in the AMS policy. These two phases have the most direct influence on a program's success, yet they are the least mature. Success for the In-Service Management and Service Life Extension Phases should follow as a result of the proper implementation of the earlier phases.

17. The FAA must drive changes in its corporate culture to remove organizational roadblocks to AMS implementation and success.

We recommend reevaluating the goals and missions of each line of business to identify conflicts and consolidate lines of business where appropriate. Establish the corporate discipline to fully implement AMS and manage acquisitions from a life cycle perspective.

18. Establish metrics for major processes in each life cycle phase.

We recommend performing a top-down analysis of AMS policy goals to develop both quantitative and qualitative performance measures for the essential processes in each life cycle phase. Metrics should be incorporated in the performance objectives for each management level from Associate Administrator down to associate product leads. Emphasis should be placed on making metrics simple, traceable and directly applicable to AMS goals.

APPENDIX A: INVESTMENT ANALYSIS DOCUMENT CHECKLIST

This appendix contains a roll-up of the document checklist to assess document compliance with AMS policy and guidance. The checklist was designed based on the Investment Analysis phase of the Acquisition Management System (AMS) Policy and Guidance. Programs that were analyzed include Operational and Supportability Implementation System (OASIS), Local Area Augmentation System (LAAS), Air Traffic Control Beacon Interrogator (ATCBI), Next Generation Communications (NEXCOM), the Acquire System, Host Computer System Replacement (HOCSR), NAS Integration Support Contract (NISC), NAS Infrastructure Management System (NIMS), Controller Pilot Data Link Communications (CPDLC), and SPAS.

The checklist column titled “Questions” records questions that are required by AMS policy or recommended by guidance and addressed for each of the programs. The column titled “Total Findings” represents the total “yes” responses for the programs analyzed.

The total number of Yes, No, and N/A responses for each question was calculated for each program and presented in terms of percentages in the “Percentage” column. Zeros indicate the document or item was not available for review.

Questions	Total	Percentage		
	Findings	Yes	No	N/A
I. Joint Resource Council (JRC) Approved Mission Need Statement (Decision of Record)				
II. Initial Requirements Document (IRD)				
1. Does the IRD translate “the need” in the MNS into an initial top-level requirements document?	0	0%	0%	0%
2. Did the IRD include the following minimum elements:				
Required Life-cycle system and availability	0	0%	0%	0%
Supportability	0	0%	0%	0%
Maintainability performance capabilities and characteristics (including human factor)	0	0%	0%	0%
3. Did the Investment Analysis Staff (IAS) support the writing of the IRD?	0	0%	0%	0%
III. Requirements Document (RD)				
1. Did the RD meet the mission needs statement?	4	100%	0%	0%
2. Did the RD address critical operational issues?	4	100%	0%	0%
IV. List of Alternatives (Includes Market Survey)				
1. Were market surveys deemed necessary? If yes, then answer the following question.	0	0%	0%	0%
2. Did the market survey identify commercial, non-developmental, or non-material solutions that were both cost effective and operationally suitable as a first priority for satisfying the mission needs and requirements?	0	0%	0%	0%
3. If market surveys weren’t necessary what was the source of information that provided required solutions to the mission need?	0	0%	0%	0%

Questions	Total	Percentage		
	Findings	Yes	No	N/A
V. Investment Analysis Plan (IAP)				
1. Did the IAP provide composition of the IAT (by name and organization): i.e., the sponsor, IPT, and IAS representatives?	2	100%	0%	0%
2. Did the IAP include a schedule for completing the activities within the IA process?	2	100%	0%	0%
3. Did the IAP include the assignment of roles and responsibilities?	2	100%	0%	0%
4. Were the assignment of roles and responsibilities for accomplishing IA activities consistent with the AMS guidelines and the defined IA process?	2	100%	0%	0%
5. Were a list of all alternatives and candidate solutions identified?	2	100%	0%	0%
VI. Evaluation Matrix				
1. Did the evaluation matrix clearly define the evaluation criteria?	0	0%	0%	0%
2. Did the evaluation matrix clearly define the relative weight for each factor?	0	0%	0%	0%
VII. Initial Acquisition Program Baseline (APB)				
1. Did the evaluation matrix consider the following typical evaluation factors:				
Life cycle cost	0	0%	0%	0%
Benefits	0	0%	0%	0%
Schedule	0	0%	0%	0%
Performance	0	0%	0%	0%
Risk	0	0%	0%	0%
2. Did the evaluation criteria emphasize the use of Pre-Planned Product Improvements (P3I)?	0	0%	0%	0%
3. Did the data from the evaluation matrix form the basis for the initial APB?	0	0%	0%	0%
4. Was the initial APB provided to the System Engineering/Operation Analysis Team (SEOAT)?	0	0%	0%	0%
VIII. Affordability Assessment Report				
1. Was the information from the initial APB used as the basis for the Affordability Assessment?	0	0%	0%	0%
2. Did the Affordability Assessment consider the following factors?	0	0%	0%	0%
Planning and program horizons	0	0%	0%	0%
Available funding	0	0%	0%	0%
National Airspace System (NAS) architecture	0	0%	0%	0%
Offsetting financing plans	0	0%	0%	0%
Offset	0	0%	0%	0%
IX. Final Requirements Document				

Questions	Total	Percentage		
	Findings	Yes	No	N/A
1. Did the Acquisition Program Baseline (APB) list the requirements the FAA is committing to meet at the Investment Decision?	10	100%	0%	0%
2. Did the sponsoring organization coordinate disposition of deferred requirements with the originating organization?	3	0%	33%	67%
3. Were any of the deferred requirements listed on the JRC approved APB?	3	0%	33%	67%
X. Final Acquisition Program Baseline (APB)				
1. Did the APB include the following?				
Approval page	10	100%	0%	0%
Performance baseline	10	100%	0%	0%
Cost Baseline	10	100%	0%	0%
Schedule Baseline	10	100%	0%	0%
Benefits Baseline	10	100%	0%	0%
XI. Investment Analysis Report (IAR)				
1. Did the IAR properly identify the relative strengths and weaknesses, advantages and disadvantages of each candidate solution?	7	57%	43%	0%
2. Did the IAR include the following?				
Signature page	7	100%	0%	0%
Assumptions, constraints, and conditions	7	100%	0%	0%
Evaluation matrix	7	71%	29%	0%
Recommendation and rationale	7	100%	0%	0%
Alternatives analyzed	7	71%	29%	0%
Evaluation criteria	6	83%	17%	0%
NDI feasibility	7	71%	29%	0%
Affordability and offset recommendation	7	86%	14%	0%
3. Did the IAR include the mandatory attachments?				
Analytical summary	7	57%	43%	0%
APB	7	57%	43%	0%
Final RD	7	57%	43%	0%
XII. JRC Approved Investment Analysis Decision Record				
1. Was an IA decision briefing scheduled with the JRC?	0	0%	0%	0%
2. Did the IA decision briefing occur?	0	0%	0%	0%
3. Were their dissenting opinions in connection with the recommendations contained within the report?	0	0%	0%	0%
4. Did applicable dissenters submit written reports, including alternative recommendations, to the JRC?	0	0%	0%	0%
5. Was the IA decision record distributed to the following?	0	0%	0%	0%
JRC	0	0%	0%	0%
IAS	0	0%	0%	0%

Questions	Total	Percentage		
	Findings	Yes	No	N/A
Sponsoring Organization	0	0%	0%	0%
Participating IPT Leads	0	0%	0%	0%
SEOAT	0	0%	0%	0%
FAA Budget Office (ABA)	0	0%	0%	0%

APPENDIX B. ANALYSIS OF SELECTED ACQUISITION PROGRAM BASELINE COSTS

The following data were used in the analysis of original Facilities and Equipment (F&E) cost baselines with current F&E cost baselines.
(Information is current as of May 22, 1999.)

Program	Program Origin (13)	Date of Original Cost Baseline Ceiling (15)	Original F&E Cost Baseline Ceiling (\$ Millions)	Current F&E Baseline/Ceiling (\$ Millions)	Date of Current F&E Cost Baseline/Ceiling	Variance	Notes
HOST replacement	Post - AMS	May-98	\$424.1	Unchanged			
FFP I	Post - AMS	(4)	\$628.8	(7)			(5)
OASIS	Post - AMS	Apr-97	\$174.7	(12)			(5), (11)
LAAS	Post - AMS	Jan-98	\$536.1	Unchanged			(11)
NEXCOM-Seg I	Post - AMS	Sep-98	\$407.6	Unchanged			(11)
NIMS-Phase I	Post - AMS	Apr-97	\$100.8	(10)			(5)
ACQUIRE	Post - AMS	Dec-96	\$ 5.6	Unchanged			(3) (5)
CPDLC	Post - AMS	Oct-98	\$166.7	(1)			
ATCBI	Post - AMS	Aug-97	\$282.8	Unchanged			(11)
NISC	Post - AMS	Oct-96	\$ 1,337.0	Unchanged			(3)
SPAS	Post - AMS	Jul-97	\$ 32.3	Unchanged			
STARS	Pre - AMS	Feb-96	\$ 1,076.1	(9)			(3), (5)
VSCS	Pre - AMS	Jan-94	\$ 1,452.9	(1)			(2), (5)
WARP	Pre - AMS	May-95	\$125.6	Unchanged			(2)
Wilcox CAT II/III	Pre - AMS	Oct-98	\$ 14.3	Unchanged			(2)
ASR-9	Pre - AMS	Oct-98	\$856.7	(6)			(5)
ASR-11	Pre - AMS	Nov-97	\$743.3	(14)			(5)
DSR	Pre - AMS	Jun-96	\$ 1,055.3	(1)			(2), (5)
Oceanic - Build 1	Pre - AMS	May-98	\$ 82.0	\$ 73.2	Sep-98	-11%	(16)

Program	Program Origin (13)	Date of Original Cost Baseline Ceiling (15)	Original F&E Cost Baseline Ceiling (\$ Millions)	Current F&E Baseline/Ceiling (\$ Millions)	Date of Current F&E Cost Baseline/Ceiling	Variance	Notes
ITWS	Pre - AMS	Jun-97	\$276.0	Unchanged			
WAAS	Pre - AMS	Jan-98	\$ 1,006.6	(1)			(5)
Common ARTS	Pre - AMS	Dec-96	\$195.9	Unchanged			(3), (17), (18)
PPSS	Pre - AMS	Oct-98	\$ 45.7	Unchanged			
IFQA	Pre - AMS	Nov-97	\$ 18.7	Unchanged			(2)
ASDE	Pre - AMS	Oct-98	\$249.1	Unchanged			(1), (2)
AMASS	Pre - AMS	Oct-98	\$ 74.1	89.8	Dec-98	21%	(2), (5), (8)
RCE	Pre - AMS	Oct-98	\$260.4	Unchanged			(2)
BUEC	Pre - AMS	Oct-98	\$ 54.1	Unchanged			
VRRP	Pre - AMS	Oct-98	\$ 28.6	Unchanged			(2)
TRACON (No. CA)	Pre - AMS	Oct-98	\$ 70.2	(19)			(2), (8)
AERO Center	Pre - AMS	Apr-99	\$ 31.0	Unchanged			
FSRM	Pre - AMS	Feb-99	\$143.6	\$ 155.3		8%	(5), (21)
AN/GRN-27	Pre - AMS	Oct-98	\$ 87.6	Unchanged			(2)
ARSR-4	Pre - AMS	Oct-98	\$511.5	Unchanged			(2), (11)
TDWR	Pre - AMS	Oct-98	\$393.5				(2)
LLWAS	Pre - AMS	Oct-98	\$ 51.3	(20)			(11)
ASR-WSP	Pre - AMS	Oct-98	\$ 80.4	Unchanged			(2)

Notes

- (1) Rebaselining in process or being reviewed at this time.
- (2) O&M baseline is under review at this time.
- (3) O&M baseline information was not available.
- (4) No Acquisition Program Baseline was available for review.
- (5) Baseline increase is principally attributable to new requirements (human factors) and design changes.

Notes

- (6) An increase of \$70.2K (8%) has been approved for this program. The increase is principally attributable to new requirements and has been attributable to service life extension costs. The increase will not be reported as an increase of the baseline.
- (7) Reflects information from a Joint Resources Council briefing; baseline costs are for the period FY98-FY02 only.
- (8) Baseline increase is attributed to increases in contractor costs and anticipated engineering changes.
- (9) Proposed new ceiling (\$1,382.2) is awaiting Joint Resources Council approval. This would represent a 47% increase over the original baseline cost.
- (10) Program is under review for possible descoping and rebaselining to reduce the baseline to \$61.3M. Without rescoping and rebaselining, cost of increases 58% and schedule slips of 123% are anticipated.
- (11) Prior year program costs were not included in the Acquisition Program Baseline approved costs. These costs have been included to reflect total F & E program costs.
- (12) A May 1999 proposal to increase this baseline to \$222.2M (27%) is awaiting approval.
- (13) Baseline information for Pre-AMS programs was obtained from the most current Capital Investment Plan (CIP). Estimate at Completion (EAC) data available as rated on the parameter sheets.
- (14) An increase of \$60.0K (8%) has been approved for this program. The increase is principally attributable to new requirements and has been attributed to service life extension costs. The increase will not be reported as an increase of the baseline.
- (15) Acquisition Program Baseline was the source for Post-AMS baseline information.
- (16) Program baseline was reduced due to performance issues with the contractor. Integrated Product Team (IPT) calculated a potential baseline increase of 85% if the program was not descoped.
- (17) Baseline amounts in the Acquisition Program Baseline were current contract values as of the date of the baseline and did not reflect total F&E baseline amounts.
- (18) Funds (5.6M) was reprogrammed from START in FY98 for on-site support, site adaptation and the resolution of program trouble reports. This was the 3% variance to the baseline.
- (19) Request for additional funding of \$4.0M (6%) is pending due to the underestimation of the construction costs.
- (20) Request for additional funding of \$3.0M (6%) is pending to provide for contractor termination costs.
- (21) Approval is pending on an increase of \$11.7M to the baseline principally due to new requirements.

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APPENDIX C: SOLUTION IMPLEMENTATION SUPPORTING DATA

C.1 Introduction

This section describes the methodology and audit ground rules used in the AMS analysis, and summary of contract file audits of pre- and post-AMS contract awards.

C.2 Methodology

Our evaluation methodology for the Solution Implementation phase included an assessment of pre-contract award activities, an audit of program performance after contract award, and an assessment of small business (SB) and small economically disadvantaged business (SEDB) utilization. The pre-contract award process audit was based upon an analysis of selected contract files. The selected contract files represented all major awards at FAA Headquarters and the FAA regional offices from October 1996 to May 1999. This resulted in the audit of 213 contract files as noted in the following schedules. The total value of the contracts audited exceeded 3.0 billion dollars.

The effectiveness of the pre-contract award activities was measured across the timeline from program authorization through contract award. The starting point for data collection was the procurement request (PR) form (which was found in tab one of nearly all files reviewed) which provided funding authority to commence the contracting process. Contract award documented the end of the process. A worksheet was developed which tracked significant milestones documenting development and award of a contract.

For post-contract award processes, we audited contract files from a representative number of major programs, documenting and analyzing contract changes to draw conclusions regarding program performance. In our assessment of small business utilization, we reviewed the statistics provided by the FAA's Small Business Utilization Office and validated these statistics based on data collected and analyzed during our pre-contract award process audit.

C.3 Pre-Contract Award Process Audit

To enable provide a fair comparison, the following ground rules were followed in collecting and recording data.

- Letter contract metrics was not included in the summary data. Letter contracts represent authorization to proceed with contract work without establishing firm prices or delivery schedules. Additional time is required to negotiate these cost and schedule issues after Letter Contract award. Contract file information was not always available to measure this additional time. It is included in the timeline measured for a normal contract, so comparison to Letter Contract award times is inappropriate.
- Program starting dates were based upon authorization to proceed against firm requirements. Several FAR programs experienced program redefinition after an initial PR was prepared and preliminary work performed. The starting point was measured from the inception of the revised program authorization.

- In some instances, the AMS Acquire system issues the PR shortly before contract award. In those cases, other available schedule dates representing initial program activity were used to measure the starting point.
- Several AMS files did not include data supporting a legitimate starting point for measuring award time. Accordingly, the abbreviated time was not included in the data.

C.3.1 Summary Findings – Award Lead Times

The results of the contract file reviews demonstrated improvement in contract award process time comparing AMS with FAR awards. Exhibit C-1 summarizes the award time improvements.

Type of Award	AMS Award Time	FAR Award Times	Savings in Days	Savings Percent
Small & Small Disadvantaged Business	114	248	134	54%
Open Competitive Awards	183	378	195	52%
Sole/Single Source	172	464	292	63%
Overall (weighted average)	164	347	183	53%

Exhibit C-1. Award Time Improvement

C.3.2 Summary Findings – Extent of Competition

AMS has resulted in an improvement of competitive awards compared with non competitive awards. Exhibit C.5-1 summarizes the percentage of competitive awards compared with non competitive awards between the pre- and post-AMS contracts reviewed.

Type of Award	FAR	AMS
Competitive	44	115
Non competitive	38	16
Total	82	131
Percentage Competitive	54%	88%

Exhibit C-2. Competitive Award Improvement

C.3.3 Contract Award Metrics – Conclusion

The two most significant conclusions that can be drawn are that AMS has resulted in significant time savings in contract award and has enhanced competition.

- AMS has resulted in significant time savings in contract award. Based upon the review of significant awards made since January 1994, AMS has led to an improvement in award times from 347 to 164 days, a 53 percent improvement.

- AMS has enhanced competition. The files reviewed showed an improvement from 54 percent to 88 percent in percentage of competitively awarded contracts based upon the sample of files reviewed.

C.4 Post-Contract Award Performance Audit

Our approach to assessing the effectiveness of AMS included the review of 35 programs representing a cross section of the FAA business base. For evaluation of the Solution Implementation Phase, we reviewed available contract files from these programs to assess changes (cost and schedule) from award forward. Contract modifications were reviewed to evaluate how well AMS was implemented. The effectiveness of AMS was measured across the completed timeline from program authorization through contract administration. Appendix E contains a listing of the selected 35 programs evaluated under this performance audit. To enable a fair comparison, the following ground rules were followed in collecting and recording data.

- Several of the FAA program contracts were awarded prior to AMS. These programs would not provide a accurate picture of how well AMS facilitates contract administration. Accordingly, programs awarded under FAR were not included in the data.
- Several of the FAA programs were not yet in the Solution Implementation Phase of AMS. Accordingly, these programs were not included in the data.

C.4.1 Summary Finding –Post-Contract Award Performance Audit

The data gathered is inconclusive concerning the effectiveness of post-contract award activities under AMS. Of the 35 programs audited, only 13 programs had contracts awarded under AMS, with 50 percent of the contracts awarded in fiscal year 1998. Several programs have had their delivery schedule or requirements revised, resulting in an increase in the contract ceiling. The evidence does not support that the AMS process caused these changes to the contract.

A majority of the contact modifications being issued are bilateral instead of unilateral. Most of the modifications issued are for administrative changes or incremental funding. These types of modifications should be issued unilaterally to contractors. The majority of Contracting Officers are issuing modifications bilaterally to ensure contractors are in agreement with the adjustments.

C.5 Small Business and SEDB Utilization Assessment

Overall awards to small business concerns have consistently exceeded goals set by the FAA and its Small Business Utilization (SBU) Office. However, awards to small and economically disadvantaged businesses (SEDB) and women-owned businesses have decreased, primarily in the area of new contract awards to SEDB firms. Although obligated funds to SEDB firms in fiscal year 1998 reached 90 percent of their goal, 70 of that 90 percent reflect modifications to existing FAR (pre-AMS) contracts. The other 20 percent (only 2 percent overall) represent awards under new AMS contracts. This decrease may be attributed to the fact that AMS policy does not require coordination between IPTs and the SBU Office during the requirements phase.

The results of the small business utilization study are based on information collected during FAA staff interviews, surveys sent to the small business community and an analysis of the information provided to us by the Small Business Utilization Office.

C.5.1 Summary Findings – Small Business Utilization

Booz·Allen conducted interviews with members of the SBU Office to ascertain their views on the effectiveness of AMS in support of small business concerns. The following observations were made:

- The SBU Office has no direct influence over IPT acquisition strategy decisions. AMS policy does not require the IPTs to coordinate with SBU during the requirements phase.
- Large contractors do not consistently report small business subcontracting accomplishments.
- The Mentor Protégé Program does not appear to be utilized to the extent intended.
- Opportunities that might have been afforded to small businesses in the past are sometimes incorporated into larger contracts for award to large businesses.
- SBU does not always have the opportunity to present the IPT with potentially qualified small business sources.

C.5.2 Summary Findings – Small Business External Survey

Booz·Allen invited 23 small businesses (8 small businesses, 7 small disadvantaged businesses and 8 woman-owned businesses) to take part in the AMS Evaluation Survey. Of the 23 contacted, 15 elected to participate and were e-mailed surveys. Only three responded. Their observations are as follows:

- AMS has streamlined the acquisition process.
- AMS does not adequately provide new small business concerns reasonable opportunities to participate as prime contractors and subcontractors. Rather, it favors companies with an established working relationship with FAA and larger small businesses.
- The Mentor Protégé Program does not have support from FAA's upper management, thus limiting teaming agreements between large and small contractors.
- The Small Business Utilization Office is understaffed and without authority.
- The appropriate stakeholders and organizations are involved in the Mission Analysis process.

C.5.3 FAA Small Business Utilization Office Input

The Small Business Utilization Office provided Booz·Allen with statistical information regarding small business goals and accomplishments from fiscal year 1994 to the present. These are also the figures that the Department of Transportation reports to the Small Business Administration. This information consisted of FAA-wide major procurement goals and accomplishments. The findings are as follows:

- Since the inception of AMS, overall awards to small businesses have consistently exceeded goals. However, SEDB 8(a) and woman-owned business awards have not met goals on a consistent basis.
- Although the overall accomplishment of obligated funds to SEDB 8(a) firms was 9 percent, 7 percent of these funds stem from modifications to pre-AMS awarded contracts; and only 2percent represent newly awarded business under AMS.

C.6 Supporting Data

This section contains supporting data that was used in the analysis. Exhibit C-3 lists the FAR contract files reviewed in the analysis.

Contract Number	Initial Award (\$)	Final Award (\$)
95C00004	224,609	224,609
94C94047	58,320	215,180
96C30042	2,163,844	2,163,844
95C30075	3,064,869	3,064,869
95C30075	3,064,869	3,064,869
95D95519	931,402	931,402
95C50074	2,795,599	2,795,599
95C10019	3,510,992	3,510,992
96C50023	1,281,533	1,281,533
95C10018	1,844,000	1,844,000
95C03167	256,301	256,301
95C50068	2,925,841	2,925,841
95C95557	1,540,333	1,540,333
95C30107	1,127,000	1,127,000
96C33745	14,944	14,944
96C00042	16,436,632	16,436,632
95D95310	3,480,432	3,480,432
94C50094	998,394	998,394
95D95501	671,309	3,562,846
95C00026	11,093,352	24,592,816
94C50065	3,186,972	3,186,972
96Y01007	2,405,822	2,405,822
94D94520	874,789	2,379,828
95C00028	2,756,000	2,756,000
95C00018	5,237,000	5,237,000
94C00062	9,709,200	9,709,200
94C00063	19,498,895	19,498,895
94C00065	18,680,601	18,680,601
95C50043	1,077,689	1,077,689
95C25026	13,414,000	13,414,000
95C30074	208,847	208,847
95C03123	3,038,978	3,038,978
96C50028	1,295,836	1,295,836
95C40031	5,945,000	5,945,000
95C50068	2,864,709	2,864,709
96C00006	7,155,152	7,155,152

Exhibit C-3. Contracts Reviewed Originating Under the FAR System

Contract Number	Initial Award (\$)	Final Award (\$)
94D94535	2,000,000	8,636,723
95C00005	7,567,367	40,672,376
95D95011	1,359,229	1,359,229
95C95058	1576741	1576741
96C00036	16,218,503	72,000,000
95D95502	1,243,485	1,243,485
94C50102	2,544,508	2,544,508
96C96005	3379554	3379554
94D03020	5,321,622	9,840,800
97D97502	3,061,987	14,585,503
95C00027	18,846,602	18,846,602
95C25011	596,800	596,800
97C00006	4,000,000	44,500,000
96D96502	95,756	2,974,084
95C00009	1,881,219	5,074,100
96C33775	214,802	214,802
95C00013	5,000,000	15,900,000
92D92903	4,142,600	20,695,587
95C50013	1,315,424	1,315,424
95D95003	1,443,503	2,942,361
96D03001	12,698,427	12,698,427
96D03002	13,584,775	13,584,775
94C94900	11,968,000	11,968,000
94D94064	338,200	1,691,000
95D95018	230,580	1,152,150
95C00047	65,000,000	140,787,031
96C96019	2789920	2789920
91D91065	926,565	926,565
94D03009	2,800,000	25,900,000
96Y01015	2,997,526	2,997,526
95C00015	10,000,000	208,564,715
96D96517	5,600,000	16,972,266
94D94032	1680460	1860351
94D94308	1,158,133	1,158,133
97D97515	1793420	1793420
95D95504	2,683,760	6,833,503
94D03018	21,318,420	21,318,420
95D03007	3,999,816	9,703,679
94D94318	260,000	5,055,866

Exhibit C-3. Contracts Reviewed Originating Under the FAR System (Continued)

Contract Number	Initial Award (\$)	Final Award (\$)
97D97510	4,613,839	25,000,000
96C30051	1,475,351	1,475,351
95C00039	10,614,845	10,614,845
96D03008	65,000,000	952,852,000
94C00070	75,768,601	187,975,250
95C00031	74,507,024	312,000,000
96D96532	8,814,619	20,750,943
TOTAL	639,266,048	2,440,209,780

Exhibit C-3. Contracts Reviewed Originating Under the FAR System (Concluded)

Exhibit C-4 lists the AMS contract files reviewed.

Contract Number	Initial Award (\$)	Final Award (\$)
98C00038	1,834,000	1,834,000
98F40536	347,192	347,192
96Y01008	121,522	2,740,806
98C00125	15,877	15,877
98C00132	171,771	171,771
98D98007	10,494,561	10,494,561
98C00042	64,092,705	64,092,705
97Y01003	22,700,000	22,700,000
97D00024	6,000,000	6,000,000
97C00032	12,060,000	12,060,000
97C00069	500,000	500,000
98D03005	1,800,000	1,800,000
97C00049	1,300,000	1,300,000
97D97549	456,000	456,000
98D98579	308,547	308,547
98D98009	1,678,282	1,678,282
98D00010	1,817,215	1,817,215
98D98007	22,042,189	22,042,189
98C00081	42,250,000	42,250,000
98C00058	11,688,612	11,688,612
98C00127	281,021	281,021
97C33855	78,500	78,500
96C03241	98,808	98,808
97C00019	2,500,000	15,797,759
97C00020	2,144,637	17,171,413
98C00036	6,427,500	6,427,500
97C10003	1,034,300	1,034,300

Exhibit C-4. Contracts Reviewed Originating Under the AMS

Contract Number	Initial Award (\$)	Final Award (\$)
96C30001	2,349,667	2,349,667
96D96530	1,590,000	1,590,000
98C00057	6,792,291	6,792,291
97C00057	275,000	2,110,134
97R03247	80,505	80,505
97C00070	105,403,856	105,403,856
97C30079	1,349,000	1,349,000
97C00021	52,400,000	110,900,000
96C26026	1,100,000	1,100,000
97D97544	259,800	259,800
98D98566	806,164	806,164
97C27033	818,420	818,420
98C00013	5,353,750	5,353,750
98C00002	7,500,000	7,500,000
97C10022	4,800,000	4,800,000
98D98567	916,369	916,369
96C03247	80,505	80,505
98Y01000	20,000,000	20,000,000
98C98021	450,020	450,020
98C10018	1,844,000	1,844,000
98C78006	172,290	172,290
96C30040	2,122,000	2,122,000
97C30040	2,122,000	2,122,000
94D30007	207,152	207,152
97C07031	1,742,069	1,742,069
97C27011	596,800	596,800
97C04000	1,637,466	1,637,466
97C50012	5,301,077	5,301,077
98C78004	156,240	156,240
96D96021	9,547,411	9,547,411
97P80385	26,240	26,240
97C00010	12,322,961	12,322,961
97C27019	288,448	288,448
98C00032	100,000,000	100,000,000
97C00072	6,216,665	6,216,665
99C50079	1,791,000	1,791,000
98C00183	176,694	176,694
98D98563	1,010,340	1,010,340
98C30046	108,674	134,655
99D05181	12,111,611	12,111,611
98D98636	12,636,415	12,636,415
97C00018	2,144,637	2,144,637

Exhibit C-4. Contracts Reviewed Originating Under the AMS (Continued)

Contract Number	Initial Award (\$)	Final Award (\$)
96C00027	3,226,383	3,226,383
99C30071	486,909	486,909
97C30050	4,783,250	4,783,250
97D97027	16,784,055	106,747,636
96C30051	1,475,351	1,475,351
98D98584	533,720	533,720
96C03249	65,197	65,197
98C00123	179,316	179,316
97C00014	603,187	1,230,000
97R30027	173,320	898,272
97C00051	4,024,000	10,778,520
97C00052	916,796	2,377,713
97C03612	2,495,000	2,495,000
97C50001	1,934,669	1,934,669
98C50005	17,106,665	17,106,665
96C03685	1,233,019	1,233,019
97C97035	104,946	1,946,807
98D98580	3,000,000	3,000,000
98C50038	7,593,844	7,593,844
98C50861	1,034,300	1,034,300
98C50023	902,363	902,363
97D97525	1,793,420	5,998,550
95C00046	1,185,961	1,185,961
97C00056	1,500,000	1,500,000
97C00004	26,500,000	26,500,000
97C30019	5,948,844	5,948,844
97C00035	3,201,450	25,000,000
97C00036	6,144,250	25,000,000
97C00037	2,883,038	25,000,000
97C50045	1,122,481	1,122,481
98C98024	5,000,000	5,000,000
98D03006	8,212,000	8,212,000
97C30043	878,000	887,696
97C33823	147,700	147,700
97C33905	367,000	367,000
97C33838	49,300	49,300
96Y00043	517,726	517,726
97C00017	7,800,000	7,800,000
96C03259	500,000	500,000
96C96033	3,623,300	3,623,300
98C30043	629,844	629,844
96C96051	1,175,000	1,175,000

Exhibit C-4. Contracts Reviewed Originating Under the AMS (Continued)

Contract Number	Initial Award (\$)	Final Award (\$)
98D98597	454,000	454,000
98C78003	376,887	376,887
98C00163	932,352	932,352
99C30045	1,026,607	1,026,607
97C50027	4,798,000	4,798,000
98C50036	14,083,379	14,083,379
99C30033	280,674	2,602,886
96C96036	1,900,460	1,900,460
98C00007	2,000,000	11,281,465
98C30002	188,482	188,482
97C03678	7,790,000	7,790,000
97C30034	122,077	122,077
97D97041	1,018,198	1,018,198
97D97004	1,416,082	9,703,939
97C50853	803,335	803,335
97D03001	2,800,000	25,900,000
98C00060	50,000,000	50,000,000
96D96517	29,244,417	29,244,417
97D97510	4,613,839	4,613,839
98D03004	1,400,000	1,400,000
Total	873,935,169	1,176,590,369

Exhibit C-4. Contracts Reviewed Originating Under the AMS (Concluded)

Exhibit C-5 provides a summary of the FAR contracts reviewed, Pre-RFP and RFP-Award times and initial and final contract values (contracts with 0 days were not included in the average).

Type of Award	Contract Number	Pre-RFP	RFP-Award	Total Days	Initial Award (\$)	Final Award (\$)
SB/SEDB ¹	95C00004	0	44	44	224,609	224,609
SB/SEDB	95C30075	21	54	75	3,064,869	3,064,869
SB/SEDB	95C10019	30	84	114	3,510,992	3,510,992
SB/SEDB	96C50023	31	275	306	1,281,533	1,281,533
SB/SEDB	95C10018	32	65	97	1,844,000	1,844,000
SB/SEDB	95C03167	34	70	104	256,301	256,301
SB/SEDB	95C50068	35	115	150	2,925,841	2,925,841
SB/SEDB	96C33745	43	137	180	14,944	14,944
SB/SEDB	94C50094	58	240	298	998,394	998,394
SB/SEDB	94C50065	65	147	212	3,186,972	3,186,972
SB/SEDB	96Y01007	74	96	170	2,405,822	2,405,822

Exhibit C-5. Summary of FAR Contracts

¹ SB (Small Business); SEDB (Small Economically Disadvantaged Business)

Type of Award	Contract Number	Pre-RFP	RFP-Award	Total Days	Initial Award (\$)	Final Award (\$)
SB/SEDB	94D94520	75	135	210	874,789	2,379,828
SB/SEDB	95C00028	76	84	160	2,756,000	2,756,000
SB/SEDB	95C03123	93	98	191	3,038,978	3,038,978
SB/SEDB	96C50028	93	102	195	1,295,836	1,295,836
SB/SEDB	95C50068	98	26	124	2,864,709	2,864,709
SB/SEDB	95D95011	117	191	308	1,359,229	1,359,229
SB/SEDB	94C50102	131	28	159	2,544,508	2,544,508
SB/SEDB	94D03020	138	192	330	5,321,622	9,840,800
SB/SEDB	96C33775	159	91	250	214,802	214,802
SB/SEDB	95C50013	180	110	290	1,315,424	1,315,424
SB/SEDB	95D95003	194	72	266	1,443,503	2,942,361
SB/SEDB	91D91065	240	180	420	926,565	926,565
SB/SEDB	96Y01015	253	68	321	2,997,526	2,997,526
SB/SEDB	94D94308	329	243	572	1,158,133	1,158,133
SB/SEDB	95D95504	360	158	518	2,683,760	6,833,503
SB/SEDB	94D94318	378	261	639	260,000	5,055,866
	TOTAL SB/SEDB	128 days average	125 days average.	248 days average	50,769,661	67,238,345
Competitive	92D92903	171	302	473	4,142,600	20,695,587
Competitive	94C00062	80	183	263	9,709,200	9,709,200
Competitive	94C00063	80	183	263	19,498,895	19,498,895
Competitive	94C00065	80	183	263	18,680,601	18,680,601
Competitive	94C00070	690	180	870	75,768,601	187,975,250
Competitive	94C94047	6	120	188	58,320	215,180
Competitive	94C94900	203	587	790	11,968,000	11,968,000
Competitive	94D03009	240	195	435	2,800,000	25,900,000
Competitive	94D03018	365	176	541	21,318,420	21,318,420
Competitive	94D94064	210	35	245	338,200	1,691,000
Competitive	95C00005	107	210	317	7,567,367	40,672,376
Competitive	95C00009	158	309	467	1,881,219	5,074,100
Competitive	95C00015	260	470	730	10,000,000	208,564,715
Competitive	95C00027	148	349	497	18,846,602	18,846,602
Competitive	95C00031	730	150	880	74,507,024	312,000,000
Competitive	95C00047	215	407	622	65,000,000	140,787,031
Competitive	95C25011	150	59	209	596,800	596,800
Competitive	95C25026	83	163	246	13,414,000	13,414,000
Competitive	95C30074	88	50	138	208,847	208,847
Competitive	95C30075	21	32	53	3,064,869	3,064,869
Competitive	95C30107	43	48	91	1,127,000	1,127,000
Competitive	95C40031	97	120	217	5,945,000	5,945,000
Competitive	95C50043	83	84	167	1,077,689	1,077,689
Competitive	95C50074	27	44	71	2,795,599	2,795,599

Exhibit C-5. Summary of FAR Contracts (continued)

Type of Award	Contract Number	Pre-RFP	RFP-Award	Total Days	Initial Award (\$)	Final Award (\$)
Competitive	95C95557	41	123	164	1,540,333	1,540,333
Competitive	95D95018	210	90	300	230,580	1,152,150
Competitive	95D95310	50	152	202	3,480,432	3,480,432
Competitive	95D95501	60	122	182	671,309	3,562,846
Competitive	95D95502	120	212	332	1,243,485	1,243,485
Competitive	95D95519	25	126	151	931,402	931,402
Competitive	96C00006	100	137	237	7,155,152	7,155,152
Competitive	96C00036	120	150	270	16,218,503	72,000,000
Competitive	96C00042	47	61	108	16,436,632	16,436,632
Competitive	96C30042	15	66	81	2,163,844	2,163,844
Competitive	96C30051	420	130	550	1,475,351	1,475,351
Competitive	96D03001	195	224	419	12,698,427	12,698,427
Competitive	96D03002	195	224	419	13,584,775	13,584,775
Competitive	96D03008	447	195	642	65,000,000	952,852,000
Competitive	96D96502	158	157	315	95,756	2,974,084
Competitive	96D96517	310	270	580	5,600,000	16,972,266
Competitive	96D96532	800	540	1340	8,814,619	20,750,943
Competitive	97C00006	150	243	393	4,000,000	44,500,000
Competitive	97D97502	145	224	369	3,061,987	14,585,503
Competitive	97D97510	420	90	520	4,613,839	25,000,000
	TOTAL COMP	190 days average	186 days average	378 days average	539,331,279	2,286,886,386
Sole Source	94D94032	323	189	512	1680460	1860351
Sole Source	94D94535	103	505	608	2000000	8636723
Sole Source	95C00013	165	245	410	5,000,000	15,900,000
Sole Source	95C00018	78	256	334	5,237,000	5,237,000
Sole Source	95C00026	60	264	324	11,093,352	24,592,816
Sole Source	95C00039	420	249	669	10,614,845	10,614,845
Sole Source	95C95058	120	90	210	1576741	1576741
Sole Source	95D03007	375	90	465	3,999,816	9,703,679
Sole Source	96C96005	131	257	388	3379554	3379554
Sole Source	96C96019	224	430	655	2789920	2789920
Sole Source	97D97515	330	195	525	1793420	1793420
	TOTAL SS	212 days average	252 days average	464 days average	49,165,108	86,085,049
Avg Total for all Contracts		170 days average	175 days average	347 days average	639,266,048	2,440,209,780

Table C-5. Summary of FAR Contracts (Concluded)

Exhibit C-6 provides a summary of the AMS contracts reviewed, Pre-RFP and RFP-Award times and initial and final contract values (contracts with 0 days were not included in the average).

Type Award	Contract Number	Pre-RFP	RFP-Award	Total Days	Initial Award (\$)	Final Award (\$)
SB/SEDB	96Y01008	0	22	22	121,522	2,740,806
SB/SEDB	98C00125	0	22	22	15,877	15,877
SB/SEDB	98C00132	0	28	28	171,771	171,771
SB/SEDB	98D98579	0	132	132	308,547	308,547
SB/SEDB	97C33855	2	35	37	78,500	78,500
SB/SEDB	97C10003	11	35	46	1,034,300	1,034,300
SB/SEDB	96C30001	13	2	15	2,349,667	2,349,667
SB/SEDB	98C00057	13	128	141	6,792,291	6,792,291
SB/SEDB	97C00057	15	121	136	275,000	2,110,134
SB/SEDB	96C26026	24	61	85	1,100,000	1,100,000
SB/SEDB	97C27033	26	65	91	818,420	818,420
SB/SEDB	96C03247	29	19	48	80,505	80,505
SB/SEDB	98Y01000	29	34	63	20,000,000	20,000,000
SB/SEDB	98C98021	29	37	66	450,020	450,020
SB/SEDB	98C10018	30	21	51	1,844,000	1,844,000
SB/SEDB	98C78006	31	6	37	172,290	172,290
SB/SEDB	94D30007	33	93	126	207,152	207,152
SB/SEDB	97C27011	34	49	83	596,800	596,800
SB/SEDB	98C78004	41	5	46	156,240	156,240
SB/SEDB	97P80385	48	50	98	26,240	26,240
SB/SEDB	97C27019	49	37	86	288,448	288,448
SB/SEDB	98C00183	55	36	91	176,694	176,694
SB/SEDB	98C00123	65	58	123	179,316	179,316
SB/SEDB	97R30027	69	134	203	173,320	898,272
SB/SEDB	96C03685	75	45	120	1,233,019	1,233,019
SB/SEDB	98C50023	86	43	129	902,363	902,363
SB/SEDB	97C50045	98	35	133	1,122,481	1,122,481
SB/SEDB	97C33823	109	46	155	147,700	147,700
SB/SEDB	97C33838	117	56	173	49,300	49,300
SB/SEDB	96Y00043	120	26	146	517,726	517,726
SB/SEDB	96C03259	123	83	206	500,000	500,000
SB/SEDB	97C50853	224	71	295	803,335	803,335
SB/SEDB	97D97510	412	107	519	4,613,839	4,613,839
	Total SB/SEDB	69 days average	53 days average	114 days average	47,306,683	52,486,053
Competitive	98C00038	0	0	30	1,834,000	1,834,000
Competitive	98D98008	0	34	34	10,494,561	10,494,561
Competitive	97D00024	0	63	63	6,000,000	6,000,000

Exhibit C-6. Summary of AMS Contracts

Type Award	Contract Number	Pre-RFP	RFP-Award	Total Days	Initial Award (\$)	Final Award (\$)
Competitive	98D03005	0	97	97	1,800,000	1,800,000
Competitive	97C00049	0	105	105	1,300,000	1,300,000
Competitive	98D98009	0	142	142	1,678,282	1,678,282
Competitive	98D00010	0	181	181	1,817,215	1,817,215
Competitive	98D98007	0	182	182	22,042,189	22,042,189
Competitive	98C00081	0	190	190	42,250,000	42,250,000
Competitive	98C00058	0	306	306	11,688,612	11,688,612
Competitive	98C00127	1	45	46	281,021	281,021
Competitive	96C03241	6	42	48	98,808	98,808
Competitive	97C00019	8	33	41	2,500,000	15,797,759
Competitive	97C00020	8	33	41	2,144,637	17,171,413
Competitive	98C00036	9	15	24	6,427,500	6,427,500
Competitive	96D96530	13	65	78	1,590,000	1,590,000
Competitive	97R03247	15	190	205	80,505	80,505
Competitive	97C00070	19	890	909	105,403,856	105,403,856
Competitive	97C30079	23	28	51	1,349,000	1,349,000
Competitive	97D97544	25	156	181	259,800	259,800
Competitive	98D98566	26	30	56	806,164	806,164
Competitive	98C00002	27	185	212	7,500,000	7,500,000
Competitive	97C10022	28	70	98	4,800,000	4,800,000
Competitive	98D98567	28	78	106	916,369	916,369
Competitive	96C30040	32	23	55	2,122,000	2,122,000
Competitive	97C30040	32	23	55	2,122,000	2,122,000
Competitive	97C07031	34	48	82	1,742,069	1,742,069
Competitive	97C04000	36	280	316	1,637,466	1,637,466
Competitive	97C50012	39	84	123	5,301,077	5,301,077
Competitive	96D96021	47	136	183	9,547,411	9,547,411
Competitive	98C00032	50	119	169	100,000,000	100,000,000
Competitive	97C00072	53	22	75	6,216,665	6,216,665
Competitive	99C50079	53	63	116	1,791,000	1,791,000
Competitive	98D98563	56	58	114	1,010,340	1,010,340
Competitive	98C30046	56	77	133	108,674	134,655
Competitive	99D05181	57	126	183	12,111,611	12,111,611
Competitive	98D98636	58	162	220	12,636,415	12,636,415
Competitive	97C00018	58	229	287	2,144,637	2,144,637
Competitive	96C00027	59	221	280	3,226,383	3,226,383
Competitive	99C30071	60	56	116	486,909	486,909
Competitive	97C30050	61	53	114	4,783,250	4,783,250
Competitive	97D97027	62	74	136	16,784,055	106,747,636
Competitive	96C30051	64	131	195	1,475,351	1,475,351
Competitive	98D98584	64	227	291	533,720	533,720
Competitive	96C03249	65	26	91	65,197	65,197

Exhibit C-6. Summary of AMS Contracts (Continued)

Type Award	Contract Number	Pre-RFP	RFP-Award	Total Days	Initial Award (\$)	Final Award (\$)
Competitive	97C00051	71	28	99	4,024,000	10,778,520
Competitive	97C00052	71	55	126	916,796	2,377,713
Competitive	97C03612	72	60	132	2,495,000	2,495,000
Competitive	97C50001	74	45	121	1,934,669	1,934,669
Competitive	98C50005	74	85	159	17,106,665	17,106,665
Competitive	97C97035	78	90	168	104,946	1,946,807
Competitive	98C50038	82	95	177	7,593,844	7,593,844
Competitive	98C50861	86	34	120	1,034,300	1,034,300
Competitive	97D97525	87	140	227	1,793,420	5,998,550
Competitive	95C00046	90	49	139	1,185,961	1,185,961
Competitive	97C00056	90	116	206	1,500,000	1,500,000
Competitive	97C30019	96	69	165	5,948,844	5,948,844
Competitive	97C00035	97	103	200	3,201,450	25,000,000
Competitive	97C00036	97	103	200	6,144,250	25,000,000
Competitive	97C00037	97	103	200	2,883,038	25,000,000
Competitive	98C98024	102	47	149	5,000,000	5,000,000
Competitive	97C30043	109	35	144	878,000	887,696
Competitive	97C33905	114	53	167	367,000	367,000
Competitive	97C00017	120	180	300	7,800,000	7,800,000
Competitive	96C96033	125	32	157	3,623,300	3,623,300
Competitive	98C30043	125	60	185	629,844	629,844
Competitive	96C96051	140	68	208	1,175,000	1,175,000
Competitive	98D98597	141	81	222	454,000	454,000
Competitive	98C78003	145	30	175	376,887	376,887
Competitive	98C00163	153	50	203	932,352	932,352
Competitive	99C30045	157	46	203	1,026,607	1,026,607
Competitive	97C50027	161	109	270	4,798,000	4,798,000
Competitive	98C50036	163	96	259	14,083,379	14,083,379
Competitive	99C30033	167	17	184	280,674	2,602,886
Competitive	96C96036	171	35	206	1,900,460	1,900,460
Competitive	98C30002	174	42	216	188,482	188,482
Competitive	97C03678	177	81	258	7,790,000	7,790,000
Competitive	97C30034	201	54	255	122,077	122,077
Competitive	97D97004	215	170	385	1,416,082	9,703,939
Competitive	97D03001	240	195	435	2,800,000	25,900,000
Competitive	98C00060	400	171	571	50,000,000	50,000,000
Competitive	96D96517	409	266	675	29,244,417	29,244,417
	Total Competitive	90 days average	105 days average	183 days average	613,662,493	842,730,045
Sole Source	98F40536	0	6	6	347,192	347,192
Sole Source	98C00042	0	37	37	64,092,705	64,092,705
Sole Source	97Y01003	0	44	44	22,700,000	22,700,000
Sole Source	97C00032	0	79	79	12,060,000	12,060,000

Exhibit C-6. Summary of AMS Contracts (Continued)

Type Award	Contract Number	Pre-RFP	RFP-Award	Total Days	Initial Award (\$)	Final Award (\$)
Sole Source	97C00069	0	86	86	500,000	500,000
Sole Source	97D97549	0	112	112	456,000	456,000
Sole Source	97C00021	24	10	34	52,400,000	110,900,000
Sole Source	98C00013	27	160	187	5,353,750	5,353,750
Sole Source	97C00010	48	106	154	12,322,961	12,322,961
Sole Source	97C00014	66	150	216	603,187	1,230,000
Sole Source	98D98580	82	48	130	3,000,000	3,000,000
Sole Source	97C00004	90	122	212	26,500,000	26,500,000
Sole Source	98D03006	107	243	350	8,212,000	8,212,000
Sole Source	98C00007	171	57	228	2,000,000	11,281,465
Sole Source	97D97041	210	8	218	1,018,198	1,018,198
Sole Source	98D03004	414	248	662	1,400,000	1,400,000
	Total Sole Source	124 days average	95 days average	172 days average	212,965,993	281,374,271
Avg Total for all contracts		88 days average	90 days average	164 days average	873,935,169	1,176,590,369

Exhibit C-6. Summary of AMS Contracts (Concluded)

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APPENDIX D. SURVEY QUESTIONNAIRE RESULTS SUMMARY

The following table provides the results of the survey questionnaire based on 106 responses.

Survey Questions	Survey Results				
	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
1. I am very familiar with the AMS process.	3%	9%	9%	49%	31%
2. AMS has improved the acquisition process by reducing the requirement to follow the previously mandatory acquisition policy (i.e., the FAR).	2%	11%	14%	56%	17%
3. AMS has improved organizational efficiency/productivity.	3%	22%	26%	40%	9%
4. AMS has successfully integrated all phases of the acquisition management lifecycle into a unified, cohesive process.	11%	28%	32%	25%	3%
5. AMS has streamlined the acquisition process.	4%	10%	20%	50%	16%
6. AMS has improved the mechanisms for managing program changes throughout a system's lifecycle.	5%	13%	43%	36%	4%
7. AMS better addresses the needs of all staff involved in the acquisitions process.	2%	17%	38%	40%	4%
8. AMS has improved management's ability to make decisions based on key program baseline indicators.	3%	11%	47%	36%	4%
9. AMS provides better links to FAA's strategic plans /goals.	2%	14%	42%	34%	8%
10. AMS considers advanced operational concepts (e.g., Free Flight, NIM, ATS 2005 NAS CONOPS, etc.) for mission needs solutions.	3%	6%	50%	38%	4%
11. AMS is better able to identify the best value mission needs solution based on quantitative data.	3%	17%	51%	24%	6%
12. AMS considers a reasonable number of alternative solutions prior to making an objective investment decision.	1%	6%	42%	49%	3%
13. AMS supports the use of COTS/NDI solutions, when appropriate, to satisfy mission needs.	3%	4%	24%	59%	10%
14. AMS allows the FAA to develop and acquire advanced technologies to satisfy mission needs.	1%	7%	22%	66%	5%
15. AMS and the IPTs integrate Human Factors Engineering with Systems Engineering and Development efforts throughout the acquisition process.	6%	11%	46%	35%	3%
16. AMS promotes full and open competition as the preferred method for source selection.	1%	11%	15%	59%	15%
17. FAA employees can easily access useful AMS information.	5%	9%	16%	50%	21%
18. AMS has increased the quality and quantity of information regarding new technological capabilities of fielded systems.	2%	25%	52%	20%	2%
19. AMS improves access and availability of information that can be used to reduce the cost of fielding systems.	3%	17%	49%	28%	4%
20. AMS increases access and availability of information to enhance the performance of systems that have been fielded.	5%	19%	55%	19%	1%
21. AMS facilitates the implementation of performance improvement plans.	3%	15%	56%	25%	2%
22. AMS has improved the process for sustainment planning and programming.	4%	26%	46%	20%	4%

Survey Questions	Survey Results				
	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
23. AMS makes it easier to insert and use new technologies.	1%	13%	32%	50%	4%
24. AMS complements other internal performance improvement initiatives the FAA has undertaken.	1%	8%	47%	38%	6%
25. AMS efficiency and effectiveness is improved as a result of the FAA Integrated Capability Maturity Model (iCMM).	6%	13%	61%	20%	1%
26. AMS effectiveness is improved as a result of the FAA's Evolutionary Spiral Prototyping (ESP) / Spiral Development approach.	9%	15%	67%	8%	1%
27. AMS supports other external (e.g., Congressional, OMB) reform initiatives such as GPRA and NPR.	3%	7%	31%	54%	5%
28. AMS considers the National Security Policy (i.e., information security and physical security of aviation infrastructure) across the system acquisition lifecycle.	1%	15%	52%	30%	2%
29. AMS has reduced program and acquisition costs.	6%	17%	27%	42%	9%
30. AMS has reduced the time necessary to secure "best value" contracts in accordance with FAA's mission needs.	2%	7%	17%	60%	15%
31. AMS has reduced the time to field new systems and capabilities.	2%	18%	30%	38%	12%
32. AMS has not adversely affected program budgets or funding mechanisms.	3%	7%	37%	50%	4%
Management Support					
33. Senior-level managers support AMS implementation.	2%	12%	27%	47%	12%
34. Mid-level managers support AMS implementation.	1%	11%	27%	53%	8%
35. Procurement decisions are made at the appropriate management level.	3%	15%	31%	47%	5%
36. Personnel systems and career development and training programs are in place to support the effective implementation of AMS.	12%	23%	25%	38%	2%
Public Opinion					
37. AMS has established an adequate system of checks and balances to ensure public trust.	4%	17%	36%	38%	6%
38. AMS has improved the fairness and integrity of the procurement process.	5%	17%	39%	36%	2%
Achieving Small Business Goals					
39. AMS provides small businesses, and socially and economically disadvantaged businesses, fair and attainable opportunities to participate as prime contractors and subcontractors.	5%	15%	28%	48%	5%
40. AMS facilitates achieving the FAA's goals for contract awards to small businesses and socially and economically disadvantaged businesses.	8%	17%	34%	37%	4%
Staffing & Training					
41. AMS has improved the acquisition process by involving acquisition teams staffed with highly qualified and adequately trained people.	7%	25%	29%	37%	2%
42. AMS clearly defines the roles and responsibilities of staff members involved in its operation.	2%	24%	24%	46%	5%

Survey Questions	Survey Results				
	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
43. Staff involved with the AMS are trained and knowledgeable about the AMS “Core Policy”.	4%	15%	33%	43%	6%
44. Staff involved with the AMS are trained and knowledgeable about the set of “generic processes” pertaining to each primary acquisition category (i.e., systems & software, facilities, services).	5%	14%	39%	38%	5%
45. The FAA Acquisition Management System Toolset (FAST) promotes access to useful AMS information and job aids to support the FAA workforce implement the AMS process.	2%	3%	24%	55%	17%
46. AMS “Job Aids” (e.g., instructions, templates, checklists, best practices & lessons-learned databases, etc.) are useful for accomplishing specific AMS activities.	2%	7%	22%	63%	6%
47. The configuration control process for the FAST ensures that the information provided via the internet is accurate and up-to-date.	3%	5%	42%	43%	7%
Mission Analysis					
48. Mission Analysis is conducted within the framework of the NAS Architecture and long-range FAA strategic goals.	2%	11%	39%	40%	7%
49. Mission Analysis considers external forces—e.g., industry / user demands, Congressional mandates and performance goals (e.g., GPRA, NPR)—in defining mission needs.	0%	6%	45%	48%	1%
50. The Mission Analysis process describes needs, rather than specifying solutions.	2%	8%	39%	48%	3%
51. Mission Needs Statements (MNS) are developed based on the results of a rigorous mission analysis.	4%	15%	48%	33%	0%
52. Under the AMS, Mission Analysis and the development of MNSs are done up-front rather than after-the-fact.	1%	5%	40%	51%	2%
53. Mission Analysis and MNSs provide useful information that is used to develop operational concepts for addressing the need(s).	1%	13%	48%	37%	1%
54. Staff are adequately trained / knowledgeable about performing the Mission Analysis.	1%	25%	52%	21%	1%
55. Staff can access useful job aids and tools to perform the Mission Analysis.	1%	11%	55%	30%	2%
56. The Mission Analysis Steering Group (MASG) provides useful guidance in defining, validating, quantifying and prioritizing mission needs.	1%	21%	53%	23%	2%
57. The Mission Analysis process applies a “systems perspective” which considers individual mission needs in the broader context of the NAS.	0%	16%	49%	33%	1%
58. Mission Needs, as developed by Mission Analysis, can be linked to FAA strategic goals.	0%	5%	49%	45%	1%
59. The appropriate stakeholders and organizations are involved in the Mission Analysis process.	0%	13%	47%	37%	3%
60. Mission Analysis generates quantifiable resource estimates—benefits to FAA / aviation community, cost of infrastructure changes, cost/risk of not addressing the need, criticality and timeframe of need.	3%	18%	53%	23%	2%

Survey Questions	Survey Results				
	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
61. Mission Analysis quantifies the capability shortfall (supply-demand) and/or the technological opportunity to increase operational safety, efficiency, effectiveness.	1%	14%	52%	29%	5%
62. Mission Analysis expedites the implementation of non-material solutions (solutions that can be accomplished within approved budgets).	0%	18%	63%	17%	1%
63. Mission Analysis is used to periodically review, re-validate, and re-prioritize existing mission needs.	1%	14%	50%	33%	2%
64. AMS has improved the quality and timeliness of the Mission Analysis process, allowing the FAA to anticipate future needs for improved strategic planning.	3%	15%	52%	28%	2%
Investment Analysis					
65. MNS are used and are useful in performing the Investment Analysis.	1%	7%	44%	47%	1%
66. AMS employs a comprehensive analysis of realistic alternatives to meet the mission needs.	1%	10%	45%	43%	1%
67. High level strategic priorities are considered during the investment analysis phase.	0%	6%	52%	37%	5%
68. Requirements are well defined in the investment analysis process.	4%	19%	51%	25%	1%
69. The roles and responsibilities for those conducting investment analysis are well defined.	5%	11%	54%	27%	4%
70. The investment analysis roles and responsibilities are appropriately assigned.	5%	11%	62%	18%	4%
71. All necessary external stakeholders are involved in the investment analysis phase.	5%	17%	49%	29%	1%
72. AMS provides for all resources required to support investment analysis.	8%	23%	45%	24%	0%
73. Investment Analysis is accomplished per AMS design.	0%	6%	56%	38%	0%
74. Investment Analysis emphasizes evolutionary development (or planned product improvements), and prioritizes requirements to achieve economical and operationally effective solutions.	2%	13%	54%	26%	5%
75. The Systems Engineering/Operational Analysis Team (SEOAT) affordability assessments consider the priorities and interdependencies of all programs in the agency's financial baseline.	6%	19%	46%	25%	4%
76. AMS Investment Analysis produces improved (e.g., more accurate) cost estimates and budget baselines.	4%	11%	58%	27%	0%
77. AMS Investment Analysis produces improved (e.g., more realistic) work schedules for contract completion.	2%	18%	59%	20%	0%
78. Investment Analysis identifies alternative solutions that meet FAA's mission needs.	0%	8%	54%	34%	4%
79. AMS has reduced the amount of work required to conduct an investment analysis.	6%	26%	61%	7%	0%
80. The AMS requires fewer program planning documents during the investment analysis phase.	0%	12%	58%	25%	5%
Solution Implementation					
81. The AMS Solution Implementation process is understood throughout FAA.	9%	36%	38%	15%	1%
82. Solution Implementation priorities are based on the	11%	23%	43%	22%	1%

Survey Questions	Survey Results				
	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
entire lifecycle cost.					
83. AMS selects contractors that provide the best value in satisfying FAA's mission needs.	2%	9%	35%	52%	2%
84. AMS collects and reports data on past vendors including information pertaining to capabilities and past performances.	2%	17%	40%	41%	1%
85. AMS has improved the process for approving baseline changes.	3%	13%	54%	28%	2%
86. AMS has simplified the decision making process for design changes / modifications.	3%	13%	45%	35%	3%
87. Source selection and contracting decisions have been made easier under the AMS.	4%	8%	22%	53%	13%
88. AMS has resulted in better production decisions.	4%	9%	55%	28%	3%
89. Since the implementation of the AMS, acquisition time has been reduced by 50%.	9%	9%	47%	28%	6%
90. The progress of contracts relative to the established baselines, budgets, and schedules is accurately measured / tracked.	6%	16%	40%	36%	2%
91. AMS has reduced the time between procurement request and request for proposal.	3%	9%	28%	48%	11%
92. AMS has reduced the time between request for proposal and contract award.	4%	5%	22%	55%	14%
93. IPTs are given realistic Acquisition Program Baselines by the JRC.	7%	15%	56%	20%	2%
94. Integrated Product Teams (IPTs) develop and deliver solutions within the constraints of the Acquisition Program Baseline.	7%	15%	49%	23%	5%
95. AMS provides useful guidance and "job aids" (e.g. best practices, lessons learned, instructions, templates, etc.) for executing solution implementation actions, while minimizing mandatory policies.	3%	8%	42%	41%	6%
In-Service Management / Service Life Extension					
96. AMS has improved the in-service management process.	9%	19%	45%	22%	4%
97. AMS has improved the partnership between IPTs and operating and support organizations.	10%	16%	27%	41%	5%
98. AMS In-service Management & Service Life Extension process measures operational performance against strategic goals.	4%	14%	57%	24%	1%
99. AMS has improved the feedback loop between field operators & maintainers and the IPTs for better operational performance monitoring and system upgrade planning.	9%	22%	50%	16%	3%
100. AMS has improved coordination among the IPTs and investment analysis staff to identify alternative solutions in advance of the expiration of a capability's service life.	3%	17%	52%	26%	2%
101. AMS facilitates the removal of "obsolete" solutions from the field (e.g., when a capability is no longer needed; when the cost to repair exceeds cost to replace).	9%	23%	43%	25%	0%
102. AMS improves the ability to sustain fielded products within the Acquisition Program Baseline.	7%	21%	51%	19%	2%
103. AMS has made planned product improvements easier to manage and implement.	2%	13%	46%	36%	3%

Survey Questions	Survey Results				
	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
104. AMS promotes proactive service life analysis to anticipate impending mission needs.	4%	8%	45%	38%	4%
105. Customers / Users of FAA systems and services are satisfied with their quality.	5%	15%	53%	24%	3%
Dispute Resolution					
106. The dispute resolution system is conducted fairly and efficiently.	1%	9%	58%	26%	7%
107. AMS has improved the contract dispute / protest resolution process.	2%	9%	48%	34%	8%
108. AMS has increased satisfaction with the resolution of contract protests.	1%	8%	64%	20%	7%
109. AMS has reduced the frequency of contract disputes/protests.	5%	6%	61%	26%	2%

Booz·Allen interviewed 92 of the 106 respondents to our assessment survey. The table below identifies the FAA organizations that participated in our survey face to face interviews.

FAA Organizations Surveyed			
AAD-20	AML-6000	AOP-1	ASD-410
AAF-1	AMQ-100	AOS-1	ASD-420
AAF-5	AMQ-110	AOS-200	ASD-430
AAR-500	AMQ-210	AOS-400	ASO-50
AAR-600	AMQ-240	AOZ-2	AST-2
AAT-1	AMQ-300	API-18	ASU-100
ABA	AMQ-310	API-19	ASU-305
ACP-300	AMQ-340	ARA-1	ASU-330
ACS-300	AMQ-4	ARA-4	ASU-340
ACT-100	AMZ-210	ARA-5	ASU-350
ACT-200	AND-100	ARN-1	ASU-410
ACT-300	AND-370	ARS-1	ATO-410
ACT-400	AND-410	ARS-200	ATQ-2
ACT-50	AND-710	ARU-1	ATS-1
ACT-500	AND-730	ARU-200	ATS-8
ACT-51	ANI-10	ARX-2	AUA-1
ACT-7	ANI-300	ARX-200	AUA-200
AFZ-100	ANI-840	ASD-1	AUA-400
AGC-70	ANI-850	ASD-100	AUA-600
AGC-76	ANM-400	ASD-130	AUS-200
AMC-4	ANM-50	ASD-200	AVN-7
AMC-50	ANM-7	ASD-300	
AML-2000	ANS-1	ASD-400	

APPENDIX E. ANALYSIS OF POST- AND PRE-AMS PROGRAMS

The following table provides an analysis of pre- and post-AMS programs in terms of percentage schedule slips.

Program	Program Origin	COMMENTS	Percentage Slip
HOST REPLACEMENT	Post- AMS	1 MONTH SLIP OF 1 ST ORD	
FFP	Post – AMS	NONE NOTED	
OASIS	Post- AMS	26 MONTH SLIP TO 1 ST ORD AND A 13 MONTH SLIP TO LAST ORD	23%
LAAS	Post- AMS	NONE NOTED	
NEXCOM SEG- I	Post- AMS	NONE NOTED	
NIMS- PHASE I	Post- AMS	58 MONTH SLIP	123%
ACQUIRE	Post- AMS	3 MONTH SLIP IN FOC	14%
CPDLC	Post- AMS	NONE NOTED	
ATCBI	Post- AMS	6 MONTH SLIP TO 1 ST IOC AND A	
NISC	Post- AMS	NONE NOTED	55%
SPAS	Post- AMS	NONE NOTED	45%
STARS	Pre- AMS	SCHEDULE REVISION IN PROCESS TO ASSESS HUMAN FACTORS IMPACTS	
VSCS	Pre- AMS	2 MONTH SLIP IN THE FIRST ORD	
WARP	Pre- AMS	NONE NOTED	8%
Wilcox CAT II/III	Pre- AMS	NONE NOTED	
ASR-9	Pre- AMS	NONE NOTED	
ASR-11	Pre- AMS	4 MONTH SLIP TO ORD AND A	8%
DSR	Pre- AMS	9 MONTH SLIP IN THE FIRST ORD	
Oceanic – Build 1	Pre- AMS	8 MONTH SLIP TO LAST ORD	16%
ITWS	Pre- AMS	NONE NOTED	
WAAS	Pre- AMS	14 MONTH SLIP TO 1 ST ORD	
Common ARTS	Pre- AMS	5 MONTH SLIP TO LAST ORD	22%
PPSS	Pre- AMS	NONE NOTED	
IFQA	Pre- AMS	NONE NOTED	
ASDE	Pre- AMS	NONE NOTED	
AMASS	Pre- AMS	11 MONTH SLIP TO 1 ST ORD	
RCE	Pre- AMS	4-6 MONTH SLIP IN LAST ORD	4-7 %
BUEC	Pre- AMS	32 MONTH SLIP TO LAST ORD	33%
VRRP	Pre- AMS	NONE NOTED	
TRACON (No. CA)	Pre- AMS	NONE NOTED	
AERO Center	Pre- AMS	NONE NOTED	
FSRM	Pre- AMS	NONE NOTED	
AN/GRN-27	Pre- AMS	NONE NOTED	
ARSR-4	Pre- AMS	LAST SITE DELIVERY DELAYED DUE TO ENVIRONMENTAL ASSESSMENT	
TDWR	Pre- AMS	NONE NOTED	
LLWAS	Pre- AMS	6 MONTH SLIP IN LAST ORD	6%
ASR-WSP	Pre- AMS	3 MONTH SLIP TO LAST ORD	4%

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APPENDIX F. MISSION NEEDS STATEMENTS REVIEWED

This appendix lists the Mission Needs Statement (MNS) documents that were reviewed during the assessment. The table identifies the MNS number, abbreviated title, the original approval data, and date that the MNS was revised/revalidated.

MNS Number	Abbreviated Title	Original Approval Date	Revised/Revalidated Date
014	OASIS	12/96	
307	TFMIP	01/96	
288	DSR	09/94	
229	TSSC	01/94	
095	ETVS	10/92	
069	DCCR	08/95	
050	SAT/NAV		06/92
042	ADL	07/91	
322	Telco Inf	01/98	
317	Acquire	12/96	
309	HOCSR	11/97	
033	AMASS		06/95
318	NISC		10/96
096	ATCBI-R		08/97
230	STARS	07/93	11/94
005	DBRITE	10/91	
041	Corporate Systems	11/91	10/93
084	WARP	02/92	03/95
112	ATL MCF	10/92	08/94
113	NoCA MCF	09/93	10/95
325	Asset Supply	06/98	
323	Airport Surface	05/98	
295	DVRS		05/95
284	HNL	04/94	06/94
269	TSD	05/91	
266	ASR-11	09/93	08/93
261	ASDE	11/91	
246	Cabin Safety	05/94	
245	AUS		05/95
237	Central FL	09/93	05/94
232	NAS Logistics	06/92	
211	TACTA	05/91	
137	NexGen A/G	10/94	
136	NAS Voice		06/95
135	PENS		05/93
124	Distance Learning	10/92	05/93
103	ATOMS	05/92	
094	Gulf of Mexico	01/92	04/92

MNS Number	Abbreviated Title	Original Approval Date	Revised/Revalidated Date
093	DSRCE	07/93	
073	SEC	11/91	
067	Child Care	11/91	03/92
062	CAMI	11/91	
060	Aircraft	11/91	
059	CAEG	12/91	
058	VASI/PAPI	11/91	
046	TIDS	11/91	
032	ISMS	12/91	
031	ASAP	12/91	
025	LDRCL	12/91	
020	ILS	06/92	
018	BUEC	04/92	
016	DASI	11/91	
015	LLWAS	12/91	
006	DoD	12/91	04/92
003	ARTS	09/91	

APPENDIX G. ACRONYMS

AAF	Airway Facilities Service
AAR	Office of Aviation Research, Human Factors Division
ADL	Aeronautical Data Link
A/G	Air/Ground
AMASS	Airport Movement Area Safety System
AML	FAA Logistics Center
AMS	Acquisition Management System
ANM	Northwest Mountain Region
AOP	Operations Program Directorate
AOS	Operational Support Directorate
AOZ	Office of Free Flight
APB	Acquisition Program Baseline
ARA	Office of Research and Acquisitions
ARTS	Automated Radar Terminal System
ARX	Office of Plans and Performance
ASA ² P	Aviation Safety Advanced Analysis Program
ASD	Office of System Architecture and Investment Analysis
ASDE	Airport Surface Detection Equipment
ASP	Acquisition Strategy Paper
ASR	Airport Surveillance Radar
ATCBI	Air Traffic Control Beacon Interrogator
ATCBI-R	ATCBI-Replacement
ATL-MCF	Atlanta Maintenance Control Facility
ATOMS	Air Traffic Operational Management System
ATQ	Office of Independent Test and Evaluation
ATS	Air Traffic Services
AUS	Austin-Bergstrom International Airport
BUEC	Backup Emergency Communications
CAEG	Computer Aided Engineering and Graphics
CAMI	Civil Aeromedical Institute Infrastructure
CDLS	Contractor Depot Logistics Support
CDM	Collaborative Decision Making
CO	Contracting Officer
COTS	Commercial off-the-Shelf
CPDLC	Controller Pilot Data Link Communications
CTAS	Center TRACON Automation Systems
DASI	Digital Altimeter Setting Indicator
DBRITE	Digital Bright Radar Indicator Tower Equipment
DCCR	Display Channel Complex Rehost
DoD	Department of Defense
DRR	Deployment Readiness Review
DSR	Display System Replacement
DSRCE	Down Scoped Radio Control Equipment
DVRS	Digital Voice Recorder System

ETVS	Enhanced Terminal Voice Switch
FAA	Federal Aviation Administration
FAR	Federal Acquisition Regulation
FAST	FAA Acquisition System Toolset
F&E	Facilities and Equipment
FFP1	Free Flight Phase 1
FSRM	Facility Security Risk Management
GPRA	Government Performance and Results Act
HARP	Human Factors Acquisition Requirements and Planning
HF	Human Factors
HNL	Honolulu
HOCSR	Host Computer Replacement System
IA	Investment Analysis
IAP	Investment Analysis Plan
IAR	Investment Analysis Report
ILS	Instrument Landing System
IPDS	Integrated Product Development System
IPT	Integrated Product Team
ISMS	Integrated Security Management System
ISR	In-Service Review
JRC	Joint Resources Council
LDRCL	Low Density Radio Communications Link
LLWAS	Low Level Wind Shear Alert System
LOB	Line of Business
MA	Mission Analysis
MASG	Mission Analysis Steering Group
MMAC	Mike Monroney Aeronautical Center
MNS	Mission Need Statement
NAS	National Airspace System
NDI	Nondevelopmental Item
NIMS	NAS Infrastructure Management System
NISC	NAS Implementation Support
NoCA MCF	Northern California Metroplex Control Facility
NPR	National Performance Review
OASIS	Operational and Supportability Implementation System
ODR	Office of Dispute Resolution
O&M	Operations and Maintenance
PAPI	Precision Approach Path Indicator
PENS	Performance Enhancement System
PR	Purchase Request
R&D	Research and Development
RFP	Request for Proposal
SAT/NAV	Satellite Navigation
SB	Small Business
SBU	Small Business Utilization
SEC	Software Engineering Capability
SEDB	Small Economically Disadvantaged Business
SEOAT	Systems Engineering Operational Analysis Team

SIR	Screening Information Request
SMA	Surface Movement Advisor
STARS	Standard Terminal Automation Replacement System
TACTA	Terminal Air Traffic Control Automation
TFMIP	Traffic Flow Management Information for Pilots
TIDS	Tower Interim Display System
TRACON	Terminal Radar Approach Control
TSD	Terminal Software Development
TSSC	Technical Services Support Contract
URET	User Request Evaluation Tool
VASI	Visual Approach Slope Indicator
VSCS	Voice Switching and Control System
WAAS	Wide Area Augmentation System
WARP	Weather and Radar Processor
WJHTC	William J. Hughes Technical Center

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