AMS/FAST CHANGE REQUEST (CR) COVERSHEET

Change Request Number: 21-26

Date Received: 1/5/2021

Title: ACAT Table and Associated AMS Policy

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Initiator Organization Name / Routing Code: Lifecycle Acquisition Policy / AAP-130

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Policy and Guidance: (check all that apply)

- ☒ Policy
- ☐ Procurement Guidance
- ☐ Real Estate Guidance
- ☐ Other Guidance
- ☐ Non-AMS Changes

Summary of Change: Revised the ACAT Table as well as the associated AMS Policy sections to reflect recommendations from the ACAT working group.

Reason for Change: Changes are result of AEB action item to review and revise ACATs. The change clarifies requirements for FAA investment activities, decision points and artifacts and refine the ACAT structure across investment types. Changed “Office of Information & Technology, Strategy & Performance Service, Investment Portfolio & CPIC Branch” to “Office of Information & Technology, Enterprise Program Management, Budget, Program Control & CPIC Branch”

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Target Audience: Acquisition Workforce, program office, governance stakeholders, program teams

Briefing Planned: Yes.

ASAG Responsibilities: ASAG approved on 12/31/20. AEB approved on 11/12/20.

Section / Text Location: 1.2.5; 1.2.15; 1.2.16; 2.2.1; 2.3.5; 2.4; 2.5; 4.4.1

The redline version must be a comparison with the current published FAST version.

(•) I confirm I used the latest published version to create this change / redline

or

( ) This is new content

Links: https://fast.faa.gov/docs/acqcattable.doc
https://fast.faa.gov/docs/acquisitionManagementPolicy/acquisitionManagementPolicy_1.pdf
https://fast.faa.gov/docs/acquisitionManagementPolicy/AcquisitionManagementPolicy_2.pdf
https://fast.faa.gov/docs/acquisitionManagementPolicy/AcquisitionManagementPolicy_4.pdf

Attachments: Redline and final documents.

Other Files: N/A.

Redline(s):

Section Revised: 1.2 – Key Elements of Acquisition Management

Acquisition Management Policy - (~~10/2020~~01/2021)

1.2 Key Elements of Acquisition Management
- 1.2.1 Strategic Planning, Management, and Budgeting Revised 1/2014
- 1.2.2 FAA Enterprise Architecture Revised 4/2017
- 1.2.3 Service Management Revised 7/2013
- 1.2.4 Portfolio Management Revised 4/2017
  - 1.2.4.1 Agency-Wide Portfolio Management Revised 4/2013
    - 1.2.4.1.1 Portfolio Management Governance Revised 4/2013
    - 1.2.4.1.2 Portfolio Management Criteria Revised 4/2013
  - 1.2.4.2 Operational Capability Portfolios Revised 4/2013
- 1.2.5 Acquisition Categories Revised ~~1/2018~~01/2021
- 1.2.6 Lifecycle Management Decision-Making Revised ~~9/2020~~01/2021
- 1.2.7 Acquisition Quarterly Program Reviews Revised 4/2019
- 1.2.8 TechStat Reviews Revised 4/2019
- 1.2.9 Cost Accounting Revised 4/2013
- 1.2.10 Workforce Development and Qualification Revised 4/2013
- 1.2.11 Continuous Improvement Revised 7/2010
- 1.2.12 On-line Policy and Guidance Revised 1/2012
- 1.2.13 AMS Change Management Revised 1/2012
- 1.2.14 Legal Coordination Revised 7/2006
- 1.2.15 AMS Lifecycle Management Documentation Revised ~~4/2019~~01/2021
- 1.2.16 OMB Budget Documentation Revised ~~1/2015~~01/2021
- 1.2.17 National Acquisition Evaluation Program Added 7/2007
- 1.2.18 Earned Value and Baseline Management Revised 4/2019

1.2 Key Elements of Acquisition Management

1.2.1 Strategic Planning, Management, and Budgeting **Revised 1/2014**

The Government Performance and Results Act of 1993, requires Federal agencies to have measurable performance targets tied to agency goals and objectives. These targets serve as the basis for planning capital investments and measuring progress.

The FAA supports this requirement through a strategic management process that forecasts the future aviation environment and captures goals, objectives, and performance targets in its strategic plan, currently FAA strategic initiatives. FAA strategic planning links the long-range vision and goals for the agency directly to the service needs of customers and defines top-level performance measures and multi-year performance targets.

The NAS Concept of Operations specifies the operational capabilities that the National Airspace System will have over time. Together, the FAA strategic plan and NAS Concept of Operations set the primary context for the FAA Enterprise Architecture and all lower-level plans and budgets within the agency. FAA lines of business and staff offices align their planning to the goals and objectives in FAA strategic planning. Service organizations within the lines of business in turn align their business and operating plans to line-of-business planning. These relationships are illustrated in Figure 1.2.1-1 FAA Strategic Planning, Management, and Budgeting.

Figure 1.2.1-1 Strategic Planning, Management, and Budgeting

Service organizations develop integrated business plans and budgets across all appropriations to achieve full lifecycle support of service delivery. Planning is realistic within budgetary constraints. Success or failure in achieving performance goals influences future planning and budgeting decisions. Resources are dedicated to key activities such as service analysis, concept and requirements definition, and investment analysis.

The Administrator approves the FAA strategic plan; the NextGen Management Board approves the NAS Concept of Operations; the Joint Resources Council approves the FAA Enterprise Architecture.

The Chief Financial Officer formulates the budget across lines of business and staff offices; tracks actual performance against planned execution based on input from these organizations; records approved resource adjustments to FAA plans and budgets; and incrementally moves FAA planning and budgeting forward each year. The Chief Financial Officer also develops the Facilities and Equipment (F&E), Research, Engineering, and Development (RE&D), and Operations (OPS) budget requests.

Planning for the Airport Improvement Program is coordinated with planning for the RE&D, F&E, and OPS appropriations so that capital assets necessary to support new and expanded airport operations are available when needed.

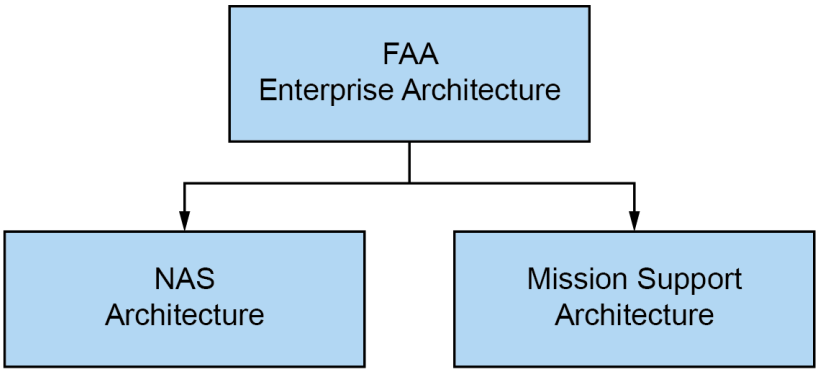
The FAA reports facility and equipment expenditures to Congress in the Capital Investment Plan; research, engineering, and development resource requirements in the National Aviation Research Plan; and operations funding requirements in the annual budget request to Congress.

1.2.2 FAA Enterprise Architecture Revised 4/2017

The FAA Enterprise Architecture (referred to as the enterprise architecture throughout AMS policy) defines the operational and technical framework for all capital assets of the FAA. It describes the agency's current and target architectures, as well as the transition strategy for moving from the current to the target architecture. The enterprise architecture is approved annually by the Joint Resources Council in support of FAA budget and strategic management processes.

The enterprise architecture has two components: the National Airspace System (NAS) architecture and the Mission Support architecture (See Figure 1.2.2-1 FAA Enterprise Architecture). The NAS architecture is comprised of the systems, people, and procedures necessary for command and control of the National Airspace System. It also includes mission-support systems that manage or design command and control components and air traffic procedures. The Mission Support architecture is comprised of the information technology operations and investments needed for agency business administration and planning. It includes all mission-support applications, systems, policies, and procedures not directly involved in air traffic control.

Figure 1.2.2-1 FAA Enterprise Architecture



The FAA Enterprise Architecture Board governs the enterprise architecture. The Chief Information Officer maintains it. The Enterprise Architecture Service Division administers the NAS architecture. The Office of Information & Technology, Solution Delivery Service, Solution Strategy Division, Enterprise Architecture (EA) Branch administers the Mission Support architecture.

1.2.3 Service Management Revised 7/2013

Acquisition management policy is structured to apply FAA investment resources to the cost- effective delivery of safe and secure services to its customers. The delivery of these services is accomplished through service organizations, which are responsible and accountable for lifecycle management of service delivery.

A service organization is any organization that manages investment resources, regardless of appropriation, to deliver services. It may be a service unit, program office, or directorate, and may be engaged in air traffic services, safety, security, regulation, certification, operations, commercial space transportation, airport development, or administrative functions.

Service organizations bring together the stakeholders and specialists necessary to plan, obtain, manage, and sustain assigned services throughout their lifecycle. A service may be delivered directly to a customer, such as flight planning for general aviation, or to other service organizations that deliver end services to customers. Together, service organizations span the spectrum of FAA activity and responsibility.

Service organizations manage service delivery by means of integrated portfolios of capital investments and operational assets. These portfolios includes investment assets under acquisition; fielded equipment, legacy systems, infrastructure, and facilities; and all other types of resources.

Service organizations perform service analysis annually to determine what capabilities must be in place now and in the future to meet agency goals and the service needs of customers and to move planning forward each year. Results are captured in enterprise architecture roadmaps, which are the transition plans for moving the current “as is” architecture to the future “to be” state. These roadmaps are the foundation for line-of-business and staff office business plans, which in turn are the basis for service organization operating plans.

The operating plan of each service organization specifies how it will manage its operational assets and investment initiatives over time to sustain and improve service delivery. Each operating plan is maintained on a continuing basis and updated yearly to reflect progress against plan, Congressional or executive direction, emerging customer needs, and critical aviation incidents. Service organizations track performance, accomplishments, and resource expenditures relative to the operating plan, and take corrective action as necessary to achieve agreed upon goals and objectives. Service organizations work closely with each other to manage shared assets efficiently and effectively.

1.2.4 Portfolio Management Revised 4/2017

The FAA views and manages its investment and operational assets through multiple levels and groupings of portfolios to ensure they work together efficiently to achieve agency strategic, mission, and service goals. At the agency level, the entire FAA budget is a portfolio of planned expenditures organized to balance support of existing operational services with investment in new capability. Within this portfolio, the R&ED, F&E, and Operations appropriations are distinct portfolios that allocate research, investment, and operational funding to the most pressing service needs of the

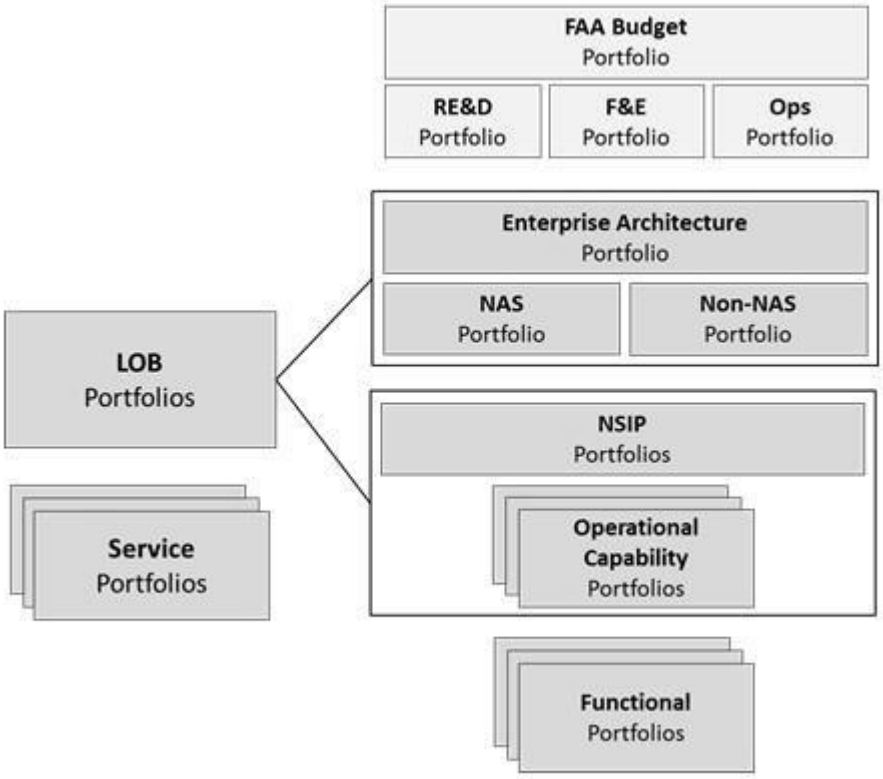
aviation community. Similarly, the enterprise architecture is a portfolio with investments and assets that make up the National Airspace System (NAS) and administrative and mission support information technology (Mission Support). The enterprise architecture can be viewed as distinct portfolios segmented in different ways for specific purposes.

Operational capability portfolios are rational groupings of NAS investment programs proceeding through the AMS lifecycle management process that have critical interdependences which must be taken into account when making investment decisions for individual components of the portfolio.

The Joint Resources Council uses portfolio management in conjunction with strategic planning, the enterprise architecture, and outcome-based performance measures when making investment decisions and managing selected groupings of investments.

AMS policy does not create a universal definition for the term "portfolio management." It establishes the definition and policy for several standard agency-wide portfolios (Section 1.2.4.1) and for operational capability portfolios (Section 1.2.4.2). This policy does not preclude other types of portfolios within the agency, nor does it provide policy or guidance for managing them. Figure 1.2.4-1 illustrates the levels and groupings of FAA portfolios.

Figure 1.2.4-1 Portfolio Management in FAA



1.2.4.1 Agency-Wide Portfolio Management **Revised 4/2013**

The FAA implements agency-wide portfolio management at multiple organizational levels and within a unified functional framework:

Corporate Portfolio Management - The FAA, through the Joint Resources Council and other means, manages the overall agency investment portfolio with the following:

Enterprise Architecture: The enterprise architecture portrays the "as is" and "to be" state of FAA operational assets along with roadmaps that lay out over time what investments will be made to achieve the end-state configuration. The enterprise architecture is developed and updated annually by analyzing the functions the FAA needs to provide based on identified gaps in needed services over time. This view of the corporate-level portfolio is presented to the Joint Resources Council each year for approval.

FAA Budget: The budget is developed using a strategic management process that ties it to the needs in the enterprise architecture and the goals in the FAA strategic plan to create a unified performance-based budget. The budget is reviewed each year considering several corporate-level portfolio measures including progress in meeting FAA strategic goals, budget allocations relative to strategic planning targets, and assessments of under-performing programs using earned value management. This information is presented to the Joint Resources Council annually when it reviews the agency budget submission.

Line-of-Business Portfolio Management - Each line of business and staff office oversees, coordinates, and integrates the service portfolios of its service organizations to achieve the greatest overall contribution to agency strategic goals and targets.

Service Portfolio Management - Service organizations (e.g., terminal services, en-route and oceanic services, regulatory services, certification services) manage integrated sets of investment and operational assets to optimize service delivery over time.

NAS Segment Implementation Portfolio Management - The NextGen organization oversees investment portfolios that cut across service organizations to provide fully integrated operational capabilities for the National Airspace System in such areas as precision-based navigation and improved runway operations. More than one service organization may be involved with implementation and in-service management of these investment packages.

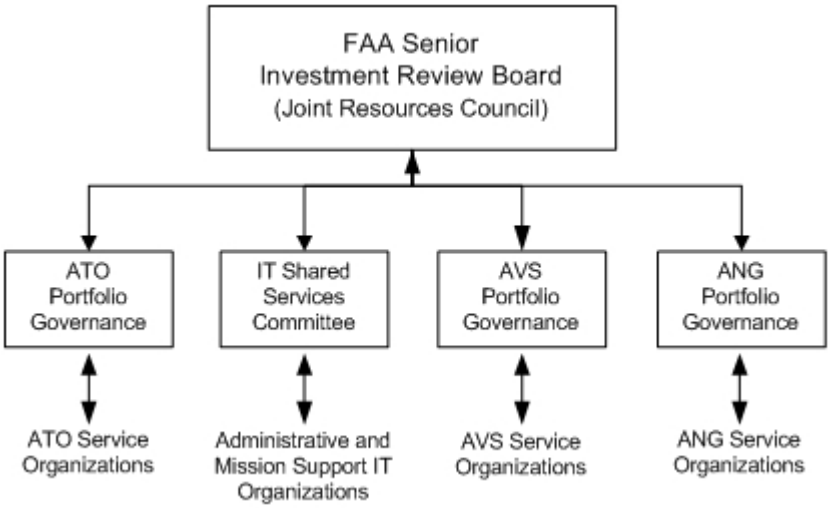
Functional Portfolio Management - The NextGen organization oversees investment packages that cut across service organizations to provide fully integrated functional capability for the National Airspace System in such areas as weather, surveillance, communications, automation, and navigation. More than one service organization may be involved with implementation and in-service management of these investment packages.

1.2.4.1.1 Portfolio Management Governance **Revised 4/2013**

Figure 1.2.4.1.1-1 portrays portfolio management governance within FAA.

Figure 1.2.4.1.1-1 FAA Portfolio Management Governance

(*representative depiction*)



The Joint Resources Council oversees the FAA investment portfolio as expressed in the enterprise architecture, FAA budget, and individual service portfolios. It evaluates the performance of all investment programs and operational assets within each service against quantified baseline measures. Planned initiatives for new investment are discussed along with proposals to remove, replace, or improve operational assets with declining performance that no longer satisfy service need or are nearing the end of their service life. The Joint Resources Council aligns and coordinates investment activity across the lines of business through annual review and approval of the enterprise architecture and agency budget submissions to Congress.

Line-of-Business portfolio governance aligns and coordinates investment activity across service organizations within a line of business or staff office. This governance ensures investment and operational resources support priority FAA strategic and performance goals; ensures there is no overlap, redundancy, or gap in service delivery; and reviews progress, tracks baseline variances, and monitors remedial planning and execution within service portfolios. Specifically, Air Traffic Organization (ATO) governance oversees, reviews, and coordinates service portfolios related to the National Airspace System and the provision of air traffic control services (e.g., terminal, en- route, and technical operations). NextGen (ANG) and Aviation Safety (AVS) governance oversee and recommend investment portfolios within their line of business.

The Information Technology Shared Services Committee reviews, oversees, and recommends administrative and mission support information technology investment portfolios.

Service organizations manage service delivery within their service area of responsibility. They evaluate service demand on a continuing basis and recommend changes to the service portfolio over time to optimize service delivery.

1.2.4.1.2 Portfolio Management Criteria Revised 4/2013

The FAA has standard criteria for selecting, controlling, and evaluating its investment portfolio. The Joint Resources Council uses the standard criteria when evaluating new investment opportunities for inclusion in a service portfolio, when evaluating the status of on-going investment programs, and when evaluating the efficiency and effectiveness of operational assets.

The three categories of portfolio management criteria are listed below. Details for some elements of these criteria are defined elsewhere in AMS (e.g., earned value management policy is in Section 4.16 and the standard selection criteria are located in FAST).

Selection criteria: The Joint Resources Council applies the following standard quantitative and judgmental selection criteria to assess the relative contribution of investment options for inclusion in an investment portfolio: benefits; lifecycle cost; benefit to cost ratio; consistency with the enterprise architecture; impact on FAA strategic goals; and risk.

Control criteria: The FAA employs earned value management, risk management, and testing to determine how efficiently developmental, modernization, and enhancement investment programs are performing relative to plan during solution implementation. For investment programs that do not involve development, modernization, or enhancement, the FAA applies multiple control techniques such as independent review of program cost and schedule estimates; comparison of spend plans against budget authorization; comparison of actual cost and schedule results against planning estimates; and periodic program and data reviews against planning. These management controls identify and quantify variances to baseline cost, schedule, and performance measures as the basis for corrective action. Service organizations test and evaluate the products of investment programs against requirements in the program requirements document to determine whether they are satisfied.

Evaluation criteria: The FAA periodically measures the efficiency (technical quality) and effectiveness (business value) of operational assets to determine whether they should be upgraded, replaced, or removed from service. Service directorates evaluate in-service assets by means of post-implementation reviews and operational analyses. Post-implementation reviews determine whether performance, cost, schedule, and benefit goals are being attained. They provide the basis for corrective action, as well as lessons learned for improving agency investment management processes. Operational analysis determines trends in such factors as reliability, maintainability, supportability, obsolescence, and operating and maintenance costs. They are the basis for validating continued support for fielded assets or some other action such as upgrade, replacement, or removal from service.

1.2.4.2 Operational Capability Portfolios Revised 4/2013

The NextGen Management Board establishes operational capability portfolios to achieve priority NAS performance and operational goals subject to concurrence by the Joint Resources Council. When an individual investment increment of the portfolio comes before the Joint Resources Council for investment decisions, the portfolio manager is present so decisions are made within context of the entire portfolio and overall corporate framework.

An operational capability portfolio may contain materiel (e.g., hardware or software deliverables) and non-materiel (e.g., airspace redesign or procedures) components. Each investment increment must receive an acquisition category designation from the Acquisition Executive Board and is managed through the AMS lifecycle according to its designation.

An operational capability integration plan (OCIP) approved by the executives responsible for each investment increment of an operational capability portfolio defines the critical interdependencies between investment increments, how they will be managed, and their interaction with each other and the overall portfolio. The OCIP specifies how cost, schedule, or performance issues will be communicated to other portfolio investment increments and how they will be resolved corporately for the benefit of the portfolio. A standard template is used to develop the OCIP, which includes measures for tracking and evaluating the portfolio (e.g., portfolio costs and benefits).

1.2.5 Acquisition Categories Revised ~~1/2018~~01/2021

Acquisition categories ensure the appropriate level of oversight and documentation requirements are applied to each FAA investment ~~program~~initiative. Acquisition categories apply to all NAS investment ~~programs~~initiatives, regardless of funding, as well as all other F~~-&~~&E~~-~~-funded ~~programs. The Joint Resources Council is the investment decision authority for all acquisition categories.~~initiatives.

Investment ~~programs~~initiatives are classified by ~~investment type~~acquisition category (new investment, software enhancement, technology refreshment portfolio, sustainment, variable quantity, facility initiative, ~~or~~ support service contract, or research and concept maturity) and then categorized by acquisition level based on qualitative and quantitative criteria. Definitions for ~~investment type and criteria for~~ acquisition categories and levels are in the AMS Table of Acquisition Categories, along with phase activity and artifact requirements for the early phases and decision points of the AMS ~~Lifecycle. Review organizations for investment decisions and required documentation also vary by investment type and acquisition category, as defined in the AMS Table of Acquisition Categories.~~lifecycle management process.

The sponsoring service organization recommends an acquisition category to the Acquisition Executive Board, which makes the categorization decision and notifies the Joint Resources Council for confirmation through the JRC Executive Secretariat. ~~-~~The ~~designation of~~ acquisition category designation is made ~~before~~early in concept and requirements definition and then revalidated in preparation for the investment analysis readiness decision.~~-~~ A standard readiness process applies to all acquisition category levels for AMS decision points.

1.2.6 Lifecycle Management Decision-Making Revised ~~9/2020~~01/2021

Table 1.2.6-1 specifies the decision authority for each AMS lifecycle management decision point. The Joint Resources Council is the FAA senior investment review board. It makes corporate-level resource decisions, including authorization and funding for investment programs, and approves changes to the enterprise architecture. The Joint Resources Council selects for approval and funding those investment opportunities having the highest potential for contributing to FAA strategic and performance goals, improving service delivery, increasing aviation safety, lowering operating costs, or otherwise providing value to the FAA and its customers. The Joint Resources Council may approve, disapprove, modify, or terminate an investment initiative at any AMS decision point.

The Joint Resources Council approves investment resources, regardless of appropriation, in useful and manageable segments (e.g., development, demonstration, production, deployment, and operations). Each segment is managed within cost, schedule, and performance targets in the acquisition program baseline or execution plan approved by the Joint Resources at the final investment decision. The portfolio manager attends all lifecycle management decision points involving each investment increment of an operational capability to disclose the impact on an end-state capability of not approving an investment increment.

The service team or program office must complete all phase activities and artifacts to qualify for a decision to proceed to the next lifecycle management phase, but can return to the Joint Resources Council at any time including the next decision point if the recommendation is to terminate the effort.

Service teams, program offices, and executing organizations may request ~~and~~ or the JRC may direct additional updates or decision meetings. These include status updates, strategy update sessions, and direction--requested decision meetings.

Status updates are conducted when the JRC requires information to closely monitor or oversee an investment as it progresses thorough ~~it's~~the AMS lifecycle. These updates may be driven by key planned events or may be conducted periodically.

Strategy update sessions are conducted to inform the JRC of changes to plans for an investment that cannot be captured in a typical AMS milestone decision. Strategy update sessions can be conducted when there is a proposed change of strategy to an investment program as it progresses through the AMS lifecycle management process or after a final investment decision. Examples include changes to approved alternatives or the acquisition strategy. Strategy update sessions may include minor requests for funding that are within the CIT--delegated funding authority. Strategy update sessions cannot be used for requests for JRC approval for decisions that would impact the cost, schedule, or performance baseline of an approved program.

The service team, program office, or executing organization must notify the JRC Secretariat as soon as the updated strategy is ready for consideration. The Secretariat will place the presentation on an upcoming JRC agenda.– When there are impacts to an approved program baseline resulting from the strategy update session, the program office must plan and conduct any required JRC decision

meetings, such as a direction--requested decision or baseline change decision, before the program ocancan execute -theany related changes- to the program.

Direction--requested decision meetings are conducted when there is a need for the JRC to approve a decision for a program that has broad implications or time--sensitive needs. -Direction--requested decisions may be used for requests to approve major changes in program scope or direction, or to approve large funding requests separate from or prior to an FID. a final investment decision. Examples of direction--requested briefings include requests to spend funding to fix critical NAS equipment, to obtain early funding, or to support pressing priorities. -A direction--requested decision is also used when a program needs to re-plan deliverables or interim milestones for an already approved acquisition program baseline/ or execution plan or to use management reserve for additional scope or new projects outside that of an already approved acquisition program baseline/ or execution plan.

The service team, program office, or executing organization must notify the JRC Secretariat as soon as the need is identified for a -JRC decision.- The Secretariat will place the presentation on an upcoming JRC meeting agenda. The JRC must approve the direction--requested decision before the program can execute the proposed approach.

-The templatesTemplates for JRC status updates, strategy update sessions, and direction--requested decisions are available on the JRC Executive Secretariat portal.

The Air Traffic Services Committee reviews all JRC investment decisions for procurement of air traffic control equipment of $100,000,000 or more in facilities and equipment costs.

Table 1.2.6-1 Lifecycle Management Decision-Making

Decision	Decision Body	Decision Chair
Concept and requirements definition readiness decision	FAA Enterprise Architecture Board	None
Investment analysis readiness decision	JRC	Acquisition Executive
Initial and final investment decisions *(including new programs and extension of current capability)*	JRC	Acquisition Executive
Status Update/Strategy Update Session/Direction Requested Decision	JRC	Acquisition Executive
Product demonstration 1	Note 2	Note 2
Production 1 and 2	Note 2	Note 2
In-service 2	Note 2	Note 2
Program baseline change	JRC	Acquisition Executive
F&E, RE&D, and OPS budget approvals	JRC	Acquisition Executive
FAA Enterprise Architecture changes	JRC	Acquisition Executive

1 Decision required for developmental products. See AMS section 2.6.1.
2 The Joint Resources Council designates the product demonstration, production and in-service decision authorities at the final investment decision. If the JRC retains any of these decisions, the chair is the Acquisition Executive.

The JRC Executive Secretariat supports the Acquisition Executive and Joint Resources Council in executing decision-making responsibilities. The Secretariat ensures service organizations have complied with AMS policy requirements before seeking JRC approval. The Secretariat also manages the JRC decision-making processes and acquisition quarterly program reviews on behalf of the Acquisition Executive.

Service organizations make and are accountable for all service-level management decisions except those explicitly assigned otherwise by this policy or the Joint Resources Council.

1.2.7 Acquisition Quarterly Program Reviews Revised 4/2019

The Joint Resources Council reviews investment programs at acquisition quarterly program reviews to oversee cost, schedule, and technical performance using a standard set of program and performance measures (see AMS 2.1.6). These standard program measures are organized into: financial, schedule, technical, resources, program manager assessment, and external interests. The status of OMB Information Technology Dashboard milestones is also reviewed along with significant program risks. The Directors of each service organization present and discuss performance for all baselined programs and those planning programs that report to the Office of Management and Budget. The reviews use SPIRE, earned-value management (or equivalent), and enterprise architecture data to assess technical, cost, and schedule issues that may impact the ability of programs to meet baseline values in their acquisition program baseline or execution plan. The portfolio manager is present at the reviews to discuss the impact on an operational capability of cost, schedule, or performance shortfalls among capability investment increments and to present for consideration potential baseline adjustments among increments, when applicable.

1.2.8 TechStat Reviews Revised 4/2019

The FAA uses TechStat reviews when appropriate to assess underperforming investment programs. A TechStat review is an in-depth examination of program performance data from the OMB Information Technology Dashboard and SPIRE, including associated earned value management data, program management and control data, and actions for achieving the JRC- approved program baseline or execution plan. The TechStat review results in a corrective action plan to improve program execution and performance within the approved program baseline or execution plan, or results in other actions if the program is unlikely to improve as baselined. The Joint Resources Council determines whether a TechStat review will be conducted, and uses acquisition quarterly program reviews and investment decision meetings to identify those programs that will be subject to a TechStat review.

1.2.9 Cost Accounting Revised 4/2013

The FAA uses a financial management system that integrates planning, budgeting, and accounting across service organizations and appropriations. Cost accounting provides the financial basis for determining whether the FAA is meeting its performance goals within baseline costs and for determining the actual cost of service delivery.

Cost categories include all activities necessary for full lifecycle management of service delivery, including research, service analysis, concept and requirements definition, investment analysis, solution implementation, operations and support, and decommissioning. The FAA standard lifecycle work breakdown structure, cost accounting system, and labor distribution report are aligned to use the same cost categories and activities.

1.2.10 Workforce Development and Qualification Revised 4/2013

The FAA manages its human capital as a critical investment to ensure the agency has the capabilities it needs to achieve business goals. The FAA Acquisition Workforce Council, comprised of executives with acquisition responsibilities from across FAA, sets acquisition workforce-related requirements and oversees implementation and annual update of FAA Acquisition Workforce Plan. The Director of Acquisition Policy and Oversight, who reports directly to the Chief Acquisition Officer, chairs the Acquisition Workforce Council and leads the acquisition career management function. AMS Section 5 contains policy related to the FAA acquisition career program and associated competency, training, and certification requirements for personnel in key acquisition positions.

1.2.11 Continuous Improvement Revised 7/2010

The FAA continually improves its policies and guidance to increase the safety, capacity, efficiency, and effectiveness of agency services. It does this through periodic comparison with the best practices of industry and other government organizations. The FAA integrates into its policy and guidance successful practices that save time, reduce cost, and improve customer satisfaction.

1.2.12 On-line Policy and Guidance Revised 1/2012

The FAA Acquisition System Toolset (FAST) is the official record of the Acquisition Management System. It is an information system available via the Internet at http://fast.faa.gov. FAST contains official lifecycle acquisition management policy and guidance, process flowcharts, contract clauses, document templates and instructions, checklists, practices, and other job-related aids for use by the workforce.

1.2.13 AMS Change Management Revised 1/2012

The Acquisition Executive Board reviews and authorizes development and implementation of acquisition management policy, guidance, processes, practices, procedures, and tools. The Acquisition Executive Board also directs and oversees the Acquisition System Advisory Group (ASAG).

The ASAG is a cross-organizational body that evaluates proposed changes to acquisition management policy and guidance to ensure:

- Changes contribute to FAA strategic goals;
- Policy is streamlined and effective;
- Best practices from industry and government are incorporated when beneficial;
- Information is consistent and compatible across functional disciplines;
- Quality is maintained and improved; and
- A consistent enterprise-wide view of policy.

The ASAG initiates changes or establishes working groups to develop new policy or guidance, as required. It also periodically reviews existing policy for effectiveness. Anyone may propose changes to acquisition management policy or guidance by submitting the change to their ASAG representative, who processes it in accordance with AMS change management procedures. Originators develop proposed changes in conjunction with primary users of the policy or guidance, or in the case of a complex change, with an ad hoc workgroup.

The Administrator approves significant changes to acquisition management policy via the Acquisition Executive. The Acquisition Executive approves all other policy changes. The Director, Acquisition Policy and Oversight approves guidance changes. Approved changes are incorporated into FAST quarterly. The acquisition policy change manager maintains FAST.

1.2.14 Legal Coordination Revised 7/2006

Service organizations coordinate with agency counsel on competitive acquisitions with an estimated total value greater than $100,000 and on non-competitive acquisitions with an estimated total value greater than $10,000. In addition, certain matters, described in Procurement Guidance (T1.15), require legal coordination regardless of their dollar value. FAA counsel also advises service organizations regarding legal issues and represents service organizations in litigation and other legal matters. Service organizations document the acquisition file with agency counsel's opinion and recommendations.

At Headquarters, the Assistant Chief Counsel for Procurement, and at Regions and Centers, the Region or Center Counsel, may make written exceptions to this coordination policy, adjust dollar minimums, or in appropriate cases, waive the coordination.

1.2.15 AMS Lifecycle Management Documentation Revised ~~4/2019~~01/2021

Table 1.2.15-1 summarizes the purpose, requirement, responsible organization, and approving official for required AMS lifecycle management planning and control documents. Appendix B contains detailed policy for investment program documents. Complete instructions and templates are in FAST. Click here to view tailoring guidelines by acquisition category.

Click here to view the official storage location of investment-related program documentation.

Table 1.2.15-1 AMS Lifecycle Acquisition Management Policy Planning and Control Documents

Agency-Level Strategic Planning Documents

Document	Purpose	Requirement	Responsible Organization(s)	Approving Official or Body
FAA Strategic Plan (currently FAA strategic initiatives)	Defines long-range vision and goals for the FAA Establishes top-level performance measures and multi-year performance targets for the FAA	Reviewed and updated annually	Strategy, Budget, and Planning Committee	Administrator
NAS Concept of Operations (ConOps)	Defines target operational capabilities of the National Airspace System	Reviewed annually and updated as needed	Advanced Concepts & Technology Development Office	NextGen Management Board
NAS Operational Requirements Document (ORD)	Specifies FAA operational services consistent with the NAS ConOps	Updated annually or as necessary to remain consistent with the NAS ConOps	Advanced Concepts & Technology Development Office ATO Operational Concepts and Requirements Lines of business	NextGen Management Board Concept Steering Group endorses
NAS Requirements Document	Specifies NAS functional and performance requirements	Updated annually or as necessary to remain consistent with	NAS Systems Engineering Services Advanced Concepts	NextGen Management Board

	derived from the NAS ORD	the NAS ConOps and ORD	& Technology Development Office NAS Lifecycle Integration Office ATO Operational Concepts and Requirements Lines of business	NAS Systems Engineering Services endorses
FAA Enterprise Architecture	Defines the FAA target architecture and the transition strategy to reach the target Establishes the basis for service organization planning Defines the strategic investment plan for the FAA	Reviewed annually and updated as needed	Chief Information Officer Assistant Administrator for NextGen	Joint Resources Council

Portfolio-Level Documents

Document	Purpose	Requirement	Responsible Organization(s)	Approving Official or Body
Operational Capability Business Case (NAS)	Defines the rough costs and benefits of an operational capability	Required as the basis for establishing a new operational capability	Advanced Concepts and Technology Development Office ATO Program Management Office Investment Analysis & Planning	NextGen Systems Engineering & Modeling

			Service organizations	
Operational Capability Integration Plan (NAS)	Defines the relationships, responsibilities, and agreements between all organizations contributing to the achievement of an operational capability	Preliminary plan required upon formation of a capture team Final plan required when all capability elements have entered concept and requirements definition	Portfolio manager Capture team	NextGen Management Board

Program-Level Documents

Document	**Purpose**	**Requirement**	**Responsible Organization(s)**	**Approving Official or Body**
Acquisition Program Baseline or Execution Plan	Establishes the performance, cost, and schedule baselines for an investment program segment	Required for the final investment decision	Investment analysis team headed by the service organization with the mission need	Chair of the Joint Resources Council Designated ACAT reviewers
Program Requirements Document	Defines the operational framework and performance requirements an investment program must achieve	Preliminary document at the investment analysis readiness decision Revised document at the initial investment decision Final document at the final investment decision	Implementing service organization Operating service organization	ATO: Vice Presidents of the executing service organization during solution implementation and the operating service organization Non-ATO: Second-level executive of the executing service organization

				during solution implementation
Business Case	Provides the analytical and quantitative basis for investment decisions	Initial business case at the initial investment decision Final business case at the final investment decision.	Investment analysis team, headed by the service organization with the mission need	ATO: Vice President of the implementing service organization Non-ATO: Director of the implementing service organization Designated ACAT reviewers
Implementation Strategy and Planning Document	Defines overall implementation strategy and planning for an investment program	~~For the initial investment decision, alternatives analyzed and summarized comparatively for factors in select sections of the ISPD Complete~~ ISPD is required for the final investment decision Reviewed annually	Implementing service organization Operating service organization	Chair of the Joint Resources Council ATO: Chief Operating Officer / Deputy Chief Operating Officer Non-ATO: Second-level executive of the organization executing during solution implementation Stakeholder organizations approve specific sections per the ISPD template Updated sections approved at the same level

Program Management Plan	Defines how the implementation strategy of the investment program will be executed during solution implementation	PMP required for the final investment decision Reviewed annually	Implementing service organization	Director, implementing service organization Updates approved at the same level
Test and Evaluation Master Plan	Describes the test strategy and scope of a test program Defines the test and evaluation methodologies that will be used to assess safety hazard controls and mitigations and security risks	Preliminary document at initial investment decision Initial document at the final investment decision Final document after contract award or as defined in the ISPD	Test and evaluation service organization(s)	Director of the test service organization Non-ATO: Second level executive of the organization executing during solution implementation For Mission Support IT programs: AIT, Solution Delivery Service
OMB Major IT Business Case	Budgetary document required by OMB for designated investment programs	Preliminary document at the initial investment decision Final document at the final investment decision	Investment analysis team Implementing service organization	ATO: Chief Operating Officer Non-ATO: Associate or Assistant Administrator of the line of business or staff office Acquisition Executive Chief Financial Officer Chief Information Officer

				Deputy Administrator concurs

1.2.16 OMB Budget Documentation Revised ~~1/2015~~01/2021

The OMB Major IT Business Case is a budget request document updated yearly and sent to Office of Management and Budget during the annual budget cycle for designated capital investment programs. Service organizations prepare the OMB Major IT Business Case, which is independently reviewed and scored by the Office of Information & Technology, ~~Strategy & Performance~~Enterprise Program Management Service, ~~Investment Portfolio~~Budget, Program Control & CPIC Branch. The Chief Information Officer, Chief Financial Officer, and Acquisition Executive approve the OMB Major IT Business Case for designated information technology capital investments before submission to OMB. The Acquisition Executive and Chief Financial Officer approve OMB Major IT Business Cases for designated non-information technology capital investments.

1.2.17 National Acquisition Evaluation Program Added 7/2007

The National Acquisition Evaluation Program provides oversight of FAA acquisition management through the evaluation of contracts, programs, and acquisition management practices. The goal is to ensure consistent implementation of AMS policy and guidance by FAA offices and to identify innovative processes or opportunities for improvements. Recommendations based on findings are tracked to closure to promote continuous process improvement and procurement integrity.

1.2.18 Earned Value and Baseline Management Revised 4/2019

The Office of Management and Budget (OMB) directs all Government agencies to use an earned value management (EVM) system that complies with the industry EVMS Standard, American National Standard Institute, Electronic Industries Alliances-748, for capital investment programs involving development, modernization, or enhancement. Service organizations comply with this directive, which includes an integrated baseline review of cost and schedule projections within six months of contract award or baseline approval. The earned-value management focal point reports quarterly the earned-value status of major investment programs to the Joint Resources Council.

Service organizations manage investment programs during solution implementation within controlled acquisition program baselines or execution plans approved at the final investment decision. They take action to correct negative variance from any cost, schedule, or performance baseline measure. Negative variances that exceed 10 percent must be reported quarterly to the Joint Resources Council, along with an explanation of the cause(s), impact on service delivery, and a recovery strategy. The Administrator must notify the Congress of any program cost or schedule variance exceeding 50 percent and must either terminate the activity or justify why it should be continued and provide a recovery plan. When the Joint Resources Council determines an investment program cannot recover from a degenerating negative baseline variance, it may elect to

rebaseline the effort by adding resources or changing its scope or schedule, or it may decide to terminate the activity.

Section Revised: 2.1 – Overview

Acquisition Management Policy - (~~10/2020~~01/2021)

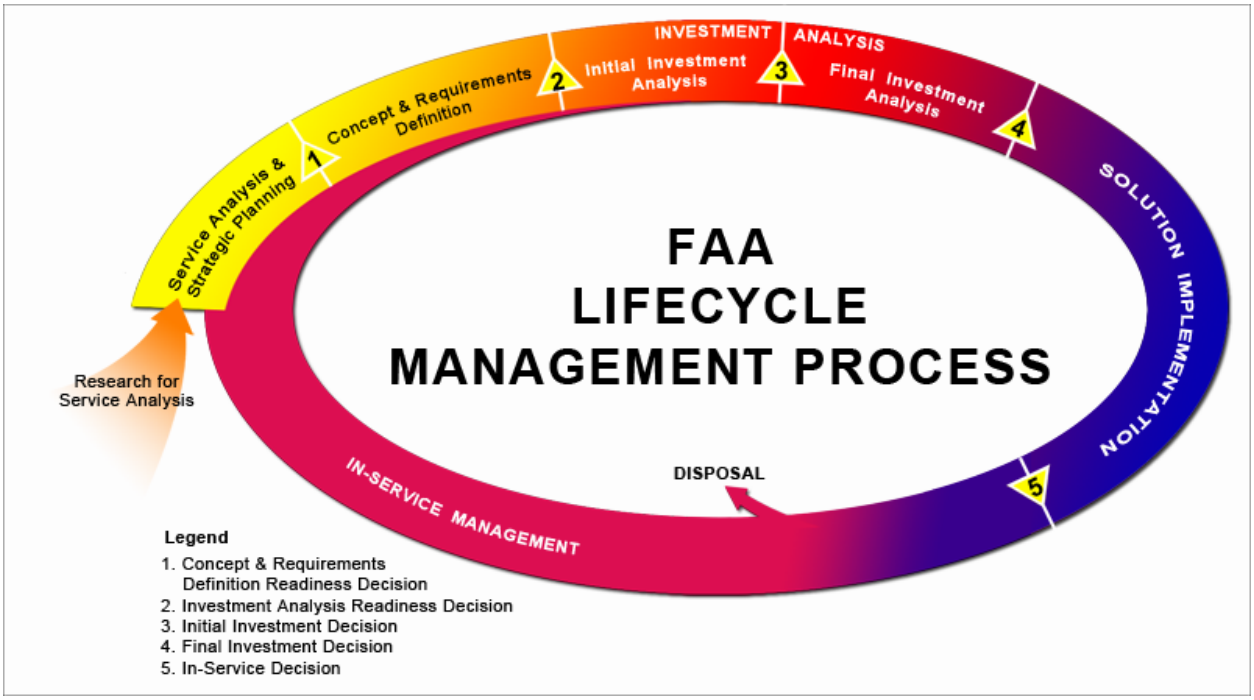
2.1 Overview Revised 4/2013
- 2.1.1 Key Elements of Lifecycle Management Policy Revised ~~4/2013~~01/2021
- 2.1.2 Evolutionary Product Development Revised 4/2013
- 2.1.3 Knowledge-Based Decision-Making Revised 4/2013
- 2.1.4 Investment Planning Revised 4/2019
  - 2.1.4.1 FAA Scheduling Practices Revised 10/2014
  - 2.1.4.2 Standard Program Milestones Revised 4/2019
  - 2.1.4.3 Standard Lifecycle Work Breakdown Structure Revised 10/2014
- 2.1.5 Measurement and Analysis Revised 4/2019
- 2.1.6 Verification and Validation Revised 10/2014

2.1 Overview Revised 4/2013

Lifecycle acquisition management is built around a logical sequence of phases and decision points (see Figure 2.1-1). The FAA uses these phases and decision points to determine and prioritize its needs, make sound investment decisions, implement solutions efficiently, and manage services and assets over their lifecycle. The overarching goal is continuous improvement in the delivery of safe, secure, and efficient services over time. Application is flexible and may be tailored by the Acquisition Executive or Joint Resources Council.

The lifecycle management process is the FAA's Capital Investment Planning and Control Process. Service analysis and investment analysis constitute the select process. Solution implementation is the control process. In-service management is the evaluation process.

Figure 2.1-1 The FAA Lifecycle Management Process



2.1.1 Key Elements of Lifecycle Management Policy Revised ~~4/2013~~01/2021

FAA lifecycle management policy emphasizes the following:

- ~~□~~ Service organizations are responsible and accountable for managing service delivery throughout the AMS lifecycle management process;
- ~~□~~ Service organizations manage fully integrated portfolios of investment and operational assets to optimize service delivery over time;
- ~~□~~ Portfolio managers coordinate implementation of all materiel and non-

materiel investment increments necessary to obtain an operational capability;

- ~~□~~ Service analysis is the foundation for long-range planning by service organizations and the FAA as a whole;
- ~~□~~ Users, customers, and industry work together to define affordable and sufficient requirements so practical solutions can be developed;
- ~~□~~ The Acquisition Executive Board assigns an acquisition category to all investment initiatives early in concept and requirements definition to ensure the appropriate level of oversight and artifact development;
- Investment decisions are based on the relative merit of different investment opportunities for satisfying priority service needs and FAA performance goals;
- ~~□~~ Commercial and non-developmental solutions are preferred when they satisfy customer needs and make economic sense;
- ~~□~~ Investment programs are approved and funded in manageable phases or segments;
- ~~□~~ Lifecycle supportability is designed into products and services to minimize both cost and risk;
- ~~□~~ Investment programs are managed within approved cost, schedule, and performance~~, and benefit~~ baselines ~~throughout their lifecycle~~;
- ~~□~~ In-service decisions are based on demonstration that operational requirements and readiness are satisfied;
- ~~□~~ Evolutionary improvement of service delivery and the quick insertion of productive new technology is encouraged; and
- ~~□~~ Operational performance, costs, and benefits are evaluated periodically throughout in- service management as a basis for improving cost-effective service delivery.

2.1.2 Evolutionary Product Development Revised 4/2013

The FAA employs evolutionary product development to limit the design challenge for any one product development cycle by deferring risky technology and immature requirements to later updates. The objective is to minimize risk and facilitate the achievement of cost, schedule, and performance goals. Product development and implementation are appropriate when risk is low, requirements are known and stable, and resources are available.

Evolutionary product development begins during research for service analysis when the FAA develops and evaluates new concepts and technology for possible application to the aviation service environment. Only the best new concepts validated to be technically, operationally, strategically, and financially mature and beneficial enter into the NAS Concept of Operations as candidates for investment and deployment.

During concept and requirements definition, service teams conduct a final assessment of the maturity of marketplace technology and customer requirements. Only low-risk, high-value investment increments proceed to investment analysis and solution implementation. Higher risk concepts are deferred, terminated, or designated for additional research or technology development.

2.1.3 Knowledge-Based Decision-Making Revised 4/2013

The FAA employs knowledge-based decision-making throughout the lifecycle management process. Specific knowledge, as defined by decision criteria, must be achieved for entry into AMS decision points. These criteria are defined as entrance criteria in the AMS policy section for each decision point. Investment programs that develop systems or software must capture additional design and manufacturing knowledge about their products as prescribed in Section 2.6.1, and base decisions on whether to proceed further in the lifecycle management process on that knowledge.

2.1.4 Investment Planning Revised 4/2019

Investment planning occurs throughout the AMS lifecycle management process (see Table 2.1.4-1). During service analysis and strategic planning, the focus is on defining corporate service needs and shortfalls and deciding when to seek solutions within realistic budgetary constraints. Investment planning during the remainder of the AMS lifecycle management process supports the definition, acquisition, deployment, and lifecycle support of affordable solutions to approved service needs. Throughout this management process, FAA service organizations employ standard scheduling practices, standard program milestones, and the standard lifecycle work breakdown structure.

Table 2.1.4-1 Investment Planning During the AMS Lifecycle Management Process

Lifecycle Management Phase	Focus of Investment Planning
Service analysis and strategic planning	FAA service needs and service shortfalls
Concept and requirements definition	Program requirements and alternative solutions for approved service needs
Initial investment analysis	Business case analysis to determine the best overall solution
Final investment analysis	Final business case and implementation planning for the alternative selected for acquisition and deployment based on vendor proposals and operational support needs
Solution implementation	Program implementation consistent with the acquisition program baseline or execution plan approved at the final investment decision
In-service management	Sustainment of operational assets including product improvements and technology upgrades as defined in the business case

2.1.4.1 FAA Scheduling Practices Revised 10/2014

Service organizations and program offices employ FAA scheduling best practices when planning investment programs. This includes communicating up-to-date acquisition and site-specific waterfall deployment schedules to all key stakeholders by means of the corporate work plan. Guidance for FAA scheduling practices is located in FAST on the investment analysis page.

2.1.4.2 Standard Program Milestones Revised 4/2019

Service organizations and program offices employ standard program milestones when planning, executing, and reporting progress on agency investment programs, including entries in the OMB Major IT Business Case (designated programs only) and acquisition program baseline or execution plan. Standard milestones for system and facility investment programs are located in FAST on the decisions / reviews / standard milestones page.

2.1.4.3 Standard Lifecycle Work Breakdown Structure Revised 10/2014

Service organizations and program offices employ the FAA standard lifecycle work breakdown structure when estimating total lifecycle cost and constructing initial program plans and schedules for each alternative solution during initial investment analysis. They use it during final investment analysis to develop a program work breakdown structure and implementation planning for the alternative approved by the Joint Resources Council.

2.1.5 Measurement and Analysis Revised 4/2019

Measurement and analysis is a management and control process applied throughout the lifecycle of an investment program or operational asset to assess progress, forecast performance, determine status, and define corrective action. Measurement and analysis provides information and visibility toward accomplishing program goals and supporting management information needs.

Each line of business or staff office institutes measurement and analysis processes in accordance with AMS policy and guidance that:

- Collect, store, analyze, and report data on seventeen standard measures defined in Standard Program Performance Measures;
- Collect, store, analyze, and report baseline performance data defined in the Acquisition Baseline Management Standard Operating Procedure for those programs with an approved acquisition program baseline or execution plan; and
- Provide early warning indicators of program issues before they become major problems.

Measurement and analysis information needs include, but are not limited to:

- Contract information that supports management and executive monitoring of vendor performance;
- Contract information that supports acquisition quality assurance;
- Program, operational, risk, and contract information that supports monitoring of lifecycle cost, schedule, performance baselines, as well as benefits and technical progress;
- Program information that supports achievement of FAA strategic goals and alignment with the enterprise architecture; and
- Operational and business case information that supports investment decision-making.

2.1.6 Verification and Validation Revised 10/2014

The FAA employs verification and validation throughout the acquisition management lifecycle in accordance with AMS verification and validation guidelines to support investment decisions and approvals. Validation ensures the right product is built (fulfills its intended use). Verification ensures a product is built right (according to specifications). Verification and validation are performed early and incrementally throughout the lifecycle management process on select work products, product components, and products. Products are intended for delivery to a customer or end user. Product components are lower-level configuration items of the product. Work products represent, define, or direct product development. The following are sample work products, work components, and products subject to verification and validation:

- Operational concept or procedures
- Planning documents
- Requirement and specification documents
- Procurement and contractual documents
- Models, prototypes, and simulations
- Design documents
- Products and product components

Section Revised: 2.2 – Research for Service Analysis

Acquisition Management Policy - (~~10/2020~~01/2021)

2.2 Research for Service Analysis Revised 4/2013
- 2.2.1 Research, Engineering, and Development Process Revised 4/2013
  - 2.2.1.1 What Must Be Done Revised 4/2013
  - 2.2.1.2 Outputs and Products Added 7/2010
  - 2.2.1.3 Who Approves? Revised 4/2013
- 2.2.2 Concept Maturity and Technology Development Process Revised ~~4/2013~~01/2021
  - 2.2.2.1 What Must be Done? Revised 4/2013
  - 2.2.2.2 Outputs and Products Revised 4/2013
  - 2.2.2.3 Who Does It? Revised 4/2013
  - 2.2.2.4 Who Approves? Revised 4/2013

2.2 Research for Service Analysis Revised 4/2013

Research and systems analysis are often required during service analysis to mature operational concepts, reduce risk, or define requirements before a decision is rendered to proceed further in the lifecycle management process. Research for service analysis (RSA) policy also applies when research and systems analysis are required to develop NAS architecture products to meet the criteria to enter concept and requirements definition. In addition, AMS portfolio management policy applies when alignment across related initiatives is necessary to mature concepts to move through the AMS lifecycle.

During RSA, the FAA engages in two general areas of applied research activity:

- Research, Engineering, and Development (RE&D)
- Concept Maturity and Technology Development (CMTD)

The RE&D process governs selection and execution of the RE&D portfolio. This portfolio includes systematic studies to gain knowledge or understanding of concepts, products, or procedures that could potentially benefit the aviation community with or without specific application or means by which a specific need may be met such as research related to materials and human factors. These activities inform FAA strategic planning, the NAS architecture, and CMTD activities, but do not lead directly to concept and requirements definition.

The CMTD process governs activities directed toward the production of useful materials, devices, systems, and methods, as well as advance the maturity of new concepts. Typical activities include concept feasibility studies, technical analysis, prototype demonstrations, and operational assessments that identify, develop, and evaluate opportunities for improving the delivery of NAS services. These efforts reduce risk, define requirements, demonstrate operational requirements, inform concept and requirements definition activities, and generate information required to support agency investment decisions and product lifecycle management.

RSA activities related to the NAS are performed in coordination with the NextGen organization to ensure alignment with the enterprise-level technical strategy as reflected in the NAS architecture.

2.2.1 Research, Engineering, and Development Process Revised 4/2013

The RE&D process supports aspects of aviation with research on materials and human factors to support development of new products, services, and procedures. These aspects include regulation, certification, and standards for aircraft, air operators, manufacturers, aircrews, and other aviation personnel; airports; commercial space transportation; environment; modernization, operation, and maintenance of the NAS; and aerospace policy formulation, planning, and analysis.

RE&D activity across FAA is coordinated through the RE&D portfolio process. The RE&D executive board develops the RE&D portfolio each year using strategic planning in the National Aviation Research Plan as a guide. This plan links FAA research activities to broader strategic planning in the NAS ConOps, NextGen Implementation Plan, the NAS Architecture, and the Joint

Planning Development Office. The RE&D executive board is supported by program planning teams assigned to prepare and manage specific research areas.

Program managers execute research programs. They work closely with research sponsors (business units that own or share the RE&D requirement) to ensure results meet customer needs.

Annual evaluations determine whether research results are meeting performance targets and supporting FAA strategic goals. Evaluations also determine whether FAA strategic planning is leading the RE&D portfolio in the right direction.

The RE&D Advisory Committee and its associated subcommittees review the RE&D portfolio twice a year, first during budget formulation and later during portfolio evaluation.

2.2.1.1 What Must Be Done **Revised 4/2013**

Service organizations:

- Identify, justify, and manage research, study, and analysis within their service area of responsibility;
- Prepare budget formulation documents for research programs approved for inclusion in the RE&D portfolio;
- Submit research, study, and analysis proposals to the RE&D portfolio development process for evaluation and possible inclusion in the RE&D portfolio;
- Facilitate peer reviews by subject-matter experts to improve the quality and timeliness of ongoing research programs; and
- Maintain documentation of research methodology, activities, and results.

NextGen organization:

- Manages the RE&D planning and budget process;
- Coordinates annual development of the National Aviation Research Plan;
- Ensures the RE&D portfolio is aligned with FAA strategic goals and the NAS architecture;
- Coordinates annual updates to the NAS architecture and ensures concept RE&D activities are properly depicted;
- Identifies and analyzes potential solutions to service need, including feasibility analyses;
- Evaluate prototypes and conducts feasibility demonstrations to validate and refine initial requirements, operational concepts, and potential solutions;
- Integrates FAA research activity with research sponsored or conducted by industry, universities, and other government organizations;
- Interfaces with Office of the Secretary of Transportation, OMB, Congress, trade associations, international organizations, and other state and federal government organizations for agency-level research issues; and

- Identifies, justifies, and manages research, study, and analysis programs.

RE&D Executive Board:

- Coordinates with the lines of business to develop the FAA RE&D portfolio each year;
- Reviews and approves the non-NextGen-funded portion of RE&D portfolio each year; and
- Coordinates sequential review of the RE&D portfolio with the Chief Operating Officer, Associate and Assistant Administrators, and Joint Resources Council.

2.2.1.2 Outputs and Products Added 7/2010

- FAA RE&D portfolio;
- Budget formulation documentation;
- National Aviation Research Plan; and
- Research products addressing the needs of the FAA and aviation community.

2.2.1.3 Who Approves? Revised 4/2013

Joint Resources Council approves the RE&D budget.

The Administrator approves the National Aviation Research Plan.

2.2.2 Concept Maturity and Technology Development Process Revised ~~4/2013~~01/2021

The concept maturity and technology development process governs conduct of NAS activities such as feasibility studies, technical analysis, prototype demonstrations, and operational assessments that identify, develop, and evaluate potential concepts for improving service delivery by the FAA. These activities may be for a single initiative or multiple initiatives related to a single concept (a portfolio, as described in section 1.2.4.2.). They may play a role in the development of service analysis products, as described in section 2.3.1. Key outputs are mature, beneficial concepts that can progress toward entry into the NAS ConOps and NAS architecture and then into concept and requirements definition phase of AMS.

If a concept maturity and technology development initiative requires F&E resources for implementation, the project office prepares an ACAT determination form and submits it to the Acquisition Executive Board for consideration. If approved, the Acquisition Executive Board assigns the appropriate acquisition category to the initiative which determines the acquisition management path to be followed and key artifacts to be developed (link to ACAT Table).

The CMTD process supports concept maturity through the following three stages:

- **Concept Exploration** identifies promising concepts with sufficient definition to begin development of a concept of operations and plan follow-on activities. Work starts with the collection of a broad and varied range of potential approaches for meeting agency strategic goals, objectives, and service needs, and organizes them into candidate concepts. Outputs are promising and feasible concepts that warrant further maturation and development.
- **Concept Development** matures and evaluates promising concepts to determine which should continue further development. Activities include modeling, simulation, and detailed analysis.
- **Concept Evaluation** confirms that a concept has great promise toward meeting the needs of the agency and begins to determine operational and technical feasibility. Concept evaluation can include concept integration, evolution, or scalability. Representative activities include prototyping and field demonstration.

Individual projects reside in one of the stages, but may not pass sequentially through each, depending on the maturity level of the concept and the progress of related initiatives.

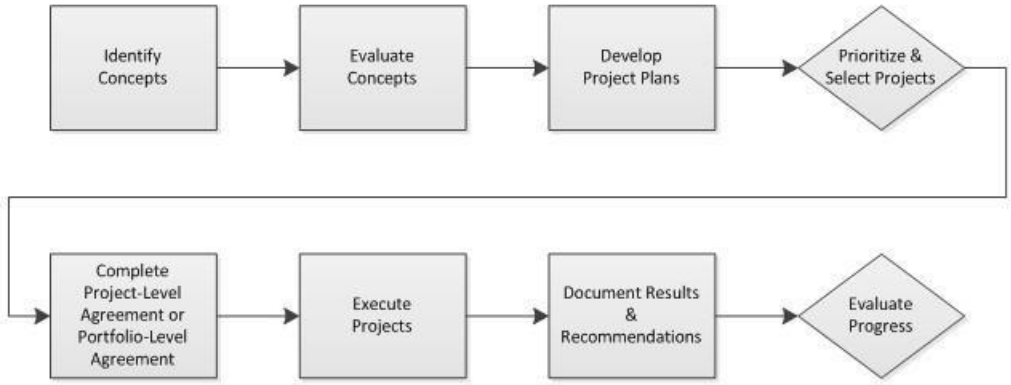
CMTD activities are selected according to their relative potential for achieving needed operational improvements identified in the NAS ConOps and NAS architecture. CMTD activities include development of mid-term operational concepts, concept evaluation studies, human factors analysis, preliminary requirements development for individual concepts, prototypes, demonstrations, and concept development. These activities generate information supporting the validity of identified capability shortfalls, future service needs, capability requirements, expectations of benefits, and design alternatives. See CMTD guidance for a list of products and how CMTD supports the development of those products.

2.2.2.1 What Must be Done? Revised 4/2013

CMTD encompasses activities designed to validate concepts for improving performance. A concept is a broad area of potential operational improvement to be explored for applicability to agency strategic goals and objectives. Concepts are evaluated for technical and operational feasibility as they progress through the CMTD process where they are prepared for entry into the NAS ConOps and NAS architecture, and eventually on to concept and requirements definition.

Individual projects are discrete efforts that evaluate specific aspects of the concept and provide data necessary to assess technical maturity and operational feasibility. The objective of each project must be defined, have definitive deliverables, and have clear success criteria. An individual project is most often completed during one stage of the CMTD process, and is always conducted in accordance with a project-level or portfolio-level agreement. Several CMTD projects may need to be completed for a concept to be deemed mature enough to continue with service analysis or enter concept and requirements definition.

The following flowchart describes the steps that projects move through during the CMTD process. The steps are cyclic and apply to each stage of the process.



- **Identify concepts.** All potential concepts for satisfying immediate or future priority service or performance needs are gathered and acknowledged. The FAA strategic plan, NAS architecture, NAS ConOps, NextGen Implementation Plan, and prior research are various sources from which to identify concepts.
- **Evaluate concepts.** Concepts are evaluated annually to determine which have the greatest potential for improving performance and service, and which need to mature in the near future. The NAS architecture links operational improvements to strategic goals and identifies when they are needed.
- **Develop project plans.** A project plan is completed for each potential project. The plan defines project goals and objectives; explains how it will mature the research concept; identifies interdependencies, related projects, risks, and safety concerns; and documents expected outputs and measures for success.
- **Prioritize and select projects.** The portfolio manager collects all project plans and prioritizes them based on immediate needs, dependencies, and projected results. Highest priority research projects are selected to be carried out based on available funding. Projects not selected return to the identify concepts step of the CMTD process for the next funding cycle.
- **Complete project-level agreement or portfolio-level agreement.** The project team completes the project-level or portfolio-level agreement, which is reviewed by the portfolio manager. This document builds on the project plan and defines project objectives, scope, schedule, deliverables, measures of success, and resources.
- **Execute projects.** The project team carries out the research in accordance with the project-level or portfolio-level agreement.
- **Document results and recommendations.** The project team documents all findings and products completed during the research. Depending on the stage, findings could be a refined concept of operations, preliminary requirements, the identification of alternative solutions, the analysis of multiple alternatives, the feasibility and scalability of a single alternative, or the demonstration of a proposed concept. The project team also recommends what should happen next based on the findings. Depending on which stage the concept is in, recommendations could consist of: continue working on the concept, the concept is mature, or terminate further consideration of the concept.
- **Evaluate progress.** Individual projects are evaluated periodically and project results are used to develop documentation for service analysis and concept and requirements definition. Often, completion of multiple projects through many cycles will be required to mature a concept from

exploration to evaluation. When a concept is deemed mature, the initiative may continue in service analysis or progress to concept and requirements definition as described in section 2.4.

2.2.2.2 Outputs and Products Revised 4/2013

- Project plans and project level or portfolio level agreements
- Project research results and recommendations
- Information that validates new ideas and concepts strategically, operationally, technically, and financially for inclusion in the NAS ConOps

2.2.2.3 Who Does It? Revised 4/2013

Organization	Responsibilities
NextGen organization	• Develops and maintains the NAS architecture; • Coordinates annual development of the NextGen Implementation Plan; • Manages the NextGen planning and budget process; • Defines project plan selection, management, and evaluation criteria for CMTD activities in coordination with project sponsors and stakeholders; • Assesses progress of research activities toward achievement of documented project plans and ensures documentation of results and recommendations; • Facilitates coordination with trade associations, international organizations, and other state and federal government organizations for agency-level research and concept development initiatives; and • Functions as the CMTD portfolio manager.
Service organizations	• Identify service gaps and prepare research proposals for activities to identify and evaluate alternative solutions to eliminate service gaps; • Prepare budget formulation documentation for CMTD activities for which the organization serves as the performing organization; • Execute projects as documented in project-level agreements and project plans; • Document project results; and • Plan and obtain support for operational prototypes as specified in the Integrated Logistics Support Process Manual. This may include training, manuals, spare parts, repair, and support services, as well as decisions related to removing prototypes and restoring sites when activity is complete.

2.2.2.4 Who Approves? Revised 4/2013

Artifact	Approval Authority
CMTD activities as part of the F&E budget	Joint Resources Council
Project-level agreements or portfolio-level agreements	NextGen organization or service organization portfolio manager

Section Revised: 2.3 – Service Analysis and Strategic Planning

Acquisition Management Policy - (~~10/2020~~01/2021)

2.3 Service Analysis and Strategic Planning Revised 4/2013
- 2.3.1 What Must Be Done Revised 4/2017
- 2.3.2 Outputs and Products Revised 4/2013
  - 2.3.2.1 Service Analysis and Strategic Planning Revised 4/2013
  - 2.3.2.2 NAS ConOps Change Development and Decomposition Revised 4/2013
- 2.3.3 Who Does It? Revised 4/2013
  - 2.3.3.1 Service Analysis and Strategic Planning Revised 4/2017
  - 2.3.3.2 NAS ConOps Change Development and Decomposition Revised 4/2013
- 2.3.4 Who Approves? Revised 4/2013
  - 2.3.4.1 Service Analysis and Strategic Planning Revised 4/2013
  - 2.3.4.2 NAS ConOps Change Development and Decomposition Revised 4/2013
- 2.3.5 Concept and Requirements Definition Readiness Decision Revised ~~4/2013~~01/2021
  - 2.3.5.1 Entrance Criteria Revised 4/2013
  - 2.3.5.2 Decision Actions Revised 4/2013

2.3 Service Analysis and Strategic Planning Revised 4/2013

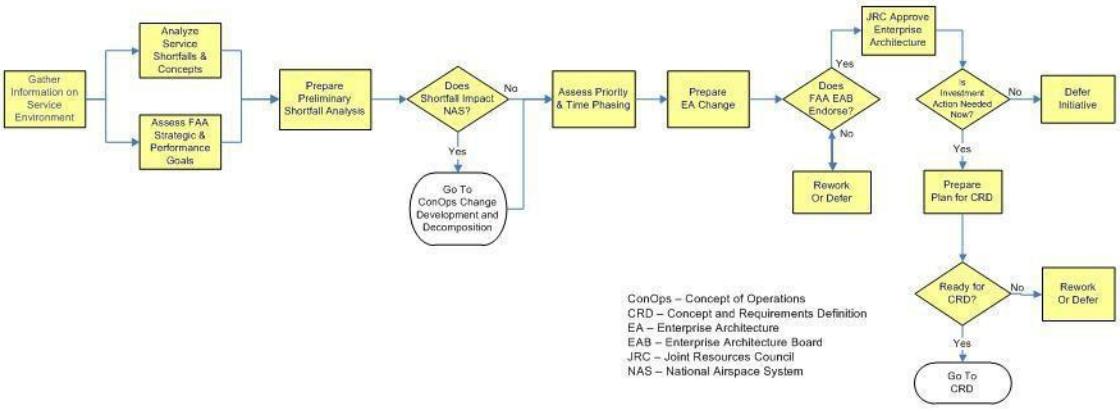
Service analysis and strategic planning determines what capabilities must be in place now and in the future to meet agency goals and the service needs of customers. Results are captured in the "as is" and "to be" states of the enterprise architecture, as well as the roadmaps for moving from the current to the future state. Results are also captured in line-of-business business plans and service organization operating plans, which specify how each will manage its RE&D, F&E, and OPS resources over time. These plans integrate new investment initiatives with the operation and support of fielded assets and other necessary actions to optimize service delivery. Continuing analysis keeps planning current with changes in the service and operational environment.

Industry best practices (e.g., technology and service demand forecasting, portfolio management, customer surveys) are employed during service analysis to align service outcomes with actions and activities necessary and sufficient to realize benefits for the FAA and its customers. Service analysis may lead to the refocus, reduction, or elimination of ongoing investment programs, and may identify new and more productive ways of doing business. It may also identify alternative paths for achieving service goals in a dynamic environment, and may identify opportunities for improving FAA strategic planning when the service environment evolves in ways not anticipated. Some investment opportunities may require research and development to demonstrate operational concepts, reduce risk, or define requirements before proceeding further in the lifecycle management process.

2.3.1 What Must Be Done Revised 4/2017

Figure 2.3-1-1 portrays the key activities of service analysis and strategic planning. These activities develop the information necessary for determining which service shortfalls or new ideas for improving service delivery are approved for inclusion in agency strategic planning documents. When a service shortfall impacts the National Airspace System, it enters the NAS ConOps change development and decomposition process (see Figure 2.3.1-2) to determine how it fits within the National Airspace System.

Figure 2.3-1-1 Key Activities of Service Analysis and Strategic Planning



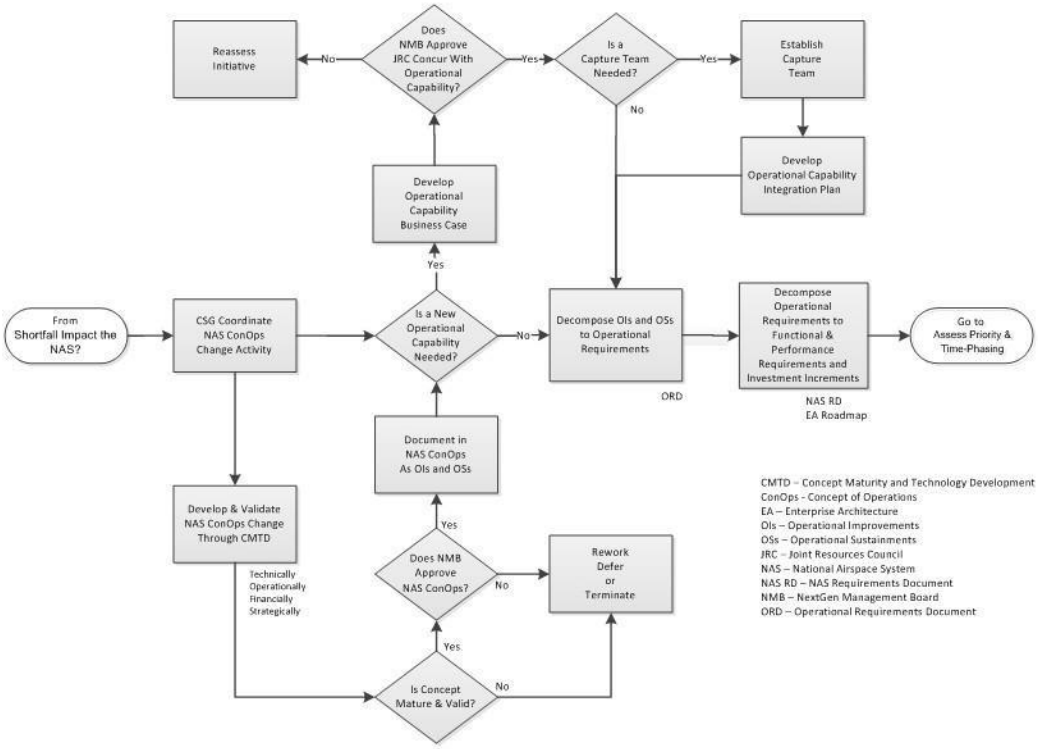
- **Gather Information on the Service Environment.** Service organizations analyze forecasts for aviation service needs and stay abreast of opportunities for improving service delivery as a basis for determining and prioritizing service needs and shortfalls. A continuing dialog with and feedback from customers (e.g., commercial air carriers, general aviation, air transport industry, state and local airport authorities) and users (air traffic and technical operations) are crucial, as is the supportability and operational outlook for fielded assets.
- **Analyze Service Shortfalls and Concepts.** Lines of business use service environment performance information to identify shortfalls and ideas for improving service delivery within their domain. Aviation research by NASA and other industry and government organizations may also identify emerging service shortfalls or technological opportunities for improving service delivery. This activity identifies business, technology, organizational, process, and personnel issues that affect service outcomes, as well as assumptions, risks, and dependencies.
- **Assess FAA Strategic and Performance Goals.** Service shortfalls or new ideas for improving service delivery should support current services or fulfillment of FAA strategic and performance goals. When they do not, the shortfall or new idea must be shown to have sufficient merit to warrant inclusion in agency strategic planning documents. Agency strategic plans and performance goals may also define service shortfalls that must be addressed in lower-level agency planning.
- **Prepare Preliminary Shortfall Analysis.** The service organization analyzes the shortfall or new idea as a foundation for understanding the problem and its urgency and impact. The shortfall is the difference between future service need and current capability. A service shortfall is usually addressed by a sustainment action for existing assets or a new service delivery idea including cloud services for predicted gaps. A new idea or concept should deliver existing services more efficiently or provide new services of value to the FAA and aviation industry. At this stage, the service shortfall is expressed as levels of service improvement, not by specific performance values.
- **Does Shortfall Impact the National Airspace System?** A new service need or shortfall that impacts the National Airspace System is assessed by means of the NAS ConOps Change Development and Decomposition Process (see Figure 2.3.1-2) to determine whether or how the NAS ConOps should be changed. Once NAS needs or shortfalls have been appropriately included in the NAS ConOps as operational improvements or sustainments, they move forward with Mission Support shortfalls to determine how they should be integrated within the FAA enterprise architecture.
- **Assess Priority and Time-phasing.** A new service shortfall or need must be shown to have sufficient merit to warrant inclusion in the enterprise architecture when evaluated against other service needs of the agency. The line of business works with the Technical Review Board (NAS) or the Architecture Review Board (Mission Support) and other lines of business to determine how a new service need, technology refresh, or sustainment activity should be planned, time-phased, and integrated within the architecture relative to all other agency service needs. This activity may require rework of existing shortfalls and improvements already in the architecture.
- **Prepare Enterprise Architecture Change.** The service organization prepares change documents reflecting the service need or shortfall and submits them to the FAA Enterprise Architecture Board for endorsement. NAS service needs and shortfalls are

expressed as operational improvements and operational sustainments.

- **Does FAA Enterprise Architecture Board Endorse the Change?** The FAA Enterprise Architecture Board determines whether and how to integrate new service needs within the enterprise architecture and its roadmaps. In making this determination, the board analyzes and assesses the new service need against all other service needs of the FAA using such criteria as contribution to agency strategic goals, monetary or performance benefits, compatibility with the enterprise architecture, risk, and political sensitivity. The decision to endorse and place a new service need, improvement, or sustainment within the enterprise architecture validates that this service need is an agency priority and warrants further action.
- **Joint Resources Council Approves the Enterprise Architecture.** The Joint Resources Council approves the FAA Enterprise Architecture annually. No service need can proceed further in the AMS lifecycle management process unless it is in the enterprise architecture approved by the JRC. Emergency needs not contained in the JRC-approved architecture may be presented to the FAA Enterprise Architecture Board by exception.
- **Rework or Defer.** Service needs, shortfalls, improvements, and sustainments not approved for inclusion in the enterprise architecture are reworked or deferred according to the direction of the FAA Enterprise Architecture Board or Joint Resources Council, as appropriate.
- **Is Investment Action Needed Now?** The investment increment enters concept and requirements definition at the appropriate time as determined by its time-phasing in the appropriate enterprise architecture roadmap.
- **Defer Initiative.** Investment action is deferred when action is not needed now to meet agency plans and schedules.
- **Prepare Plan for Concept and Requirements Definition.** NAS Systems Engineering Services (NAS) Office of Information & Technology, Solution Delivery Service, Solution Strategy Division, EA Branch (Mission Support) works with the implementing and operating service organizations to prepare a plan for concept and requirements definition. This plan (1) specifies how tasks will be accomplished; (2) defines roles and responsibilities of participating organizations; (3) defines outputs and exit criteria; (4) establishes a schedule for completion; and (5) specifies needed resources. By signing the plan for concept and requirements definition, organizations that will do the work agree to provide the necessary resources.
- **Ready for Concept and Requirements Definition?** The FAA Enterprise Architecture Board makes the decision to enter concept and requirements definition or directs other action.
- **Rework or Defer.** The investment initiative is reworked or deferred when planning or organizational support is not sufficient to enter concept and requirements definition.

Figure 2.3.1-2 NAS ConOps Change Development and Decomposition Process

(Applies to the NAS only)



- **Concept Steering Group Coordinates NAS ConOps Change Activity.** The Concept Steering Group reviews the preliminary shortfall analysis to determine whether the service shortfall or new idea is addressed in the NAS ConOps. New shortfalls or ideas that are already within the scope of the NAS ConOps move to decomposition into operational requirements and investment initiatives after determining whether they should be incorporated into a new or existing operational capability. For shortfalls and ideas not addressed in the NAS ConOps, the Concept Steering Group coordinates discussion with the sponsor and the lines of business to determine what development or validation activity is needed.
- **Develop and Validate NAS ConOps Change Through Concept Maturity and Technology Development.** New ideas for improving NAS service or eliminating a shortfall must be validated to be technically and financially feasible, strategically aligned with agency goals and objectives, and have significant operational benefit to warrant inclusion in the NAS ConOps. The Concept Steering Group coordinates activity to develop and validate new ideas and concepts. Typically, the concept maturity and technology development process is applied to the point where technical risk is sufficiently low and potential benefits sufficiently high to justify inclusion. This activity includes safety and security assessments to identify and characterize any safety hazards and information security factors associated with the idea or concept.
- **Is Concept Mature and Valid?** The NAS ConOps is a stable document that evolves

over time. Only the best high-value new concepts and ideas are added. The Concept Steering Group assesses development and validation results and records their findings and recommendations in a memorandum to the NextGen Management Board, which approves all changes to the NAS ConOps.

- **Does NextGen Management Board Approve NAS CONOPS?** The NextGen Management Board approves changes to the NAS ConOps. Changes are presented to the Joint Resources Council. Any JRC concerns or issues are resolved to ensure approved concepts are beneficial *and* affordable and supported by both management bodies.
- **Document Changes in NAS ConOps as Operational Improvements or Sustainments.** Service shortfalls and new concepts are documented in the NAS ConOps as operational improvements and operational sustainments.
- **Is a New Operational Capability Needed?** Grouping and managing operational improvements and sustainments with a high degree of interdependency may result in a high-value operational capability for the agency and aviation community. In such cases, one or more operational improvements will be organized and managed as a portfolio to ensure all essential elements of the operational capability are obtained and deployed.
- **Develop Operational Capability Business Case.** Advanced Concepts and Technology Development works with the ATO Program Management Office and Investment Planning & Analysis to develop a business case for the operational capability. The business case contains a rough estimate of the costs and benefits associated with developing and deploying the operational sustainments and improvements necessary to enable the operational capability. The PMO coordinates with ATO service organizations
- to derive rough cost estimates for the work required to develop and deploy the investment increments necessary to achieve the operational capability. These same organizations derive a rough monetized estimate of benefits that will accrue to the FAA and aviation community when the operational capability is fully deployed. A preliminary assessment of risk, priority, affordability, and political sensitivity complete the business case.
- **Does NMB Approve and JRC Concur With the Operational Capability?** The
- NextGen Management Board decides whether to approve and establish the operational capability. The decision is based on the business case, contribution to agency strategic and performance goals, and affordability. The operational capability is implemented through its constituent investment increments approved and baselined individually by the Joint Resources Council. Obtaining these capabilities may require establishment of a capture team to integrate and coordinate activity by multiple program offices or service organizations providing the investment increments necessary to achieve the overall operational capability. By concurring with the NextGen Management Board decision, the Joint Resources Council acknowledges the operational capability and its constituent investment increments are agency priorities. The business case for the operational capability is a determining factor at future investment decisions for increments necessary to achieve the operational capability.
- **Reassess Initiative.** If the NextGen Management Board does not approve the operational capability, it may terminate the effort or recommend other activity to amend the concept or reduce risk. Any issues or concerns of the Joint Resources Council must be resolved before the operational capability is implemented.
- **Is a Capture Team Needed?** The NextGen Management Board decides whether to establish a capture team to coordinate the development, integration, and deployment of

investment increments necessary to achieve an operational capability. In making this decision, the board evaluates the complexity and risk associated with the operational capability and the availability of resources. The capture team brings together cross- agency empowered representatives from each organization that must develop and deploy an investment increment to achieve the operational capability. The objective is informed, integrated, and coordinated decision-making by all parties.

- **Establish Capture Team.** Each line of business that must contribute to achieve the operational capability provides an empowered representative to the capture team. The capture team monitors development, integration, and deployment of all elements of the operational capability, as well as plan and oversee a post-implementation evaluation to confirm that forecast benefits are being achieved or to define and implement corrective action when they are not.
- **Develop Operational Capability Integration Plan.** The team works with the portfolio manager to develop an Operational Capability Integration Plan (OCIP) that specifies responsibilities and agreements among all team members and organizations. The OCIP also defines the lifecycle plan, performance goals and measures, and operational benefits that will accrue from implementation of the operational capability.
- **Decompose Operational Improvements and Operational Sustainments to Operational Requirements.** A cross-organizational team with members from all lines of business and led by Advanced Concepts and Technology Development decomposes the NAS ConOps narrative of operational improvements and operational sustainments into NAS operational requirements. These requirements are recorded in the NAS Operational Requirements Document.
- **Decompose Operational Requirements to Functional and Performance Requirements and Investment Increments.** A cross-organizational team decomposes NAS operational requirements to NAS functional and performance requirements. These requirements are specified with sufficient detail for allocation to investment increments that will be undertaken to achieve the operational improvements and sustainments in the NAS ConOps. The goal is clear and unambiguous traceability of requirements from the NAS ConOps to the NAS Operational Requirements Document to the NAS Requirements Document and then to the program requirements document of specific investment increments. Each investment increment enters concept and requirements definition at the appropriate time as determined by their time-phasing in the enterprise architecture roadmap.

2.3.2 Outputs and Products Revised 4/2013

2.3.2.1 Service Analysis and Strategic Planning Revised 4/2013

- Preliminary shortfall analysis that describes qualitatively the service need, shortfall, and legacy assets;
- Enterprise architecture change notices, products, and amendments;
- Updates to the enterprise architecture; and
- Plan for concept and requirements definition.

Key work products are verified and validated according to the FAA AMS Verification and

Validation Guidelines before the CRD readiness decision.

2.3.2.2 NAS ConOps Change Development and Decomposition Revised 4/2013

- White papers, research reports, and outputs from concept maturity and technology development;
- Updates to the NAS ConOps;
- Operational capability business case;
- Operational capability;
- Capture team;
- Operational Capability Integration Plan;
- Updates to the NAS Operational Requirements Document; and
- Updates to the NAS Requirements Document.

Key work products are verified and validated according to the FAA AMS Verification and Validation Guidelines before the CRD readiness decision.

2.3.3 Who Does It? Revised 4/2013

2.3.3.1 Service Analysis and Strategic Planning Revised 4/2017

Organization(s)	Responsibilities
Service organizations	• Conduct service analysis • Prepare preliminary shortfall analysis reports • Prepare EA change notices, products, and amendments
Advanced Concepts and Technology Development Office (ANG-C), NextGen Lifecycle Integration Office (ANG-D)	• Assists NAS service organizations when preparing service analysis outputs and products
Office of Information & Technology, Solution Delivery Service, Solution Strategy Division, EA Branch (Mission Support)	• Assists Mission Support service organizations when preparing service analysis outputs and products
Lines of Business	• Prioritize LOB service shortfalls and new ideas • Determine whether a service shortfall impacts the National Airspace System • Work with the Technical Review Board to time-phase operational improvements and operational sustainments in the NAS architecture roadmaps
Technical Review Board	• Works with the lines of business to time-phase operational

	improvements and operational sustainments in the NAS architecture roadmap
Architecture Review Board	• Works with the lines of business to prioritize Mission Support service shortfalls and needs
FAA Enterprise Architecture Board	• Manages the FAA Enterprise Architecture

2.3.3.2 NAS ConOps Change Development and Decomposition Revised 4/2013

Organization(s)	Responsibilities
Service organization with shortfall/concept, Advanced Concepts and Technology Development Office (ANG-C), NextGen Lifecycle Integration Office (ANG-D)	• Develop information needed to assess impact of shortfall/concept on the NAS ConOps
Service organization with shortfall/concept, Advanced Concepts and Technology Development Office (ANG-C), Investment Analysis and Planning (IP&A)	• Develop and validate shortfalls and new concepts technically, operationally, strategically, and financially
Advanced Concepts and Technology Development Office (ANG-C), CSG, service organization with shortfall/concept	• Present shortfall/concept to the NextGen Management Board for inclusion in the NAS ConOps
NAS Systems Engineering Services Office (ANG-B), Advanced Concepts and Technology Development Office (ANG-C), NextGen Lifecycle Integration Office (ANG-D)	• Document shortfall as operational improvements or sustainments in the NAS ConOps
ANG-B/C/D, PMO/LOB	• Determine need for new operational capability
ANG-C, ANG-5, PMO/LOB, IP&A	• Develop operational capability business case • IP&A reviews the business case for the Joint Resources Council

ANG-C, ANG-5, PMO/LOB	• Contribute to and participate in the decision to create a new operational capability
ANG-C/D, PMO/LOB	• Determine the need for a capture team to plan and oversee a new operational capability
ANG-C/D, PMO/LOB, operating organization	• Contribute to and establish a capture team
ANG-C, AJV-7, LOBs, service organizations	• Decompose operational improvements and sustainments in the NAS ConOps into operational requirements and investment increments
ANG-B/C/D, operating organization, capture team (if applicable)	• Decompose NAS operational requirements into NAS functional and performance requirements

2.3.4 Who Approves? Revised 4/2013

2.3.4.1 Service Analysis and Strategic Planning Revised 4/2013

Artifact	Approval Authority
Preliminary shortfall analysis	NextGen Lifecycle Integration Office, Director of the service organization with the need
Enterprise architecture products and amendments	FAA Enterprise Architecture Board
Plan for concept and requirements definition	Vice Presidents (ATO) or Directors (non-ATO) of the service organization with the service need and the operating service organization and the FAA Enterprise Architecture Board chairperson
FAA Enterprise Architecture	Joint Resources Council

2.3.4.2 NAS ConOps Change Development and Decomposition Revised 4/2013

Artifact	Approval Authority
NAS ConOps	NextGen Management Board
Operational Capability Business Case	NextGen Systems Analysis and Modeling (ANG-5)
Operational capability	NextGen Management Board (JRC concurs)
Capture team	NextGen Management Board
Operational Capability Integration Plan	NextGen Management Board
NAS Operational Requirements Document	ATO Operational Concepts, Validation & Requirements (AJV-7)
NAS Requirements Document	NAS Systems Engineering Service (ANG-B)

2.3.5 Concept and Requirements Definition Readiness Decision Revised ~~4/2013~~01/2021

~~The~~The FAA Enterprise Architecture Board makes the concept and requirements definition readiness Decision. This decision occurs when an enterprise architecture roadmap indicates action must be taken to address a critical service shortfall or opportunity. At this decision, the FAA Enterprise Architecture Board verifies: (1) the service shortfall, operational improvement, or operational sustainment is in an enterprise architecture roadmap; and (2) planning and resources for concept and requirements definition are in place. ~~The readiness decision is the gateway between service analysis and strategic planning and concept and requirements definition.~~

2.3.5.1 Entrance Criteria Revised 4/2013

The following are required for the concept and requirements definition readiness decision:

- Service shortfall, operational improvement, or sustainment is in an enterprise architecture roadmap and represents a compelling need of the FAA; and the
- Plan for concept and requirements definition is approved by the FAA Enterprise Architecture Board.

2.3.5.2 Decision Actions Revised 4/2013

The FAA Enterprise Architecture Board makes the decision to enter concept and requirements definition.

Section Revised: 2.4 – Concept and Requirements Definition

Acquisition Management Policy - (~~10/2020~~01/2021)

2.4 Concept and Requirements Definition Revised 4/2019
- 2.4.1 What Must Be Done Revised 4/2017
- 2.4.2 Outputs and Products Revised 10/2017
- 2.4.3 Who Does it? Revised 4/2017
- 2.4.4 Who Approves? Added 4/2013
- 2.4.5 Investment Analysis Readiness Decision Added 4/2013
  - 2.4.5.1 Entrance Criteria Added 4/2013
  - 2.4.5.2 Joint Resources Council Actions Added 4/2013

2.4 Concept and Requirements Definition Revised 4/2019

All investment opportunities that require funding outside the scope of an approved acquisition program baseline or execution plan undergo concept and requirements definition. This includes upgrades or replacements to existing capability without approved investment funding.

~~Concept~~Activity during concept and requirements definition ~~translates~~achieves the following primary objectives:

- Translate priority operational needs in the enterprise architecture into preliminary requirements and a solution concept of operations for the capability needed to improve service delivery~~. It also quantifies~~;
- Quantify the service shortfall in sufficient detail for the ~~definition of~~ realistic ~~preliminary requirements and the~~ estimation of potential costs; and
- Identify and ~~benefits. Finally, concept and requirements definition identifies~~define the most promising alternative ~~solutions~~solution(s) able to satisfy the service need, one of which must be consistent with the conceptual framework in the enterprise architecture.

~~Planning for concept~~Concept and requirements definition ~~begins~~is authorized to begin when ~~a roadmap in~~ the ~~enterprise architecture specifies~~FAA Enterprise Architecture Board determines that action must be taken to address a priority service or infrastructure need~~.~~ in an enterprise architecture roadmap. These needs typically relate to existing or emerging shortfalls in the "as is" architecture or to essential building blocks of the "to be" architecture. Should a service organization wish to pursue an investment opportunity not in an enterprise architecture roadmap, it must first develop architectural change products and amendments and get endorsement from the FAA Enterprise Architecture Board and approval by the Joint Resources Council.

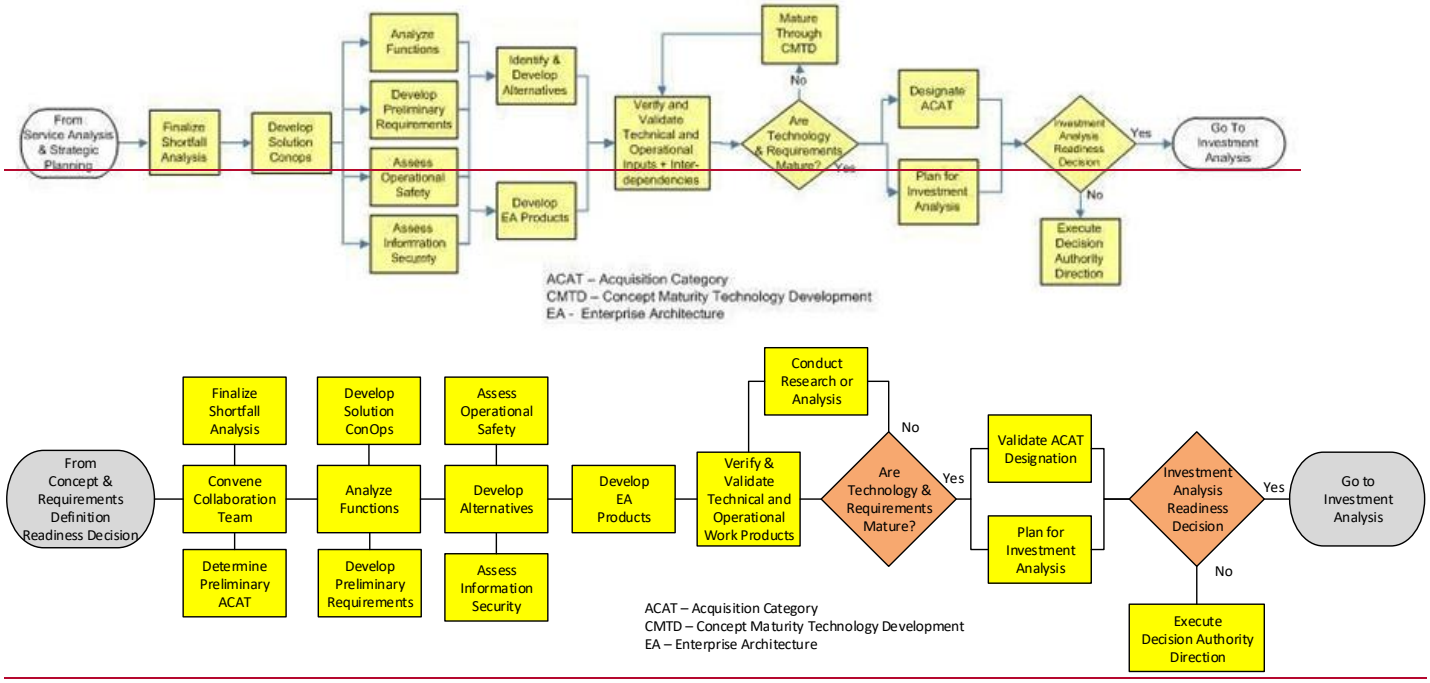
The FAA may undertake research activity during concept and requirements definition or employ research by other agencies or industry to define the operational concept, develop preliminary requirements, demonstrate and refine computer-human interfaces, reduce risk, or achieve customer buy-in to potential solutions to service need.

When the investment initiative entering concept and requirements definition is an element of an operational capability (NAS only), the ~~capture~~management team responsible for achieving the operational capability ~~(if established)~~ participates in and contributes to CRD activity. The ~~capture~~management team is populated with representatives from each service team or program office that will provide an increment of the overall operational capability. These team members ensure all preliminary alternatives emerging from concept and requirements definition for each investment increment fit within the strategy for obtaining the capability and can provide the necessary performance and functionality.

~~A nonmateriel solution that emerges during concept and requirements definition may proceed to solution implementation upon approval of implementation and resource planning, provided it satisfies the need, can be achieved within approved budgets, and is acceptable to users and customers. This determination is made by the Vice President or Director of the service organization with the service need with the concurrence of the FAA Enterprise Architecture Board.~~

~~The~~Figure 2.4-1defines the key activities of concept and requirements definition ~~are shown in Figure 2.4-1. They apply to all investment initiatives seeking investment funding, whether~~for a ~~stand-alone~~New Investment Level 1 acquisition category, which is the most complex and highest risk investment initiative ~~or~~undertaken by the FAA. For other acquisition categories, these activities are adjusted to require what is needed for each individual initiative using the ACAT table as the basis. As an ~~element of~~example, a ~~complex~~ Sustainment initiative to replace obsolete processors in a radar system with a form-fit-function equivalent does not impact the solution concept of operations or performance requirements of the operational ~~capability.~~asset and would not need to develop those artifacts.

Figure 2.4-1 Key Activities of Concept and Requirements Definition



2.4.1 What Must Be Done **Revised 4/2017**

~~NOTE: The plan for concept and requirements definition must be approved by the Vice Presidents (ATO) or Directors (non-ATO) of the service organization with the service need and the operating service organization and by the FAA Enterprise Architecture Board chairperson before the start of any CRD activity (see AMS Section 2.3.1). Roadmap planning in the enterprise architecture specifies when concept and requirements definition activity must begin.~~

~~□~~

□ **Convene Collaboration Team.** A collaboration team of key stakeholder organizations and the program office or service organization with the need is formed at the start of CRD phase activity to facilitate determination of the appropriate acquisition category for each initiative and to foster teamwork and shared goals during the conduct of concept and requirements definition. The

collaboration team typically has representatives from the program office (or service team) proposing the initiative; key stakeholder organizations such as the NAS Systems Engineering Office, ATO Technical Operations, safety, information security, and testing; and the AMS policy team. The collaboration team is also available throughout execution of concept and requirements definition to resolve issues that are delaying or affecting the quality of the work effort.

- **Finalize Shortfall Analysis.** The service organization or program office updates, refines, and quantifies the preliminary shortfall identified during service analysis in sufficient detail to serve as the basis for (1) clearly understanding the nature, urgency, and impact of the service need; (2) defining preliminary requirements; (3) determining realistic and economic alternative solutions; and (4) quantifying likely program costs and benefits. Results are recorded in the final shortfall analysis report.
- **Determine Preliminary ACAT.** The collaboration team evaluates the complexity, risk, political sensitivity, safety, and security associated with the investment initiative to recommend the appropriate acquisition category. The program office or service team prepares a preliminary ACAT determination request based on this evaluation and presents it to the Acquisition Executive Board for approval.

Develop Solution Concept of Operations. ~~The solution concept of operations describes how users will employ the new capability within the operational environment and how it will satisfy service need.~~ The solution ConOps defines the roles and responsibilities of key participants (e.g., controllers, maintenance technicians, pilots); explains operational issues that system engineers must understand when developing requirements; identifies procedural issues that may lead to operational change; and establishes a basis for identifying alternative solutions and estimating their likely costs and benefits. ~~More than one solution concept of operations may be required if proposed alternative solutions differ significantly from each other.~~

- **Analyze Functions.** The service organization or program office translates stakeholder needs in the shortfall analysis, solution concept of operations, and NAS Requirements Document (NAS only) into high-level functions that must be obtained to achieve the desired service outcome. These are then decomposed into sequentially lower level functions. For NAS investment initiatives, this decomposition may have been done during service analysis when operational improvements and sustainments in the NAS ConOps were decomposed into functional and performance requirements and investment increments.

~~**Develop Solution Concept of Operations.**~~ The solution concept of operations describes how users will employ the new capability within the operational environment and how it will satisfy the service need. ~~The solution ConOps defines the roles and responsibilities of key participants (e.g., controllers, maintenance technicians, pilots); explains operational issues that system engineers must understand when developing requirements; identifies procedural issues that may lead to operational change; and establishes a basis for identifying alternative solutions and estimating their likely costs and benefits.~~ ~~**Perform Preliminary Information System Security (ISS) Assessment.** Service organizations assess the investment initiative to determine: (1) ISS risk factors for input to the ACAT determination, (2) ISS requirements for the preliminary program requirements document, (3) a rough ISS cost estimate for each alternative solution, and (4) a rough estimate of annual operational benefits gained from implementing security requirements.~~

- Multiple solution concept of operations may be required if more than one alternative is

proposed and they differ significantly from each other.

- **Develop Preliminary Requirements.** The service organization or program office prepares preliminary requirements in consultation with the NAS Systems Engineering Services organization (NAS) or the Office of Information & Technology, Solution Delivery Service, Solution Strategy Division, EA Branch (Mission Support). Preliminary requirements specify only function and performance, and do not define a solution. They ~~must be~~are expressed such that the degree to which different solutions satisfy them can be measured and evaluated. Research and analysis or even prototyping ~~during service analysis~~ may be necessary to define preliminary requirements adequately. When the investment increment is an element of an operational capability, preliminary *program* requirements must be derived from and be traceable to overall operational capability requirements, when applicable.
- ~~**Identify and**~~ **Develop Alternatives.** The service organization or program office surveys the marketplace to identify feasible and economic solutions~~.~~ to the service need or shortfall. Both ~~material~~materiel and non-~~material~~materiel alternatives ~~are~~can be evaluated. ~~One~~When multiple solutions are identified, one candidate solution must be the hypothesized "best" alternative in the enterprise architecture. Key factors are safety, security, operational cost efficiencies, technological maturity, and impact on the workforce and enterprise architecture. ~~Alternatives~~When multiple alternatives are identified, they should be qualitatively different from each other. Low-~~-~~risk, cost-effective, and operationally suitable commercial or non-developmental solutions are preferred. ~~Alternatives~~Alternative(s) may not meet 100 percent of preliminary requirements. Rough lifecycle costs are developed for each alternative and compared to the monetized shortfall as a basis for determining ~~whether it~~which should be retained or eliminated from consideration. Rough lifecycle costs are also calculated for sustaining the legacy case in service. When a new capability involves information processing and storage, use of cloud computing is considered and the results of the cloud suitability assessment are documented.
- **Assess ~~Operational Safety.~~ Information System Security.** The service organization or program office assesses each proposed alternative solution to determine information security: (1) risk factors, (2) requirements for the preliminary program requirements document, (3) rough cost estimates to mitigate security risk for each alternative solution, and (4) a rough estimate of annual operational benefits to be gained from implementing security requirements.
- **Assess Operational Safety.** The service organization or program office works with ATO Safety and Technical Training to assess the operational safety of ~~the proposed initiative.~~each alternative solution. This assessment identifies, assesses, and documents operational hazards and risks ~~associated with alternative solutions~~. No alternative is pursued whose operational risk cannot be mitigated to an acceptable level at affordable cost.
- **Develop Enterprise Architecture Products.** The service organization or program office engages with the appropriate architecture organization (NAS or Mission Support) to develop required products, views, and amendments. These include the operational (business rule) and systems (engineering) view families.
- **Verify and Validate Technical and Operational ~~Inputs and Interdependencies.~~** ~~Key technical and operational work products are verified and validated to be~~**Work Products.** The service organization or program office uses the FAA AMS Lifecycle Verification and Validation Guidelines to evaluate whether key work products produced during concept and requirements definition are sufficiently complete and mature as the basis for proceeding to the investment analysis readiness decision. This includes the solution ConOps, preliminary requirements

document, safety and security risk assessments, architecture products, and interdependencies with other investment increments.

- **Are Technology and Requirements Mature?** NAS Systems Engineering Services (NAS) or Office of Information & Technology, Solution Delivery Service, Solution Strategy Division, EA Branch (Mission Support) evaluates preliminary requirements and the technology base to ensure sufficient maturity of ~~alternatives~~singular or multiple solutions ~~to ensure they are sufficiently mature~~ for further progression in the AMS lifecycle management process. The objective is to have only low-risk investment initiatives entering investment analysis and solution implementation. Additional research and development may be prescribed when technological risk is too high or when requirements are not mature - or the investment initiative may be deferred or terminated.
- ~~**Mature Through Concept Maturity and Technology Development (NAS only).** The~~**Conduct Research or Analysis.** For NAS initiatives, the Technical Review Board recommends further ~~development for NAS initiatives~~research or analysis when ~~technological risk is too great~~technology or requirements are not sufficiently ~~known~~mature. Prescribed activity may take the form of simulation, analysis, operational prototyping, or field demonstration in a controlled operational environment. See the Guidelines for Concept Maturity and Technology Development ~~for more information~~in the FAA Acquisition System Toolset for more information. For Mission Support initiatives, the Architecture Review Board defines what analytical activity may be needed.
- ~~**Designate**~~**Validate Acquisition Category.** The ~~service~~collaboration team either concurs with the preliminary ACAT designation or ~~program office prepares an acquisition category determination request~~recommends a different designation based on ~~preliminary financial data, as well as subjective assessments~~the results of ~~complexity, risk, political sensitivity, safety,~~concept and ~~security.~~requirements definition. The ~~request~~concurrence or recommendation is vetted through NAS Systems Engineering Services ~~(~~for NAS~~)~~ initiatives or the Office of Information &Technology, Solution Delivery Service, Solution Strategy Division, EA Branch ~~(~~for Mission Support~~)~~ initiatives and submitted to the Acquisition Executive Board ~~for a designation~~.
- **Plan for Investment Analysis.** The plan for investment analysis: (1) defines scope and assumptions; (2) describes the singular or multiple alternatives and their associated rough lifecycle costs; (3) describes planned activities and specifies how tasks will be accomplished; (4) defines output and exit criteria; (5) establishes a schedule for completion; (6) defines roles and responsibilities of participating organizations; and (7) estimates resources needed to complete the work. By signing the plan for investment analysis, the organizations that will conduct the analysis agree to provide the resources necessary to complete the work. This activity includes development of the investment analysis readiness decision package and pre-briefings to decision-makers.

2.4.2 Outputs and Products **Revised 10/2017**

- ~~Solution concept of operations;~~
- ~~Preliminary program requirements document;~~
- ~~Architecture products and amendments;~~
- ~~Realistic alternatives with rough cost estimates;~~
- ~~Detailed shortfall and functional analyses;~~

- ~~Safety risk assessment;~~
- ~~Information systems security assessment~~
- ~~Shortfall analysis report;~~
- ~~Acquisition category designation request; and~~
- ~~Investment analysis plan.~~

~~Key work products are verified and validated according to the FAA AMS Verification and Validation Guidelines before the investment analysis readiness decision.~~

Refer to the ACAT Table found on the FAST website (link) and the JRC checklist for required outputs and products for each decision point for New Investment Level I.

2.4.3 Who Does it? Revised 4/2017

Organization(s)	Responsibilities
Collaboration team	• Facilitates determination of the appropriate acquisition category for each investment initiative and fosters cooperation and common goals among key stakeholders of concept and requirements definition • Assists in the resolution of issues delaying or affecting the quality of the work effort during concept and requirements definition
Implementing service ~~organization~~Organization or program office	• Leads and completes all activities and outputs of concept and requirements definition unless otherwise specified in the plan for CRD • Prepares the acquisition category designation request
NAS Systems Engineering Services Office (ANG-B), Office of Information & Technology, Solution Delivery Service, Solution Strategy Division, EA Branch (Mission Support)	• Provides engineering services in such areas as specialty engineering, safety and security ~~analysis~~assessments, and architecture products • Validates technical and operational products of CRD • Assesses maturity of solution technology and requirements
NAS Lifecycle Integration Office (ANG-D), Program Management Office, lines of business, operating service organization, Office of Information & Technology, Solution Delivery Service,	• Assists the implementing service organization or program office in completing CRD activities • Maintains guidance and acquisition aids for service analysis and concept and requirements definition

Solution Strategy Division, EA Branch (Mission Support)	
~~Capture~~Operational capability management team (NAS only)	□ Monitors and oversees CRD activity when the investment initiative is an element of an operational capability □ Ensures alternatives can provide the performance and functionality necessary to achieve the overall operational capability

Detailed roles and responsibilities of participating organizations for each CRD activity and output or product are found in the Service Analysis and Concept and Requirements Definition Guidelines.

2.4.4 Who Approves? Added 4/2013

Artifact	Approval Authority
Acquisition category	Acquisition Executive Board recommends, FAA Acquisition Executive approves, ~~JRC~~Joint Resources Council concurs
CRD outputs and products	Approval authorities are found in the Service Analysis and Concept and Requirements Definition Guidelines.

2.4.5 Investment Analysis Readiness Decision Added 4/2013

The investment analysis readiness decision determines whether the solution ConOps, preliminary requirements, architecture products and amendments, and preliminary alternatives are sufficiently mature to warrant entry into investment analysis. The decision is made within context of all ongoing and planned investment activities to sustain and improve service delivery. It ensures proposals for new investment are consistent with overall corporate needs and planning.

2.4.5.1 Entrance Criteria Added 4/2013

The ~~following are~~ artifacts required for all acquisition categories at the investment analysis readiness decision~~:~~

- ~~Preliminary program requirements document;~~
- ~~Realistic alternative solutions;~~
- ~~Architecture products and amendments;~~
- ~~Approved shortfall analysis report;~~
- ~~Signed plan for investment analysis.~~

~~The full list of work products that may be required for~~ are located in the ~~investment analysis readiness decision is~~ACAT Table found on the ~~JRC Secretariat~~FAST website~~.~~ (link).

2.4.5.2 Joint Resources Council Actions Added 4/2013

The Joint Resources Council makes the decision to enter investment analysis~~.~~ when it determines:

- The initiative is consistent with agency strategic goals and plans;
- Investment action needs to be taken now; and
- The required artifacts and activities of concept and requirements definition have been completed, validated, and verified.

Section Revised: 2.5 – Investment Analysis

Acquisition Management Policy - (~~10/2020~~01/2021)

2.5 Investment Analysis Revised ~~4/2013~~01/2021

~~2.5.1 What Must Be Done Revised 7/2020~~

~~2.5.2 Outputs and Products Revised 1/2010~~

~~2.5.2.1 Initial Investment Analysis Revised 4/2013~~

~~2.5.2.2 Final Investment Analysis Revised 4/2019~~

~~2.5.3 Who Does It?~~

2.5.1 Initial Investment Analysis Revised 01/2021

2.5.1.1 What Must be Done Revised 01/2021

2.5.1.2 Outputs and Products Revised 01/2021

2.5.1.3 Who Does It? Revised 01/2021

2.5.1.4 Who Approves? Revised ~~7/2015~~01/2021

~~2.5.4 Who Approves?~~2.5.1.5 Initial Investment Decision Revised ~~4/2013~~01/2021

~~2.5.5 Initial Investment Decision Added 4/2013~~

~~2.5.6 Final Investment Decision Added 4/2019~~

2.5.1.5.1 New Investment I Added 01/2021

2.5.1.5.2 Prototype Added 01/2021

2.5.2 Final Investment Analysis Revised 1/2021

2.5.2.1 What Must be Done Revised 01/2021

2.5.2.2 Outputs and Products Revised 01/2021

2.5.2.3 Who Does It? Revised 01/2021

2.5.2.4 Who Approves? Revised 01/2021

2.5.2.5 Final Investment Decision Revised 01/2021

2.5 Investment Analysis Revised ~~4/2013~~01/2021

Investment analysis is a disciplined process that supports sound capital investment decisions. Investment analysis is conducted in the context of the enterprise architecture and FAA strategic goals and objectives. Such plans serve as guides to prioritize current and future investment analyses. Investment analyses, in turn, help to refine and mature those plans by providing decision-makers with a clear picture of investment opportunities and their risks and value.

NAS and Mission Support roadmaps in the enterprise architecture establish when an operational capability or service need must be in place. This, in turn, determines when investment analysis should be complete to allow sufficient time to acquire and deploy a suitable solution. The key is to balance timeliness, complexity, and size of the investment analysis with the rigorous development of quantitative data needed by the Joint Resources Council to make an informed investment decision.

Affordability and accurate cost and schedule estimates are important factors in the decision to approve a new investment program. The results of investment analysis help the Joint Resources Council determine which potential investments will improve operations across the air transportation system and by how much. The outcome of investment analysis can be used to make individual, portfolio, and prioritization decisions.

When the investment initiative is an element of an operational capability (NAS only), the ~~capture~~management team for the capability (if established) participates in and contributes to investment analysis activity. The ~~capture~~management team is populated with representatives from each service team or program office that will provide an increment of the overall operational capability. They ensure the alternative emerging from ~~initial~~ investment analysis for each increment fits within the strategy for obtaining the operational capability and can provide the necessary performance and functionality.

~~A nonmateriel solution that emerges during investment analysis may proceed to solution implementation upon approval of solution requirements and implementation and resource planning, if it meets the following criteria:~~

- ~~Satisfies the need;~~
- ~~Can be achieved within approved budgets; and is~~
- ~~Operationally acceptable to the user.~~

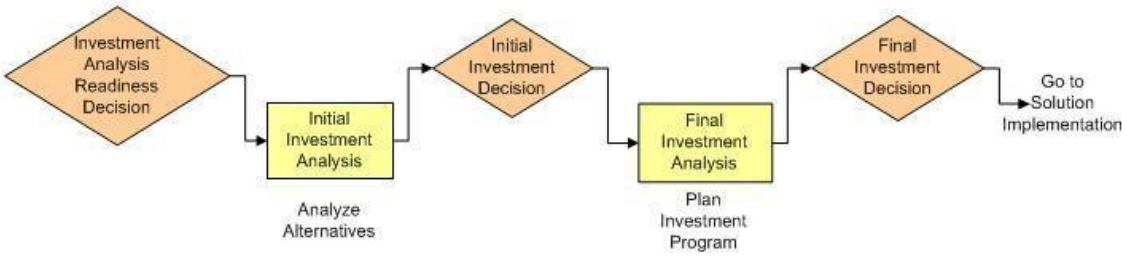
~~This determination is made by the Vice President or Director of the service organization with the service need with the concurrence of the FAA Enterprise Architecture Board.~~

All proposed investments must answer the same ~~basic~~following questions:

- What ~~is the~~ problem ~~that~~ needs to be addressed or resolved?
- What is the range of alternatives that could address this problem?
- What are the costs, benefits, and risks associated with ~~each~~ alternative solutions to the problem?
- Based on the above, what is the recommended course of action?

Figure 2.5-1 illustrates the phases and decision points of investment analysis. Initial investment analysis evaluates alternative solutions to service needs, and recommends the most promising for further development. Final investment analysis develops detailed cost and benefits estimates, detailed plans, and final requirements for the most promising alternative.

Figure 2.5-1 Phases and Decision Points of Investment Analysis



The level of activity required during investment analysis is based on the acquisition category assigned to the investment ~~opportunity~~initiative. In general, the larger and more complex ~~an investment~~the initiative, the greater the ~~level of~~ effort required during investment analysis.

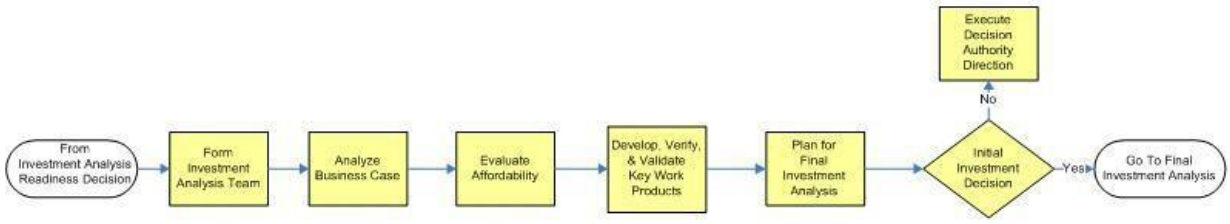
Very complex investment programs are structured into manageable, lower-risk segments and approved incrementally by the Joint Resources Council. When sequential segments are required to fully implement an investment opportunity, the program office (or service organization conducts final investment analysis for each segment and brings planning and baseline documents to Joint Resources Council for approval.

2.5.1 Initial Investment Analysis Revised 1/2021

2.5.1.1 What Must Be Done Revised ~~7/2020~~01/2021

Figure 2.5.1-1 defines the key activities that must be completed during initial investment analysis~~. The Investment Analysis Process Guidelines on FAST describe the full range of activities that may be required.~~ for the New Investment Level I acquisition category which is the most complex and highest risk initiative undertaken by FAA.

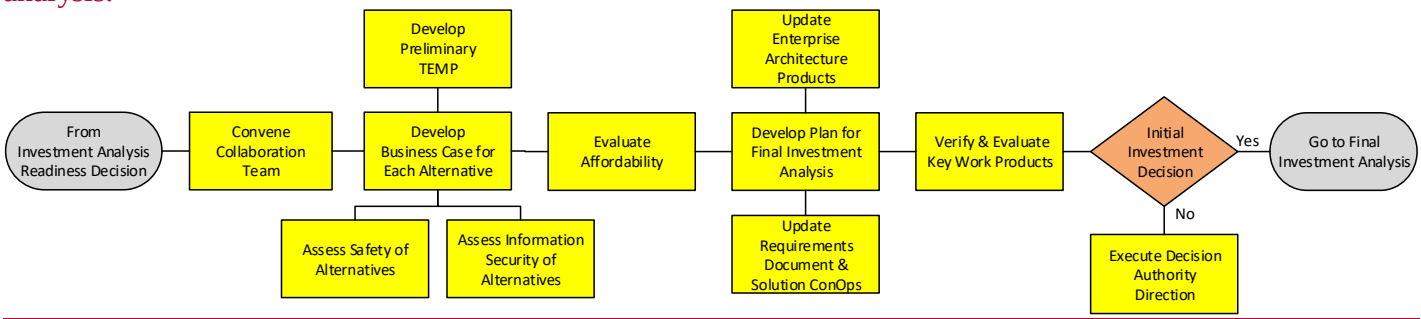
Figure 2.5.1.1-1 Key Activities of Initial Investment Analysis



- ~~**Form Investment Analysis Team.** An investment analysis team is formed and scaled to the size and complexity of the analysis. Team membership is flexible depending on the needs of the analysis, but typically includes system, technical, logistics, specialty engineering, testing, and operational subject-matter experts, and business case analysts. Security and regulatory specialists are team members when potential solutions involve facility, asset, personnel, or~~

~~information security; hazardous materials; emergency operations; or when they impact aircraft, airspace, or the public.~~

~~ **Analyze Business Case.** The business case focuses on those key factors that demonstrate value and worth of a proposed investment initiative to the FAA and the aviation industry. This includes updating the preliminary requirements document to reflect any changes resulting from the investment analysis.~~



- **Convene Collaboration Team.** The collaboration team convenes to agree on the goals and outcomes of initial investment analysis and to identify participants who will work together to facilitate and contribute to the work effort. The collaboration team will typically have representatives from the program office (or service team) proposing the initiative; key stakeholder organizations such as Investment Analysis and Planning, ATO Technical Operations, safety, information security, and testing; and the AMS policy team. The collaboration team is also available during execution of initial investment analysis to resolve issues that are delaying or affecting the quality of the work effort.
- **Develop Preliminary Test & Evaluation Master Plan.** The test service organization develops a preliminary test and evaluation master plan ~~based upon the concepts and requirements documented in~~consistent with the initial ~~program~~ requirements document ~~(iPRD)~~ to ~~support~~provide sufficient detail to define the investment program test strategy and scope prior to the initial investment decision.
- **Develop Business Case for each Alternative.** The business case focuses on key factors such as cost, benefits, schedule, and risk associated with each alternative. The objective is to determine which alternative demonstrates the most value and worth to the FAA, aviation industry, and flying public at acceptable cost and risk. When the investment initiative is an increment necessary to achieve an operational capability, the impact on achieving the capability is also a key factor of the business case. See the Business Case Analysis Guidance for more details.
- ~~ **Assess Safety of each Alternative.** The system safety organization assists in determining safety risks and the likely cost of mitigation efforts for each alternative. Results are recorded in a comparative safety analysis report in accordance with the Safety Risk Management Guidance for System Acquisitions.~~
- **Assess Information Security of each Alternative.** The Information Systems Security organization assists in determining information security risks and the likely cost of mitigation efforts for each alternative. Results are recorded in accordance with the Information Systems Security Guidance for System Acquisition.
- **Evaluate Affordability.** FAA Finance assesses the budget impact and relative contribution to agency goals of each alternative against other ongoing and proposed investment programs

in the FAA financial baseline. The impact assessment may shape subsequent deliberations of the investment analysis team.

- **Develop Plan for Final Investment Analysis.** The plan defines work activities, resources, schedules, roles and responsibilities, and products required for final investment analysis. It also specifies exit criteria and a planning date for the final investment decision. See Investment Analysis Plan Guidance and Template for more details.
- **Update Enterprise Architecture Products and Views.** Should the results of initial investment analysis and the determination of the most beneficial and affordable alternative affect the enterprise architecture, the program office (or service organization) prepares the necessary products and views and submits them to the FAA Enterprise Architecture Board for review and approval.
- **Update Requirements Document and Solution ConOps.** The program office (or service team) updates the Program Requirements Document and Solution ConOps to reflect outcomes and trade-off decisions made during initial investment analysis and to reflect the anticipated functional and performance capability of the alternative determined to be most beneficial and affordable from the analysis.
- **Develop, Verify, and Validate Key Work Products.** Validation of the business case is described in the Business Case Evaluation and Assessment Guide. Verification and validation for all other documentation is described in the FAA AMS Lifecycle Verification and Validation Guidelines. The full list of work products that may be required for the initial investment decision is found on the JRC Secretariat website.

2.5.1.2 Outputs and Products Revised 01/2021

~~The principal output~~ from initial investment analysis is information that enables the Joint Resources Council to select the alternative that best satisfies agency functional and performance requirements and offers the greatest value to the FAA and its customers. ~~The following are required products:~~

- ~~Updated program requirements document;~~
- Business case for each alternative;
- Safety and information security assessment for each alternative;
- Updated enterprise architecture products and views (if the recommended alternative requires change to the enterprise architecture); and
- ~~Plan for final investment analysis.~~

Key work products are verified and validated according to FAA AMS Verification and Validation Guidelines before the initial investment decision.

2.5.1.3 Who Does It? Revised 01/2021

~~Organization~~	~~Responsibilities~~
Collaboration team	• Facilitates agreement on the goals and outcomes of initial investment analysis and identifies participants who will work together and contribute to the work effort • Assists in resolving issues delaying or affecting the quality of the work effort during initial investment analysis.
Investment analysis team	• Performs work activities and prepares the outputs and products of initial investment analysis
Implementing service organization or program office	• Typically leads the investment analysis team • Works with stakeholder organizations to ensure their essential needs are integrated into the analysis of alternative solutions
Investment Planning and Analysis organization	• Verifies and validates the business case for both NAS and Mission Support initiatives • Provides standards, guidance, training, and consulting services to ensure consistency in the conduct of investment analysis • Provides analysts who may lead, conduct, or review business cases as agreed in the investment analysis plan
Stakeholder organizations	• Represent their organizations on the investment analysis team and contribute to the products and outcomes of initial investment analysis
Capability management team (NAS only)	• Ensures the recommended alternative emerging from initial investment analysis can provide the performance and functionality necessary to obtain the overall operational capability (when the initiative is a building block of an operational capability)

2.5.1.4 Who Approves? Revised 01/2021

Approval authorities for the outputs and products of initial investment analysis are found in the document template for each artifact located on the initial investment analysis page of the FAST website.

2.5.1.5 Initial Investment Decision Revised 01/2021

~~The Joint Resources Council makes the~~ initial investment decision. The decision applies to the following acquisition categories:

- New Investment Level I
- Prototype

2.5.1.5.1 New Investment Level I Added 01/2021

For a New Investment Level I initiative, the Joint Resources Council selects the best alternative for the required capability or rejects all alternatives and specifies what action is needed. It uses the following criteria when making the investment decision:

- Lifecycle costs;
- ~~Benefits;~~
- Risk;
- ~~Benefit to cost ratio;~~
- ~~Consistency with the FAA enterprise architecture; and~~
- ~~Impact on FAA strategic goals.~~

~~If the Joint Resources Council approves an alternative, it:~~

- ~~**Plan for Final Investment Analysis.** The plan for final investment analysis defines work activities, resources, schedules, roles and responsibilities, and products.~~ It also specifies exit criteria and a planning date for the final investment decision. See Investment Analysis Plan Guidance and Template for more details.
- ~~Approves entry into final investment analysis;~~
- ~~Approves funding for any analytical or developmental work related to the selected alternative; and~~

Designates a service organization or program office to lead

- Figure 2.5.~~1-2 defines the key activities that must be completed during~~ final investment analysis.

~~Alternatives can be rejected if the technology is not mature~~, when requirements are not sufficiently defined, or when relative costs and benefits of the initiative are not favorable. ~~If rejected, the Joint Resources Council can approve such actions as research, further analysis, development, or termination.~~

When the initial investment decision involves an investment initiative that is an element of an operational capability, the capability portfolio manager attends the JRC decision meeting to explain the interrelationships among capability elements and the impact on the overall operational capability of not approving the initiative.

2.5.1.5.2 Prototype Added 01/2021

For a Prototype acquisition category, the Joint Resources Council may:

- Approve the prototype concept to continue to final investment analysis;
- Continue prototype development and evaluation;
- Continue to initial investment analysis with the prototype concept as an alternative for a New Investment initiative; or
- Terminate the initiative.

~~The Joint Resources Council uses the following~~ criteria when determining the course of action following completion of the prototype demonstration:

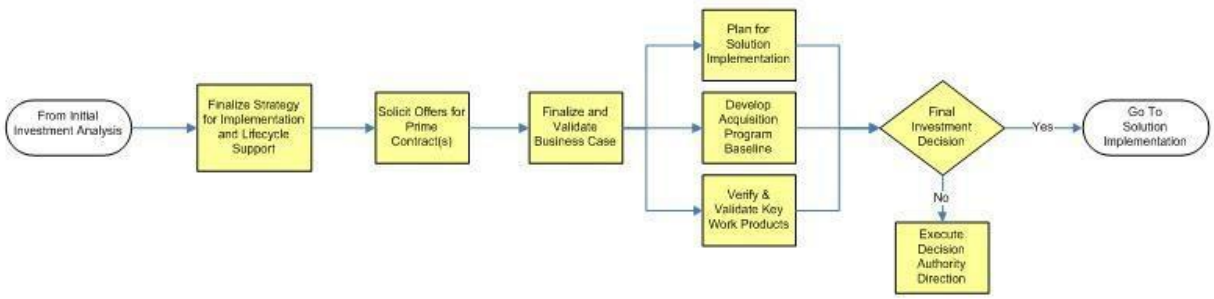
- Cost/risk/performance assessment;
- Safety assessment;
- Information security assessment;
- Maturity of the technology base;
- Maturity of functional and performance requirements; and
- Degree to which the demonstrated capability satisfies priority agency service needs.

2.5.2 Final Investment Analysis. Revised 01/2021

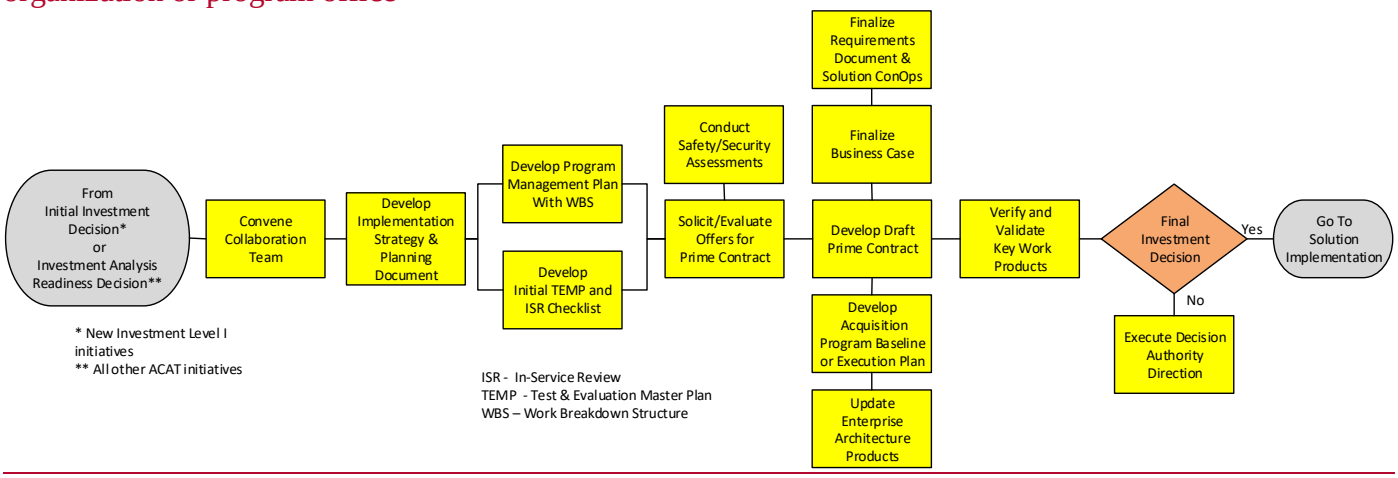
2.5.2.1 What Must Be Done Revised 01/2021

~~Figure 2.5.The~~ 2.1-1 defines the key activities of final investment analysis for a New Investment ~~Analysis Process Guidelines on FAST describe the full range~~Level 1 acquisition category, which is the most complex and highest risk investment initiative undertaken by the FAA. For other acquisition categories, these activities are adjusted based on artifact requirements in the ACAT table. The flow of activities ~~that may be required~~in Figure 2.5.2.1-1 is intended as a logical guide for the program office or service organization as they complete the work activities of final investment analysis. In actual practice, the outputs and products of final investment analysis are interdependent and will evolve and mature over time during the conduct of phase activities. However, all must be finalized, verified, validated, and have the required approvals before the final investment decision.

Figure 2.5.2.1-~~2~~1 Key Activities of Final Investment Analysis



~~ **Finalize Strategy for Implementation and Lifecycle Support.** The implementing service organization or program office~~



- **Convene Collaboration Team.** The collaboration team convenes to agree on the goals and outcomes of final investment analysis and to identify participants who will work together to facilitate and contribute to the work effort. The collaboration team will typically have representatives from the program office (or service organization) proposing the initiative; key stakeholder organizations such as Investment Analysis and Planning, ATO Technical Operations, safety, information security, and testing; and the AMS policy team. The collaboration team is also available during execution of final investment analysis to resolve issues that are delaying or affecting the quality of the work effort.
- **Develop Implementation Strategy and Planning Document.** The program office (or service organization) develops a detailed strategy for procuring, implementing, and supporting the solution over its service life with input from ~~the investment analysis team.~~key stakeholder organizations. This strategy is the foundation for a request for offer to industry for procurement of the solution and all ~~subsequent~~other program planning~~. The test~~ and tasking artifacts. Planning is recorded in the implementation strategy and planning document which must be completed and signed before the final investment decision.
- **Develop Program Management Plan with Work Breakdown Structure.** The program office (or service organization) uses the FAA standard work breakdown structure and in-service review checklist as the basis for preparing the program management plan for implementing the solution. This plan specifies how the program office (or service organization) will execute the implementation strategy in the ISPD and defines the roles and responsibilities of key participating organizations. Planning must cover all aspects of obtaining the solution so costs and schedules are accurately reflected in resource documents and the acquisition program baseline or execution plan. The program work breakdown structure (Section 3 of the FAA standard work breakdown structure) is a required attachment to the program management plan.
- **Develop Initial Test & Evaluation Master Plan and In-Service Review Checklist.** The test organization develops an initial test and evaluation master plan ~~(TEMP) that is based on~~consistent with the ~~approved~~ final ~~program~~ requirements document ~~(fPRD).~~, program

management plan and draft prime mission product contract. The TEMP describes the test ~~strategy and scope~~program for the ~~investment program~~initiative, establishes the basis for test requirements in the request for offer to industry, and establishes the basis for test costs~~/~~ and schedules in the acquisition program baseline or ~~the~~ execution plan. The in-service decision authority organization works with the program office and key stakeholder organizations to develop the in-service review checklist. Completion of checklist items is a foundational basis for making the in-service decision.

- ~~□~~ **Solicit Offers For Prime Contract(s).** The ~~implementing~~ program office (or service organization ~~or program office prepares an independent government cost estimate,~~) with assistance from key stakeholder organizations develops and releases a request for offers~~,~~ and then evaluates industry responses for completeness, technical suitability, and compliance with the statement of work. The most acceptable industry response forms the basis for the final business case, final requirements document, final planning, and the acquisition program baseline or execution plan for the initiative.
- ~~□~~ **Conduct System Safety and Information Security Assessments.** The program office (or service organization) works with the system safety organization to develop a preliminary system safety hazard analysis for the proposed solution in support of the final investment decision. It also works with the information systems safety organization to conduct and document a final information security assessment of the proposed solution.
- **Finalize ~~and Validate~~Requirements Document and Solution Concept of Operations.** The program office (or service organization) updates the program requirements document and solution concept of operations as necessary to be consistent with the draft contract to be awarded to the prime mission product contractor.
- **Finalize Business Case.** ~~The~~ The investment analysis organization and program office (or service organization) work together to finalize the business case and supporting documents ~~are prepared~~ according to ~~the ACAT designation for the solution. These requirements are found in the appropriate business case template~~templates located on the final investment analysis web page in FAST. ~~This includes preparation of~~The final business case must take into consideration the ~~final requirements document~~costs and schedules from the prime contractor proposal selected for award.
- ~~□ **Plan for Solution Implementation.** The investment analysis team develops realistic plans for solution implementation using the FAA standard work breakdown structure and a tailored in-service review checklist. Planning must cover all key aspects of obtaining the solution so costs are reflected in resource documents and the acquisition program baseline or execution plan. The program implementation strategy is recorded in the implementation strategy and planning document. The program management plan specifies how the service organization or program office will execute the implementation strategy and defines the roles and responsibilities of key stakeholders.~~
- ~~□~~ **Develop Draft Prime Contract.** The program office (or service organization) develops the draft contract to be awarded to the prime mission product contractor after the Joint Resources Council approves the initiative for implementation and funding at the final investment decision. Key stakeholder organizations assist by providing statement of work paragraphs and contract deliverable descriptions within their domains of responsibility (e.g., logistics, test and evaluation, information security, safety, configuration management, training, and system engineering).
- **Develop Acquisition Program Baseline or Execution Plan.** The acquisition program baseline

or execution plan establishes the cost, schedule, and key performance baselines for the investment initiative. It is the agreement between the ~~implementing~~ program office (or service organization ~~or program office~~) and the Joint Resources Council concerning the performance that will be obtained and the timeframe and resources agreed to by the agency. ~~For some investment types (e.g., facilities, service contracts, variable quantities), an execution plan is developed in lieu of an acquisition program baseline.~~

- **Update Enterprise Architecture Products.** The program office (or service organization) works with the enterprise architecture organization to produce the products and views required for the final investment decision and submits them to the FAA Enterprise Architecture Board for review and approval.
- **Verify and Validate Key Work Products.** Investment Planning and Analysis validates the business case as described in Business Case Evaluation and Assessment Guide. Verification and validation for all other program work products is done according to the FAA AMS Lifecycle Verification and Validation Guidelines. The full list of work products that may be required for the final investment decision is found in the JRC Checklist located on the JRC Secretariat website.

~~See detailed guidance for investment analysis.~~ In all cases, organizations conducting investment analysis must apply the ~~standard~~ processes and guidelines located in the investment analysis section of FAST.

2.5.2.2 Outputs and Products Revised ~~1/2010~~01/2021

~~2.5.2.1 Initial Investment Analysis Revised 4/2013~~

The principal output ~~for initial investment analysis is information that enables the Joint Resources Council to select the best alternative that meets the required performance and offers the greatest value to the FAA and its customers.~~ of everyThe following are required products:

- Updated program requirements document;
- ~~Initial business case;~~
- ~~Initial implementation strategy and planning documents for each alternative; and~~
- Plan for final investment analysis.

~~Key work products are verified and validated according to the FAA AMS Verification and Validation Guidelines before the initial investment decision.~~

~~2.5.2.2 Final Investment Analysis Revised 4/2019~~

The principal output ~~for~~ final investment analysis is detailed planning for the alternative selected for implementation. ~~The following are required products:~~The required outputs and products for a Level 1 New Investment are listed below. Refer to the ACAT table (link) for outputs and products for other acquisition categories.

- ~~Final implementation strategy and planning document;~~
- ~~Acquisition~~Program management plan with program ~~baseline or execution plan;~~work breakdown structure;
- ~~Initial~~ test and evaluation master plan;
- In-service review checklist;
- Solicitation for prime contract;
- Preliminary system safety hazard analysis;
- Final information security assessment;
- Final program requirements document with concept of operations;
- ~~Final~~ business case;
- ~~Final~~ implementation strategy and planning document;
- ~~Program management plan; and~~
- ~~Updated~~ architecture products and ~~amendments~~views;
- Draft prime mission product contract; and
- Acquisition program baseline or execution plan.

Key work products are verified and validated according to the FAA AMS Verification and Validation Guidelines before the final investment decision.

2.5.2.3 Who Does It? Revised ~~7/2015~~01/2021

Organization	Responsibilities
	Organization / **Responsibilities**
	Collaboration Team / • Facilitates agreement on the goals and outcomes of final investment analysis and identifies participants who will work together and contribute to the work effort • Assists in resolving issues delaying or affecting the quality of the work effort during final investment analysis.
	Investment analysis team / • Performs the activities and prepares the outputs and products of investment analysis
~~Implementing service organization or program office~~	~~• Typically leads the investment analysis team~~ ~~• Coordinates with stakeholders throughout investment analysis~~
~~Investment Planning and Analysis~~	~~• Provides standards, guidance, training, and consulting services to ensure consistency in the conduct of investment analyses~~ ~~• Provides analysts who may lead, conduct, or review business cases as agreed to in the investment analysis plan~~

	~~ Verifies and validates the business case for both NAS and Mission Support investments~~	
~~Stakeholder organizations~~	~~ Participate as team members throughout investment analysis~~	
~~Capture team (NAS only)~~	~~ Contributes to investment analysis activity when the investment initiative is an element of an operational capability~~ ~~ Ensures the recommended alternative can provide the performance and functionality necessary to achieve the overall operational capability~~	
~~Test service organization~~	~~ Develops the preliminary and initial test and evaluation master plan~~	
	Implementing service organization or program office	~~ Typically leads the investment analysis team~~ ~~ Works with stakeholder organizations to ensure their needs are integrated into the solution especially the draft prime mission product contract~~
	Investment Planning and Analysis	~~ Verifies and validates the business case for both NAS and Mission Support investments~~ ~~ Provides standards, guidance, training, and consulting services to ensure consistency in the conduct of investment analyses~~ ~~ Provides analysts who may lead, conduct, or review business cases as agreed to in the investment analysis plan~~
	Stakeholder organizations	~~ Represent their organizations on the investment analysis team and contribute to the products and outcomes of final investment analysis~~
	Capability management team (NAS only)	~~ Ensures the solution emerging from final investment analysis can provide the performance and functionality necessary to obtain the overall operational capability (applies when the initiative is a building block of an operational capability)~~
	Test service organization	~~ Develops the initial test and evaluation master plan during final investment analysis~~

2.5.2.4 Who Approves? Revised ~~4/2013~~01/2021

Approval authorities for the outputs and products of final investment analysis are found in ~~AMS Appendix B, Acquisition Planning and Control Documents.~~document template for each artifact located on the final investment analysis page of the FAST website.

2.5.2.5 ~~Initial~~Final Investment Decision ~~Added 4/2013~~Revised 01/2021

~~At the initial investment decision, the Joint Resources Council selects the best alternative for implementation or rejects all alternatives and specifies what action is needed next.~~

If the Joint Resources Council approves an alternative, it:

- ~~Selects an alternative~~The Joint Resources Council makes the final investment decision except in the case of Tech Refresh Portfolio sub-ACAT 2 initiatives for which the Stakeholder Governance Board is the decision authority. The Stakeholder Governance Board follows the decision guidelines and criteria in the governance board charter approved by the Joint Resources Council.

If the Joint Resources Council approves the initiative for funding and implementation, it:

- Establishes an investment program and delegates responsibility for implementation~~;~~
- ~~to the appropriate~~Approves entry into final investment analysis;
- ~~Approves~~Approves funding for any analytical or developmental work related to the selected alternative; and
- ~~Designates a~~ service organization ~~to lead final investment analysis and be responsible for solution implementation.~~or program office;
- Approves the final program requirements document, final business case, enterprise architecture products, implementation strategy and planning document, program management plan with program work breakdown structure, acquisition program baseline or execution plan, initial test and evaluation master plan, and draft prime contract;
- Commits the FAA to funding the program, as specified in the acquisition program baseline or execution plan; and
- ~~Approves adjustments to FAA plans and budgets to reflect the investment decision.~~

Alternatives can be rejected if the technology is not mature ~~or when requirements are not sufficiently defined.~~ If rejected, the Joint Resources Council can approve such actions as research, further analysis, development, or termination.

If the Joint Resources Council disapproves the recommendation, it returns the investment package to the program office or service organization with specific instructions for further work or it terminates the effort.

When ~~the initial~~a final investment decision involves an investment initiative that is an element of an operational capability, the portfolio manager attends the JRC decision meeting to explain the interrelationships among capability elements and the impact of not approving the initiative on the overall operational capability.

The Joint Resources Council uses the following ~~standard selection criteria when making the investment decision:~~

- ~~Lifecycle costs;~~

- Benefits;
- ~~Risk;~~
- Benefit to cost ratio;
- Consistency with the FAA enterprise architecture; and
- Impact on FAA strategic goals.

~~2.5.6 Final Investment Decision Added 4/2019~~

The Joint Resources Council makes the ~~final investment decision. If the Joint Resources Council disapproves the recommendation, it returns the investment package with specific instructions for further work or terminates the effort. If the Joint Resources Council accepts the recommendations, it:~~

- ~~Approves the investment program for implementation and delegates responsibility to the appropriate service organization or program office;~~
- ~~Approves the final program requirements document, final business case, and the implementation strategy and planning document;~~
- ~~Approves the acquisition program baseline or execution plan;~~
- ~~Commits the FAA to funding the program segment, as specified in the acquisition program baseline or execution plan;~~
- ~~Approves updated architecture products and amendments; and~~
- Approves adjustments to FAA plans and budgets to reflect the investment decision.

~~Before the Joint Resources Council approves documents at the initial or final investment decisions, the documents require approval from other officials, as can be found in AMS Appendix B, Acquisition Planning and Control Documents.~~

~~When a final investment decision involves an investment initiative that is an element of an operational capability, the portfolio manager attends to explain the interrelationships among capability elements and the impact of not approving the initiative on the overall operational capability.~~

Section Revised: 4.4 – Test & Evaluation

Acquisition Management Policy - (~~10/2020~~01/2021)

4.4 Test and Evaluation Revised 7/2016
- 4.4.1 Service Analysis, Concept and Requirements Definition, and Investment Analysis Revised ~~4/2019~~01/2021
- 4.4.2 Solution Implementation Revised 7/2020
- 4.4.3 In-Service Management Revised 7/2016

4.4 Test and Evaluation Revised 7/2016

Test and evaluation is planned and conducted in accordance with the guidelines, standards, and practices found on the FAA Acquisition System Toolset (FAST) to:

- Provide essential information in support of decision-making for investment programs;
- Provide essential information for assessing technical and investment risks;
- Verify the attainment of technical performance specifications and objectives; and
- Verify and validate that systems, solutions, and capabilities are operationally effective and suitable for the intended use.

The types of test and evaluation standards and processes to be followed for each investment program are based on the milestones and decision points they support and the type of investment program. These test and evaluation standards and processes address: NAS new investment, NAS modifications, and Mission Support programs.

The high-level test strategy is defined in the implementation strategy and planning document. The program management plan specifies how the test strategy will be executed. Based on complexity and criticality, new investments may be required to deliver a test and evaluation master plan (TEMP), as indicated on the ACAT designation form. For designated investment initiatives, the TEMP provides more detail than the ISPD and the PMP on contractor and FAA test needs, scope, planning and reporting.

The test and evaluation approach, level of analysis, and test criteria are determined by reporting requirements for program milestones and decisions. The requirements that need to be verified and validated form the basis for test criteria. The risks and complexity of the system, solution, or capabilities being tested drive the scope and robustness of evaluation methods, test cases, and reporting structure.

4.4.1 Service Analysis, Concept and Requirements Definition, and Investment Analysis

Revised ~~4/2019~~01/2021

During service analysis, test and evaluation activities help identify and prioritize critical FAA service needs. During concept and requirements definition, test and evaluation helps to identify the best alternative solutions to those needs. During investment analysis, the criteria for testing operational effectiveness and suitability are expressed as critical performance requirements and critical operational issues in the program requirements document.

For investment programs designated to have a test and evaluation master plan (New Investment and Software Enhancement only unless otherwise required by the Acquisition Executive Board), a preliminary TEMP (pTEMP) is developed during initial investment analysis based on the concepts and functions documented in the preliminary program requirements document to support the initial investment decision. An initial TEMP (iTEMP) is developed during final investment analysis once program requirements are finalized and the identity of the most promising solution is known. The iTEMP describes the test program and establishes the basis for test requirements in the request for

offer to industry and test costs/and schedules in the acquisition program baseline or execution plan. The iTEMP is required to support the final investment decision. The ISPD and PMP define the plan and schedule for delivery of the final TEMP (fTEMP).

4.4.2 Solution Implementation Revised 7/2020

Solution implementation activities follow documented and structured T&E processes appropriate to the systems, solutions, and capabilities being tested. Early test and evaluation activity assesses potential operational, safety, and security risks and identifies opportunities for risk mitigation. Later test and evaluation examines performance and operational readiness (suitability and effectiveness) in support of decision-makers at the production, deployment, and in-service decisions.

Each test and evaluation program consists of developmental, operational and site testing as specified in the fTEMP and associated PMP and ISPD, as well as independent operational assessment for designated programs (see AMS Section 4.5). Developmental testing verifies requirements, functional design, and integration of the system, solution, or capability. Operational testing validates achievement of operational needs, as well as the effectiveness and suitability of the solution. For deployable products site testing verifies and validates requirements, design, and suitability of the solution in the fielded environment and configuration. As part of site testing, field familiarization testing may be required to support the site operational readiness decision.

4.4.3 In-Service Management Revised 7/2016

Developmental, operational and site testing are performed in accordance with documented, structured test processes defined by each in-service management organization in accordance with FAA Orders and Acquisition Management System Policy guidance. This applies to development and implementation of all NAS and Mission Support modifications during the in-service management lifecycle phase. In-service management test processes include standard test approaches that define the phases and detailed activities to be included during testing. These processes also support/and ensure that safety risk management and information system security requirements are addressed.