National Transportation Safety Board

Enterprise Architecture Transition Roadmap

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National Transportation Safety Board
Office of the Chief Information Officer
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Record of Changes

Modifications to this document since the issuance are as follows:

Record of Changes			
Version	**Description of Change**	**Date**	**Name**
2.4	Updated initiatives and projects	8/1/2011	Ev Totten
2.3	Updated to reflect Open Government Initiative (Data.gov), NTSB organization changes and changes concerning the EA assessment framework	8/23/2010	Ev Totten
2.2	Updated transition sequencing plan	12/23/2009	Ev Totten
2.1	Finalized version 2.1 for posting	9/26/2008	Ev Totten
2.0	Version 2.0 finalized	6/30/2008	Ev Totten
1.1	Initial Draft for Version 2.0 of the Roadmap; Reinstated Sections 5 and 6 which were removed for Version 1.0	6/17/2008	Bill Dana
1.0	Finalized version for delivery	5/13/2008	Bill Dana

Table of Contents

List of Figures

List of Tables

Message from the Chief Enterprise Architect, Ev Totten

The release of this Enterprise Architecture Transition Roadmap marks one of the first major milestones in the establishment of the National Transportation Safety Board's (NTSB) Enterprise Architecture Program. The Office of the Chief Information Officer began the initiative to establish an Enterprise Architecture Program during the last half of Fiscal Year (FY) 2007. I joined the National Transportation Safety Board midway through the first quarter of FY 2008 to serve as the first Chief Enterprise Architect and implement the vision for the Enterprise Architecture Program established in the Information Technology Strategic Plan FY 2007 – FY 2012 by the Chief Information Officer, Bob Scherer.

I am new to the NTSB, and the concept of an Enterprise Architecture is new to the NTSB. Therefore, it is important to publish a Transition Roadmap immediately to:

- introduce the Enterprise Architecture Program to you;
- meet and get to know my new coworkers; and
- learn more about our mission/internal operations/administrative tasks (both those supported by Information Systems and those not supported by Information Systems).

This document is primarily focused on the efforts I intend to accomplish this year in order to establish the Enterprise Architecture Program. It is important that you understand the purpose of the program, how you can leverage the program, as well as how you can influence and participate in the development of the future of the Enterprise Architecture.

To that end, this Transition Roadmap is focused on education and information rather than serving as a technical treatise. Hence, I am providing within the roadmap a brief, non-technical description about the initiatives I will be working to complete within my first year as Chief Enterprise Architect. You may notice, as you read this document, that many of the processes are not new. They are revisions to existing processes, a formalization of a current informal or undocumented process, or a combination of similar processes into an integrated and comprehensive process.

This document will be updated over time and will undoubtedly become more technical in nature concerning specific initiatives to improve how the existing infrastructure and information system support your duties. However, its overall purpose will not change. It will continue to:

- provide information about the various initiatives to improve our infrastructure, and to further support accomplishing our jobs;
- highlight recent accomplishments; and
- provide milestones for completing the initiatives that are currently in progress.

I recognize that in many cases the descriptions provided in this document are at a very high level. After you have read over this document, I invite you to ask me (or any of the people supporting the program) any questions you have, either in person, by phone, or via e-mail.

I look forward to working with you over the coming years.

Sincerely,

Ev Totten

1.0 Introduction

The National Transportation Safety Board (NTSB) has established an Enterprise Architecture (EA) Program within the Office of the Chief Information Officer (OCIO) under the leadership of the Chief Enterprise Architect (CEA). Enterprise Architecture is an emerging discipline for NTSB; in fact, the Enterprise Architecture Program itself is still in the early stages of implementation.

The release of the Enterprise Architecture Transition Roadmap is the first step towards establishing an Enterprise Architecture Program at the National Transportation Safety Board. It also marks the beginnings of a continuous planning process to improve the National Transportation Safety Board's performance in realizing its mission, goals, and objectives through effective alignment of information technology resources.

1.1 Background

On December 16, 2005, the Office of Management and Budget released *OMB M-06-02: Improving Public Access to and Dissemination of Government Information Using the FEA Data Reference Model*. The guidance states that "cost-effective and consistent access to and dissemination of government information is essential to promote a more citizen-centered government." The memorandum identifies procedures to organize and categorize information and make it searchable across agencies to improve public access and dissemination, and it discusses the use of the Federal Enterprise Architecture Data Reference Model (DRM). Agencies must continue to review the performance and results of their information dissemination programs.

The Office of the Chief Information Officer (OCIO) at NTSB was established in 2006 with the task of providing strategic direction and operational support for the NTSB's information systems, developing and distributing programs and products for use by the NTSB and the public, and managing a security program that ensures the confidentiality, integrity, and availability of information. The implementation of an EA program by the OCIO assists in fulfilling these tasks and furthermore helps to improve enterprise-wide delivery of IT products and services.

During Fiscal Year 2007, the National Transportation Safety Board laid the foundation for establishing an NTSB specific Enterprise Architecture Program by:

- Acquiring a slot for a Chief Enterprise Architect within the Office of the Chief Information Officer,
- Developing position descriptions and standards,
- Initiating the hiring process and hiring a Chief Enterprise Architect, and
- Listing Enterprise Architecture as one of the goals in the Information Technology Strategic Plan (FY 2007 – FY 2012) published in August of 2007.
- Key Legislation, Regulations, and Guidance drivers for the NTSB Enterprise Architecture Program include:
- The Government Performance Results Act of 1993
- The Paperwork Reduction Act of 1995

- The Clinger-Cohen Act of 1996
- Executive Order 13011, Federal Information Technology, FR 61-140, July 19, 1996
- The Government Paperwork Elimination Act of 1998
- Federal Enterprise Architecture Framework (FEAF), September 1999
- Architecture Alignment and Assessment Guide, October 2000
- The President's Management Agenda
- The E-Government Act of 2002
- The Federal Information Security Management Act of 2002

1.2 Purpose

This document is intended to provide an introduction to what Enterprise Architecture is to NTSB stakeholders, describe the major activities related to the implementation of the Enterprise Architecture Program, and begin to define the functions, processes, and interactions of the Enterprise Architecture Program. Furthermore, this document will function as a tool to provide status updates during the ensuing year, as well as collect data to establish a baseline for the development of performance metrics for the Enterprise Architecture Program.

1.3 Audience

The intended audience of the Enterprise Architecture Transition Roadmap includes all NTSB Enterprise Architecture stakeholders as well as anyone interested in the activities and accomplishments of the NTSB Enterprise Architecture Program. The stakeholders include:

- NTSB Managing Director
- NTSB Strategic Management Division
- NTSB Office of the Chief Financial Officer (OCFO)
- NTSB Office of Administration
- NTSB Acquisitions Division
- NTSB Office of the Chief Information Officer (OCIO)
- NTSB Program Offices and Divisions
- NTSB Business Owners
- NTSB Employees and Contractors supporting the Enterprise Architecture and IT Infrastructure

1.4 Document Organization

This document has been divided in the following manner to provide a concise, cohesive flow:

Section 1, **Introduction** – (this section) provides a general description of the background, purpose, audience, and structure of this document.

Section 2, Enterprise Architecture 101, An Introduction – provides an overview of what Enterprise Architecture is, the business drivers related to Enterprise Architecture, and what the Enterprise Architecture Program is responsible for.

Section 3, NTSB's Enterprise Architecture Program – provides an overview of the NTSB Enterprise Architecture Program.

Section 4, Transition Planning – provides information related to the processes used, goals, and milestones for the Enterprise Architecture Program.

Section 5, Transition Strategy – provides an overview of each of the initiatives, projects, and/or programs currently underway or planned to be started by the Enterprise Architecture Program and for the transition of the IT infrastructure towards the Target State Vision.

Section 6, Transition Sequencing Plan – provides information regarding priority or schedule for the initiatives, projects, and/or programs currently underway or planned, any dependencies between the initiatives, projects, and/or programs, and key milestones for each of the projects / programs.

Section 7, Review of Prior Fiscal Year Accomplishments – provides information regarding the status and accomplishments of the Enterprise Architecture Program in Fiscal Year 2008.

Appendix A – Acronyms, contains explanations for all the acronyms used in this document.

Appendix B – Glossary, contains definitions of important terms used in this document.

Appendix C – NTSB Enterprise Architecture Governance, contains the framework established to implement, manage, monitor, and control the Enterprise Architecture program.

2.0 Enterprise Architecture 101 – An Introduction

The purpose of this section is to:

- Define and facilitate the use of one consistent understanding of what the term "Enterprise Architecture" means, since the term can have a variety of different meanings;

Enterprise Architecture – a strategic information asset base which defines the mission, the information and technologies necessary to perform the mission, and the transitional processes for implementing new technologies in response to the changing mission needs.

- Discuss the purpose of having an Enterprise Architecture and identify some of the business drivers that influence the activities for the Enterprise Architecture Program; and
- Discuss the key responsibilities and areas of oversight for the NTSB Enterprise Architecture.

2.1 What Is the Federal Enterprise Architecture?

The Federal Enterprise Architecture is a mission-focused framework for federal agencies, the Office of Management and Budget and Congress to improve government performance. By aligning organizations, business processes, information flows, and technology consistently across and throughout the Federal Government, the Federal Enterprise Architecture builds a blueprint for improving programs. Through the use of a set of reference models, the Federal Enterprise Architecture promotes shared development for common Federal processes, interoperability, and sharing of information among federal agencies and other governmental entities.

The concept of a Federal Enterprise Architecture began in 1996 with the passage of the Clinger-Cohen Act, which was the mandate for agencies to develop and maintain enterprise IT architecture. The E-Government Act of 2002 established the Office of Electronic Government within the Office of Management and Budget to oversee the development of the Enterprise Architecture across the federal government, and it helped to establish the guiding principles for the Federal Enterprise Architecture Framework.

The Federal Enterprise Architecture is a mission-focused framework for federal agencies, OMB and Congress to improve government performance. By aligning organizations, business processes, information flows, and technology consistently across and throughout the Federal Government, the FEA builds a blueprint for improving programs.

The Federal Enterprise Architecture seeks to achieve operational excellence for the American public by focusing on the following principles:

- The federal government focuses on citizens
- The federal government is a single, unified enterprise
- Federal agencies collaborate with other governments and people
- The federal architecture is mission-driven
- Security, privacy and protection of information are core government needs
- Information is a national asset
- The federal architecture simplifies government

2.2 What Is Enterprise Architecture?

The term Enterprise Architecture can have a variety of meanings, but in general it refers to a framework that establishes a comprehensive series of principles, guidelines, diagrams, and standards that describe how the elements of an organization fit together — the business processes, organizations responsible for them, Information Technology (IT) capabilities and infrastructure, both today and in the future. The Enterprise Architecture also describes how the elements are aligned to support the organization's strategic plans.

To put it in simpler terms, the role of the Enterprise Architecture is not only to document how things are being done, but also to work collaboratively with the organization's business process owners to find ways to better achieve its mission. Part of what Enterprise Architecture provides to the organization is an iterative process that provides a standard methodology for business transformation.

An Enterprise Architecture provides a standard approach for planning and implementing transformation, and it is a key to realizing the potential of the organization's enterprise architecture and inter-organizational collaboration efforts.

There are four key principles that can be derived from this definition of an Enterprise Architecture:

- **Enterprise Architecture is about Business Transformation to Improve Performance**

  One of the major barriers to having a successful enterprise architecture is the confusion concerning exactly what Enterprise Architecture is and what it is not. To some practitioners, Enterprise Architecture is seen as a type of system engineering. Other practitioners view Enterprise Architecture as the development of specific processes and data models. Other groups attempt to build enterprise architectures by developing centralized IT structures without directly engaging the business units and their stakeholders.

  A more practical interpretation of what Enterprise Architecture is can be captured in one phrase: business transformation. Business transformation is about working with business organizations to help guide them towards developing and implementing their own unique plans for change. True business transformation can only be achieved by working with business organizations and enterprise governance groups as trusted change agents. This includes understanding the business units' short and long-term goals and objectives, including their existing challenge points and weaknesses. It also includes understanding the acceptable rate of change for a given business area.

- **Enterprise Architecture is a Service Delivered to the Business**

  Enterprise Architecture, as a structured discipline, must be balanced against the reality that Enterprise Architecture is delivered as a service to a customer base. Architecture practitioners are service providers that have to deliver high quality resources and techniques for helping to solve business problems. Embracing this philosophy enables Enterprise Architecture practitioners to build trusted relationships with their customers and develop a reputation of assistance rather than inconvenience.

- **Architecture Practitioners are Change Agents**

  Effective architecture practitioners are powerful change agents within the enterprise. In fact, Enterprise Architecture should be seen as a powerful tool that enables a business organization to improve its performance and more effectively carry out its mission.

- **Enterprise Architecture is about Communication – Communication – Communication**

  Effective communication is an absolute necessity for an effective, results-oriented Enterprise Architecture program. Simply put, the architects must be in a position to communicate complex ideas to a wide variety of people at all levels within an organization.

  Without good communication capabilities, good ideas can be lost and business transformation stalled. Here are some warning signs that communication is a problem for the architecture program: 1) No one knows the architecture team; 2) The architecture team is left out of many important planning meetings; and 3) The architecture team spends the vast majority of its time talking internally rather than with its customers.

2.3 Why Does NTSB Need an Enterprise Architecture Program?

As most would agree, enterprise architecture is about transforming some aspect of an organization to make it more efficient and more effective in performing its mission. There are wide ranges of thought on how to set up an Enterprise Architecture organization and how to actually conduct the practice of Enterprise Architecture. In the end, though, all agree that Enterprise Architecture is about changing something for the better.

It is important to understand from the onset that accepting a standard approach for planning and implementing transformation is key to realizing the potential of enterprise architecture and inter-organizational collaboration efforts. There is a natural expectation that organizational missions and dynamics might demand different approaches to transformation. However, leveraging a standard process or Methodology for Business Transformation (MBT) provides for consistency in training, procurement, communications, planning, outputs, and innovation throughout your transformation efforts. Internal benefits to adopting a standard include consistency amongst your internal planning efforts and quality control for outputs destined for decision makers. External benefits to adopting a standard include efficiencies in collaborative planning with other organizations and the establishment of federal planning skills and deliverables, which helps shape training and recruiting of personnel and contractor resources.

Overall, change is important as we collectively work towards a government that is more effective in meeting the needs of its citizens. This change manifests itself in presidential initiatives, federal budgets, congressional hearings, and citizen feedback efforts. The grand ideas of government are passed to the Agencies through a variety of influence channels, and the Agencies move forward with the resources that are made available. The role of the Enterprise Architecture is not only to document how things are being done, but also to work collaboratively with the organization's resource base to find ways to implement the grand ideas of government in order to better achieve its mission. Enterprise Architecture is a facilitator, an enabler, a motivator, and an

information source. In participating in these roles, the Enterprise Architecture practitioners are constantly involved in communications and outreach at many levels, to many types of audiences, and under many different circumstances. It is through the delivery of consistently high quality analysis and highly crafted communications that the Enterprise Architecture function can be one of significant intra- and inter-organizational impact.

2.3.1 What are the potential benefits from Enterprise Architecture?

An Enterprise Architecture offers tangible benefits to the enterprise and those responsible for evolving the enterprise. Some of the potential benefits the Enterprise Architecture offers are to:

- Capture facts about the mission, functions, and business foundation in an understandable manner to promote better planning and decision making;
- Improve communication among the business organizations and IT organizations within the enterprise through a standardized vocabulary;
- Provide architectural views that help communicate the complexity of large systems and facilitate management of extensive, complex environments;
- Focus on the strategic use of emerging technologies to better manage the enterprise's information and consistently insert those technologies into the enterprise;
- Improve consistency, accuracy, timeliness, integrity, quality, availability, access, and sharing of IT-managed information across the enterprise;
- Support the Capital Planning and Investment Control (CPIC) processes by providing a tool for assessing benefits, impacts, and capital investment measurements and supporting analyses of alternatives, risks, and tradeoffs;
- Highlight opportunities for building greater quality and flexibility into applications without increasing cost;
- Achieve economies of scale by providing mechanisms for sharing services across the enterprise;
- Expedite integration of legacy, migration, and new systems; and
- Ensure legal and regulatory compliance.

2.3.2 Why do we need a Methodology for Business Transformation (MBT)?

Planning projects generally start with weeks or months of discussion and deliberation over the approach that will be taken, the terminology that will be used, the work products that will be created, and the governance bodies that will be engaged. In many instances, these items are not resolved up front but are handled as needed throughout the duration of the planning and implementation work. These discussions are often complicated further by the participation of multiple organizations, the need to meet the output expectations of a variety of decision makers, and the presence of multiple professional services companies with their own proprietary methods and techniques. Enterprise architecture is a very robust planning function that is, in fact, more susceptible to the above scenarios than most planning projects are.

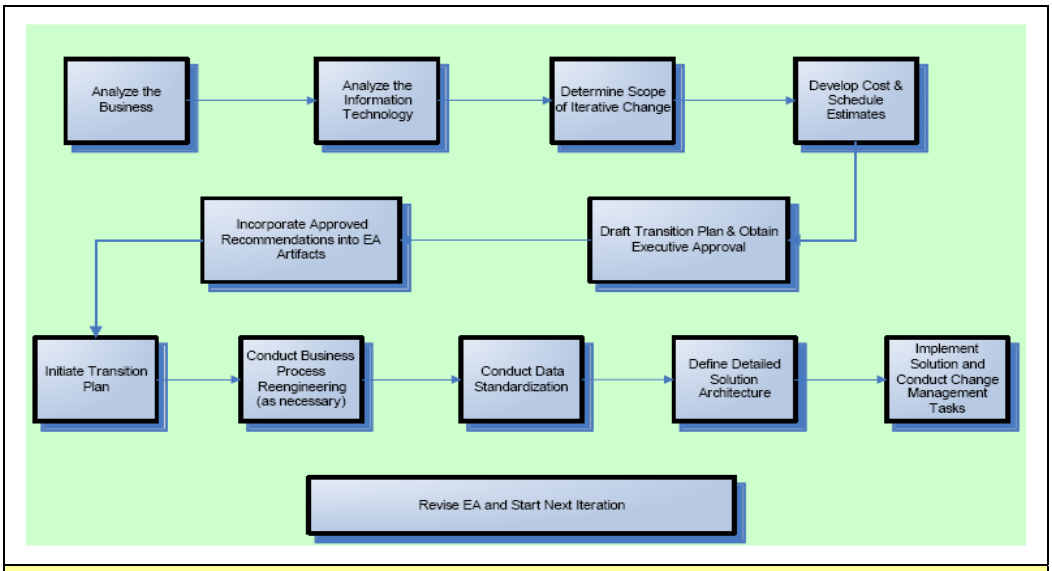

Figure 2.3-2, Example of a Methodology for Business Transformation (MBT) Process

As a result, there is a critical need for the establishment of a standard methodology for conducting architecture planning and implementation. The MBT is a standard methodology as it provides a standard process, standard terminology, and standard work product expectations, governance checkpoints, and communications suggestions. The benefits include:

- Architects that can more effectively engage one another for ideas, inspiration, and lessons learned when they are using the same methodology.
- Government architects that can more effectively communicate expectations for skills, deliverables, and outcomes when a robust, standard methodology is government property rather than proprietary contractor property.
- Contracted architects that can be expected to work more closely together, regardless of the employer, when they use the same non-proprietary methodology.
- Solution architects, developers, and procurement specialists that can tailor their process not to each individual project, but to the standard planning methodology used by all projects.
- Training of architecture practitioners that can be designed around the standard methodology to save money, reduce conflicting course materials, and reduce confusion.
- An Enterprise Architecture community of practice that can innovate more quickly and significantly when working from the same standard methodology.

3.0 NTSB's Enterprise Architecture Program

The purpose of this section is to:

- Provide an introduction to the National Transportation Safety Board Enterprise Architecture Program;
- Provide information related to some of the business drivers that influence the Enterprise Architecture Program; and
- Provide a "Roadmap" for the evolution of the Enterprise Architecture Program.

In order to more effectively manage the achievement of the IT Vision, an IT Strategic Focus Area has been directly aligned with each IT Strategic Goal. Focus Areas provide key information, the Long-Term Strategic Goal, the Process Maturity Model to *MEASURE* progress, and Outcome Goals.

3.1 Enterprise Architecture's Mission, Vision, and Goal

3.1.1 Mission

To assist in the improvement of the National Transportation Safety Board's ability to carry out the NTSB mission performance and realize its strategic goals and objectives.

3.1.2 Vision

The Enterprise Architecture Program provides a framework that supports the National Transportation Safety Board's mission, strategic plan, lines of business, information technology portfolio (i.e., data, applications, and technologies), and security measures, as well as the inter-relationships among them. It is maintained to provide support for the National Transportation Safety Board's strategic planning, budget formulation and execution, information technology capital planning, information technology acquisition, human capital, and security planning processes.

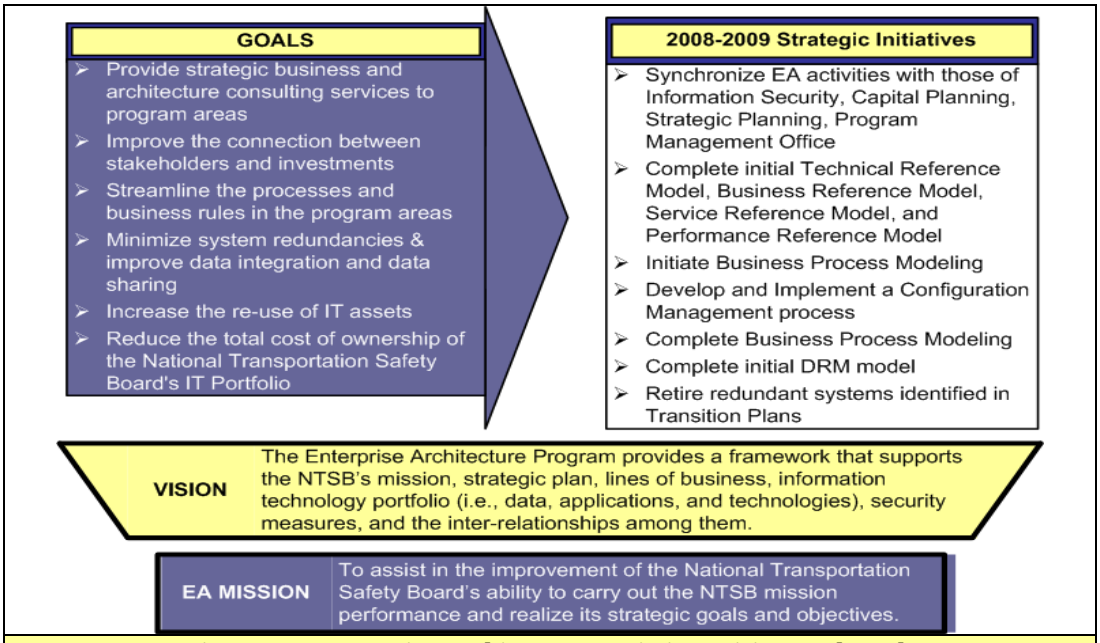

Figure 3.1, Enterprise Architecture's Mission, Vision, and Goals

3.1.3 Goal

The goal of the Enterprise Architecture Program is to improve the National Transportation Safety Board's ability to carry out the National Transportation Safety Board mission performance and realize its strategic goals and objectives. The Enterprise Architecture Program seeks to achieve this goal by:

- Providing strategic business and architecture consulting services to program areas;
- Improving the connection between stakeholders and investments;
- Streamlining the processes and business rules in the program areas;
- Minimizing system redundancies;
- Improving data integration and data sharing;
- Increasing the re-use of IT assets; and
- Reducing the total cost of ownership of the National Transportation Safety Board's IT Portfolio.

3.2 Enterprise Architecture Performance Life Cycle Framework

The Enterprise Architecture Performance Life Cycle Framework, pictured in Figure 3.2-1, *Performance Life Cycle Framework,* represents the implementation of the vision for Enterprise Architecture at the National Transportation Safety Board and how the mission and goals for the Enterprise Architecture Program can be achieved. The enterprise life cycle is a dynamic, iterative process of changing the enterprise over time by incorporating new business processes, new technology, and new capabilities, as well as maintenance and disposition of existing elements of the enterprise. It is not a process that is isolated to the National Transportation Safety Board Office of the Chief Information Officer; it is a process that extends across the entire enterprise that also involves the Strategic Management Division, the Office of Management, the Office of the Chief Financial Officer, the Office of Administration, and every Program Area, Office, and Division.

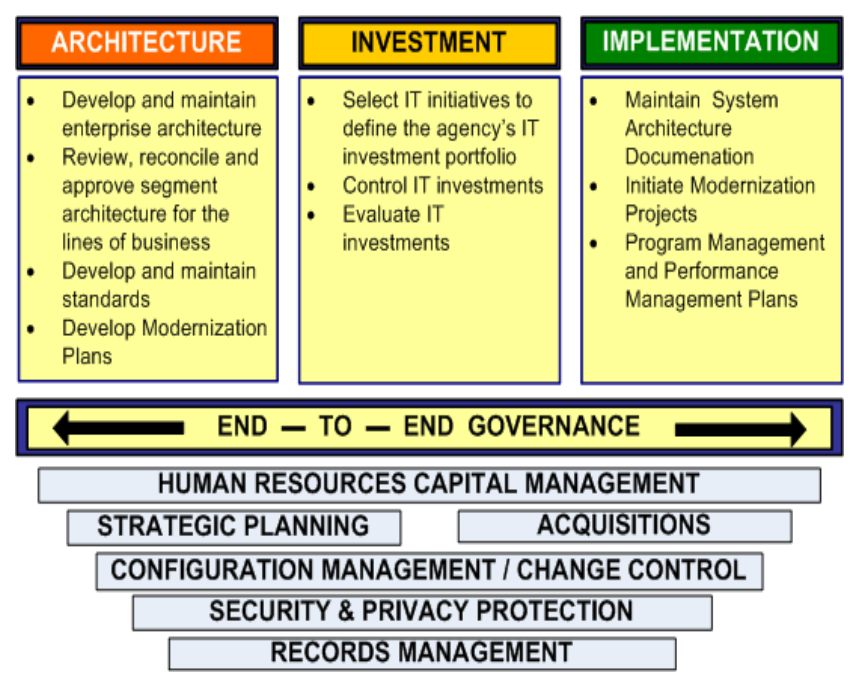

Figure 3.2-1, Performance Life Cycle Framework

The framework is comprised of three phases — Architecture, Investment, and Implementation. This provides for an integrated system comprised of multiple lifecycle processes and activities (both IT lifecycles and business lifecycles) that can cover multiple years, with each year supporting multiple projects in one or more of the three phases. As illustrated in Figure 3.2-2, *Activities within the Performance Life Cycle Framework*, the primary activities at the enterprise level (which also indicate what Capital Planning and Investment Control (CPIC) Phase an activity may be associated with) that occur within each of the three phases can be seen as well as the primary focus for the activities within a phase. As can be seen from the activities that compose the Performance Life Cycle Framework, the framework overlays numerous functions that help to ensure the implementation and governance of the IT Portfolio Management, IT Capital Plan, Methodology for Business Transformation, and IT Project Management process.

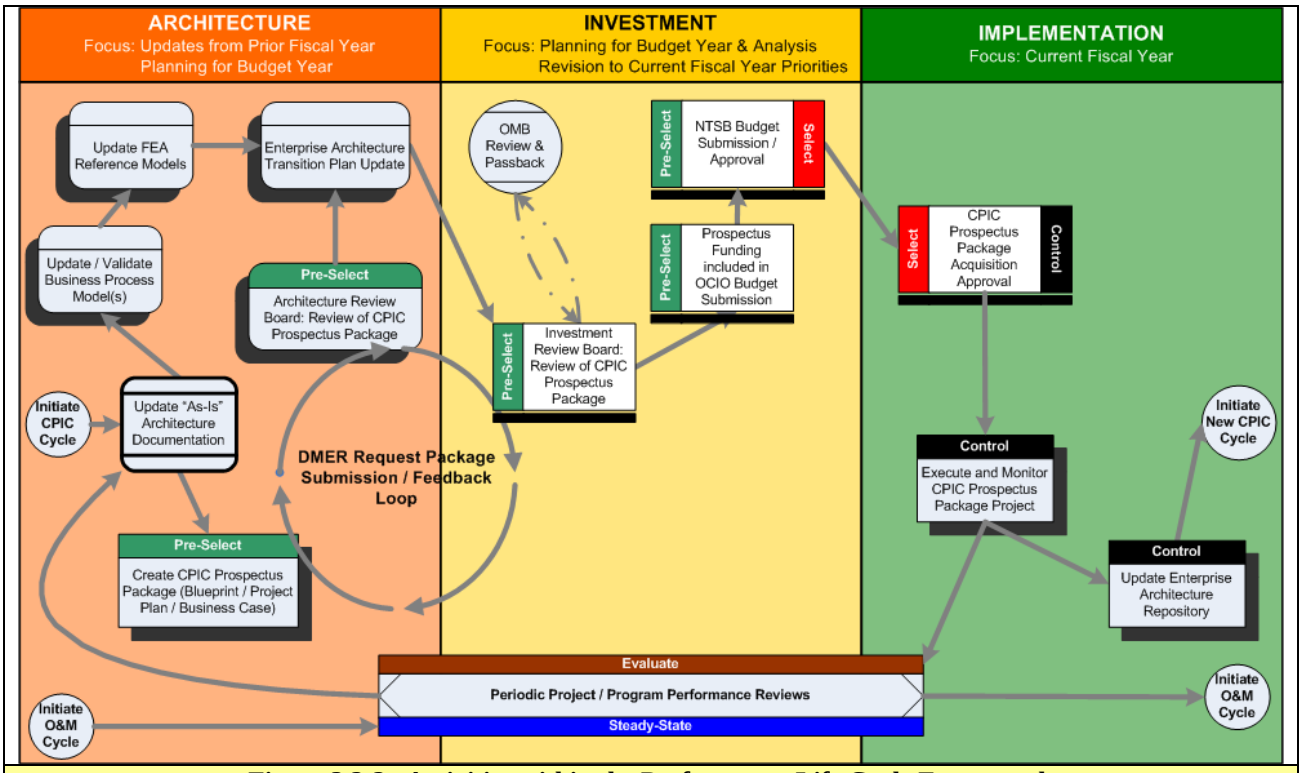

Figure 3.2-2, Activities within the Performance Life Cycle Framework

Figure 3.2-3, *Performance Life Cycle Framework applied to an Individual IT System*, shown on the next page, illustrates how the process for an IT System flows over the course of its life cycle.

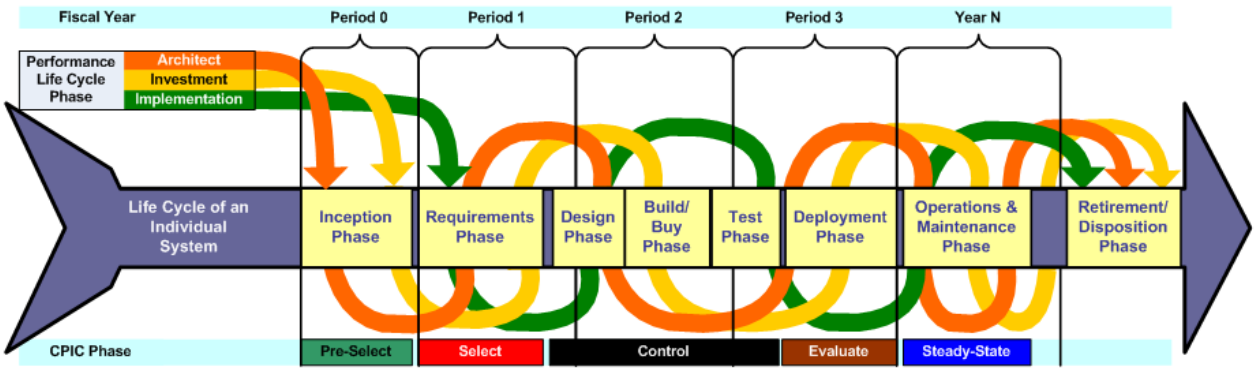

Figure 3.2-3, Performance Life Cycle Framework applied to an Individual IT System

Figures 3.2-2 and 3.2-3 show a logical and sequential process that occurs annually based on the annual budget cycle. However, the cycle often occurs as needed based on NTSB's annual budget cycle AND the execution / evaluation / reprioritization of the fiscal year in which NTSB operates.

3.2.1 Activities of the Performance Life Cycle Framework for IT

In 2007, the Chief Information Officer, as part of the National Transportation Safety Board's Information Technology Strategic Plan, published the *Information Technology Capital Planning & Investment Control (CPIC)* Process, to improve the management and oversight of the NTSB's IT Portfolio Management. The CPIC Process requires that both major and non-major IT projects prepare and submit documentation for review at the enterprise level for investment decisions and prioritization as part of the budget cycle. Beginning with budget year 2009, the CPIC Process will require an additional level of detail to "front-load" the entire process with the information required. This will serve to reduce or eliminate the need to make several disparate data calls during the process in order to collect additional information.

The sections that follow will provide a high-level overview of the primary activities of the Performance Life Cycle Framework for IT systems. Details concerning the CPIC Process can be found in the NTSB Operations Bulletin CIO-GEN-022 IT Capital Planning and Investment Control Process.

3.2.1.1 Architect Phase

The Architect Phase of the Performance Life Cycle Framework is focused on two different periods for a given information system: 1) Updates/Reconciliations of design and architecture information for an information system to ensure that development and changes during the past year are accurately reflected in the Enterprise Architecture Repository; and 2) Architecting and Planning for the next budget cycle.

It is during this phase that IT project proposals are developed for consideration by the business areas to modernize information systems, to develop new systems, or for technical refresh of components that are near the "end-of-life," either by NTSB or by the manufacturers of the components. The Architect Phase of the Performance Life Cycle Framework will leverage and enhance activities from the Pre-Select Phase of the CPIC Process as the method to capture and review architectural information.

During the Pre-Select Phase, the IT project proposals (also known as the CPIC Prospectus Package), after being completed by the business owner, are submitted to the NTSB Architecture Review Board for evaluation. The Architecture Review Board looks to ensure that the initiative is compatible with the Target State Vision and that it does not duplicate existing functionality or systems in the NTSB IT Portfolio or under development, and helps ensure that the project is properly documented and utilizing an appropriate development methodology.

Once the Architecture Review Board has completed its review of the CPIC Prospectus Package, the package is either 1) returned to the submitter to request additional information; or 2) forwarded to the IT Investment Review Board for selection and prioritization.

3.2.1.2 Investment Phase

The Investment Phase of the Performance Life Cycle Framework is focused on two different periods for a given information system: 1) planning and analysis of project proposals for the next budget year; and 2) performance reviews of active projects, reprioritization of projects, and budget reallocation to respond to new requirements.

As a continuation of the Pre-Select Phase of the CPIC Process, the IT Investment Review Board reviews the CPIC Prospectus Package that has been forwarded from the Architecture Review Board. The IT Investment Review Board may return the package to the submitter to request additional information or data analysis. If no major changes are made to the CPIC Prospectus Package in response to the requests from the Investment Review Board, the submitter will return the package directly to the Investment Review Board. However, if the result is major changes to the concept of operations, the submitter will need to re-submit the package to the Architecture Review Board to be re-evaluated before being returned to the Investment Review Board.

At the conclusion of the Investment Review Board's evaluation of the CPIC Prospectus Package the Board will either approve the package or deny it and return it to the submitter. At this point, even if a CPIC Prospectus Package has been accepted and approved, it is still in the Pre-Select Phase and has not been authorized for work. The approved packages are provided to the Chief Information Officer (CIO), who will ensure that appropriate resources required from the OCIO staff to support the project have been secured. There is no decision point during this step; it is strictly a time to ensure that resources required from the OCIO will be available. If the CIO cannot ensure that the resources will be available for the proposed scheduled of a package, the CIO will add notations to the package as to why resources will not be available to support the proposed schedule, as well as include information as to when the CIO expects the required resources to be available to support the project. The CIO will then allocate the resources and obligate the required funds for the project. If the project's value exceeds the threshold established by NTSB for an acquisition to be considered a capital asset, the CIO then forwards the packages to the Chief Financial Officer (CFO). Based on the availability of funding and resources, the CFO will allocate or obligate the required funds for the project. Once the funds and resources have been allocated and the CPIC Prospectus Package has been selected and authorized to be executed, it moves to the Implementation Phase of the Performance Life Cycle Framework.

3.2.1.3 Implementation Phase

The Implementation Phase of the Performance Life Cycle Framework is focused exclusively on the current fiscal year and is concerned with implementing the IT project outlined in the approved CPIC Prospectus Package.

With a CPIC Prospectus Package being in the Select Phase of the CPIC Process, an OCIO Project Manager is assigned to the project, and together with the Business Owner / IT System Owner / System Manager the NTSB Project Management Team is formed. The Project Management Team will then work with the NTSB Acquisitions Division to finalize the acquisition strategy for the project and issue any Requests for Proposals (RFPs) for support, services, or equipment needed, as outlined in the CPIC Prospectus Package and within the financial limits established and/or project funding. As part of the selection process associated with the acquisition, the selection committee reviewing and evaluating the proposal received in response to the RFP will extract the technical approach from each proposal and provide it to the Architecture Review Board. The Architecture Review Board will review each of the technical approaches and provide a ranking for the selection committee to indicate how well the technical approach is aligned with the NTSB Enterprise Architecture Target State Vision and Configuration Standards, and if it complies with the NTSB Systems Development Life Cycle.

With the issuance and execution of the contract, the IT Project completes the Select Phase and begins the Control Phase of the CPIC Process. During the Control Phase, the NTSB Project Management Team tracks and monitors the work done to design, develop, and test the IT project. Periodically during this phase, the project team will provide updates relating to the design and system architecture for the project for inclusion in the Enterprise Architecture Repository.

Periodically throughout the Implementation Phase of the Performance Life Cycle Framework, the NTSB Project Management Team will assess and evaluate the project's performance, maintenance activities, cost, resource allocation, defects, problems, schedule slippage, and system changes. When a project has adequately completed system testing, a Readiness Review will be conducted to determine if the project is ready to be implemented into the "Production" IT Environment and begin operations to support NTSB business functions. The IT Investment Review Board may use these reviews in making budget re-allocations during a fiscal year to respond to changes to NTSB's business priorities. Additionally, these reviews will provide NTSB with insight into the status of the projects to determine if corrective actions or cancelations might be appropriate for under-performing projects.

A Post Implementation Review of the project is also conducted after the project has been placed into production and has transitioned from "Development" (and the "initial warranty period" following implementation) to "Operations & Maintenance."

3.3 Enterprise Architecture Program Roadmap

The Enterprise Architecture Transition Roadmap identifies and sequences transition activities at the strategic level for the next few years and at a tactical level for the current year. The NTSB Enterprise Architecture Roadmap, seen in Figure 3.3-1, provides a high level view of the activities over the first five years of the Enterprise Architecture Program, outlines the development and maintenance of the enterprise architecture program, and interprets the effort

and project maturity level to roughly equate the Information System Development Life Cycle (ISDLC) Phase had the Enterprise Architecture Program been an automated information system.

From this Roadmap, the NTSB Enterprise Architecture Annual Program and Reporting Life Cycle, seen in Figure 3.3-2, provides a concept of operations of NTSB's Enterprise Architecture Program by offering a graphical representation of the Enterprise Architecture Program, relating processes within the Office of the Chief Information Officer and building relationships to certain internal and external drivers mapped to the approximate period (or month) of the fiscal budget year when the activity is anticipated. Finally, the NTSB Enterprise Architecture Annual Program and Reporting Life Cycle begins the process of mapping and documenting the processes and business functions for enterprise architecture, just as the Enterprise Architecture Program will be seeking to assist and ensure that the same is done for the existing NTSB processes and business functions.

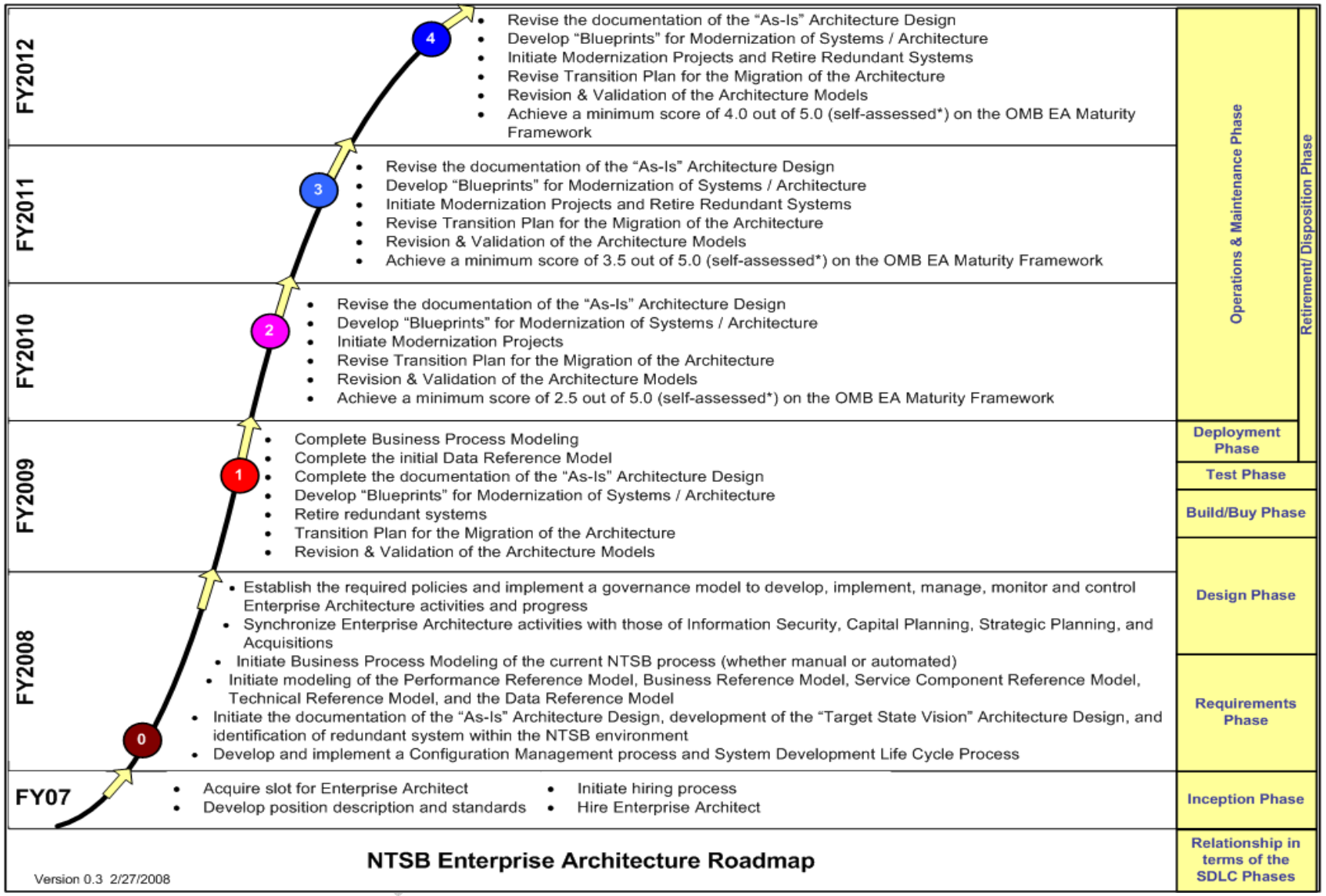

Figure 3.3-1, NTSB Enterprise Architecture Roadmap

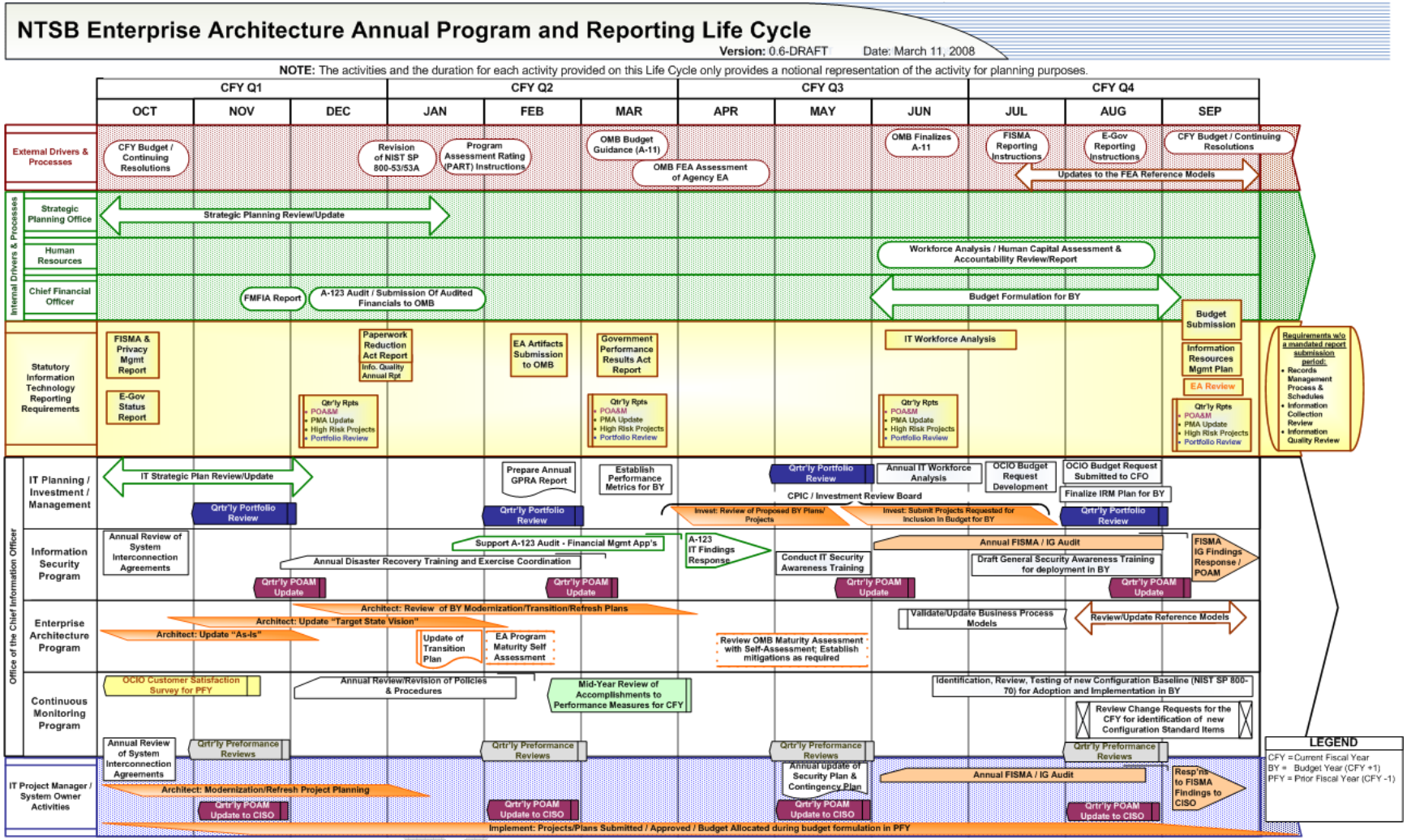

Figure 3.3-2, NTSB Enterprise Architecture Annual Program and Reporting Life Cycle

3.4 Business Drivers for the Enterprise Architecture Program

The majority of the business drivers for the National Transportation Safety Board's Enterprise Architecture Program have already been internalized and are documented in either the *National Transportation Safety Board Strategic Plan for Fiscal Years 2007 Through 2012* or in the *Information Technology Strategic Plan For FY 2010 – FY 2015.* The business drivers influencing the future direction and management of the National Transportation Safety Board's Enterprise Architecture Program are as follows:

- **Accomplish Objective Investigations of Transportation Accidents to Identify Issues and Actions that Improve Transportation Safety**

  Architecture Impacts:

  ❖ The Enterprise Architecture Program must be able to identify IT initiatives that potentially can be leveraged to support NTSB's business processes to improve NTSB's mission performance and realize its strategic goals and objectives.

- **Increase our Impact on the Safety of the Transportation System**

  Architecture Impacts:

  ❖ The Enterprise Architecture Program should seek to establish an infrastructure that helps to streamline NTSB's business processes and adopt flexible, expandable technology solutions to support completing the process effectively and efficiently to allow for the NTSB workforce to focus more on investigations and safety studies.

- **Outstanding Stewardship of Resources & Organizational Excellence**

  Architecture Impacts:

  ❖ The Enterprise Architecture Program shall support Organization Outstanding Stewardship of Resources and Organizational Excellence of the:

  - **IT Infrastructure and E-Government Initiatives:** By providing enterprise solutions — improving the quality, accessibility, and information sharing capabilities between NTSB and its customers that also improve the efficiency and effectiveness of NTSB's business processes;
  - **IT Capital Planning & Investment Control (CPIC):** By improving the planning, execution, and management of IT investments and incorporation of Architectural Reviews; and
  - **Information and Records Management:** By ensuring that the appropriate documents and records associated with the enterprise architecture program, system development life cycle process, CPIC process, and Configuration Management process are identified, created, and maintained accordingly.

External Influences

- **Major Transportation Disasters & Significant Terrorist Incidents**

  Architecture Impacts:

  ❖ The Enterprise Architecture Program shall strive to establish a flexible IT infrastructure that:

- Can support the rapid deployment of components to support field investigations and safety studies at multiple locations;
- Can protect the security of the investigation or study information at the remote site as well as during transit of the information from the remote site back to an NTSB facility; and
- Does not require an IT Specialist to visit the remote site established to support an investigation or study, to install or configure the components.

- **New Technologies**

  Architecture Impacts:

  ❖ The Enterprise Architecture Program shall establish a "Target State Vision" Architecture that can incorporate new technologies as appropriate. In addition to this, the Enterprise Architecture Program shall establish a flexible set of architectural and configuration standards, as well as a "technical proof of concept" process to allow for fast adoption and incorporation of new technologies into the NTSB "Target State Vision" and/or standards.

- **Change in Budgeting Priorities**

  Architecture Impacts:

  ❖ The Enterprise Architecture Program shall establish a transition plan to ensure that initiatives are prioritized in accordance with the changes to NTSB's budget and budget priorities to meet mission objectives and adapt to new requirements.

Additional Influences on the Enterprise Architecture Program

- **Laws and regulations**

  The Clinger-Cohen Act of 1996 (CCA) - The Clinger-Cohen Act [formally the Information Technology Management Reform Act (ITMRA), Public Law 104-106] requires federal agencies to focus on the results achieved through IT investments while streamlining the federal IT procurement process. This act requires agencies to document their baseline and target enterprise architectures and introduces much more rigor and structure into how agencies approach the selection and management of IT projects.

  Architecture Impacts:

  ❖ NTSB must document its baseline and target architectures and align its IT investments to the architectures.

  Government Performance and Results Act (GPRA) of 1993 - GPRA (Public Law 103-62) directs federal agencies to improve program management by implementing outcome-oriented performance measurement systems. Agencies are to prepare annual performance plans with objective, quantifiable and measurable performance indicators to determine relevant outputs, service levels, and outcomes of each program activity.

  Architecture Impacts:

  ❖ The NTSB's target data and business architectures must include explicit connections between its budget and performance results that are significant to NTSB's ability to accomplish its mission.

Government Paperwork Elimination Act of 1998 (GPEA) - Title XVII of GPEA (Public Law 105-27) requires that within five years of enactment, federal agencies provide a substitute for paper when practicable. These substitutes include the option of electronic maintenance, submission, or disclosure of information by acquiring and using information technology, including alternative information technologies.

Architecture Impacts:

- ❖ NTSB must work to ensure that it has comprehensive, secure, electronic authentication technology that protects the security of its information while in transit, yet can be deployed quickly without the requirement of an IT Specialist to visit the site to install the equipment. For example, NTSB might leverage webcasting and web conferencing in support of hearings or testimony associated with accident investigations.

Federal Information Security Management Act of 2002 (FISMA) - The Federal Information Security Management Act outlines and addresses proper management and security for the information resources supporting federal operations and assets, and it is key in creating a more effective electronic government.

Architecture Impacts:

- ❖ The NTSB architecture must ensure the use of security architecture planning for all technology purchases and change management, and in the life cycle process.

The E-Government Act of 2002 - is increasingly expected to follow the private sector's lead in implementing e-commerce to improve customer service and deliver E-Government services. Since the passage of the E-Government Act, about Twenty-four initiatives have been designed to improve the efficiency and effectiveness of the federal government's transactions through the use of improved technology.

- **Audit Findings**

November 2006 GAO Report 07-118 – The GAO report cited several findings concerning IT planning, enterprise architecture, IT investment management, IT acquisition, and knowledge management, as well as to several other concerns around various NTSB business processes.

Architecture Impacts:

- ❖ The GAO concerns related to the CIO's Office will need to be one of the primary drivers during Fiscal Year 2008 as the Enterprise Architecture Program is established, in order to ensure that it will be able to address specific GAO concerns related to IT Planning, enterprise architecture, IT investment management, IT acquisition, and knowledge management.
- ❖ The NTSB Enterprise Architecture Program should focus on providing proactive solutions to concerns cited in the GAO report and those from other audit findings. In some cases, this will require the Enterprise Architecture Program to seek or coordinate participation in business processes in which the NTSB CIO's office may not have been involved in the past.

- **Increased Workload/Workforce Planning**

  Increased Workload - The ability to respond to rapid changes in NTSB's workload to support multiple concurrent accident investigations and safety reviews/research projects will be a continuing driver on the NTSB's personnel, processes, and technology.

  Workforce Planning - NTSB faces a highly competitive market for recruiting, compensating, and retaining employees in key technical areas. As NTSB's processes become more reliant on technology, NTSB will need to assess the new skill sets required, focus on training existing staff in those skills, and hiring new employees with those skills. It will also need a clear strategy for using contractors where it is most advantageous.

  Architecture Impacts:

  - ❖ NTSB must streamline its business processes and adopt flexible, expandable technology solutions to support those processes. In order for this to occur, NTSB must first understand and have its processes documented. The Enterprise Architecture Program will assist in both documenting and maintaining these processes.
  - ❖ The NTSB's architecture should focus on providing secure leading edge technologies that have a proven track record, and that can be leveraged to help the architecture periodically "refresh" systems, components, and peripherals within a two or three year window.

3.5 Enterprise Architecture Program Integration with other NTSB Processes

This section describes the primary functional areas under the scope of the Enterprise Architecture Program at NTSB, and explains the role of Enterprise Architecture in the various processes and activities in which Enterprise Architecture participates. Additionally, the type of involvement anticipated with the various processes is shown for certain stakeholders who will be interacting with the Enterprise Architecture Program.

Participants	Configuration Management	Standards Integration	Information System Development Life Cycle	Investment / Capital Planning	Enterprise Architecture Development	IT Acquisitions	Information Security	IT Performance Measurement & Management	Strategic Planning
Chief Information Officer		C	C	A	C	A	C	A	A[1]
Chief Enterprise Architect	A	A	A	C	A	R	C	C	C
Chief Security Officer		C	R	R		R	A	C	C
Office of the Chief Financial Officer				C		R			C
Office of Administration, Acquisitions Division						C			C
Director of Strategic Planning									A
Business Owners/System Owners	R	I	I	R	C	I	R	I	C
IT Program/Project Manager	R		R	R	R	R	R	R	I
OCIO Staff	R	I	R		R	R	R		I

Legend: A = Accountable (process owner); R = Responsible (conducts the work); C = Consulted (has the information and/or capability to complete the work); I = Informed (informed of progress/results)

Figure 3.5, Participation in Enterprise Architecture and Related Processes

3.5.1 Standards Integration

As the process owner, the Enterprise Architecture Program will seek to develop enterprise standards related to NTSB's technology, data, and service standards. These enterprise standards are intended to be applied across NTSB. The development of standards will be driven by need and by external and internal factors.

External factors for NTSB include government-wide initiatives, regulations, or guidance with applicability to all federal agencies, as well as domain-specific standards which NTSB may be obligated to adopt due to its position in the transportation safety community. Internal factors for NTSB include the existing use of technologies, data standards, and services, as well as intended standards identified through strategic planning, target architecture development, or other analysis.

[1] The CIO is owner of the IT Strategic Planning Process.

3.5.2 Configuration Management Process

The configuration management process is one of the first "standards" to be established by the Enterprise Architecture Program. While the Enterprise Architecture Program is the process owner for Configuration Management and establishes the processes and procedures, Enterprise Architecture does not manage implementation and execution of the process. The Enterprise Architecture Program also utilizes the configuration management procedures for receiving, analyzing, and adjudicating change requests, as well as tracking the disposition of submitted change requests, whether approved for implementation or rejected. The details of the NTSB Configuration Management process are described in the NTSB Configuration Management Plan, a document maintained by the Enterprise Architecture Program. The Configuration Management processes and procedures are implemented by the Computer Services and Systems Support Divisions of the Office of the Chief Information Officer. The Change Request process is managed by the Management Analyst of the Office of the Chief Information Officer.

3.5.3 Information System Development Life Cycle

The NTSB Information System Development Life Cycle is another "standard" that will be established by the Enterprise Architecture Program. NTSB seeks to ensure that IT projects are effectively managed throughout their life cycle and that proven best practices and methods are applied consistently to every IT project. This is accomplished by establishing a formal Information System Development Life Cycle that provides, for project managers charged with developing systems, standardized modules, methodologies and guidelines for implementing a structured and consistent approach to IT project development. It provides a standard from initiation through deployment, operation, maintenance, and eventually retirement. However, no process or technique presents a one-size-fits-all solution for IT projects. Therefore, the Information System Development Life Cycle and supporting management processes will be flexible and adaptable based on several considerations, including: new developments vs. maintenance, large enhancements vs. midsize-to-small, projected time to complete, and human and capital resources required. Once the NTSB Information System Development Life Cycle becomes effective, all IT development projects will be required to use the Information System Development Life Cycle tailored appropriate to the project.

3.5.4 Investment/Capital Planning

The Enterprise Architecture Program is closely aligned with the NTSB CPIC Process in terms of collecting and modeling information associated with major and non-major investments in the NTSB IT portfolio as well as using the Enterprise Architecture as a basis for supporting key CPIC processes. The details of NTSB's CPIC activities will be described in the Capital Planning and Investment Control Operations Bulletin. As discussed in Section 3.2, the CPIC process is also part of how the NTSB Enterprise Performance Life Cycle is implemented, and it fulfills specific roles and responsibilities within the context of the Enterprise Performance Life Cycle phases.

3.5.5 Enterprise Architecture Development

The Enterprise Architecture Program is responsible for the development of the NTSB Enterprise Architecture, including an NTSB-wide perspective that incorporates information from all

Business Areas and Offices. Enterprise Architecture development activities conducted by the Chief Enterprise Architect are specified annually in the Enterprise Architecture Transition Plan.

3.5.6 IT Acquisitions

The Enterprise Architecture Program participates in the IT Acquisition process by reviewing the technical proposal submitted in response to NTSB-issued RFP's to provide feedback to the selection committee and evaluation of how the technical proposal works with and supports the current and target state vision for the Enterprise Architecture. Additionally, the Enterprise Architecture Program provides input to help draft and maintain the NTSB IT Acquisition procedures.

3.5.7 Information Security

The Enterprise Architecture Program works closely with the NTSB Chief Information Security Officer (CISO) to ensure that the Enterprise Architecture Framework — and, in particular, the Security Aspect of the Framework — accurately reflects the NTSB information assurance program. The CISO also participates in the evaluation of Architectural Designs and Standards to help ensure the selection of secure solutions. Additionally, the Enterprise Architecture Program supports the CISO by overseeing the creation of policies and procedures for establishing system interconnections with systems outside the NTSB Enterprise Architecture boundary.

3.5.8 IT Performance Measurement & Management

Performance measurement and management is a fundamental requirement for all programs operating within the Office of the Chief Information Officer. The NTSB Enterprise Architecture Program develops and maintains a performance architecture framework for NTSB, derived from the Federal Enterprise Architecture Performance Reference Model. The performance architecture provides a mechanism through which specific performance measurement indicators can be specified for initiatives, projects, investments, and other relevant activities.

3.5.9 Strategic Planning

The CIO is responsible for developing and updating the Information Technology (IT) Strategic Plan on an annual basis. The IT Strategic Plan describes a future state for IT using a five-year planning horizon. The IT Strategic Plan establishes IT goals, objectives, and outcomes and aligns the IT-specific goals and objectives to the business goals and objectives articulated in the NTSB Strategic Plan. The IT Strategic Plan is an important input to effective target architecture planning and development, which in turn drives appropriate IT investment decision making. The goals, objectives, outcomes, and performance measurement indicators documented in the NTSB Strategic Plan and the IT Strategic Plan will be reflected in the NTSB Enterprise Architecture Repository. These enable alignment of initiatives, investments, and programs to appropriate strategic drivers and performance measures.

4.0 Transition Planning

The National Transportation Safety Board has adapted the Federal Enterprise Architecture Framework (FEAF) to provide the foundation for the establishment of its Enterprise Architecture Program. Transition Planning will provide the ability for the Enterprise Architecture Program to prioritize IT investments in a structured sequence of initiatives that align and support the strategic goals and objectives established by the NTSB, review the initiatives to identify any gaps between the baseline and target architectures, identify performance measures and milestones for each initiative, and assess the relative maturity of the Enterprise Architecture Program.

4.1 Approach

The NTSB Enterprise Architecture Transition Roadmap provides the baseline for establishing the relative maturity level of the enterprise architecture in place, performance measures and milestones for fiscal year 2008, and an initial sequencing for transition activities. As the foundation for IT modernization, supporting business and IT investment management and program management and execution, the Roadmap will be incrementally updated and revised to meet the changing business environment and other architectural drivers, including relevant cross-agency initiatives.

4.2 Methodology

The overall strategy for developing and implementing an Enterprise Architecture Program is to foster an understanding of and commitment to the Program within the NTSB. The Enterprise Architecture Program is deploying processes based on best practice approaches, including guidance from the Federal Enterprise Architecture Framework of other government agencies, the NTSB Enterprise Architecture team, and other individuals throughout NTSB. The Transition Roadmap provides the details about the process and activities the Enterprise Architecture Program will be establishing during its first year. As these processes are implemented and are beginning to be used, the Transition Roadmap will evolve from a plan focused on establishing processes and procedures into a Transition Plan that identifies current and existing initiatives and investments approved for inclusion in the IT portfolio for the current planning year. Each year, the Enterprise Architecture Program will update the Transition Plan to reflect the IT projects and initiatives approved, describe gaps identified between current and future states of the architecture and business processes, and identify and report on performance measures for the projects and initiatives discussed in the document.

The Transition Plan will also provide strategies, prioritizations, and interim milestones for implementing the projects and initiatives that align with NTSB's Strategic Plan. In addition, the Transition Plan will provide an annual status of accomplishments made in the previous year and anticipated progress to be made in the coming year. In this way, the Transition Plan can help NTSB draw attention to obligations, strategic gaps, and other risk areas, as well as provide strategies for mitigating any such risks. The Transition Plan is also an important tool to support proper alignment of IT investments to business strategies and programs.

4.3 Enterprise Architecture Assessment Framework

The Enterprise Architecture Assessment Framework is an assessment of the capability of our Enterprise Architecture program and guide to our strategic IT investments. This assessment allows us to identify strengths and weaknesses within the Enterprise Architecture program and initiatives, pro-actively adjust the program and initiatives accordingly, and improve the performance of Information Resource Management (IRM) and Information Technology (IT) investment decision-making. The Assessment Framework that is used to assess our Enterprise Architecture program and initiatives is the same framework that the Office of Management and Budget uses to conduct a comprehensive review of the state of an enterprise architecture program, and that is used as part of the quarterly updates and progress required of the NTSB by the E-Government Act of 2002.

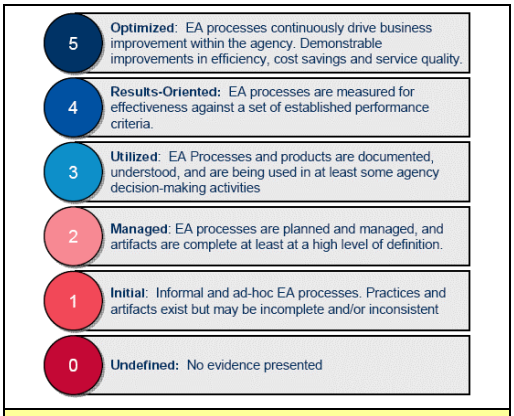

Figure 4.3, Enterprise Architecture Assessment Framework Maturity Levels

The OMB Enterprise Architecture Assessment Framework (Version 2.2) uses fourteen assessment criteria components to evaluate the maturity and effectiveness of agency enterprise architecture programs. Each criterion consists of five maturity levels, scored from 1-5. Related assessment criteria components are grouped into three capability areas: Completion, Use, and Results.

Below is a brief outline of each of the three capability areas:

Completion measures

- Incorporation of relevant architectural content from the cross-agency initiatives in the Federal Transition Framework;
- Development of segment architectures;
- Linkage of horizontal layers of an agency's EA (e.g., performance, business, data, services, and technology) through a line of sight from program performance to IT investments;
- Transition strategy from the baseline to the target architecture; and
- Alignment to the FEA reference models.

Use measures

- Policies and procedures necessary for an agency to develop, maintain, and oversee its EA; and
- Integration of an EA with the agency's IRM programs and IT management processes, including strategic and capital planning and program/project management.

Results measures

- Agency cost savings, cost avoidance, and mission performance improvements attributable to the EA program;
- Agency internal EA value measurement programs; and
- IPv6 implementation performance.

The results of these three measures are used to provide an average assessment score.

4.3.1 Assessed Maturity Level

An assessed maturity level supports the reporting timeline for the comprehensive Enterprise Architecture Annual Assessment which is to be completed by March of each year, as well as the ability to provide quarterly progress reports related to the Enterprise Architecture Initiatives.

Capability Area	Capability Specification	Evidence Supporting Assessment Determination	Level Assessed
Completion This category measures the completion maturity of an agency's EA artifacts in terms of performance, business, data, services, and technology. The agency's baseline and target architectures are well-defined, showing traceability through all architectural layers. Using its transition strategy and sequencing plan, the agency is able to achieve its desired target state.	**Performance Architecture** The EA contains performance measurement indicators, based on the FEA Performance Reference Model (PRM) linked to and reflecting the agency's strategic plan. The EA is used to help track improved agency performance.	N/A	0
	Business Architecture EA contains an inventory of agency business processes, aligned to the FEA Business Reference Model (BRM), linked to layers of the agency's EA and used to inform investment decision making. Segment architectures are developed for each agency line of business, including Services for Citizens, as well as Support Lines of Business.	1. Models of the CIO POA&M process, Strategic Management process, General Counsel's Correspondence & Suspense Tracking process. 2. Enterprise Architecture Transition Roadmap Section 5.8, Business Process Flow Documentation.	1
	Data Architecture (Information Management) Enterprise data described at the level of business data entities, linked to the FEA Data Reference Model (DRM) and other layers of agency EA.	N/A	0
	Service Component Architecture This architecture describes agency services linked to the FEA Service Component Reference Model and other layers of the agency EA.	N/A	0
	Technology Architecture The technology architecture contains an inventory of deployed and approved technologies linked to the FEA Technical Reference Model and other layers of the agency EA, providing a basis for standardization	N/A	0
	Transition Strategy A transition strategy describes the agency's plan for migrating from its baseline architecture to its target architecture.	1. The Enterprise Architecture Transition Roadmap (this document). 2. Information Technology Strategic Plan for FY 2010 – FY 2015.	1
	Completion Score		**0.3**

Table 4.3.1-1, Enterprise Architecture Completion Capability Maturity Level

Capability Area	Capability Specification	Evidence Supporting Assessment Determination	Level Assessed
Use The agency has established the necessary management practices, processes, and policies needed for developing, maintaining and overseeing EA, and demonstrating the importance of EA awareness and the value of employing EA practices within the agency. The agency uses its EA to inform strategic planning, information resources management, IT management, and capital planning and investment control processes.	**EA Governance and EA Program Management** The agency must govern and manage the implementation and use of EA policies and processes. This includes the appointment of a Chief Architect (CA), allocation of resources and the sponsorship of EA at the executive level. The agency's EA Program Management Office governs the development, implementation and maintenance of the EA.	1. Enterprise Architecture Program Charter. 2. Enterprise Architecture Transition Roadmap, Section 3.0 NTSB's Enterprise Architecture's Mission, Vision, and Goals. 3. Enterprise Architecture Transition Plan, Section 5.1 Enterprise Architecture Program Framework and Governance. 4. The Enterprise Architecture Transition Roadmap (this document).	2
	EA Change Management and EA Deployment The agency should have the ability to effectively manage changes to EA artifacts, including documents and any EA repositories. The agency should have the ability to deploy EA content out to their user community, including deployment of a repository, communications and training.	1. Enterprise Architecture Transition Plan, Section 5.1 Enterprise Architecture Program Framework and Governance. 2. Enterprise Architecture Transition Plan, Section 5.4 Configuration Management Program/Process. 3. NTSB Configuration Management Program Policy and Procedure.	1
	Collaboration and Reuse Agencies should have the ability to effectively federate lower-level segment architectures (including content, structure and policies) with higher-level agency-wide EA initiatives. Effectively federated architectures should promote collaboration and reuse opportunities within	N/A	0
	CPIC Integration The agency EA should be integrated with the agency's CPIC processes, including agency ability to align proposed investments to the approved transition strategy.	1. Enterprise Architecture Transition Plan, Section 3.2 Enterprise Architecture Performance Life Cycle Framework. 2. Enterprise Architecture Transition Plan, Section 3.5.3 Investment/Capital Planning. 3. Enterprise Architecture Transition Plan, Section 5.2 IT Capital Planning. 4. Enterprise Architecture Transition Plan, Section 5.3 IT Acquisitions. 5. Information Technology Strategic Plan for FY 2010 – FY 2015, Focus Areas 1 & 4.	1
	Use Score		**1.0**

Table 4.3.1-2, Enterprise Architecture Use Capability Maturity Level

Capability Area	Capability Specification	Evidence Supporting Assessment Determination	Level Assessed
Results The agency is measuring the effectiveness and value of its EA by assigning performance measurements to its EA and related processes, and using its analysis of the performance measurements to update its EA practice and guidance.	**Cost Savings and Cost Avoidance** The agency enterprise architecture is achieving demonstrable benefits to the agency in cost savings and cost avoidance for IT investments. The agency should develop and submit an EA Program Results Analysis document clearly demonstrating the improvements to agency IT investment performance attributable to the EA program, and explain how the EA program activities resulted in cost savings, cost avoidance, and/or improved mission performance for the agency. The agency fulfills this requirement by demonstrating results in one of three ways: demonstrating that the EA program has resulted in cost savings and/or cost avoidance; maintaining agency IT spending below a certain percentage of its overall discretionary budget authority; or achieving PART scores above a certain level. See criteria below for specific thresholds.	N/A	**0**
	Performance Improvement The agency transition strategy should include well-defined and objectively measurable performance milestones. These performance milestones must enable the agency to determine whether it is meeting its mission and performance objectives, defined by the business owners who have ultimate responsibility for agency performance. See section 5.1.6 of this assessment framework and the FEA Practice Guidance located at www.egov.gov for more information regarding transition strategy.	1. The Enterprise Architecture Transition Roadmap (this document). 2. Information Technology Strategic Plan for FY 2010 – FY 2015.	**1**
	Measuring EA Program Value EA value measurement is a continuous, customer-focused process integrated with each phase of the Performance Improvement Lifecycle. The principal goals of EA value measurement are to document EA value to agency decision-makers and to identify opportunities to improve EA products and services. EA value measurement tracks architecture development and use, and monitors the impact of EA products and services on IT investment decisions, collaboration and reuse, standards compliance, stakeholder satisfaction, and other measurement areas and	1. Enterprise Architecture Transition Roadmap, Sections 4.4 – 4.6. 2. Information Technology Strategic Plan for FY 2010 – FY 2015.	**1**
	Internet Protocol Version 6 (IPv6) The agency's EA (including Transition Strategy) must incorporate Internet Protocol version 6 (IPv6) into the agency's target architecture.	1. Enterprise Architecture Transition Roadmap, Sections 6.1, IPV6 Transition Project. 2. Information Technology Strategic Plan for FY 2010 – FY 2015, Focus Area 5.	**2**
	Results Score		**1.0**

Table 4.3.1-3, Enterprise Architecture Results Capability Maturity Level

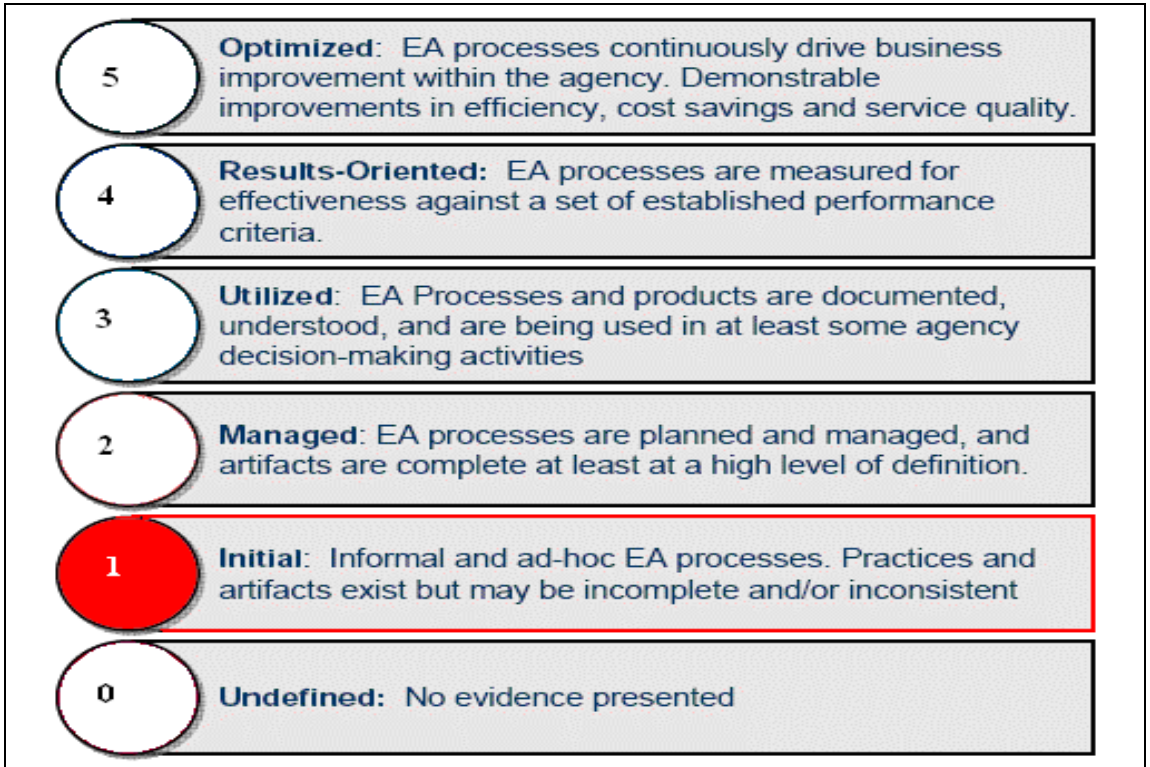

Figure 4.3-1, NTSB's Enterprise Architecture Self Assessed Maturity Level – FY 2008

5.0 Transition Strategy

The Transition Strategy describes the overall strategy for NTSB to achieve its Target State Vision. The Transition Strategy outlines the various transition initiatives, projects, and programs that will allow NTSB to progress towards achieving the Target State Vision. The Transition Strategy also provides the mechanism that links NTSB's Investments to the Target State Vision and is used to track investment performance through clearly defined milestones and associated performance metrics. Also, the Transition Strategy helps prioritize and define dependencies between transition activities (programs and projects) and helps to define the relative priority of these activities (for investment purposes). Figure 5-0.1 below graphically represents NTSB's Enterprise Architecture Transition Strategy from Baseline to Target.

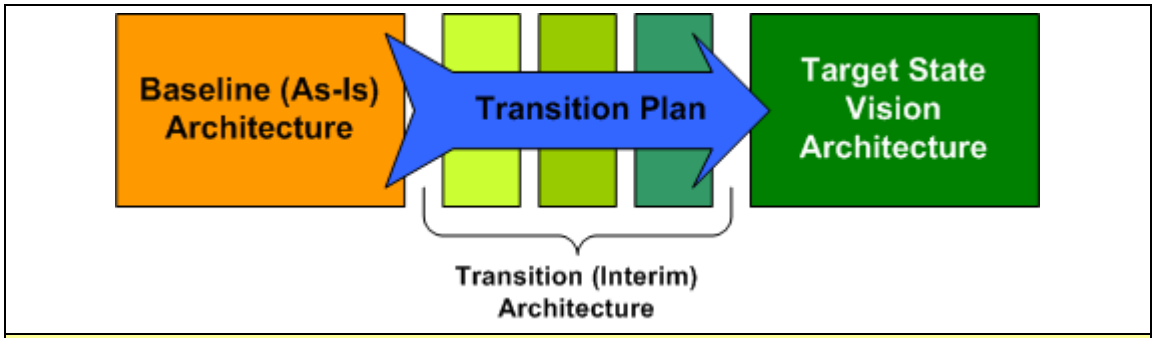

Figure 5.0-1, NTSB's Enterprise Architecture Transition Strategy: from Baseline to Target

5.1 Define Initiatives, Projects, and Programs

According to OMB's Enterprise Architecture Assessment Framework there are two categories of activities: projects and programs.

- A program is an activity or set of activities intended to help achieve a particular outcome. A program consists of a set of related activities and/or projects which together support a specific Business Architecture Segment, Business Area, or Line of Business.
- A project is a discrete, planned effort to achieve a specific goal or result within a brief timeframe. Each project is assigned to a program. A project manager is accountable for the project as it moves through the investment process and implementation. Interactions between projects should be used to show accurate dependencies between programs; the sequencing plan is not intended to replace ongoing project management or to track agency budgets down to the project level.

For the purposes of NTSB's Transition Strategy, NTSB has further defined a third activity, "initiatives," which are similar to a project. Unlike a project, an initiative is not assigned to support any one program, however the results or output from the initiatives are used by all the NTSB Transition projects and programs.

Figure 5.1-1 provides a visual representation between the NTSB Target State Vision Architecture, Transition Programs, Transition Projects, and Transition Initiatives.

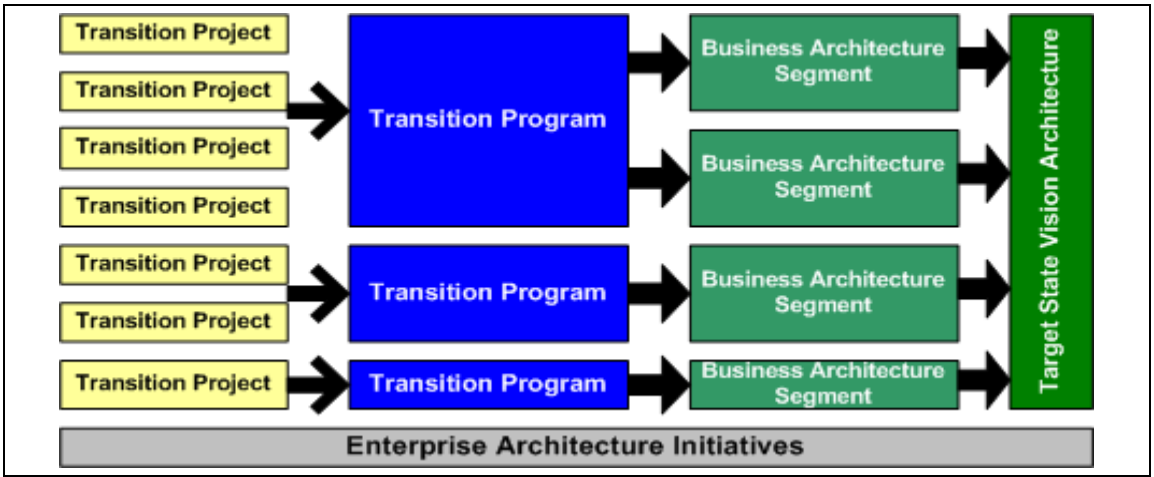

Figure 5.1-1, Initiatives, Projects, and Programs Relationship

5.1.1 Transition Initiative Description

Transition Initiatives are discrete projects related to the management of the Enterprise Architecture Program for the NTSB. These initiatives are required to define, maintain, and improve the architectural models, activities, processes, and governance of NTSB's Enterprise Architecture. Additionally, the initiatives form the framework to manage and evolve the integrated architecture through the combined efforts of all business, application development and information technology (IT) operations staff working collaboratively to conform to and implement.

The initiatives are overseen by the Office of the Chief Information Officer at NTSB, and in most cases are managed or coordinated by the Chief Enterprise Architect.

5.1.2 Transition Project Description

A transition project is a discrete activity that transition a specific business process or information technology component from its current state to a transition state and then to the target state architecture. Transition Projects can be further categorized as:

- **Business Transition Projects:** A Business Transition Project cause changes in NTSB's business process components by leveraging individual information technology components into the business process. Business Transition Projects are dependent on NTSB's Technology Transition Programs. These Business Transition Projects are not part of NTSB's Enterprise Architecture Technology Programs and as such are not part of NTSB's IT investments, but are instead dependent on NTSB's IT investments
- **Technology Transition Projects:** Technology Transition Projects cause changes in NTSB's information technology components, which are leveraged into NTSB's business processes via NTSB's Business Transition Programs. As such, these Programs are dependent on NTSB's Technology Transition Projects. NTSB's Technology Transition Projects are part of a Technology Transition Programs that correspond directly to NTSB's IT investments.

5.1.3 Transition Program Description

A transition program is a set of related activities and/or projects that transition an entire segment (either business or technology) of the NTSB architecture from its current state to its target state. Transition Programs can be further categorized as:

- **Business Transition Programs:** Business Transition Programs either sustain or cause changes in NTSB's business process components by leveraging enabling information technology. As such, these Programs are dependent on NTSB's Technology Transition Programs. NTSB's Business Transition Programs do not correspond directly to NTSB's IT investments, but are instead dependent on NTSB's IT investments.
- **Technology Transition Programs:** Technology Transition Programs either sustain or cause changes in NTSB's information technology components, which are leveraged into NTSB's business processes via NTSB's Business Transition Programs. As such, NTSB's Business Transition Programs are dependent on NTSB's Technology Transition Programs.

5.2 Transition Initiatives

The following provides descriptions of the transition initiatives that currently are in process or planned by NTSB:

5.2.1 Enterprise Architecture Program Framework and Governance

The Enterprise Architecture Program Framework and Governance initiative is to establish and implement the required governance model to develop, implement, manage, monitor and control the Enterprise Architecture activities progress for NTSB. Information concerning the Enterprise Architecture Program Framework and Governance model can be found in Appendix C of this document.

5.2.2 Enterprise Architecture Transition Roadmap

The Enterprise Architecture Transition Roadmap initiative is to establish an introduction to what Enterprise Architecture is to NTSB stakeholders, describe the major activities related to the implementation of the Enterprise Architecture Program, and begin to define the functions, processes, and interactions of the Enterprise Architecture Program. Furthermore, this document will function as a tool to provide status updates during the ensuing year, as well as collect data to establish a baseline for the development of performance metrics for the Enterprise Architecture Program.

5.2.3 IT Capital Planning and Investment Control (CPIC)

The IT Capital Planning and Investment Control initiative is to establish and implement the policy and procedure for staff to use for ensuring that IT investments and expenditures are aligned with Safety Board mission and strategic objectives. Furthermore, it establishes one process for the review and selection of IT investments and expenditures.

5.2.4 Configuration Management Program/Process

The Configuration Management Program/Process initiative is to define the configuration management responsibilities, resources, and processes required during the development, support and maintenance of NTSB systems. This configuration management program/process will: (1) document a plan to ensure NTSB is compliant with federal government configuration management guidelines, (2) provide a mechanism that increases the probability of an accurate NTSB hardware and software baselines, (3) document the interim and future change control procedures and change management process, (4) increase the probability that changes are reviewed and approved before implementation, (5) document the plan for notifying affected parties of proposed changes, (6) define the requirements for the coordination of changes, and (7) increases the probability for NTSB to successfully deploy/maintain a variety of major applications and a general support system.

5.2.5 Information System Development Life Cycle Model (ISDLC)

The Information System Development Life Cycle Model initiative provides policy and procedures to promote effective and efficient solutions for designing and operating information systems through a process of progressive steps to ensure proper management review and

approval, as well as integration with the Agency's IT security, Enterprise Architecture (EA) and IT Capital Planning and Investment Control (CPIC) processes, while allowing flexibility to accommodate varying developmental approaches.

5.2.6 FEA Business Reference Model Development

The Federal Enterprise Architecture (FEA) is an initiative of the US Office of Management and Budget that aims to comply with the Clinger-Cohen Act and provide a common methodology for information technology (IT) acquisition in the United States federal government. It is designed to ease sharing of information and resources across federal agencies, reduce costs, and improve citizen services.

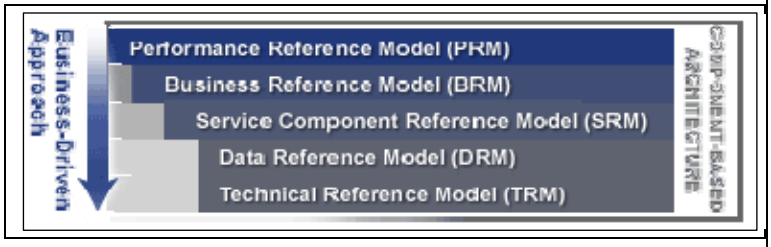

Figure 5.2.6 Federal Enterprise Architecture Components

The FEA is currently a collection of reference models that develop a common taxonomy and ontology for describing IT resources. These include the Performance Reference Model, the Business Reference Model, the Service Component Reference Model, the Data Reference Model and the Technical Reference Model.

5.2.6.1 Business Reference Model

The Business Reference Model is a function-driven framework for describing the business operations of the Federal Government independent of the agencies that perform them.

The Business Reference Model provides an organized, hierarchical construct for describing the day-to-day business operations of the Federal government using a functionally driven approach. The BRM is the first layer of the Federal Enterprise Architecture and it is the main viewpoint for the analysis of data, service components and technology.

The BRM is broken down into four "business areas", each with multiple "Line of Business" activities that are associated with a particular "business area." *Figure 5.2.6.1-1, Federal Reference Model Components*, seen below, are the current business areas and lines of business established by the Office of Management and Budget in ,the *FEA Consolidated Reference Model Document (Version 2.3*).

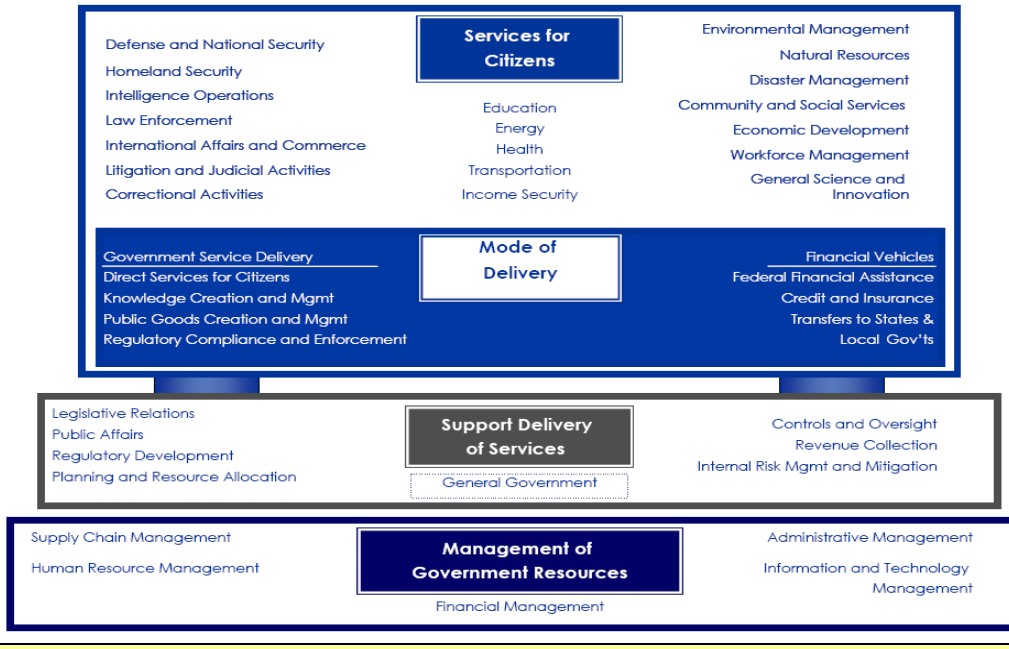

Figure 5.2.6.1-1, Federal Business Reference Model Components

The initial details of the business operations at NTSB have now been captured using the Federal Business Reference Model and are stored in the Enterprise Architecture repository. Figure 5.2.6.1-2 provides a summary representation of the core business areas and the service areas (which correspond with the Services for Citizens and Mode of Delivery components in the Federal BRM), along with the management business areas (which corresponds to the Support Delivery of Services component in the Federal BRM), and enabling business areas (which corresponds to the Management of Government Resources component in the Federal BRM).

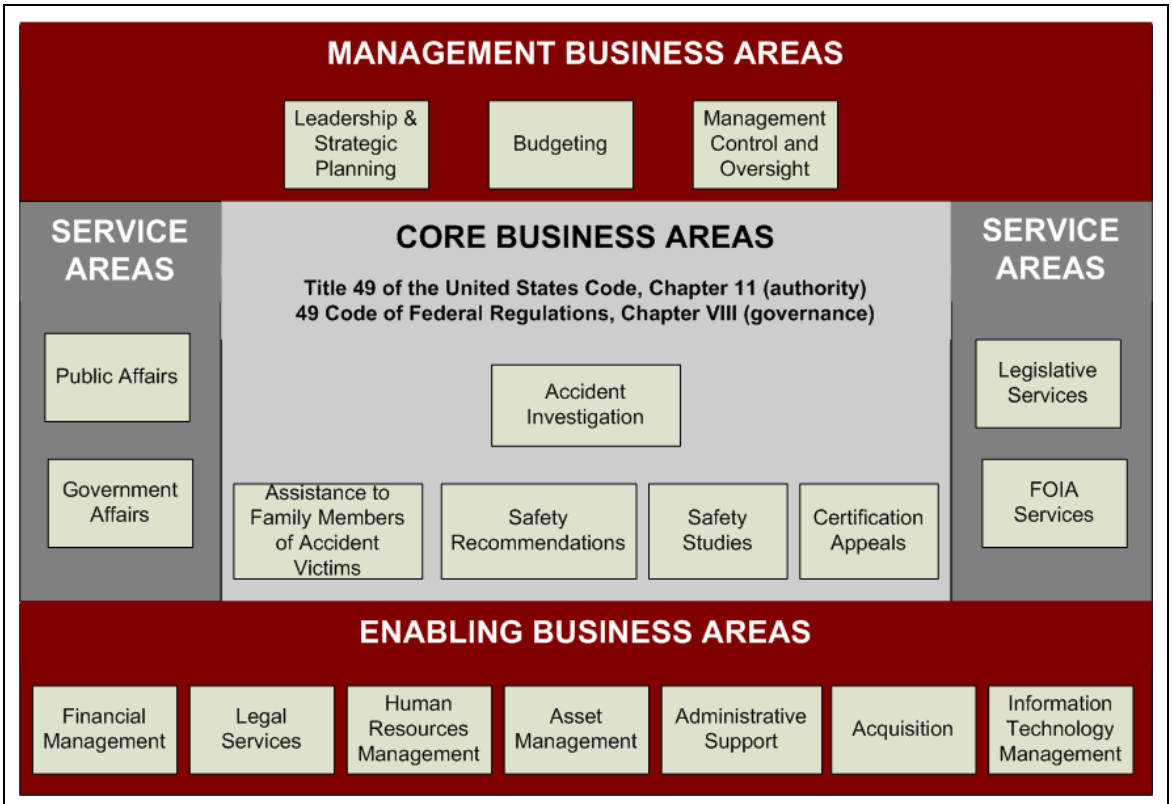

Figure 5.2.6.1-2, NTSB Business Reference Model Components

Additionally, the initial identification of the Business Areas and Lines of Business, as provided in the *FEA Consolidated Reference Model Document (Version 2.3*) that are appropriate to NTSB's activities.

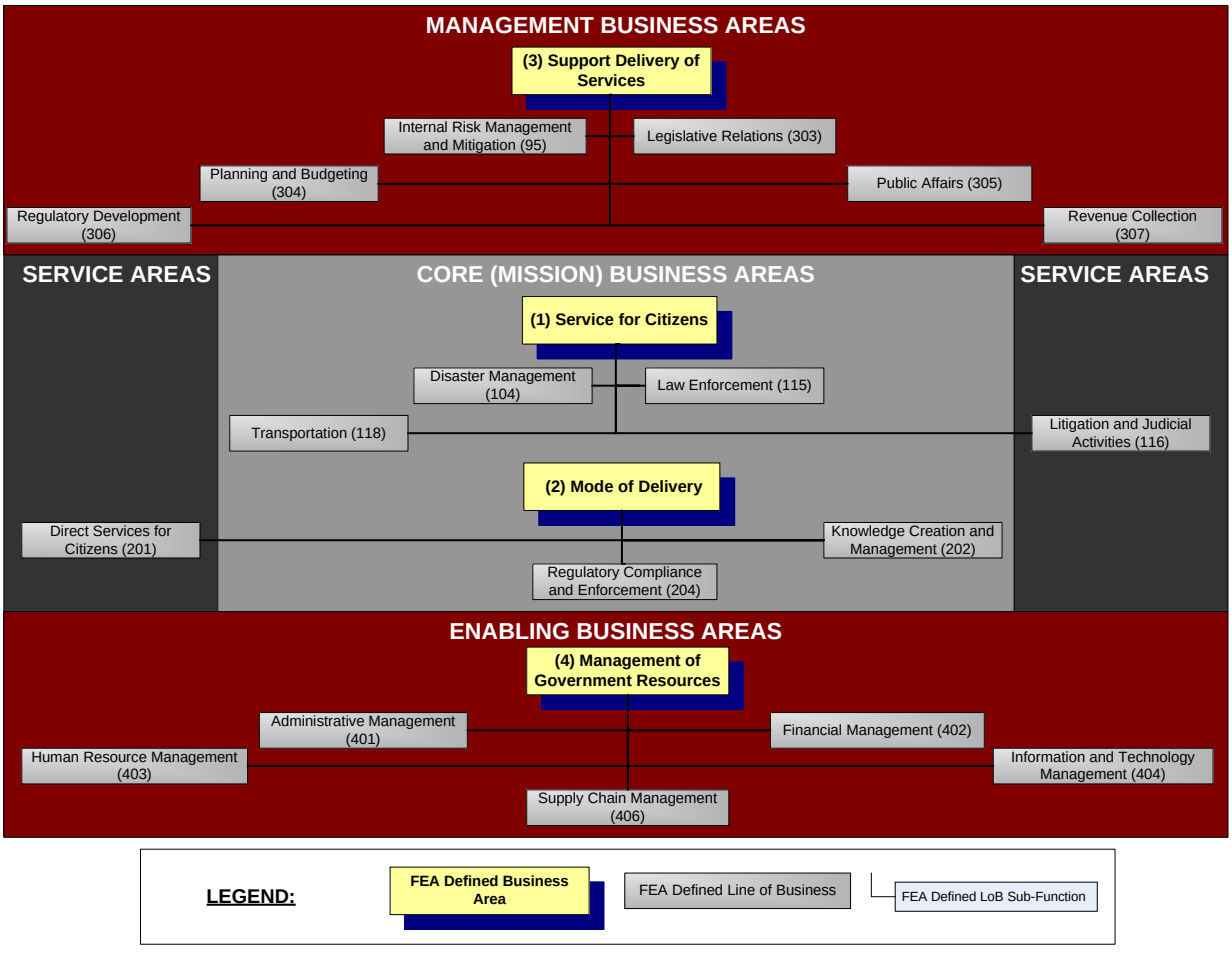

Figure 5.2.6.1-3, FEA Business Areas and Lines of Business's aligned to NTSB's Activities

5.2.6.2 Performance Reference Model

The PRM is a standardized framework to measure the performance of major IT investments and their contribution to program performance. The PRM has three main purposes:

- Help produce enhanced performance information to improve strategic and daily decision-making;
- Improve the alignment — and better articulate the contribution of — inputs to outputs and outcomes, thereby creating a clear "line of sight" to desired results; and
- Identify performance improvement opportunities that span traditional organizational structures and boundaries

The PRM uses a number of existing approaches to performance measurement, including the Balanced Scorecard, Baldrige Criteria, Value Measurement Methodology, program logic models, the value chain, and the Theory of Constraints. In addition, the PRM was informed by what agencies are currently measuring through PART assessments, GPRA, Enterprise architecture,

and Capital Planning and Investment Control. The PRM is currently composed of four measurement areas:

- Mission and Business Results
- Customer Results
- Processes and Activities
- Technology

5.2.6.3 Service Component Reference Model

The Service Component Reference Model (SRM) is a business and performance-driven, functional framework that classifies Service Components with respect to how they support business and/or performance objectives.

The SRM is intended for use to support the discovery of government-wide business and application Service Components in IT investments and assets. The SRM is structured across horizontal and vertical service domains that, independent of the business functions, can provide a leverage-able foundation to support the reuse of applications, application capabilities, components, and business services.

A high level summary of the structure and hierarchy of the SRM is pictured below in *Figure 5.2.6.3-1, FEA Service Component Reference Model Domains and Service Types.*

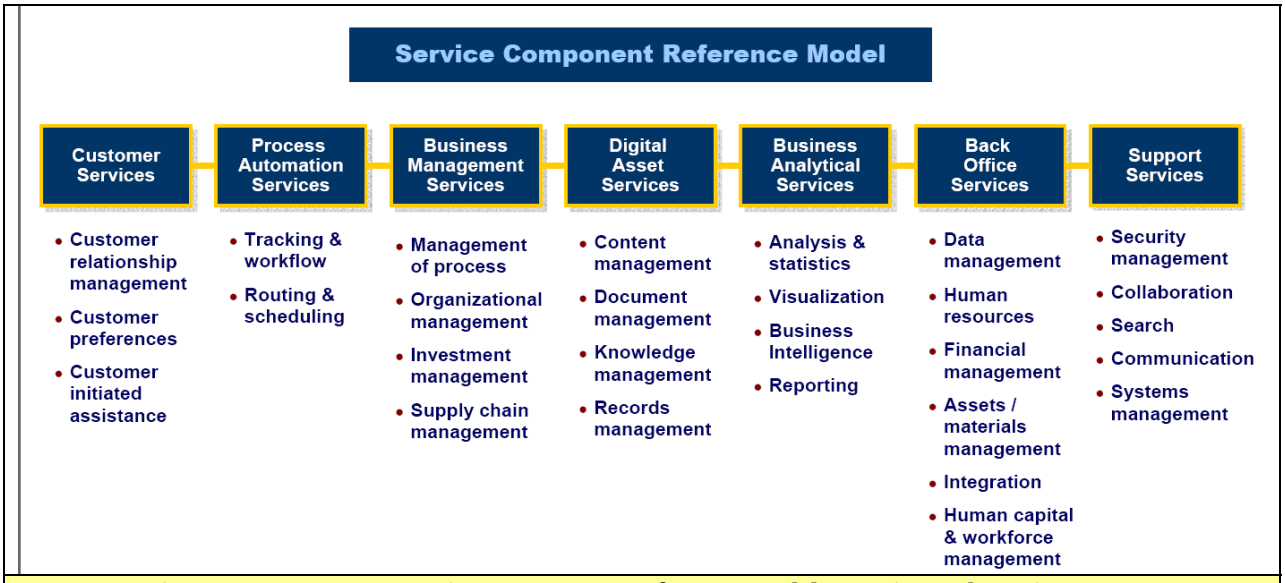

Figure 5.2.6.3-1, FEA Service Component Reference Model Domains and Service Types

5.2.6.4 Technical Reference Model

The TRM is a component-driven, technical framework used to categorize the standards, specifications, and technologies that support and enable the delivery of service components and capabilities.

The Technical Reference Model provides a foundation to categorize the standards, specifications, and technologies to support the construction, delivery, and exchange of business and application components (Service Components) that may be used and leveraged in a Component-Based or Service-Oriented Architecture. The TRM unifies existing Agency TRMs and E-Gov guidance by providing a foundation to advance the re-use of technology and component services from a government-wide perspective.

The Service Areas in the TRM can be seen below in *Figure 5.2.6.4-1, FEA Technical Reference Model Service Areas/Components*.

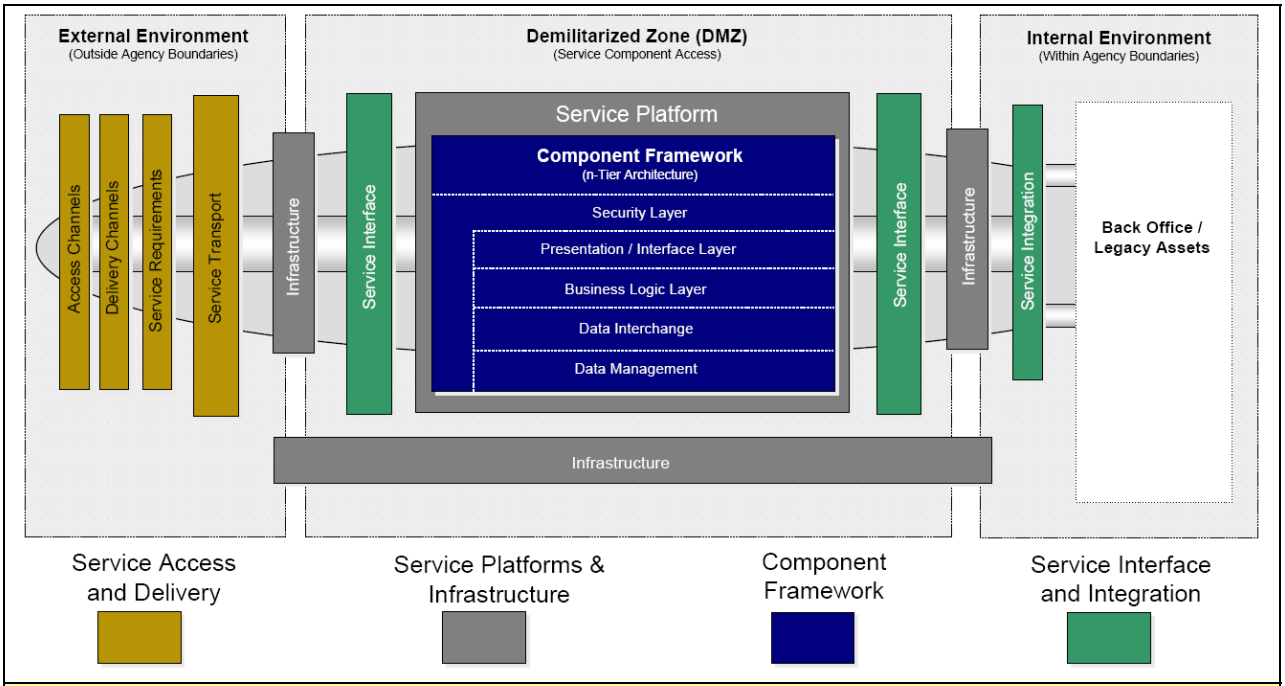

Figure 5.2.6.4-1, FEA Technical Reference Model Service Areas/Components

5.2.6.5 Data Reference Model

The Data Reference Model (DRM) describes, at an aggregate level, the data and information that support government program and business line operations. This model enables agencies to describe the types of interaction and exchanges that occur between the Federal Government and citizens.

The DRM categorizes government information into greater levels of detail. It also establishes a classification for Federal data and identifies duplicative data resources. A common data model will streamline information exchange processes within the Federal government and between government and external stakeholders.

The DRM is the starting point from which data architects should develop modeling standards and concepts. The combined volumes of the DRM support data classification and enable horizontal and vertical information sharing.

5.2.7 Business Process Flow Documentation

The Business Process Flow Documentation Initiative is to do identify and document the key business process used by the various business NTSB business areas. This documentation will to capture business processes so that others can understand how they work, who is involved, and how activities flow from beginning to end. Having this document can then allow NTSB to improve their business processes to reduce inefficiencies, reduce or eliminate manual work, apply automation, drive down costs, and respond faster to customer requests.

Process Mapping	Mission / Admin	Key Process(es) to address
Office of Aviation Safety	Mission	Accident Investigation Management (Principle Issue Mgmt Model for Investigations)
Office of Research & Engineering	Mission	
Office of Railroad, Pipeline, and Hazardous Materials Safety	Mission	
Office of Highway Safety	Mission	Highway Accident Investigation and Report Development
Office of Marine Safety	Mission	
Crosscutting Process	Mission	Accident Report Development (standard practices for all modal offices)
Office of Safety Recommendations and Communications	Mission	Transportation Disaster Assistance
		Safety Recommendations
Office of Administrative Law Judges	Mission	Calendar/Hearings Schedules
Office of Management	Admin	Executive Rollup Dashboard
		Notations
		Mail Control
		Operation Plan Review Process
		Strategic Management Reporting
Office of General Counsel	Admin	Caseload Tracking
		General Correspondence/Suspense Tracking
Government Affairs Director	Admin	Congressional Hearing Process
EEO Director	Admin	
Office of the Chief Financial Officer	Admin	Management Controls (A-123)
Office of the Chief Information Officer	Admin	POAM/FISMA Tracking
		Configuration Management
		Capital Planning and Investment Program
		IT Security Trust Model / Interconnection Agreements
		Information System Development Life Cycle
Office of Administration	Admin	Administrative Services
		Acquisitions Division
		Human Resources Division

Table 5.2.6, Business Process Flow Documentation

5.2.8 IT Security Trust Model (System Interconnections)

The IT Security Trust Model (system interconnections) Initiative is to provide procedures and guidance for planning, establishing, maintaining, and terminating interconnections between information technology (IT) systems which are owned and operated by the National Transportation Safety Board with IT Systems that are owned and operated by an organization(s) external to the NTSB.

5.2.9 "As-Is" Architecture Design

The "As-Is" Architecture Design Initiative is to develop and fully document the National Transportation Safety Board's initial "As-Is" architecture of the technical infrastructure.

5.2.10 "Target State Vision" Architecture Design

The "Target State Vision" Architecture Design Initiative is to develop "Target State Vision" architecture for the NTSB that will be based on standards and alignment with the NTSB Reference Models and Business Process Flow Documentation.

5.2.11 Standards Integration

The Standards Integration Initiative seeks to develop enterprise standards related to the technology, services, products, and data used within the NTSB Enterprise Architecture. As part of the establishment of NTSB's Enterprise Architecture Program during fiscal year 2008, the following "standards" documents were identified for development:

1. Enterprise Architecture Technology Standards & Product Guide; and
2. Enterprise Architecture Data Standards and Guidelines.

Both documents will be drafted by the Enterprise Architecture Program which will then be circulated with the various stakeholders within NTSB as a "Discussion Draft" to review and vet the "standards" and "guidelines" established in these documents.

5.2.11.1 NTSB Enterprise Architecture Technology Standards & Product Guide

The Enterprise Architecture Technology Standards & Product Guide addresses the fundamental components comprising the architecture and focuses on services that maintain a reliable and secure environment. The standards established in this document detail the currently approved architecture and identifies the preferred/approved products (current and target state) used by the National Transportation Safety Board in maintaining and modernizing the NTSB IT systems.

The Enterprise Architecture Technology Standards & Products Guide is for all personnel (including contractors) who are responsible for or involved in the development/maintenance/modernization of NTSB's general support systems and applications (both major and non-major applications) and is intended to assist the reader in applying the relevant standards and products as a system/applications matures through the NTSB Information System Development Life-Cycle.

5.2.11.2 NTSB Enterprise Architecture Data Standards and Guidelines

The National Transportation Safety Board's Enterprise Architecture Data Standards and Guidelines (EADSG) document will define data standards for the development and modification of the data models, as well as the nomenclature, format, and/or schema for entity/classes, tables, attributes, columns, definitions, and other metadata. Additionally, the EASDG also establishes a required level for the correctness, consistency, and completeness of the data elements and data models.

5.3 Transition Projects

The following provides descriptions of the transition projects that currently are in process or planned by NTSB:

5.3.1 Internet Protocol Version 6 (IPV6)

OMB has directed federal agencies to implement Internet Protocol Version 6 (IPv6) within its core network backbone infrastructure by June 2008. To successfully fulfill the requirements of OMB Memorandum 05-22 NTSB must exchanged IPv6 traffic across the network core and with an external partner.

The National Transportation Safety Board has defined that the Ethernet LAN located in the Washington DC Office as the Agency "core network" for the purpose of the IPv6 demonstrations.

NTSB successfully completed the demonstration test on June 26, 2008 with external partner, Verizon Business, and proved the ability to exchange IPv6 traffic across the network core and with an external partner.

5.3.2 Federal Desktop Core Configuration (FDCC)

OMB Memorandum's 07-11 and 08-22 directed all federal agencies to implement a Commonly Accepted Security Configurations for Windows Operating Systems. The Federal Desktop Core Configuration (FDCC) establishes a common security configuration for the WindowsXP and Vista desktop operating systems and establishes a governance structure to ensure a very small number of secure configurations are allowed to be used.

5.3.3 Trusted Internet Connections (TIC)

OMB Memorandum 08-05 has directed federal agencies to implement a Trusted Internet Connections (TIC) to optimize individual network services into a common solution for the federal government. This common solution facilitates the reduction of our external connections, including our Internet points of presence, to a target of fifty. Additionally, the role of the US-CERT will be enhanced to improve our response capabilities.

The National Transportation Safety Board will be implementing the TIC as part of the General Services Administration (GSA) award of the NETWORX contract for telecommunications service.

5.3.4 Domain Name System Security (DNSSEC)

OMB Memorandum 08-23 has directed federal agencies to secure their Domain Name System Infrastructure by deploying Domain Name System Security (DNSSEC) to all federal information systems by December 2009. DNSSEC provides cryptographic protections to DNS communication exchanges, thereby removing threats of DNS-based attacks and improving the overall integrity and authenticity of information processed over the Internet.

Per the OMB Memorandum, The National Transportation Safety Board will establish a POA&M entry for management oversight and tracking of the project's progress. Additionally, NTSB will develop a specific DNSSEC Deployment Plan to secure the "ntsb.gov" domain.

5.3.5 Open Government/Data.gov

OMB Memorandum M10-06, Open Government Directive, established specific actions to implement the principles of transparency, participation, and collaboration set forth in the President's Memorandum on Transparency and Open Government.

As a priority Open Government Initiative for President Obama's administration, Data.gov increases the ability of the public to easily find, download, and use datasets that are generated and held by the Federal Government. Data.gov provides descriptions of the Federal datasets (metadata), information about how to access the datasets, and tools that leverage government datasets. The data catalogs will continue to grow as datasets are added. Federal, Executive Branch data are included in the first version of Data.gov.

NTSB published the query and extract tools for high valued data sets by the deadline established by the OMB Open Government Directive and has continued to participate in the Open Government Initiative by submitting additional data sets to the Data.Gov collection and is on track to make changes to the safety recommendation repositories so that they can be more readily accessible to the public.

5.4 Transition Programs

At the current time, the National Transportation Safety Board has not defined any Transition Programs.

6.0 Transition Sequencing Plan

The National Transportation Safety Board's Transition Strategy maps the dependencies between transition initiatives, projects, and programs so the effects of budget decisions or slipping schedules can be quickly assessed for impacts on performance milestones and plans to achieve its Target State Vision.

NTSB's technology transition initiatives, projects, and programs where defined in the previous section. This section of the transition strategy subdivides transition activities to show the dependencies between activities to understand what activities are dependent upon the completion of tasks for another activity. This sequencing plan provides a NTSB-wide view of initiatives, projects, and programs across the agency, giving NTSB's leadership the visibility to use NTSB's Enterprise Architecture for NTSB-wide planning. This enables high-level impact assessment of investment decisions and programmatic changes on NTSB's overall plans for moving toward NTSB's target state vision. The plan is used to quickly assess the impacts of budget cuts, cancelled or delayed projects, or changes to program priorities. The effects of those changes on other projects and programs are then identified and dealt with as needed.

6.1 Transition Prioritization / Dependencies

The following table provides the prioritization and dependencies for each of the NTSB Enterprise Architecture transition initiatives, projects, and programs:

Identifier	Activity	Priority	Dependencies
FY08-1	Enterprise Architecture Program Framework and Governance	1	• None
FY08-2	Enterprise Architecture Transition Roadmap	1	• Enterprise Architecture Program Framework and Governance
FY08-3	IT Capital Planning (CPIC)	2	• None
FY08-4	Configuration Management Program/Process	2	• Enterprise Architecture Transition Roadmap
FY08-5	Information System Development Life Cycle Model (ISDLC)	2	• IT Capital Planning (CPIC)
FY08-6	Business Reference Model	2	• None
FY08-7	Performance Reference Model	3	• Business Reference Model
FY08-8	Service Component Reference Model	4	• Performance Reference Model
FY08-9	Technical Reference Model	5	• Service Component Reference Model
FY08-10	Data Reference Model	6	• Technical Reference Model
FY08-11	Business Process Flow Documentation	7	• Business Reference Model • Performance Reference Model • Service Component Reference Model

Identifier	Activity	Priority	Dependencies
FY08-12	IT Security Trust Model	8	• Enterprise Architecture Program Framework and Governance • IT Capital Planning (CPIC) • Configuration Management Program/Process • Information System Development Life Cycle Model (ISDLC)
FY08-13	"As-Is" Architecture Design	9	• Configuration Management Program/Process • Business Reference Model • Performance Reference Model • Service Component Reference Model • Technical Reference Model
FY08-14	"Target State Vision" Architecture Design	10	• Business Reference Model • Performance Reference Model • Service Component Reference Model • Technical Reference Model • "As-Is" Architecture Design
FY08-15	Standards Integration	11	• Service Component Reference Model • Technical Reference Model
FY08-PRJ1	Internet Protocol Version 6 (IPV6)	1	• External - Verizon
FY08-PRJ2	Federal Desktop Core Configuration (FDCC)	2	•
FY08-PRJ3	Trusted Internet Connections (TIC)	3	• NETWORX contract modifications regarding TIC providers
FY08-PRJ4	Domain Name System Security (DNSSEC)	4	•
FY10-PRJ1	Open Government/Data.gov	1	•

Table 6.1, Transition Prioritization / Dependencies

6.2 Transition Start/End Dates

The following table provides the transition start/end dates for each of the NTSB Enterprise Architecture transition initiatives, projects, and programs, with its appropriate Life Cycle stage where appropriate:

Activity	Life Cycle Stage	Start Date	End Date
Enterprise Architecture Program Framework and Governance	Deployment Phase	January 2008	6/30/2008
Enterprise Architecture Transition Roadmap	Operations & Maintenance Phase	January 2008	On Going
IT Capital Planning (CPIC)	Deployment Phase	March 2008	6/30/2008
Configuration Management Program/Process	Test Phase	January 2008	9/30/2008
Information System Development Life Cycle Model (ISDLC)	Design Phase	March 2008	6/30/2008
Business Reference Model	Operations & Maintenance Phase	January 2008	9/30/2008

Activity	Life Cycle Stage	Start Date	End Date
Performance Reference Model	Design Phase	January 2008	9/30/2009
Service Component Reference Model	Requirements Phase	January 2008	9/30/2008
Technical Reference Model	Requirements Phase	January 2008	9/30/2009
Data Reference Model	Requirements Phase	January 2008	9/30/2009
Business Process Flow Documentation	Requirements Phase	January 2008	9/30/2008
IT Security Trust Model	Requirements Phase	June 2008	9/30/2008
"As-Is" Architecture Design	Initiation Phase	June 2008	9/30/2009
"Target State Vision" Architecture Design	Initiation Phase	June 2008	9/30/2009
Standards Integration			
• Enterprise Architecture Technology Standards & Product Guide	Design Phase	July 2008	9/30/2009
• Enterprise Architecture Data Standards and Guidelines	Design Phase	July 2008	9/30/2009
Internet Protocol Version 6 (IPV6)	Test Phase	January 2008	6/30/2009
Federal Desktop Core Configuration (FDCC)	Requirements Phase	January 2008	9/30/2009
Trusted Internet Connections (TIC)	Design Phase	January 2008	9/30/2009
Domain Name System Security (DNSSEC)	Requirements Phase	September 2008	12/31/2009
Open Government/Data.gov	Operations & Maintenance Phase (initial effort)	June 2009	1/20/2010

Table 6.2, Transition Start/End Dates

6.3 Transition Milestones

The National Transportation Safety Board's transition initiatives, projects, and programs have defined specific implementation milestones throughout the course of their respective life cycles. Implementation milestones (associated with specific completion dates) represent:

- Individual stages into which a program or project is divided for monitoring and measurement of work performance.
- A major scheduled event that indicates the completion of a major stage of the initiatives, projects, and programs, leading towards the realization of its Target Architecture.
- Implementation milestones result in performance milestones. Performance milestones are quantifiable metrics that are direct, business and results-oriented outcomes of implementation efforts - thereby rationalizing the need/purpose of implementation milestones and defining measurable performance improvements.

The following table defines the milestones for the NTSB transition initiatives, projects, and programs providing measurement indicators, fiscal year of milestones, baselines, planned improvements, and actual results/completion dates:

Milestone Area	Measurement Category	Fiscal Year	Measurement Indicator	Baseline	Planned Improvement	Actual Results / Completion Dates
Enterprise Architecture Program Framework and Governance						
Processes and Activities	Policy & Compliance	FY08	Draft Enterprise Architecture Program charter and Governance Framework	N/A		Draft EA Charter developed on 2/29/2008 Draft EA Governance Framework developed on 3/18/.2008
Implementation	Policy & Compliance	FY08	Publish Formal Enterprise Architecture Program charter and Governance Framework	N/A		EA Charter finalized and approved 3/10/2008
Enterprise Architecture Transition Roadmap						
Processes and Activities	Knowledge Management	FY08	Publish Version 1.0 of Transition Roadmap to provide introduction to NTSB personnel to the EA Program	N/A		Draft delivered on 4/24/2008 Version 1.0 Finalized on 5/15/2008
Processes and Activities	Innovation and Improvement	FY08	Publish Version 2.0 of Transition Roadmap to include transition strategy, activities, and sequencing information	N/A		Draft delivered on 6/24/2008 Version 2.0 Finalized on 6/30/2008

Milestone Area	Measurement Category	Fiscal Year	Measurement Indicator	Baseline	Planned Improvement	Actual Results / Completion Dates
Performance	Quality	FY09	Review FY08 Milestones and determine performance in meeting established milestones.	Achieve at least a 50% completion of Milestone goals.	Revise and development better milestone categories, indicators, and baselines.	
IT Capital Planning (CPIC)						
Processes and Activities	Knowledge Management	FY07	Publish information about CPIC	N/A		August 2007, the framework for CPIC was published in the IT Strategic Plan
Implementation	Policy & Compliance	FY08	Publish CPIC policy, procedures, and submission package	N/A	Update CPIC Submission package to include ISDLC Tailoring information and Enterprise Architecture Blueprint	Draft CPIC Policy and Governance framework drafted and provide to CIO for review and publication on June 19, 2008
Performance	Participation	FY08	Utilize new CPIC policy, procedures and submission package for FY09 CIO budget development.	50% of all IT projects utilize the new CPIC process	100% of all IT projects utilize the CPIC process in 2009.	
Processes and Activities	Innovation and Improvement	FY09	Revise CPIC Submission package for FY09 and incorporate improvements	N/A		
Configuration Management Program/Process						
Processes and Activities	Innovation and Improvement	FY08	Publish CM Plan and procedures	N/A		Version 1.3 of the NTSB CMP was published on April 10, 2008 , revised in 2009
Technology	Functionality	FY10	Implement CMP Workflow using the HEAT system. Incorporate MS TFS methodology.			HEAT manages the service calls (2009), Projects are transitioning to MS Project Server in 2010. To-Be: Align with MS Team Foundation Server in 2010.
Processes and Activities	Quality	FY10	Evaluate use of, compliance with, issues with CMP to make process improvements	N/A		
Information System Development Life Cycle Model (ISDLC)						
Processes and Activities	Innovation and Improvement	FY08	Publish ISDLC policy and guidance documents	N/A		• Draft ISDLC policy developed in April 2008 and revised and published in June 2008 • Life Cycle process guidance documents and deliverables checklist published in 2009

Milestone Area	Measurement Category	Fiscal Year	Measurement Indicator	Baseline	Planned Improvement	Actual Results / Completion Dates
Implementation	Policy & Compliance	FY10	Implementation of the ISDLC by NTSB development projects	• 100% of new development project stated in FY10 utilize the ISDLC • 25% of exisiting development projects migrate to ISDLC		
Implementation	Policy & Compliance	FY12	Implementation of the revised ISDLC (Project Server and TFS) by NTSB development projects	• 100% of new development project stated in FY12 utilize the revised ISDLC • 25% of exisiting development projects migrate to revised ISDLC		
Business Reference Model						
Processes and Activities	Policy & Compliance	FY08	Develop NTSB specific Business reference model	NA		NTSB specific reference model developed on June 4, 2008
Performance Reference Model						
Processes and Activities	Policy & Compliance	FY08	Develop basic Performance Reference model for NTSB based on the FEA Performance Reference Model	N/A		NTSB basic performance reference model drafted on June 4, 2008
Processes and Activities	Participation	FY09	Coordinate with business owners and collect generic performance data using the basic performance reference model for NTSB to establish specific NTSB performance measures.	N/A		
Implementation	Quality	FY11	Implement performance measurement system.	N/A		
Service Component Reference Model						
Processes and Activities	Policy & Compliance	FY08	Develop basic Service component reference model	N/A		

Milestone Area	Measurement Category	Fiscal Year	Measurement Indicator	Baseline	Planned Improvement	Actual Results / Completion Dates
Processes and Activities	Participation	FY08	Develop NTSB specific / customized service component reference model and segment architecture components	N/A		
Technical Reference Model						
Processes and Activities	Policy & Compliance	FY08	Began developing NTSB Technical reference model	N/A		
Data Reference Model						
Processes and Activities	Policy & Compliance	FY08	Began to establish, document, and normalize a NTSB Data reference model	N/A		Documented and published raw data sets and tools in Data.Gov in FY10.
Business Process Flow Documentation						
Processes and Activities	Knowledge Management	FY08	Identify key business processes in all NTSB business areas to be documented	N/A		
Processes and Activities	Participation	FY10	Develop process models with appropriate business owners	N/A		Completed As-Is process model of the Congressional Hearings Process in 1Q 2010. Initiated procurement action to map out the To-Be process model for Electronic Appeals 3Q 2010.
Processes and Activities	Innovation and Improvement	FY08-09	Please see Section 6.3.1 for specific details for each identified business process.			
IT Security Trust Model						
Processes and Activities	Policy & Compliance	FY08	Publish IT Security Trust Model procedures and guidance documents.	N/A		Draft IT Security Trust Model procedures and guidance document developed on 6/17/2008
Implementation	Policy & Compliance	FY09	External system connections documented.	100% of applicable IT systems have implemented requirements of the IT Security Trust Model for external system connections.		
"As-Is" Architecture Design						
Processes and Activities	Innovation and Improvement	FY08	Develop template for documenting the NTSB "As-Is" Architecture	N/A		
"Target State Vision" Architecture Design						
Processes and Activities	Innovation and Improvement	FY08	Develop template for the documentation of the NTSB "Target State Vision" and/or standard technology and products guide	N/A		
Standards Integration						

Milestone Area	Measurement Category	Fiscal Year	Measurement Indicator	Baseline	Planned Improvement	Actual Results / Completion Dates
Processes and Activities	Policy & Compliance	FY08	Develop the Enterprise Architecture Technology Standards & Product Guide & the Enterprise Architecture Data Standards and Guidelines documents	NA		Follow on action: Built and populated the desktop software standard products (core image sets, specific targeted installations, provisional products) in conjunction with the new FDCC laptop rollout in FY 2010.
Processes and Activities	Participation	FY09	Stakeholder review and comments on draft documents	N/A		Facilitated desktop application product approval via the CCB review process (FY2010).
Implementation	Policy & Compliance	FY09	Publish Version 1.0 of the standards documents	N/A		Working copy of the standard desktop software list is published and available for viewing via SharePoint.
Internet Protocol Version 6 (IPV6)						
Processes and Activities	Compliance	FY08	Publish Project Plan for implementation of IPV6 and define core network	NA		
Technology	Functionality	FY08	Complete and document exchange of IPv6 traffic across the network core and with an external partner	N/A		
Technology	Technology Improvement	FY09	Develop plan for expanding IPV6 capability from core network to remaining NTSB network segments.	N/A		
Federal Desktop Core Configuration (FDCC)						
Processes and Activities	Compliance	FY08	Adopt FDCC as the standard install / configuration for NTSB workstations and laptops	N/A	Formal documentation of the FDCC as a transition project in FY09	The FDCC concept for a standard install / configuration for workstations and laptops was adopted by NTSB
Technology		FY08	Deploy FDCC to NTSB workstations and laptops	0% of system compliant with FDCC	FY09 – achieve at least 25% of NTSB workstations and laptops compliant with FDCC.	The FDCC standard has been adopted by NTSB, deployment is nearly completed in conjunction with the rollout of new laptops agency wide (FY2010).
Technology	Standards Compliance and Deviations	FY08	Provide FDCC deviations report/information to NIST	N/A		Deviation report submitted in March 2008
Trusted Internet Connections (TIC)						
Processes and Activities	Compliance	FY08	Publish project plan for implementation of the TIC	N/A		Project Plan developed in June 2008
Technology	Technology Improvement	FY09	Implementation of the TIC	N/A		
Domain Name System Security (DNSSEC)						
Processes and Activities	Compliance	FY08		NA		
Processes and Activities	Innovation and Improvement	FY09		N/A		
Technology	Technology Improvement	FY09		N/A		
Open Government Initiative						

Milestone Area	Measurement Category	Fiscal Year	Measurement Indicator	Baseline	Planned Improvement	Actual Results / Completion Dates
Processes and Activities	Compliance	FY10	Publish Open Government Plan	N/A		Draft plan is ready to be published pending management review (2010)
Technology	Functionality	FY10	Complete changes to database query to allow data extract	N/A		Query tools for the Aviation accident data base have been modified to allow for data extract and download (2010).
Technology	Technology Improvement	FY10	Post Data sets (tools) to Data.gov	N/A		22 raw data sets , query and extract tools have been published in Data.gov in 2010.
Technology	Technology Improvement	FY11	Post Data sets (tools) to Data.gov's new platform (Socrata)	N/A		Primary aviation accident data set published in the new Data.gov platform in 2011.

Table 6.3, Transition Milestones

6.3.1 Business Process Flow Documentation Transition Milestones

Several business processes have been identified and are in various stages of completion. Initial prototypes for eleven processes have been completed within a development version of Microsoft SharePoint platform augmented with CorasWorks. Implementation of the prototypes will be managed in phases; the initial three have been approved to enter the final development/test stages and implemented for production. The schedule for these prototypes is included in the table below.

Process Mapping	Mission / Admin	Key Process(es) to address	Documentation	Priority		Status	Target Dates
Office of Aviation Safety	Mission	Accident Investigation Management (Principle Issue Mgmt Model for Investigations)	Process Flow and Pilot			Initial model completed ready to be validated in Pilot Program	Process Flow: FY08 Pilot: FY08-09
Office of Research & Engineering	Mission						Process Flow: TBD Prototype: TBD Implementation: TBD
Office of Railroad, Pipeline, and Hazardous Materials Safety	Mission						Process Flow: TBD Prototype: TBD Implementation: TBD
Office of Highway Safety	Mission	Highway Accident Investigation and Report Development	Process Flow			Initial process flow completed	Process Flow: TBD Prototype: TBD Implementation: TBD
Office of Marine Safety	Mission						Process Flow: TBD Prototype: TBD Implementation: TBD

Process Mapping	Mission / Admin	Key Process(es) to address	Documentation	Priority		Status	Target Dates
Crosscutting Process	Mission	Accident Report Development (standard practices for all modal offices)	Process Flow & Prototype			Working group being formed	Process Flow: TBD Prototype: TBD Implementation: TBD
		Photo Editing and Management				Photo Task Force formed in 2010 charged with examining the processes of handling photos in conjunction with investigations and making recommendations concerning photo management software tools.	
Office of Communications (Safety Advocacy and Transportation Disaster Assistance)	Mission	Transportation Disaster Assistance	Process Flow & Prototype			Initial process flow completed	Process Flow: FY08-Q2 Prototype: TBD Implementation: TBD
		Safety Recommendations	Process Flow & Prototype			Initial process flow completed	Process Flow: FY08-Q2 Prototype: TBD Implementation: TBD
Office of Administrative Law Judges	Mission	Calendar/Hearings Schedules	Process Flow & Prototype			Initial process flow completed	Process Flow: FY08-Q2 Prototype: TBD Implementation: TBD
		Electronic Appeals	SOW			SOW submitted for assistance with requirements definition, market survey, and to create the initial process flow FY2010-Q4)	Process Flow: TBD Prototype: TBD Implementation: TBD
Office of Management	Admin	Executive Rollup Dashboard	Process Flow & Prototype	1	D	Initial process flow completed	Process Flow: FY08-Q2 Prototype: 2010-1Q Implementation: 2010-4Q
		Notations	Process Flow & Prototype		A	Initial process flow completed	Process Flow: FY08-Q2 Prototype: 2010-1Q Implementation: 2010-4Q
		Mail Control	Process Flow & Prototype		A	Initial process flow completed	Process Flow: FY08-Q2 Prototype: 2010-1Q Implementation: 2010-4Q
		Operation Plan Review Process	Process Flow & Prototype		B	Initial process flow completed	Process Flow: FY08-Q2 Prototype: TBD Implementation: TBD

Process Mapping	Mission / Admin	Key Process(es) to address	Documentation	Priority		Status	Target Dates
		Strategic Management Reporting	Process Flow & Prototype		C	Initial process flow completed	Process Flow: FY08-Q2 Prototype: TBD Implementation: TBD
Office of General Counsel	Admin	Caseload Tracking	Process Flow & Prototype			Initial As-Is and To-Be Process Flows completed	Process Flow: 2011 Prototype: TBD Implementation: TBD
		General Correspondence/Suspense Tracking	Process Flow & Prototype				Process Flow: TBD Prototype: TBD Implementation: TBD
Office of Communications - Government Affairs	Admin	Congressional Hearings Process	Process Flow			Initial Process Flow completed	Process Flow: 2010-Q1 Prototype: TBD Implementation: TBD
EEO Director	Admin						Process Flow: TBD Prototype: TBD Implementation: TBD
Office of the Chief Financial Officer	Admin	Management Controls (A-123)	Process Flow & Prototype			Initial process flow completed	Process Flow: FY08-Q2 Prototype: TBD Implementation: TBD
Office of the Chief Information Officer	Admin	POAM/FISMA Tracking	Process Flow & Prototype			Initial process flow completed	Process Flow: FY08-Q2 Prototype: TBD Implementation: TBD
Office of Administration	Admin	Performance Evaluation	Prototype			Implemented 2010	Process Flow: Prototype: 2010 Implementation: 2010
		Facilities Request Tracking	Prototype			Implemented HEAT instance for Facilities Requests in 2010	Process Flow: Prototype: 2010 Implementation: 2010

Table 6.3.1, Business Process Flow Documentation Transition Milestones

7.0 Review of Prior Fiscal Year Accomplishments

The purpose of this section is to review the milestones and accomplishments that were outlined in the Transition Roadmap for the prior fiscal year.

Identifier	Activity	Planned Status	Actual Status
FY08-1	Enterprise Architecture Program Framework and Governance	**Completed**	**Completed**
FY08-2	Enterprise Architecture Transition Roadmap	**In Progress**	**In Progress**
FY08-3	IT Capital Planning (CPIC)	**Completed**	**Completed**
FY08-4	Configuration Management Program/Process	**Completed**	**Completed**
FY08-5	Information System Development Life Cycle Model (ISDLC)	**Completed**	**Completed**
FY08-6	Business Reference Model	**Completed**	**Completed**
FY08-7	Performance Reference Model	**In Progress**	**In Progress**
FY08-8	Service Component Reference Model	**Completed**	**Completed**
FY08-9	Technical Reference Model	**In Progress**	**In Progress**
FY08-10	Data Reference Model	**In Progress**	**In Progress**
FY08-11	Business Process Flow Documentation	**Completed**	**In Progress**
FY08-12	IT Security Trust Model	**In Progress**	**In Progress**
FY08-13	"As-Is" Architecture Design	**In Progress**	**In Progress**
FY08-14	"Target State Vision" Architecture Design	**In Progress**	**In Progress**
FY08-15	Standards Integration	**In Progress**	**In Progress**
FY08-PRJ1	Internet Protocol Version 6 (IPV6)	**In Progress**	**In Progress**
FY08-PRJ2	Federal Desktop Core Configuration (FDCC)	**Completed**	**Completed for new laptops**
FY08-PRJ3	Trusted Internet Connections (TIC)	**In Progress**	**In Progress**
FY08-PRJ4	Domain Name System Security (DNSSEC)	**In Progress**	**In Progress**
FY10-PRJ1	Open Government/Data.gov	**In Progress**	**Initial effort completed** (additional synchronization APIs to be developed in last quarter of 2011)

Table 7.0, Review of Prior Fiscal Year Accomplishments

Appendix A – Acronyms

-A-	
App	Application
-B-	
BRM	Business Reference Model
BY	Budget Year
-C-	
CA	Chief Architect
CCA	Clinger-Cohen Act of 1996
CEA	Chief Enterprise Architect
CFO	Chief Financial Officer
CFY	Current Fiscal Year
CIO	Chief Information Officer
CISO	Chief Information Security Officer
CPIC	Capital Planning and Investment Control
-D-	
DC	District of Columbia
DRM	Data Reference Model
-E-	
EA	Enterprise Architecture
E-Gov	E-Government Act of 2002
-F-	
FEA	Federal Enterprise Architecture
FEAF	Federal Enterprise Architecture Framework
FISMA	Federal Information Security Management Act of 2002
FMFIA	Federal Managers Financial Integrity Act of 1982
FY	Fiscal Year
-G-	
GAO	General Accountability Office
GPEA	Government Paperwork Elimination Act of 1998
GPRA	Government Performance and Results Act of 1993
-H-	
-I-	
Inc.	Incorporated
IP	Internet Protocol
IRM	Information Resource Management

ISDLC	Information System Development Life Cycle (sometimes referred to as SDLC)
IT	Information Technology
ITMRA	Information Technology Management Reform Act

-J-

-K-

-L-

-M-

MBT	Methodology for Business Transformation

-N-

N/A	Not Applicable
NIST	National Institute of Standards and Technology
NTSB	National Transportation Safety Board

-O-

O&M	Operations & Maintenance
OCFO	Office of the Chief Financial Officer
OCIO	Office of the Chief Information Officer
OMB	Office of Management and Budget

-P-

PART	Program Assessment Rating Tool
PFY	Prior Fiscal Year
PMA	President's Management Agenda
POA&M	Plan of Action & Milestones
PRM	Performance Reference Model

-Q-

Qtrly	Quarterly

-R-

RFPs	Request for Proposals

-S-

SDLC	System Development Life Cycle (sometimes referred to as ISDLC)
SP	Special Publication
SW	Southwest

-T-

-U-

-V-

VA	Virginia

-W-

-XYZ-

Appendix B – Glossary

Architecture	Design; the way components fit together. May be conceived of any complex system such as "software architecture" or "network architecture." An IT architecture is a design for the arrangement and interoperation of technical components that together provide an organization its information and communication infrastructure.
Architecture Drivers	The external component of the Federal Enterprise Architecture Framework representing an external stimulus, which causes the enterprise architecture to change. Architecture drivers consist of two sub-components: business and design drivers.
Architecture Review Board	A decision-making body, made up of senior information technology managers and business process owners, that is responsible for making decisions about the design and standards for the Enterprise Architecture.
"As-Is" Architecture	Representation of the cumulative "as- built" or baseline of the existing architecture. The current architecture has two parts: • The current business architecture, which defines the current business needs being met by the current technology. • The current design architecture, which defines the implemented data, applications, and technology used to support the current business needs.
Blueprint	Plan or guide, commonly used in construction, laid out logically and including essential elements to be addressed and followed as building progresses.
Business Case	A structured proposal for business improvement that functions as a decision package for organizational decision-makers. A business case includes an analysis of business process performance and associated needs or problems, proposed alternative solutions, assumptions, constraints, and a risk-adjusted cost-benefit analysis.

Business Drivers	The external component of the organization representing an external stimulus, which causes the enterprise architecture to change. Architecture drivers consist of two sub-components: business and design drivers. - Internal goals and strategies and external trends that influence the business. These are captured in three stages of drivers: • Industry Trends – Emerging trends within the business world that impact how services and information will be provided. • Business Best Practices – Trends and approaches that are most successful at providing services and information over time. • Business Principles – Business practices and approaches the organization chooses to institutionalize in order to better the services and information it provides.
Business Reference Model	One of the five models in the Federal Enterprise Architecture reference model framework, this is a function-driven framework for describing the business operations of the Federal Government independent of the agencies that perform them.
Capital Planning And Investment Control	A management process for ongoing identification, selection, control, and evaluation of investments in information resources. The process is linked to budget formulation and execution and is focused on Agency missions and achieving specific program outcomes. A process to structure budget formulation and execution and to ensure that investments consistently support the strategic goals of the Agency.
Chief Enterprise Architect	The Agency official responsible for leading the program to develop, maintain, govern and evolve the enterprise architecture.
Chief Information Officer	Agency official responsible for: 1) Providing advice and other assistance to the head of the executive agency and other senior management personnel of the agency to ensure that information technology is acquired and information resources are managed in a manner that is consistent with laws, executive orders, directives, policies, regulations, and priorities established by the head of the agency; 2) Developing, maintaining, and facilitating the implementation of a sound and integrated information technology architecture for the agency; and 3) Promoting the effective and efficient design and operation of all major information resources management processes for the agency, including improvements to work processes of the agency.

Chief Information Security Officer	Official responsible for carrying out the Chief Information Officer responsibilities under the Federal Information Security Management Act (FISMA) and serving as the Chief Information Officer's primary liaison to the agency's authorizing officials, information system owners, and information system security officers.
Concept Of Operations	Document describing an organization's structure, roles and responsibilities, processes, and policies that detail the way the organization operates.
Configuration Standards	The policies, standards, and products selected by an organization that enable the organization to leverage common components of the architecture to realize cost savings and accumulate skills and knowledge around the common components.
Control Phase	The objective of the Control Phase is to ensure, through timely oversight, quality control, and executive review, that IT initiatives are conducted in a disciplined, well-managed, and consistent manner. Investments should be closely tracked against the various components identified in the Risk Management Plan developed in the Select Phase. This phase also promotes the delivery of quality products and results in initiatives that are completed within scope, on time, and within budget. During this process, senior managers regularly monitor the progress or performance of ongoing IT investments against projected cost, schedule, performance, and delivered benefits.
Corrective Actions	A document that identifies tasks that need to be accomplished. It details resources required to accomplish the elements of the plan, any milestones in meeting the tasks, and scheduled completion dates for the milestones.
Data Reference Model	Describes, at an aggregate level, the data and information that support government program and business line operations. This model enables agencies to describe the types of interaction and exchanges that occur between the Federal Government and citizens. It is the starting point from which data architects should develop modeling standards and concepts. One of the five models in the Federal Enterprise Architecture reference model framework.
Development, Modernization, Or Enhancement (DME)	An IT initiative funding category depicting IT efforts other than maintenance or "steady state."
Earned Value Management	A systematic approach to the integration and measurement of cost, schedule, and technical (scope) accomplishments on a project or task.

Electronic Government	The use by the Government of web-based Internet applications and other information technologies, combined with processes that implement these technologies, to (a) enhance the access to and delivery of Government information and services to the public, other agencies, and other Government entities; or (b) bring about improvements in Government operations that may include effectiveness, efficiency, service quality, or transformation.
End-Of-Life	Refers to hardware and software that is no longer manufactured or supported. An end-of-life announcement by a vendor stipulates when the manufacturing will end, or if already ended, how far into the future support for the product will be provided.
Enterprise	Represents an organization in total, including all subordinate entities, encompassing corporations, small businesses, non-profit institutions, government bodies, as well as other kinds of organizations. An organization supporting a defined business scope and mission. An enterprise is comprised of interdependent resources (people, organizations, and technology) that should coordinate their functions and share information in support of a common mission (or set of related missions).
Enterprise Architecture	A strategic information asset base, which defines the business, the information necessary to operate the business, the technologies necessary to support the business operations, and the transitional processes necessary for implementing new technologies in response to the changing business needs. It is a representation or blueprint.
Enterprise Architecture Program	Process of defining architectures to use information in support of the business and the plan for implementing those architectures.
Enterprise Architecture Repository	An information system used to store and access architectural information, relationships among the information elements, and work products.
Evaluate Phase	The purpose of the Evaluate Phase is to compare actual to expected results after an investment is fully implemented. This is done to assess the investment's impact on mission performance, identify any investment changes or modifications that may be needed, and revise the investment management process based on lessons learned.
Federal Enterprise Architecture	A business and performance-based framework being constructed through a collection of interrelated "reference models" to support cross-agency collaboration, transformation, and government-wide improvement. It provides OMB and the Federal agencies with a new way of describing, analyzing, and improving the Federal Government and its ability to serve the citizen.

Federal Enterprise Architecture Framework	An organizing mechanism for managing development, maintenance, and facilitated decision making of a Federal EA. The Framework provides a structure for organizing Federal resources and for describing and managing Federal EA activities.
Gap Analysis	The difference between projected outcomes and desired outcomes.
Governance	Governance relates to decisions that define expectations, grant power, or verify performance. It consists of either a separate process or a specific part of management or leadership processes.
Information Owner	Official with statutory or operational authority for specified information and responsibility for establishing the controls for generation, collection, processing, dissemination, and disposal of that information.
Information Resource Management	Includes related resources such as personnel, equipment, funds, and information technology.
Information Systems	An organized collection, processing, transmission, and dissemination of information in accordance with defined procedures, whether automated or manual. Information systems include non-financial, financial, and mixed systems.
Information System Owner	Official responsible for the overall procurement, development, integration, modification, or operation and maintenance of an information system.
Information Technology (IT)	Includes all matters concerned with the furtherance of computer science and technology and with the design, development, installation, and implementation of information systems and applications.
Infrastructure	The basic, fundamental architecture of the system that supports the flow and processing of information and determines how it functions and how flexible it is to meet future requirements.
Integration	The ability to access and exchange critical information electronically at key decision points throughout the enterprise.
IT Investment Review Board	A decision-making body, made up of senior program, financial, and information managers, that is responsible for making decisions about IT projects and systems, based on comparisons and trade-offs between competing projects and an emphasis on meeting mission needs and improving organizational performance.

IT Portfolio	The IT Portfolio refers to investments made by an organization in Information Technology capabilities. Examples of IT portfolios would be planned initiatives, projects, and ongoing IT services (such as application support).
Iterative Process	The basic idea behind iterative enhancement is to develop a software system incrementally, allowing the developer to take advantage of what was being learned during the development of earlier, incremental, deliverable versions of the system. Learning comes from both the development and the use of the system, where possible. Key steps in the process are to start with a simple implementation of a subset of the software requirements and iteratively enhance the evolving sequence of versions until the full system is implemented. At each iteration, design modifications are made and new functional capabilities are added.
Legacy Systems	Those systems in existence and either deployed or under development at the start of a modernization program. All legacy systems will be affected by modernization to a greater or lesser extent. Some systems will become transition systems before they are retired. Other systems will simply be retired as their functions are assumed by modernization systems. Still others will be abandoned when they become obsolete.
Methodology	A documented approach for performing activities in a coherent, consistent, accountable, and repeatable manner. The way in which you find out information; a methodology describes how something will be (or was) done. The methodology includes the methods, procedures, and techniques used to collect and analyze information.
Performance Life Cycle Framework	The integration of management, business, and engineering life cycle processes that span the enterprise to align IT with the business.
Performance Metrics	A measure of the level of performance to be achieved during a period. For example, a standard performance for direct labor of two standard hours to complete a task would be combined with the rate per standard hour for labor, to create the performance metric of the cost for the task.

Performance Reference Model	One of the five models in the Federal Enterprise Architecture reference model framework, it measures the performance of major IT investments and their contribution to program performance. The PRM has three main purposes: • Help produce enhanced performance information to improve strategic and daily decision-making; • Improve the alignment and better articulate the contribution of inputs to outputs and outcomes, thereby creating a clear "line of sight" to desired results; and • Identify performance improvement opportunities that span traditional organizational structures and boundaries.
Plan Of Action And Milestones	A document that identifies tasks that need to be accomplished. It details resources required to accomplish the elements of the plan, any milestones in meeting the tasks, and scheduled completion dates for the milestones.
Post Implementation Review	An evaluation tool that compares the conditions prior to the implementation of a project (as identified in the business case) with the actual results achieved by the project.
Pre-Select	The Pre-Select Phase provides a process to assess a proposed investment's support of the organization's strategic plan and mission. It is during this phase that the business or mission need is identified and relationships to the organization's strategic planning efforts are established. This phase allows project teams to begin the process of defining business requirements and associated system performance metrics, performance measures, benefits, and costs, as well as subsequent completion of a business case and initial project planning efforts in preparation for inclusion in the organization's IT portfolio.
Reference Model	A reference model is a framework for understanding significant relationships among the entities of an environment, and for the development of consistent standards or specifications supporting that environment. A reference model is based on a small number of unifying concepts and may be used as a basis for education and for explaining standards to a non-specialist.
Repository	A store of items that typically are fetched in order to perform some task. Items in a repository (such as a document) would be retrieved in order to be used in their own right. In contrast, data in a database might be used to compute statistics, verify access, or retrieve information associated with a triggering event, rather than serving as an artifact in its own right; however, the distinction is not a hard one.

Select Phase	In the Select Phase, the organization ensures the IT investments that best support the mission and the organization's approach to enterprise architecture are chosen and prepared for success (e.g., have a trained or experienced project manager, risk management, etc.). Investments are also reviewed to ensure that there is no duplication of initiatives or existing system applications. Individual investments are evaluated in terms of technical alignment with other IT systems and projected performance as measured by Cost, Schedule, Benefit, and Risk (CSBR). Milestones and review schedules as part of a work breakdown structure are also established for each investment during the Select Phase.
Service Component Reference Model	One of the five models in the Federal Enterprise Architecture reference model framework, this is a business and performance-driven, functional framework that classifies Service Components with respect to how they support business and/or performance objectives. It is a component-based framework that can provide, independent of business function, a leverage-able foundation for reuse of applications, application capabilities, components, and business services.
Stakeholder	An individual or group with an interest in the success of an organization in delivering intended results and maintaining the viability of the organization's products and services. Stakeholders influence programs, products, and services. Examples include congressional members and staff of relevant appropriations, authorizing, and oversight committees; representatives of central management and oversight entities such as OMB and GAO; and representatives of key interest groups, including those groups that represent the organization's customers and interested members of the public.
Standards	A component of the FEAF. Standards are a set of criteria, voluntary guidelines, and best practices. Some may be mandatory. Examples include: • Application development • Project management • Vendor management • Production operation • User support • Asset management • Technology evaluation • Architecture governance • Configuration management • Problem resolution

Steady State Phase	The Steady State Phase provides the means to assess mature investments, determine their continued effectiveness in supporting mission requirements, evaluate the cost of continued maintenance support, assess technology opportunities, and consider potential retirement or replacement of the investment.
Strategic Plan	The U.S. federal government is in the midst of a massive change in the way it does business. For decades, the primary federal government driver has been the budget. Unfortunately, this may never change. However, in August 1993 Congress passed legislation, signed into law by President Clinton, entitled the Government Performance and Results Act of 1993 (GPRA). This law, which the federal government has been implementing for the past several years, sets the stage for the federal government to be managed and measured in different ways. First, it mandates new documents. Rather than being driven by the budget, the law requires agencies of the federal government to have long-range strategic plans. These plans must encompass at least five years plus the budget year, or a total minimum of six years. The strategic plans are to be driven by the mission of the agency and developed and implemented in consultation with Congress, stakeholders, customers, and employees of the organizations.
System Interconnections	The direct connection of two or more IT systems for the purpose of sharing data and other information resources.
Target State Vision	Representation of a desired future state or “to be built” for the enterprise within the context of the strategic direction. The target architecture consists of two parts: • Target Business Architecture – defines the enterprise future business needs addressed through new or emerging technologies • Target Design Architecture – defines the future designs used to support future business needs
Technical Reference Model	One of the five models in the Federal Enterprise Architecture reference model framework. Provides a foundation to describe the standards, specifications, and technologies to support the construction, delivery, and exchange of business and application components (Service Components) that may be used and leveraged in a Component-Based or Service-Orientated Architecture. The TRM unifies existing Agency TRMs and electronic Government (e-Gov) guidance by providing a foundation to advance the re-use of technology and component services from a Government-wide perspective; i.e., it identifies and describes the information services (e.g., database, communications, Intranet, etc.) used throughout the Agency

Appendix C – NTSB Enterprise Architecture Governance

NTSB's Enterprise Architecture provides a framework that supports the NTSB's mission, strategic plan, lines of business, information technology portfolio (i.e., data, applications, and technologies), security measures, and the inter-relationships among them. It is maintained to provide support for the NTSB's strategic planning, budget formulation and execution, information technology capital planning, information technology acquisition, human capital, and security planning processes.

Additionally, The National Transportation Safety Board's Enterprise Architecture serves as a subcomponent of the Federal Enterprise Architecture (FEA) and is therefore maintained in alignment with Federal Enterprise Architecture and e-Government requirements. As such, for the National Transportation Safety Board's Enterprise Architecture to be consistent with the FEA, the following principles are implemented within the National Transportation Safety Board's Enterprise Architecture:

(1) Develop information systems that facilitate interoperability, application portability, and scalability of electronic applications across networks of heterogeneous hardware, software, and telecommunications platforms;

(2) Meet information technology needs through cost effective intra-agency and interagency sharing, before acquiring new information technology resources; and

(3) Establish a level of security for all information systems that is commensurate to the risk and magnitude of the harm resulting from the loss, misuse, unauthorized access to, or modification of the information stored or flowing through these systems.

The Enterprise Architecture Program shall assist in:

- providing strategic business and architecture consulting services to Offices, Divisions, and program areas;
- improving the connection between stakeholders and investments;
- streamlining the processes and business rules in the program areas;
- minimizing system redundancies;
- improving data integration and data sharing;
- increasing the re-use of IT assets; and
- reducing the total cost of ownership of the National Transportation Safety Board's IT Portfolio.

The National Transportation Safety Board's Enterprise Architecture will consist of the following components:

(1) A Baseline Architecture that describes the current state of the Agency Enterprise Architecture and a Target Architecture that describes its desired future state;

(2) A Life Cycle Management processes, procedures, and/or guidelines that support and implement principles of the National Transportation Safety Board's Enterprise Architecture and are consistent with other federal requirements and guidelines;

(3) Processes and procedures to be followed for National Transportation Safety Board's systems to be interconnected with other government or non-government IT systems;

(4) Guidance, procedures, processes, and requirements for the identification and selection of information and technology services and products for use within the National Transportation Safety Board's Enterprise Architecture;

(5) A configuration standard(s) which the information technology and information systems have to comply with and shall establish the control mechanism for ensuring configuration management of both the systems and the standard(s);

(6) shall develop and align information technology and information system specific planning requirements that shall include, but not necessarily limited to:

- In coordination with the Chief Financial Officer, establish an IT Capital Planning and Investment Control process that is integrated with Enterprise Architecture and Life Cycle Management processes;
- In coordination with the Chief Financial Officer and the Chief Acquisitions Officer, establish requirements for acquisition planning related to information technology and information system to be used by the agency;
- Establish processes to support a consistent method for cost estimation for information technology, information systems, and security controls which would support the agency's enterprise architecture current and target states;

The Chief Enterprise Architect (CEA) is responsible for the following:

(1) Developing, disseminating, and ensuring compliance with NTSB Enterprise Architecture policy, processes, and governance as foundational principles and practices for business and information system development;

(2) Developing the NTSB Enterprise Architecture Program budget; managing NTSB Enterprise Architecture Program resources; Implementing and maintaining the NTSB Enterprise Architecture Repository and related tools;

(3) Ensuring the definition and documentation of NTSB "Baseline" architecture, "Target State Vision" architectures, and transition plans;

(4) Developing and promulgating architectural standards and configuration standards;

(5) Coordinating the documentation of NTSB business processes, NTSB Federal Enterprise Architecture Reference Models;

(6) Providing updated architectural standards for use: when procurement requests are developed, when IT Policy is developed, when IT program managers and business personnel request guidance, and use when advising development efforts of options to mitigate problems; Proposing initiatives to consolidate IT systems with similar functions to reduce redundancies or to automate processes used NTSB-wide or within multiple Offices or Divisions;

(7) Ensuring implementation of the Enterprise Architecture within the Capital Planning and Investment Control (CPIC) processes, System Development Life Cycle (SDLC) standards, Configuration Management (CM) processes, and IT System

Interconnection procedures of the NTSB; implementation of an NTSB Architecture Review Board, and ensuring Enterprise Architecture reviews for projects within the NTSB's procurement and project review cycles;

(8) Ensuring NTSB adherence to Enterprise Architecture performance and compliance mandates, including Enterprise Architecture-related Records Management requirements, of governmental review;