



State of Tennessee

Division of TennCare

TennCare Enterprise Architecture Framework

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Table 1: Enterprise Architecture Framework Standard Version History

| Revision | Description of Change | Author | Date |
|----------|---|--------|-------------------|
| 1.0 | Approved by TARB. | KPMG | August 13, 2020 |
| 1.1 | Replaced SPMO with TAS – Updates Approved by the Architecture Sub-Committee | KPMG | November 22, 2021 |

1. Introduction

1.1. Purpose of This Document

This Enterprise Architecture Framework governs the design, implementation, and operations of an enterprise architecture (EA) capability within TennCare.

This standard will be used by TennCare Information Systems (IS) projects to develop and maintain TennCare technology solutions. It introduces the processes and artifacts to be produced by this architecture capability, both at the enterprise level and within each solution project.

Solution implementation projects are expected to comply with the processes, methods, and specifications of this standard to produce consistent and aligned architectures.

This standard describes:

- How the enterprise architecture capability will be governed
- The processes and methods used to manage the development of enterprise and solution architecture artifacts
- The roles of stakeholders in the enterprise and solution architecture lifecycles
- How the architecture artifacts will be approved through the architecture review process
- The interactions and relationships between the enterprise architecture concepts

This framework governs both the TennCare EA and the solution architectures for TennCare projects.

This standard does not contain any TennCare enterprise architecture artifacts.

1.2. Objective

TennCare will realize the following benefits by using this enterprise architecture framework:

- Streamlined and effective development and management of a holistic enterprise architecture capability
- Achievement of stakeholder agreement on the architecture, including clear and accurate representation of the current state, consensus on the future state, and the respective effective transition from current to future state
- Alignment of solution architectures with TennCare's enterprise architecture to achieve business and technical goals and objectives
- Integration of different architecture perspectives into a coherent set of enterprise blueprints that will drive greater consistency through reuse
- Support of effective change management and impact analysis with well-defined business and system descriptions

- Availability of solution blueprints in an Architecture and Design Repository, supporting the development of solution architectures based on a consistent enterprise architecture through effective blueprint reuse

1.3. Audience of Standard

The intended audience of this standard is:

- TennCare Architecture Review Board (TARB)
- TennCare Chief Technology Officer/Chief Architect
- TennCare architects
- Project teams
- Solution vendors
- Technical Advisory Services (TAS) vendors
- Business Support Services (BSS) vendors

1.4. Compliance of Solutions

Solution vendors will work with the TennCare EA capability to ensure the architecture artifacts they produce can be aligned with this standard and TennCare's Enterprise Architecture. To do so, solution vendors may employ various architecture methods, approaches, and tools.

This standard specifies the artifacts required in the solution architecture (section 6), the software with which it must be compatible (section 3.3), and the reviews that govern it (section 7). TennCare may make variations on these specifications in a Request for Proposal or a vendor contract.

1.5. Sources

This framework has drawn upon the methods and standards defined in The Open Group Architecture Framework (TOGAF).

This framework is aligned with and constrained by the TennCare Solution Implementation Lifecycle Process and other standards developed by TennCare.

The architecture requirements herein are constrained and informed by the Medicaid Information Technology Architecture (MITA) toolkit produced by the Centers for Medicare and Medicaid Services (CMS). Modifications to CMS requirements may cause updates to this standard.

See references in section 1.7.

1.6. Framework Diagram

Figure 1 provides a summary for context of the information and guidance described in this document.

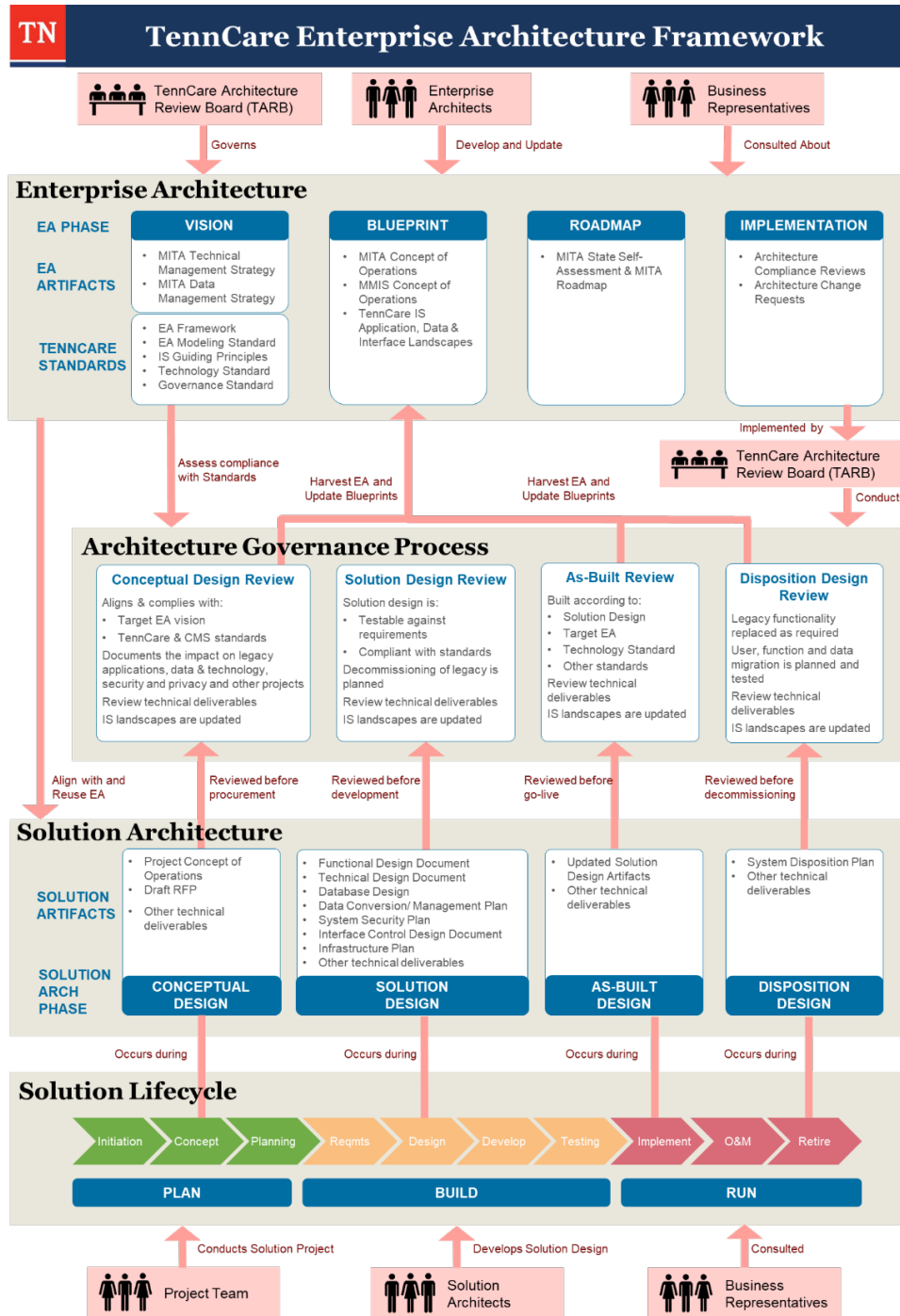


Figure 1: TennCare Enterprise Architecture Framework

1.7. Referenced Documents

This document is interrelated with the other standards and documents in Table 2.

Table 2: Referenced Documents

| # | Document Name | Content Overview |
|----|---|---|
| 1. | TennCare IS Governance Standard | Defines the process and standards for TennCare governance. |
| 2. | TennCare Solution Implementation Lifecycle Standard | Defines the lifecycle phases, gate reviews, and milestone reviews of solution projects at TennCare. Based on the Solution Development Lifecycle methodology as defined by CMS. |
| 3. | TennCare Solution Implementation Lifecycle RACI and Deliverables | Describes the deliverables, required throughout the lifecycle phases. Specifies a RACI chart of which organization roles are responsible, accountable, consulted and informed of the deliverables and activities. |
| 4. | TennCare Requirements Management Standard | Defines how business and technical requirements for solutions are managed at TennCare. |
| 5. | TennCare Enterprise Architecture Modeling Standard | Defines the model artifacts that fulfill this standard's requirements for deliverables. |
| 6. | TennCare Information Security Program Plan (ISPP) | TennCare's enterprise IT security framework. Contains references to additional security standards that apply to TennCare. |
| 7. | NIST Special Publication 800-53A, Assessing Security and Privacy Controls in Federal Information Systems and Organizations – Revision 4 | Reference document for security and privacy control assessments. |
| 8. | CMS – MARS-E 2.0 Catalog of Minimum Acceptable Risk Security and Privacy Controls for Exchanges | An assembled document of MARS-E guidance, requirements, and templates for security at Medicaid agencies. |
| 9. | Medicaid Information Technology Architecture (MITA) 3.0 | A CMS initiative that fosters integrated business and information technology (IT); a basis for TennCare's enterprise architecture. |

| # | Document Name | Content Overview |
|-----|---|---|
| 10. | TOGAF Architecture Development Method (ADM) | <p>An industry-standard cycle, used as the basis for the phases of TennCare Enterprise Architecture.</p> <p>The Open Group is a technology-neutral consortium, whose mandate supports open standards and global interoperability. TOGAF standards will be adapted to project-specific requirements.</p> |

2. Architecture Definition and Benefits

2.1. Definition of Enterprise Architecture

Enterprise Architecture (EA) is defined as the use of structured methods and models, also known as blueprints or artifacts, which are used to plan and design complex digital capabilities, transformations, or changes. An EA is the “fundamental organization of an enterprise embodied in its components, their relationships to each other and to the environment, and the principles guiding its design and evolution, where:

- Fundamental organization means essential, unifying concepts and principles
- An enterprise is an organization or unit thereof, plus its relationships with other organization units, which collaborate to deliver products and/or services. Enterprise includes the business and its supporting information systems
- Environment is the context of the enterprise including its markets or jurisdiction as well as its planning, development, and operational contexts¹

An EA is a set of information (blueprints) that defines the business and technology structure of an enterprise by representing its people’s roles, business processes, information and other resources, computer system components, and the internal and external relationships of all of the above. An EA also sets the vision and principles for the enterprise’s IT. The EA represents the current state and desired future state of the enterprise at some level of resolution, whether a high-level or more detailed representation. The IS Landscapes (section 5.2.6) constitute TennCare’s high-level EA blueprint.

EA is also a discipline that has been established worldwide. If an organization has an architecture capability, that means that it has people with the skills, time, and resources to develop and govern those architectural blueprints. The terms “architecture” and “blueprint” are metaphorical references to building-construction practices.

Operating an EA capability provides the ability to oversee the development and management of blueprints for a target state vision of IT operations and the roadmaps required to implement the vision.

Implementing the vision means understanding how the organization would operate in an ideal manner to meet business goals, including the IT that will enable future operations.

¹ Based on the definitions of architecture of a system in ISO/IEC/IEEE 42010:2011, Systems and software engineering — Architecture description

The EA vision is designed and maintained through a series of business transformation and IT-enablement projects. The target state architecture is to be defined and implemented through these projects.

2.2. Definition of Solution Architecture

A solution is the implementation of a system, which combines computer hardware and software with human activities, to contribute to the IT capabilities and digital transformation of an enterprise.

A solution architecture is the blueprint defining the business and technology structure of a solution. It is the fundamental organization of a technology-enabled solution. A solution architecture has a narrower scope than an enterprise architecture. It is constrained by, and should align with, the overall architecture of the enterprise.

The skills required to build a solution architecture overlap with the discipline of EA, including analysis, architecture and design in the business, data, application, technology, and security domains.

Figure 2 shows that the many solution architectures relate to one central EA. The arrows point outward to solution architectures indicating reuse of the EA. The arrows also point inward, indicating that solution architectures align with and contribute to the evolution of the EA.

Compared to the EA, a solution architecture typically has more detailed logical and physical representation of a system, in both current and target states.

An organization's EA capability will develop and/or oversee both the Enterprise Architecture and the Solution Architectures.

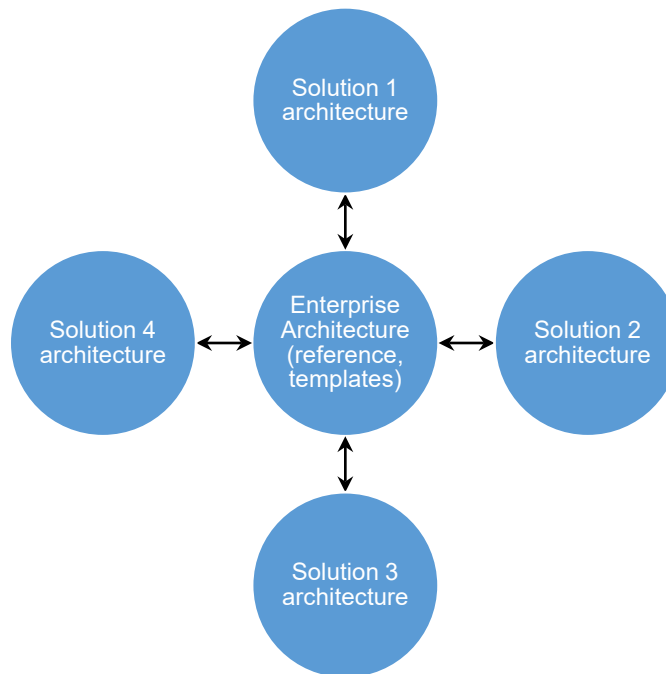


Figure 2: Relationship between EA and Solution Architectures

2.3. Architecture Artifacts

An architecture artifact is one of the blueprints: a model or document that represents some aspect of the design of the enterprise or its solutions.

A model artifact is a chart or diagram in one format, systematically representing one or a few kinds of objects (such as roles, data elements, processes, or application components), and one or a few kinds of relationships between them (such as sequence or dependency). The TennCare Enterprise Architecture Modeling Standard defines the formats required for model artifacts.

Deliverables are described in the TennCare Solution Implementation Lifecycle RACI and Deliverables Standard. This EA Framework standard lists some of the deliverables that need to be reviewed in the Architecture Governance Process. These architectural deliverables may contain model artifacts.

An EA artifact describes the architectural concepts spanning all TennCare solutions, or may be a reference model that serves as a reusable template for solutions to follow. EA artifacts may be produced by a project with an enterprise-wide scope.

Solution architecture artifacts describe the architecture of a TennCare solution being delivered by a solution project. Solution architecture artifacts should be implementations of the EA. Solution architecture includes both the Conceptual Design artifacts developed before procuring a solution, and the Solution Design artifacts developed by a solution vendor.

As solutions are planned, designed, and incorporated into the enterprise, solution architecture artifacts may be harvested and incorporated into EA artifacts to demonstrate the impact of the solution on IT operations and technology.

2.4. Benefits of Enterprise Architecture

EA is a leading practice within large corporations and governments concerned with achieving successful IT capabilities and digital transformations. More than a structured methodology for creating blueprints, an EA practice and its products directly support better project outcomes:

- Multi-stakeholder participation in standards-based and reusable approaches:
 - Clarity and Consensus: Multistakeholder understanding, agreement, and commitment to current and future state business and IT descriptions and designs
 - Confidence: Multistakeholder confidence in, and commitment to, the benefits and costs of developing new IT capabilities and performing digital transformations
- Greater enterprise coherence and efficiency by promoting reuse of existing capabilities and components that align with the EA
- Design alignment:
 - With larger context (enterprise-wide business architecture): Means more effective enterprise-wide operations, based on interoperable data and components
 - With other projects: Means better project scoping and more efficient utilization of technical, human, and capital resources
- Well-defined business and systems descriptions (current state) and designs (target state) for transformation means more effective change management:
 - Architecture “blueprints” provide an authoritative system of record for enterprise design
- Transfer of business and systems modeling skills to the enterprise’s staff, during the development of architecture
- Improved complexity management:
 - Essential complexity:
 - Essential complexity occurs in enterprises with a high number of stakeholder relationships, business processes, and policies
 - By encouraging an enterprise-wide view by all stakeholders across an organization, increasing co-operation between the business and technology communities, and encouraging disciplined portfolio management
 - The elimination of “stove-pipe” thinking, including line-of-business or jurisdictional or interagency conflicts, enables enterprise-wide optimization of business processes and services. Increased co-operation promotes the delivery of risk-reduced transformations, while portfolio management separates evolution of the architecture of an enterprise from project-based initiatives
 - Accidental complexity:
 - Accidental complexity (introduced by technology) is present when technology solutions that solve business problems are complex in themselves

- Additionally, a divergence between business and IT systems engineering adds a further layer of complexity
 - Complexity is a direct driver of implementation cost and time for developing new IT capabilities and performing large digital transformations; specifically, accidental complexity can result from disparate application or infrastructure portfolios, multiple data sources, and varying integration methods
 - By creating a frame of reference and enterprise view, accidental complexity can be minimized or avoided
- Supports greater interoperability and business-IT alignment
 - Helps senior business managers see the benefits of all the architecture domains
 - Encourages the common use of abstraction and modeling techniques amongst those working in the business and technology domains
 - Helps to delineate the roles of architects, analysts, developers, and project managers
 - Supports the alignment of all architecture domains within EA

2.5. Project Portfolio Management

The EA capability works with Project Portfolio Management at TennCare to ensure that business and technology initiatives and investments are aligned with business strategy. The current EA blueprint is used for planning a roadmap of projects that lead to the EA vision. See the Roadmap phase of the EA in section 5.2.6.

3. Architecture at TennCare

3.1. Architecture Capability

TennCare IS is responsible for implementing this standard, developing the EA artifacts, and operating the EA capability in compliance with the methods described in this standard. The EA capability includes key roles that are filled by TennCare and associated vendor resources, as directed by TennCare.

This standard supports the definition of key EA roles supporting the establishment of architecture standards and oversight of the development of EA, solution architectures, and associated artifacts in compliance with standards. These roles include an Enterprise Architect (Chief Architect) and representation from all domains of architecture (business, application, data/information, security, and technology). See section 3.4 for description of these roles.

Solution vendors will be responsible for providing project resources for a variety of these roles as necessary to align the solution architecture with the target enterprise architecture.

3.2. Architecture Governance

Governance ensures that architecture work adheres to standards, principles, and best practices and results in an architectural alignment with business intent and requirements. Architecture governance reviews will ensure architecture compliance with policy, regulations, principles, and standards set at the federal, state, and TennCare level.

TARB is accountable for setting and enforcing the architecture principles and standards (section 8) to guide TennCare projects. TARB may update or grant exemptions to standards as needed, as detailed in the TennCare IS Governance Standard.

TARB will conduct architecture reviews to oversee the alignment of solution architectures with TennCare's EA, and will determine which solution artifacts will be harvested to evolve the EA. Section 7 describes the architecture governance process and lifecycle.

The architecture process, including governance, applies wherever business and technology strategy need to be aligned. Most changes to business policy or procedures will require some update to technology solutions. Business activities delegated to a service-partner vendor may still affect TennCare's technology, such as for data sharing. Business projects with no effect on technology are not in scope for architecture governance.

3.3. Architecture Software and Repository

Modeling software such as Sparx Enterprise Architect (Sparx EA) is critical for TennCare to be able to implement and maintain its EA. TennCare uses Sparx EA as its standard for managing the TennCare Requirements and Architecture Repository.

TennCare requires that solution vendors develop solution architectures using digital architecture tools and a repository that are interoperable with the TennCare Requirements and Architecture Repository to allow for the sharing of artifacts between solution vendors and TennCare.

The TennCare Requirements and Architecture Repository contains the TennCare IS Application, Data & Interface Landscapes, which are a key set of EA blueprints.

3.4. Architecture Stakeholders and Roles

To successfully implement an EA, key capabilities need to be delivered by TennCare and its vendor community. This section defines the responsibilities of each stakeholder in the definition and implementation of an EA, solution architectures, and the architecture governance processes.

Section 3.4.1 describes the participants in the architecture process.

Key architecture enablement and support roles are required by TennCare and supported by the TAS and solution vendors' solution architecture resources. Solution vendors will typically only be involved in EA development as necessary to provide an understanding of new or evolving technologies — they will typically become heavily involved during solution detailed design.

3.4.1. Architect Roles

All architects are responsible for conducting research and providing guidance on emerging technologies, trends, and leading practices in their architecture domain. Architects may be members or participants in TARB and other governance bodies, according to the charters of those bodies.

- **Enterprise Architect** is responsible for:
 - Ensuring the completeness and integrity of the architecture from the perspective of all architecture domains (business, application, information, security, etc.)
 - Ensuring consistency between design artifacts, reuse of common elements, and conformance to architecture standards and practices between analysis work streams and projects
 - Ensuring the coherence of the overall EA and its alignment with and evolution towards the architecture vision
- **Business Architect** is responsible for:
 - Defining the business architecture for the enterprise and its programs and projects, based on the business strategy, business goals, and business objectives, including business capabilities along with business and stakeholder needs
 - Ensuring that solution architectures, and other domains of EA, align with and trace back to the business architecture for the project, program, and enterprise through effective requirements management
- **Technical Architect** is responsible for:

- Ensuring that the technical architectures of solution designs are suitable within the context of TennCare's technology stack (meaning, alignment to the enterprise technology architecture)
- Providing a focal point for all technical architecture and infrastructure-related issues during all phases of the project lifecycle
- Ensuring that all infrastructure-related requirements are met by the solution (e.g., system performance, network capacity, etc.)
- **Application Architect** is responsible for:
 - Defining the application architecture of the enterprise, its programs, and its projects
 - Identifying opportunities to leverage existing application assets along with opportunities to replace, upgrade, or decommission applications
 - Ensuring application integration requirements and standards are met
 - Ensuring that the application designs of solutions align and adhere to application architecture principles and standards
- **Data Architect** is responsible for:
 - Defining, at an enterprise level, data architecture for the enterprise and its programs, at the conceptual and perhaps logical perspective
 - Defining, at an enterprise level, how data will flow through the systems (internal and external)
 - Addressing data conversion (migration) and validation issues across the enterprise
 - Ensuring that for each solution, the logical and physical data design aligns and adheres to data architecture principles and standards and is aligned with the EA vision
- **Security Architect** is responsible for:
 - Defining security architecture for the enterprise and its programs
 - Ensuring that solution designs align with and adhere to relevant external and internal security principles and standards
- **Solution Architect** is responsible for:
 - Designing a project solution throughout the entire solution implementation lifecycle; they are responsible for converting requirements into an architecture and design that will become the blueprint for the solution being created
 - Ensuring the solution design aligns with and adheres to standards (as identified in this standard and other standards and principles as defined by TARB)
 - Ensuring traceability of the solution design to business requirements and solution requirements
 - Incorporating knowledge on emerging technologies, trends, and leading practices in the architecture domains into solution designs and presenting relevant findings to TARB or other oversight bodies
 - Design of physical-level application, technology, security, and data architectures

TennCare may engage other types of architects, whose responsibilities are combinations or subsets of the roles above.

3.4.2. Other Roles

TAS Program & Project Management Team

The TAS Program & Project Management Team is responsible for:

- Ensuring that project lifecycle and delivery requirements are being met
- Monitoring all project-related activities throughout each phase of the lifecycle

Project Teams

Project Teams will be key stakeholders in the overall EA, solution architecture, and architecture governance processes and will be responsible for:

- Ensuring that solution architecture is developed, in alignment with enterprise architecture
- Ensuring that the architecture processes are duly followed and all the necessary stakeholders are involved at the respective stages
- Facilitating the updates to the enterprise and solution artifacts through the architecture governance process

Business Representatives

Business Representatives will be responsible for:

- Describing TennCare's current activities and structure as necessary to support development of the current state EA and solution architectures
- Describing TennCare's business vision, goals, and strategy as necessary to support the development of the future state EA and solution architectures
- Validating that project requirements and deliverables, including solution architectures, are aligned to the business vision, goals, strategies, and needs
- Supporting the Business Requirements gathering process
- Providing overall oversight to projects and addressing escalations

4. Architecture Process Overview

4.1. Architecture Process

The most important output of TennCare's architecture capability is the implementation of the EA vision, or how TennCare will operate to meet its business goals and how information systems and technical infrastructure will enable that operation. This ensures that new technology-enabled solutions are aligned with and meet business needs and goals.

TennCare's architecture vision is defined in a set of target state business, data/information, application, and technical architectures. The target state is described in a series of architecture artifacts, blueprints, requirements, and roadmaps. These blueprints and roadmaps can be designed in two ways:

1. Through a pure architecture effort, where time is taken to do the target-state modeling, gaps against current state are understood, and a roadmap is developed to achieve that target state through a series of implementation projects; and/or,
2. Through a series of IT, business, or other transformational projects that develop the target state vision as a byproduct of their progress. Reusable target architecture blueprints can be harvested from solution projects, and continuously aligned and integrated with the target state EA, for input to future solution projects. This is a very practical and common approach to implementing an architecture vision.

This standard catalogs the architecture process and blueprint specifications that can be drawn upon and adapted depending on the need of individual solution projects.

The TARB is accountable for setting and enforcing the architecture standards that will be followed by TennCare projects and may adapt or grant exemptions to these specifications as needed.

4.2. Architecture Process Cycles

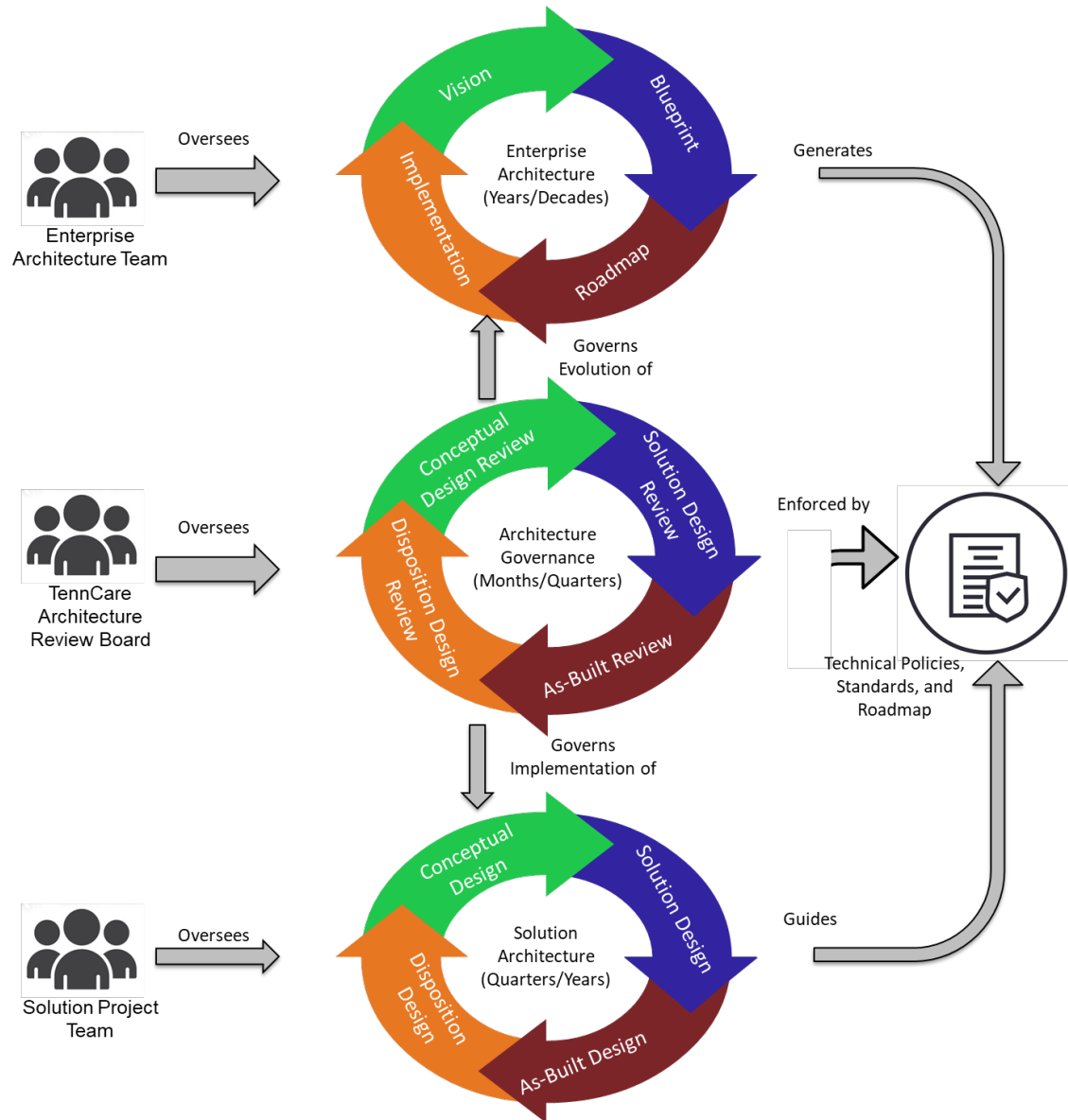


Figure 3: Architecture Process Cycles

Figure 3 illustrates the three architecture processes and their cycles that align solution architectures with an EA through architecture governance:

The Enterprise Architecture Process at the top of the diagram manages the evolution of the TennCare EA in cycles measured in years and decades.

The EA process consists of the Vision, Blueprint, Roadmap, and Implementation phases. This process is derived from TOGAF ADM. It supports the development and implementation of an

architecture vision, blueprints, and roadmap, overseen by the TennCare EA team. It is recommended that TennCare’s EA should be reviewed on a rolling three-year cycle.

The Solution Architecture Process at the bottom of the diagram manages the design and implementation of compliant solution architectures in conjunction with solution implementation lifecycles, which may be measured in months, quarters, or years.

The Solution Architecture Process unfolds within the Plan, Build, and Run phases of the TennCare Solution Implementation Lifecycle. It includes processes for the Conceptual design, Physical design, As-Built design, and Disposition design. The process is guided by the TennCare Technical Policies, Standards, EA Vision, Blueprints, and Roadmap. The Solution Architects within a Solution Project Team oversee the solution architecture process.

The Architecture Governance Process in the middle of the diagram aligns TennCare solution architectures with the TennCare EA Vision, Blueprints, and Roadmap. This process oversees the evolution of the TennCare EA by governing the implementation of solution architectures against technical standards.

This cycle consists of four reviews of a project-based solution architecture against the enterprise target state architecture: Planning, Design, As-Built, and Disposition Review. This cycle is based on the intersection of the TOGAF ADM and the solution architecture processes within the TennCare Solution Implementation Lifecycle. The Architecture Governance Cycle provides the “gearing” to align both the EA and solution architecture cycles. It is overseen by TARB acting as a design authority.

Table 3 illustrates the alignment between the TennCare Solution Implementation Lifecycle and the Architecture Governance Process.

Table 3: TennCare Solution Implementation Lifecycle Alignment

| Lifecycle Phase | Review Gate | Architecture Governance |
|--------------------------|---------------------------------|-------------------------|
| Initiation | Project Startup Review | |
| Concept | Architecture Review | Conceptual Design |
| Planning | Project Baseline Review | |
| Requirements Review | Requirements Review | |
| Design | Final Detailed Design Review | Solution Design |
| Development | Validation Readiness Review | |
| Test | Implementation Readiness Review | |
| Implement | Operational Readiness Review | As-Built Design |
| Operations & Maintenance | Post Implementation Review | |
| Retire | Disposition Review | Disposition Design |

5. Enterprise Architecture Process

This section describes the activities and products of each phase of the EA Process. It details the following portions of Figure 4.

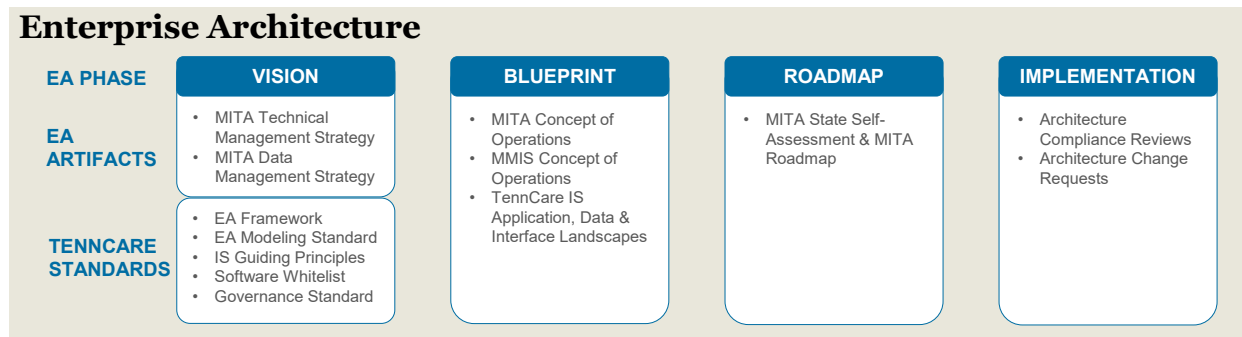


Figure 4: Enterprise Architecture Summary

Table 44 shows the four phases of the TennCare EA Process and their alignment with the eight phases of the TOGAF ADM.

Table 4: TennCare and TOGAF Enterprise Architecture Phases

| Enterprise Architecture Process Phase | | | | |
|---------------------------------------|------------------------------|--|--------------------------------------|---|
| | VISION | BLUEPRINT | ROADMAP | IMPLEMENTATION |
| TOGAF Phase | Preliminary | B Business Architecture | E Opportunities and Solutions | G Implementation Governance |
| | A Architecture Vision | C Information Systems Architectures D Technology Architecture | F Migration Planning | H Architecture Change Management |

Table 55 provides an overview of TennCare EA deliverables, standards, and activities that happen or are produced in each phase of the EA lifecycle. Refer to the SILC Deliverables chart for specifications of each Deliverable.

Table 5: EA Products by Phase

| Enterprise Architecture Process Phase | | | | |
|---------------------------------------|---|--|---|---|
| | VISION | BLUEPRINT | ROADMAP | IMPLEMENTATION |
| Deliverables | Architecture Vision MITA Data Management Strategy MITA Technical Management Strategy | MITA Concept of Operations MMIS Concept of Operations TennCare IS Application, Data and Interface Landscapes | MITA State Self-Assessment and MITA Roadmap | |
| TennCare Standards | Enterprise Architecture Framework EA Modeling Standard IS Guiding Principles Technology Standard IS Governance Standard | | | |
| Activities | | | | Architecture Compliance Reviews Architecture Change Requests |

5.1. Vision Phase

The Vision Phase aligns with the TOGAF Preliminary Phase and Vision Phase (known as phase A in TOGAF).

The Vision phase is initiated in the context of starting a large program, in the annual TennCare Information Systems Planning (ISP) process, or to support a major TennCare strategy.

During this phase, the TennCare architecture capability is established:

- The scope and context of the architectural effort desired is determined
- The frameworks, standards, methods, relevant artifacts, and processes that will be used to develop an EA are established and defined
- Architecture principles are defined
- Tools that support an architecture capability are selected
- An organizational model that supports delivering the architecture capability is established
- Key stakeholders for architecture are identified
- The relationships between different management frameworks are defined
- The approach to partitioning the work is determined

Also during this phase, TennCare outlines its EA:

- A vision of the capability and business value that will be delivered as a result of the proposed architecture is established
- Business goals, strategic drivers of the program, and business principles are defined
- The stakeholder concerns that the architecture will address are elaborated
- A high-level description of the baseline and target enterprise architectures is defined
- The value propositions and Key Performance Indicators (KPIs) that the target EA will achieve are defined
- Business transformation risks and mitigation activities are identified

The Architecture Vision is reviewed on a regular cycle to ensure the architecture capability is adequate to meet the needs of TennCare.

The enterprise artifacts are also updated in accordance to the TennCare Solution Implementation Lifecycle Standard during solution projects.

5.1.1. Vision Phase Products

The TennCare EA Capability will develop the Vision Phase artifacts. They may harvest material from solution architectures or other documents.

The **MITA Data Management Strategy** provides guidance for documenting technical needs for sharing of TennCare's information, including standards for data auditing, retention, and purging.

The **MITA Technical Management Strategy** provides guidance for documenting technical needs for managing TennCare services and information.

TennCare IS standards governing EA and solution architectures are also produced by the Vision Phase. This includes the IS Guiding Principles. As the standards and principles evolve, they need to be kept consistent with each other.

5.2. Blueprint Phase

The intent of the Blueprint Phase is to describe how the business needs to operate to achieve its goals as set out in the Vision Phase. The following describes the development of EA, which may be done gradually by developing and harvesting solution architectures.

The Blueprint Phase aligns with the TOGAF Business Architecture (known in TOGAF as phase B), Information Systems Architecture (C, including data and application architecture), and Technology Architecture (D) phases. MITA extends the TOGAF architecture domains to include security architecture, in addition to the business, data, application, and technology architecture. Often these domains of the architecture are developed concurrently, and during execution, the effort may cycle back between the different architecture domains as work is completed.

The Blueprint Phase starts with a baseline description of the current architecture, to a level of detail appropriate for the goals of the architecture effort. Target (future state) architecture is then defined, which supports the Roadmap Phase to close the gap between current state and target state.

The EA blueprint is stored in the TennCare Requirements and Architecture Repository, so it may be easily reused to define solution architectures. To minimize the effort to create a new solution architecture, requirements and design artifacts harvested from other solution architectures will be available for reuse.

The enterprise business, data, application, security, and technology architecture can be defined at a high level or specified with more detail. Where TennCare has a common business process, shared database, or multipurpose application component, its EA will detail those shared elements in the Blueprint artifacts. Where business functions and information systems are more diverse, the solution architecture detail may not be harvested, and the EA would remain high-level.

During the Blueprint Phase, the modeling effort will cycle back and forth between the different domains of architecture because the impacts to the target EA need to be addressed across all of the different domains.

5.2.1. Business Architecture

The effort starts with the Business Architecture definition, which then supports completing all of the other architecture domains. The TennCare EA Modeling Standard defines enterprise-wide business models such as the Capability Model and Context Model.

5.2.2. Information Systems Architecture

The Information Systems Architecture is comprised of the data and application architectures.

Data management requirements are addressed as part of this phase. Models capture the current (if necessary) and target state information requirements. The target architecture should be designed to have high-quality data when it is implemented. Alignment between the business and data requirements ensures business functions are supported by data and that there are business functions using the organization's information. The data and security architecture address data security requirements, protection of personally identifiable information, and requirements for access to information.

The application architecture must completely support the business architecture scope and the data requirements. Models capture the current application landscape (if necessary) and define the target state's application components and integration requirements. The application components that are required should be internally consistent, without duplication. The application architecture choices may be influenced by the organization's capability to operate the application components.

5.2.3. Technology Architecture

The Technology Architecture defines the platforms and services required to support the business, data, and application architectural requirements. New technology components may be defined and products may be selected. Existing technology components that need to be supported in the target environment are determined, and a design for how these components interoperate will be defined. Non-functional requirements will influence the target technology architecture.

5.2.4. Security Architecture

The Security Architecture takes into account legal requirements (such as privacy legislation) and business requirements (such as business continuity in case of a security breach). Business, data, application, and technology architecture will influence and be influenced by the Security Architecture, so models need to be aligned. For example, data access permissions will be designed, using roles specified in the business architecture, to protect personally identifiable information and other sensitive information as specified by the Security Architecture. The current state of the security landscape is documented as necessary, and the target state of the Security Architecture is described.

5.2.5. Blueprint Phase Products

The TennCare EA Capability will develop the Blueprint Phase artifacts. They may harvest material from solution architectures or other documents.

The blueprint artifacts identify and visualize the information technology asset portfolio of the enterprise in the **TennCare IS Application, Data and Interface Landscapes**, described in section 5.2.6.

The Enterprise Architecture blueprint is described through the **MITA Concept of Operations** as specified by CMS, which includes:

- As-is operations (business, architecture, data)
- Drivers and enablers for transformation
- Environment (business, architecture, data)
- Operational scenarios
- Conditions of modularity and reuse and how to meet

The Blueprint Phase also specifies the **MMIS Concept of Operations**, which includes a narrative description of the basic functions and the business area supported by each identified MMIS component, plus a statement of security, interface, and disaster recovery requirements.

This enterprise blueprint is used by the business to build consensus with stakeholders across the enterprise on services, stakeholders, requirements, business processes, and how solutions will be integrated into TennCare's business. The blueprint artifacts will build upon, update, and trace back to the Architecture Vision.

5.2.6. IS Landscapes

The EA Blueprint artifacts include the TennCare IS Application, Data & Interface Landscapes. These IS Landscapes visually represent all of the information systems assets of TennCare, and how they are connected. This includes:

- All applications (systems, software, modules, components)
- All interfaces between applications
- All databases and repositories

The IS Landscapes are a comprehensive reference tool for TennCare IS to:

- Aid assessments and planning in the Roadmap phase of EA
- Make investment decisions for the organization
- Identify cost savings opportunities by leveraging existing investments
- Avoid duplication
- Manage the lifecycle (e.g., upgrades, replacements, decommissioning)
- Manage IS performance, security, business continuity, and disaster recovery

The TennCare EA capability is responsible for creating and updating the IS Landscapes, using information provided by project teams and solution vendors, during the Architecture Governance reviews.

Each asset on the IS Landscapes shall be marked with a status, updated at each Architecture Review:

- Planned
- In development

- In production
- To retire
- Retired

See the TennCare Enterprise Architecture Modeling Standard for more about the content and format of the IS Landscapes.

5.3. Roadmap Phase

The Roadmap Phase aligns with the TOGAF Opportunities and Solutions phase (known in TOGAF as phase E) and Migration Planning phase (phase F).

The Roadmap Phase considers all of the gaps between the current and target state EA, as well as the projects and work packages required to close the gaps through an implementation roadmap. Transition architectures are used as needed to implement the target architecture incrementally.

The roadmap is influenced by the business priorities of TennCare, its technology readiness, and by implementation constraints (e.g., resources, budget). It is structured to account for work package dependencies. Solution projects will be scoped to execute development of new IT capabilities and perform digital transformations in stages according to the roadmap.

This phase starts by analyzing the target-state blueprint artifacts to find how they differ from the current state, and identify gaps in each architecture domain. Dependencies are defined and validated, and the major work packages are identified. Potential solutions are mapped against the consolidated gaps within each architecture.

The work packages are validated and the dependencies mapped out into a roadmap. If transition architectures are used to incrementally implement capabilities, then the work packages are further broken down to show actions within projects that achieve the full target capability. The work packages and transition architectures are then assembled into a final roadmap.

During the Roadmap phase, implementation and migration strategies are determined. This may include specifications for converting existing data to new data stores, plans to transition from existing to new application software and components, and plans to change technology and security infrastructure. Decommissioning should be planned for information and technology no longer needed in the target state. When planning to add, change, or decommission any information or technology, its interoperability and dependencies should be analyzed across all domains of the architecture.

The TennCare roadmap is reviewed and updated at least every three years and updated to reflect changes in strategic priorities.

5.3.1. Roadmap Phase Products

The Roadmap Phase will produce the MITA State Self-Assessment and Roadmap document specified by CMS. This artifact includes the current (as-is) state and target (to-be) state of the EA. Long-term milestones are specified in quarters.

The TennCare EA Capability will develop the Roadmap Phase artifacts. They may harvest material from solution architectures or other documents. The roadmap should be aligned with Project Portfolio Management; see section 2.5.

See the TennCare Enterprise Architecture Modeling Standard for the definition and an example of the Application Roadmap diagram that illustrates the architectural effects of projects included in the enterprise portfolio roadmap.

5.4. Implementation Phase

The Implementation Phase aligns with the TOGAF Implementation Governance phase (known as G in TOGAF) and Architecture Change Management phase (known as H).

The Implementation Phase ensures that the solution architecture being implemented by projects conforms to the target EA and, once implemented, is maintained, governed, and meets business needs.

The Implementation Phase does not execute any solution projects but runs in parallel with those projects. The Implementation Phase contains all of the architectural activities that must be completed for the solution projects to achieve the target EA. The EA Implementation Phase contains all four phases of Solution Architecture (section 6) and the four reviews of it (section 7).

The key activity within this phase is to ensure that solution projects comply with the target EA and with architecture standards and policies. This is done through compliance reviews with the project at key points along the development lifecycle as defined in section 7 and by the TennCare Solution Implementation Lifecycle Standard.

The target EA will evolve through implementation of each solution project over time. The reviews govern updates to the EA, as well as solution architecture. Once the solution is implemented, the As-Built Review checks for alignment between the solution and the target EA.

This phase also includes architecture change management, which ensures that the architecture achieves its business value and manages changes to the target architecture in a cohesive way. Architecture change management needs to be a dynamic and flexible process, because multiple projects will be defining the target architecture concurrently. As solutions are implemented, the target EA may need adjustment to reflect changes in design.

5.4.1. Implementation Phase Products

At the enterprise level during the Implementation Phase, the following activities are conducted and documented:

- Architecture Compliance Reviews
- Architecture Change Requests

The documentation of TARB approvals at each review, and of changes to the EA, forms an important record of TennCare's decisions.

Each solution project creates solution architecture artifacts that are used in this Implementation Phase.

The TennCare IS Governance Standard has defined how architectural principles, architecture governance, and TARB are operated to ensure solution architectures comply and align.

6. Solution Architecture Process

The solution architecture defines and describes an architecture of a system delivered in the context of a specific TennCare project.

Figure 5 illustrates the four phases of the solution architecture process. Each phase is described in the sections below. The TennCare Solution Implementation Lifecycle RACI and Deliverables gives details about each of the artifacts (deliverables) listed. Refer to the TennCare Enterprise Architecture Modeling Standard for model artifacts that are recommended and suggested for inclusion in these deliverables.

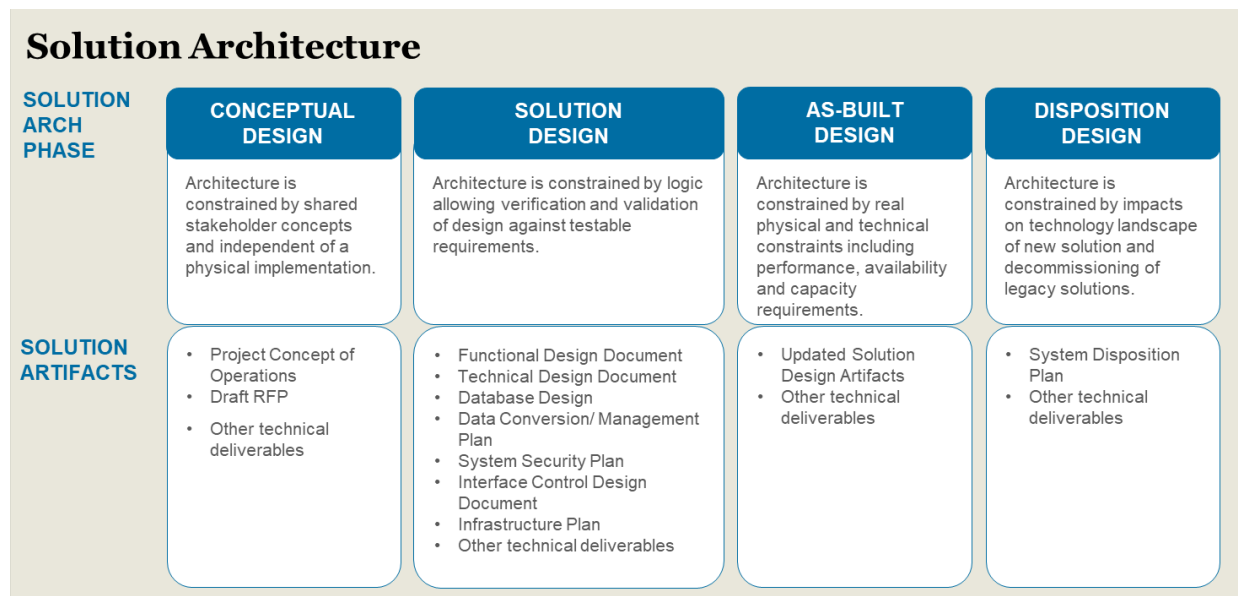


Figure 5: Solution Architecture Process

6.1. Conceptual Design

The Conceptual Design Phase includes the business architecture and conceptual system architecture design for the solution in scope. A conceptual design represents the shared concepts of the stakeholders of a given TennCare solution. A conceptual design of a solution is developed in the Concept Phase, as outlined by the TennCare Solution Implementation Lifecycle Standard. TennCare IS architects, supported by a TAS vendor where necessary, are responsible for ensuring that a solution project develops a conceptual design. Architectures produced in the conceptual design are captured as part of the Project Concept of Operations (ConOps) deliverable.

The conceptual design of a solution is aligned with the EA, especially the business architecture artifacts from the Blueprint Phase. The conceptual design of a solution will also reflect the work packages and transition architecture from the Roadmap Phase. Referring to the IS Landscapes

will help to reuse existing systems, avoid duplication, and anticipate the decommissioning of legacy systems.

The conceptual design of a solution is created at sufficient level of detail that it can support the Conceptual Design Review by TARB for:

1. Reviewing the impact of the solution on TennCare's EA as described in section 7.1.
2. Procurement of a solution through a Request for Proposal (RFP) or other procurement process.
3. Updating the TennCare IS Application, Data and Interface Landscapes to show the planned solution.

The Conceptual Design Phase of a solution project will deliver the following deliverables:

- Project Concept of Operations
- Draft RFP
- Other technical deliverables specified in the Concept phase of the TennCare Solution Implementation Lifecycle RACI and Deliverables

6.2. Solution Design

The Solution Design ensures that the logical and physical architecture of a solution addresses the solution's functional and non-functional requirements. The Solution Design is developed in the Design phase described within the TennCare Solution Implementation Lifecycle Standard by the solution vendor.

Logical architecture is constrained by logic but is independent of any particular technology (such as the choice of database software). Physical architecture is constrained by the laws of physics and what can be physically implemented with the available technology.

The solution design is aligned with the EA, especially the data, application, technology, and security architecture artifacts from the Blueprint Phase. The solution design will also reflect the transition architecture and dependencies from the Roadmap Phase.

The solution design is created at sufficient level of detail that it can support:

1. Solution Design Review (section 7.2) by TARB.
2. Review for the impact of the solution on TennCare's operational systems and compliance with TennCare standards, including the Technology Standard.
3. Verification and validation against the system requirements.
4. Preparation of test cases, scripts, and scenarios.
5. Showing how the solution will meet the performance, availability, and capacity requirements of TennCare users.
6. Updates to the TennCare IS Application, Data, and Interface Landscapes to show the designed solution.

The Solution Design Phase of a solution project will deliver the following deliverables:

- Functional Design Document
- Technical Design Document
- System Security Plan
- Interface Control Design Document
- Infrastructure Plan
 - May include the System Architecture and Design Document
 - May include the System Design Package or the Cloud Design Package
- Database Design
- Data Conversion/Management Plan
- Other technical deliverables specified in the Design phase of the TennCare Solution Implementation Lifecycle RACI and Deliverables

6.3. As-Built Design

The As-Built Design Phase ensures that the Solution Design is updated as it is being built and implemented for Production.

As-Built Design is part of the Implementation phase described within the TennCare Solution Implementation Lifecycle Standard.

The solution vendor is responsible for making updates to all artifacts delivered in the Solution Design phase.

Other technical deliverables specified in the Implementation phase of the TennCare Solution Implementation Lifecycle RACI and Deliverables are part of the As-Built Design. If any responsibilities will be transferred to another vendor after implementation, these deliverables include a Turnover Plan with technical documentation.

The As-Built Design of a solution is created at sufficient level of detail that it can support:

1. As-Built Review (section 7.3) of the solution architecture by TARB for the impact of the solution on TennCare's operational systems and compliance with TennCare standards, including the Technology Standard.
2. Updates to the TennCare IS Application, Data, and Interface Landscapes to show the implemented solution.
3. Updates to TennCare's configuration management database (CMDB).

6.4. Disposition Design

The Disposition Design Phase occurs near the end of a legacy system's lifecycle, when it will be decommissioned and possibly replaced by a new solution.

The Disposition Design solution addresses all impacts of decommissioning the legacy system on existing and new systems. The Disposition Design reflects the Roadmap Phase of the EA.

Planning and designing a new solution may trigger the Disposition Design of one or more legacy systems. If so, the Disposition Design of a legacy system is developed at the same time as the Solution Design subphase of the new solution project, and must be aligned with it, to ensure smooth transitions are feasible. The Disposition Design is implemented during the Retire phase of the new solution project.

A legacy system's manager is responsible for developing a Disposition Design, in cooperation with the solution vendor developing the new solution.

Other technical deliverables specified in the Retire phase of the TennCare Solution Implementation Lifecycle RACI and Deliverables are part of the Disposition Design. If any responsibilities will be transferred to another vendor during disposition, the deliverables include a Turnover Plan with technical documentation.

The solution architecture produced in this phase is captured and delivered as part of the **System Disposition Plan** artifact.

The Disposition Design of a solution is created at sufficient level of detail that it can support:

1. Data migration from existing to new systems.
2. Disposition Design Review (section 7.4) by TARB, which is coincident with the new solution's Solution Design Review.
3. Updates to the TennCare IS Application, Data and Interface Landscapes to show what has been retired.
4. Updates to TennCare's configuration management database (CMDB).
5. Updates to the Roadmap Phase of the EA.

7. Architecture Governance Process

The Architecture Governance Process facilitates the review of solution architecture artifacts (produced by solution projects) by TARB, including TennCare's Enterprise Architects. The purpose of these reviews is to ensure that solution architectures are in alignment with:

- TennCare's business and technical vision and strategy as expressed in its EA artifacts
- TennCare's EA vision and strategy
- Applicable standards and legal requirements

The architecture governance process also ensures that both EA and solution architecture artifacts are kept current. Refer also to the TARB Charter and the TennCare IS Governance Standard for more information.

The following section describes the types of architecture reviews that will be conducted by TARB for a solution project. Figure 6 illustrates the four reviews in the architecture governance process in relation to the phases of the Solution Development Lifecycle (from the TennCare Solution Implementation Lifecycle) and the solution architecture design stages.

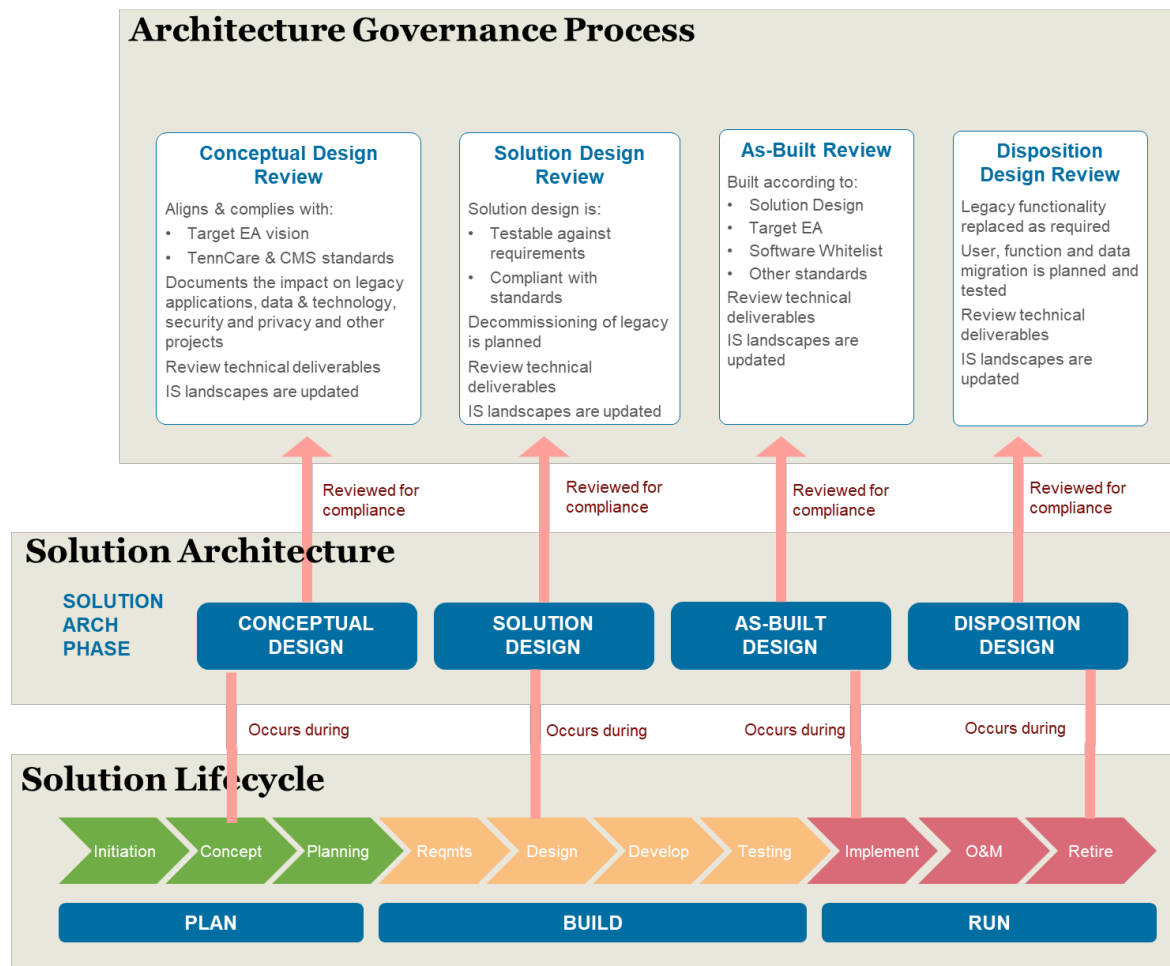


Figure 6: Architecture Review Processes

7.1. Conceptual Design Review

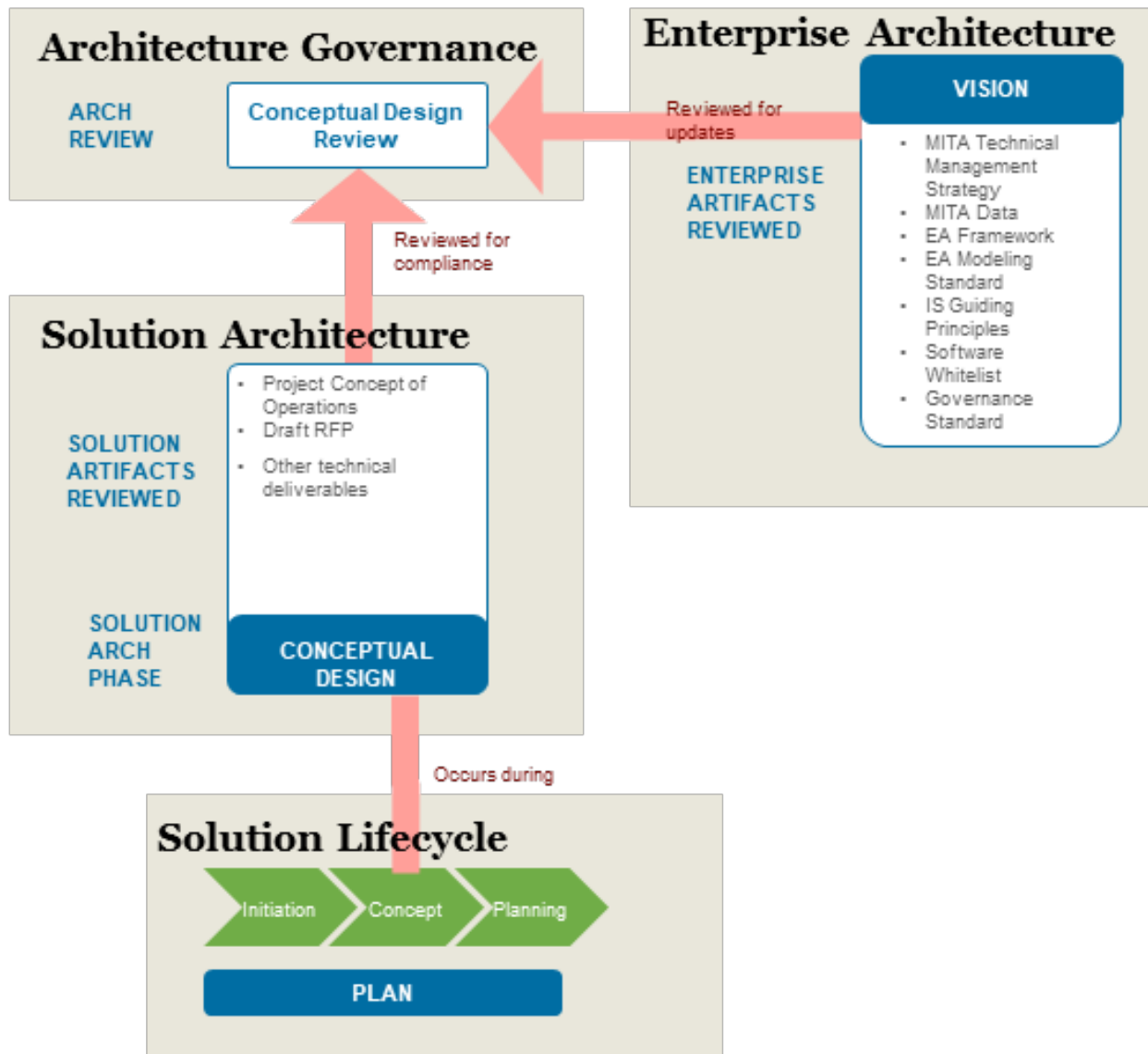


Figure 7: Conceptual Design Review

Passing the Conceptual Design Review is required for a project to complete the Concept phase of the TennCare Solution Implementation Lifecycle, and to pass the Architecture Review gate.

Figure 7 provides a description of artifacts that are reviewed in the Conceptual Design Review. These include conceptual architecture of the solution, and any other technical deliverables

specified in the Concept phase of the TennCare Solution Implementation Lifecycle RACI and Deliverables.

Appendix B contains a checklist of questions that TARB will consider at the Conceptual Design review.

The review helps ensure that the project is supported with TennCare architecture tools and compliance reporting tools. The IS landscapes are used to consider effects on, and potential reuse of, TennCare's applications, data, and interfaces.

The steps to complete the Conceptual Design Review are as follows:

- The project team makes an introductory presentation to TARB
- TARB commissions a team of reviewers, who read and comment on the Conceptual Design artifacts and discuss the Conceptual Design amongst themselves and with the project team
- The review team makes a recommendation and TARB decides whether to pass, conditional pass or fail the review. Any conditions on passing the review are recorded in the TARB minutes
- If the Conceptual Design passes without conditions, the review is complete. Otherwise:
- The project team conducts remediation work to resolve the conditions and submits a revised Conceptual Design to TARB
- The review team reviews the revised Conceptual Design
- TARB updates its decision to pass, conditional pass or fail the review (requiring a new review cycle).

The following tools are leveraged for this Architecture review:

- TennCare Requirements and Architecture Repository
- TennCare IS Application, Data & Interface Landscapes
- CMS compliance requirements
- Architecture artifact templates
- External Mandatory Requirements and Internal Standards, detailed in sections 8.1 and 8.2 respectively

7.2. Solution Design Review

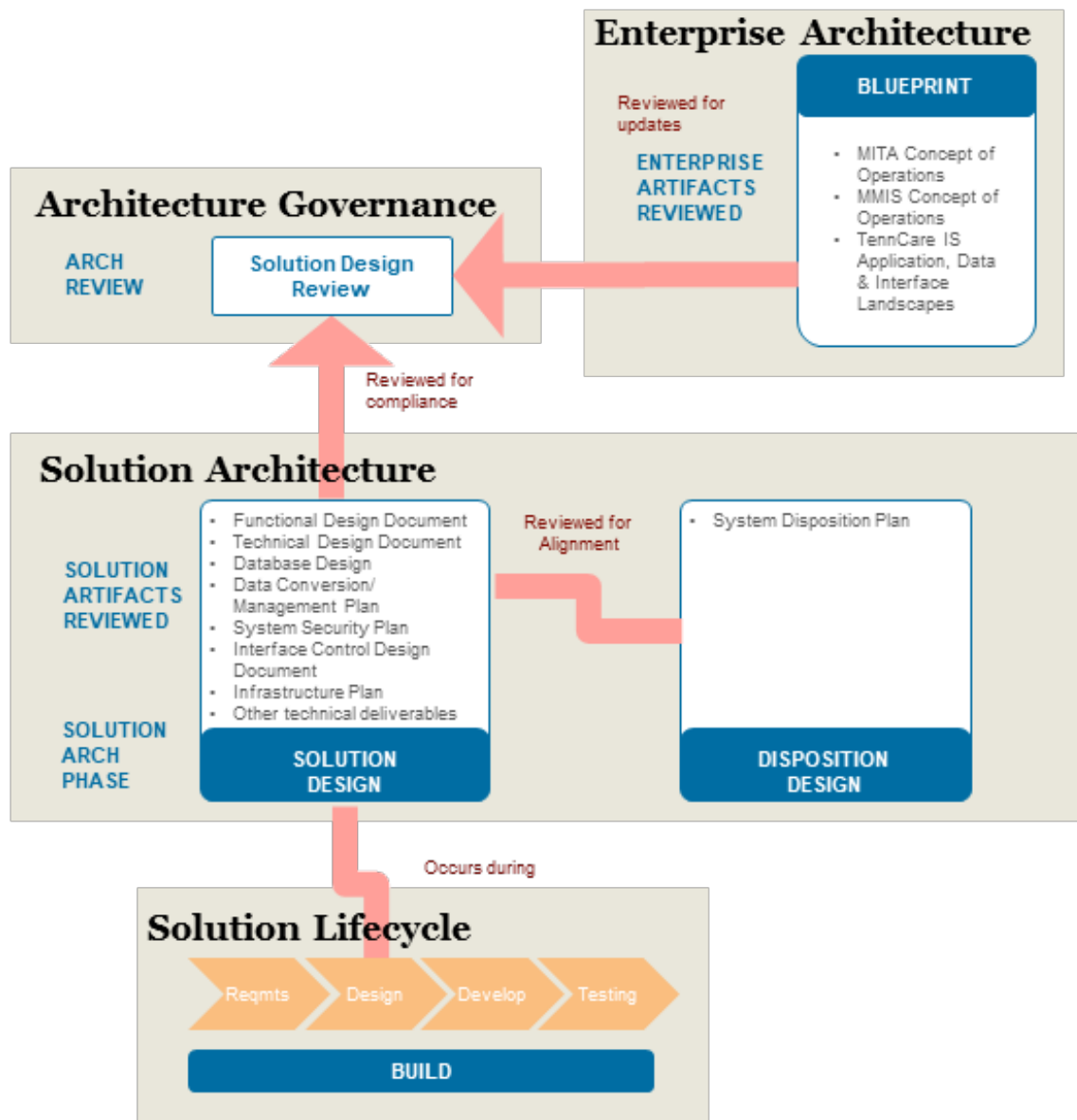


Figure 8: Solution Design Review

Passing the Solution Design Review is required for a project to complete the Design phase of the TennCare Solution Implementation Lifecycle, and to pass its Final Detailed Design Review gate.

Figure 8 illustrates the solution artifacts reviewed in the Solution Design Review. These include logical and physical architecture of the solution. Other technical deliverables specified in the Design phase of the TennCare Solution Implementation Lifecycle RACI and Deliverables may also be reviewed by TARb.

Appendix B contains a checklist of questions that TARB will consider at the Solution Design review.

The steps to complete the Solution Design Review are as follows:

- The solution vendor presents an overview of its design to the review team appointed by TARB for the Conceptual Design
- The reviewers read and comment on the Solution Design artifacts, and discuss the Solution Design amongst themselves and with the solution vendor and TennCare project team
- The review team makes a recommendation and TARB decides whether to pass, conditional pass or fail the review. Any conditions on passing the review are recorded in the TARB minutes
- If the Solution Design passes without conditions, the review is complete. Otherwise:
- The project team conducts remediation work to resolve the conditions, and submits a revised Solution Design to TARB
- The review team reviews the revised Solution Design
- TARB updates its decision to pass, conditional pass or fail the review (requiring a new review cycle).

The following tools are leveraged for Design Review:

- TennCare Requirements and Architecture RepositoryArchitecture artifact templates
- TennCare IS Application, Data & Interface Landscapes
- External Mandatory Requirements and Internal Standards, detailed in sections 8.1 and 8.2 respectively

For a solution that will replace a legacy system, the Disposition Design Review of the legacy system needs to be done at the same time as the Solution Design Review of the new solution, to ensure a well-managed migration.

7.3. As-Built Review

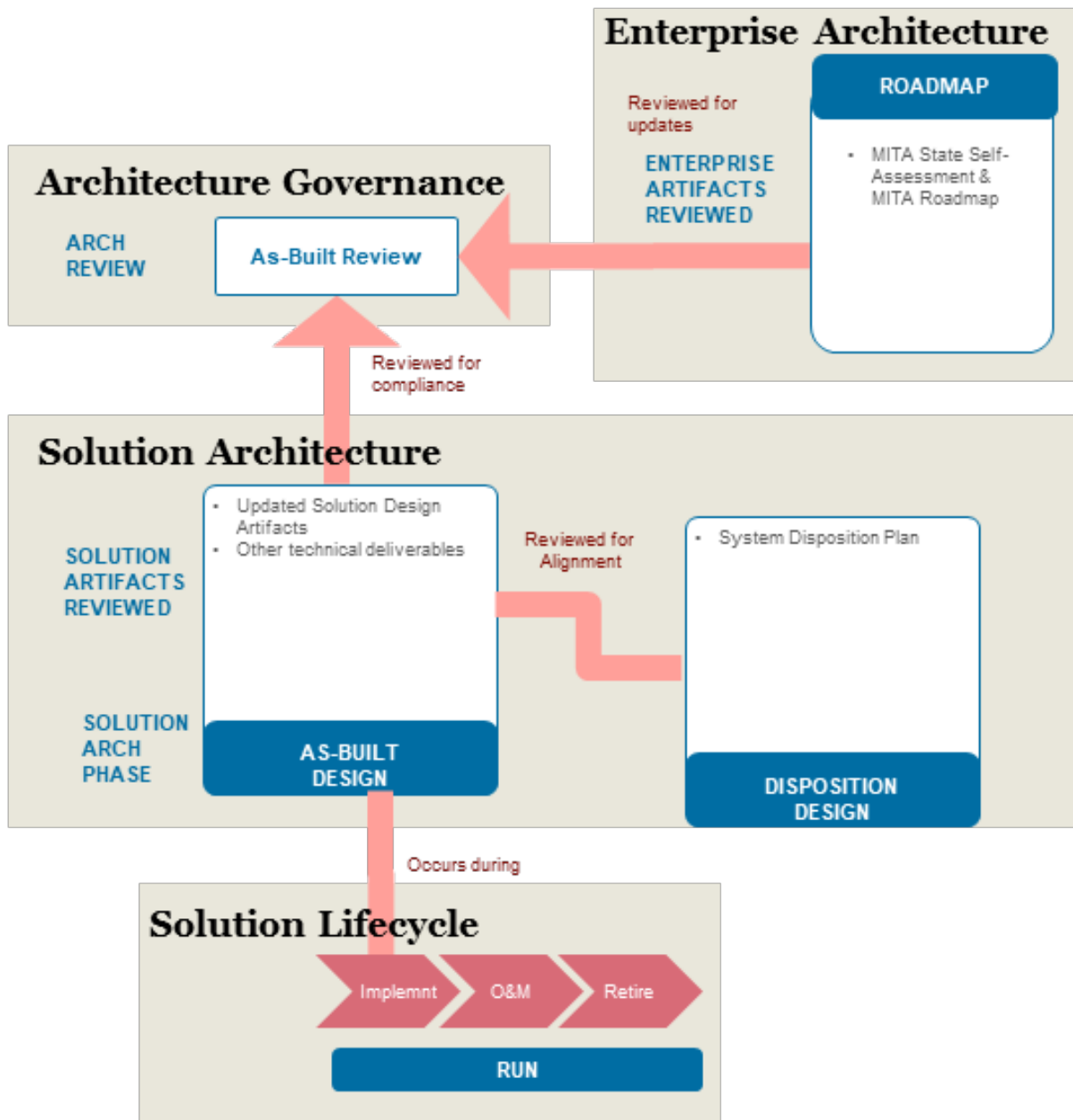


Figure 9: As-Built Review

The As-Built Review is conducted after a solution is developed but before it goes live into production. Passing the As-Built Review is required for a solution project to complete the Implementation phase of the TennCare Solution Implementation Lifecycle and to pass its Operational Readiness Review gate.

The As-Built Review covers updates to the Solution Design, including any changes to the logical and physical architecture of the solution. It also reviews other technical deliverables specified in

the Implement phase of the TennCare Solution Implementation Lifecycle RACI and Deliverables standard.

Figure 9 provides an illustration of solution and enterprise artifacts reviewed as part of the As-Built Review.

Appendix B contains a checklist of questions that TARB will consider at the As-Built review.

At the As-Built Review:

- The solution project team makes a presentation to TARB, confirming that the solution is developed and tested successfully, and summarizing any artifacts and technical deliverables to be reviewed
- If the Solution Design has changed since it was approved, the solution vendor presents what changed and why. The review must determine whether the changes are aligned with the target EA, comply with Standards, and will work with the Disposition Design of systems to be retired
- If a Disposition Design has changed, for a system being retired by the new solution, the responsible vendor or project team presents how the updated Disposition Design will work with the updated Solution Design for a smooth transition
- TennCare's EA capability reports to TARB that they have reflected the new solution in updated IS Landscapes, other EA artifacts, and standards such as the TennCare Technology Standard
- The team of reviewers checks the updated EA artifacts, Solution Design and Disposition Design
- The team of reviewers checks the technical deliverables against the criteria in the TennCare Solution Implementation Lifecycle RACI and Deliverables
- If required, the team of reviewers meets to discuss the updated artifacts and deliverables amongst themselves and/or with applicable parties such as the solution vendor
- The review team makes a recommendation and TARB decides whether to pass, conditional pass or fail the review. Any conditions on passing the review are recorded in the TARB minutes
- If the review passes without conditions, it is complete. Otherwise:
- The project team conducts remediation work to resolve the conditions, and submits revised artifacts to TARB
- The review team reviews the revised artifacts
- TARB updates its decision to pass, conditional pass, or fail the review (requiring a new review cycle)

The tools that are leveraged for this architecture review are as follows:

- TennCare Requirements and Architecture RepositoryTennCare IS Application, Data, and Interface Landscapes
- External Mandatory Requirements and Internal Standards, detailed in sections 8.1 and 8.2 respectively

For on-premises solutions, there will also be an ITSM Change Management review by the Change Approval Board that will cover the details of installation, migration, and conversion.

7.4. Disposition Design Review

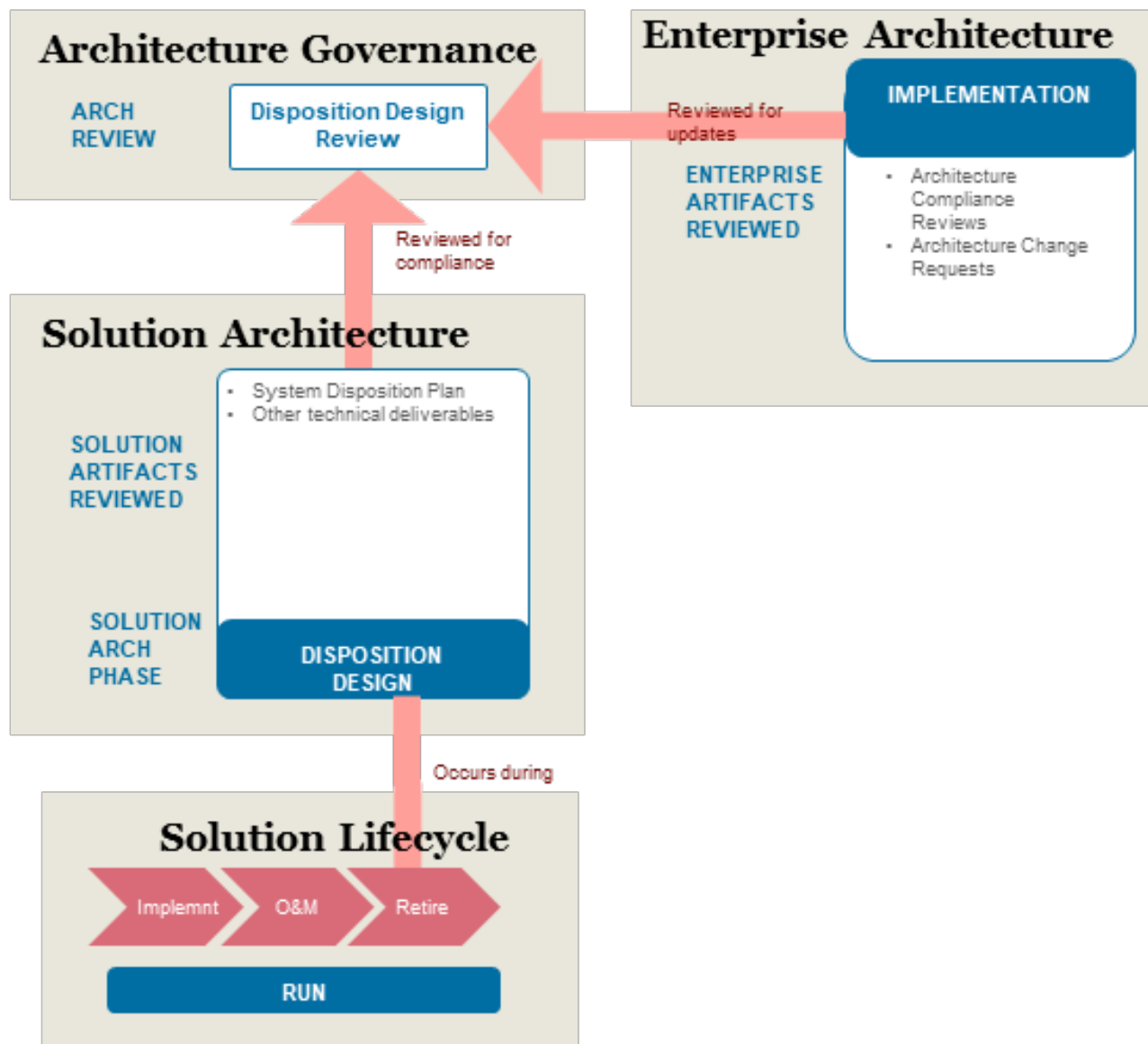


Figure 10: Disposition Design Review

The Disposition Design Review assesses the impact of a solution on existing (legacy) systems and technology to be retired. The solution's Disposition Design is reviewed to ensure a smooth transition from legacy to new systems.

Figure 10 illustrates the process, phases, and artifacts that comprise the Disposition Design Review.

In the TennCare Solution Implementation Lifecycle for the legacy system, the Retire phase includes this Disposition Design Review to pass the Disposition Review gate.

In cases other than new capability implementations, a new system's Solution Design triggers the Disposition Design and the Retire Phase of any legacy systems being retired. The Disposition Design Review will coincide with the Solution Design Review of the new solution, to ensure smooth transitions are feasible.

The As-Built Review will also check any changes needed to the Disposition Design, perhaps because of updates to the Solution Design, before decommissioning starts.

Appendix B contains a checklist of questions that TARB will consider at the Disposition Design review.

The Disposition Design Review will be conducted in tandem with the Solution Design Review of the replacement system. The review process at TARB is as follows:

- The legacy system's manager presents an overview of the Disposition Design
- The new solution vendor confirms that the Disposition Design plans for a smooth migration
- The new solution's review team reads and comments on the Disposition Design, and discusses it amongst themselves and with the new solution vendor and the legacy solution's manager. The review team makes a recommendation to TARB.
- TennCare's EA Capability confirms that the IS Landscapes and other EA and Standards have been updated to reflect decommissioning
- TARB decides whether to pass, conditional pass or fail the review. Any conditions on passing the review are recorded in the TARB minutes.
- If the Disposition Design passes without conditions, the review is complete. Otherwise:
 - The project team conducts remediation work to resolve the conditions, and submits a revised Disposition Design to TARB
 - The review team reviews the revised Disposition Design
 - TARB updates its decision to pass, conditional pass or fail the review (requiring a new review cycle)

The following tools are leveraged during this architecture review:

- TennCare Requirements and Architecture RepositoryTennCare IS Application, Data, and Interface Landscapes
- TennCare Application Roadmap

8. Applicable Principles, Policies and Standards

This section provides an overview of the standards to be enforced in reviews by TARB. The standards include TennCare's IS Guiding Principles.

TennCare is implementing and operating TARB, which is accountable for setting and enforcing the architecture standards that will be followed by projects, and may adapt or grant exemptions to these specifications as needed. Other policies and standards may be added in future or for specific projects.

This includes Solution Architecture Reviews (Section 7) where TARB will review solution architecture compliance to legal and regulatory requirements. More detailed and prescriptive information is provided in the respective standards documents.

8.1. External Mandatory Requirements

There are federal and state legal requirements that must be met by target and solution architectures without exception. TARB is accountable for program compliance to these standards. TennCare must incorporate and comply with all of the following that are applicable to the TennCare and/or CoverKids programs:

- Federal and state laws, rules, regulations, subregulatory guidance, and executive orders
- CMS requirements and waivers
- Current court decrees, orders, or judgments

This includes, but is not limited to:

1. Patient Protection and Affordable Care Act (PPACA).
2. HIPAA – specifically Title II, with the five rules regarding Administrative Simplification: the Privacy Rule, the Transactions and Code Sets Rule, the Security Rule, the Unique Identifiers Rule, and the Enforcement Rule.
3. Medicaid Information Technology Architecture (MITA).
4. Minimum Acceptable Risk Standard for Exchanges (MARS-E), which includes security principles.
5. NIST Special Publication 800-53A, Assessing Security and Privacy Controls in Federal Information Systems and Organizations – Revision 4.
6. HIPAA EDI from CMS, where applicable to interface transaction definitions.
7. Additional security requirements listed in the TennCare Information Security Program Plan (ISPP).

Other external standards may be required for particular solutions, as specified in the applicable procurement or contract document.

8.2. Internal Standards

Organizational architecture policies and standards are set at the discretion of TARB and support achievement of business and architecture principles. Exemptions from these standards can be granted by TARB as necessary.

The following Organizational or program standards are applicable to all Enterprise Architecture and Solution Architecture:

1. TennCare IS Guiding Principles
2. TennCare IS Standards including:
 - a. TennCare Solution Implementation Lifecycle Standard
 - b. TennCare IS Governance Standard
 - c. TennCare EA Modeling Standard
 - d. TennCare Technology Standard
 - e. TennCare Requirements Management Standard
3. TennCare Data Policies and Standards
4. State of Tennessee Technology Standards (e.g., application development, technology lifecycle, infrastructure stack, security, etc.)

Appendix A: Role Definitions

This appendix describes the key participants in the architecture process. It complements the definition of architecture roles in section 3.4 of this standard.

Table 6: Participant Role Definitions

| Participant Role Definitions | | |
|---------------------------------|--------------------------------------|---|
| State | Program and Project Management | The management team that includes the TennCare IS Program Director and assigned Project Managers. |
| | TennCare Business | Organizational units that oversee the policies and operations of the TennCare business functions, such as member services. |
| | TennCare Information Systems (IS) | Provides support for planning, design, implementation, and operation of information technologies and methodologies. |
| | TennCare Enterprise Security | Includes the TennCare and contractor resources responsible for reducing the risk of unauthorized access to systems and data. |
| | Strategic Technology Solutions (STS) | Provides direction, planning, resources, execution, and coordination in managing the information systems needs of the State of Tennessee (the State); STS is a division within the Department of Finance & Administration. |
| TennCare IS Program Contractors | Technical Advisory Services (TAS) | Supports and advises the State in completing the TennCare IS program by offering Organizational Change Management and Training, Operations and Maintenance Planning, TennCare Solution Implementation Lifecycle Advisory Services, Quality Management, and EA services. Provides program and project management support to the State in completing the TennCare IS program. |
| | Business Support Services (BSS) | Assists with Strategic Planning and Development of Business Enterprise Architecture strategy; providing subject-matter expertise supporting certification, testing, Medicaid Information Technology Architecture (MITA), and Advanced Planning Documents; assistance preparing for and coordinating project reviews; and, assistance with the documentation of existing processes and recommendations for process improvements. |
| | Solution Vendor | May be responsible for the design, development, testing, implementation, operations, and/or maintenance of a technology-enabled system that performs any specified function of TennCare. |

Appendix B: Architecture Governance Process Checklists

Table 7: Architecture Governance Process Checklists

| Checklist Item | Response |
|--|----------|
| Conceptual Design Review | |
| Does the Conceptual Design align and comply with TennCare's target EA Vision and blueprint? | |
| Does the Conceptual Design align and comply with TennCare's standards? | |
| Does the Conceptual Design align and comply with CMS standards? | |
| Were the expected impacts of the solution on other projects considered and documented? | |
| Were the expected impacts of the solution on the security and privacy considered and documented? | |
| Were the expected impacts of the solution on the existing (legacy) applications, data, and technology considered and documented? | |
| Have the EA blueprints and the IS Landscapes been updated with the proposed solution? | |
| Have all other technical deliverables required in the Concept phase of the TennCare Solution Implementation Lifecycle been reviewed? | |
| Solution Design Review | |
| Will the functional and nonfunctional requirements meet the solution design? | |
| Is the Solution Design testable against those requirements? | |

| Checklist Item | Response |
|---|----------|
| Will the Solution Design implement the Conceptual Design as intended? | |
| Is the solution design compliant with TennCare and CMS standards, including the Technology Standard? | |
| Have the EA blueprints and the IS Landscapes been updated with the proposed solution? | |
| As-Built Review | |
| Is the solution built according to the Solution Design? | |
| Does the solution implement the Conceptual Design as intended? | |
| Has the Solution Design been updated to reflect any changes made after the Solution Design Review? | |
| Does the solution comply with standards, including the Software Whitelist, subject to any exemptions that have been made? | |
| Do all legacy systems that will be replaced by the new solution have an updated Disposition Design, aligned with the updated Solution Design, to enable smooth decommissioning and migration? | |
| If any responsibilities will be transferred to another vendor, is there sufficient technical documentation in the Turnover Plan? | |
| Is the solution reflected in the IS Landscapes as “in production” status? | |
| Are all planned or designed solutions that will not be implemented removed from the IS Landscapes? | |
| Have all other necessary updates to the Enterprise Architecture and Standards been made, such as additions to the Technology Standard? | |

| Checklist Item | Response |
|---|----------|
| Disposition Design Review | |
| Is the System Disposition Plan complete and aligned with the new system's Solution Design, for a smooth migration? | |
| Have all other technical deliverables specified in the Retire phase of the TennCare Solution Implementation Lifecycle RACI and Deliverables met the criteria in the standard? | |
| Are the IS Landscapes updated to reflect the impact of decommissioning? | |