OIT Governor's Office of Information Technology

C²P: The Colorado Consolidation Plan

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State of Colorado
Information Technology
Enterprise Architecture,
Governance and Consolidation
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Section I Introduction

2 Introduction and Scope

In 2007 Governor Bill Ritter Jr. announced a multi-year information technology consolidation plan that folds state government's decentralized operations into the Governor's Office of Information Technology (GOIT). The plan calls for centralized information technology management, purchasing, spending and planning. The plan will also create a statewide enterprise structure compared with today's department-by-department model. The successful consolidation efforts of other states were studied as part of the plan development process.

In May 2007 Governor Ritter issued an Executive Order which elevated the position of the State of Colorado Chief Information Officer (CIO) to a cabinet level position and addressed a number of administrative changes to Information Technology management processes. An "IT Consolidation Bill" will be introduced in the 2008 legislative session by sponsors Representatives Andy Kerr and Bernie Buescher and Senators Bill Cadman and John Morse to enact the reforms. In addition, an Enterprise Architect was appointed.

In June of 2007, the State of Colorado engaged CIBER to assist in developing an Enterprise Architecture program which is foundational to consolidation and associated governance consistent with the State of Colorado's drive toward consolidation of Information Technology functions. The development of an Enterprise Architecture discipline will address key technology and business issues enabling a consolidated Information Technology discipline throughout the State of Colorado.

Early in 2007 an initial assessment was performed by North Highland Company. Some of the findings of the study concluded:

- A large number of State of Colorado personnel were involved in technology decisions but under no central authority resulting in a fragmented approach to Information Technology management
- There is no consolidated view of the enterprise
- There are large numbers of redundant infrastructures (hardware and software) across multiple departments providing essentially the same functions
- The state has experienced a number of challenged and failed projects
- Tracking of IT spend across the State of Colorado is problematic
- There is a lack of technology standardization across the enterprise

The conclusion of the study was that the State of Colorado is unlikely to realize either the Colorado Promise or an Enterprise Technology Strategy the way Information Technology is currently organized in the State of Colorado.

Enterprise architecture describes how an organization performs its work using business processes, information, people, technology and facilities. Once documented, this can serve as a reference point to manage the coordination of common business processes, information flows and supporting technology investments across all state departments. The State needs to leverage technology to boost the effectiveness and efficiency of service delivery (i.e., doing the right things) and to maximize the coordination of these technology investments (i.e., doing them the right way). Colorado will standardize state-wide enterprise architecture as a means of connecting individual agency goals to a shared information technology strategy so the State can realize the return on its IT investment. The overarching goal is to manage technology investments from a statewide approach which allows it to proactively capture economy-of-scale opportunities. The key results will be a reduction of the total cost of ownership for the State's existing

technology. This enables an opportunity to reinvest savings, continue to drive greater cost reductions and provide better service to citizens.

Enterprise Architecture is a key governance discipline leveraged within enterprise focused organizations providing oversight of information technology investments, standards, processes, alignment of business and Information Technology objectives, responsible for planning and implementing the various architectures required to support business objectives.

Enterprise Architecture to date has not been staffed or supported as a formal discipline in the State of Colorado. There are a limited number of personnel who act as architects and there are very few individuals dedicated to the discipline. The State of Colorado has however, recognized that when attempting to move from a series of vertically oriented organizations to an enterprise organization, there needs to be a discipline that is chartered with providing enterprise-wide oversight. Such oversight addresses not only evaluation of new technologies and initiatives but also the more proactive aspects of the discipline such as technology standards, platform and reference architectures, enterprise integration, and support for defining enterprise processes.

As such, this effort was designed to address the development of the Enterprise Architecture discipline for the State of Colorado Information Technology organization. Enterprise Architecture for the purposes of this engagement is defined within the State of Colorado Information Technology Strategic Plan and is presented immediately below.

The Enterprise Architecture Design Team (EADT) has addressed the core responsibilities of this engagement (Enterprise Architecture and Enterprise Architecture Governance) but also undertook a number of additional activities which were designed to assist the State of Colorado in achieving its consolidation-oriented goals. The Enterprise Architecture Design Team assisted the State of Colorado in not only performing the research for undertaking consolidation inclusive of internal discussion activities, external discussions, and research, but also worked with the State of Colorado to develop a four phase consolidation framework and the initial activities within Phase I of the framework. The framework and Phase I activities were developed in concert between the State of Colorado Chief Information Officer, the State of Colorado Deputy Chief Information Officer, State of Colorado Departmental Chief Information Officers, the State of Colorado Enterprise Architect, and two senior consultants from CIBER.

The EADT has also provided a Communications Plan to address consolidation mechanisms and structures, basic information on Information Technology governance extending beyond Enterprise Architecture governance, a review of existing initiatives designed to determine how these initiatives fit within the goal of consolidation, and a limited amount of information on organizational benchmarks.

This engagement has not addressed the more encompassing concepts of the Project Management Lifecycle, the Software Development Lifecycle, and Program Management (some aspects of which have been addressed by another entity) but has provided a framework under which these processes can be further refined and standardized.

In addition, although this engagement's primary focus areas were Enterprise Architecture, governance and consolidation, the subsequent disciplines of Data Architecture and Business Architecture governance and compliance have been addressed at only a superficial level in early phases but are identified as core deliverables of later phases. In addition, the definition of the Enterprise Architecture discipline does not provide prescriptive standards, policies, procedures and processes but rather identifies those as needs which will need to be addressed when the Enterprise Architecture discipline is created. Elements of Enterprise Architecture transcend almost all aspects of the project life cycle as shown below in figure 2.1

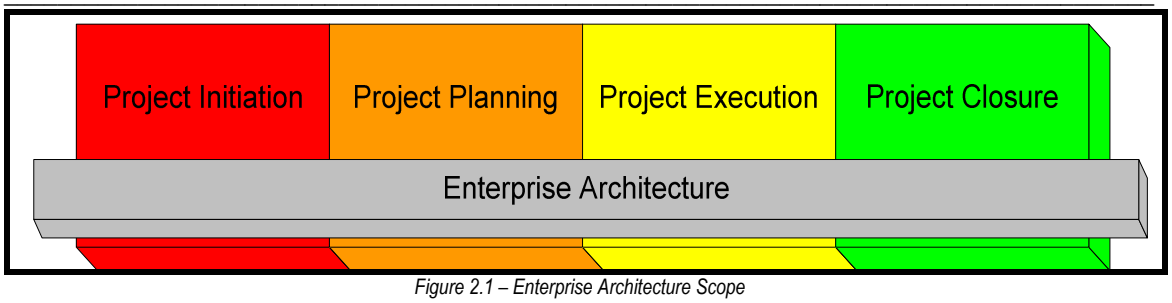

Figure 2.1 – Enterprise Architecture Scope

By way of organizational scope, although this engagement has primarily focused on Executive Level departments, the goal of this is to ensure that the enlisted approach and resultant services are extensible to all State of Colorado departments including the Legislature, Department of Higher Education and its constituent institutions, the Secretary of State, and Judicial branch departments as well.

Proceeding forward within this document, the EADT is the Enterprise Architecture Design Team and is referenced as EADT underscoring the collaborative nature of this engagement. The EADT is comprised of Mr. Ron Huston, the State of Colorado Enterprise Architect, and two senior consulting resources, Mr. Manish Sharma, and Mr. Gregg Powers.

3 Executive Summary

The initial scope of this activity involved engaging the EADT to provide guidance with respect to Enterprise Architecture governance for the State of Colorado in light of its consolidation activities. The EADT has provided this guidance within this document but has also provided consolidation guidance, a communications plan, as well as addressing a wide variety of issues related to consolidation. A summary of the findings and recommendations of these activities are listed below.

- Consolidation activities should be undertaken in a logical order starting with organizational preparation, followed chronologically by infrastructure, service, and business (or program) function consolidation. The latter consolidation activities (service and business) should be carefully evaluated for investment value before embarking on such a consolidation. If sufficient value is not present for an out-of-cycle consolidation, then consolidation should be revisited when the existing service or function requires an upgrade or replacement.

- As new functions or services (e.g. content management) are procured for departments, each of these functions or services should be carefully scrutinized to determine whether there is enterprise applicability for the service or function to be acquired. If it is determined that it is an enterprise level service or function, an enterprise wide set of requirements should be collected and products supporting enterprise wide requirements should be selected and implemented as an enterprise service. This approach will involve Enterprise Architecture in identifying solutions but will result in not having to re-procure the same solutions over and over.

- Careful evaluation should be undertaken with respect to which information technology functions should be physically consolidated and which should be logically consolidated (e.g. placed under the control of a centralized authority but executed in distributed locations). In general, the EADT would counsel that the State of Colorado physically consolidates functions which require minimal interaction with departmental programs and thoughtfully consider whether or not to consolidate those functions which interact heavily with departmental programs and personnel. Of specific note, the EADT would counsel careful consideration before physically consolidating (but logical consolidation should still be undertaken) the following functions:

    - Program specific application development
    - Quality assurance
    - Business analysis
    - Desktop support
    - Departmental coordination and planning

- Consolidation should initially be undertaken using a broadly-based and collaborative approach using State of Colorado information technology expertise to assist in effecting the change. Although this approach may take slightly longer, the overall strain on the organization will be less than a purely top down approach and should enjoy the benefits of reducing risk since the very individuals who have traditionally managed Information Technology functions can be engaged to identify and address risk as well as participate in the consolidation. The EADT acknowledges and believes it is critical that the State of Colorado Chief Information Officer has both the mandate and the authority to act in the event that progress towards consolidation does not move forward in a reasonable manner.

- The EADT believes that there are flaws in the existing structure and the support of the centralized IT organization. Although the existing Division of Information Technology will be able to be re-

organized in a manner that will support successful service delivery, the amount of work required to effect the changes will be significant and will take considerable time. Failure to dramatically upgrade the capabilities of a consolidated information technology organization prior to consolidation will introduce additional risk to the consolidation effort. Areas that must be addressed include personnel issues, funding and investment issues, service provisioning functions, institutionalization of enterprise processes, and enhancing organizational capabilities through the introduction of new services. Finally, provisioning of utility infrastructure management functions is not from the EADT's perspective, a core competency of a state government. As such, the EADT would recommend the State of Colorado consider whether management of utility information technology services is a core competency of the state before determining the service provisioning strategy.

- The EADT would recommend that the State of Colorado begin the process of institutionalizing departmental processes through formal documentation of the various processes. This will not only provide a mechanism to protect the departments from a continuity perspective, but will also facilitate quicker consolidation of departmental functions in the future.

- The EADT recommends the use of a multi-tiered Enterprise Architecture discipline and associated governance with oversight provided by an Enterprise Architecture Board which is chaired by the Chief Architect or Chief Technology Officer. The EADT would recommend the use of several existing departmental CIOs to sit on this board as well as the Chief Information Officer, Deputy Chief Information Officer, Service Delivery Officer, and Chief Information Security Officer. Since Enterprise Architecture is not a robustly staffed discipline anywhere in the State of Colorado at this time, the EADT would recommend that the State of Colorado start the process of identifying and hiring Enterprise Architects to begin building the Enterprise Architecture discipline responsible for building the reference architectures, defining State of Colorado platform and technology standards, defining technology review, adoption, and compliance processes, and developing technology policies.

- Communication will be one of the most important, yet troublesome areas of consolidation if not properly addressed. As such, the EADT strongly recommends acquiring dedicated communications resources whose primary mission is to ensure consistent and accurate communications to a variety of audiences as well as providing education to key decision makers throughout State of Colorado government. Communications focus has been strongly accentuated by other state CIOs that have been consulted throughout this engagement and who have persevered through their own challenges encountered from their consolidation efforts.

- The critical path of the pre-consolidation activities is based around determining what organization (internal or external) will provide managed services, which in turn drives the organizational change approach. As such, any short circuit evaluations which can be undertaken to expedite the decision related to the service provisioning organization will reduce the overall organizational preparation time required. In the event that the State of Colorado were able to determine whether or not to use an external managed service provider, the State of Colorado may be able to leverage potential managed service provider resources and processes to address many of the activities described in this document as a prelude to both consolidation and the move to a managed service provider. The EADT does acknowledge there are aspects of state procurement code which must be complied with nevertheless anything that can be done to shorten this process will be of benefit.

- A very basic analysis of compensation levels within the State of Colorado would suggest that the State of Colorado will need to analyze and potentially upgrade compensation for certain positions, especially if service provisioning will be internally staffed. This will be an important consideration in delivering consistent enterprise service. Above average employee turnover, extended position

vacancy periods, and the inability to attract experienced candidates will all contribute to service degradation which will in turn compromise consolidation efforts. The State of Colorado should wait until decisions are made on the location of functions before undertaking this step.

4 Strategic Issues

As a part of this activity The EADT has identified a number of different issues that the EADT would recommend the State of Colorado carefully consider prior to adopting and executing a final consolidation strategy. Some of these issues are core to the service provisioning strategies that the State of Colorado will adopt and the others are related to more cultural and political issues which the State of Colorado will have to deal with, especially if it decides that service provisioning is a core competency of the State of Colorado.

Is Information Technology service provisioning (in part or in whole) a core competency of the State of Colorado?

Although this is a question best answered by the State of Colorado, the EADT will observe that the more utilitarian nature of the Information Technology function, the fewer tendencies there are to consider them core competencies. Certain information technology functions can be executed effectively by a wide variety of organizations without extensive program or domain knowledge. The State of Colorado government exists to protect and serve its citizens and while Information Technology management is an enabler of programs and services, the execution of the more utilitarian (operations, infrastructure) Information Technology functions are not considered a core competency of a state government. Many states have outsourced their infrastructure and operations to 3rd party managed services providers. This approach to providing service should not be considered a panacea however. Although this approach solves many issues, it introduces other issues which the State of Colorado will have to manage.

Does the State of Colorado have the political will to fund Information Technology services to the level required to make it effective?

Again this is a question best answered by the State of Colorado. The EADT will observe that traditionally, funding of Information Technology personnel, infrastructure, and projects in the State of Colorado has in some cases, been insufficient and has directly contributed to some failures and challenges in State of Colorado Information Technology projects. This is a core educational issue that must be addressed with the State of Colorado legislature and other State of Colorado executives ensuring that the correlation between adequate funding and success is clearly defined. Furthermore, if the State of Colorado determines that it will own service provisioning for State of Colorado departments, there could be some short term increases in costs but the result will be a more robust and more effective information technology infrastructure.

Since the goal is to move to a consolidated Information Technology discipline would departmental or centralized competency centers be developed?

Although the exact distribution of various competency centers should be determined by the nature and users of the individual competency centers, the location of such centers should be determined using proximity values of the centers. As such, if there is significant value in maintaining the competency centers or parts of the competency centers near their users, the competency centers should be logically centralized, but physically distributed. If there is no compelling value to distributing the personnel, the competency centers can be both logically and physically consolidated.

Is physical consolidation of human resources also a goal of the envisioned consolidation?

There will likely be some physical consolidation of human resources, the degree to which will be determined by the final nature of the consolidation. The initial consolidation phase calls for infrastructure consolidation most of which should be able to be provisioned from a centralized location. There are certain Information Technology functions which do not easily lend themselves to physical consolidation and these should probably be left in a more decentralized structure even if logical control is used to manage the distributed function. Example of these types of services are those that are distributed over the expansive geography of the State of Colorado and which have been positioned there because of the need to have them local. In any event, careful consideration should be given as to whether physical consolidation should be undertaken because there may be considerable impact on individuals who may have to travel to different facilities.

Will the State of Colorado be able to sustain attracting and retaining the level of Information Technology personnel required to provide support for the goals of its departments, especially in more robust economic times?

This is a question that can best be answered by looking at existing compensation structures and behavioral patterns of employees which transcend various generations of potential employees. The general statement that State of Colorado Information Technology personnel compensation (in this case total compensation) must at least mirror marketplace compensation is true. The State of Colorado must also recognize that there are some types of marketplace compensation (e.g. stock options) which it can not easily compete with. Furthermore, there are different employee demographics and generations and as such, it may be possible to develop targeted offerings to each of these demographics and generations. As such, it is important to define compensation offerings and value propositions which position the State of Colorado to offer different types of compensation to remain competitive. If a managed service provider is selected, the managed service provider will likely be required to maintain compensation levels consistent with market compensation levels.

Different generations of potential employees may well have different motivations. For example many existing employees of the State of Colorado considered stability as a motivator in choosing a career with the State of Colorado. The current generation may be more interested being compensated for their drive and innovation. These types of employees often place less priority on stability and more emphasis on compensation. This was revealed through a survey of employee ages of existing employees within state governments. Although economic times can have a profound effect on the motivations of individuals, the nature of the various generations needs to be considered.

This is an important consideration especially as it relates to Information Technology introduced efficiencies and innovation. Private companies can more easily attract and retrain more driven individuals and can harness these talents to optimize the service provisioning process resulting in lower costs to provide equivalent levels of service.

Will the State of Colorado continue to allow departments to control spend for Information Technology assets and services, but now consistent with enterprise standards?

This is a fundamental issue that must be addressed by the State of Colorado. Other states have taken varied approaches to consolidation and as such, some have transferred all funds to a centralized organization and others have left responsibility for spend within the various departments using a “fee for service” model under a tightly controlled set of policies, processes, and standards. There are advantages and disadvantages to each model, but this will need to be resolved and if the existing model (e.g. departmental responsibility for spend) is radically changed, this will require additional education and cooperation with departmental representatives.

Section II Consolidation

5 Consolidation Objectives

Although there are a number of possible objectives for Information Technology consolidation, setting these objectives up front will allow the State of Colorado to determine when consolidation has been successful. In general, it would be more valuable to define the magnitude of the scalar quantities presented below, but even defining the objectives in a subjective manner would allow the State of Colorado to measure progress against the objectives and to determine if additional consolidation activities need to be undertaken.

Listed below are the perceived objectives of the consolidation activities. These have been garnered from the State of Colorado Promise, the State of Colorado Information Technology Strategic Plan, informal discussions, and input from other states.

Objective 1

Achieve Information Technology Strategic Plan Objectives and the Colorado Promise

A number of specific objectives have been identified within the State of Colorado Promise and the State of Colorado Information Technology Strategic Plan. Not only are objectives identified within these documents laudable, they represent fundamental commitments to the State of Colorado constituents, businesses, and employees. As such, consolidation is an enabler of many of the stated objectives and should be aggressively pursued. Examples of the objectives from the Colorado Promise include:

- Instituting state government performance and financial reviews that have generated savings of as much as 6% in other states
- Improving purchasing and coordination of state information technology
- Establishing Colorado as a 21st century leader in applications of information technology
- Converting state government telecommunications to Voice over Internet Protocol (VoIP)
- Taking advantage of improvements in technology, purchasing, and business processes

Examples of objectives from the State of Colorado Information Technology Strategic Plan include:

- Securing and protecting IT assets
- Optimizing spending for IT decisions, projects, and technology
- Managing effective IT projects
- Improving service delivery
- Improving collaboration and innovation

Anticipated Results: Achieving objectives stated in both the State of Colorado Promise and the State of Colorado Information Technology Plan.

Objective 2

Standardize Technology Usage, Procurement, and Contracting

In order to optimize spend within the State of Colorado for information technology, it is necessary to both standardize technology and the processes used to acquire technology. This does not mean that a single vendor needs to be selected in each solution space, but reduced numbers of vendors allow the state to take advantage of greater volume discounts using more aggressive negotiating postures, requiring less differentiated skills to support, and reducing the overall cost to procure and support information technology.

Anticipated Results: Technology and technology acquisition standardization will result in lower cost acquisition of technologies and reduced support costs requiring less differentiated skills and eventually less personnel to support the technologies supporting State of Colorado programs.

Objective 3
Standardize Processes and Policies

Differentiated standards and policies create artificial barriers between organizations inhibiting both the sharing of resources and experience as well as resulting in disparities between individuals in different departments.

Anticipated Result: Information Technology staff utilizing a common set of policies and processes would enable the capability for the organization to move resources, as state requirements demand, between various departments or parts of the enterprise. In addition, certain disciplines with which the State of Colorado has traditionally struggled (e.g. project management) can be handled in a more enterprising fashion enabling the development of superior practices, risk identification and mitigation techniques, and accountability.

Objective 4
Unify the Infrastructure Supporting Program Operations

The existing infrastructure supporting programs and services is both distributed and diversified across a large number of facilities, platforms, and communications mechanisms. While it is neither necessary nor desirable to consolidate to a single facility, usage of a smaller number of facilities will concentrate experience and knowledge and reduce the overall costs to provide service. Furthermore, once infrastructure is consolidated, there are natural savings opportunities (e.g. reduce physical security constructs, server virtualization, common management tools) which can be exploited to the benefit of the state.

Anticipated Result: Usage of a reduced set of infrastructure will result in reduced operational costs as well as opening up additional opportunities to save additional resources.

Objective 5
Enterprise Level Planning

Historically the State of Colorado has identified and acquired technology solutions in support of programs by identifying departmental requirements and then provisioning the solution. By planning for and identifying solutions that can meet the needs of multiple (or all) departments, the overall cost of acquisition is reduced and a single solution can be applied to multiple business needs. Furthermore, as Enterprise Integration is addressed, a smaller number of solutions enables the State of Colorado to focus the integration on the richness (or depth) of the services as opposed to the breadth of the services. Traditionally there has been a large amount of redundancy in information (e.g. constituent information) which has been implemented through multiple solutions throughout the State of Colorado which can now be addressed from an enterprise perspective as opposed to a departmental perspective.

Anticipated Result: Enterprise level planning will result in a smaller subset of solutions as well as less replicated data (which is problematic to keep synchronized) reducing the overall costs of providing program services to the State of Colorado constituents.

Objective 6
Effective Use of Information Technology Resources

The State of Colorado has a large array of information technology resources distributed across more than 20 different organizations. At this time, there is considerable diversity in both the technologies used and skills required to support state programs and services and in a FTE constrained environment, this leads to a requirement to have broad skills as opposed to deep skills. Furthermore, in many cases, key technologies are underutilized.

Anticipated Result: Optimizing the use of information technology resources by reducing both the number of differentiated skills required and differentiated technologies used by the state enabling State of Colorado resources to develop deeper skills across a smaller number of technologies. In addition, consolidation will facilitate combining various applications and data onto a less number of underutilized devices reducing the managed asset base.

Objective 7
Reduce Exposures Associated with Information Technology Investments

The State of Colorado has historically presided over a number of both challenged and failed projects along with many more successful projects. Although the successes should not be lost in the shuffle, the goal is to achieve 100% success in projects. The reasons for execution miscues can not be laid at the door of any one organization or individual but many dollars have been invested without returning appropriate business value to the constituents funding them.

Anticipated Result: By managing these investments from an enterprise perspective using a mixture of best practices, education, and expectation management, the State of Colorado will be able to proactively manage information technology investments in a manner that will greatly reduce the number of challenged and failed projects.

Associated with the overarching objectives identified above, the following performance objectives can be used to track organizational performance at an enterprise level. It should be noted that the State of Colorado does not have an established baseline for some of these objectives. The State of Colorado can quickly establish some of these baselines whereas others may not merit the investment in developing the baseline but can use measurement of the objectives to determine organizational performance moving forward. The specific objectives are depicted below in tables 5.1 – 5.8.

Data Center Objectives	Enterprise Objective
Reduce the number of raised floor data centers housing State of Colorado information technology equipment	Reduce the overall cost of facilities required to support Information Technology infrastructure
Provide a standardized disaster recovery data center equipped with appropriate connectivity	Ensure that all State of Colorado systems are identified, categorized, and prioritized with respect to recovery

Table 5.1 – Data Center Objectives

Shared Application Objectives	Enterprise Objective
Reduce the number of groupware systems providing productivity applications throughout the State of Colorado	Reduce the cost of providing groupware and productivity services to State of Colorado agencies
Reduce the number of systems providing administrative functions throughout the State of Colorado	Reduce the cost of overall administrative functions throughout the State of Colorado
Develop enterprise services which can be standardized and provided to the State of Colorado	Standardize selective services transitioning them to enterprise services which can be administered

departments	consistently across the enterprise

Table 5.2 – Application Objectives

Investment Objectives	Enterprise Objective
Adopt project management best practices including advanced risk management techniques	Reduce the number of challenged or failed IT investments driving project success towards 100%
Develop processes for evaluating information technology investments	Ensure that funds invested in information technology provided are compliant with enterprise standards and deliver business value

Table 5.3 – Investment Objectives

Network Objectives	Enterprise Objective
Reduce the number of network links used throughout the State of Colorado	Reduce the overall cost of network services supporting delivery of State of Colorado programs and services
Integrate voice, data, audio, and video over a common network infrastructure	Reduce the overall cost of network services supporting delivery of State of Colorado programs and services and simplifying network management

Table 5.4 – Network Objectives

Enterprise Architecture Objectives	Enterprise Objective
Utilize enterprise wide planning supporting the implementation of new programs and services	Reduce the number of types of similar services leveraging instead a series of enterprise level services and focusing on reuse
Define enterprise standards for hardware, software, and service types throughout the State of Colorado	Enable the procurement organization to leverage aggregate buying power reducing the overall cost of information technology goods and services
Develop various enterprise architectures	Ensure an enterprise approach to design, development, and implementation of systems
Develop agency architectures	Ensure that each agency has a service delivery architecture based on a common architectural base reducing design efforts and improving reuse
Develop enterprise solutions	Consolidate the number of departmental solutions into a lesser number of enterprise solutions meeting the needs of many departments

Table 5.5 – Enterprise Architecture Objectives

Security Objectives	Enterprise Objective
Define and implement an integrated Information Security plan	Secure State of Colorado resources and data

Table 5.6 – Security Objectives

Procurement Objectives	Enterprise Objective
Procure a lesser number of types of goods and services	Reduce the overall cost of procurement of goods and services throughout the State of Colorado reducing the per unit price and the number of differentiated skills required to manage IT infrastructure

Table 5.7 – Procurement Objectives

Financial Objectives	Enterprise Objective
Account for all funds expended on information technology resources	Provide the capability to definitively understand how and where funds are being expended for information technology resources

Table 5.8 – Financial Objectives

6 Consolidation Approaches

One of the identified goals of the State of Colorado is to consolidate Information Technology disciplines resulting in a more economical, standardized, and institutionalized discipline which is able to more effectively serve the citizens and businesses of Colorado.

Virtually every state has attempted some type of consolidation effort in order to more effectively utilize taxpayer resources to provide governments services. There are a number of approaches to consolidation, but the most common approach to consolidation is a physical consolidation followed in some cases, by applications consolidation. Other approaches include consolidation by department or consolidation by function. The EADT would define physical consolidation as physically consolidating Information Technology disciplines into a single location or set of locations under a common management structure and logical consolidation as standardizing execution of Information Technology disciplines across a distributed set of physical locations. To date, more states have focused on the low hanging fruit (e.g. infrastructure consolidation) whereas less have focused on applications consolidation.

Even if both types of consolidation are undertaken within the State of Colorado, the degree of complexity suggests that an infrastructure consolidation be attempted before an applications consolidation. This is largely because of the complexity in trying to identify the normalized business processes required to consolidate applications. Furthermore, having a robust and well managed infrastructure available to house the consolidated applications eliminates one potential source of performance and availability problems for the consolidated applications. Once the physical consolidation has been successfully undertaken, it is then possible to focus on applications consolidation. Within these two categories of consolidation (physical, logical) there is a further breakdown of consolidation efforts that will streamline the process.

There are a number of approaches to Information Technology consolidation that have been undertaken within state governments. In some cases, single state governments have used multiple approaches. A quick survey of these approaches is described below.

Consolidation by stepwise progression

Consolidation by stepwise progression involves identifying a series of steps to move through consolidation in an evolutionary manner. The goal of such an approach is to ready the organization for consolidation and then start focusing on the highest value and lowest risk targets for consolidation first and then over time move to lower value and more risky consolidation targets. The advantage of such a strategy is that consolidation efforts may be halted at any point or suspended for a period of time and the more significant benefits will still have accrued to the organization. Such an approach usually involves focusing on infrastructure first, followed by more functional consolidations later.

Consolidation by business function

Consolidation by business function focuses on identifying common business functions and then centralizing those services. This approach will work and is a variant of a stepwise approach, but there are challenges in implementing such a strategy if the underlying governance, processes, and infrastructure are not in place to support the standardized business functions. As such there is the potential that such an approach can either be derailed or progress significantly impeded if business processes are not standardized. In addition, if a responsive service organization is not prepared to operate the consolidated systems supporting the applications and the individuals using the systems, this can cause service disruptions which would also threaten further consolidation efforts.

Consolidation by department

Consolidation by department focuses on consolidating entire departments into a centralized Information Technology organization. Such an approach can also work, but this approach can have considerable challenges to it if not clearly thought through. A simple example is the challenge in uniting disparate software development life cycles and tools. The time and effort to consolidate these may be overwhelming and yet without undertaking this standardization, few savings will occur from a consolidation involving for example, application development disciplines. If this strategy is chosen, it is imperative that slow and methodical assimilation of departments occurs. It can be problematic for any but the most experienced state CIO's to quickly assimilate the domain knowledge and issues faced by twenty (20) different governmental departments all delivering unique programs and services.

6.1 *Recommended Approach*

Given the input from the State of Colorado CIO's, lessons and approaches learned from other states, and adopting a risk profile that facilitates thoughtful execution, the EADT recommends that the State of Colorado proceed towards consolidation through a multi-phased approach which can best be described as crawl, walk, run resulting in a stepwise progression which builds on successes from a prior phase to launch new consolidation activities in the current phase. As such, the approach creates sustainability for the current and subsequent phases.

This consolidation approach utilizes as a fundamental axiom that it is important to get robust standards, processes, management services, and infrastructure in place before starting to embark upon consolidation of the more important infrastructure services and eventually, business services. If we approach consolidation targeting infrastructure and business services first without having the processes and operational services to support them, we risk failed consolidations. This is the case because throughout the consolidation process, certain processes will have to transition from departmental only processes to departmental/service provider processes. Although not impossible to address business and infrastructure consolidation concurrently, the real opportunity is to consolidate infrastructure first, acquiring the most aggressive pricing possible, and reducing the total assets under management to provide IT services. Furthermore, a solid infrastructure, complete with responsive service is a requirement for service and business function consolidation. If these foundations are not in place, service and business functions consolidations can fail affecting the enterprise.

When proceeding into infrastructure consolidation in Phase II and beyond, the EADT would recommend utilizing a formal framework to guide the consolidation. This framework would ensure that individual requirements of the various departments are addressed and that subtle nuances in service requirements are addressed. The EADT has defined a framework below although the framework could easily be modified once phase I activities are complete.

6.2 *Framework*

In order to pursue consolidation activities, the EADT has worked with the State of Colorado to define a consolidation framework which will generally guide consolidation activities. The framework is not designed to be absolute in nature but is designed to describe a general approach to consolidation which is logical and which is evolutionary in nature (e.g. organization → infrastructure → services → business functions). This is a logical approach since business functions supporting programs rely on services and they both rely on infrastructure. All aspects of IT service further rely upon the organization.

The framework depicted below in figure 6.1 is broken down into four (4) phases – a preparatory phase and a series of consolidation phases. The preparatory phase is designed to ready the organization to support consolidated information technology services and the subsequent phases are designed to address actual consolidation activities.

Infrastructure consolidation activities are centered on consolidating the physical infrastructure but introducing either no change or a very minimal amount of change to the business functional environment. As such, the planned organizational change will be focused largely on infrastructure support and design personnel. Once the base infrastructure consolidation is completed, the service provisioning organization will start to explore ways to achieve further consolidation to save funds (e.g. server virtualization, combining of network links, standardizing platforms). In addition, phase II activities also focus on establishing common platform architectures and technology standards guiding technology procurement going forward so the amount of investment in legacy platforms is minimized.

Once consolidation of the infrastructure is complete, it will be time to start undertaking service consolidation. Service consolidation will be done through the collection and normalization of service based processes and will also require organizational change. In general, it is the EADT's counsel that investment value be determined for all service consolidation activities since in many cases, large outlays of capital and manpower will be required to establish common software bases. There will be personnel based services (e.g. applications development, help desk) and technology services (e.g. email) that will be candidates for consolidation. Consolidation of services will require in some cases, both business process re-engineering and normalization across the enterprise. Furthermore, since services are beginning to be consolidated at the logical level, some programming may be required if underlying services are consolidated and normalized (e.g. migrating to Exchange or Groupwise may require some programmatic interfaces to be changed). Such an opportunity will enable the State of Colorado to build an enterprise service to abstract the underlying technology from the program using the service.

Finally, similar to service consolidation, business functions supporting State of Colorado services and programs will be undertaken. The same comments that apply to service consolidation also apply to business function consolidation except that in most cases, business process re-engineering and normalization across the enterprise will be required. Business function consolidation will be by far the most complex consolidation activities undertaken not only because of the various business process re-engineering and business process normalization efforts, but also because a modicum of organizational change will be required as a part of the business process changes. Similar to the organizational change that usually accompanies new ERP (Enterprise Resource Planning) system deployments a similar set of activities will have to be undertaken even if the State of Colorado both physically and logically consolidates enterprise business functions.

The discussion of business function consolidation gets even more complex when we consider domain function consolidation. For example although there are some elements of licensing that are the same across all licensing functions, there are others that are unique to the programs and services needing licensing functionality. As such, a careful and thorough requirements development activity will be required followed by a functional decomposition of enterprise licensing and domain licensing services. These types of consolidation can be undertaken and will provide benefit, but will require considerable work.

It is the expectation of this framework that the initial two phases (e.g. organizational preparation and infrastructure consolidation) may be undertaken without a great deal of evaluation as to the benefits that will result from these types of consolidation activities. Experiences from other states have clearly demonstrated the value of such consolidations. At this time, there is no reason to believe that the State of Colorado is any more or less standardized than other states which have undergone similar consolidation efforts.

The framework developed provides a roadmap consistent with the approach described above. The EADT has leveraged the use of the existing State of Colorado project life cycle and depicted each phase, governed by this life cycle, along with sample activities included within the framework.

The framework is depicted below in figure 6.1.

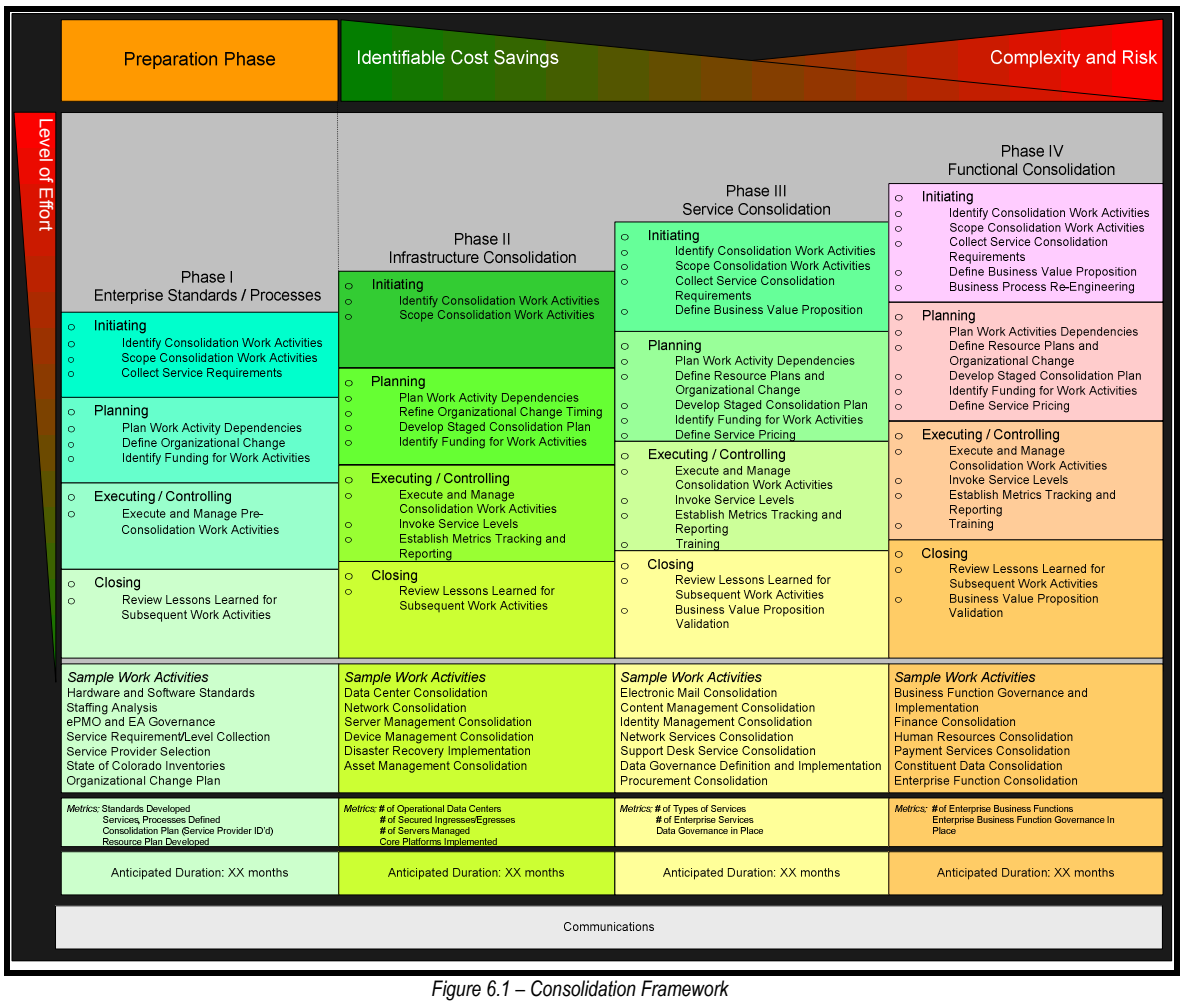

Figure 6.1 – Consolidation Framework

6.3 *Phase I Framework Narrative*

The proposed approach to consolidation for Phase I is straightforward. It is designed around defining business requirements for service, defining existing State of Colorado Information Technology resources, determining the type of organization required to support those requirements, and then determining how the organization must be upgraded to support enterprise wide management. There are other activities that will be undertaken within Phase I as well, but these activities are not in the critical path and have more to do with governance. A high level, graphical depiction of the process is shown below in figure 6.2 followed by short narratives of each of the steps. More detail, in the form of specific activities supporting the steps is documented in a later section.

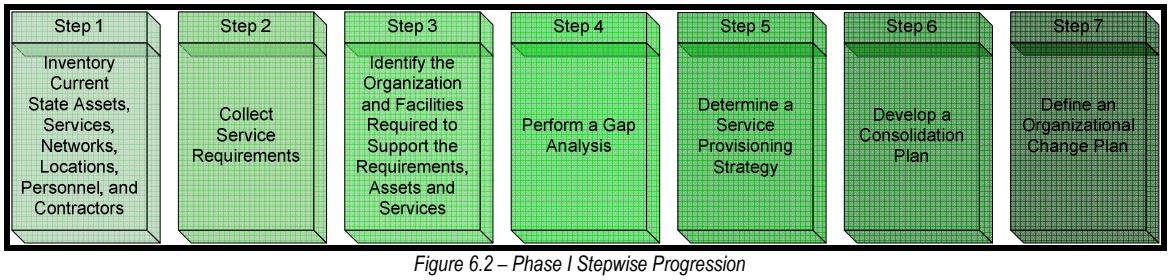

Figure 6.2 – Phase I Stepwise Progression

Step 1
Start by inventory and identifying the personnel, contractors, contracted services, assets, networks, and services currently in place within the State of Colorado departments. In addition, identify the Information Technology services required by each of the State of Colorado departments and use this as a service baseline. The goal of this set of activities is to define the baseline of what the State of Colorado currently has in place with respect to the various items that need to be managed and the resources available to manage them.

Step 2
Collect the business requirements for various types of services needed to support business operations and the service levels required for each of those services. This is a critical step as it sets forth the business requirements for the services needed and the service levels for delivering those services. Such requirements must include the applications and their service levels for those applications.

Step 3
Identify the type of organization required to support the assets and services defined above in steps 1 and 2. The identification of such an organization would include # of individuals, skills requirements, location requirements, etc. This step would result in a staffing plan for an enterprise information technology services organization.

Step 4
Perform a gap analysis of what steps would be required to upgrade the centralized service organization to meet the defined business requirements, service levels, and support the defined assets and services. This includes such items as developing bridge processes to enable the defined distribution of information technology functions.

Step 5
Contact external managed service providers to determine their capability to meet State of Colorado needs and the costs to provide the defined service provide. A subtlety of this gap analysis is that it must be conducted at both a departmental level and an enterprise level. This is so that individual migration plans may be developed on an agency basis and that the necessary level of services are available at departmental cutover.

Step 6
Define a detailed consolidation plan to support the consolidation of all in-scope functions targeted for consolidation in Phase II. The consolidation will depend on the service provisioning strategy selected and will address what will be consolidated and in what order functions and departments will be consolidated.

Step 7
Define the necessary organizational change plan to enable the transition from the existing organization(s) to the new organizations. This would include transition of departmental personnel as required, potential usage of a managed service provider, any required training, etc.

The steps above are chronologically ordered, but are not an exhaustive list of activities that have to be undertaken to effect consolidation. As such, there are a number of activities not directly within the critical path defined above which also need to be addressed. These activities are identified below and generally affect items such as funding and governance.

There are also a number of other activities which are not directly in the path of the consolidation planning process which have been included in the detail activities. These represent organizational preparation activities and include such items as setting up the appropriate governance, defining funding strategies, defining technology standards, aligning procurement with those standards, defining various processes, and so forth. These are not directly consolidation planning activities but do support some aspects of organizational change required to manage information technology from an enterprise perspective.

Within each of the various phases of the consolidation framework, there are additional levels of breakdown. For example in Phase II when network consolidation is undertaken, it is not advisable to undertake network consolidation across the breadth of State of Colorado departments. As such each of the individual activities in the consolidation phases (Phase II – Phase IV) will also be broken down into a logical series of migration activities that will affect either one or a small number of departments at a time.

It should be noted that in some cases, consolidation activities will need to be linked to ensure that orderly migrations are undertaken. For example, if servers are moved, in some cases, it may be necessary to move communication links at the same time. Such activities will be planned at the end of Phase I activities. The development of this plan will require considerable effort but has NOT been depicted on the Phase I activities.

6.4 *Approach Rationale*

The rationale for using the defined approach and framework is based on the commonly agreed upon principles of obtaining maximum value for minimum investment and minimum risk (80/20 rule). Having studied other states experience as well as using the experience of various Information Technology executives, the choice to focus on infrastructure consolidation first is based on this rule. The specifics of focusing on infrastructure first are driven by the following factors:

- The cost to consolidate infrastructure will be less than combining business functions
- The consolidation of infrastructure is less complex than business function or service consolidation
- State of Colorado program services, although they rely on infrastructure services, have no requirements dictating who provides the infrastructure services
- Since applications and program services rely on infrastructure it makes sense to ensure that infrastructure and infrastructure services are robustly implemented before starting to address service or business function consolidation
- The greatest value will be obtained from infrastructure consolidation and standardization
- Infrastructure consolidation value will be easiest to define and capture

In Phase II the following disciplines are expected to be consolidated in a phased manner:

- Network design, administration, operation, and management (including support of remote network access points and devices)
- Systems (mainframe and servers) implementation design, storage design and management, administration, operation, and management
- Enterprise facilities management including facility security
- Enterprise asset management
- Physical and logical security of networks and systems
- Facility security
- Enterprise approach to disaster recovery of infrastructure
- Enterprise architecting
- Procurement and contracting
- Portfolio and investment management

- Program Management Office oversight

In Phase II the following disciplines are expected to continue to be located in the departments but reporting to the consolidated information technology organization:

- Application development and support processes (QA, Business Analysis)
- Help desk
- Desktop support
- Applications administration (but not server administration)
- Customer liaison

Because of the split of some of these functions, certain interim processes will have to be developed (or updated) as a part of the actual Phase II activities. This is because as of today, these processes (regardless of whether institutionalized or not) are executed within the bounds of a single department whereas during the consolidation process, these processes will be split over the departments and the consolidated organization. Longer term these processes may reside completely within the consolidated service organization or maintain a distributed execution profile.

During the consolidation transition period, there will need to be changes to selective processes as facets of the organization are divested from departments and instantiated in the consolidated service organization. Some of the processes that will need to be adjusted (or defined as necessary) are listed below. The list below in table 6.3 is not designed to be comprehensive but features some of the more common processes that will need to be addressed and should spur thinking as to other processes that will have to be addressed.

Process	Current Process	Transitional Process
Move to Production	Departmentally Coordinated	Coordinated between Department and Consolidated Organization
Configuration Management	Departmentally Coordinated	Coordinated between Department and Consolidated Organization
Help Desk (infrastructure)	Departmentally Coordinated	Coordinated between Department and Consolidated Organization
Operational Change Control	Departmentally Coordinated	Coordinated between Department and Consolidated Organization

Table 6.3 – Sample Processes Requiring Re-Factoring

6.5 *Activities and Roadmap*

Listed below in figure 6.4 are the various activities which must be undertaken to complete Phase I activities. In some cases, aspects of these activities have already been addressed, either partially or fully by activities already initiated. These initiatives will be undertaken and data collected and placed in a common repository. Once the data has been collected, various analysis activities and decisions will be made based on the data collected. Once the various decisions have been made, then formal plans to begin the consolidation will be developed.

Most of the initial data collection activities will be conducted through both structured inquiries, document inquiries, and in some cases, individual consultation. Individual issues which may arise will be addressed through collaborative and consensus building mechanisms. The EADT has developed and vetted these activities but acknowledge that there are many circumstances under which execution of these activities may be modified. Furthermore, the State of Colorado will leverage all existing information sources which can be used to reduce the defined work efforts.

A temporal depiction of the 31 activities, complete with predecessor / successor relationships is shown below in figure 6.4.

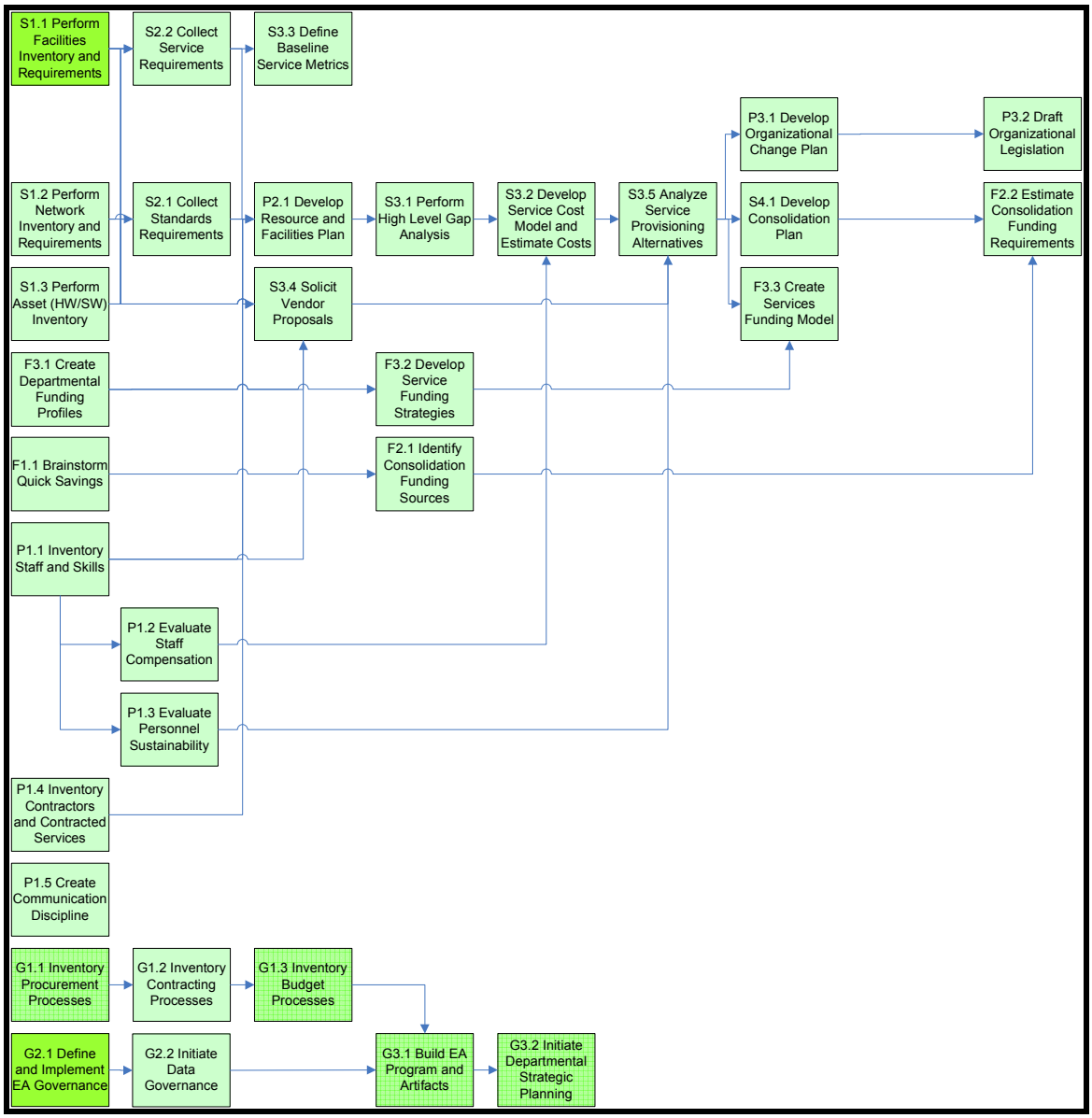

Figure 6.4 – Phase I Activities

Caveats: There is the potential as selective activities are undertaken that the overall order of progress may change. This may happen due to new information uncovered, interim decisions which are made and potentially new activities or information which was not envisioned at the time this plan was created. In addition, conservative estimates have been provided for the activities but there is a chance depending on a variety of factors, that additional time or resources may be required. Furthermore, these activities and associated timelines assume that sufficient resources are available to staff the activities. Large scale changes are not expected but there may be some changes that will be required moving forward.

A high-level, grouped timeline has been provided for the activities listed above. A more detailed plan can not be developed until such time as detailed planning meetings are completed for each of the activities and

resources are identified. Once these two things have been done, more accurate estimates can be provided. The initial estimates for the durations of these activities are believed to be conservative in nature, but until the scope and resources are finalized, a more definitive schedule is not possible. As such, the schedule provided below in figure 6.5 is high-level and is subject to variances. Initiation of these activities can proceed as soon as the legislation is passed.

Once again, it must be stressed that this timeline is a preliminary timeline only and assumes that sufficient resources are available to staff and execute multiple activities in parallel.

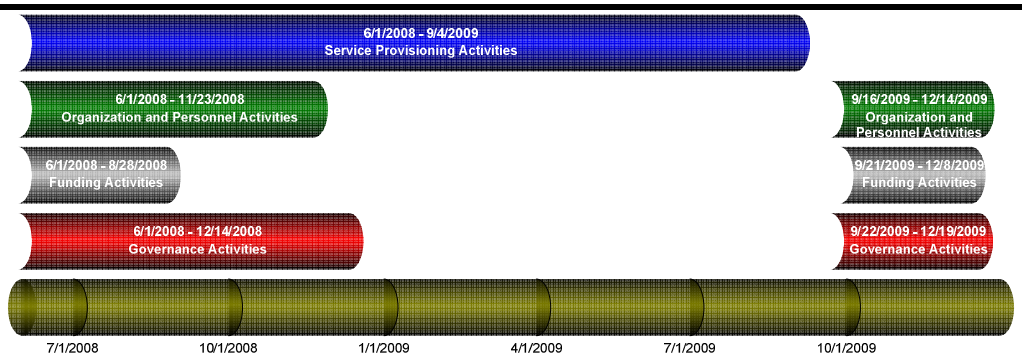

Figure 6.5 – Phase I Projected Timeline

Section III Service Provisioning

7 Information Technology Function Distribution

As a part of a consolidation effort, it is necessary to identify all of the various Information Technology and related functions and then categorize them into how they are controlled and who is responsible for their execution. In the current State of Colorado model, most of these disciplines are both replicated and distributed, and in most cases, are executed inconsistently across the various departments. This approach leads to not only redundant functions, but in higher than average costs to execute the function or provide the service.

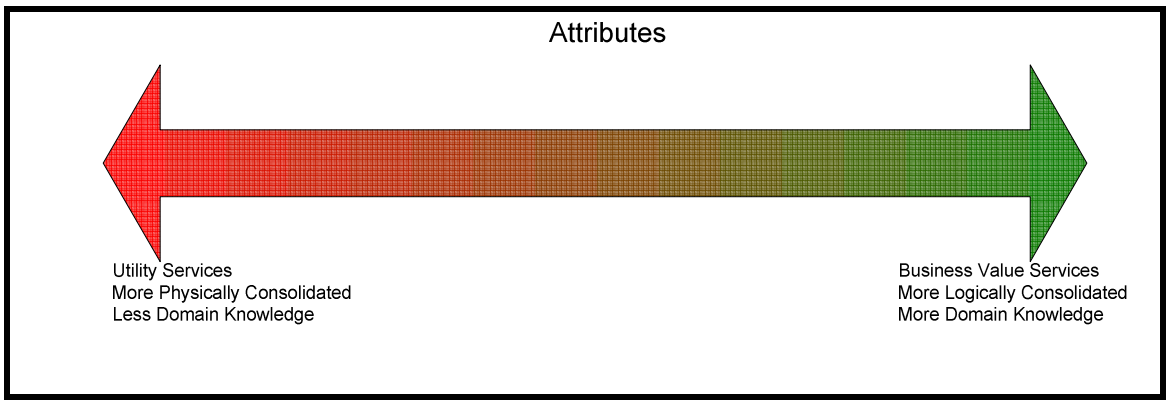

Figure 7.1 – Functional Alignment

The same concepts are depicted in figure 7.2 along a more vertical dimension and using a similar color scheme.

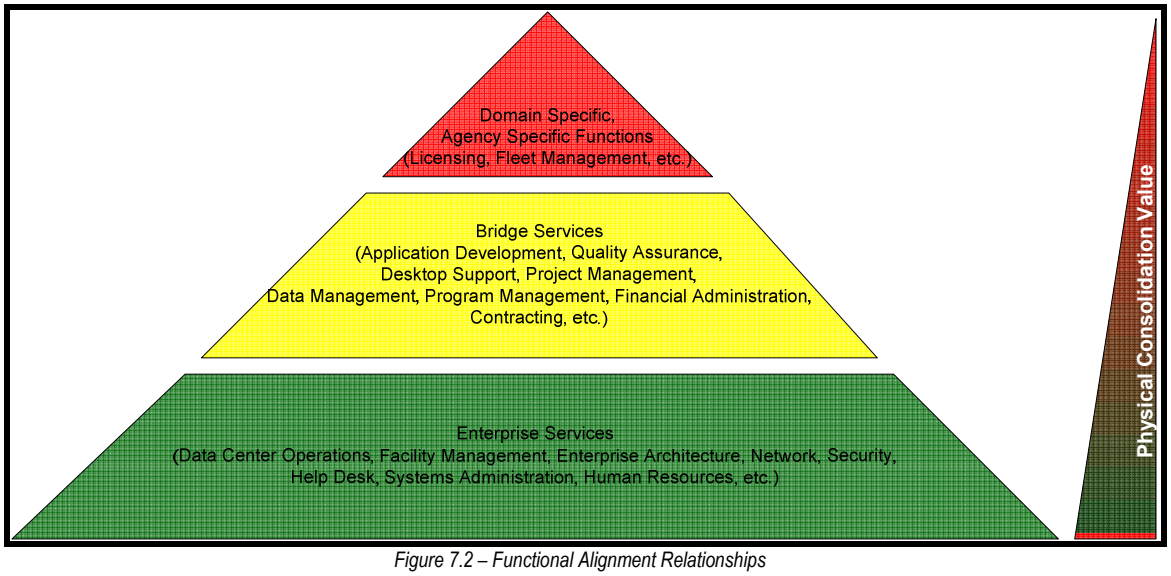

Figure 7.2 – Functional Alignment Relationships

In short, the more aligned with domain (or department) specific functions, the less the physical consolidation value and the more risk there is to physically consolidate those functions. In all cases however, logical consolidation makes sense as logical consolidation is required to effectively standardize information technology disciplines across the state.

Those functions that are within the green section are either purely utilitarian in nature or have compelling enterprise value to consolidate physically as well as logically.

Those functions that are in the yellow section can go in either location, or in most cases, represent functions which may be physically split between a consolidated and distributed structure based on the nature of the function. For example a help desk function which deals with supporting Information Technology functions and systems can easily be consolidated. A help desk function which is specific to program operations (for example in responding to county personnel delivering state services such as voting, drivers license services, and social services) may not be the best target for consolidation although even this is subject to evaluation.

Those functions that are in red may actually be harmed by consolidation and in general are program areas which are assigned to various departments. This does not mean that they can not be standardized, but the ultimate responsibility for managing those functions are best handled within the departments since in many cases, they are statutorily charged with those responsibilities. Furthermore, the information technology systems supporting some of the functions in red may be standardized (e.g. a licensing system supportive of both the Department of Regulatory Agencies and Department of Natural Resources requirements).

The table below is designed to be a decomposition of the various information technology functions (only) with identification of the proposed management strategy in a consolidated organization. It should be noted that even though this considers where various functions should end up, the EADT would continue to recommend an evolutionary approach to consolidation. This means addressing functions on the left side of the arrow first and then moving to the right side of the arrow (or bottom to top in the 2nd diagram) over time. The EADT has provided this spectrum in figures 7.1 and 7.2 respectively based on discussions with the State of Colorado Executive Leadership, research into how other states have distributed these responsibilities, its experience, and industry best practices.

The EADT has provided (P) preferred and (A) alternate functional distribution strategies in table 7.3. In some cases, no alternate model has been proposed because either an alternative model introduces unneeded risk, or distribution of the functions is not in the enterprise's best interest. In other cases, an alternative model, the envisioned second best model has been proposed. It should be noted that these designations are not absolute. That is with the proper planning and process, almost any distribution can be accomplished. However, the recommendations below represent a mix of value and logic and should be the most effective locations from which the various functions can be managed and executed.

Discipline	Centralized Control, Centralized Execution	Centralized Control, Distributed Execution	Distributed Control, Centralized Execution	Distributed Control, Distributed Execution	Hybrid Model
Procurement	P	A			
Desktop Support		P		A	
Project Management		P			A[1]
Technology Standards	P				
Asset Management	P	A			
Applications Development		P		A	
Network Engineering	P				
Program Management	P				

[1] Project management standards centrally defined; project certification processes and measurement centrally managed; actual project management depends on size and scope of project; all projects require review by central program management office

Discipline	Centralized Control, Centralized Execution	Centralized Control, Distributed Execution	Distributed Control, Centralized Execution	Distributed Control, Distributed Execution	Hybrid Model
Quality Assurance		P		A	
IV & V	P	A			
Business Continuity		P	A		
Enterprise Architecture	P				A
Data Governance	P	A			
Data Center Operations	P		A		
Disaster Recovery	P				
Network Management	P				
Capacity Planning	P				
Change Management	P				
Configuration Management	P				
Security Management	P				
Help Desk Services	P		A		
Business Analysis		P		A	
Human Resources	P		A		
Training (Dept. Specific)				P	A
Training (Enterprise)	P		A		
Service Level Management	P				
Contracting Management	P		A		

Table 7.3 – Proposed Functional Distribution

The goal of such a model is to ensure that all activities which need to be close to the departments are close enough to be completely successful and those that do not need to be close to the departments are consolidated and optimized in the best interest of the state and its constituents. It should be noted that this does not, at this time, advocate for complete consolidation or distribution of certain functions (e.g. development at this time). The EADT has advocated an evolutionary approach where the low hanging fruit (e.g. utilitarian function) are addressed first and then more subjective functions are addressed at a later point in the consolidation plan.

For all consolidation activities there are two types of consolidation – physical and logical. Physical consolidation activities involve moving personnel and equipment to a consolidated location or locations from where all activities are managed. Logical consolidation involves leaving personnel and equipment distributed across multiple locations and *either* managing them from a centralized location *or* standardizing the manner in which their work is carried out (in the latter case, an accountability framework will be required to ensure that the distributed functions are complying with enterprise standards and policies).

The following charts demonstrate the value of the two consolidation approaches. In most cases, the lions share of the value of business specific services (development, business analysis, desktop support) are obtained through logical consolidation and not necessarily physical consolidation where as for business in-specific services (infrastructure, security) the lions share of the value is obtained through physical consolidation.

This occurs because logical consolidation of business specific services results in common Software Development Life Cycles (SDLCs), common platforms, common tools, common design patterns, common requirements formats, common architectures, etc. All of these not only enable the larger organization to maximize its investments with smaller numbers of vendors, but also allows gained experience to permeate throughout the organization so that in some cases if resources are moved from one type of project to

another, there is no need to retrain individuals on key processes since they are standardized across the organization. This offers a considerable productivity benefit *and the potential* for resource pooling.

Physical consolidation of infrastructure offers similar benefits by leveraging a common set of technologies, sharing key physical resources across multiple departments, consolidating to a pair of common facilities, etc. All of these consolidation and standardization activities serve to reduce the overall number of devices, facilities, and hence personnel to provide services.

The primary reason for this is clear. In the case of business specific services we are dealing with more ethereal services (e.g. they are not physical) which are tied closely to the business where as with business in-specific services (e.g. utility services), we are dealing with more physical assets and services related to managing them which are not tied as closely to the business.

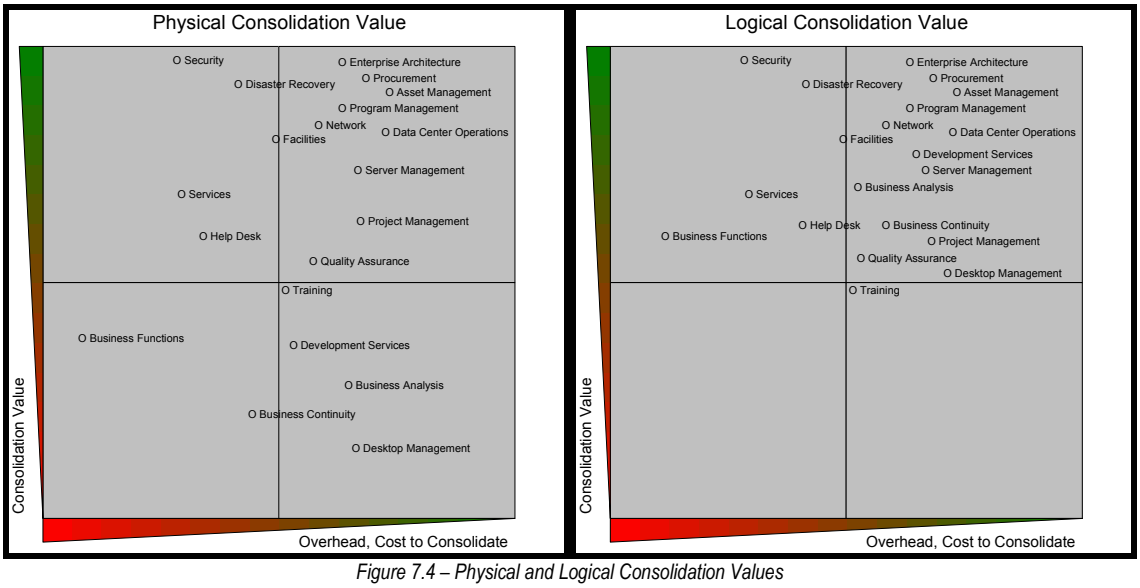

Figure 7.4 – Physical and Logical Consolidation Values

7.1 *Function Location Considerations*

When considering the distribution or centralization of infrastructure and services between one or more entities, there are a number of considerations which should be undertaken before making a final decision as to how the function is controlled and from where it is executed. A partial list of these considerations is listed below. Many of these considerations can be addressed, but the core question that needs to be answered is: does the value obtained by consolidation outweigh the overhead required to consolidate the function?

- Δ Exclusive allocation of personnel to a specific grant or funding stream
- Δ Experience developed and ownership or certain program or service activities
- Δ Effectively managing prioritization conflicts that will inevitably develop and incurring the management overhead of doing so
- Δ Repositioning of personnel from multiple locations to another
- Δ Retraining new personnel on departmental programs and services
- Δ Absorbing all of the "business arrangements" with individual employees
- Δ Potential loss of domain knowledge
- Δ Time to normalize all of the individual processes
- Δ Proper security around specific domain data

- Building the infrastructure to facilitate repetitive interaction with business stakeholders and subject matter experts

Remember that there is the potential for a centrally controlled, but distributed function to be more effective and responsive than a centrally controlled and centrally executed function, yet still have enterprise wide oversight and standardization. In short, there are a number of issues that will have to be addressed to consolidate some Information Technology functions in a manner that does not affect delivery of programs and services.

There are several other questions that should be asked when considering the location of a given function. These are addressed below.

Can the function be executed centrally and still provide optimal value?

In some cases a function can be executed easily from a centralized location. In other instances, centralized execution of a function would make it far less valuable. An example of such a function is desktop support, which generally needs to be executed at the location at which the devices requiring support are located. Maintaining a reasonable level of productivity precludes dispatching desktop support personnel from a centralized location to the various remote areas of the State of Colorado. There is the potential to eventually change the strategy surrounding desktop devices and their support through means such as expanded remote control capabilities, storing of all data on servers, using pre-configured commodity devices, etc. to greatly reduce a distributed presence, but in the short term there will be a need for location resident desktop support. This does not mean there should not be centralized control, but in the short term, the execution must be distributed to the locations needing the support.

In general, the more related to the geography or the program supported by the Information Technology function is, the more there is to be gained by leaving the Information Technology function proximate to the geography or program personnel. The EADT has provided a recommended functional distribution for a number of different functions. Although the list is non-comprehensive, it does address many IT functions and the recommended positioning of these functions.

Can the function be logically decomposed to provide enterprise standardization and distributed execution?

Many functions can be logically decomposed into centralized control and distributed execution. For example, application development can be centrally controlled so that the same System Development Life Cycle (SDLC), the same requirements formats, the same development tools, the same move to production processes, etc. are used throughout the enterprise. Although this approach does not provide the true "resource pooling" that could be employed in a consolidated staff, it does have other benefits as well. First and foremost, it allows some level of autonomy at the departmental level to work on activities critical to delivery of their programs and services. Secondarily, there is less upheaval in terms of employees having to report to a different location under a consolidated structure. Third, some personnel have developed an affinity and loyalty for the departments they work for taking ownership of the service that the Information Technology organization provides to the program areas in the department in which they reside. Finally, because of the tenure of some employees within specific departments, many have amassed considerable program and policy knowledge which enables them to better service the departmental program areas.

Furthermore, through the standardization of process, tools, etc. individuals could be moved in either emergency situations or when a given department may not have critical work underway (rare) to other departments or development efforts.

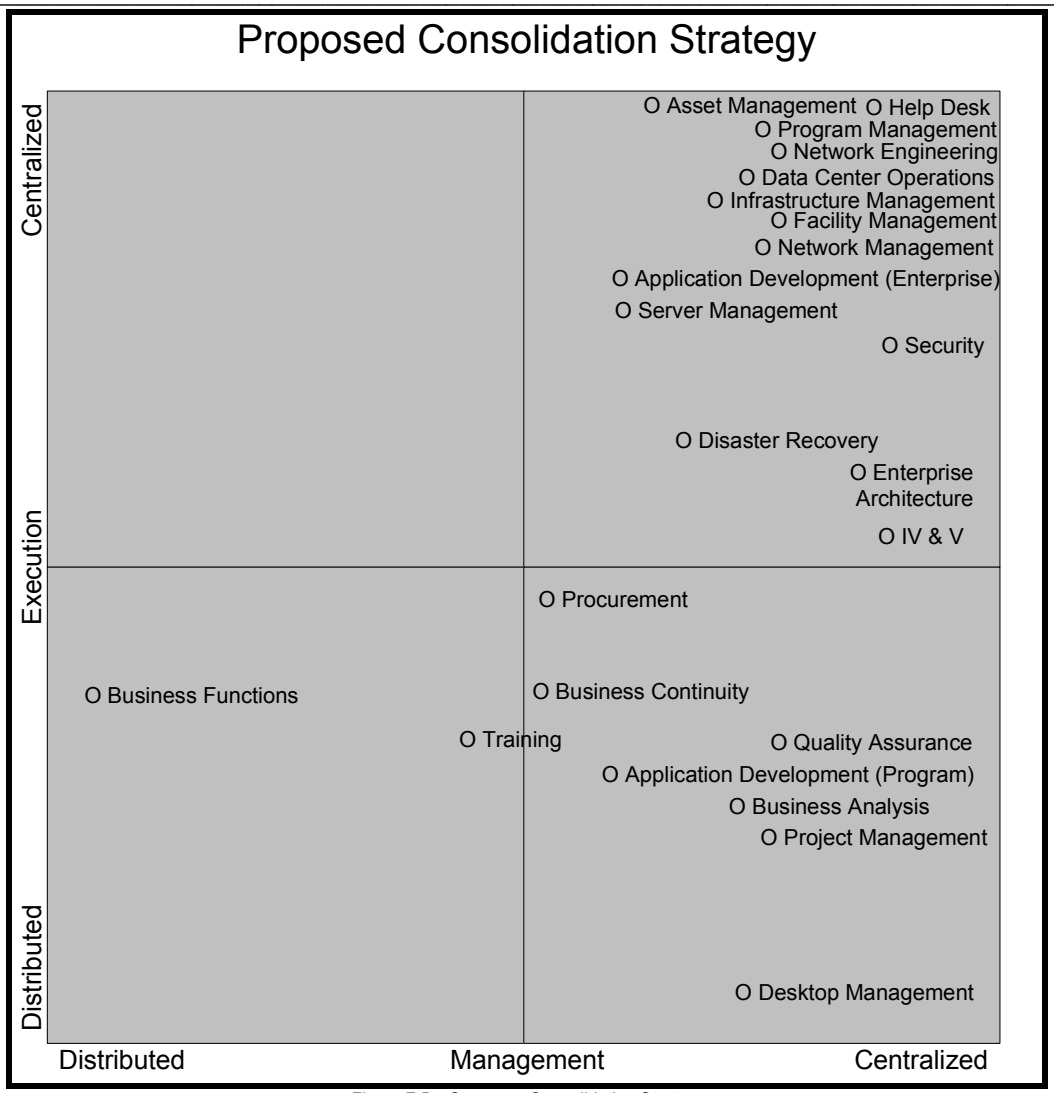

Figure 7.5 – Summary Consolidation Strategy

Figure 7.5 depicts the recommended strategy for distribution of functions which are separate from the charts shown in figure 7.4. Furthermore, the chart above contains a superset of functions of those depicted in figure 7.4. Final determination of where these functions are managed from and where they are executed will be determined through the lifecycle of the framework. There is the potential that as the organization matures, some functions which have been initially implemented in a centrally managed but distributed execution structure could shift over time to a centrally managed AND centrally executed function.

One of the primary reasons cited for distribution of Information Technology services amongst the various departments is the need to provide responsive service to the agencies they service. Most agencies are under the impression that the more centralized aspects of the Information Technology management structure have historically not been able to deliver the responsive and predictable level of service required. In addition, departments often have to deal with late fiscal year unplanned charges as general funds they had planned to use for other purposes are moved from their budgets to the Division of Information Technology to address funding shortages encountered by that division.

This issue is of paramount importance in a consolidated service organization. If the organization responsible for delivering service to the constituent departments initiates consolidation efforts with poor

service, there is a significant potential this will become a fatal blow to consolidation. As such, it will be very important to position the service provider to succeed, but also to manage expectations related to the delivery of service.

7.2 *Service Alternatives*

Since the State of Colorado will develop a consolidated managed service organization (regardless of where it is located or who provisions it) there are a number of different options which can be pursued. Among these are using an external managed service provider, creating a new department within the State of Colorado or managing all Information Technology functions out of the Governors Office of Information Technology. This is not necessarily an exhaustive list of options but represents the major scenarios in use today for state government information technology service provisioning.

The solutions described above are not necessarily comprehensive or total solutions (e.g. it would not be required to transfer all Information Technology functions to a State of Colorado department or to an external managed service provider). For example, Texas outsourced all infrastructure (e.g. hardware and network) support to an external managed service provider and allowed the departments to retain control of development and project personnel. These considerations will be reviewed as a part of Phase I activities described later within this document. Once the final determination of what functions should be physically consolidated and what functions should be logically distributed, a more reasonable picture will emerge as to what potential functions if any should be consolidated to an external managed service provider.

Although there are many different issues with each of the options, the EADT has provided table 7.6 below which is designed to cover some of the issues that may need to be addressed when considering the three options provided above. It must be noted that at this point, there is no clear decision or recommendation as to which path should be taken. Phase I activities when executed, will allow the State of Colorado to make more objective judgments as to which service provisioning alternative should be selected.

There is no perfect service provisioning solution. Each alternative will have its own set of problems, issues, benefits, and liabilities which will need to be addressed to allow that service provisioning strategy to succeed. Once one of the strategic issues identified earlier is addressed, this will lend insight as to which options the State of Colorado should be most carefully considered. The table below is not designed to be exhaustive but is designed to address some of the issues which should be considered as well as listing some of the benefits and liabilities of such an approach.

Category	External Managed Service Provider	New Information Technology Department	Information Technology Managed From Governor's Office
Enterprise Readiness	Enterprise ready with established processes and work activities	Would have to acquire, define various processes including prioritization of work, etc.	Would have to acquire, define various processes including prioritization of work, etc.
Employee Compensation	Required to pay market compensation; expanded employee opportunities.	Could leverage new department creation with new set of compensation rules for their employees	Compensation would likely not mirror market unless changes are made
Optimization	Motivated to optimize costs where possible; client organization may see limited returns	Moderately interested in cost optimization	Cost optimization driven through management structure
Economic Benefit	Provides economic value to State of Colorado; may directly invest in State of Colorado. Would ensure that optimization benefits are shared by provider and state	Some benefit acquired through savings	Some benefit acquired through savings
Departmental Focus	Allows state of Colorado departments to focus on delivery of programs and services	Allows state of Colorado departments to focus on delivery of programs and services	Allows state of Colorado departments to focus on delivery of programs and services
Service	Negotiated with service provider; may be many change orders for new services. Service could be less but can be managed through SLA's; service levels likely more effective with external entity.	Negotiated with service provider; may be many change orders for new services. Service could be less but can be managed through SLA's	Negotiated with service provider; less tendency for change orders for new services. Service could be less but can be managed through SLA's
Budgeting	Fee for service model	Fee for service model or internal funds transfer	Fee for service model or internal funds transfer
Negotiation	Wide and extensive negotiations required covering variety of topics. May be able to use other state's contracts.	Limited negotiation required	Very limited negotiations required
Management	Requires significant vendor management structure; EA and PMO still required	Requires significant Information Technology management structure	Requires significant Information Technology management structure
Setup	Extensive work to setup unless existing contract used	Extensive work to setup	Moderate work to setup

Table 7.6 – Service Provisioning Alternative Issues

7.3 *Issues*

Identified within the service provisioning category are several issues that should be addressed as a part of the overall process structure associated with service provisioning. These issues and recommendations to address the issues are listed below.

Location Changes for Personnel

What could be a challenging issue, consolidation of personnel to a centralized location may prove to be too much for some personnel. This is especially true for the few outlying Information Technology organizations which may be considerably remote from a consolidation point. The size of the State of Colorado's geographic footprint and distance from employees, to physically consolidated functions, must be analyzed when considering personnel relocation caused by physical consolidation.

Recommendation to Address

When the final managed service (internal or external) provider is determined, at that point it will become necessary to poll the individual members of the staffs that are remote from the physical consolidation point to determine if any extra commute is problematic for them to undertake. If that scenario develops, it may be necessary to either hire or acquire replacement resources to support consolidation.

Program Individuals Loaned to IT

Various program areas within the State of Colorado have "loaned" individuals reporting to the program areas to the Information Technology organizations. As consolidation proceeds, it is likely that the program areas will want those FTE's returned to them since they are largely supportive of program operations.

Recommendation to Address

There are several ways this can be addressed with the underlying assumption that the personnel identified are still required. If they are not, they can be simply returned to the program area. If the assigned personnel are desired to be retained, negotiations with the program office providing the personnel can be opened to try to secure the personnel. If this does not work, then it will likely be necessary to either assign the responsibilities outside of the consolidated IT organization or secure a replacement assuming those responsibilities.

This activity does not need to be addressed initially however as the plan calls for collecting departmental requirements and then developing a formal organizational structure into which existing personnel should be able to map. Deficiencies in skills or numbers of individuals may occur at that time.

Training

The State of Colorado has traditionally not invested to the level necessary to maintain an innovative and effective workforce. As such, the State of Colorado, while it has a reasonable workforce, is often not considered an innovative workforce. In some cases, the State of Colorado lags other states in terms of their technology adoption, especially as it relates to best practices of information technology.

Recommendation to Address

As a part of the management of the overall workforce, a formal training program should be implemented which is designed to identify future skills that will be needed by the information technology organization and then to proactively invest in upgrading the workforce through formal training plans. The training need not all be external, but training should be addressed as a formal part of workforce management.

This training program will gain increased importance going forward as the organization begins to address the needs of the enterprise and various types of disciplines are standardized across the enterprise. It will be

necessary that the entire organization is trained on various standards and processes that will be used across the enterprise.

Prioritization of Departmental Requests within a Consolidated Organization

One of the biggest concerns about consolidation of service is that the consolidated service organization will not be able to effectively prioritize requests that may be made of it. Concerns have been raised expecting the consolidated service organization to respond less quickly than a more distributed Information Technology organization.

Recommendation to Address

The EADT has espoused a basic model for "Priorities of Government" structure that could be used to evaluate specific initiatives proposed for funding. This same structure can be extended to cover departmental requests as well. As a part of the implementation of the consolidated service organization, it will be necessary to establish formal priorities for service requests which are not too complicated but which mirrors the priorities of State of Colorado government as a whole.

In addition to this, the current consolidation plan calls for collecting departmental requirements for service and then developing the profile for the consolidated service organization so that the consolidated service organization is staffed to handle all steady state operational requirements as well as some extreme operational requirements.

There is one other dimension to this issue that must be addressed. We are looking to provide sufficient service, not optimal service for State of Colorado departments. Service provisioning can be implemented on a spectrum. Most departments would agree (and have shared with this document's authors) that they could provide better service if they had more people. Most would agree with this statement, but the overall strategy even in the departments is to provide sufficient service, not optimal. As such, the goal of the consolidated organization is to provide sufficient service, as defined currently by the departments.

Asset Transference

As a part of moving to a consolidated service provider, assets are likely going to have to be moved from departmental organizations to either an internal or external service provider. Based on the research, doing this in other states has been considerable work.

Recommendation to Address

No state suggested that there was an easy way to handle this, but several states suggested that it was considerable work. As a part of the Phase I activities, there is a goal to not only identify various assets but also to identify with what types of funds these were procured so that rules around federal funds, grants, and so forth may be preserved regardless of the owning organization.

Once the determination has been made where the assets are to be transferred to, this can be undertaken in several different ways. The first is to purchase the assets based on some residual value of the asset. The second method is to establish an inter-agency transfer of some type. Both of these methods would require consistency in accounting, especially if the assets were acquired with federal or grant funding.

A third method would be to start the process of establishing a new infrastructure and then start the process of charging the various departments on a service basis for the services provided by the consolidated service agency to their respective departments. This approach is cleaner, but the disposition of existing assets would have to be determined before transitioning to a service based model.

7.4 *Service Provisioning Activities*

A number of different service provisioning activities have been provided in the figures below. Each of these activities has been described along with potential approaches, key resources, scope, and both duration and hour estimates. Before actually initiating these activities, a formal planning meeting will be held to refine the scope, define the approach, define a work plan, and identify the resources which will support each activity.

Initiative Attribute	Description
Initiative Name	Perform Facilities Inventory and Requirements
Initiative Status	Mostly Completed
Initiative Number	S1.1
Scope of Initiative	Inventory all raised floor data centers used to house information technology equipment throughout the State of Colorado inclusive of those contracted for. Collect lease terms (lease dates, monthly costs (if any), termination fees) for leased facilities, raised floor space, raised floor usage, power capacity, power usage, UPS capacity, physical security, environmental capacity, environmental usage, users of the space. Store this information in a repository and establish a process to collect any newly established or leased facilities. Also, quality of space will be revisited as well as determining whether vacated spaces can effectively be re-used or returned to those whom they are leased from. Collect departmental facility requirements for computer rooms and other facilities required to house information technology equipment if different from existing facilities. Inventory must consider any upcoming plans for new deployments, timeframes, consolidation activities (e.g. server virtualization) or introduction of new services to remote locations requiring facilities. Also included are any physical security requirements which may not be met by current facilities or which would need to be addressed in a consolidated facility.
Resource Hour Estimate	160 hours
Coordination Hour Estimate	20 hours
Duration	3 Weeks
Key Resources	CH2MHILL (Existing Report), Department Personnel
Key Contact	Departmental CIOs
Requirements (Entrance Criteria)	Acceptance of CH2MHILL Report
Deliverables (Success Criteria)	Inventory of space used for computer facilities used by State of Colorado departments.
Approach	Utilizing the existing CH2MHILL report, send out additional requests for information from the departmental CIOs to augment this data, storing it in a common repository.
Predecessors	None

Table 7.7 – Activity S 1.1

Initiative Attribute	Description
Initiative Name	Perform Network Inventory and Requirements
Initiative Status	Partially completed
Initiative Number	S1.2
Scope of Initiative	Inventory all wide area network links (inclusive of radio links, internal providers of WAN services and external providers of WAN services) used throughout the State of Colorado. Collect lease terms (service levels, lease dates, costs, and termination fees), bandwidth, cyclical traffic patterns, origination and destination, usage, type of link, network nodes connected to link, traffic carried. Store this information in a repository and establish a process to collect any newly established network links. Also, collect any planned departmental network requirements including bandwidth, destination and origin, reliability, QoS (Quality of Service) requirements, security, and type of service. Included within this activity is collection of facilities (network closets) used by the individual departments throughout the State of Colorado using network links and the level of security on those facilities. In general, network requirements and network inventories are not expected to vary greatly.
Resource Hour Estimate	400 Hours
Coordination Hour Estimate	50 Hours
Duration	6 Weeks
Key Resources	DPA Network Personnel, Departmental Personnel
Key Contact	Departmental CIOs
Requirements (Entrance Criteria)	None
Deliverables (Success Criteria)	Inventory of networks used by State of Colorado departments as well as any new network requirements.
Approach	Inquire of DPA of any network inventory that they have and then send this out to the departmental CIOs as an information request asking them to validate and augment the existing data, storing it in a common repository.
Predecessors	None

Table 7.8 – Activity S 1.2

Initiative Attribute	Description
Initiative Name	Perform Asset (HW/SW) Inventory
Initiative Status	Not started
Initiative Number	S1.3
Scope of Initiative	Inventory all information technology assets (routers, storage devices, servers, desktops, laptops, IDSs, switch, printers, etc.) used throughout the State of Colorado inclusive of those that are leased. Collect lease terms (service levels, lease dates, buy out amounts monthly costs, refresh schedule, and termination fees) for hardware, hardware type, serial number, model, original cost, manufacturer, location positioned, installed software, software versions, license type (enterprise, concurrent users, named users, processor, system) date placed into service, primary purpose, depreciation schedule, 3rd party acquisition terms (if any), maintenance costs, utilization (if any), and types and % of funds the asset was acquired with. Store this information in a repository and establish a process to collect any newly procured assets. As possible, the capacity and utilization of these assets will be collected as well. Also this activity will collect any projected increases in capacity required for either hardware or software over the next 24 months.
Resource Hour Estimate	400 Hours
Coordination Hour Estimate	80 Hours
Duration	8 Weeks
Key Resources	Departmental Personnel
Key Contact	Departmental CIOs
Requirements (Entrance Criteria)	None
Deliverables (Success Criteria)	Inventory of assets and associated information in use at State of Colorado departments.
Approach	Discuss the possibility of using automated tools to capture base asset information attached to networks throughout the State of Colorado. Once collected send this base list of assets to departmental CIOs as a request for information having them augment the information and then storing it in a repository. If a tool can not be found, an asset spreadsheet will be developed which the departmental CIOs will be requested to fill out.
Predecessors	None

Table 7.9 – Activity S 1.3

Initiative Attribute	Description
Initiative Name	Collect Standards Requirements
Initiative Status	Not started
Initiative Number	S2.1
Scope of Initiative	Collect any requirements that a department may have with respect to specific standards that it must adhere to which has an impact on specific technology selection. These may include federal standards, state standards, organizational standards, or industry standards. This will also collect existing departmental standards that are in place.
Resource Hour Estimate	50 Hours
Coordination Hour Estimate	10 Hours
Duration	2 Weeks
Key Resources	Departmental Resources
Key Contact	Departmental CIOs
Requirements (Entrance Criteria)	None
Deliverables (Success Criteria)	Inventory of State of Colorado existing standards and standards requirements by department.
Approach	Develop a document and then send out to the departmental CIOs inquiring as to any specific technology standards that must be adhered to as a part of their business as well as any departmental standards that are in place within their departments.
Predecessors	None

Table 7.10 – Activity S 2.1

Initiative Attribute	Description
Initiative Name	Collect Service Requirements
Initiative Status	Not started
Initiative Number	S2.2
Scope of Initiative	Create a service catalog with services and then collect departmental service requirements and service levels required for those services (as is) and any additional services or improved service delivery required. Included within these requirements and levels operational services, installation services, administrative services, management services, and support services related to both computer room equipment and desktop equipment. This activity also includes an inventory of all services and applications (and their users) provided by State of Colorado departments and their geographic distribution across the State of Colorado. Specifics of the services to be collected include all the service requirements and attributes – service description, hours required, response times required from service, availability of service, location where service is required, etc. In addition, fixed service requirements will be identified well along with their attributes. Also to be collected, although not initially used is the requirements for development services, asset management services and similar types of services. Such projections will come from both departmental and enterprise projects as well as projections of staff changes. This activity will attempt to collect existing service baselines if they exist. This activity will validate network requirements and design with the geographic services map. Finally any growth projections for services will be captured as well.
Resource Hour Estimate	600 Hours
Coordination Hour Estimate	100 Hours
Duration	8 Weeks
Key Resources	Departmental Personnel
Key Contacts	Departmental CIOs
Requirements (Entrance Criteria)	Listing of services in a service catalog, service requirements by department, location, service levels.
Deliverables (Success Criteria)	State of Colorado service catalog, geographic service map, and required services, service levels by department, and current providers of defined services.
Approach	Start by building a service catalog. Once completed, the service catalog would be distributed to the departmental CIOs in an information request. The service catalog would cover such items as the type of service, the frequency of the service, the location the service is provided in, specific requirements of the service, the response time required for the service, the current provider of the service, and the duration of the service. The catalog could be augmented by departmental CIOs as necessary to include services they provide which are not listed. Once received, this will form the basis of the service requirements and will be stored in the repository.
Predecessors	None

Table 7.11 – Activity S 2.2

Initiative Attribute	Description
Initiative Name	Perform High Level Gap Analysis
Initiative Status	Not started
Initiative Number	S3.1
Scope of Initiative	Identify the gaps between the level of services required by State of Colorado departments and what the existing consolidated organization can provided. This activity would include not only the gaps between types of services offered and required, but also the gaps between the performance of those services between what can be supported and what is required.
Resource Hour Estimate	40 Hours
Coordination Hour Estimate	20 Hours
Duration	2 Weeks
Key Resources	GOIT
Key Contact	GOIT
Requirements (Entrance Criteria)	Service requirements and levels, staff and contractor inventory
Deliverables (Success Criteria)	Gap analysis of departmental service requirements versus capabilities of existing consolidated organization.
Approach	Once the total requirements for personnel as dictated by the service requirements and consolidated organization staff and skills inventory are completed, along with a proposed organization, a high level comparison would be undertaken to map out the deltas between how the current organization is structured and staffed and how the proposed organization would be structured and staffed.
Predecessors	S2.2 – Collect Service Requirements P1.1 – Inventory Staff and Skills P1.4 – Inventory Contractors P2.1 – Develop Resource and Facilities Plan

Table 7.12 – Activity S 3.1

Initiative Attribute	Description
Initiative Name	Develop Service Cost Model and Estimate Costs
Initiative Status	Not started
Initiative Number	S3.2
Scope of Initiative	Once the resource plan is known, facilities requirements, the requirements for services, the network requirements, and the asset inventory are all known, a formal cost model will be developed for services that would be provided by an internal consolidated service provider to State of Colorado agencies. Also included would be the various processes (billing and remediation process, annual budgeting process, and annual service re-factoring process). In addition, any potential consolidation activities would be considered as a part of this activity. This would extend the concept of a service catalog to include charges for the various services discriminated by location, time, and execution. The purpose of this activity is to develop a measuring stick with which to evaluate external service provider costs as well as develop high level cost comparisons for the costs of services for departments, pre and post consolidation.
Resource Hour Estimate	60 Hours
Coordination Hour Estimate	20 Hours
Duration	3 Weeks
Key Resources	GOIT
Key Contact	GOIT
Requirements (Entrance Criteria)	Resource plan, assets, service requirements, facilities, networks, staff and contractors, funding profiles, staff compensation
Deliverables (Success Criteria)	Projected cost model that would be used to fund a consolidated organization's delivery of services to the State of Colorado departments. This includes the annual budgeting process, annual service re-factoring process, and the billing and process for the services.
Approach	The approach will be to take the information provided in the data and requirement collection activities and calculate the proposed cost of various types of services and then compare these to the cost of existing services within the departments. This will be done by aggregating the resources (and fractions thereof) of the departmental personnel and contrasting this with the costs of the resources in the individual department.
Predecessors	S1.1 – Perform Facilities Inventory and Requirements S1.2 – Perform Network Inventory and Requirements S1.3 – Perform Asset (HW/SW) Inventory P1.1 – Inventory Staff and Skills P1.4 – Inventory Contractors S2.2 – Collect Service Requirements P2.1 – Develop Resource and Facilities Plan (for consolidated org)

Figure 7.13 – Activity S 3.2

Initiative Attribute	Description
Initiative Name	Define Baseline Service Metrics
Initiative Status	Not started
Initiative Number	S3.3
Scope of Initiative	This activity works to define the various baseline service metrics to be used in assessing delivery of service by a service provider to State of Colorado departments. The activity also includes defining reporting of service metrics, and frequency of reports. It does not include development of service levels although such metrics may be used to drive future service level agreements.
Resource Hours Estimate	20 Hours
Coordination Hours Estimate	4 Hours
Duration	1 Week
Key Resources	GOIT
Key Contact	GOIT
Requirements (Entrance Criteria)	Listing of service requirements
Deliverables (Success Criteria)	Formal definition of service metrics, reporting schedule, and reporting structure
Approach	Take the existing service requirements which have been collected and then define reporting metrics, reporting schedules, and report distribution for those service metrics.
Predecessors	S2.2 – Collect Service Requirements

Figure 7.14 – Activity S 3.3

Initiative Attribute	Description
Initiative Name	Solicit Vendor Proposals
Initiative Status	Not started
Initiative Number	S3.4
Scope of Initiative	Once all of the requirements are known for servicing State of Colorado departments, managed service providers will be solicited to determine the costs of providing such services at the required service levels and locations in a manner consistent with the defined service catalog. This activity also includes development of the RFP and the entire RFP process including analysis of the responses.
Resource Hour Estimate	TBD
Coordination Hour Estimate	TBD
Duration	44 Weeks
Key Resources	GOIT
Key Contact	DPA Procurement Director DPA
Requirements (Entrance Criteria)	Departmental service requirements, staff inventory, assets, networks, facilities
Deliverables (Success Criteria)	RFP(s), responses to the RFP(s), and RFP analysis
Approach	Utilizing the information collected develop 1 or more (TBD) RFP's that will be issued to solicit pricing for managed services and potentially economic investment in the State of Colorado. More than one RFP may be developed if the decision is made to utilize more than one master vendor for different disciplines.
Predecessors	S1.1 – Perform Facilities Inventory and Requirements S1.2 – Perform Network Inventory and Requirements S1.3 – Perform Asset (HW/SW) inventory P1.1 – Inventory Staff and Skills P1.4 – Inventory Contractors S2.1 – Collect Standards Requirements S2.2 – Collect Service Requirements

Figure 7.15 – Activity S 3.4

Initiative Attribute	Description
Initiative Name	Analyze Service Provisioning Alternatives
Initiative Status	Not started
Initiative Number	S3.5
Scope of Initiative	Once the costs of the services provided by a consolidated service organization are known and the costs of services provided by managed service providers are known, this activity will assess the benefits and liabilities associated with each of the service provisioning alternatives.
Resource Hour Estimate	80 Hours
Coordination Hour Estimate	40 Hours
Duration	8 Weeks
Key Resources	GOIT
Key Contact	GOIT
Requirements (Entrance Criteria)	Service cost model and estimates, vendor proposals
Deliverables (Success Criteria)	Analysis of the service provisioning alternatives and recommendation
Approach	Take RFP responses as well as the prototype consolidated organization and the costs associated with that organization (service cost model and estimates) and evaluate, both subjectively and objectively addressing issues associated with using both internal and external service providers.
Predecessors	S3.2 – Develop Service Cost Model and Estimate Costs S3.4 – Solicit Vendor Proposals

Figure 7.16 – Activity S 3.5

Initiative Attribute	Description
Initiative Name	Develop Consolidation Plan
Initiative Status	Not started
Initiative Number	S4.1
Scope of Initiative	This activity entails the development of a consolidation plan for Phase II activities. The consolidation plan will be developed in a manner that is evolutionary in nature and will start the consolidation of infrastructure in a logical manner potentially using assets, locations, facilities, and staff as discriminators. If an external managed service provider is selected, this activity will be jointly undertaken with the managed service provider but will be delayed until such time as a formal contract has been signed.
Resource Hour Estimate	200 Hours
Coordination Hour Estimate	80 Hours
Duration	8 Weeks
Key Resources	GOIT, Consultant, Departmental CIOs, ED's
Key Contact	GOIT
Requirements (Entrance Criteria)	Determination of managed service provider, asset list, network list, staff inventory, service requirements, organization change plan
Deliverables (Success Criteria)	Phase II evolutionary consolidation plan
Approach	Once the service provisioning strategy has been determined, take the various assets, service requirements, facility plans, etc. and develop a plan for consolidation grouping together logical associations (skills, assets, etc,), but also soliciting volunteers. Develop the high level plan and then review with Departmental CIOs and Executive Directors adjusting as necessary. The plan will be tailored to address movement of assets, movement of personnel, signing of service levels, and related activities. In addition it will identify tasks required to bridge processes between remaining department personnel and the service provisioning organization.
Predecessors	S1.2 – Perform Network Inventory and Requirements S1.3 – Perform Asset (HW/SW) Inventory S2.2 – Collect Service Requirements S3.3 – Analyze Service Provisioning Alternatives P1.1 – Inventory IT Staff and Skills P2.1 – Resource and Facilities Plan (if internal provider) P3.1 – Develop Organizational Change Plan

Figure 7.17 – Activity S 4.1

Section IV Funding

8 Funding

As a part of this effort, funding is an issue which must be addressed. Within a state government, information technology assets and services are procured using a variety of "colors of money". Each of these "colors of money" comes with associated:

- Δ Usage constraints
- Δ Approval processes
- Δ Reporting requirements

As such, careful consideration must be given when planning funding for consolidating information technology asset and service acquisition and disposition. The EADT has provided a high level overview of the different types of funding and some of the restrictions that exist for those funding types. Although this overview has been provided in table 8.1 below, the real issues of funding will arise as the departmental funding profiles are developed and a detailed understanding of how specific individuals, assets, and services are funded. The EADT has defined an activity to develop formal departmental funding profiles so that consolidation efforts can develop effective consolidation plans.

A key consideration in resolving funding issues and ensuring a sufficient level of service to the various departments from a consolidated service organization will be to ensure that the departments participate in identifying all information technology assets, resources, and services along with the mechanisms through which they are funded.

Funding Type	How Acquired	Conditions	Usage
General Funding	Through application via requests to the legislature. Must be approved via formal process involving the OSPB and the JBC.	Must be approved through State of Colorado processes. There are very few restrictions on how general funds can be expended. TABOR when active can affect the amount of general funds available for allocation.	General funding is used to support a wide array of State of Colorado mandates and activities.
Cash Funding	Through receipt of funds from selective agency operations. Although possible to move funds from a cash funded agency to the general fund, this is an exception rather than the rule.	Generally must be approved through senior executives of the cash funded agency.	Can be used for virtually any items required for or related to delivering required services or programs, some of which are statutorily required. In most cases, cash funds are retained within the agency generating the cash funds
Federal Funding	Can be acquired through multiple sources including federal mandates. There are multiple types of	Generally there are a specific set of requirements for both usage and tracking of	Federal funds can be used for a wide variety of programs; most often used for federal programs

	federal funding including project and operational funding, the latter which is normally used to sustain a program implemented through project funding.	federal money. In many cases, federal funding may require dedicated resources or a tracking system that accurately tracks resources ensuring they are expended on what they were intended for.	that are instituted at the state level. Can not mix funds between defined allocations (e.g. can not spend funds approved for one program on another program). In some cases, may require dedication of resources (e.g. prevent sharing of resources)
Grant Funding	Generally acquired through application for a specific type of grant to provide a specific service or program. Departments (PH & E) can easily use a large number of grants to funds operations and careful accounting is required to ensure that grant funding is not intermixed.	Generally there are a specific set of requirements for both usage and tracking of grant money. In many cases, requires dedicated resources or a tracking system that accurately ensures that resources expended on a grant are for what they were awarded for.	Generally associated with either upgrading an existing program or implementing a new program. In general, there are restrictions on grant funding.
Block Funding	Funding provided for a group of services and provided at one time (e.g. an entire block). Distinguished by other funds which may be dispersed over time	Similar to other federal funding the issuance of block funds is for a specific purpose. Generally not considered a flexible funding source as the block funds are targeted for a specific purpose, group, and often location. At times, block funding will even specify the service provider.	Often provided to service providers who deliver services on a specific constituency.

Table 8.1 – Funding Types

The EADT recommends that the State of Colorado consider using a formal service funding model whereby individual agencies pay for services as they consume them from the centralized service organization. If the centralized service organization is not managed properly and runs out of funds late in the fiscal year, it would not be able to go back to the agencies and request additional funds. As such, the centralized service organization would have to be run as a business. Such an organization must not only be accountable to meeting the needs of its users but must do so in a manner which is competitive with other providers of similar services. A potential way to address this is to have the consolidated service provisioning organization, once it has defined the annual service fees to the departments, to request a supplemental appropriation if additional funds are required near the end of the year. Also of importance with respect to this strategy is that the service provider (whether internal or external) has the capability to provide the necessary granularity of reporting and auditing to comply with requirements of the various funding models (general funding, cash funding, federal funding, or grant funding).

Such a model will require the use of a formal planning process initiated before the start of a new fiscal year. At that time, each agency would provide estimates of the services they will need during the year. These

estimates then become the fixed basis of the funds they will pay to the centralized service organization which will then be used to develop the centralized service organization budget. If the agency uses more services, these are charged for these additional services at an incremental rate. If the agency uses less service however, funds may only be refunded if services are re-consumed by other departments. This is largely because it is impractical for an organization to continue to grow and shrink dynamically based on dynamic changes in required resources. If new resources are needed, these may be sourced, depending on the nature of the need, through new employees or contract positions. To support short-term labor requirements, the centralized service organization should develop several contracts with vendors who will provide short term contractors without requiring formal negotiations.

The TABOR (Taxpayers Bill Of Rights) is currently suspended within the State of Colorado for a period of five years from the passage of Referendum C. There are many indirect outcomes resultant from TABOR (see publication A FORMULA FOR DECLINE: Lessons from Colorado for States Considering TABOR, Center on Budget and Policy Priorities) but the single largest concern is that the State of Colorado may return to the restrictions placed on funding its services. This could trigger an impact on consolidation in the long term as funds required to support consolidated service provisioning could be impacted. If the funds supporting consolidated service are housed within the Governor's Office there could be challenges in providing services to departments if those funds are cut resulting in service degradation. If the funds remain in the departments, they continue to have the autonomy to invest in what they want and if they determine to cut funds for information technology investment, then a corresponding reduction in service provisioning staffs can be undertaken. The key here is to keep the alignment between departmental spend on IT services with those being serviced. If the two of these are split, there is the potential for chasms to develop through a variety of different mechanisms.

Existing levels of federal funding may also be in jeopardy in the future as the federal government looks to the states to assume more responsibility for certain types of programs. This may be caused by several factors including the % of federal funds required to service the national debt and the desire to limit government spending through various financial mechanisms. Regardless of whether or not federal funds actually decrease however, each state should optimize their revenues so that they are able to allocate greater shares of the revenues to program services.

A 2003 Gartner article[2] focused on a case study of governance of funding Hennepin County Information Technology services by migrating from direct appropriations to using internal service funds. The underlying problem was that those responsible for overall financial management (administrators and commissioners) did not have a "strong grasp of technology and its effect on the delivery of services", but that these individuals were often asked to make decisions regarding appropriations. Respectfully, the State of Colorado is in the same position. State of Colorado budget personnel and the Legislature do not have a full comprehension of the impact of some of their financial decisions have on the information technology projects they approve, but constrain, thereby greatly reducing the chances of success. This can seriously handicap the capability of the State of Colorado's capability to be successful with Information Technology projects.

The overall counsel from Gartner, as stated in their Strategic Planning Assumption, is that "…in difficult budget times, IS organizations that fund operations throughout charge backs to user agencies and therefore maintain a tighter linkage to the policy priorities of the jurisdiction, will see fewer reductions in their operating budgets". Furthermore, the key results of this change in Hennepin County funding resulted in:

- The Office of Information Technology operating more like a business

[2] Improving Governance Through Internal Service Funds, Gartner Group, January 2003

- Operating departments having a better grasp of what the Governor's Office of Information Technology does and what it costs to provide technology solutions
- Improvement in communications between departments and the Governor's Office of Information Technology as they were required to work together to plan new initiatives
- Securing buy-in across the various departments because the two entities (Governor's Office of Information Technology and the departments) have worked together to establish the services required

8.1 *Enterprise Service Funding*

As the State of Colorado moves towards consolidation, two different categories of funds will be required. The first are the funds required to meet departmental requirements and objectives usually resulting in various types of information technology projects or services. Current thinking would suggest that funding for these types of initiatives is probably most effectively handled through departmental allocation and management.

There are however two different sets of funding requirements which exist outside of the departmental projects. These two funding requirements are

- Consolidated organization management (GOIT)
- Enterprise projects

The first of these, consolidated organization management is the core structure used to oversee the delivery of Information Technology goods and services to the State of Colorado departments.

The second of these are enterprise projects. Enterprise projects may develop from multiple sources. Departments may for example identify a product or service they need but are not able to fund the enterprise version of the product or service. Funds could be used to augment the initial departmental contribution and positioning it as an enterprise service which other departments, at cost, could use at a later date. Another possibility is to cover variations in service provisioning. A third possibility is that the Enterprise Architecture organization may identify some activity that may be required on behalf of the enterprise which does not truly attach to a single project or department. The EADT would recommend that before investing in such services or functions, that a strategic basis of value be determined before embarking on such investments.

When considering the overall funding strategy for Information Technology goods and services, the EADT would propose consideration of a service fee as depicted in figure 8.2. This service fee would be used to provide funding for the consolidated management organization structure and the positions within as well as for enterprise level projects. As a part of this, a formal reserve level would be set and any funds in excess of this reserve level would be returned to the State of Colorado departments on an annual basis. The concept here is to ensure that the consolidation service organization has funds available to operate in the best interest of the enterprise when needed without having to spend large amounts of time "soliciting funds from departments" for each activity. Furthermore, this also provides value in that separate appropriations are not required to support the consolidated organization (e.g. GOIT).

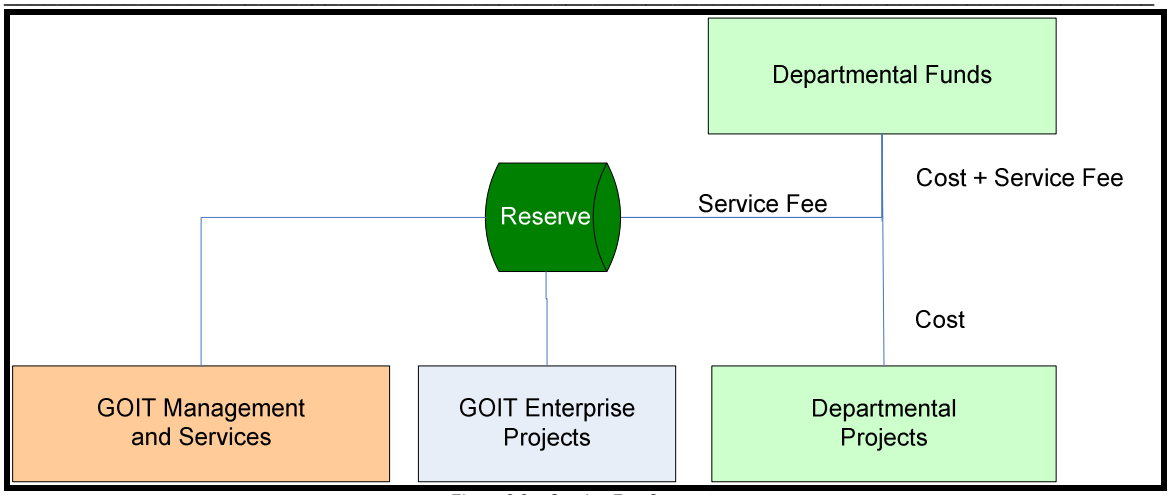

Figure 8.2 – Service Fee Concept

This approach would require that services provided to the departments be augmented with some sort of service fee that would cover the areas defined above. This is no different than a department funding their own Information Technology staff and the associated management overhead as well as initiatives and services supportive of their long term goals and objectives. Traditionally the departmental CIOs have been responsible for identifying services and products that the department will need in the long term.

8.2 *Federal Funding Issues Guidance (provided by VITA)*

As a part of the research associated with this effort, VITA (the Virginia Information Technology Agency) has provided guidance on how VITA has resolved perceived federal funding issues. Colorado may or may not be able to leverage all of the proposed resolutions for these issues but they serve as a baseline in addressing federal funding regulations and potential issues.

Over the past several months representatives from the Virginia Information Technologies Agency (VITA) met with representatives from State agencies to identify issues that might inhibit the transfer of personnel and other information technology (IT) resources to VITA in accordance with the provisions Chapter 981, Acts of the Assembly, 2003. In response to expressions of concern, VITA held in-depth meetings with ten state agencies for the purpose of better understanding the related federal issues. At the conclusion of these meetings, VITA researched the issues and developed conclusions to resolve these issues.

This document summarizes federal issues raised in VITA meetings and the results of their research of federal regulations and policies pertaining to the issues. VITA has concluded based on their research that nothing in these regulations or policies acted to prevent the transfer of IT resources to VITA.

Similar to what VITA undertook, the State of Colorado will have to work with each agency to ensure that its concerns are addressed appropriately.

Issue 1: Administrative Fee

Is the VITA administrative fee an allowable cost under Federal grants?

Conclusion

OMB Circular A-87, Cost Principles for State, Local, and Indian Tribal Governments, prescribes the general principles for determining allowable costs and defines allowable and unallowable costs. In addition, OMB Circular A-87 states that each governmental unit, in recognition of its own unique combination of staff, facilities, and experience, will have the primary responsibility for employing whatever form of organization and management techniques may be necessary to assure proper administration of Federal awards."

The VITA administrative fee will be an amount set to recover the actual administrative support costs attendant to the IT services provided to State agencies. As long as the costs covered by the administrative fee are allowable under the provisions of Attachment B and sections A and G of Attachment C, of OMB Circular A-87, they are allowable charges to Federal grants and contracts.

VITA will include the costs and the methodology used to allocate the costs to the transferred IT activities in its cost allocation plan, which it will submit as required by OMB Circular A-87 to its Federal cognizant agency for approval (as its predecessor department has in the past).

Issue 2: Allow ability of Depreciation on Equipment Previously Purchased with Federal Funds

Can VITA include in its rate calculation depreciation on equipment previously charged to Federal grants directly?

Conclusion

No. The cost of equipment funded entirely by the Federal Government and charged to grants or contracts cannot be charged subsequently to grants or contract through depreciation. Depreciation on equipment acquired with Federal funds and transferred to VITA must be excluded from VITA's cost pool used to establish billing rates. See OMB Circular A-87, Attachment B, paragraph 15.c (2).

VITA's Physical IT Asset Inventory System includes a field for agencies to indicate that an asset was purchased with Federal funds. These assets will be excluded from depreciation calculations provided the agency has so indicated when recording their assets.

Issue 3: Allow ability of Direct Charges for Equipment Purchases

Can agencies have VITA purchase IT equipment for the agency's use; bill the agency for the equipment; and exclude the depreciation on equipment from VITA's billing? (Example: VEC use of unexpended grant funds.)?

Conclusion

Yes. VITA services include IT services in the form of personal services, equipment and software use charges, and buying services for State agencies. In the event VITA acquires equipment and software for a State agency and is reimbursed by the State agency with Federal funds, depreciation of such equipment cannot be included in billings to Federal programs. See OMB Circular A-87, Attachment B, paragraph 15.c (2).

Issue 4: Pre-approval of IT Equipment Purchases

Federal agencies require pre-approval of agency IT purchases; will this requirement extend to VITA equipment purchases, the costs of which are recovered through the depreciation component of the service billing rate base?

Conclusion

No. VITA is a central service as defined in Attachment A, paragraph B.4, and Attachment C of OMB Circular A-87. Equipment purchases of central service activities are not charged directly to Federal programs, and, accordingly, are not subject to Federal agency pre-approval requirements. Federal programs are charged for IT services, which includes charges for depreciation on equipment used in the delivery of billed services.

Equipment purchases by VITA for other State agencies are subject to Federal agency pre-approval requirements in accordance with grant agreements. Such purchases will not be made without agency authorization.

Issue 5: Asset Ownership

Is equipment purchased with Federal funds owned by the Commonwealth or the acquiring agency?

Conclusion

The Commonwealth is the owner. "Uniform Administrative Requirements for Grants and Cooperative Agreements to State, Local, and Tribal Governments," Section 92.32 (a), provides that title to equipment acquired under a grant or sub grant will vest upon acquisition in the grantee or sub grantee, respectively. Section 92.3 defines a grantee as the Government to which the grant is awarded, that is, the entire legal entity even if a particular component of the entity is designated in the award document.

Issue 6: Changes in Equipment Utilization

Can VITA use equipment acquired by an agency with Federal funds and used solely on a Federal program to serve multiple agencies and/or programs?

Conclusion

Yes, unless specifically provided otherwise in the grant program regulations. "Uniform Administrative Requirements for Grants and Cooperative Agreements to State, Local, and Tribal Governments," Section 92.32, paragraph (b) provides that a State will use, manage, and dispose of equipment acquired under a grant by the State in accordance with State laws and procedures.

However, it is important that VITA be mindful of the provisions of paragraph (g) of the foregoing Section. This paragraph provides that a Federal agency may reserve the right to transfer title of equipment acquired with Federal funds. VITA will give careful consideration to the use provisions of paragraph (g) when it takes possession of equipment acquired with Federal funds.

VITA will not use equipment acquired with Federal funds for any purpose other than the purpose for which it was acquired without coordinating such a change with the original purchasing agency.

Issue 7: Sale of Equipment

How will VITA handle proceeds from the sale of equipment acquired with Federal funds?

Conclusion

"Uniform Administrative Requirements for Grants and Cooperative Agreements to State, Local, and Tribal Governments," Section 92.32, paragraph (b) provides that a State will use, manage, and dispose of equipment acquired under a grant by the State in accordance with State laws and procedures.

However, it is important that VITA be mindful of the provisions of paragraph (g) of the foregoing Section. This paragraph provides that a Federal agency may reserve the right to transfer title of equipment acquired with Federal funds. VITA will give careful consideration to the use provisions of paragraph (g) when it takes possession of equipment acquired with Federal funds.

VITA will not sell equipment acquired with Federal funds without coordinating such a sale with the original purchasing agency.

Issue 8: Allow ability of Direct Charge Salaries

Time and effort reporting is a requirement for personnel charges to Federal grants; during transition to a rate based system, will VITA be able to identify the grants to which its direct charge salaries relate?

Conclusion

OMB Circular A-87, Attachment B, paragraph 11(h), addresses the support requirements for salaries and wages. VITA currently has no automated way to identify the specific grants to which direct charge salaries relate. VITA and State agencies working collaboratively will identify the time worked on Federal programs by employees in a manner that fully complies with this requirement.

Issue 9: Third Party services

Are VITA services (e.g., patient billings) on behalf of state hospitals reimbursable under Medicaid?

Conclusion

Allowable costs of central services are allowable under all Federal programs unless otherwise prohibited or limited by program legislation. We are unaware of any prohibitions against charging otherwise allowable central service costs to Medicaid.

Issue 10: Interagency Billings

Will costs associated with providing IT services to hospitals continue to be recoverable from billings to the DMAS/Medicaid?

Conclusion

Allowable costs of central services are allowable under all Federal programs unless otherwise prohibited or limited by program legislation. We are unaware of any prohibitions against charging otherwise allowable central service costs to Medicaid.

Issue 11: Rate base cost variances

How will VITA handle income over expenses or losses?

Conclusion

Income over expenses will be considered in the setting of future rates.

Issue 12: Allow ability of duplicate services

The costs of certain agency administrative services do not change substantially by the transfer of a portion of such services to VITA. Example: Purchasing. This has the effect of increasing the cost of such services to Federal programs; consequently, the Feds may push back because its programs do not benefit from the service transfer. Will the cost of both VITA and agency services be allowed?

Conclusion

Generally yes. OMB Circular A-87, Attachment A, paragraph A.1 provides that “The principles are for the purpose of cost determination and are not intended to identify the circumstances or dictate the extent of Federal or governmental unit participation in the financing of a particular program or project.” This provision provides discretion to Federal agencies. However, of equal importance is the provision of the Circular that provides that “The principles are designed to provide that Federal awards bear their fair share of cost recognized under these principles, except where restricted or prohibited by law.” Paragraph A.2.a. (3) of Circular A-87 states that “Each governmental unit, in recognition of its own unique combination of staff, facilities, and experience, will have the primary responsibility for employing whatever form of organization and management techniques may be necessary to assure proper administration of Federal awards.” The foregoing “fair share” principle considered with the “management discretion” principle makes it difficult to disallow these costs, especially in light of the overall cost reduction and operating efficiency objectives of central service activities, such as VITA.

Issue 13: Indirect Cost Rate

Movement of equipment or personnel may impact an agency's current indirect cost rate (approved or otherwise); what action needs to be taken to address this?

Conclusion
No action is required if the affect on cost pool underlying the rate and Federal reimbursement is minimal. The affect of the change is simply to change the character of expenses from personal services and equipment purchases to IT service costs. If the affect on the cost pool and the Federal reimbursement is material, the agency should address the matter by contacting the grantor or cognizant cost negotiation agency for guidance.

Issue 14: Allow ability of increased costs for similar or like services
VITA services with the fee may be greater than the cost of current services. Will the cost increases be allowed by Federal agencies?

Conclusion
The VITA administrative fee will be an amount set to recover the actual administrative support costs attendant to the IT services provided to State agencies. As long as the costs covered by the administrative fee are allowable under the provisions of Attachment B of OMB Circular A-87, they are allowable charges to Federal grants and contracts.

8.3 *Requirements for Funds*
The State of Colorado has a requirement for certain funds supporting consolidation activities. These funds are needed to secure the personnel required to implement the enterprise functions required to support both consolidation and enterprise Information Technology management. Staffing these functions is critical to overall execution of the consolidation activities and immediate implementation of the Enterprise Architecture practice implementation.

- Communications (PIO, Legislative Liaison)
- Funding for Key GOIT Positions (Statewide Human Resources Director, Statewide Budget Director)
- Enterprise Architecture Personnel (Enterprise Architect, Domain Architects)
- PMO Director

As of the writing of this document, a Statewide Budget Director and Statewide Human Resources Director are being acquired.

8.4 *Issues*
Identified within the funding category are several issues that should be addressed as a part of the overall process structure associated with funding. These issues and recommendations to address the issues are listed below.

Pink sheets / Blue Sheets and Unfunded Mandates
Pink and blue sheets are specific items that are measures which are eligible for debate after having been presented to the Chief Clerk. Pink sheets are normally associated with the Senate and Blue sheets are normally associated with the House. In general, there is the potential for these measures to result in activities which must be undertaken by Information Technology organizations. In some cases, these result in unfunded mandates. This also happens at the federal level as well over which the State of Colorado has less control.

Recommendation to Address
The EADT would recommend this issue be addressed through both education and liaising. For example, the governor and legislators (respectfully so) in large part do not understand the concept of Information Technology management to a degree to which they can anticipate how large of an impact a given mandate

will have on information technology staff. As such, they first should be educated that unfunded mandates can cause staff resources dedicated to a given set of projects to be re-allocated putting those projects in jeopardy. In addition, such mandates may also take funds destined for some other planned work activity and redirect them to address the unfunded mandates. Secondarily, the EADT would recommend that the Governor's Office of Information Technology establish legislative liaisons designed to address unfunded mandates in order to ensure that appropriate fiscal notes are attached to such mandates. These liaisons may work with the legislature to adjust their processes to enable additional consideration time by the Governors Office of Information Technology staff before mandates are passed in order to define the impact of such mandates.

At the federal level, the problem becomes much more intractable. Although there is the possibility that State of Colorado representatives could monitor federal activities and discussion, there is a smaller chance of leveraging dedicated liaisons to affect federal processes.

Colors of Money

The State of Colorado, like most other states, funds the acquisition of information technology goods and services using a variety of different fund sources, each of which have their own approval cycles, constraints, reporting requirements and so forth. This can create a considerable accounting overhead which carries with it, the potential of financial penalties.

Recommendation to Address

Determine using State of Colorado Departmental Budget Directors, OSPB staff, and other personnel acquainted with funding constraints, if there is a method through which funds used to procure information technology goods and services can be translated to a single "color of money". It is believed, based on research that acquisition of facilities for example, does not have to worry about "color of money" issues. If something similar could be done for information technology services, this would greatly simplify the accounting issues around not only expending funds for information technology goods and services, but also for reporting on funds used to acquire information technology goods and services.

If this can not be done, it will be necessary to engage the use of a system through which detailed allocation and accounting of information technology resources can be tracked.

Enterprise Initiatives

There are likely to be certain types of enterprise investments that the Information Technology organization will want to undertake on behalf of the larger enterprise. In some cases, these may be driven through the strategic planning process and it may be necessary to augment funds from a given department with additional funds to extend the acquisition to an enterprise acquisition. In other cases, the Information Technology organization may through its own vision, seek to either offer new or enhance existing service offerings.

Recommendation to Address

Define a method through which enterprise initiatives, which may be initiated by the consolidated Information Technology organization, may be funded. Potential solutions to this are to request funds from the legislature directly, or an alternative is to develop a reserve using an administrative fee for provided services. The concept of an administrative fee could also be used to fund services provided by the consolidated Information Technology organization (e.g. management, PMO, project management services, EA, etc.)

8.5 *Funding Activities*

A number of different funding activities have been provided in the figures below. Each of these activities has been described along with potential approaches, key resources, scope, and both duration and hour

estimates. Before actually initiating these activities, a formal planning meeting will be held to refine the scope, define the approach, define a work plan, and identify the resources which will support each activity.

Initiative Attribute	Description
Initiative Name	Brainstorm Quick Wins
Initiative Status	Partially completed
Initiative Number	F1.1
Scope of Initiative	This initiative would be used to identify any "Quick Savings" that the State of Colorado could pursue in order to reduce existing information technology costs within no or minimal impacts to State of Colorado departmental business processes.
Resource Hour Estimate	24 Hours
Coordination Hour Estimate	6 Hours
Duration	1 Week
Key Contact	GOIT Budget Director
Key Resources	Departmental CIOs, GOIT Budget Director, Departmental Budget Directors
Requirements (Entrance Criteria)	None
Deliverables (Success Criteria)	List of quick wins and estimated savings
Approach	Develop an invite to a meeting specifying the subject matter to be discussed and request those attending to consider what opportunities there are for generating quick savings. Also, develop an online survey or similar mechanism that would be used to solicit ideas for quick savings. Conduct the meeting and identify and address those activities which could result in short term savings. As necessary, assign ownership or generate additional activities to recover those costs in the short term.
Predecessors	None

Table 8.3 – Activity F 1.1

Initiative Attribute	Description
Initiative Name	Identify Consolidation Funding Sources
Initiative Status	Not started
Initiative Number	F2.1
Scope of Initiative	Identify potential funding sources to be used for consolidation. Consider other states approaches to funding.
Resource Hour Estimate	24 Hours
Coordination Hour Estimate	4 Hours
Duration	2 Weeks
Key Resources	GOIT, Select Departmental Budget Directors
Key Contact	GOIT Budget Director
Requirements (Entrance Criteria)	Quick Wins
Deliverables (Success Criteria)	List of potential funding sources for consolidation activities
Approach	Develop an invite to a meeting specifying the subject matter to be discussed and request those attending to consider what opportunities there are for funding consolidation activities. Conduct the meeting and identify and address those activities which could result in short term savings. As necessary, assign activities which may be required to investigate or confirm sources of funds.
Predecessors	F1.1 – Brainstorm Quick Savings

Table 8.4 – Activity F 2.1

Initiative Attribute	Description
Initiative Name	Estimate Consolidation Funding Requirements
Initiative Status	Not started
Initiative Number	F2.2
Scope of Initiative	Identifies estimates as to what Phase II consolidation funds will be required to facilitate consolidation. The activity will include consideration of activities such as movement of equipment, training, de-installation / installation, licensing, new leases, etc. Estimates developed will be used to identify funding required for the next fiscal year and will be refined upon Phase II consolidation activities.
Resource Hour Estimate	80 Hours
Coordination Hour Estimate	20 Hours
Duration	2 Weeks
Key Resources	GOIT Budget Director, GOIT, Departmental CIOs, Consultant
Key Contact	GOIT Budget Director
Requirements (Entrance Criteria)	Knowledge of consolidation plan and service provisioning strategy
Deliverables (Success Criteria)	Funding plan
Approach	Once the potential funding strategies are known, the consolidation plan, and the organizational change plan
Predecessors	F3.2 – Develop Funding Service Strategies P3.1 – Organizational Change Plan P3.3 – Develop Consolidation Plan

Table 8.5 – Activity F 2.2

Initiative Attribute	Description
Initiative Name	Create Departmental Funding Profiles
Initiative Status	Started
Initiative Number	F3.1
Scope of Initiative	Develop a funding profile for each department showing what type of funds (e.g. "color of money") are generally used in the department for acquisition of information technology equipment and personnel and who has control of the funds and through whom they are approved. This activity will also address unusual funding strategies used by departments (e.g. using funds from multiple sources to fund a position or acquisition of an asset). It will seek to define the various line items that compose the funding for information technology within the department (although this changes). This activity will define the various types of funds that are used throughout the State of Colorado, how those funds are requested, approved, acquired, accounted for, and reported on. In addition, this activity will capture constraints on funds provided from sources and how and when savings in funds are returned to the sources of the funding. This activity will address the disposition of funds in the event that the expected expenditures are not made. This activity will also address how assets and services which are currently acquired through program funds will be handled in the future (if differently). Also this activity will work through how to address unfunded mandates (pink/blue sheets) and grant processing to ensure that OIT has some input to the impacts and fiscal notes required to support the mandates or grants. This activity will also capture prior year IT budgets, current year IT budgets both broken down into relevant categories, FTE load (program and IT)
Resource Hour Estimate	320 Hours
Coordination Hour Estimate	40 Hours
Duration	6 Weeks
Key Resources	Departmental Budget Directors, GOIT, Departmental CIOs
Key Contact	GOIT Budget Director
Requirements (Entrance Criteria)	None
Deliverables (Success Criteria)	Departmental funding profiles and related information
Approach	Develop a formal information request around departmental funds used (the types, amounts in the previous fiscal year, restrictions, line items, process for acquisition, and approvals). Also map out the process how grants are addressed and how pink/blue sheets are developed so that processes can be developed around the fiscal components of these instruments.
Predecessors	None

Table 8.6 – Activity F 3.1

Initiative Attribute	Description
Initiative Name	Develop Service Funding Strategies
Initiative Status	Not started
Initiative Number	F3.2
Scope of Initiative	Once the departmental funding profiles are known and information about the various types of funds, a list of potential funding strategies for services provided by a consolidated service provider will be developed. Such strategies must take into account the level of accountability and reporting around such services, who will pay for what, and funding enterprise level services.
Resource Hour Estimate	80 Hours
Coordination Hour Estimate	20 Hours
Duration	3 Weeks
Key Resources	Departmental Budget Directors, GOIT Budget Director, OSPB, JBC
Key Contact	GOIT Budget Director
Requirements (Entrance Criteria)	Understanding of how current funding models are used to acquire IT goods and services
Deliverables (Success Criteria)	Various funding strategies for services provided though a consolidated service department.
Approach	Take the information related to the funding models in each of the departments. Then develop and consider alternatives to service and asset funding that will meet the needs of the various funding sources identified within each of the departments. Identify strengths and weaknesses of each model.
Predecessors	F3.1 – Create Departmental Funding Profiles

Table 8.7 – Activity F 3.2

Initiative Attribute	Description
Initiative Name	Create Service Funding Model
Initiative Status	Not started
Initiative Number	F3.3
Scope of Initiative	Once funding service strategies and the service provider has been developed, and the consolidated provider of managed services has been determined, this activity will result in definition of the exact service funding strategies compliant with each of the various departmental funding sources identified. In addition, it will address how penalties for missed service objectives are addressed and what processes will be used to forecast and consume services at the departmental level.
Resource Hour Estimate	160 Hours
Coordination Hour Estimate	20 Hours
Duration	3 Weeks
Key Resources	Departmental Budget Directors, GOIT Budget Director, GOIT, OSPB, JBC, Departmental CIOs
Key Contacts	GOIT Budget Director
Requirements (Entrance Criteria)	Funding strategies, funding profiles, and current funding models
Deliverables (Success Criteria)	Actual services funding model
Approach	Once the consolidated service provider has been determined and the various funding strategies have been developed, as well as funding profiles created this activity will define the actual service funding model that will be used.
Predecessors	F3.2 – Develop Service Funding Strategies S3.5 – Analyze Service Provisioning Alternatives

Table 8.8 – Activity F 3.3

Section V Organization and Personnel

9 Structure of a Consolidated IT Organization

There are a number of different ways in which a consolidated Information Technology organization can be structured within a State of Government, but three (3) different types are in most common usage. Each of these options will require some type of legislation to enable them. Legislation is currently under development in the State of Colorado to logically consolidate information technology management responsibilities under the State of Colorado CIO resident within the State of Colorado Governor's office.

Establish a New Department of Information Technology

Establishing a separate State of Colorado department would position the Information Technology discipline for sufficient funding and would make delivery of information technology services supportive of programs an executive department responsibility, but not the direct responsibility of the governor. Some insulation would be provided in the event of administration change although some executive management would likely be replaced as well. It is also believed that a department may be able to more effectively address certain aspects of restructuring Information Technology employee management more simply than in other options.

There are limitations on the number of departments that can be established consistent with the State of Colorado constitution. In the event that the 20th and final department is created, either another department would have to be terminated or the constitution would have to be amended in order to create a new department.

Manage Information Technology out of the Governor's Office

Managing all information functions out of the Governor's Office of Information Technology can work, but the Governor's office assumes direct responsibility of providing information technology services to State of Colorado departments. In the event that a severe impact to the information technology infrastructure occurs, many programs will be affected. In addition, there could be long term funding issues in the event that the State of Colorado legislature and the State of Colorado Governor's office become disjointed.

This type of structure can work and if the State of Colorado pursues this strategy (which is likely) it will be important to moderate the level of responsibility assumed by the Governor's office. For example, there is value in leaving the funding for information technology services (to be secured in a fee for service model) in the departments because this leaves the department as responsible for complying with expenditure requirements that exist for both federal funds and grants. In the short-term, this strategy will likely allow for a more responsive organization in terms of dealing with consolidation issues, but long-term it may make sense to consider alternate structures.

Information Technology Management Structure Advised by a Board

Another alternative is to establish an entity which could serve as an advisory board to the State of Colorado CIO. An example of such a board would be the Innovation Council. Such a board could be comprised of State of Colorado leaders, private industry leaders or a mix. The State CIO still would own all operational responsibility for information technology services, but would be able to leverage the expertise of the board on key information technology issues.

The EADT's preferred strategy would be to establish a new State of Colorado department with the head of that department participating as a member of the Governor's cabinet. The EADT believes long-term that this establishes the long term political detachment needed to effectively govern Information Technology without the risk to the Governor. The EADT has through its research of other states, already encountered a

number of different models and most of these models, with the appropriate diligence and structures, work fine. The EADT does acknowledge that each of these options carries with them, a number of additional benefits and liabilities but in general, any strategy will work so long as the underlying sponsorship (commitments and legislation as required) are in place.

9.1 *Organizational Challenges*

The State of Colorado, like most other states, has a number of organizational challenges with its existing workforce. Many of these will need to be addressed before consolidation to an enterprise staff can be accomplished. The organizational challenges are among the most critical to be addressed because once multiple departmental staffs are consolidated to an enterprise staff, delivering poor service will no longer just affect a single department but potentially the entire enterprise. Staff turnover, poor morale, inadequate funding, failed processes, un-recognized priorities, and similar organization issues all will affect the level of service that a consolidated organization can provide.

9.1.1 Compensation

Although the State of Colorado is committed (see below) to providing total compensation which is either competitive or comparable to the market, an analysis of prevailing market conditions and State of Colorado pay plans for Information Technology professionals is required.

The State of Colorado's statutory philosophy is to provide prevailing total compensation (competitive or comparable to the market) in order to recruit, retain, and motivate a qualified workforce. The major components of the FY06-07 total compensation package include pay (official compensation plan), group benefit plans, retirement, performance pay, work-life, premium pay, and paid time-off. The department has developed a strategy that sets the vision and direction for achieving competitive total compensation. A history of benefits and compensation changes to the personnel system is documented in the Total Compensation Time Line.

C.R.S. 24-50-104 states that (1) Total compensation philosophy. (a) (I) It is the policy of the state to provide prevailing total compensation to officers and employees in the state personnel system to ensure the recruitment, motivation, and retention of a qualified and competent work force. For purposes of this section, "total compensation" includes, but is not limited to, salary, group benefit plans, retirement benefits, performance awards, incentives, premium pay practices, and leave." A January 2007 memo from Rich Gonzales, the Executive Director of the Department of Personnel and Administration addressing the lack of adjustment in Information Technology salaries and salary structure compression identifies the fact that this impacts the State of Colorado's ability to attract and retain qualified Information Technology professionals.

It is a fallacy to assume that the State of Colorado must compensate its Information Technology professionals consistent with other governments. Rather, they must compete for the same labor resources within the market within which they operate. It is not necessary that there be exact salary matches between marketplace salaries and State of Colorado salaries, but the overall compensation should be similar. In places where the total compensation is similar but different, formal communication and marketing of the strengths of the State of Colorado as an employer should be emphasized. The State of Colorado must realize however that many individuals (especially some of the most capable individuals) have a short-term focus and may be attracted to larger base compensation and short-term benefits which have the potential to provide significant financial incentives. The State of Colorado's retirement program, while laudable, can not financially complete with large scale financial incentives properly invested earlier in an employee's career.

This is problematic for State of Colorado departmental Information Technology organizations in general, but as the State of Colorado seeks to centralize more functions, the potential lack of qualified individuals will

result in poorer and less responsive services, placing the entire consolidation effort at risk from Executive Directors who will see support for their business needs compromised.

The EADT was able to capture information about existing Information Technology pay grades within the State of Colorado and these are depicted in table 9.1 below.

Job Title	Code	Monthly Minimum	Monthly Maximum
Computer Operator Prod Coordinator Intern	G24	$1,942	$2,723
Computer Operator Prod Coordinator I	G28	$2,141	$3,002
Computer Operator Intern	G30	$2,248	$3,154
Computer Operator I	G34	$2,479	$3,477
Computer Operator II	G42	$3,013	$4,222
Computer Operator Supervisor I	G54	$4,037	$5,659
Computer Operator Supervisor II	G62	$4,903	$6,878
Application Programmer Intern	H80	$3,083	$4,446
IT Technician	H81	$3,234	$4,669
Application Programmer I	H82	$3,397	$4,900
IT Technician	H83	$3,568	$5,148
Application Programmer II	H84	$3,747	$5,403
IT Professional I	H85	$3,934	$5,674
Application Programmer III	H86	$4,130	$5,956
IT Professional II	H87	$4,336	$6,255
IT Professional III	H88	$4,780	$6,894
IT Professional IV	H89	$5,536	$7,983
Application Programming Manager	H89	$5,536	$7,983
Computer Operations Manager	H90	$6,237	$8,993
IT Professional V	H91	$6,547	$9,112
IT Professional VI	H92	$6,873	$9,112
IT Professional VII	H93	$7,217	$9,112

Table 9.1 – State of Colorado Pay Grades

The broad bands used by the State of Colorado make it difficult to provide exact matches between industry standard positions and State of Colorado positions. In fact, although the structure allows flexibility in some ways, it inhibits comparisons with industry defined job descriptions and titles. Furthermore, there is the potential with the broad banding that the same individual with the same responsibilities is compensated differently in different agencies.

The EADT has looked at a number of external positions from a salary survey[2] conducted in mid-2007 and the compensation received by various positions in large organizations and these are depicted in table 9.2 below. Although the positions can not be compared in an apples-to-apples manner, even general comparisons are revealing. Note how many of the positions fall at or near the top of the salary ranges for State of Colorado personnel. The figures below represent base compensation only. The compelling aspect of this comparison is that State of Colorado compensation can not even come close to 4th Quartile compensation for these representative positions and for the State of Colorado to meet even Mean level compensation would require that individuals be placed within the higher bands.

Position	**Mean**	**4th Quartile**
Project Manager - Applications	$91,525	$160,731
Webmaster	$61,147	$133,486
Database Specialist	$79,262	$132,099

Software Engineer	$78,359	$159,860
Senior Network Specialist	$80,912	$165,713

Table 9.2 – Mid 2007 Salary Survey Results Mean and 4th Quartile Base Compensation

Furthermore, according to a June 2007 Salary Survey[3] there are a number of companies providing additional compensational benefits to their employees, some of which the State of Colorado can not provide.

Benefit	Percentage of Respondents
Stock Options	21%
Enterprise Performance Bonus	38%
Personal Performance Bonus	52%
Flex Schedule	56%

Table 9.3 – Secondary Compensation Benefits

9.1.2 Departmental Personnel and Spend

The existing IT personnel profile throughout the State of Colorado is listed in table 9.4 below. Note that this does not include IT personnel from which may be used or allocated to Information Technology organizations, but report and are funded through program areas. The number of these individuals is unknown.

Department	Identified IT FTE[4]	Vacant IT Positions	Salary + Benefits	Total Projected IT Spend[5]
DPA	208	6	$14,554,354	$36,016,030
Human Services	163	28	$13,193,856	$50,497,456
Revenue	121	23	$8,933,846	$25,187,186
Transportation	99	6	$8,280,086	$23,087,789
Health	89	7	$6,918,710	$11,553,456
Corrections	85	6	$6,325,819	$14,065,271
Public Safety	82	8	$5,302,325	$12,776,028
Labor	71	7	$6,365,621	$12,168,108
Natural Resources	67	10	$5,814,763	$13,764,390
Regulatory Agencies	29	1	$2,200,334	$4,064,291
Education	24	1	$1,851,912	$4,836,039
HCPF	20	3	$1,657,598	$2,559,681
Local Affairs	12	1	$954,864	$1,785,382
Agriculture	8	0	$648,605	$1,464,383
Military Affairs	8	0	$410,314	$1,120,049
Governors Office	1	1	$83,250	$625,843
Judicial				
Law				
Higher Education				
Treasury				
Historical Society				
Totals	1087	108	$83,496,528	$215,571,381

Table 9.4 – IT Spend by Colorado Department

Of the total spend reported above ($215,571,381), the estimated breakdown across all departments is as follows

[3] 2007 Midyear Salary Survey, Janco, June 2007
[4] Does not include IT positions allocated from and funded by program areas
[5] Does not include IT spend from program areas but does include IT spend for salary and benefits for personnel

- Δ FTE Salaries and Benefits 38.7%
- Δ Operating Leases, Indirect, Support FTE 3.1%
- Δ Contracted IT Services 11.9%
- Δ IT Operating Budgets 46.3%

The EADT believes that the total spend represented above is not comprehensive. It is not believed to cover all FTE's and equipment that may be coded to different accounts or which may reside in other areas (e.g. program areas or non-executive departments). There is the potential that significant (perhaps as much as $100+ million dollars) in additional spend has not been captured. The EADT has proposed a formal activity of developing a comprehensive departmental spend model required to identify ALL information technology spend.

The projected funding profiles, using the information provided by the Department of Personnel and Administration for each of the various departments are listed below in table 9.5. These will need to be validated in subsequent activities. Those departments whose funding source breakdown was not available were left blank.

Department	Projected IT Spend[6]	% General Funded	% Cash Funded	% Federal Funded
DPA	$36,016,030	2.09%	97.35%	0.56%
Human Services	$50,497,456	28.59%	17.45%	53.96%
Revenue	$25,187,186	20.73%	78.99%	0.28%
Transportation	$23,087,789	0.00%	32.15%	67.85%
Health	$11,553,456	4.70%	35.09%	60.21%
Corrections	$14,065,271	91.20%	7.62%	1.18%
Public Safety	$12,776,028	29.61%	53.11%	17.28%
Labor	$12,168,108	0.00%	76.83%	23.17%
Natural Resources	$13,764,390	6.52%	85.31%	8.17%
Regulatory Agencies	$4,064,291	2.25%	95.82%	1.93%
Education	$4,836,039	44.34%	48.07%	7.59%
HCPF	$2,559,681	42.23%	9.51%	48.25%
Local Affairs	$1,785,382	2.90%2	57.86%	39.25%
Agriculture	$1,464,383	12.09%	66.50%	21.40%
Military Affairs	$1,120,049	28.03%	10.17%	61.80%
Governors Office	$625,843	18.91%	19.97%	61.13%
Judicial				
Law				
Higher Education				
Treasury				
Historical Society				
Dollar Totals	$215,571,381	$42,438,319	$112,898,905	$60,234,156
Percentage Totals	100%	19.69%	52.37%	27.94%

Table 9.5 – Breakdown of Departmental IT Spend Funding Sources

9.1.3 Retirement

The State of Colorado has in front of it, serious concerns with respect to retirement of the existing employee base. Although this concern extends beyond the Information Technology discipline, Information Technology is particularly susceptible to the loss of tenured and dedicated State of Colorado employees. The existing

[6] Does not include IT spend from program areas but does include IT spend for salary and benefits for personnel

compensation structure for Information Technology employees within the State of Colorado makes this even more problematic since it may be hard to attract the level of individuals required to replace those who have built up a body of knowledge over their tenure.

This often results in many departments hiring entry level personnel and attempting to train them. This in itself causes a loss of productivity. The potential for trained employees to leave the organization once they have built up a critical mass of skills and the overall productivity hit is significant. Add this to the fact that many aspects of Information Technology operations are not institutionalized and personnel loss results in a direct loss of knowledge about State of Colorado Information Technology operations and this introduces a significant risk associated with State of Colorado employee retirement.

The EADT researched information related to State Government employee retirement through a study conducted by NASCIO[7] in which the State of Colorado participated. This study revealed that:

- 18.2% of state government workers were less than 30 years old
- 21.2% were 31-39 years old
- 27.1% were 40-49 years old
- 33.5% were 50 years old or older

It would be expected that if state governments were attracting younger workers at the same rate that a more uniform distribution would occur. It should be noted that these ranges are somewhat skewed because the age range of 50 years or older encompass more years than the other ranges.

More specific to the State of Colorado is table 9.6 which depicts the percentage of employees eligible for retirement over the next ten (10) years by department. The subtlety here is there is a distinction between those eligible to retire and those who will actually retire. No analysis has been performed within this effort to assess on average how long after an individual is eligible to retire, they actually retire. It is important to note that some deficiencies have been found in the information provided although these are not expected to materially skew the size of the issue that the State of Colorado is facing.

Department	% of Employees Eligible for Retirement within the Next 10 Years
Personnel and Administration	46.23%
Agriculture	25.00%
Corrections	45.12%
Education	21.74%
Public Health and Environment	42.86%
Transportation	35.29%
Human Services	27.22%
Labor and Employment	46.48%
Law	42.86%
Local Affairs	25.00%
Military Affairs	28.57%
Natural Resources	19.40%
Public Safety	25.00%
Regulatory Agencies	16.67%
Revenue	47.62%
Health Care Policy / Financing	30.43%
Secretary of State	12.50%

Table 9.6 – Age of State Workers

[7] State Workforce, Here Today, Gone Tomorrow!, NASCIO, 2005

The State of Colorado potential employee retirement demographics have presented slightly differently. Table 9.7 below depicts the number and percentage of employees that are eligible to retire over the next ten (10) years. In general, the distribution of the potential retirees are distributed over the various State of Colorado departments but the as shown from table 9.6 above, the departments of Revenue, Personnel and Administration, Corrections, Labor and Employment, Law, and Public Health and Environment will have almost 50% of their workforces eligible for retirement over the next ten years. Particularly concerning is that one of the potential departments into which consolidation of Information Technology services is being contemplated (e.g. Personnel and Administration) may be particularly vulnerable to a loss of intellectual capital and experience.

All of the percentages presented in figure 9.7 are based on a total of 1,141 employees and were provided by the Department of Personnel and Administration. They do not include the Department of Higher Education or any of the institutions of higher education.

Year	# (%) of Employees Eligible
2007-2008	52 (4.56%)
2008-2009	18 (1.58%)
2009-2010	29 (2.54%)
2010-2011	39 (3.42%)
2011-2012	31 (2.72%)
2012-2013	36 (3.16%)
2013-2014	52 (4.56%)
2014-2015	55 (4.82%)
2015-2016	52 (4.56%)
2016-2017	52 (4.56%)
Total Over the Next 10 Years	415 (36.37%)

Table 9.7 – State of Colorado Employee Retirement Profile

9.1.4 Missing Skills

The State of Colorado, although it has a widespread Information Technology staff, is missing some key resources which would be of value in a consolidated organization. During the discussions with the departmental CIOs, virtually every CIO indicated that they did not have Enterprise Architecture resources, although some indicated that the function was addressed by committee. In a consolidated organization, especially one that aspires to performing enterprise wide planning, standardizing on enterprise products and services, and seeking to optimize IT investments, these resources will be critical as the organization seeks to operate as an enterprise.

In some cases, existing staff may be able to be used as Domain Architects if their level of experience is sufficient in their respective domain. Once the staff inventory and skill analysis has been initiated the State will be in a better position to understand what roles can be filled with what individuals. Training and potentially external mentorship may be used for some resources to position them to serve in the role of Domain Architects.

In addition to Enterprise Architecture resources, the Governor's Office of Information Technology (GOIT) will have need of individuals who are formally chartered with managing communications not only to the many media outlets, but also to the State of Colorado employees. Frequency and consistency in messages will be critical to manage because not only are there many things happening within consolidation efforts which various audiences need to be aware of, but there is the potential for employees to generate issues which if left unchecked, can affect morale throughout the organization.

9.1.5 Policies

The State of Colorado also has a number of policies that affect their ability to attract and retain qualified individuals. Each of these policies should be reviewed to determine if these policies should be changed. An example of one of the policies is that the state prohibits hiring of employees above the minimum whereas most commercial organizations state a preference that new employees are hired in at or below the midpoint of the job they are filling. Most commercial organizations are able to adjust this preference to the individual they are hiring.

9.1.6 Classified Employees and At Will Employees

Most State of Colorado Information Technology personnel are considered classified employees endowing them with certain rights. Most of the rest of the State of Colorado employees are "at will" employees. Such employees are employed at the will of their employer. Many public organizations operate using the classified system. Some organizations have undertaken efforts to move classified personnel to at will personnel. A common question is: why would an employee voluntarily undergo such a move? The most common response to such an issue is that there is a much better chance of obtaining a prevailing market rate for their skills in an at will environment when compared to a classified environment. Some organizations (e.g. Kansas State Legislature Forum Dec 7, 2005) have informed their classified employees that regular stepwise increases are not coming back for classified employees. Others plan to offer new sets of benefits to at will employees providing further incentives to move from a classified to at will status.

The classified system, to some degree hurts both the employee and the State of Colorado government when compared to a merit based system. The classified system can make it much more difficult to try to replace poorly performing employees as well as limit the compensation that State of Colorado employees receive. These effects will be more impacting in a consolidated service organization since failures introduced through personnel can now affect the enterprise rather than an individual department. There will be less tolerance for enterprise wide service failures in a consolidated model than failures affecting individual departmental operations.

Many other states have noticed that the classified system does not necessarily suit them and have attempted to change the classified system for a variety of reasons. An article[8] published by the Council of State Governments addressed changes to the classification systems that various states have undertaken in an attempt to retain employees. This study was undertaken at the peak of the .COM era when Information Technology personnel were acquired at a premium.

Attempted Change to Classified System	Percentage of States Attempting
Salary Increases	44%
Un-classifying Positions	8%
Bonus Programs	22%
Enhanced Benefits Programs	4%
Employee Development Programs	20%
Alternate Schedules / Flex Time	22%
Higher Profile Project Participation	6%
Telecommuting	28%
Enhanced IT Training Programs	20%
Support for Higher Education	18%
Increased Opportunity for Advancement	2%

[8] CSG Survey of State IT Administrators, Council of State Governments, 1999

Other	8%

Table 9.8 – Changes Made to Classified System

9.1.7 Personnel Sustainability

Not only is the question of employee performance important, but the question of sustainability is also very important (especially in robust economic times). In a consolidated organizational structure it is not reasonable to expect to have employee turnover rates vary wildly based purely on economic times. It will be important moving forward that regardless of the service provisioning model chosen, that those actually providing the service are compensated equal to or better than prevailing market rates. Failure to do this will simply result in service degradation regardless of how institutionalized processes becomes.

The same article also provided the survey results which were somewhat expected. The State of Colorado participated in this survey. Although the overall survey responses are interesting, the more interesting aspects of the survey were the State of Colorado's responses showing just how economic times can have an adverse effect on State of Colorado IT staffing. Some of the responses to the questions in the survey included those listed below and whether Colorado's responses were in the (majority) or a (minority) of how other states responded. Colorado's responses and their position either with the majority or minority of the States is shown below in table 9.9.

Question # (some omitted)	Colorado Response	Majority or Minority
1.) Does your state have a shortage of IT workers?	Yes	Majority
2.) How would you classify your state's shortage of IT workers?	Regular	Majority
3.) At which levels are you experiencing shortages of IT staff?	Intermediate	Majority
5.) Estimate the % of IT positions currently open in the state.	16% – 20%	Minority
7.) Estimate the total % of IT staff outsourced during fiscal 1998/1999	11% - 15%	Majority
11.) In your opinion which are barriers to recruiting new staff in your state?	Base salary too low Insufficient benefit package Poor image of civil service Lack of qualified candidates	Majority Minority Majority Majority
12.) Has your state restructured the classification / compensation system to attract new candidates?	No	Minority
14.) Does your state have a high degree of annual turnover for current IT staff?	Yes	Majority
15.) Estimate the annual turnover rate	16% - 20%	Minority
16.) Has your state restructured the classification / compensation system to retain existing IT personnel?	No	Minority
18.) In your opinion which obstacles exist in your state in retaining trained IT personnel?	Unable to compete with private sector Not enough high profile projects Base salary too low Insufficient reward system	Majority Minority Majority Majority

Table 9.9 – Colorado Responses to 1999 Council of State Governments Survey

What this information underscores (and in the majority of cases other states answered similarly) is that if the State of Colorado can not adequately fund information technology disciplines and the personnel that support them, then the capability to provide optimized service will be hampered. These barriers will be accentuated in a consolidated organization as the enterprise will rely on a smaller number of individuals to provide service to a larger contingent of departments.

9.1.8 Normalization of Titles and Compensation

Because of the State of Colorado's historically distributed approach to Information Technology management, each department has exercised its autonomy in defining and compensating personnel supporting their departmental operations. This has resulted in a very inconsistent set of job descriptions and compensation levels. Extension of this practice in an enterprise environment will cause significant challenges. It will be necessary, once the service provisioning strategies and organizational structures are defined, to normalize the various State of Colorado Information Technology positions.

Furthermore, challenges with the compensation structure in the State of Colorado have fueled another situation which should be addressed. Although not a commonly acknowledged process, it is believed that departments will often promote individuals into managerial positions in an effort to retain them even though those promoted may have limited managerial skills. This practice can lead to ineffective management and leadership in State of Colorado departments.

Although the State of Colorado utilizes Information Technology personnel like any other organization, a move towards consolidation of Information Technology resources also requires a review of existing skills to ensure they can support the enterprise. The level of skill required to support enterprise level services represents an increase of capability over providing departmental level service. Not only is the scope of the work expanded, but decisions now must be made in the best interest of the enterprise. Another consideration related to consolidation is that errors made by personnel distributed over a large number of departments are often confined to departmental limits whereas errors made by enterprise personnel can affect the enterprise.

9.1.9 Organizational Positioning for Change

Most organizations undergoing consolidation incur some level of resistance to the change and the State of Colorado will be no different. Most of the personal resistance will likely come from one of four basic areas of anxiety. These are fear of change, fear of losing their job, fear of losing control, or fear of losing their position. There will also be organizational resistance that will occur and most of this will be related to losing control of certain functions. There will also be concerns related to service from a more centralized or consolidated organization, some of which are historically founded. The reasons for these service failures are not all one-sided, but regardless of the reasons, the existing shared services model has not worked well. In some cases, the poor service is the result of poor service definitions, lack of service levels, scope creep, mismatched expectations, disparate technologies, and not leveraging economies of scale. Regardless of the source of the resistance, service issues should be addressed in a proactive manner.

Some of these issues (e.g. service provisioning) can be addressed in a more objective manner through for example service levels and well defined and managed expectations for service, but some of these issues (e.g. loss of control) need to be addressed in a less structured manner. When addressing the more subjective issues, the EADT would recommend that a number of key messages are used across the organization as consolidation is initiated and proceeds forward. These messages should be kept consistent and should be repeated often to ensure that the message reaches the intended audience.

The core themes of these messages are:

- The needs of the organization outweigh the needs of the individual however every attempt to protect individual jobs will be undertaken
- The State of Colorado may not save many resources in the short run, but in the long run, Information Technology consolidation will generate savings which will benefit State of Colorado constituents and businesses
- Although a consolidated Information Technology organization may not provide the absolute best level of service, it can provide a sufficient level of service at a lower total cost
- A consolidated organization will offer new career opportunities that simply did not and could not exist in departmental Information Technology organizations
- Pressures to optimize State of Colorado spend will continually increase as the federal government will reduce the funding supplied to states

Issues that also must be addressed as a part of the move to a more consolidated organization are the culture in the State of Colorado and the readiness of the organization to undergo the change. The EADT would generally characterize the State of Colorado as a "change resistant" organization, not because of the individuals per se, but because of the way the State of Colorado has traditionally organized Information Technology. Attributes of change resistant organizations include:

- Manual processes
- Tribal knowledge
- Silo based systems
- Stable organization (not used to large scale changes)
- Lack of change agents (those desiring and leading the change)

Furthermore, the change that the State of Colorado is proposing to undertake is of a very large scale. Combined with the change resistant nature of the organization, the proposed change would be considered a risky change if implemented in a short time frame. Thus, the EADT would recommend that the process of introducing the organizational change be addressed in smaller, more incremental steps as opposed to large, more sweeping changes. Individuals often react more positively if slower, more incremental changes are introduced to the environment and if there is constant communication of what is occurring. Although pending legislation is expected to introduce changes to limited aspects of the reporting structure commencing in state fiscal year 2008/2009, the actual changes resulting from consolidation activities will be spread over a much longer period of time resulting in less severe culture shock.

The emotional side of change must be considered as a part of the change as well. There is expected to be various stages that individuals may go through as a part of the change including an initial acceptance, denial, resistance, exploration, and finally true adoption. The more compressed these periods are the less likely the individual will be able to make the transition. Some individuals may be able to make the transition easier than others, but it will be important to make conscientious efforts to given individuals time and bring along as many people as possible, but if in the end, individuals are unwilling to accept the change, it may be necessary to help them find a venue in which they can be more successful.

The EADT would recommend the State of Colorado ensure that the following activities are undertaken as a part of the overall change.

- Provide compelling justification for the change
- Communicate goals and objectives clearly
- Secure commitments from departmental CIOs and EDs
- Leverage a well planned approach

- Provide clear definition of roles and responsibilities in GOIT and on the change team

By addressing these activities, not only will a great deal of ambiguity be removed for rank-and-file State of Colorado employees, but also the change management team (e.g. GOIT) will have a clear understanding of who supports and who will oppose the change. This will become valuable later in the change if declared supporters undertake activities not demonstrating or communicating their support (e.g. they can be held accountable) or those individuals who have declared they are not supportive may have to be replaced if they have not come around when their participation is required.

9.2 *Competency Centers (a.k.a. Enterprise Services)*

The State of Colorado has considered the identification and development of various competency centers (ex. GIS - Geographic Information Services) around the State of Colorado. Indeed, many of the individual agency IT organizations have demonstrated a proficiency in one or more disciplines. It now becomes necessary to adopt their best practices and extend those practices to the enterprise. As such, these should really take the form of enterprise services. That is services which are offered across the enterprise and which are managed, funded, and controlled from an enterprise perspective.

As such, the EADT would recommend that such competency centers utilize a "Centralized Control" and potentially a distributed execution model and not reside within the various departments. This does not mean, like certain Information Technology functions, that certain elements of the enterprise services can not be distributed to constituent agencies.

As a part of managing these enterprise services, the EADT would recommend that a formal strategic plan be created for each of these services, linking it with the Information Technology Enterprise Strategic Plan. In addition, formal coordination with the Enterprise Architecture team should be defined (so for example the strategic planning process can cover enterprise services as well). Because these are essentially service offerings however, it is recommended that these enterprise services or competency centers report to the service delivery organization. If these services attempt to be managed outside of the enterprise organization, the following challenges are to be expected.

- Lack of funding
- Inconsistent application of the service
- Competing initiatives developing in other departments

Furthermore, competency centers (if used) should be delineated or defined by their enterprise applicability meaning that a competency center should not be developed around something that delivers value to a very limited part of the organization.

9.3 *Roles, Responsibilities, and Authorities*

Enterprise architecture is a discipline whose responsibilities are often distributed among multiple individuals across the organization. Below is a depiction of several possible organizational charts. *These charts should NOT be automatically accepted as the proposed or recommended organizational charts.* Further discussions on the nature of the structure, organizational responsibilities, organizational authorities, and similar topics will need to be defined before an organizational structure can be finalized. The plan for the final organizational structure will be developed out of Phase I activities and will also depend heavily on how service provisioning is handled for the State of Colorado.

The following assumptions are made as a part of this organizational structures depicted below in figure 9.10 and figure 9.11.

- The organization will evolve over time, thus the initial organization will not mirror the final organization
- The organization should be structured so that it can be easily evolved without large scale re-organizations required
- There is a review and potential control point covering *all critical* information technology decisions including technology selection, security, enterprise architecture, projects undertaken, funding, vendor selection, etc.
- Some funding types for IT services shall continue to remain in the various departments
- Some functions will be always be physically located within the various departments and as such, an IT representative will remain in each of the departments (roles and titles TBD); smaller departments can not over the long term, justify a senior IT official dedicated exclusively to that department
- Final roles and responsibilities have yet to be determined yet a baseline set of assumptions regarding roles can be made from the titles; it is important to define these responsibilities and the locations from which they are met, before finalizing the organizational structure and initiating organizational change
- At this time, there will not be a Department of Information Technology, nor will there be any type of governing board to which the State CIO will report
- Competency centers (e.g. GIS) may or may not have senior officials responsible for them
- Span of control must be kept to a manageable level for the CIO given that there are a number of other responsibilities that position must attend to
- The general model adopted is that the Governor's Office of Information Technology will be responsible for delivering service to the various State of Colorado departments and will manage the delivery of that service
- In general, functions are aligned most closely with those they interact with and support

The plan for the final organizational structure will be developed out of Phase I activities and will depend heavily on how service provisioning is handled for the State of Colorado. The EADT has provided several organizational structures for consideration. It must be stressed that these are ***potential*** structures and not necessarily recommended structures. There remain many issues that must be resolved before a final structure is determined. The potential structures are presented in preferred order based upon functional alignment in other states and in a manner generally consistent with some industry analyst's recommendations.

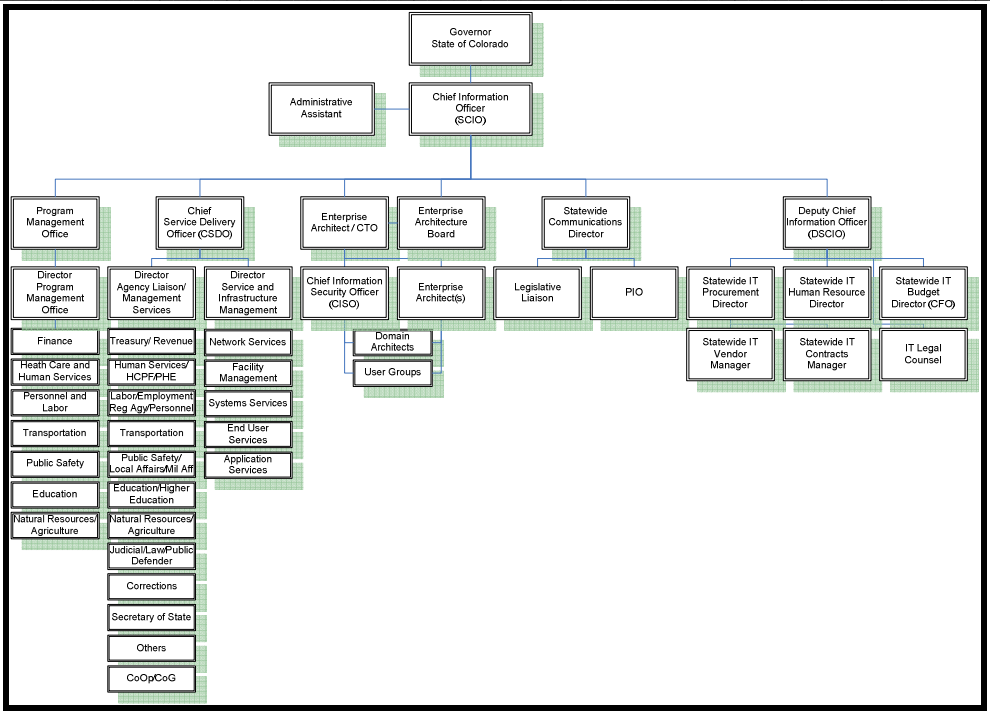

Figure 9.10 – Potential Consolidated Organizational Structure 1

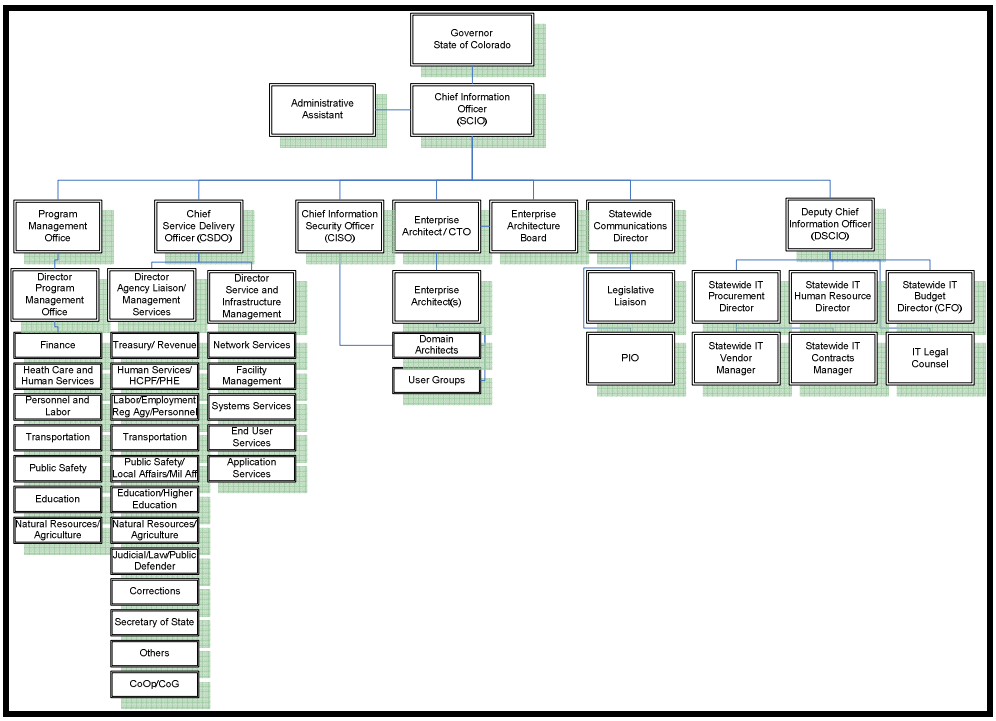

Figure 9.11 – Potential Consolidated Organizational Structure 2

Discussion

In order to manage information technology across the State of Colorado a number of different disciplines are required at both the centralized and distributed organizations. Although there are as many different ways to organize an information technology organization as there are states, generally the same functions are

required regardless of their reporting structure. Some exceptions to this will occur however, if the State of Colorado determines that it will leverage an external managed services provider.

When designing an organizational structure, it is *generally* advisable to keep as many disciplines aggregated to ensure success within the responsible reporting structure. Stated a different way, it is inadvisable to delegate core responsibilities required for successful execution of duties, to other organizations. Although a formal organizational structure has not been provided as a part of this document, there is a Phase I activity within when an organizational plan (and associated change plan) will be developed.

Having said this, the EADT has worked with the State of Colorado to provide a potential consolidated organizational structure supportive of enterprise information technology management. The EADT at this time has not documented lower level positions, but only those either reporting within GOIT or senior Information Technology management within the departments.

In conjunction with the potential consolidated organization provided in figure 9.10, there are several items for which the rationale should be called out.

First, the CISO is depicted as reporting to the CTO (or Chief Architect). The reason for this is related to the overall interaction between the two organizations. Security is a prime consideration in virtually all architectures, yet security needs, especially at the logical level (but to some degree at the physical level) should be integrated with other aspects of the architecture. Security decisions can not be made autonomously of the system architecture. As such security is a domain of expertise within the Enterprise Architecture group. This is consistent with the structures employed in many state governments (e.g. Pennsylvania), with some industry pundits (e.g. Gartner), and with the author's experience.

Second, a Chief Service Delivery Officer position has been identified. This position has overall responsibility for all service provisioning throughout the State of Colorado. Reporting to the Delivery Officer are the various departmental IT Directors who are extensions of a consolidated staff and who are primarily responsible for not only local service provisioning, but also liaising with the individual departments to identify and respond to service needs, hence the alignment with the service delivery organization.

Third, administrative functions are reporting to a single individual whose charge will be to manage administrative functions across the enterprise. This is critical in a consolidated organization because it will be important to act as an enterprise. Thus policies and processes related to human resources, finances, legal, and similar disciplines should all be defined and enforced at the enterprise level.

Fourth and finally, the Statewide Communications Director, given the criticality of its responsibility in both a consolidation and post-consolidation world (e.g. keeping State of Colorado employees and stakeholders aware of what is occurring during consolidation and communicating in a post consolidation organization) has been structured to report to the CIO. Indeed, many aspects of the Statewide Communications Director's position involve preparing communications for the CIO and ensuring that accurate and consistent messages are delivered from GOIT. The Statewide Communications Director has two primary positions reporting to the role – the PIO and the Legislative liaison. It is important to note that it is envisioned that the Statewide Communication Director would not directly implement all communications mechanisms, but would be responsible for determining provisioning strategies for each of the communications mechanisms.

Listed below are selective high level functions of various positions within the organization. These are not meant to be comprehensive job descriptions, but cover some of the core responsibilities.

State of Colorado CIO	
Organization	Governors Office of Information Technology
Reports To	Governor, State of Colorado
Responsibilities	Manage enterprise wide Information Technology functions including service delivery, enterprise planning, architecture, budgeting, policy and standards development, enterprise processes, and enterprise security

Table 9.12 – CIO High Level Position Description

State of Colorado Deputy CIO	
Organization	Governors Office of Information Technology
Reports To	State of Colorado CIO
Responsibilities	Manage administrative functions handing all functions related to acquiring goods and services for the State of Colorado as well as overseeing administrative functions such as budgeting, billing, contracting, vendor management, etc.

Table 9.13 – Deputy CIO High Level Position Description

State of Colorado CISO	
Organization	Governors Office of Information Technology
Reports To	State of Colorado CTO or State of Colorado CIO
Responsibilities	Ensure State of Colorado resources (both logical and physical) and data are protected. Oversee the development of security policies, standards, and procedures governing security in the State of Colorado. Initiate risk assessments and proactively address vulnerabilities. Oversees vulnerability assessments, remediation and the development of proactive security measures designed to identify and remediate security threats against State of Colorado resources and data.

Table 9.14 – CISO High Level Position Description

Program Director, PMO	
Organization	Governors Office of Information Technology
Reports To	State of Colorado CIO
Responsibilities	Manage administrative functions associated with the Program Management Office. Develops and owns PMO related policies, processes, and standards. Owns key business artifacts (investment cases, project initiation forms) and communicates changes in forms and processes. Maintains master project repository of key project performance metrics and status. Maintains organizational project performance metrics. Reports on project metrics to key stakeholders and executive leadership. Convenes emergency meetings of the EGC's as required. Captures and publishes EGC meeting minutes.

Table 9.15 – Program Director High Level Position Description

State of Colorado EGCs(7)	
Organization	Various (Departmental Representatives)
Reports To	Program Director, PMO
Responsibilities	Ensures cross-departmental cooperation across the State. Acts as the escalation point for the project steering committees working to cooperatively resolve major issues that need escalation beyond the project steering committees. Reviews Independent Verification &

	Validation (IV&V) reports and helps mitigate risks and issues with the project teams. Helps leverage IT and business resources across Departments. Helps identify projects and systems that can be used more effectively across the enterprise. Addresses resource issues that may arise. Participates in prioritization of information technology investments.

Table 9.16 – EGC High Level Position Description

State of Colorado Enterprise Architecture Board (Chaired by the CTO)	
Organization	Governor's Office of Information Technology
Reports To	State of Colorado CIO
Responsibilities	Reviews and approves new policies and standards, approves various initiatives, initiates EA initiatives, evaluates information technology investments. Provides strategic leadership for information technology investments. Ensures information technology investments are driven by business objectives. Reviews and approves the State of Colorado strategic plan. The Enterprise Architecture Board should contain at a minimum, the following key roles: CTO or Chief Architect (chair), Chief Information Security Officer, Deputy Chief Information Officer, and the Chief Service Delivery Officer.

Table 9.17 – Enterprise Architecture Board High Level Position Description

State of Colorado CTO	
Organization	Governor's Office of Information Technology
Reports To	State of Colorado CIO
Responsibilities	Oversees the development of new enterprise policies, procedures, and standards. Ensures compliance with State of Colorado policies, processes and standards. Coordinates and participates in the Strategic Planning process. Manages enterprise architecture organization ensuring that reference architectures are developed and updated as required, that architecture personnel participate in the design and evaluation of systems, develops and owns best practice introduction and compliance. Oversees enterprise view of business requirements and applicability of solutions spaces to enterprise requirements.

Table 9.18 – CTO High Level Position Description

State of Colorado PIO	
Organization	Governor's Office of Information Technology
Reports To	State of Colorado CIO
Responsibilities	Ensure accurate and consistent communications related to both consolidation activities and enterprise activities. Educate key decision makers and stakeholders on issues confronting Information Technology service providers. Develop branding strategy. Execute communications plan ensuring that State of Colorado personnel are kept informed of activities and plans. Develops and utilizes electronic communications mechanisms to communicate consistent messages to State of Colorado employees and governmental officials.

Table 9.19 – PIO High Level Position Description

Chief Service Delivery Officer	
Organization	Governor's Office of Information Technology

Reports To	State of Colorado CIO
Responsibilities	Responsible for end to end service delivery from consolidated service provider to State of Colorado departments. Responsible for developing and maintaining service levels and reporting on service to key stakeholders and departments. Responsible for identifying and responding to departmental operational and tactical needs. Responsible for maintaining effective relationships with State of Colorado liaison personnel and working with departmental liaisons to define and implement required business solutions.

Table 9.20 – Chief Service Delivery Officer High Level Position Description

Departmental IT Director	
Organization	Governor's Office of Information Technology
Reports To	Chief Service Delivery Officer
Responsibilities	Responsible for managing local Information Technology functions consistent with enterprise policies, processes, and standards. Responsible for liaising with business personnel and acting as intermediary between service provisioning organization and department to identify, raise, and address departmental concerns. Briefs departments on enterprise capabilities and new service offerings. Participates in the Strategic Planning process as SME (Subject Matter Expert) in departmental business functions.

Table 9.21 – Departmental IT Director High Level Position Description

Enterprise Architect	
Organization	Governor's Office of Information Technology
Reports To	State of Colorado CTO
Responsibilities	Coordinates design and implementation approaches across multiple domains. Works to develop enterprise policies, processes, and standards eliminating potential conflicts across domains. Owns various reference architectures. Coordinates enterprise activities across multiple domains including solution development.

Table 9.22 – Enterprise Architect High Level Position Description

Domain Architect (General)	
Organization	Governor's Office of Information Technology
Reports To	Enterprise Architect
Responsibilities	Provides subject matter expertise to one or more of the domains. Develop technology solutions ensuring the harmonious integration of various domains. Develop solutions meeting business needs which are cost effect and which have been vetted for enterprise applicability.

Table 9.23 – Domain Architect High Level Position Description

Domain Architect – Applications Architect	
Organization	Governor's Office of Information Technology
Reports To	Enterprise Architect
Responsibilities	Selects the paradigm and technology for application program-to-program communication (APPC) among the components. Determines the overall priority ranking of each of the possible system qualities (cost, reusability, robustness, etc.) so the other architects can design models that enforce

	the "balance of concerns". Responsible for defining the application tiers, frameworks, components types and interfaces. Also, creates the first-draft graphical template of UML design models used by the Project Architects. Specifies and provides ownership of reusable application components or reusable application code. Develops and specifies design patterns and strategies. Supports the Applications architect in selecting the application framework. Balances the quality issues cost vs. robustness, and hardware architecture, such as share-nothing n-tier vs. share-all symmetric multi-processing (SMP). Monitors performance benchmarks provided by the Transaction Processing Council (TPC). Defines applications components including usage including reuse. Works to identify and specify enterprise application solutions.

Table 9.24 – Applications Architect High Level Position Description

Domain Architect – Platform Architect	
Organization	Governor's Office of Information Technology
Reports To	Enterprise Architect
Responsibilities	Design systems and services; develop and specify integration strategies; compiles enterprise and reference architectures. Focuses on the standards and technologies for enabling systems and network performance qualities, such as availability, scalability, recoverability, etc. Evaluates and selects the enterprise's server hardware, operating system, job control. Defines enterprise platforms used to house developed applications. Defines and identifies enterprise requirements for storage, servers, operating systems, and similar. Defines and identifies process for provisioning and configuration of hardware. Defines management strategy for storage, computing, and related devices.

Table 9.25 – Platform Architect High Level Position Description

Domain Architect – Integration Architect	
Organization	Governor's Office of Information Technology
Reports To	Enterprise Architect
Responsibilities	Defines integration strategies and identifies middleware technologies used to facilitate integration. Defines integration patterns for developers. Develops conceptual and logical models depicting integration of application systems, business information, and functional areas. Maintains catalog of enterprise services using in integrating various components. Defines and identifies mechanisms for interfacing business logic and persistence layer, and applications and network services.

Table 9.26 – Integration Architect High Level Position Description

Domain Architect – Security Architect	
Organization	Governor's Office of Information Technology
Reports To	Enterprise Architect
Responsibilities	Monitors security guidelines such as HIPAA. Establishes and enforces the Security Policy and Trust Model for Administrators to follow in delegating and granting application privileges. Establishes and enforces the Security Model, technologies and standards for system architects and designers. Tracks warnings of new types of security threats and assures that the systems in place guard against these threats. Establishes the

	systems for discovering, tracking and convicting abusers of security and system integrity. Performs periodic security audits on existing systems. Defines and implements identity management protocols and works with Application Architect to design authorization schemes for application functions.

Table 9.27 – Security Architect High Level Position Description

Domain Architect – Network Architect	
Organization	Governor's Office of Information Technology
Reports To	Enterprise Architect
Responsibilities	Focuses on the lower-level transport protocols and the standards and technologies for enabling systems qualities via network command-and-control structures. Evaluates and selects the enterprise's networking hardware. Selects and defines management strategy for bandwidth management, topologies, carrier services, protocols, network integration. Establishes network operation center (NOC) command-and-control structures for auto-discovery, event monitoring, trouble ticketing. Facilitates the upgrade to the Web-Based Enterprise Management (WBEM) standard of the Distributed Management Task Force (DMTF) and select the appropriate Common Information Model Object Manager (CIMOM) for tracking the state of the enterprises assets.

Table 9.28 – Network Architect High Level Position Description

Domain Architect – Data Architect	
Organization	Governor's Office of Information Technology
Reports To	Enterprise Architect
Responsibilities	Sets Data Policy and the technical solution for the management, storage, access, navigation, movement, and transformation of data. Specifies recommended DBMS and ETL tools and technologies for structured and unstructured content. Creates and maintains the Metadata Repository. Creates a semantically rich business model of the enterprise problem domain that is independent of any technology solution and defines the Content of the business. Compiles and maintains the Enterprise Schema across all applications. Enforces principles of good canonical data design. Examines and enforces opportunities to provide data reuse, balancing the issues of centralization and replication. Ensures the preservation of strategic data assets as applications and technologies *de jure* come and go. Reviews policies and work of the Data Base Administrators.

Table 9.29 – Data Architect High Level Position Description

Domain Architect – Information Architect	
Organization	Governor's Office of Information Technology
Reports To	Enterprise Architect
Responsibilities	Defines the visual roadmap seen by the constituents of the state with emphasis on making it easy for customers to find the needed data and services. Establishes branding policy and holds the UI templates. Establishes the personalization policy with a goal to building customer loyalty and relationship enrichment. Defines the recommended dialog flow for long-running transactions and "speech acts" in coordination with

the Business Process Group.

Table 9.30 – Information Architect High Level Position Description

Domain Architect – Project Architects	
Organization	Governor's Office of Information Technology
Reports To	Enterprise Architect
Responsibilities	Responsible for translating application requirements and business process models (BPM) into component and interface specifications. Ensures that the technology partners and development teams adhere to the principles established by the Enterprise Architects. Designs first-draft graphical UML & ER models that are delivered to the software development & DBA teams. Coordinates and marshals domain architect input into project solutions.

Table 9.31 – Project Architect High Level Position Description

9.4 *Issues*

Identified within the organization and personnel category are several issues that should be addressed as a part of the overall process structure associated with organizational change. These issues and recommendations to address the issues are listed below.

Classified System

Although many employees residing within State of Colorado Information Technology staffs are considered classified, there are challenges in effectively executing a consolidated Information Technology discipline using a purely classified system. This is largely because of the many regulations around staff management including for example, termination. Performance will be paramount in a consolidated service organization and it will be important to "pay for performance" and not "pay for entitlement". Furthermore, the classified system is not always the best motivator of personal responsibility in extending one's skills.

Recommendation to Address

The EADT would recommend that the State of Colorado look at different methods to address the classified system under which most State of Colorado Information Technology employees operate to determine if this is the most effective workforce management structure. A 2005 report by the Government Performance Project indicated within the State of Colorado that "increases for performance have not been funded in recent years due to fiscal constraints". This lack of funding can have an adverse effect on employee retention which may impact the service provided by a consolidated organization. Other entities have developed both incentive and disincentive (both designed to encourage employees to voluntarily switch classification) based programs to migrate personnel from a classified system to an at will system. It will be critical as the State of Colorado consolidates information technology resources, to ensure that those providing service to the enterprise are compensated in a manner that facilitates no less than an average retention rate and facilitates timely resolution on those individuals who do not perform. Another way to potentially address the classified systems is to encourage, through attractive offerings, the migration of state personnel to a managed service provider.

Normalization of Personnel

In many different agencies, the same person doing essentially the same job may be classified differently. This can and will present a challenge as consolidation activities move forward. Infrastructure personnel will be affected first and subsequently other types of personnel. It will be important to address this to ensure that the State of Colorado is compensating individuals for their capabilities and performance in a uniform manner. In addition, this is important to address because of external pressures as well. Maintaining an effective workforce will be one of the greatest success factors in achieving effective consolidation.

Recommendation to Address

The EADT would recommend that once the final organizational structure has been determined, a new set of job descriptions and a new compensation structure be established. This will be important because consolidation will likely cause some positions to be eliminated, some new positions to emerge, and some positions combined. Once this has been done, each individual (using the staff and skills inventory) should be evaluated against these job descriptions with the objective of normalizing titles, compensation, and responsibilities. After being initially developed, these job descriptions and compensation structures should be re-evaluated every 18-24 months to ensure consistency with market forces.

9.5 *Organization and Personnel Activities*

A number of different organization and personnel activities have been provided in the figures below. Each of these activities has been described along with potential approaches, key resources, scope, and both duration and hour estimates. Before actually initiating these activities, a formal planning meeting will be held to refine the scope, define the approach, define a work plan, and identify the resources which will support each activity.

Initiative Attribute	Description
Initiative Name	Inventory Staff and Skills
Initiative Status	Not started
Initiative Number	P1.1
Scope of Initiative	Inventory all Information Technology staff positions within all State of Colorado departments including open staff positions, reporting structure, roles and responsibilities, pay, classification, benefits, direct personnel expenses, potential retirement dates, and skills. This activity includes all IT positions that may be resident in program and other departmental areas and how those individuals are allocated (potentially with split responsibilities). This activity will identify any individuals supporting information technology which are on the payroll of the program areas. This activity will identify any key individuals that need to be retained throughout consolidation. It will identify any specific training that various positions require in order to execute their responsibilities (e.g. fixing computers in a maximum security facility) or certifications or personnel checks required. Furthermore, this activity will address how much training a given individual receives per year. Scope includes all Executive level departments, the Secretary of State, Judicial, and Legislative Information Technology staffs.
Resource Hour Estimate	1600 Hours
Coordination Hour Estimate	400 Hours
Duration	10 Weeks
Key Resources	Departmental CIOs, DPA, Department HR Directors(Coordinator), Individual IT Personnel
Key Contacts	GOIT
Requirements (Entrance Criteria)	None
Deliverables (Success Criteria)	Inventory of employees currently employed by the State of Colorado along with the relevant attributes of their employment
Approach	Utilizing a tool from CDLE, provide the capability for each Information Technology person in the state to enter information about their skills Once this is done, the basic skills information will be augmented by departmental CIO's forming the basis of the employee skills and

	personnel inventory.
Predecessors	None

Table 9.32 – Activity P 1.1

Initiative Attribute	Description
Initiative Name	Evaluate Staff Compensation
Initiative Status	Partially completed
Initiative Number	P1.2
Scope of Initiative	Develop a high level, but accurate comparison of staff compensation for State of Colorado employees and comparing that compensation to prevailing market conditions. This activity will require comparing various State of Colorado positions against more industry standard position descriptions. The goal of this activity is to compare State of Colorado total compensation versus total market compensation. This must be conducted at both the base salary and total compensation levels.
Resource Hour Estimate	300 Hours
Coordination Hour Estimate	100 Hours
Duration	6 Weeks
Key Resources	External Resource, DPA Human Resources Director
Kid Contacts	TBD
Requirements (Entrance Criteria)	None
Deliverables (Success Criteria)	High level comparison of market compensation versus State of Colorado compensation
Approach	Once the basic information about skills and compensation has been collected, this information will be weighed against market compensation structures commensurate with positions requiring similar skills and capabilities.
Predecessors	P1.1 – Inventory Staff and Skills

Table 9.33 – Activity P 1.2

Initiative Attribute	Description
Initiative Name	Evaluate Personnel Sustainability
Initiative Status	Partially completed
Initiative Number	P1.3
Scope of Initiative	Evaluate whether the State of Colorado will be able to maintain an effective workforce in all types of economic conditions given the current compensation structures, and workforce management structures. This activity will attempt to develop a total experience metric covering the state workforce to assess whether there is a net drain on experience within the state. Furthermore, this activity will evaluate the impact of the loss of experienced workers on a consolidated IT structure. In addition, evaluation of the current legislative support, SES (Senior Executive Service) system, the classified system, and funding support for such services need to be considered during this activity.
Resource Hour Estimate	120 Hours
Coordination Hour Estimate	20 Hours
Duration	4 Weeks
Estimated Resources(Duration)	DPA Human Resources Director, OSPB, GOIT Budget Director, GOIT Human Resources Director
Key Contact	GOIT Human Resource Director
Requirements (Entrance Criteria)	Inventory of existing staff
Deliverables (Success Criteria)	Analysis of sustainability of an effective State of Colorado Information Technology workforce.
Approach	Using the staff and skills inventory and the staff compensation analysis, another analysis will be performed to determine between the potential for retirement and market conditions, whether the State of Colorado is prepared to invest in and sustain the workforce necessary to support a consolidated Information Technology organization.
Predecessors	P1.1 – Inventory Staff and Skills P1.2 – Evaluate Staff Compensation

Table 9.34 – Activity P 1.3

Initiative Attribute	Description
Initiative Name	Inventory Contractors and Contracted Services
Initiative Status	Not started
Initiative Number	P1.4
Scope of Initiative	Inventory all contractor positions within all State of Colorado departments including open contractor positions, their roles and responsibilities, department worked for, project(s) or work activities assigned to, skills, compensation model, term of their engagement, termination terms, and their compensation model. Included in this activity is collection of all existing managed service contracts with vendors, services provided, duration of the contract, termination terms, and the method and locations through which the contract services are sourced. Finally, capture any contractual provisions or restrictions on transferring these to a different provider.
Resource Hour Estimate	240 Hours
Coordination Hour Estimate	30 Hours
Duration	4 Weeks
Key Resources	Departmental CIOs
Key Contact	GOIT
Requirements (Entrance Criteria)	None
Deliverables (Success Criteria)	Inventory of contractors and managed services currently employed by the State of Colorado along with the relevant attributes of the employment
Approach	Utilizing a simple spreadsheet, request Departmental CIO's enter relevant information regarding contractors employed within the state. Develop a separate Excel spreadsheet to capture all existing services contracted for inclusive of the relevant information. Issue an information request to Departmental CIO's to provide this information. Store all information in a repository.
Predecessors	None

Table 9.35 – Activity P 1.4

Initiative Attribute	Description
Initiative Name	Create Communication Discipline
Initiative Status	Not started
Initiative Number	P1.5
Scope of Initiative	Create the communications disciplines, consistent with the communications plan supportive of undertaking many of the changes and initial consolidation planning activities throughout the enterprise. This activity has multiple independent efforts for completion and thus requires different skills for each of the activities. One activity establishes the Statewide Communication Director, Public Information Officer (PIO), and Legislative Liaison and then charters them with specific activities related to communicating with the enterprise. This activity includes interviewing and identifying resources and defining core activities that these positions will undertake. There will be an activity to define the provisioning strategy for each of the various communications mechanisms and initiate as funds and resources allow, the various communications mechanisms. For example, developing the web presence for communicating the projects progress, gathering employee questions and posting the question with a response, etc. Another activity is identification of how the consolidation web portal will be developed, branding strategy and development of the brand, development of core messages, values, objectives, and mission, and scheduling of resources to support core communications activities. Furthermore, creation of the various templates for State of Colorado policies, procedures, and standards will be developed as well.
Resource Hour Estimate	100 Hours
Coordination Hour Estimate	20 Hours
Duration	5 Weeks
Key Resources	GOIT PIO, SCIO
Key Contact	SCIO
Requirements (Entrance Criteria)	None
Deliverables (Success Criteria)	Staffed positions
Approach	Seek funding for the positions. Develop formal job descriptions for the three positions and post the positions, interview for the positions and then select appropriate candidates, establishing their charter. Define the sourcing strategy for the various types of communications mechanisms for the initial work and long term responsibility. Initiate the various work streams associated with each of the communications mechanisms. Work will proceed on aspects of this activity even without dedicated State of Colorado resources.
Predecessors	None

Table 9.36 – Activity P 1.5

Initiative Attribute	Description
Initiative Name	Develop Resource and Facilities Plan
Initiative Status	Not started
Initiative Number	P2.1
Scope of Initiative	Once the requirements for service are known, the service levels required for such services, and the inventory of staff and skills completed, a high level resource plan can be developed supportive of the requirements, assets, etc. defined in earlier activities. This would be created using a "green field" type of approach and would be used as input to the gap analysis between the existing consolidated service organization and this organization.
Resource Hour Estimate	120 Hours
Coordination Hour Estimate	40 Hours
Duration	5 Weeks
Key Resources	GOIT, Departmental CIOs
Key Contact	GOIT
Requirements (Entrance Criteria)	Service requirements, inventory of staff and contractors, asset and network inventory, facilities requirements
Deliverables (Success Criteria)	Resource plan to provide the services required, at the service levels defined, for State of Colorado departments.
Approach	Using all of the existing information, develop an organizational model, complete with required staffing levels, to meet the needs of the organization. The model is designed to be high level so that a comparison can be drawn at a later time not only between the consolidated service organization and an external provider. For the purposes of this exercise the impact that a consolidated facility may have on employees will not be considered. Compensation for the new organization will be driven off existing market metrics for compensation.
Predecessors	S1.1 – Perform Facilities Inventory and Analysis S1.2 – Perform Network Inventory and Requirements S1.3 – Perform Asset (HW/SW) Inventory S2.2 – Collect Service Requirements P1.1 – Inventory Staff and Skills P1.4 – Inventory Contractors and Contracted Services

Table 9.37 – Activity P 2.1

Initiative Attribute	Description
Initiative Name	Develop Organizational Change Plan
Initiative Status	Not started
Initiative Number	P3.1
Scope of Initiative	One of the largest work activities, the goal of this activity is to develop a formal organization and an organizational change plan based upon the outcomes of the service provisioning analysis. This activity, based on the outcome of the service provisioning analysis will address needed changes required to maintain an effective workforce if the consolidation service agency will reside partly or wholly within the State of Colorado inclusive of such items as at-will versus classified classification, pay for performance, training, compensation, etc. In addition, this change plan will address organizational transition issues in moving personnel from one department to another or from departments to an external service provider. Activities will be identified from this activity including development of a normalized set of job descriptions to be used across the state, titles, and an appropriate compensation structure consistent with prevailing market conditions. This may require the development of legislation. This activity will also define how existing CIO's will be engaged to support consolidation and ongoing activities. It will also define the overall process that will be followed to fill the resource plan. This will address the usage of (Senior Executive Service) SES versus classified personnel and any proposed changes in the classification of State of Colorado employees as well as any statewide administrative rules that must be addressed.
Resource Hour Estimate	400 Hours
Coordination Hour Estimate	100 Hours
Duration	12 Weeks
Key Resources	GOIT Human Resources Director, GOIT Budget Director, SCIO, Departmental CIO's, Consultant
Key Contact	GOIT Human Resources Director
Requirements (Entrance Criteria)	Knowledge of service provisioning model, staff and contractor inventory, sustainability, funding model
Deliverables (Success Criteria)	Formal organization structure and organizational change plan covering migration from the current organization to the to be organization inclusive of changes in employee compensation or status, required legislation, etc.
Approach	Determine what functions will remain in the State of Colorado and which will be transitioned (if any) to a managed service provider. Build a normalized set of job descriptions for remaining positions and appropriate compensation models. Initiate the position fulfillment process by posting jobs as appropriate. Develop a current state to future state mapping of where each employee is targeted based on fulfillment and need.
Predecessors	S3.5 – Analyze Service Provisioning Alternatives

Table 9.38 – Activity P 3.1

Initiative Attribute	Description
Initiative Name	Draft Organizational Legislation
Initiative Status	Partially completed; may need to be amended or augmented
Initiative Number	P3.2
Scope of Initiative	This activity will result in the drafting of organizational legislation (as necessary) to address the organization structure and the organizational change plan identified in the previous activity. This activity may or may not be required depending on the nature of the final organization. Furthermore, this legislation would be expected to address required changes to compensation structures, classification structures, etc. Although organizational legislation will be drafted for some elements of consolidation long before this activity is initiated, this activity may either initiate the drafting new legislation or amending existing legislation. **NOTE:** This activity is separate from the consolidation legislation previously created and this potential legislation would be created in support of identified changes to State of Colorado workforce management.
Resource Hour Estimate	200 Hours
Coordination Hour Estimate	20 Hours
Duration	8 Weeks
Key Resources	GOIT, Legislative Staff, Legislative Liaison
Key Contact	GOIT Legal Counsel
Requirements (Entrance Criteria)	Organizational change plan and target organization
Deliverables (Success Criteria)	Legislation to enable an organizational structure supportive of an effective workforce which can support State of Colorado departmental service requirements
Approach	Once the final state organization has been developed, the GOIT will work with the Governor and the Legislature to draft any legislation that might be required to support the change in organizational structure, classification, and compensation.
Predecessors	P3.1 – Develop Organizational Change Plan

Table 9.39 – Activity P 3.2

Section VI Governance

10 Governance Foundations

As a part of Information Technology management in any type of organization, usage of governance models enable the organization to make decisions in the best interest of the larger organization as well as provide prescriptive methods to initiate and manage work throughout the organization. Although this document addresses primarily Enterprise Architecture Governance, the State of Colorado will require other governance structures and processes as it matures. Among these are structures and processes (e.g. governance) that cover data, business functions, and program (or portfolio) management.

The purpose of IT governance as a whole is to oversee the following activities.

- Ensuring alignment between business units and Information Technology
- Evaluating and validating information technology investments
- Managing risk in both project execution and decision-making thereby preserving financial resources and ensuring value propositions are realized
- Providing resource management ensuring that resources are allocated to the highest priority activities
- Defining and measuring organizational performance and initiating activities introducing change as required to address organizational performance deficiencies

A common model depicting the way in which governance operates is shown in figure 10.1.

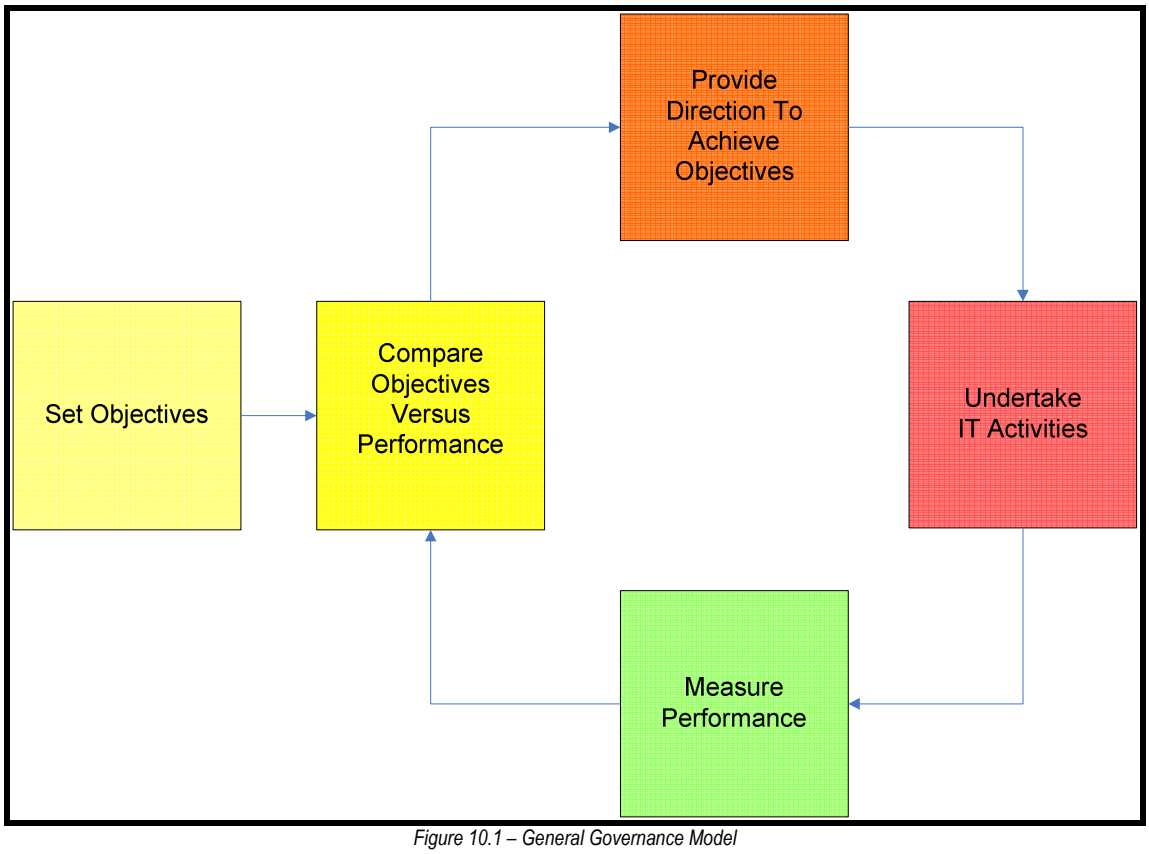

Figure 10.1 – General Governance Model

From an enterprise perspective governance can be viewed as shown in figure 10.2 below.

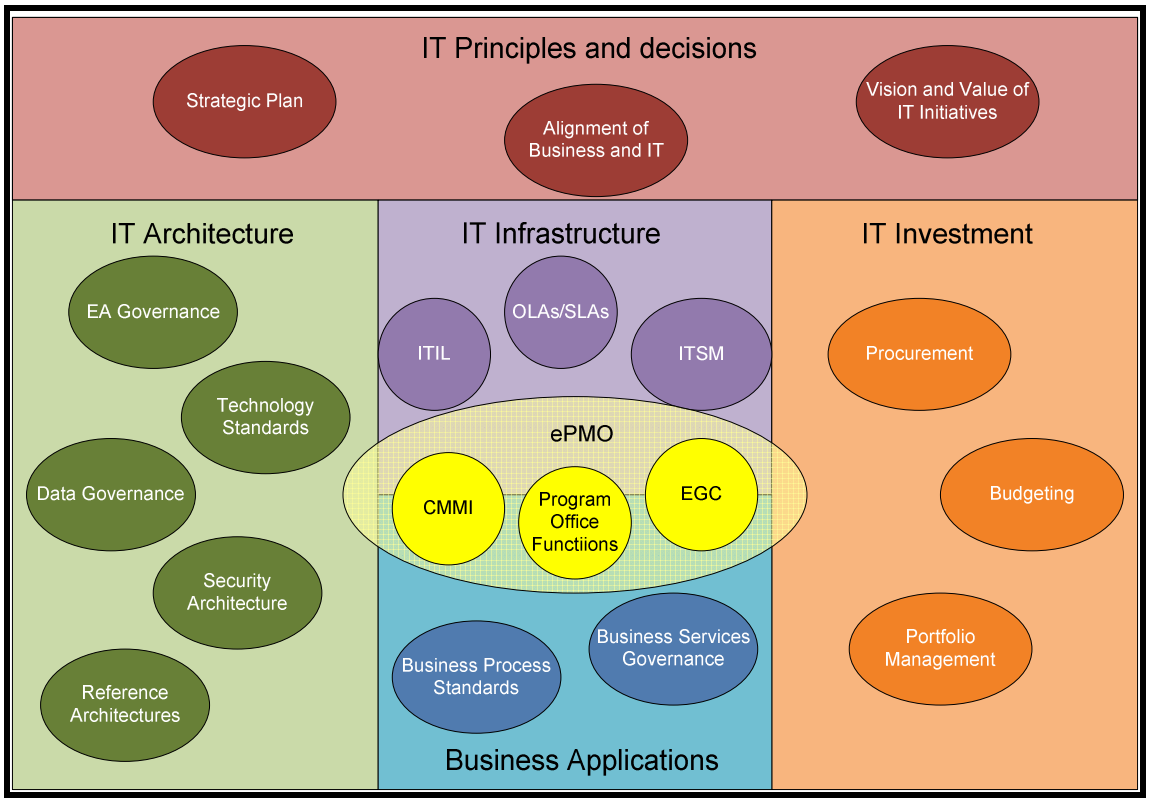

Figure 10.2 – Enterprise Governance View

IT requires co-ordination across these areas to effect IT decisions that support the strategic objectives of the enterprise and allow IT to be an enabler of executing business decisions. The initial drivers of each of the depicted disciplines are the strategic plan through which business objectives are defined. All of these disciplines are designed to achieve business objectives in a manner that is manageable, repeatable, and effective.

Generically, governance is the set of authorities, processes, and procedures guiding strategic and key decisions made for the enterprise. Furthermore, it clarifies the core roles, relationships, authorities, and responsibilities among the entities making up the enterprise.

For the purposes of his engagement, the EADT considers Enterprise Architecture governance as one of the pillars of Information Technology Governance along with Data Governance, Business Function Governance, and Program (or Portfolio) Governance. A high depiction of this is shown in figure 10.3. It should be noted that other organizations may depict additional governance structures, yet these are in effect a subset of the defined governance structures.

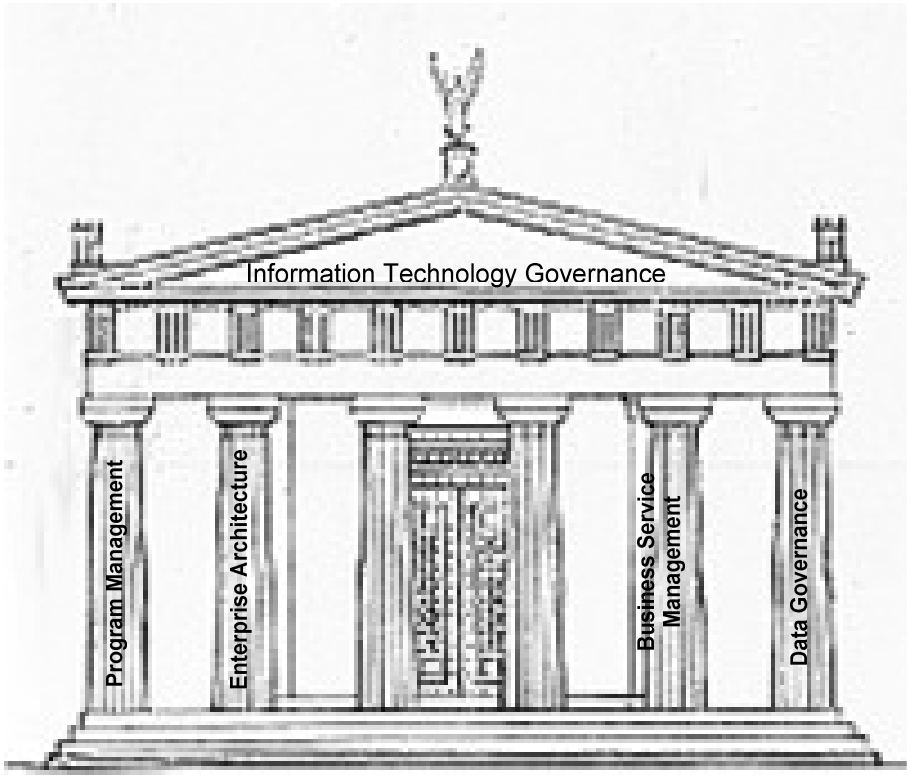

Figure 10.3 – IT Governance Pillars

The various governance functions are defined below.

Program (or Portfolio) Management Governance

Program Management involves the process of providing enterprise wide management of multiple ongoing inter-dependent projects designed to achieve a set of business objectives. The State of Colorado has already developed the concept of a formal Program Management Office using a series of 7 related EGC's (Executive Governance Committees).

Strategic

- Ownership of the DITP (Departmental Information Technology Planning) Process (which will be replaced eventually by the Enterprise Strategic Planning Process owned by Enterprise Architecture)
- Management of the certification legislative requirements
- Budget review and approval process
- Project risk profiling
- Internal GOIT project selection and staffing
- Communication of project selection

Internal Operations

- Budgetary review of internal projects
- Alignment of projects to strategic vision
- Internal web-site management
- GOIT knowledge management
- GOIT vendor management
- Internal project dashboards and benefits verification
- Internal GOIT staffing and scheduling

- Communication of strategic intention and benefits
- Management of ePMO tools

Program Operations

- Manages the certification process
- Reports on active status on Certified projects including dashboard reports to the State of Colorado CIO and Governor's Office
- Provides oversight of external entities engaged in project turn-around or departmental level management
- Staffs and schedules designated GOIT project managers
- Coordinates EGC (Executive Governance Committees)
- Coordinates IV&V reports for projects, reviewing them and developing mitigation strategies for identified risks and issues
- Reviews expenditure requests
- Communicates governance as needed, including intradepartmental communications
- Acts as the escalation point for project steering committees
- Resolves issues beyond project steering committee
- Leverages business and IT resources across the departments
- Identifies projects and systems that can be used more effectively across the enterprise
- Provides communication to Executive management
- Provides oversight of active and certified projects
- Ensures cross-departmental cooperation across the state

There are 7 EGC's which handle most of the program operations. These EGC's (and their constituent departmental representation) are:

- Agriculture and Natural Resources (Department of Agriculture (3), Department of Natural Resources (3))
- Public Safety (Department of Corrections (2), Department of Public Safety (2), Department of Local Affairs (1), Department of Military, Veterans Affairs (1))
- Finance (Department of Revenue (3), Department of Regulatory Agencies (1), Secretary of State (1), State Controllers Office (1), Treasury (1))
- Personnel and Labor (Department of Personnel and Administration (3), Department of Labor and Employment (3))
- Health Care and Human Services (Department of Human Services (2), Department of Health Care Policy and Finance (2), Department of Public Health and Environment (2))
- Education (Department of Education (2), Department of Higher Education (2), Historical Society (1))
- Transportation (Department of Transportation (4), Department of Personnel and Administration (1), Department of Revenue (1))

To each of these EGC's, the GOIT Chair and the GOIT PMO Director will be added, the latter of which is an ex-officio position. The EGC's are scheduled to meet monthly unless the EGC's has no active projects. Certified projects (at this time) are defined to be projects with the following attributes.

- More than $5,000,000 in funding OR
- More than 2 years duration OR
- High risk (e.g. implications to public safety or health – the highest priorities of government) OR
- Multi-jurisdictional OR
- Designated by GOIT

In some organizations, the Program Management Office is limited to the scope of a set of projects whose life is determined by the time it takes to execute those projects within the program. Since the Program Management Office in the State of Colorado is a persistent entity, The EADT would recommend the appointment of a formal Program Manager (or PMO Director as specified in the North Highland presentation) to not only handle administrative aspects of the office, but also to be the process owner for selective processes.

Enterprise Architecture Governance

Enterprise Architecture is the practice of applying a comprehensive and rigorous method for describing a current and/or future structure and behavior for an organization's processes, information systems, personnel and organizational sub-units, so that they align with the organization's core objectives and strategic direction.

Business Service Governance

Although not a term in common use, the term business service governance, for the purposes of this document and the consolidation effort, refers to the governance associated with managing the process of changing, standardizing, and implementing a common set of business processes across an enterprise. More often referred to as ERP governance, this has been expanded to cover a wider array of business functions within the State such as licensing, constituent management processes, etc.

Data Governance

Data governance is the practice of organizing and implementing policies, procedures and standards for the effective use of an organization's structured/unstructured information assets. Data governance seeks to ensure the data is standardized, owned, maintained, and used in a consistent manner across the enterprise.

11 Enterprise Architecture Governance

As a part of implementing a consistent Enterprise Architecture within an organization, a formal governance structure is required to not only define the various standards, policies, processes, and procedures but also to ensure compliance with the defined standards, policies, processes, and procedures.

All governance mechanisms have one underlying premise- if the enacted governance mechanisms do not result in serving the business in an effective manner allowing the business units to operate their business productively, economically, and with innovative prowess then they have not fulfilled their purpose.

Within any effective governance structure, one of the core tenets is to push the decision making down to the lowest level possible without compromising the processes or the compliance. It is however, important to note that when implementing a new discipline and the associated governance, that an increased level of oversight will initially be required until such a point as the organization becomes acclimated to the new standards, policies, processes, and procedures.

The Enterprise Architecture governance structure takes into account that the State of Colorado is moving towards more of a consolidated Information Technology discipline and as such has positioned Enterprise Architecture as the primary enabler of not only the consolidation, but the standardization that accompanies such consolidation.

11.1 *Priorities of Government*

The State of Colorado Governor's Office of Information Technology has developed a basic set of priorities for government structure similar to what has been undertaken in other states. This structure is used when evaluating various initiatives requested by State of Colorado Departments. For the chart items below, a formal rating is assigned based on the initiative presented with 1A being the highest priority and 4B being the lowest priority. Note that for category 3 (moderate) the overall return on investment can affect the final priority of a given initiative (e.g. a 3D priority initiative that would return significantly more than a 3A priority initiative may be escalated within category 3).

Such a prioritization scheme is not designed to be exactly prescriptive but is generally meant to set the basis of decision making on initiatives according to the value that they deliver. For those initiatives which rank high in terms of their effect, there tends to be less need to quantify the actual value of the result of the initiative but when there are competing initiatives within the same categories either return on investment or protection of resources (human or otherwise) can be used to rank such competing initiatives.

Such priorities can also be used to set CoOp (Continuity of Operations) and CoG (Continuity of Government) priorities dictating in which order programs and services are restored or provisioned after an event which interrupts delivery of those services. The scheme below is designed to be demonstrative only, although it is loosely based on the perceived priorities of government that the State of Colorado and other states ascribe to in delivering programs and services. Definition of these priorities should be undertaken by the representative governance structure (EGC's) and defined for all State of Colorado initiatives.

Agreeing to such a priority scheme in advance will make convergence on enterprise priorities a more straightforward task and will minimize, but not eliminate, discussions around organizational priorities. It is the counsel of the EADT that the priorities assigned to various work activities should be determined through a representative governance structure thereby establishing buy-in and ownership of decisions surrounding priorities.

Priority Category	Sub Category	Requires Return on Investment Analysis
Vital (1)	1A - Protects or Preserves Public Safety	
	1B - Protects or Preserves Public Health	
	1C - Provides Public Welfare	
	1D - Mandated by Federal Statute(s)	
	1E - Mandated by State Statute(s)	
Important (2)	2A - Required for Federal Funding	
	2B - Required for State Funding	
	2C - Maintains or Advances Educational Capabilities	
	2D - Protects Natural Resources	
	2E - Facilitates Energy Independence	
Moderate (3)	3A - Protects or Enhances State Revenue / Economy	X
	3B - Mitigates a Legal Liability	X
	3C - Addresses a Compliance Gap	X
	3D - Improves Productivity / Efficiency Resulting in Savings	X
Low (4)	4A - Improves Customer Service (e.g. new services)	X
	4B - Maintains or Restores Public Image / Confidence	X

Table 11.1 – Priorities of Government

11.2 *Governance Guiding Principles*

The EADT has identified ten (10) guiding principles that will guide the Enterprise Architecture governance and Information Technology governance as a whole.

Principle 1 Governance is a Shared Responsibility

Governance for the State of Colorado Information Technology and Enterprise Architecture blends the use of control and autonomy, ensuring that the governance structure is responsible to those it serves. Process and technical controls shall be used to assist in the enforcement of defined policies and standards. Information Technology and Enterprise Architecture governance is designed to be flexible and is subject to orderly change to meet the needs of the organization. Project priorities will be collectively determined with the EGC's owning prioritization decisions. Formal processes to address conflict resolution will be used, defined, and employed as needed with the stated goal of meeting departmental requirements.

Principle 2 Decisions are made with the Best Interests of the Largest Contingent in Mind

The State of Colorado Information Technology and Enterprise Architecture governance model utilizes a mixture of both individual direction setting and collaboration with a common understanding that the needs of the many exceed the needs of the few. Decisions will be made in the best interest of the larger organization when a clear demarcation exists between local and global interests. When the needs of the global and the local organization can both be met, they will be. Decisions will be made at the lowest possible level ensuring consistency in process and compliance with standards. Decisions will adhere to the State of Colorado priorities of the government model espoused by the Governor's Office of Information Technology.

Principle 3 Simplicity is the Basis of the State of Colorado Enterprise Architecture Model

The Enterprise Architecture for the State of Colorado focuses on simplicity of structure and reducing complexity. Shared services will have a single owner. Standardization on common business processes across State of Colorado departments will be a goal wherever possible. Infrastructure will be built on common hardware and software standards. Security will be managed from an enterprise perspective.

Principle 4 There will be Accountability to Defined Standards and Processes

The State of Colorado will execute in a disciplined and consistent manner. All personnel will be expected to conform to formal Information Technology and Enterprise Architecture standards, policies, processes, and procedures. Exception processes will be created to handle required or requested deviations from defined standards and policies. Accountability is the cornerstone of this principle. Attempted violations of defined standards will be escalated to executive management for remediation.

Principle 5 Transparency

The State of Colorado Information Technology and Enterprise Architecture governance structures will operate in a transparent manner, communicating standards, policies, and decisions in a timely manner. Individuals, through the appropriate channels, may communicate or raise an issue related to Information Technology or Enterprise Architecture organizations or governance structures.

Principle 6 Artificial Constraints

When we provide well considered costs to implement a given system or pursue a given initiative, we will not accept responsibility for artificial constraints placed on the project by external entities. If funding to the level required is not available, additional levels of planning may be undertaken to see what alternatives exist, but implementation will not proceed without thoughtful planning. If no alternatives exist and the funding is not available, the initiative will not be undertaken. If forced to undertake an initiative under an artificial constraint placed on us by an external entity, individuals or entities placing those constraints must assume responsibility for success or failure of the effort.

Principle 7 Accountability is the Basis of Reliable Service

Service provided without accountability is doomed to disappoint. The State of Colorado utilizes a formal accountability model, combined with objective metrics where possible, to measure service. When failures in service occur, the root cause of such failures is determined and corrective action undertaken. Vetted service levels are used as the basis of service commitments.

Principle 8 Business Drives Information Technology

Information Technology exists to serve the business. As such, the Information Technology organization strives to make decisions in the best interest of the business. When an outcome expected by the business organization is not possible we tell them. When a selected course of action is not in the best interest of the business we tell them. Information Technology can and will add value to business units by sharing how and when technology can augment and extend defined business objectives or lead to more timely achievement of business objectives.

Principle 9 Evolution is Less Risky than Revolution, Yet Both Lead to the Same Goal

Evolutionary changes, because of their nature are less risky than revolutionary changes. Whenever possible, the State of Colorado utilizes measured and thoughtful evolutionary approaches so that the risk to the State of Colorado and its constituents is minimized resulting in a reduction in the loss of constituent based funding. As such, State of Colorado IT governance will seek to establish a risk / value equilibrium avoiding situations of extreme risk or minimal value.

Principle 10 Consolidation Will Occur, but Will Occur Together

Although debates as to the nature and timing of consolidation may linger, consolidation is a fact of life and will be undertaken by the State of Colorado consistent with many of its peer entities. Although the State of Colorado may not choose the same path as other states, the State of Colorado consolidation plan will be broadly-based and will seek input and participation from State of Colorado employees.

Enterprise Architecture governance is the practice of implementing and managing enterprise architecture and other architectures within the enterprise in a cohesive manner. Enterprise Architecture governance

does not operate in isolation and is not the only governance mechanism required within the enterprise. An overview of the various dimensions of governance and their interrelationships is presented in Section 10. In essence if governance is implemented correctly, it should:

- Strengthen IT/business unit working relationships
- Improve accountability (IT and business) for results
- Reduce operational risks / inefficiencies
- Enrich IT service quality and effectiveness
- Lead to a more efficient use of internal and external resources
- Attend to statutory/legal mandates necessary for funding approval can lead to less onerous oversight
- Focus IT spending on business drivers, value, needs and priorities
- Avoid problems or project overruns/failures stemming from false reactive reprioritization
- Lead to lower IT complexity and greater enterprise systems integration
- Give rise to a more effective IT strategic planning process

As a subset of the overall objectives of IT governance, Enterprise Architecture governance deals with the following core areas

- Providing a process for developing and improving the various architectures (like business, data, technology and information)
- Developing processes and systems to ensure compliance with the standards
- Provide effective management of the processes
- Provide clear communication to the various stakeholders and assign accountability for decisions within the enterprise continuum

In addition to supporting the key objectives above there needs to be a well defined architecture organization with specific areas of responsibility and cross functional reporting requirements with other governing bodies like the Project Management Office (PMO).

One of the key tenets of a successful centralized enterprise is that processes and governance around any decisions made in relation to IT projects are vetted with an architectural body to ensure that it is aligned with the overall direction and vision for the enterprise as a whole.

11.3 *Architecture Framework*

The framework of the architecture needs to separate the processes from the various content used to drive the delivery, so that changes can be made to one or the other without any impact to the operational aspects of either one. There are a set of core processes within the framework:

- Policy management including waivers and appeals
- Compliance
- Assessment and selection of architectures, technologies and products
- Environment management

Policy Management will deal with maintaining all the artifacts related to architectural amendments, contracts and supporting information. These will be maintained and recorded for all concerned parties including ensuring integration with existing practices and procedures. This process will also provide the overall flow for determining the appeals and waivers process, which are essential for any governance process. This will provide project sponsors with the means to provide interim solutions or participate in enhancing the overall breath of the enterprise architecture with the State.

Compliance will be done against Service Level Agreements (SLAs), Operational Level Agreements (OLAs), standards and policies on an ongoing basis to ensure stability, conformance, and timely technology infusion. These assessments will be rejected or accepted based on the criteria defined in the governance framework.

Assessment and selection of architectures provides a means for reviewing and validation of new technology for use within the State. These are meant to be ongoing studies and researches undertaken by members of project teams or people assigned by the Architecture Review Board. This will allow the state to ensure that it is not using technologies that are about to lose support, while keeping up with the innovation curve which will allow the State to use technology effectively.

Environment management is a key aspect of the governance framework. This ensures that the repository used to drive the decisions is kept up to date and will deal with the management, communication and training against the artifacts in the library.

In addition to the processes the organizational structure required to support this process is detailed in figure 11.2

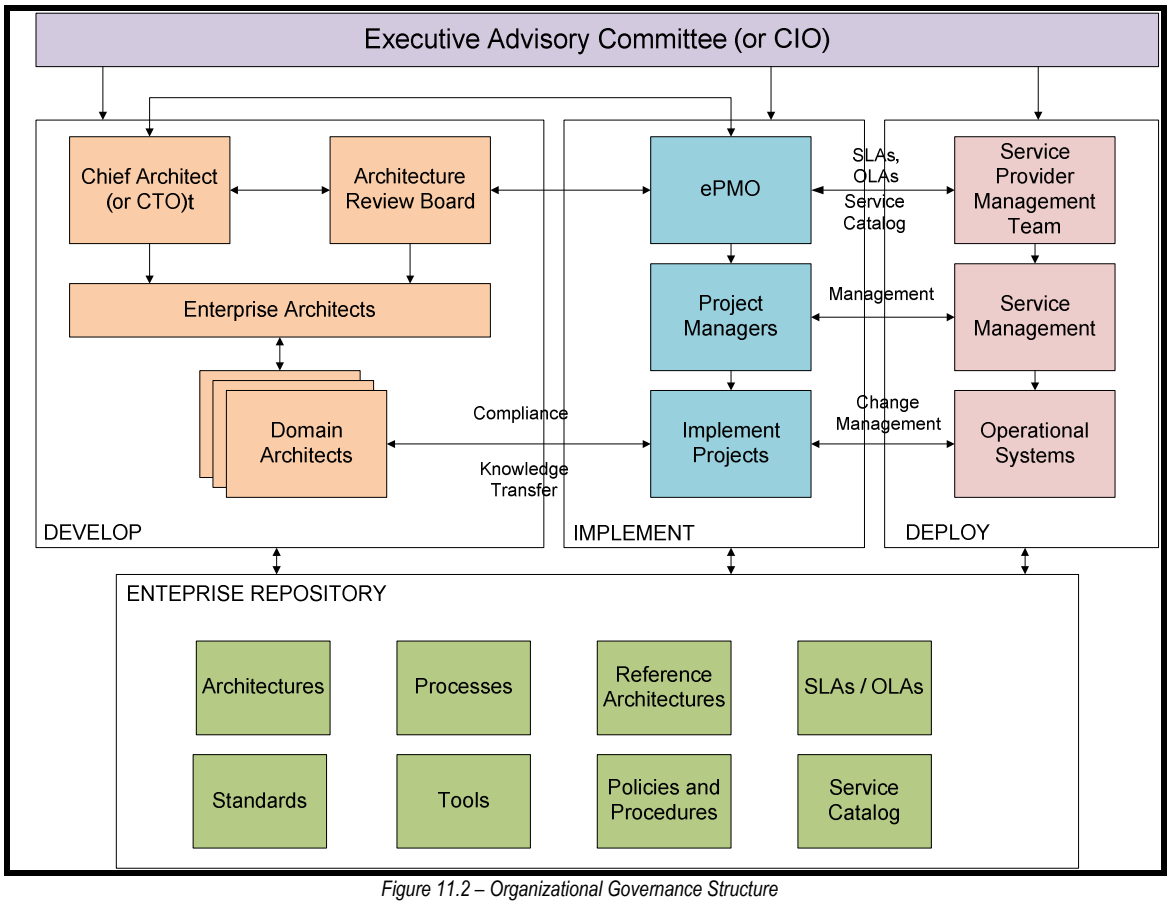

Figure 11.2 – Organizational Governance Structure

The development of the overall standards and guidelines will be undertaken by the Core EA team (detailed in 8.7) and vetted by the Architecture Review Board (ARB). The implementation will be overseen by the ePMO with scheduled compliance reviews and readouts to the ARB and Chief Architect. The organization that will provide Services to the enterprise will use the standards developed by the architecture team but

report operational issues and concerns through the ePMO, which can then involve the enterprise architecture team, if required.

11.4 *Contributing Organizations*

The State of Colorado currently has a number of organizations in place that will be used as a part of the Enterprise Architecture governance. These organizations will continue to be used to contribute to a wide variety of standards and processes, except that their new focus will be to addresses standards and processes from an enterprise wide perspective. These existing organizations are listed below along with their scope. While some of these organizations are loosely defined, under the Enterprise Architecture governance each of these groups will develop a formal mission, charter, scope and will have a defined reporting structure.

Entity	Primary Scope
Citrix Users Group	Defines usage of Citrix throughout the state addressing issues that arise with Citrix usage
Project Management Users Group	Holder of the existing State of Colorado project management lifecycle
Desktop Support Group	Currently defines various standards and some processes around desktop technologies
GIS Coordinating Council	Designed to coordinate the usage of spatial technologies, imaging, and data across the enterprise through a standardized set of tools
Colorado Integrated Communications Network	Designed to manage the integrated voice and data network across the state
Mainframe Users Group	Defines mainframe usage throughout the state addressing mainframe issues that arise

Table 11.3 – State of Colorado Contributing Entities

11.5 *Organization*

The conceptual structure for the Enterprise Architect discipline is depicted in figure 11.4. The structure builds on existing committee structures that already exist within the State of Colorado and also depicts interaction between the Enterprise Architecture organization and other governance structures.

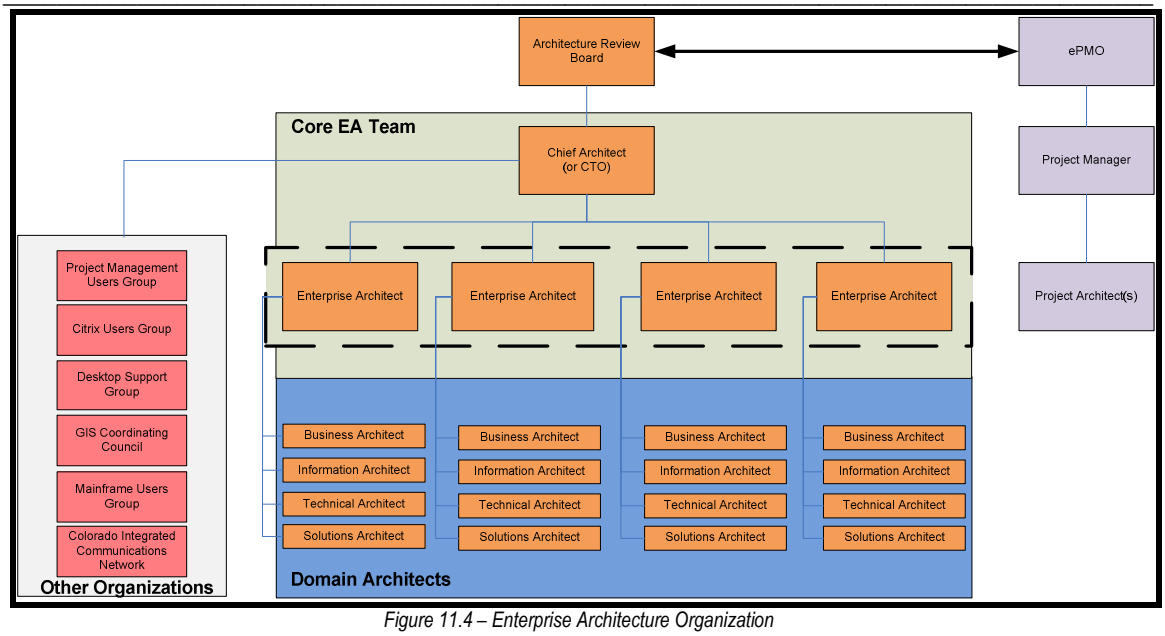

Figure 11.4 – Enterprise Architecture Organization

The Enterprise Architecture team within the State will be headed by an Architecture Review Board (ARB). This Board will be constituted from cross sections of business and technology across all the agencies within the State. This body will be representative of all the key stakeholders in the architecture, and will typically comprise a group of executives responsible for the review and maintenance of the overall architecture. This body will have enterprise wide scope and hence will work across business areas and enterprise disciplines.

The Chief Architect would be responsible for co-ordination activities across the Enterprise Architects, working with the ePMO and overseeing the workings of the various sub-committees or organizations that will contribute to enterprise architecture standards. All the project architects will report to the Chief Architect, but will take their day-to-day instructions from the domain architects. Depending on the nature of the project there maybe more than one domain architect assigned to the project, in which case the project architect will be responsible for co-ordination of architectural activities in and around the project scope.

It is recommended that the state start out with Enterprise Architects for each project or initiative and dedicate a team of domain architects to the Enterprise Architect. In the future there will be an opportunity to consolidate these positions and treat this team as a matrix managed team, where an individual could be responsible for more than one initiative while drawing from a pooled set of resources. The dashed line around the enterprise architects are meant to signify what should be put into a matrix structure first and then the domain architects.

It is foreseeable that the Enterprise Architects will work closely with subcommittees or organizations supporting the State enterprise architecture vision and standards, however they will still report through the State Chief Architect.

The EADT team has provided a high level description of each of the levels within the Enterprise Architecture organization as well as high level responsibilities. Some of these responsibilities have already been provided above in Section 9.3 which deals with a *potential* centralized Information Technology organization structure designed to provide enterprise wide Information Technology management. It should be noted here, as well as is noted in Section 9.3, that the final design of the enterprise wide Information Technology management structure should not be fully defined or implemented until key activities are undertaken and the resultant decisions determined.

Enterprise Architecture Review Board

The Enterprise Architecture Review Board is the entity responsible for providing oversight and leadership to Enterprise Architecture activities throughout the organization. As such, it is the ultimate authority for approving Information Technology standards, Information Technology policies and processes and providing guidance to the development of such standards, policies and processes. The Enterprise Architecture Review Board is also involved in reviewing and approving the Information Technology Strategic Plan and ensuring that business drivers and objectives from the various State of Colorado departments are aligned with technology investments and initiatives. The Enterprise Architecture Review Board will also act as the final arbiter in resolving enterprise versus departmental issues that may arise. Finally, the Enterprise Architecture Review Board will weigh in on specific Information Technology investments evaluating enterprise applicability and considerations and vetting the work already undertaken within the Enterprise Architecture organization hierarchy.

CTO or Chief Architect

The CTO or Chief Architect is the individual primarily responsible for shepherding activities within the Enterprise Architecture organization. This position is responsible for coordinating all activities related to managing strategic activities (e.g. development of standards, policies, best practices, and procedures), overseeing the strategic planning process, and also managing more tactical activities (e.g. project evaluation and enterprise and departmental solution development). The position is also responsible for coordinating the resolution of issues with other enterprise Information Technology management leaders (CIO, DCIO, Service Provisioning Officer, etc.). As necessary, oversees business requirement development to ensure that enterprise wide requirements are considered for enterprise wide services and functions.

Enterprise Architects

The Enterprise Architects are the primary entities responsible for not only coordinating the activities of the Domain Architects but also for maintaining enterprise wide architectures, for developing or overseeing the development of enterprise wide processes and standards and for developing and overseeing the development of various reference architectures. The Enterprise Architects own the development and oversight of the enterprise wide architecture framework. In addition, the Enterprise Architects are responsible for reviewing proposed architectural and integration solutions, ensuring solutions have been reviewed so they consider enterprise applicability and issues. The Enterprise Architects are the primary owners of key processes such as the SDLC (Software Development Life Cycle) and the PMLC (Project Management Life Cycle).

Other Organizations (User Groups)

The State of Colorado currently has a number of different user groups that oversee certain types of technology standards and process development. At this time, many of their efforts are guidance level efforts only with no enforcement of defined technology standards or processes. Within the Enterprise Architecture organization, these entities, working with the Enterprise Architects, will be responsible for eliciting specific technology requirements and process requirements and then developing the various standards and processes that will be used throughout the enterprise. Once these technology standards and process standards have been developed, these are formally escalated throughout the Enterprise Architecture organization until they reach the Enterprise Architecture board at which point they become enterprise standards and processes. The other organizations identified above will work with specific domain architects as necessary to address specific technology standards.

Domain Architects

Domain Architects are the individuals, which have specific experience in a given domain, which will work to address and drive specific solutions to business requirements which are both optimized and designed with enterprise wide principles in mind. In general, Domain Architects work together to develop solutions to specific business requirements and do most of the heavy lifting with respect to enterprise architecture

works. They are responsible for creating the various reference architectures guiding the overall solution development process. In addition, Domain Architects work to optimize solutions minimizing the cost of solutions wherever possible. There are many different types of Domain Architects and the final types and responsibilities of the Domain Architects will be developed as a part of the organizational work in Phase I. Envisioned types of Domain Architects include Business, Solution, and Information Architects as well as Technology Architects which are further divided into Network, Security, Platform, Data, Information, Integration, and Applications Architects. In addition, there is the potential to utilize Project Architects as well which are more generalists in nature and work to coordinate enterprise architecture activities with the bounds of a given project (or set of projects).

11.6 *Processes*

The process of architecture governance does not work in isolation. Here in figure 11.5 is a representation of an overall flow for a complete project lifecycle which leverages a two-phase review process. The initial level of review is only for funding requirements collection, high-level design, and project estimation. This approach will provide superior implementation estimates as compared to attempting to estimate implementation in one initial step consistent with the rule "Estimates based on larger amounts of data will be better than estimates based on lesser amounts of data".

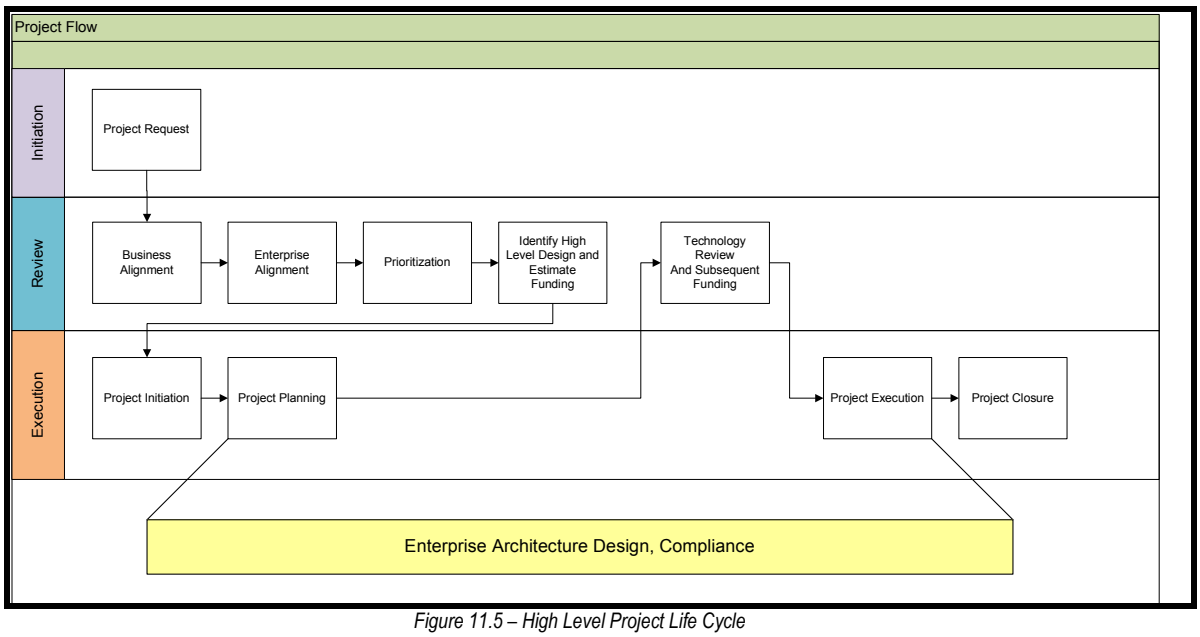

Figure 11.5 – High Level Project Life Cycle

There are three basic phases for every project within the governance structure, Initiation, Review and Execution. The review process is where Enterprise Architecture Governance[9] will play a key role in ensuring adherence to standards and processes. The specific area of "Technology Alignment" and Software development and process alignment will involve the EA governance processes is detailed in figure 11.6.

[9] Enterprise Architecture Governance Process, Gartner, February 2007

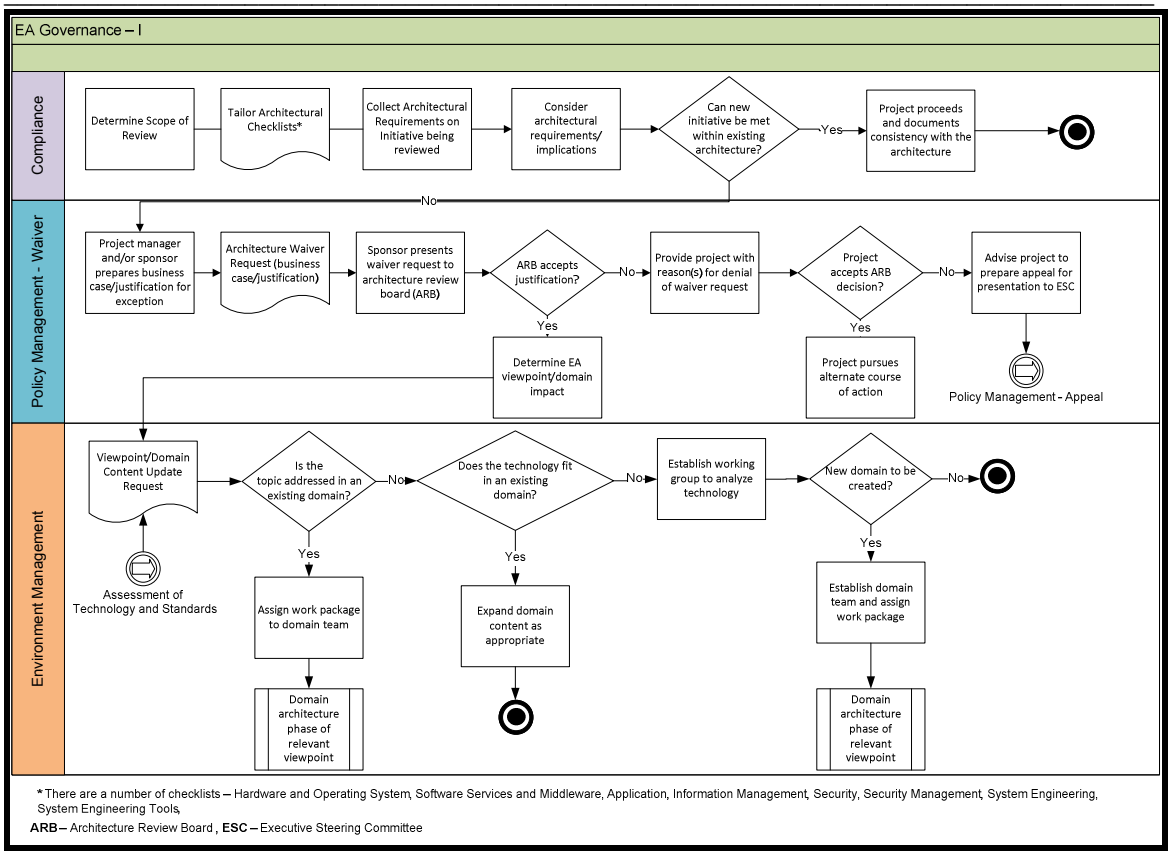

Figure 11.6 – Enterprise Architecture Governance Processes

Engagement with the governance process will start with the *Compliance*. *Compliance* will determine the fit for purpose with regards to enterprise architecture and align the project with overall standards and services available. Initially this is expected to be a compliance of the tools and technologies which will help in deriving the benefits from Phase 2 of the consolidation framework in section 7.1.

The *Policy Management Waiver* process will allow project sponsors the ability to use processes, tools and technologies that are in line with the overall approach, but are not currently supported within the enterprise space. A good example is an Enterprise Service Bus (ESB) that is required for the deployment of a solution. In the overall framework(section 7.1), this would be part of Phase 3, but could be looked into early if there is a pressing need to use it in a business solution.

The *Environment Management* processes ensure that the repository that drives the overall governance process is effective and efficient. This will require definition of other administrative processes under the overall process structure identified in the schematic above, but will help drive the use of common strategies and concepts across the enterprise.

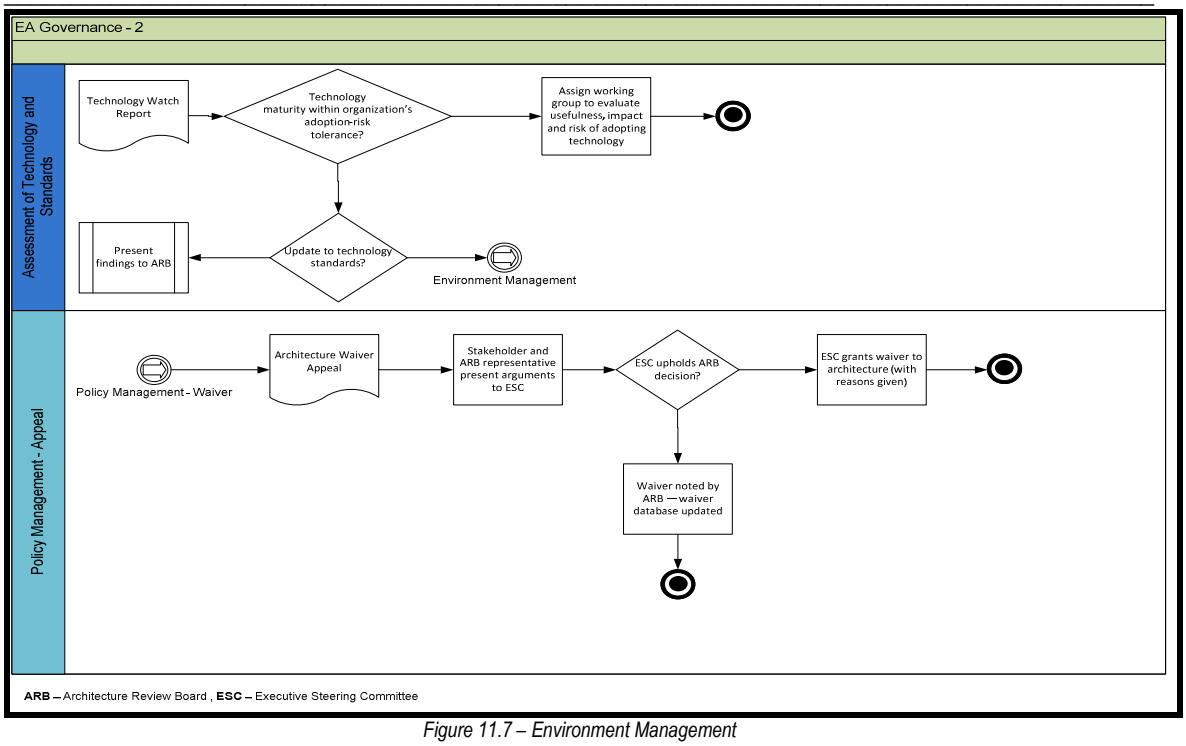

Figure 11.7 – Environment Management

Assessment of Technology and Standards is a core set of processes that ensure an enterprise remains with the innovation curve in technology. There needs to be defined areas of excellence and focus which drive the overall approach to ensuring that investments within the State of Colorado are protected from losing support from vendors, and also having affordable manpower to work with these tools.

The *Policy Management Appeal* process allows for the project sponsor to appeal the decisions made during the compliance review. In case a project sponsor feels that a certain technology or solution is required for the effective management of a program, they can appeal the decision to the Executive Advisory Committee, which will have a final say in the matter.

The overall process is meant to be representative of a broad overview of the tasks and decisions points that are usually encountered within the EA governance space. These tasks will need to be revised and kept up to date with changing requirements as the EA organization within the State evolves.

11.7 *Architectural Reviews and Checklists*

The overall architectural review process will be supported by a number of checklists, as outlined in the governance process in figure 11.8

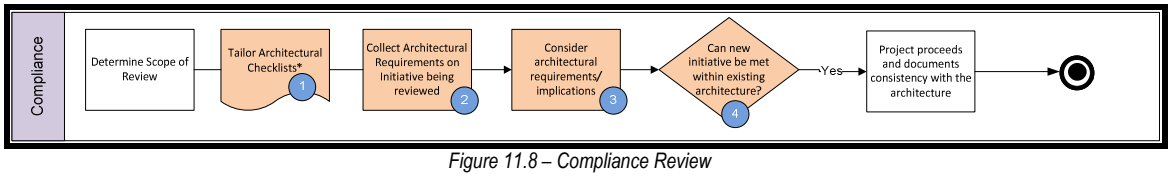

Figure 11.8 – Compliance Review

Tailor Checklists

The checklists (Step 1) that are required to support the overall architectural review process for compliance and value can be divided into the following areas as depicted in figure 11.9. Note that this is not a complete list of the issues that would be reviewed, but a summary list.

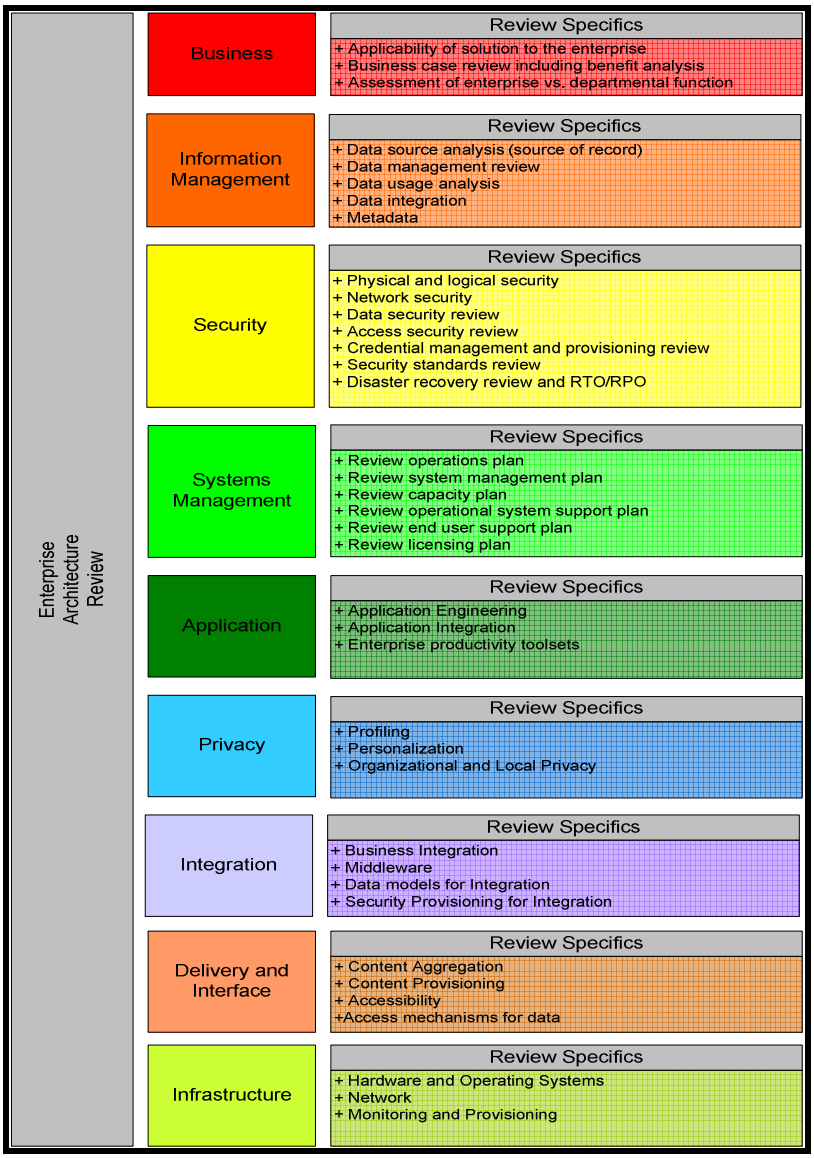

Figure 11.9 – Review Checklists

These checklists will need to be developed in detail to support the overall process for governance, but the outline below is an abbreviated scope for some of these checklists.

Business review

- Is the solution in line with overall business functions and objectives of the specific agency or functional areas within the State?
- Is there a plan to ensure that all federal and state requirements for acquisition, delivery, reporting, auditing, and compliance are addressed?

- What are the RTO (Recovery Time Objectives) and RPO (Recovery Point Objectives) required for the function?
- Can the system use any services from systems that have already been developed?
- Are the services being offered part of the enterprise scope, or should they be considered as local services?
- Are the goals and objectives of the system stated clearly, with a well defined benefit to the local agency or State?
- Is the impact of not implementing the system clearly identified and articulated? And additionally are there efficiencies that will be gained by the implementation identified?

Information Management

- What are the processes that standardize the management and use of the data?
- What business processes support the entry and validation of data?
- What are the data quality requirements and how are they met in the system?
- What are the rules for defining and maintaining the data requirements and designs for all components of the information system?
- What software development and data management tools have been selected?
- What are the data entity and attribute access rules which protect the data from unintentional and unauthorized alterations, disclosure, and distribution?
- What is the discipline for managing sole-authority data as one logical source with defined updating rules for physical data residing on different platforms?
- What tier data server has been identified for the storage of high or medium-critical operational data?
- Is there is a need for a Business Intelligence solution? Has the architecture and toolset been defined?
- Is there an Extract Transform, and Load (ETL) component to the overall data management design and has that been identified?

Security

- Is there a security plan for the solution?
- Is authorization controls defined with appropriate policies?
- Is the network security outlined in the security plan?
- Is there clear rules and direction for identity management usage and definition within the system?
- Are the communication security requirements outlined?
- Does the solution follow the guidelines laid out by the Chief Information Security Officer for the State of Colorado?

Systems Management

- Is there an operational plan for the system?
- Are the licensing requirements clearly articulated in the solution?
- Is there modification to the helpdesk procedures required to support the system? Are they identified and documented or budgeted for?
- Is there a capacity plan or is the capacity planning covered in the operational plan?
- Is there a business continuity plan? If there is none, is there a waiver in place for the system or is it covered by another business continuity plan?

Application

- Are there coding standards in place?
- Does this follow the overall reference architecture for solutions in the State of Colorado?
- Does it use standard enterprise-wide services defined and/or implemented for the State?
- Does the solutions architecture conform to best practice architectures adopted by the State?
- Is there a defined business rules component in the solution? Does it align with the overall standards for the State?
- Have you defined a clear strategy for organizing the source code modules in your system?
- Have you defined a general set of rules governing the dependencies that can exist between code modules at different abstraction levels?
- Have you identified all of the aspects of element implementation that need to be standardized across the system?
- Have you clearly defined how any standard processing should be performed?
- Have you identified any standard approaches to design that you need all element designers and implementers to follow? If so, do your software developers accept and understand these approaches?
- Will a clear set of standard third-party software elements be used across all element implementations? Have you defined the way they should be used?

Privacy

Privacy defines the appropriate use of information and cannot be implemented without the right level of security.

- Are there any specific privacy acts that apply to this solution? Have they been accounted for in the architecture?
- Is there a plan to personalize the information based on user role? Does that fall in-line with the security architecture for the solution and the state?
- Are there any Enterprise privacy concerns that need to be addressed in the solution? Is there a solution in place or is there a plan to define the solution?

Integration

- Describe how error conditions are defined, raised, and propagated between application components.
- Describe the general pattern of how methods are defined and arranged in various application modules.
- Describe the general pattern for how method parameters are defined and organized in various application modules. Are [in], [in/out], [out] parameters always specified in the same order? Do Boolean values returned by modules have a consistent outcome?
- Describe the approach that is used to minimize the number of round-trips between client and server calls, particularly for out-of-process calls, and when complex data structures are involved.
- Describe the major data structures that are passed between major system components.
- Describe the major communication protocols that are used between major system components.
- Describe the marshaling techniques that are used between various system components. Describe any specialized marshaling arrangements that are used.
- Describe the approach and the internal documentation that is used internally in the system to document the methods, methods arguments, and method functionality.
- Describe the code review process that was used to build the system.
- Describe the unit testing that has been used to test the system components.

- Are there any canonical data models used for information interchange? Are they defined and published?
- Is there is a product used in supporting integration of various parts of the system?

Delivery and Interface

- Have you identified and obtained stakeholder approval of the extent to which the system must support the needs of disabled users?
- Have you provided for the needs of indirect disabled users, such as customers who need paperwork provided in Braille format?
- Have you identified the disability legislation that affects the system and assessed the system against it?
- Have you ensured that the system meets any internal accessibility standards?
- Have you considered all points at which the system has any human interaction? For example, have you considered operational management and monitoring of the system or printed forms that are sent to customers to be filled in?
- Do the interactive elements of your architecture sufficiently separate presentation and content to meet the system's accessibility objectives?
- Are the interfaces between components (particularly those leading in and out of presentation devices) sufficiently generic to be able to take on board new devices without (much) rework?
- Does the architecture allow for presentation alternatives to convey meaning (e.g., text, pictures, and/or sound in a user interface)?
- Do standards for user interface design emphasize simplicity, consistency, and clarity in place? Does the architecture adhere to them?

Infrastructure

- What is the hardware required for this solution?
- Are the software platforms identified and supported?
- Can this application support virtualization?
- Can this solution share a database server with other solutions?
- Does this solution use COTS (Commercial-Off-The-Shelf) solutions? Is the solution a part of the State standards?

Collect Architectural requirements

The architectural requirements should be in support of the solution and based on the architectural checklists that apply. The requirements should be based on the following tenets:

- They should be provided by the project sponsor in consultation with an architect assigned to the project
- They should be used as the basis for all technology decisions in the project and hence need to be at a level of detail that supports overall design decisions within the project
- There should be enough environment detail that helps drive an implementation plan, or at a minimum have a starting point for the implementation plan
- The requirements collected should be able to support availability, scalability and reliability requirements for the project.

Although this part of the process seems like a simple filling out of checklists, there will be an education cycle required for the project teams and clear guidelines published to insure that the information is useful in driving the project forward.

Consider architectural requirements implications

This step provides the enterprise control and keeps initiatives focused on growing overall competency within the enterprise to move towards common platforms, services and delivery capabilities over the long term. This is where the dependencies and reuse of existing capabilities need to be considered and articulated. This should involve the enterprise architecture core team to provide guidance on relevant initiatives and goals for the enterprise.

Can the new initiative be met?

In case the initiative can be met within the currents standards, this step leads to the architectural approval of initiating the project however this is not the only time that this evaluation will be carried out in the lifecycle of the project. In case the initiative requires new services or technologies, the project will have to go through the waiver process. This also provides control on investments being made in technologies to ensure that they are procured just in time and provide the maximum benefit to the widest number of projects in the enterprise.

11.8 *Defining the process*

In the first phase of consolidation there will have to be considerable effort in working through the guidelines for each step and developing detailed checklist relevant to the types of projects and technologies that will be consolidated in the phase two of consolidation. It is advisable to inventory the current project and have representation from business and technology while developing some of the detailed workflows around these processes.

11.9 *Standards, Policies, Processes, Artifacts, & Metrics*

In support of the defined structures, responsibilities, and authorities a number of standards, policies, procedures, and processes will need to be defined. The EADT has provided baseline processes for some activities but the State of Colorado may elect to adjust or replace these processes using the defined governance structure.

11.9.1 Required Standards

In order to begin the move towards a more standardized (and consolidated) set of technologies a number of standards are required to be developed. Development of, and accountability to such standards will not only reduce the overall cost of technology acquisition by the State of Colorado, but will also reduce the overall number of differentiated skills required to manage the technology and recover the technology. Addressing compliance with technology standards should be forward looking only. That means that if an organization has or utilizes technologies not consistent with the standards, no expectation should exist that this will trigger a migration. Rather, a planned obsolescence, consistent with Enterprise Architecture product roadmap will classify the various technologies and seek their replacement at the next opportunity (e.g. perhaps at technology refresh cycle, or as other types of consolidations occur). This would be true unless there were a compelling investment case for an immediate migration.

A partial list of the standards which should be developed is listed below in table 11.10.

Technology	Domain	Responsibility
Operating System	Server	Enterprise Architecture
Operating System	Desktop	Enterprise Architecture
Computer Systems	Server	Enterprise Architecture
Computer Systems	Desktop	Enterprise Architecture
Server Virtualization Software	Server	Enterprise Architecture
Database Management System	Desktop	Enterprise Architecture
Database Management System	Server	Enterprise Architecture
Productivity Suite	Desktop	Enterprise Architecture
Electronic Mail and Calendaring	Mixed Mode	Enterprise Architecture
Switches	Network	Enterprise Architecture
IP Load Balancers	Network	Enterprise Architecture
Routers	Network	Enterprise Architecture
Firewalls	Security	Enterprise Architecture (Security)
IDS	Security	Enterprise Architecture (Security)
Access Control	Security	Enterprise Architecture (Security)
Event Logging and Correlation	Security	Enterprise Architecture (Security)
Content Caching	Network	Enterprise Architecture
JAS	Server	Enterprise Architecture
Message Queuing Software	Server	Enterprise Architecture
File Sharing Services	Server	Enterprise Architecture
Print Sharing Services	Server	Enterprise Architecture
Storage Area Network	Server	Enterprise Architecture
Mainframe	Server	Enterprise Architecture
Content Management	Server	Enterprise Architecture
Thin Client Access	Server	Enterprise Architecture
Authentication and Authorization	Mixed Mode	Enterprise Architecture

Table 11.10 – Required Technology Standards

Since the State of Colorado would have to expend large amounts of resources to facilitate a short-term migration to the new standards, the EADT would propose grandfathering existing hardware technologies not meeting the standard but ensuring that all new acquisitions comply with the standards (unless there is a business case for deviating from the standard). This will greatly reduce the overall cost of migration. A similar strategy could be used for software ensuring that software migrations occur consistent with maintenance and support payments.

In addition, a formal technology refresh schedule should be developed for the various technologies acquired and these refresh rates must be communicated to those entities approving funds. The method through which a technology refresh is undertaken can be left to financial analysis of the situation or state wide policy.

11.9.2 Required Policies

The State of Colorado will have need for a number of policies to govern both Enterprise Architecture and Information Technology. The list in table 11.11 is not designed to be exhaustive, but is designed to identify some of the major policies that will be required. Once the two major governance structures and their supportive personnel are in place, these structures will begin to address development of these policies. Some of these policies have been developed already while others will require development. All existing policies should be revisited within the context of a consolidated organization.

Policy	Proposed Owner
Technology Standardization Policy	Enterprise Architecture
Information Technology Resource Usage Policy	Enterprise Architecture
Digital Media Policy	Enterprise Architecture
Software Usage Policy	Enterprise Architecture
Data Management Policy	Enterprise Architecture
Procurement Policy	Procurement
Contracting Policy	Procurement
Information Dissemination Policy	Enterprise Architecture(Security)
Disaster Recovery Policy	Enterprise Architecture(Security)
Information Disposal Policy	Enterprise Architecture(Security)
Access Control Policy	Enterprise Architecture(Security)
Identity Management Policy	Enterprise Architecture(Security)
Electronic Communications Policy	Enterprise Architecture(Security)
Internet and State Network Usage Policy	Enterprise Architecture(Security)
Whistleblower Policy	State of Colorado CIO

Table 11.11 – Required Policies

11.9.3 Required Processes

The State of Colorado will have need for a number of processes to govern both Enterprise Architecture and Information Technology. The list in table 11.12 is not designed to be exhaustive, but is designed to identify major processes that will be required. Once the two major governance structures and their supportive personnel are in place, these structures will begin to address development of these processes. Some of these processes may have already been developed but all of these should be revisited within the context of a consolidated organization.

Process	Proposed Owner	Methodology (Phase)
Prioritizing Resources Across EGC Committees	PMO	PMLC (Initiation)
PMO Training Process	PMO	NA
Project Request Process	PMO	PMLC (Initiation)
Project Change Process	PMO	PMLC (Planning, Execution)
Project Termination Process	PMO	PMLC (Closure)
Project Risk Management Process	PMO	PMLC (Planning, Execution)
Project Status Reporting Process	PMO	PMLC (All)
Project Prioritization Process	PMO	PMLC (Initiation)
Project Benefits Review Process	PMO	PMLC (Post Closure)
Project Management Lifecycle Process	PMO	N/A
Unfunded Mandate Process	PMO	N/A
Grant Management Process	PMO	N/A
Software Development Lifecycle Process	Enterprise Architecture	PMLC (Execution)
Quality Assurance Process	Enterprise Architecture	PMLC (Execution
System Design Review Process	Enterprise Architecture	PMLC (Execution
Development Process	Enterprise Architecture	PMLC (Execution
Technology Selection Process	Enterprise Architecture	PMLC (Execution
Deployment Process	Enterprise Architecture	PMLC (Execution
Strategic Planning Process	Enterprise Architecture	N/A
Strategic Planning Process	Enterprise Architecture	N/A

Architecture Review Process	Enterprise Architecture	PMLC
Architectural Waiver Process	Enterprise Architecture	PMLC
Departmental Budgeting Process	Budgeting	N/A
Hardware and Software Procurement Process	Procurement	N/A
Contracting Process	Procurement	N/A
Services Procurement Process	Procurement	N/A
Services Requirement Definition Process	Service Delivery	N/A

Table 11.12 – Required Processes

11.9.4 Required Artifacts

The State of Colorado will have need for a number of artifacts which will be used in conjunction with processes to convey information between various types of entities. The list in table 11.13 is not designed to be an exhaustive list of artifacts, but is designed to identify major artifacts that will be required. Once the two major governance structures and their supportive personnel are in place, these structures will begin to address development of these artifacts which should be created coincident with the various processes. Some of these artifacts may have already been developed but all of these should be revisited within the context of a consolidated organization and within the context of updated processes.

Artifact	Proposed Owner	Methodology (Phase)
Investment Case	PMO	PMLC (Initiation)
Project Lessons Learned	PMO	PMLC (Closure)
Project Plan	PMO	PMLC (Planning, Execution)
Project Communications Plan	PMO	PMLC (Planning, Execution)
Project or Initiative Pipeline	PMO	N/A
Risk Management Plan	PMO	PMLC (Planning)
Pro Forma	PMO	PMLC (Initiation)
Resource Plan	PMO	PMLC (Planning)
Statement of Work	PMO	N/A
Project Status Report	PMO	PMLC (Execution)
Service Level	PMO	N/A
Project Initiation Form	PMO	PMLC (Initiation)
Project Change Control Form	PMO	PMLC (Planning, Execution)
RFP Template	Procurement	N/A
System Design Document	Enterprise Architecture	PMLC (Execution)
Architectural Compliance Review	Enterprise Architecture	SDLC (Design)
Architectural Design Review	Enterprise Architecture	SDLC (Design)
Architectural Waiver	Enterprise Architecture	SDLC (Design)
Technology Standard	Enterprise Architecture	N/A
Service Requirement Projections	Service Delivery	N/A

Table 11.13 – Required Artifacts

11.9.5 Recommended Metrics

As a part of measuring organizational performance as part of a consolidated organization, the EADT would propose the creation of specific metrics which are not only tracked, but reported on regularly. These metrics are designed to measure organizational performance enabling those responsible for providing service and accounting for expenditures to be able to address organizational issues long before a "pattern" of failure develops. Although the recommended metrics are provided in table 11.14, these metrics must be assigned to a given organizational unit for tracking. In many cases, the PMO (Program Management Office)

Director can own these metrics but in others, the lead Service Delivery Individual should own some of these metrics.

The EADT would recommend monthly tracking and reporting of these metrics with the potential to extend these metrics directly to legislators and other elected officials so that they may determine for themselves, the effectiveness of the statewide Information Technology organization. These metrics can be placed on the website as well for general. These metrics are a starting point only and may be expanded through the various governance structures.

Metric	Discipline	Goal	Owner
Projects delivered on time	Project Management	80%	PMO
Projects delivered within budget	Project Management	80%	PMO
Projects delivered with defined scope	Project Management	80%	PMO
Projects with test plans	Project Management	90%	PMO
Projects with approved requirements	Project Management	90%	PMO
% of service requests handled within service level agreement by priority by type	End User Support	90%	Service Provisioning Lead
% of systems meeting availability service level agreements	Operations	90%	Service Provisioning Lead
% of identified critical systems with disaster recovery plans	Operations	100%	Service Provisioning Lead
% of hardware acquisitions complying with standards	Enterprise Architecture	95%	CTO
% of software acquisitions complying with standards	Enterprise Architecture	95%	CTO

Table 11.14 – Recommended Metrics

Furthermore, in addition to these metrics, it would make sense to establish part of the core website that would report on project activity throughout the State of Colorado. Such a website would provide an easily accessible repository of information on project health and would include information such as that listed below.

- Planned versus actual schedule
- Planned versus actual budget
- Planned versus actual resource
- Planned versus actual milestones and deliverables
- Project approved change controls
- Project team members and contact information
- Project sponsors and contact information
- Project schedule and project plan
- Project risk management plan
- Project communications plan
- Project test plan
- Project design documents
- Project issues
- Project approvals
- Project design

11.9.6 Representative Processes

As a part of this document, the EADT has provided several *representative* processes that might be able to either be used in the state or as the basis of state defined processes. These processes should not be automatically adopted by the State of Colorado but they may serve to start the development process. Once processes are defined within the State of Colorado, each process should have a process owner who is responsible for coordinating needed changes to the process and for communicating the process to the relevant audiences. An example of a process whereby enterprise strategies are realized is below in figure 11.15.

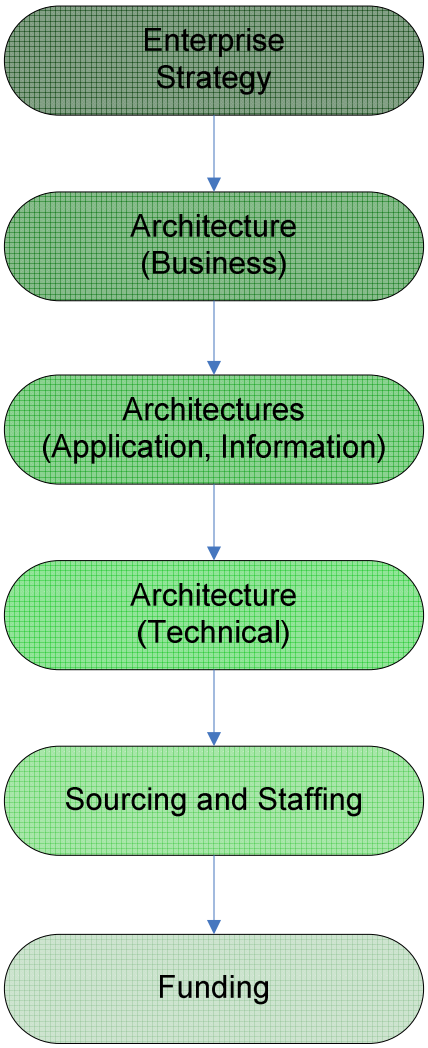

Figure 11.15 – Strategy Realization Process

The EADT has also provided some additional representative processes as well. These are depicted in figure 11.16. As stated previously, it is the expectation that the PMO and the Enterprise Architecture group will work together to define and integrate their processes ensuring seamless execution from the perspective of the requesting organizations considering any baseline processes that may already exist.

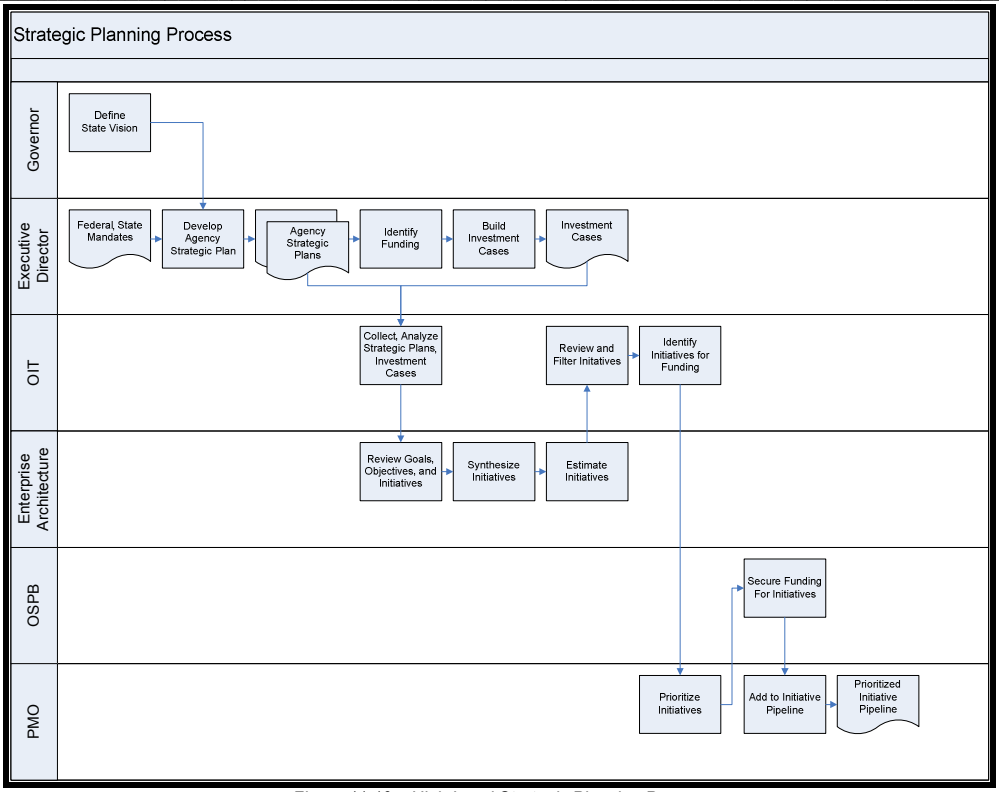

Figure 11.16 – High Level Strategic Planning Process

The High Level Strategic Planning Process is an annual process that is invoked to determine organizational objectives across the 19 State of Colorado departments, objectives from the State of Colorado CIO, and the State of Colorado Governor identifying departmental and enterprise level activities achieving the defined objectives.

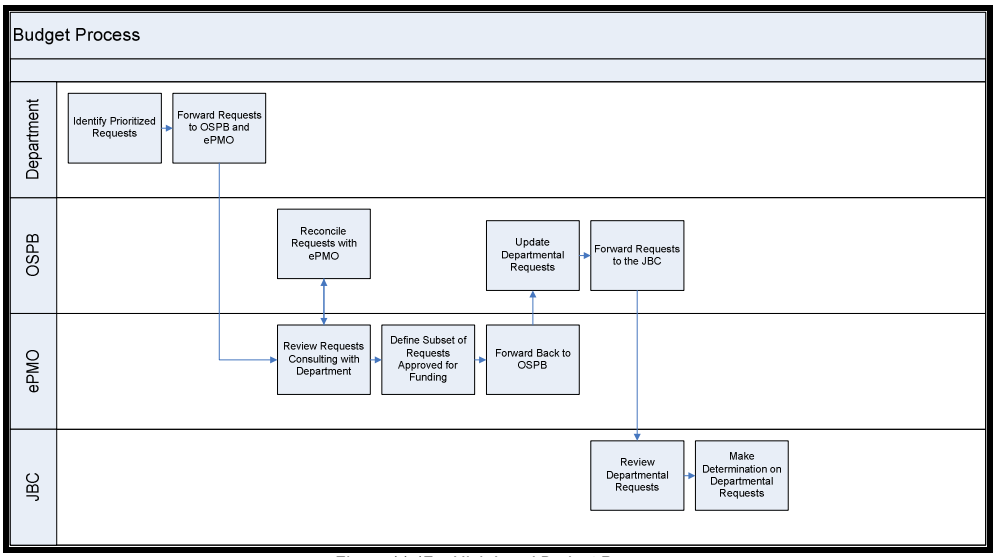

Figure 11.17 – High Level Budget Process

The high level budget process depicted above in figure 11.17 is the one developed as a part of the new consolidation structure (GOIT).

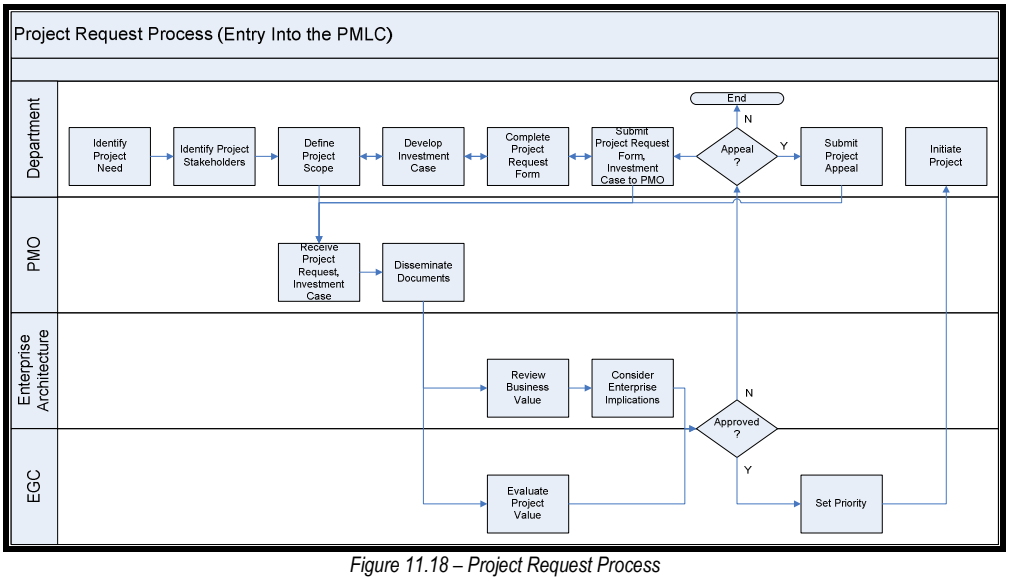

Figure 11.18 – Project Request Process

The Project Request Process example in figure 11.18 is the setup for the Project Initiation Phase of the Project Management Life Cycle. There is an important subtlety here related to the reviews by the CTO and Enterprise Architecture Board. The first time they are presented to the organization business value and enterprise suitability are evaluated. Once a project is initiated, however, the Enterprise Architecture organization is intimately involved in design and architecture ensuring compliance with defined design patterns, established reference architectures, and technology standards.

11.9.7 Issues

Identified within the governance category are several issues that should be addressed as a part of the overall process structure associated with the governance. These issues and recommendations to address the issues are listed below.

"Drive-by" projects

Drive-by projects are work activities initiated through hallway or similarly located conversations. The EADT clearly understands the desire to serve customers forms the basis of accepting such projects in an informal manner. Nevertheless, in the long run, this practice hurts both the Information Technology organization and the business units they serve by creating stress and over allocation challenges within the organization.

Recommendation to Address

Develop a formal set of standards and processes around requests of this nature. First, the request should go through a formal tracking system such as a help desk system so that it is logged. This will help ensure that the request is not lost, but will also form the basis of managing these types of requests going forward. Once the request has been accepted, except for the most basic of requests, the level of effort and financial resources to satisfy the request should be estimated. If these are over a certain threshold, they should invoke the normal project process. This threshold should be set by the State of Colorado PMO. If it falls below a given threshold, the work needs to be scheduled within periods when resources are available to address the request. If there are financial or resource (which in effect are financial) ramifications to the request, these would be addressed proactively rather than commitments being made prior to understanding the financial and resource requirements for the work.

Grants

Individuals or groups within various departments will from time to time, make application for specific types of grants to support new or existing program activities required to achieve departmental objectives or delivery of services to constituents. In many cases, these grants have information technology components or services required to fulfill them, but the Information Technology organization often inherits responsibilities in complying with grant restrictions without having had the chance to participate in the review and application prior to submission. If information technology or information technology resources required to support the grant are not planned for, there is a chance that approved funds will not result in what the grant was approved for.

Recommendation to Address

Similar to how to how to handle the issues with unfunded mandates above, grant writing issues can be addressed through both education *and* process. The process would require review and evaluation of specific grants by information technology personnel vis-à-vis requirements for information technology necessitated by the grants. Some sort of penalty should exist for failing to adhere to the process, but there should also be a service levels which departments can count on with respect to the timing of the review. Not only must new information technology requirements be considered, but also the impact on existing systems should be considered as well. It is important that the Information Technology organization have an opportunity to weigh in on these requirements before a grant is submitted and not after.

Also, as a part of this activity, the EADT would counsel the development of a grant writing service within Information Technology which can be engaged by departments. This service would not only provide value to the departments which are writing grants, but would also place the consolidated information technology organization on the front end of the grant application process.

Procurement Processes are Not Optimized

State of Colorado procurement rules and processes can often serve as a barrier to cost effective Information Technology management both from a process and a consolidation perspective. There are multiple examples of this, but one example involves not specifying brand names for certain types of resources. Buying power often is achieved through aggregating procurement, *through a given vendor*. Another example is the focus on attempting to secure the lowest bid for certain types of procurements (especially around commodity acquisitions). There are multiple bid mechanisms which can be used depending on the nature of the acquisition and it is important to select the correct vehicle. Furthermore, although evaluation of value allowed, it remains a subjective evaluation even though price (key attribute) is an objective measure. This is a concept that is theoretically sound but in practice the numbers of subjective variables make the concept problematic.

Recommendation to Address

State of Colorado procurement rules can be updated to eliminate specific requirements which will inhibit or reduce the cost effectiveness of the procurement process. This will allow the State of Colorado more flexibility and potentially more value for the funds expended. Other aspects of the procurement code should be similarly reviewed to ensure the rules are flexible enough to ensure that the State of Colorado receives the maximum value for the price paid. Furthermore, as standards are defined and promulgated, purchasing power should be able to be increased to drive lower prices and more value but this may also require a re-visitation of the procurement rules to enable vendor specific standards in addition to industry standards.

Asset Management

There are a number of cases where assets are purchased with one or more types of funds. These could be federal, grant, cash, or general funds. This can be an issue both when required to accurately report expenditure of funds and in some cases (> $5,000) the disposition of assets purchased with various types of funds. Furthermore, lack of a consolidated asset database inhibits sharing of resources across State of Colorado departments.

Recommendation to Address

As a part of the asset management discipline, it would be wise to capture not only the asset information, but how the acquisition was undertaken (e.g. what types and percentages of funds were used to acquire the asset). This will help in both reporting and complying with federal regulations related to disposition of larger assets. A master asset list will also allow for repositioning of assets across State of Colorado departments (and potentially the service provider) resulting in more thorough usage of State of Colorado resources and potential cost avoidance.

Timing of Activities

Although a formal framework has been described to guide consolidation, there are going to be business events which may trigger consolidation of functions or services at the point of acquisition sooner than had been anticipated. These events will occur as a part of "business as normal" and must be addressed in a proactive manner.

Recommendation to Address

Enterprise architecture oversight will address the enterprise suitability of functions and services that are required by business units prior to their planned consolidation phase. Once a department (or departments) has identified the need for a new function or service (e.g. content management), Enterprise architecture may initiate a review of statewide requirements so that the selected solution or solutions will be able to meet the needs of all departments. As a part of this review, existing solutions resident in various departments may be considered for consolidation and extension to a larger number of departments.

It is only pragmatic that the State of Colorado addresses these potential enterprise wide services as business events dictate their need. To allow individual departments to continue to potentially source their own solutions for their business requirements only wastes more resources (money and time).

11.10 *Governance Activities*

A number of different governance activities have been provided in the figures below. Each of these activities has been described along with potential approaches, key resources, scope, and both duration and hour estimates. Before actually initiating these activities, a formal planning meeting will be held to refine the scope, define the approach, define a work plan, and identify the resources which will support each activity.

Initiative Attribute	Description
Initiative Name	Inventory Procurement Processes
Initiative Status	Completed
Initiative Number	G1.1
Scope of Initiative	This activity will inventory and define procurement processes used in State of Colorado departments and will define the procurement processes moving forward. This activity covers only acquisition of hardware and software and does not cover procurement of services requiring a contract.
Resource Hour Estimate	N/A
Coordination Hour Estimate	N/A
Duration	N/A
Estimated Resources(Duration)	N/A
Key Resources	DPA, Procurement
Key Contact	Tom McGimpsey
Requirements (Entrance Criteria)	None
Deliverables (Success Criteria)	Inventory of procurement processes used for hardware and software and a definition of procurement processes moving forward.
Approach	N/A
Predecessors	None

Table 11.18 – Activity G 1.1

Initiative Attribute	Description
Initiative Name	Inventory Contracting Processes
Initiative Status	Not started
Initiative Number	G1.2
Scope of Initiative	This activity will inventory contracting processes used in State of Colorado departments. This activity covers contracting for all types of services as well as for hardware and software which is acquired through contractual methods.
Resource Hour Estimate	160 Hours
Coordination Hour Estimate	160 Hours
Duration	6 Weeks
Key Resources	DPA, Procurement, Departmental Contracting Personnel, Consultant
Key Contact	Consultant
Requirements (Entrance Criteria)	None
Deliverables (Success Criteria)	Inventory of current contracting processes used for hardware, software and services
Approach	Develop a formal request for information regarding contracting processes within the departments and within the State of Colorado purchasing office distributing it to departmental contracting personnel. Once information has been received consolidate the information and then hold a meeting to present the results to ensure they are vetted. Take the collected contracting information and store it in a normalized manner in a repository.
Predecessors	None

Table 11.19 – Activity G 1.2

Initiative Attribute	Description
Initiative Name	Inventory Budget Processes
Initiative Status	Partially completed
Initiative Number	G1.3
Scope of Initiative	This activity will inventory budget processes centering on the various types of funding that are secured for departmental usage inclusive of cash funds, federal funds, grant funds, and general funds. In addition, this activity will define budget processes moving forward for the various types of funds.
Resource Hour Estimate	120 Hours
Coordination Hour Estimate	40 Hours
Duration	4 Weeks
Key Resources	Departmental Budget Directors, GOIT, OSPB, JBC
Key Contact	GOIT Budget Director
Requirements (Entrance Criteria)	None
Deliverables (Success Criteria)	Inventory of budgeting processes used for various types of funds
Approach	Develop a formal request for information regarding budgeting processes within the departments and within the State of Colorado purchasing office distributing it to departmental budgeting personnel. Once information has been received consolidate the information and then hold a meeting to present the results to ensure they are vetted. Take the collected budgeting information and store it in a normalized manner in a repository.
Predecessors	None

Table 11.20 – Activity G 1.3

Initiative Attribute	Description
Initiative Name	Define and Implement EA Governance/Practice
Initiative Status	Partially completed
Initiative Number	G2.1
Scope of Initiative	This activity oversees the implementation of the governance structure identified and defines the roles, responsibilities, structures, and processes associated with the State of Colorado Enterprise Architecture organization and governance. Also included is identifying those who will serve in EA governance and who will fill the various slots within the Enterprise Architecture organization. Lastly is facilitating the initial meetings.
Resource Hour Estimate	160 Hours
Coordination Hour Estimate	80 Hours
Duration	6 Weeks
Key Resources	GOIT (EA), Consultant, SCIO
Key Contact	EA
Requirements (Entrance Criteria)	Enterprise Architecture roles, responsibilities, and structures
Deliverables (Success Criteria)	Enterprise Architecture members and initial meetings
Approach	Using the information provided within this document, start the process of implementing the EA practice within the State of Colorado using position fulfillment processes. Also, institute the Enterprise Architecture Governance structures with key representatives.
Predecessors	None

Table 11.21 – Activity G 2.1

Initiative Attribute	Description
Initiative Name	Initiate Data Governance
Initiative Status	Not started
Initiative Number	G2.2
Scope of Initiative	This activity will inventory sensitive data sources within the state and classify the most sensitive data in accordance with FIPS 199 data classification guidelines. Once the sensitive data sources are classified, a governance program framework will be established to guide design of adequate security controls and guide measurement of operating effectiveness for justified security controls.
Resource Hour Estimate	400 hours
Coordination Hour Estimate	120 hours
Duration	12 weeks
Key Resources	CISO, GOIT EA, AG Privacy Officer, GOIT Compliance Officer, State of Colorado user groups
Key Contact	CISO
Requirements (entrance criteria)	State and federal regulatory requirements for data privacy and data security, systems inventories, current IT security and data privacy audits performed as either internal assessments or external audits in accordance with specific regulatory requirements, Data Privacy policies and statements by agency or system and any external designation of agency systems being subject to regulatory oversight.
Deliverables (success criteria)	A list of high risk data sources that require short term governance or oversight and a formal program to implement effective oversight and governance for those high risk data sources to include integration of regulatory requirements in the oversight process.
Approach	To establish the initial framework for providing data governance, the state will implement a two phase process: 1. An inventory of sensitive data sources will be consolidated and rated for criticality in accordance with FIPS 199 2. A Data Governance program framework will be formalized to guide effective oversight of the security controls necessary to protect sensitive data in accordance with the risk to the state as well as the requirement to maintain compliance with various state and federal regulations including: HIPAA, GLBA, PCI, FISMA and other applicable regulations. The framework will be focused on only the highest level risk ratings for sensitive data in this initial phase. Other less sensitive data sources will be included in subsequent phases. At a minimum, the governance program will address the following functions: • Data Inventory and Classification • Information Risk Assessment • Control Design and Selection • Control Implementation and Operating Guidelines • Control Measurement and Reporting • Program adjustment justified by Control Review
Predecessors	None

Table 11.22 – Activity G 2.2

Initiative Attribute	Description
Initiative Name	Build EA Program, Artifacts, and Processes
Initiative Status	Not started
Initiative Number	G3.1
Scope of Initiative	This activity builds the Enterprise Architecture program, the processes, and the artifacts required for management information technology from an enterprise perspective. It also includes integration of the processes across governing bodies used to manage information technology. Furthermore, it will initiate (only) the process of developing enterprise standards and formal architectures for the State of Colorado.
Resource Hour Estimate	240 Hours
Coordination Hour Estimate	120 Hours
Duration	8 Weeks
Key Resources	GOIT EA, GOIT PMO, State of Colorado user groups
Key Contact	GOIT EA
Requirements (Entrance Criteria)	Input from existing State of Colorado user groups (e.g. PMUG)
Deliverables (Success Criteria)	Formal State of Colorado project lifecycle segmented by project classification (e.g. certified, non-certified, etc.)
Approach	Identify any additional processes used to manage information technology. Update existing processes, define new processes and artifacts and then present to the governance structures for approval. Initiate additional activities around developing enterprise standards and the various architectures supporting the enterprise.
Predecessors	G1 1 – Inventory Procurement Processes G1.2 – Inventory Contracting Processes G1.3 – Inventory Budgeting Processes G2.1 – Define and Implement EA Governance

Table 11.23 – Activity G 3.1

Initiative Attribute	Description
Initiative Name	Initiate Departmental Strategic Planning
Initiative Status	Not started
Initiative Number	G3.2
Scope of Initiative	This activity performs the initial enterprise strategic planning process using departmental input to identify business objectives and activities required to support business objectives.
Resource Hour Estimate	320 Hours
Coordination Hour Estimate	40 Hours
Duration	6 Weeks
Key Resources	EA
Key Contact	GOIT EA
Requirements (Entrance Criteria)	State of Colorado Vision
Deliverables (Success Criteria)	Departmental Business Objectives, Environmental Analysis, Synthesized Initiatives, Objective Performance Measures, Organizational Profile
Approach	Meet with each of the State of Colorado departments and collect business requirements over the 24 - 36 month timeframe. Analyze the various factors (P.E.S.T.L.E.) that would impact the realization of those objectives. Define the organizational posture with respect to risk. Synthesize enterprise initiatives that would need to be undertaken to allow State of Colorado departments to reach their objectives.
Predecessors	G2.1 – Define and Implement EA Governance/Practice G3.1 – Build EA Program and Artifacts

Table 11.24 – Activity G 3.2

12 Adaptive Enterprise Architecture

Defining enterprise architecture has always been based on decomposing it into its constituents of Business, Data, Technology and Solution (or application) architectures. There are various frameworks for defining enterprise architectures, like Federal Enterprise Architecture Framework (FEAF), Department of Defense (DoD) Command, Control, Communications, Computer, Intelligence, Surveillance and Reconnaissance (C4ISR) Architecture Framework, Treasury Enterprise Architecture Framework (TEAF) and the reference architecture defined by NASCIO (National Association of State Chief Information Officers). These are a small list of frameworks available to define the overall strategy for enterprise architecture.

Frameworks are good at providing reference points for interleaving content and activities. The overall objective is to serve is around tracing high level business objectives down to organizational functions, processes, systems and infrastructure. It is important to understand that the mere adherence to a framework without having a close alignment of business strategy with the IT strategy will not produce the desired results, or the results might come at a significantly higher cost than anticipated going into the exercise.

Enterprise Architecture (EA) is not an end product; rather it is a process of mapping a business strategy into strategy for the enterprise which is delivered through its systems. In order to develop this cohesive vision it is required to have strategy, process, artifacts and communication for EA. In other respects since EA does not have a defined event that triggers its activity cycle, EA can also be seen as a function which helps support various processes like solution development or IT operations.

The enterprise architectural process in figure 12.2 starts with mapping the business strategy to the overall architectural process, which provides the basis of making all decisions related to the enterprise. The following are key considerations in this area:

- Strategic requirements for the state
- Strategic requirements of enterprise IT
- Business requirements
- Requirements for migrating the business from its current state to future state,
- Metrics for measuring fulfillment of requirements and traceability to core business requirements

The overall enterprise architecture depicted in figure 12.1 can be expressed as a combination of the following viewpoints

- Business architecture
- Information architecture
- Services / reuse architecture
- Technology architecture
- Solution architecture – which a combination of the viewpoints above applied to solve a specific business problem or provide an enterprise infrastructure

Using a combination of these we can express the viewpoint of a solution architecture with which is the application of the above viewpoints to provide a specific solution. The services and reuse architecture is the next level of maturity for the solutions architectures and provides effective use of overall IT assets within the enterprise. Security is another dimension that needs to be considered and is utilized across all the layers of the architecture. There will be need to standards for networks, transmission, policies for usage, privacy, data and identity management across the enterprise.

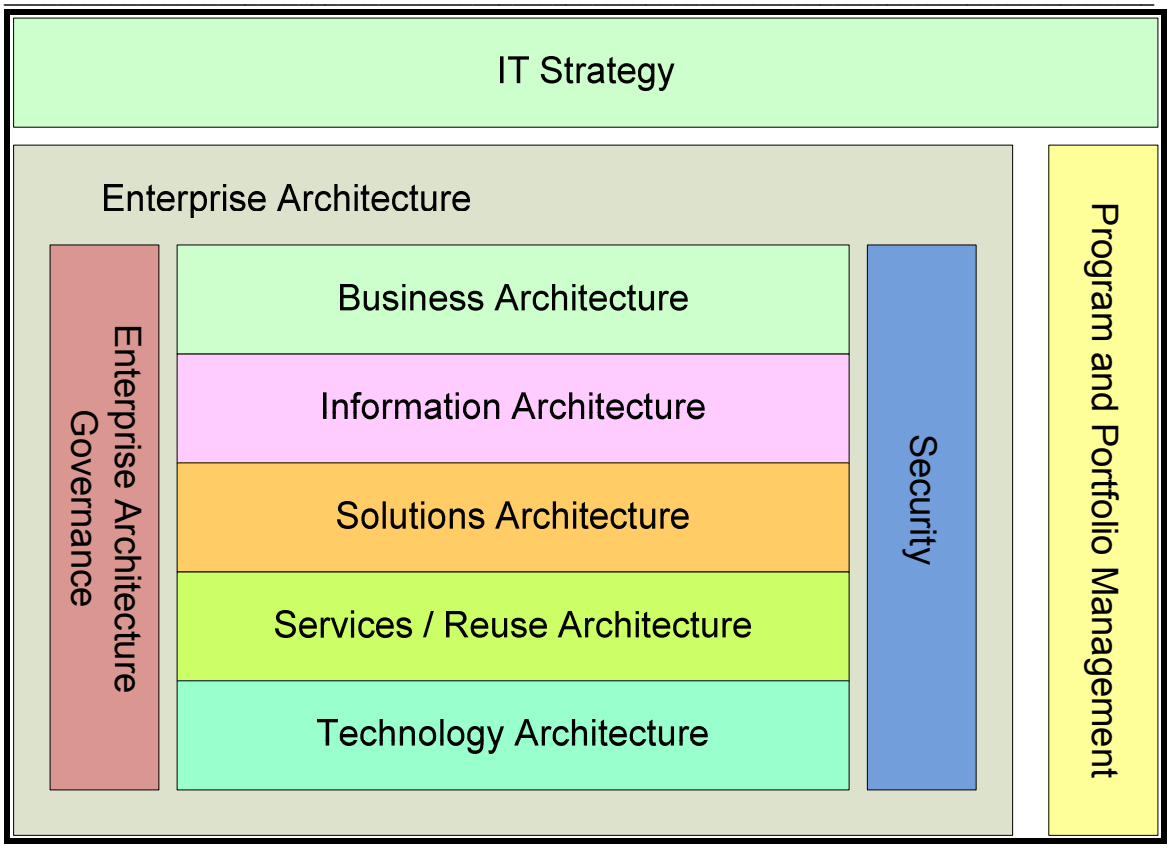

Figure 12.1 – Architecture Inter-relationships

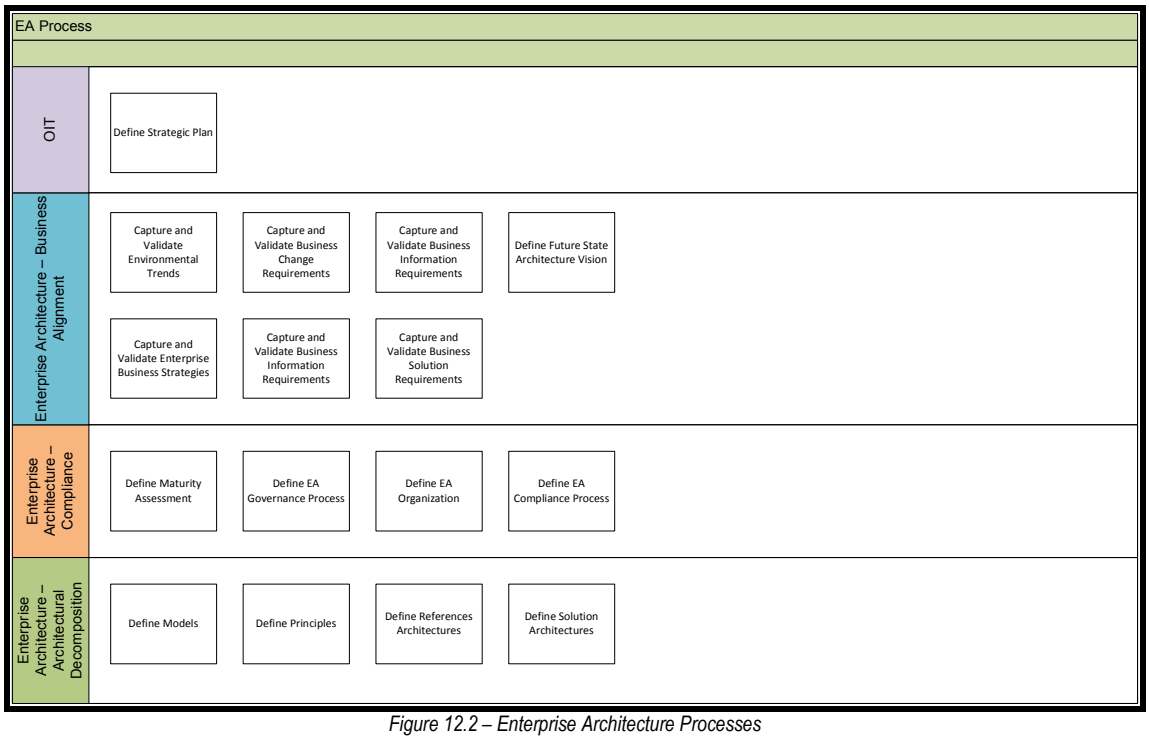

Figure 12.2 – Enterprise Architecture Processes

Overall the EA plan consists of the following core activities[10]

Define goals and objectives of EA program including organization structure

- Define the EA core team
- Define the EA charter
- Define primary goals for EA
- Identify approach
- Develop EA metrics for measurement
- Develop overall project plan for EA

Define the business context and mapping to strategic plan

- Create overall business context
- Look at business areas of focus and business trends (if required)
- Create alignment to strategic plan

Develop EA requirements

- Develop information architecture requirements
- Develop technical architecture requirements
- Develop business architecture requirements
- Develop solution architecture requirements
- Validate against business context and map to overall consolidation plan

Develop EA principles

- Develop architectural principles
- Validate principles against overall strategic plan and business context

Develop EA models

- Develop current state model
- Develop future state model
- Conduct gap analysis
- Develop roadmap to bridge gap

Develop EA governance

- Consider domains, styles and mechanisms of governance
- Align EA governance with PMO and overall IT governance

Develop Communication Strategy

- Develop a repository for all EA artifacts
- Develop a training program for initiating people in the EA program

Develop Technical Architecture

[10] Common requirements Vision, Gartner, April 2007

- Develop technical standards for various domains
- Develop services standards

Develop overall Business context and high-level business architecture

- Develop the business architecture for overall systems of systems view
- Validate business architecture against high level requirements

Assess Current state architecture

- Capture current state architectures for information, business and technology

Define Future state architecture

- Define the suture state architecture for information, business and technology
- Define a migration plan

Some of the activities will need to be treated in an iterative manner, since there will be a progressive level of decomposition required to ensure that implementation plans can be developed across the various architectural views.

12.1 *Business Architecture*

The business architecture provides a high level framework for the overall business and functions within the State. This will start out at the highest level defining the functional decomposition of the lines of business and provide a level of context around service delivered within those lines of business. The business architecture if fundamentally used to provide business context around any solution being provisioned in the state.

The Federal Enterprise Architecture defines the following lines of business

- Service for Citizens and mode of delivery
- Support delivery of business services
- Management of government resources

However the state would need a classification to define the business architecture more in line with the definition of the EGCs, since they provide a model for governance and oversight that is more in line with the States overall business model.

Is it important as a part of the business model to define the following:

- The enterprise's high-level objectives and goals.
- The business processes carried out by the entire enterprise, or a significant portion of the enterprise.
- The business functions performed.
- Major organizational structures.
- The relationships between these elements.

These processes that made up the business architecture should be articulated using the following views

- What -- the activities that are done to accomplish the purpose identified for the business process. The list will include everything required to accomplish the purpose even if a given element is only used occasionally. The set of elements is constructed hierarchically just as a work break down structure for a project plan.
- Who -- the participants of the process. Participants are divided into four groups: people, organizations, roles, and IT applications.
- Where -- the location of activities. In this dimension the model supports relationships between the elements so that information such as distance or travel time between locations may be incorporated if it is relevant.
- When -- the timing of the business process. This dimension captures the relationship between various time factors of the business.
- Which -- the data and artifacts that support the business. This dimension records the information that the business keeps about itself and the various forms in which it is displayed and manipulated.

The overall processes around business architecture and other architectural views cannot be treated like a waterfall. There will need to be iterations through the business architecture to a sufficient level of detail that can support the overall planning within the enterprise.

12.2 *Information Architecture*

The information architecture is one of the most critical aspects of ensuring the integrated enterprise delivers value across all businesses in the State. This has three distinct dimensions:

- People
- Process
- Tools

There are the following distinct components and the processes of the above dimensions of information management:

Data Governance

- Data policies
- Data standards
- Business data ownership
- Data workflow
- Common definitions for key entities (e.g. constituent, business, etc.)

Data Classification and Models

- Taxonomies
- Logical data models
- Business process workflows

Data Architecture

- Data sizing
- Data storage
- Data retention policies
- Physical data models

Data Services

- Service composition
- Service delivery
- Process models for delivering aggregated content

Metadata definition and management

- Metadata definition and management
- Reference data

Master Data Management

- Master data governance
- Processes
- Metrics

Data Quality

- Rules and policies
- Compliance rules
- Standards

Data Security

- Compliance

In addition there will need to be a definition of the information requirement tied to the business architecture and business processes. This view of information is required by each business domain, but more importantly the requirements of information across domains starts to materialize as well.

The Data Reference Model (DRM) in figure 12.3, defined by the Federal Enterprise Architecture provides a very good basis to promote information exchange between systems. This can be used as a standard to articulate data information interchange between the various business systems

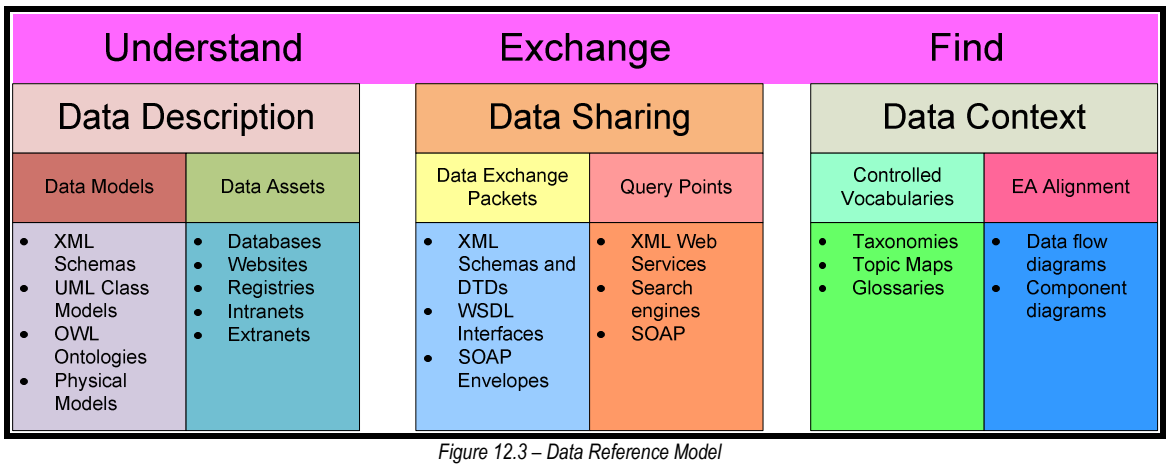

Figure 12.3 – Data Reference Model

A DRM is just one example of frameworks that can be utilized to articulate the information architecture, as detailed above there are other dimensions within the information architecture that will require some definition of standards and processes. It should be noted that not all the work products from this exercise will be used directly in the consolidation, rather these will provide guidelines for systems in development, and will also prove invaluable during phases 3 and 4 of the consolidation.

12.3 *Technical Architecture*

The technical architecture represents the core operational model and constraints that are used to run IT systems. The decisions around technology architecture have to be vetted in the following areas:

- Investments for ongoing implementations
- Ensuring that current and future systems can be supported
- Managing risk around introducing rapid change by emerging technologies and obsolesce of technologies on the other end of the spectrum
- Ensuring that the technology architecture is tied into the overall IT strategic planning process

Apart from standardization, technical architectures should deliver the following benefits:

- Create a common vocabulary for agencies to share information about platforms and collaborate
- Ensure support for IT projects throughout their lifecycle
- Provide continuity of resources to help implement and maintain operational systems

The second phase of the framework calls for infrastructure consolidations, which will necessitate technology architecture planning to be integrated with the overall strategic planning for the agencies and the State as a whole. The aspects of strategic planning that will have input into the decisions around the technology architecture are:

- Planning drivers – for example technology strategy, business strategy etc.
- Characteristics for decisions around technology usage, aging and alignment with solutions
- Determining interactions between overall strategic planning and technology architecture planning

As a part of this effort, there will be a need to devise a plan for taxonomy for technology services along with a provisioning model that can be supported by an overall planning process.

Starting point taxonomy with some examples is detailed in figure 12.4

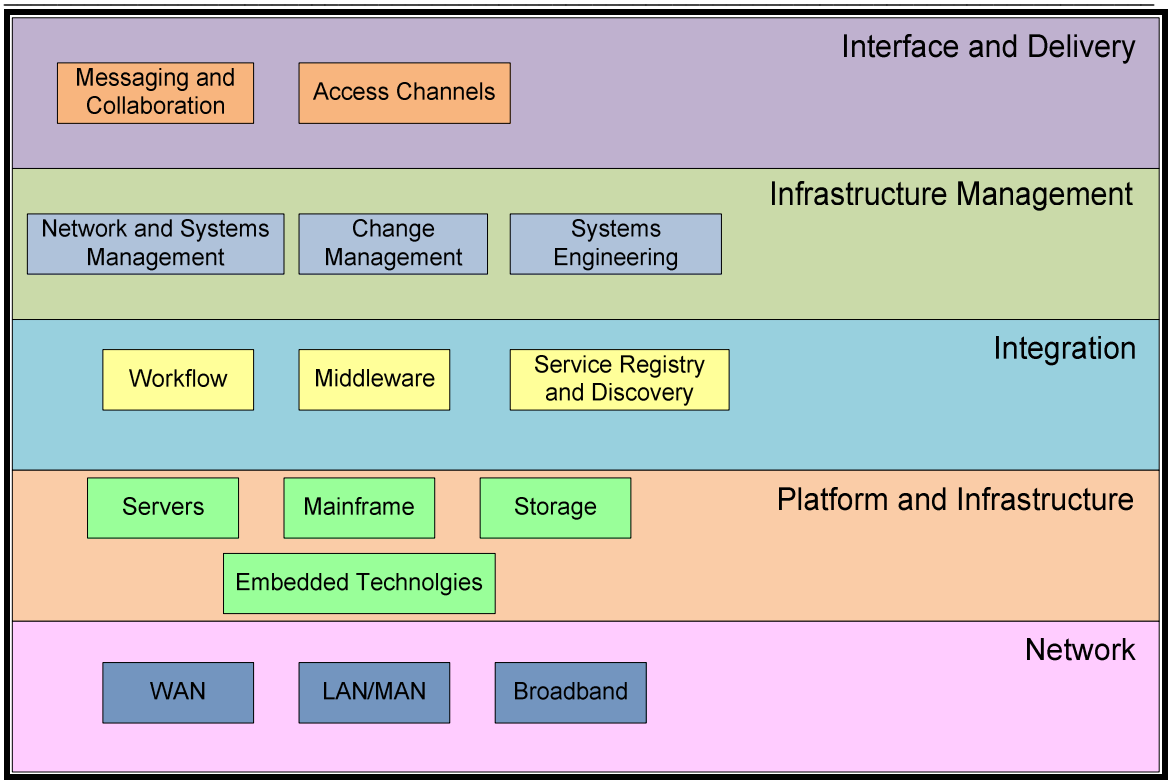

Figure 12.4 – Initial Taxonomy

This model will need to be refined and the process developed to integrate the technology decisions into the overall planning IT planning process.

12.4 *Future State Services Model*

It is important to have an architectural reference model that can support the core needs of a business. In the case of the state (and any large enterprise) it is not possible to try and change all the architectural components including technologies and services to a common platform in a short period of time, and it might not even be feasible given the diverse requirements from various departments.

The architectural reference model provides a basis for classifying services that are used in the enterprise so that the architecture team can develop detailed technical models that eventually provision the overall business services being provided in the enterprise. Using a services model allows the enterprise to change the underlying technology implementation because the service defines a contract related to functional scope rather than a physical implementation.

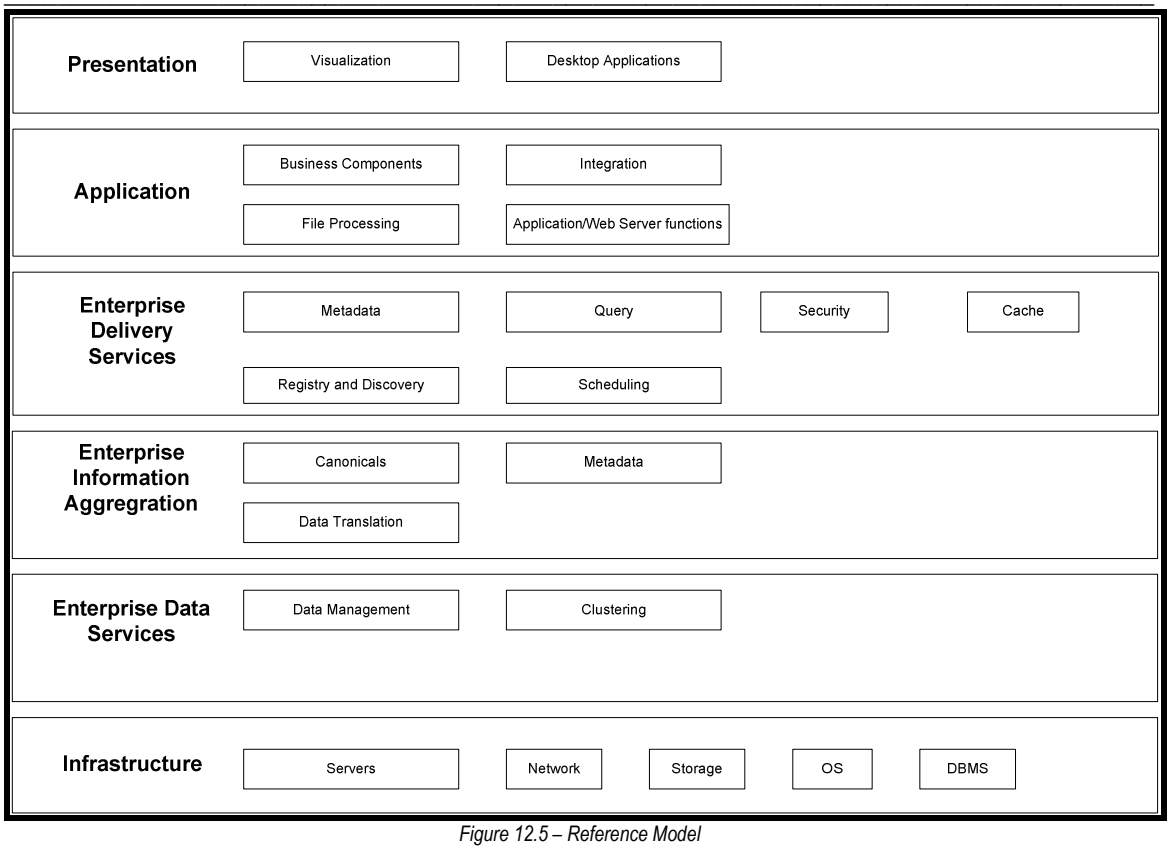

Figure 12.5 – Reference Model

The diagram in figure 12.5 represents a preliminary definition of the various services within the enterprise. In keeping with the overall consolidation framework, the definition of the services should be started bottom up. The definition of data services can start in phase 1 of consolidation, but should be limited to features required in phase 1. There needs to be a detailed definition of services defined for the enterprise as a part of phase 1, because there will be a need to define reference architectures for various implementations, which will be used in later phases of consolidation, but more importantly should be put into practice for all new projects sanctioned within the State as soon as the framework and recommendations are available.

12.5 *Relevance to Strategic Plan*

The strategic objectives called out in the strategic plan are:

- Δ Secure and protect IT assets
- Δ Optimize spending for IT decisions, projects and technology
- Δ Effectively manage IT projects
- Δ Improve enterprise service delivery
- Δ Improve collaboration and innovation

Enterprise architecture effects all the objectives laid out above. Securing the IT assets will be easier to protect if there are standards for infrastructure, standardized deployment plans, standard monitoring facilities and centralized infrastructure.

The optimization of IT decisions, projects and technology is a direct benefit of having governance in place. The decisions made through the governance committees will enable the State to make informed decisions about the overall investment and priority across the various projects and agencies within the State.

The effective management of IT is not only applying rigorous project management to the planning and execution of IT projects, but having robust portfolio management in place. These will be provided by the enterprise architecture, project management and the various governance councils being put in place.

Improving service delivery and improving collaboration has its roots in developing services that are enterprise class with data that can be shared across agencies. Having enterprise architecture defined will help with driving cost effective collaboration in a timely manner.

12.6 *Maturity Cycle*

The Office of Management and Budget (OMB) has designed a robust enterprise architecture assessment framework that is meant to help organizations advance the use of enterprise architecture. The overall objective of the maturity framework is to help in IT decision making while aligning it with IT investment. The benefits of having a framework are:

- Δ They describe the practices that any organization must perform in order to improve its processes
- Δ They provide a yardstick against which to periodically measure improvement
- Δ They constitute a proven framework within which to manage the improvement efforts

The various practices are typically organized into five levels, each level representing an increased ability to control and manage the development environment.

An evaluation of the organization's practices against the model — called an *assessment* —determines the level at which the organization currently stands. It indicates the organization's maturity in the area concerned, and the practices on which the organization needs to focus in order to see the greatest improvement and the highest return on investment.

There are various capability models, but for the state, using OMB's model would prove to be a good starting point, since the state architecture can gain enterprise benefits by having a compliance with the overall federal architecture.

Level	Name	Description
1	Initial	Informal and ad-hoc EA processes. Some inventories of information for a given architecture layer may exist, but it is not linked to other layers of the architecture and is incomplete.
2	Baseline	The agency has developed baseline architectures. The architecture has an enterprise-wide scope and communicates a clear line of sight between EA layers.
3	Target	The agency has developed target architectures. Architecture elements are aligned to agency programs and lines of business. The target architecture addresses priorities and performance objectives identified in the agency's strategic plan. Architecture has an enterprise wide scope and communicates a clear line of sight between EA layers.
4	Integrated	The agency has developed at least one segment of architecture for a core mission line of business, business service or enterprise service. The relevant business owner has approved the segment architecture in writing. The agency's transition strategy shows migration to the target architecture. Relevant cross-agency initiatives from the Federal Transition Framework and other official sources have been

		incorporated into the agency's target architecture.
5	Optimized	The agency has developed multiple segment architectures to support core mission lines of business, business services or enterprise services, as defined in Appendix B. The relevant business owners have approved segment architectures in writing.

Figure 12.6 – Architecture Maturity Level Descriptions

These levels are applied to business, information, technology and solution architectures. One of the first activities of the enterprise architecture review board will be to develop a mode that can be used effectively for the State of Colorado, and architecture activities for the future should be aligned with the maturity levels.

Section VII Plan Forward

13 Next Steps

In order to begin the process of addressing the Phase I activities, the EADT has put forth a general approach, resource plan, and issues that need to be addressed in order to move forward. This approach is designed to provide a method to jumpstart the various activities and engage State of Colorado resources in the process of enabling consolidation. If the State of Colorado opts for a strategy using a managed service provider up front, lesser numbers of these activities will be required.

13.1 *Approach*

Within Phase I of the consolidation framework, the lion's share of activities are related to data collection, identifying and addressing issues covering how individual activities and issues are addressed in a consolidated organization, setting up the appropriate enterprise wide governance, as well as making key decisions on the organizational structure, service provisioning, and funding.

The general approach for addressing these consolidation activities includes:

- Developing communities of interest around certain topics (e.g. funding or service provisioning)
- Communicating that the activities are about to start and the general nature of the activities
- Soliciting support for planning the activities
- Holding a planning meeting to develop a WBS (Work Breakdown Structure), any clarification of scope, requirements, and activity plan assigning responsibilities as necessary
- Identifying the resources which will be used to achieve the work
- Initiating and executing the activity

This approach has the benefit of using both internal and external expertise to build the detailed work breakdown structure. Since many of the activities involve data collection and decision making, a consolidation repository will be developed to capture all of the information and decisions proceeding from the pre-consolidation activities. The information in these repositories will not only be used to support other pre-consolidation activities, but will also be used to develop a consolidation plan for Phase II.

As a part of the planning activity, the team will seek to use whatever information is already available and will not seek to initiate work activities that may not be necessary. It should be noted the essence of this process covering data collection is breadth-oriented and not depth-oriented. That means that it is not necessary for example, to collect information on every single asset, but rather collect information to the level of detail that will allow us to make informed decisions. This again is an application of the 80/20 rule. Spending time to collect every piece of information will be both counterproductive as well as extending the consolidation work dramatically.

13.2 *Resource Plan*

A transient organizational structure for addressing consolidation activities has been developed and depicted below. This structure will last through the completion of Phase I activities and will be disbanded at that time. Similar structures may be re-instantiated for later phases (Phase II and beyond) of consolidation. The structure is designed to be relatively low cost and will attempt to make use of the goodwill that the State of Colorado has engendered over the years by borrowing resources from private firms whose experience is consistent with the activities they are overseeing.

The core team members for each activity are designed to be State of Colorado employees so that they are fully integrated in the consolidation planning. A depiction of this facilitation organization is show below in figure 13.1

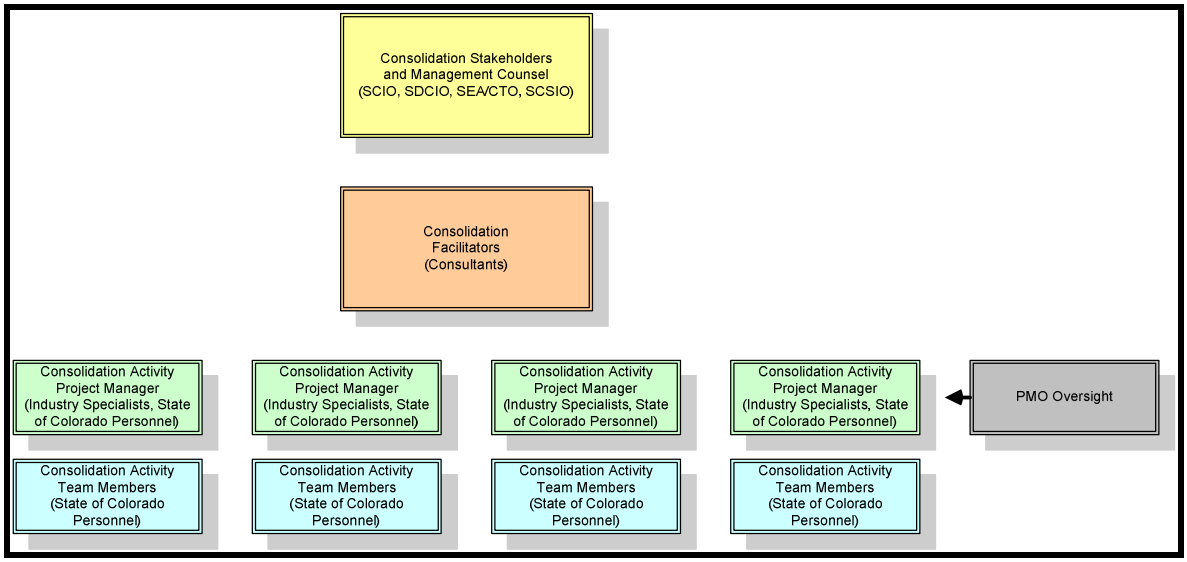

Figure 13.1 – Phase I Activity Facilitation Structure

Some other notes with respect to the proposed structure are as follows.

- The number of active consolidation activities at any one time will vary and as such so will the number of engaged staff
- The project managers for the individual activities will be sourced from external resources ("industry specialists") on an as needed basis or from internal State of Colorado IT leadership. These positions are not expected to be full time positions
- Consolidation activity team members will be comprised primarily of State of Colorado employees. It is the current thinking that once the initiatives are defined more thoroughly in the early part of the Phase I, the resource requirements will be posted and State of Colorado Departmental personnel. will be solicited. Key contributors who have expressed interest will also be contacted to participate in the activities.
- Consolidation activities are discrete units of work and have fixed durations. Once a given activity is complete, resources from that activity may be requested for subsequent activities.

Once Phase I of the consolidation effort has commenced, each of these work activities will be developed with an appropriate WBS (Work Breakdown Structure) and then initiated consistent with all required predecessor and successor relationships.

13.3 *Enterprise Architecture Organization Setup*

Setup of this Enterprise Architecture organization is one of the most important activities moving forward because this organization will be chartered with the responsibilities for enterprise wide technology management. In general, there are activities identified to cover the setup of this organization in the list of Phase I activities as well as some of the activities to be undertaken by the organization once initiated. It should be noted that the process definition aspects of the work activities need to be completed in conjunction with State of Colorado personnel and can not be developed autonomously.

Once the Enterprise Architecture organization is staffed, the initial focus will be on the following activities. These activities are identified from a more global perspective here and also in some of the activities.

- Δ Defining processes for architecture reviews, design, and compliance
- Δ Developing standards
- Δ Developing solution patterns (e.g. ways to solution specific functions in a consistent manner)
- Δ Developing various reference architectures and models
- Δ Developing of lifecycle roadmaps for selective products
- Δ Defining and implementing an Enterprise Architecture repository

13.4 *Potential Issues*

In order to start the process of preparing the organization for consolidation, there are a number of different activities that should be undertaken aside from the core initiatives defined as a part of the consolidation plan. Among these are:

Identification of Personnel Resources

The State of Colorado, as evidenced through the various discussions, does not have an Enterprise Architecture practice at this time. As such, there are limited resources from which to draw in building an Enterprise Architecture practices, especially at the domain specific levels. There are not only a number of initial tasks that must be undertaken to establish the Enterprise Architecture practice, but there are also the regular activities involving Enterprise Architecture oversight of information technology investments.

In addition, there is a need for dedicated communication personnel to begin the process of initiating a communications campaign consistent with a communications plan. The individuals assigned these positions will be responsible for a host of activities centered around keeping State of Colorado employees (management and individual contributors) informed about consolidation progress.

Additional Funds

Additional funds may be required for some of the activities identified within Phase I. For example in order to conduct a market compensation study, additional funds may be required. In addition, when undertaking the asset inventory, a tool may be required to jumpstart collection of the information. Although attempts will be made to get individuals and organizations to contribute resources to enable this to happen, there is the chance that the State of Colorado may have to expend funds or look for alternative methods of acquiring this information.

Section VIII Communications

14 Communication Plan

As a part of any activity requiring organizational change and a number of other activities around activities which may affect employees, contractors, and vendors, a formal communication plan is required to ensure communications all throughout the change lifecycle. Savvy organizations often initiate communications long before final decisions are determined related to change activities as a means of proactively addressing the potential for those affected by the changes. The communication plan is designed to address three major elements of change. These elements are:

- Ensure the accurate and consistent communication of information to the appropriate audiences
- Minimize the number of concerns which develop organically generating uncertainty in the population of users
- Provide forums through which specific issues can be addressed

14.1 *Goals of the Communication Plan*

The goals of this communication plan are defined below. In the most general of terms, the goal is to ensure "consistent, accurate, and timely dissemination of relevant information to the appropriate parties". Specifically, the goals of this communication plan are:

- Ensuring State of Colorado employees are kept up to date with respect to consolidation activities and progress
- Ensuring State of Colorado employees are aware of activities or issues that may affect them and allaying fears to the degree possible
- Ensuring State of Colorado employees have multiple venues through which they may raise issues having them addressed in a timely manner
- Ensuring media outlets have a defined, authoritative source of information as relates to Information Technology in the State of Colorado
- Ensuring a common repository exists in which to store policies, procedures, processes, standards, templates, and other artifacts defining how Information Technology related work is undertaken in the State of Colorado
- Building credibility over time for the Information Technology management discipline by establishing expectations, executing, and then reporting on execution
- Ensuring the accurate and consistent communication of information to the appropriate audiences
- Minimizing the number of concerns which develop organically generating uncertainty in the population of users
- Providing forums through which specific issues can be addressed
- Coordinating the development and usage of branding

14.2 *Roles and Responsibilities*

The core individual responsible for communications in most organizations is the head of Public Relations, the head of Corporate Communications, or a Public Information Officer. In a public entity, a Public Information Officer is the most common position. As a part of the Communications discipline, either a Public Information Officer role should be established or an individual should be charged with the responsibilities of a Public Information Officer. Specifically they should be charged with:

- Handling all media relations

- Writing and disseminating all departmental releases (or reviewing and editing as appropriate)
- Responding to inquiries from public communication entities
- Serving as the department's spokesperson
- Reviewing and approving articles drafted by external entities
- Drafting and coordinating internal State of Colorado communications
- Ensuring delivery of a set of consistent and accurate messages
- Setting up and facilitating State of Colorado Communication forums
- Identifying the provisioning strategy for the identified communications mechanisms as well as ongoing maintenance and management of those mechanisms

Of particular importance is to keep public communications conduits provisioned with authoritative, consistent, accurate, and timely information pursuant to their requests. The preferred means of doing this is to establish a formal line of responsibility for information coming from the State of Colorado consistent with a Public Communications Policies and Processes document. Such a policy would include information identifying the authoritative sources of information with respect to Information Technology, processes for review and approval of information and articles destined for publishing, timeframes for activities, key communications contacts and responsibilities, prohibited content, implications of not having content approved through the process, definitions of different types of information, and what types of communications are covered by the policies. The owner of such a document would be the State of Colorado Information Technology Public Information Officer.

The PIO would be overloaded if required to assume responsibility for actually creating and managing all of the communications mechanisms identified in this document. As such, the PIO will be responsible for identifying how such communications mechanisms will be provisioned and how they will be maintained over the long run. The EADT envisions for example that the web-based mechanisms could be offered through the State of Colorado portal for external content and an internal website for State of Colorado employees. Thus, the PIO would not develop all of the mechanisms but would oversee their initial development and implementation as well as long term maintenance of the mechanisms. They would also develop the processes whereby content is published to the portals, identifying those for creating the content in a manner consistent with standards and then setting up an approval workflow for the content.

For other types of communications mechanisms, the PIO would act more as a coordinator for both the event and the messages. When unique opportunities (e.g. conferences) arise to present information, the PIO would either develop the presentations (largely from existing materials) or would engage an organization to create these materials, subsequently storing them for future re-use.

Ideally, the State of Colorado Information Technology Public Information Officer (or the person fulfilling those responsibilities) would have final approval of all articles or information before they are published. A media outlet entity may be unwilling to agree to this stipulation however, the State of Colorado can establish via policy that only formally approved articles, from identified sources are authoritative in nature and that the publishing entity risks publishing inaccurate information if they do not have the articles they are planning to publish, approved through the defined channels. Once this policy has been defined and communicated, media outlets assume responsibility for inaccurate or inconsistent content since a conduit for receiving and vetting accurate content has been developed and communicated.

Communications which are of a planned nature should have ample opportunity to be reviewed through the process to ensure consistency and accuracy. Those communications that are impromptu in nature should be minimized wherever possible as the potential exists to introduce inconsistent information into the flow.

Although recommended elsewhere in this document, it is recommended that the Governor's Office of Information Technology also acquire a legislative liaison. This is partially a communications function and

partially a coordination function. There are multiple places where such a liaison would prove invaluable. Among these are:

- Educating legislative members on issues faced by the Information Technology management organization
- Working to set specific expectations and explaining the rationale behind such expectations
- Coordinating briefings with legislative members and subcommittees to ensure that legislators are informed as to a variety of information technology management issues
- Working with State of Colorado legislators to draft or amend legislation as necessary and ensuring that the legislation is consistent with the requirements for effective Information Technology management
- Inform the Legislator's how specific activity from the Governor's Office of Information Technology is either directly (e.g. broadband) or indirectly (e.g. savings reallocated to programs) benefiting their constituents
- Reporting to the Governor's Office of Information Technology on legislation, debates, mandates, requests, concerns, and related business being addressed by the State of Colorado legislature
- Testify on issues as appropriate
- Review legislation as it is introduced, determining any impact (fiscal or otherwise) on Information Technology management

This position will be important in helping to address issues as well as keep abreast of legislative actions that could have an effect on the Governor's Office of Information Technology and information technology management in general.

14.3 *Branding*

As a part of the activities that the State of Colorado is undergoing, especially with the myriad of communications activities that will be initiated, the EADT would recommend the development of a specific branding, logos and templates used to identify consolidation communication mechanisms. The branding, logos, and templates would support all types of communication activities including:

- Press releases
- Power Point presentations
- Invitations to consolidation functions and activities
- Status reports
- Memorandums
- Word documents
- User manuals
- Policies, procedures, and standards

14.4 *Communication Content and Mechanisms*

As a part of this communications plan, a number of different mechanisms have been proposed to keep the various audiences up to date with specific types of information. There are three primary types of interaction called for in this communications plan:

- Printed material
- Personal interaction
- Web site (internal and external)

It should be noted that for the purposes of these communication conduits, the web site used should be a secured site which should be available to State of Colorado employees.

Some of the communications mechanisms are "push", mechanisms in that we provide or push information to individuals on a regular (and in some cases scheduled) basis. In other cases, the communications are "pulled" by those individuals who are interested in the information, but it remains our responsibility to ensure the information is available to be pulled.

Content	CIO Forum	Newspaper	Governor/Legislative Briefings	Face to Face Town Hall	EGC	CIMA Conference	ED Exchange	Ask the State CIO	Electronic Mail	Electronic Town Hall	I've Got a Suggestion	Key Contacts/Responsibilities	The Library	How Do I?	Articles and Press Releases	The Plan
Interviews with key state leaders															X	
Press releases															X	
Questions targeted for the CIO, DCIO, CISO, or EA				X				X		X						
Recommendations on savings, ideas on consolidation, personnel issues, issues regarding consolidation, etc.											X					
Who to contact to resolve an issue or get an answer to a question												X				
Consolidation progress reports	X	X	X	X	X		X			X						X
Frequently asked questions								X								
How to accomplish a given objective														X		
New business arrangements negotiated															X	
Get to know the ….		X														
List of policies, procedures, and standards													X			
Templates for initiating activities, presentation templates, and logos													X			
Process flows													X			
Vendor presentations						X										
Notifications,directives, information					X				X							
Newly engaged departments		X														X
Consolidation deliverables															X	
Benefits accrued to the State		X		X		X	X									
Service, project, and organizational performance metric reporting													X			
Service catalog													X			

Vendor information	X		
Project health reports			X
Initiative pipeline			X
Agency strategic plans			X
Surveys		X	

Table 14.1 – Communication conduit and subject matter matrix

Certain types of communications are on-going and are updated as new information is developed. Electronic mail communications may be sent out to notify State of Colorado employees of various updates to website content.

Other types of communications would be scheduled at regular intervals with the actual content varying depending on the timing of the communications and recent events. In the diagram immediately below for example, scheduled times and frequencies for certain types of communications activities have been proposed. For example face-to-face town hall meetings, which may be held each quarter, may have a standing section of the meeting allocated to reviewing plan progress, but there may also be variable sections to the meeting so that relevant material may be reviewed consistent with the meeting is held.

It should be noted that as with ANY communications plan, the actual communications plan should evolve to serve the needs of the organization. This will be exceptionally important as consolidation activities occur. Not only will these mechanisms serve to address and allay fears, but they will also serve to build momentum around the cultural changes that need to occur for consolidation to be successful. As such, the State of Colorado CIO, Deputy CIO, PIO and other individuals should work together from time to time to evaluate the efficacy of the existing communications plan to see if it is addressing the organization's needs.

One mechanism that can be used to facilitate this input is surveys. Focus groups may also be used to collect more detailed input but because of the overhead should only be used when surveys reveal that an issue exists. As such, focus groups are not listed as a primary communications vehicle for this activity.

The specific communications mechanisms and the markers (■) indicating the frequency of those communications activities are listed below in figure 14.2. For those activities which have no markers, these are considered persistent communications in that those conduits are always available.

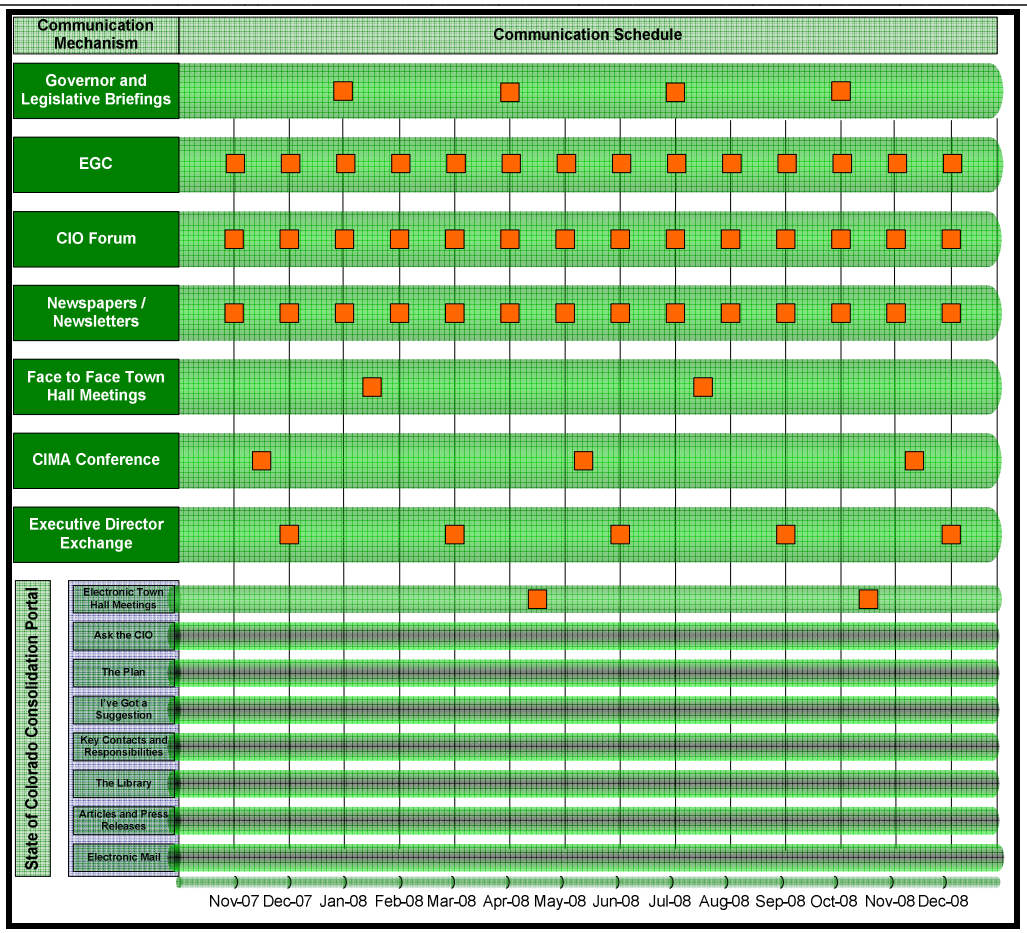

Figure 14.2 – Communication Schedule and Frequency Chart

Governor and Legislative Briefings

This is a communications outlet whereby updates can be provided to both the Governor and the Legislature as relates to IT consolidation activities. It is also a forum where the process of education can begin as to the level of resources necessary to support an effective Information Technology discipline, funding approaches, etc.

CIO Forum

The CIO Forum is a monthly meeting held between all of the State of Colorado departmental CIO's and provides an excellent forum to discuss consolidation and related issues, present information to existing Information Technology leadership, and initiate communications to State of Colorado Information Technology professionals. Furthermore, this forum should be used to communicate information and critical messages to departmental CIO's so that they are well positioned to be able to respond to queries from their staffs. In the end, departmental CIO's will own front line communications responsibilities as they interact with their staffs on a daily basis where as Governor's Office of Information Technology personnel do not. To this end, it is important that departmental CIO's have access to not only the most current information, but that they also have additional conduits through which they can follow up on issues that may be presented to them.

Newspapers/Newsletters

The Stateline newspaper is a regular publication and the concept here is to acquire a CIO column where information can be disseminated to State of Colorado employees in a regular manner.

In addition, the Governor's Office of Information Technology may want to consider the usage of a newsletter specifically targeted at State of Colorado Information Technology personnel covering a variety of issues (consolidation progress, new standards, new vendors, policies, suggestions and awards, etc.) Such a newsletter could be distributed in HTML format through electronic mail.

Face to Face Town Hall Meetings

An in-person forum, the goal of these meetings is to present information and then address a limited number of questions. In addition, these offer the opportunities for guest speakers (e.g. Governor, Legislators, and other State CIO's) to address issues designed to reassure State of Colorado employees and to underscore commitment to the process. Furthermore, selective social aspects of the meetings would allow State of Colorado employees to mingle with State of Colorado Information Technology leadership. These meetings would be held no more than once every six months because of the level of preparation and logistical work that would have to be undertaken. These face-to-face town hall meetings would augment the electronic town hall meetings. The general audiences for these meetings are Information Technology personnel and selected State of Colorado leadership.

CIMA Conference

Although only held twice per year, the CIMA (Colorado Information Managers Association) conference provides an additional venue through which to disseminate information. In general, this would be an excellent place to provide a consolidation update as to the progress as well as address issues associated with consolidation. The CIMA conference draws large numbers of vendors, and as such, can be used as a mechanism to both brief vendors and to respond to individual inquiries they may have related to consolidation. Follow up activities could be scheduled through this venue as well, but as with all external communications, it will be important to ensure that communications to the vendor community are both accurate and consistent.

Executive Governance Committees (EGCs)

A part of the Program Management Office, the Executive Governance Committee's can be another communications conduit which can be used to disseminate information, especially with respect to consolidation related plans and initiatives. Furthermore, one of the goals of the EGC's is to prioritize work and once initiative priorities are determined and a pipeline built, this information can easily be summarized and provided through EGC members who would assume ownership of committee decisions.

Executive Director Exchange

The Executive Director Exchange is designed to be a forum where the State of Colorado CIO and the Executive Directors of the various departments meet to discuss issues related to consolidation and for the State of Colorado CIO to brief State of Colorado Executive Directors on specific consolidation progress. It would also be used as a forum to discuss specific departmental issues as relates to consolidation.

Each of the communication venues below are designed to be delivered over the web through a portal. In general, the EADT would recommend that individuals are authenticated before using these conduits so as to ensure accountability (limiting crank and inappropriate communications) and enabling the ability to address specific issues back to their originators. The general audiences of these communications are State of Colorado Information Technology employees but there should be no reason that all State of Colorado employees can not access the communications and information (with possible exception of the Electronic Town Hall Meetings due to capacity issues).

There would be some work to set up the initial web site and then there would need to be a person allocated to maintaining the website (estimated to 1 FTE) as content requires updating.

Electronic Town Hall Meetings

Similar to the face-to-face town hall meetings, these meetings would be held over the Internet using something similar to go-to-meeting technology. The advantage of these types of meetings is that they require less logistical support and can be convened more quickly. The general format may involve opening remarks, followed by a formal presentation, followed by a question and answer session. Any issues which may not be able to be directly addressed could be captured with follow-up with the appropriate individuals.

Ask the State CIO

Ask the State CIO is a forum, offered through a web portal which would allow any State of Colorado employee to ask a question of the State of Colorado CIO. Questions received would be reviewed weekly with the *goal* to address and respond to 100% of the questions. Some of the questions, specifically those thought to be of the broadest interest would have their questions published along with the response from the State of Colorado CIO. In cases, where questions of the same nature arrive over a period of time, a single question may be published as well.

The Plan

The plan is a location on the website that all State of Colorado employees can reference to review the progress of Information Technology consolidation within the State of Colorado. Historical consolidation progress and future consolidation plans are the only focus of this area of the website. The goal is to provide a reference point so that the employees can understand what has occurred and what will occur going forward. It also will provide a formal schedule of consolidation activities so that if there are for example, contentious issues which must be addressed, the schedule for resolution is presented.

I've Got a Suggestion…

This is essentially an electronic suggestion box. It is envisioned that a set of rules would be published regarding scope, content, etc. that would bound the types of suggestions that an employee (or contractor) potentially would make. As with the 'Ask the CIO' section the suggestions would be reviewed on a weekly basis and a determination made as to whether individual follow up is warranted. Each individual's suggestion would be acknowledged even if their suggestion is not adopted. Those providing suggestions delivering value and having been adopted would be singled out for recognition to demonstrate the widespread participation in the consolidation effort.

Key Contacts and Responsibilities

The Key Contacts and Responsibilities section would contain both bio's and other information about roles and responsibilities for consolidation and more importantly, managing information technology within the State of Colorado. It would include not only those directly responsible for information technology management, but also those who have related roles such as human resources, procurement, etc. It would also contain an individual who could be contacted for any issues which may not be well defined within this section. Finally, it would contain a functional organizational chart of the Information Technology management structure in the State of Colorado and would be updated as consolidation progresses.

The Library

The library is primary location of all documents, presentation templates, forms, policies, procedures, etc. that arise from not only the consolidation activities but from general purpose Information Technology management and governance. It would contain a "How Do I..?" section that would let State of Colorado employees know how they undertake certain types of activities with respect to information technology management. Also included in this section would be the State of Colorado Information Technology Strategic plan, any legislation or Executive Orders, and any other information relevant to managing Information Technology in the State of Colorado.

Articles and Press Releases

This section of the website will be dedicated to both internal and external press releases that have been reviewed and approved by the Governor's Office of Information Technology Public Information Officer prior to publishing. This area of the website would also contain articles or press release information from key industry pundits and organizations such as NASCIO when Colorado is featured, or when the content is relevant to what the State of Colorado is doing.

Electronic Mail

Although not envisioned to be a primary information dissemination mechanism, electronic mail may be used to communicate very selective information or to let State of Colorado Information Technology personnel and selective others know that there is updated information on the website. This mechanism could be implemented using a 'publish and subscribe' mechanism or it may be better to identify all such employees, building an address list. The initial list should be comprised of all State of Colorado Information Technology employees through potentially a listserv so that they can subscribe or unsubscribe as they desire.

Even though there are many communications venues identified here, it is the initial expectation that the State of Colorado CIO and the State of Colorado PIO will jointly review all content formally published to ensure accuracy and consistency. Eventually, the State of Colorado PIO will be able to assume responsibility for ensuring accuracy and consistency of most communications in an autonomous manner although the most contentious and public issues should still be reviewed by multiple parties including potentially the Governor's office as well.

14.5 *Expectation Management*

Throughout the consolidation process, there are a number of expectations that will need to be managed. These are critical to the overall success of the effort. While these do not need to be stressed at every potential communications opportunity, these are key points that if addressed early in the process, will result in more performance expectation latitude as various processes are executed. The key expectations that need to be managed as a part of this effort are listed below and will evolve over time.

There will be some pain associated with the process

Although we will continue to work towards the overall goal, there should be no expectation that all parts of the consolidation effort will proceed smoothly. There will be problems. Our response to such problems should be to persevere constructively through such problems in a manner that furthers progress towards our goals. If we can not find a way to resolve an issue in a smaller group, we will enjoin additional resources to find a way to address each issue that surfaces.

Initial service will experience some challenges

We should not expect that everything will work correctly the first time. This will require patience on the part of ourselves and those to whom we provide service. We must communicate that there will be likely be some short term service disruptions and that it will take some time to work through issues that arise as a part of the consolidation efforts. Every effort will be made to address service shortfalls but a reasonable goal is not 100% service on day one, but to arrive at that goal within 6-12 months of consolidation.

Some funding will be required to effect consolidation efforts

The old adage "it takes money to make money" is true. We will need to invest in some elements of the consolidation effort in order to make them occur. While this funding can be derived from a variety of sources, it will need to be available. The exact amount of funding required will be dependent on the actual initiatives and activities required to carry out the consolidation.

Arbitrary reductions in funding of information technology initiatives can not be accepted

When we request funding from a funding source, we will attempt to provide the funding entity a sufficient level of detail on the request for funding, what the funding will be used for, the benefits of such an investment, and a reasonable subset of alternatives which can be selected. If the funding entity summarily (e.g. without forethought) reduces the amount requested, we will either change scope to match available funding levels or reject the investment knowing that the reduced funding would put success of the investment at risk. Information Technology can not operate effectively under a model where arbitrary decisions are made as to the costs of providing a program or service.

Consolidation will occur

Consolidation, if properly managed, is in the best interest of the constituents of the State of Colorado, the State of Colorado employees, and the State of Colorado government. As such, consolidation will proceed in a planned, measured, and thoughtful manner utilizing an evolutionary approach to consolidation. The final level to which consolidation will occur has yet to be determined and for the more domain specific issues, consolidation will be reviewed in light of defined business value.

Savings will not be fully returned to the State

Although there will be savings from the consolidation process, not all of the savings will be returned to the State of Colorado for expenditure on program areas. State of Colorado Information Technology has long been a starved discipline and investment in the discipline will be required to bring it up to a level that will effectively serve the departments that rely on it to deliver program services. This is exceptionally critical in a consolidated model as a failure in IT may result in affecting large numbers of program areas across multiple departments. Furthermore, there are many programs and services that are funded through federal funds. Consolidation will eventually result in the overall cost to provide such programs and services. Reductions in the cost of some services (both operational and project federal funding) will require that the State of Colorado return a percentage of these funds to the federal government.

Not everyone will agree with the consolidation approach

It is natural that not every single individual will agree with all elements of the consolidation process. However, attempting to satisfy each individual's desires with respect to consolidation creates a mutually exclusive set of conditions which would impair progress towards the goal. As such, a plan that is consistent with a large group of individual positions on consolidation, as well as experience from other states has been selected.

The Governor and Legislature will need to be fully on board with key consolidation activities

Although there is general support for consolidation, this support will be tested as consolidation activities are undertaken and standards and processes implemented. There is a concern that they will not be prepared for some of the lobbying pressure they will undergo, especially when some vendors are not selected to provision hardware, software, or services to the State of Colorado. If support for these aspects of consolidation (e.g. standardization) is not there, work should not be undertaken to try to realize savings in these areas.

To date, both the Governor and the legislature have been extremely supportive of consolidation efforts and have been willing to support consolidation with both Executive Orders and Legislation as required. Nevertheless when the specific decisions are made which lobbyists do not like, the noise will rise over the effort and it will be important to have briefed the Governor and legislators so they are not caught unaware.

Protection of jobs

Although there can be no definitive assurances given that every State of Colorado Information Technology position will remain a State of Colorado Information Technology position, the protection of State of Colorado Information Technology jobs is a goal of the consolidation effort.

The consolidation effort will take longer than expected

The consolidation effort will take longer than many people expect. While there are various political realities which need to be considered in moving forward, the urgencies associated with potential administration changes should be counterbalanced with the need to be relatively thorough. A NASCIO article[11] mirrors this position and counsels to "think enterprise, but implement at the team level". This approach will be more methodical but will take longer.

14.6 *Consistent Messages*

As we communicate throughout the State of Colorado, both internally and externally, there are a number of themes that should frame as many of our communications as possible. Although there will still be independent discussion, rumors, and concerns among many State of Colorado employees, the more that we can emphasize these themes, the less independent communications will occur. Many communications experts say that a person must hear something seven (7) times to fully absorb and process the message.

Message 1 – This is best for State of Colorado employees

Although the final disposition of State of Colorado employees has not been determined, there is a commitment to protecting State of Colorado employees. This combined with the ability to evolve the focus of individual's jobs from a departmental focus to an enterprise focus will not only enable tremendous personal growth, but will also allow employees to be involved with a wider range of new technologies and program services. Furthermore, State of Colorado employees will receive more training and potentially better compensation under a more consolidated and effective organization. This is not business as usual.

Message 2 – This is best for State of Colorado constituents

Optimizing spend on information technology will allow the State of Colorado to eventually re-allocate some of the optimized spend on programs and services, the primary beneficiaries of which are the constituents. In addition, consolidation will also simplify the process of securing State of Colorado constituent data thereby protecting that data from hostile agents trying to compromise that data.

Message 3 – This is best for State of Colorado government

The State of Colorado government has had many challenging projects over the years, some of which have suffered from poor execution, but many which have been artificially constrained leading to the challenges encountered. With an empowered Information Technology leader, issues which have traditionally been left unaddressed will now receive consideration and meaningful dialogue to address and resolve issues that have traditionally handicapped the state's ability to execute projects.

[11] Transforming Government Through Change Management, NASCIO, 2007

Section IX Research

15 State Government IT Personnel Discussions

As a part of the goal to define a formal consolidation plan resulting in an enterprise Information Technology function, the State of Colorado Enterprise Architect and the EADT solicited input from the existing State of Colorado departmental CIO's as to how to achieve the defined strategic objectives related to consolidation.

A structured interview format was used for the interviews. Information forthcoming from the interviews, as expected when consulting any diverse group of this size, was mixed and offered at various levels of details. In general, there were many areas where the departmental CIO's did not agree, testifying to the nature of a distributed authority structure and their individuality in perspectives on certain issues and approaches to solving the consolidation challenge. Having said this, there were also areas where common themes and approaches surfaced and these have been incorporated into various approaches offered in this document.

In addition, during this engagement, a number of personnel (including CIO's from other states) were consulted with respect to their experience in Information Technology consolidation. This effort was undertaken so that the State of Colorado might learn from those having already undertaken the consolidation journey. It should be generally noted that while almost every state has either envisioned or initiated the consolidation process few have actually completed most aspects of consolidation.

15.1 *State of Colorado Departmental CIO's Discussions*

Table 15.1below lists each of the State of Colorado Departmental CIO's which were consulted during the discussion process.

Agency	Individual Consulted
Department of Agriculture	Mr. John Picanso
Department of Revenue	Mr. Brett Mueller
Department of Personnel and Administration	Mr. Todd Olson
Department of Human Services	Mr. Ron Huston
Department of Human Services	Mr. Steve Swanson
Department of Public Safety	Mr. Jim Lynn
Department of Correction	Mr. Paul Lewin
Department of Law	Ms. Carol McDonald
Department of Justice	Mr. Bob Roper
Department of Military Affairs	Mr. Harley Rinerson
Department of Natural Resources	Ms. Kim Heldman
Department of Transportation	Ms. Kim Heldman
Department of Local Affairs	Mr. Brian Morrow
Department of Labor and Employment	Mr. Joe Lambert
Department of Public Health and Environment	Mr. Bob O'Doherty
Department of Education	Ms. Diane Kress
Secretary of State	Mr. Trevor Timmons
Department of Regulatory Agencies	Mr. Mike Whatley
Office of the Public Defender	Mr. Doug Tracey
Department of Health Care Policy and Financing	Mr. John Wagner
Governor's Office of Information Technology	Mr. Mark Weatherford

Table 15.1 – State of Colorado Resources Consulted

The Department of Higher Education (Ms. Julie Carnaghan) was not consulted during these interviews but it is believed that the Department of Higher Education (and potentially its constituent institutions) will be able to take advantage of some of the services offered by the resultant consolidated Information Technology organization.

15.2 *Themes Arising from the Departmental CIO Discussions*

During the discussions with State of Colorado Departmental CIO's, a number of common themes surfaced. Most of these were not unanimous, but there was broadly-based consensus on these themes. It is important to note that as the State of Colorado moves forward towards consolidation, a reasonable expectation should be communicated and maintained that not all individuals will all agree on the way in which the consolidation effort is undertaken and that there is no consolidation plan with which everyone will agree with, but that it will be important not to be sidetracked by individual motives or agendas.

The common themes surfacing from the discussions are as follows.

- Consolidation will result in benefits if managed correctly

Most departmental CIO's interviewed buy into the value proposition from consolidation, namely the savings in resources and common ways to achieve objectives. They are concerned however, that degradation in service may accompany such savings, and that if the State of Colorado utilizes an internal service provider, there may be no way to hold those providing service accountable to such service. Most departmental CIO's have, at least to some degree, followed what other states have achieved and note that the claimed benefits are possible.

- DoIT and the constraints under which it currently operates will not provide an acceptable level of service

One of the concerns raised during the interviews is that service experience with the Division of Information Technology (DoIT) has been less than stellar. Service is not predictable with some services being provided in a timely manner, others services are provided extremely slowly, and in some others cases, service has been non-responsive. Further, the organization is unable to provide services in many cases (e.g. MNT) at costs equal to or lower than what individual departments can acquire. Finally, the existing funding model for DoIT is not practical. Although DoIT sets a series of costs at the beginning of a fiscal year, departmental funding challenges arise when DoIT often asks for considerably more general fund re-allocations from the departments near the end of the fiscal year, restricting what departments can do with their remaining funds.

There also was a general feeling of concern on how specific requests would be addressed (e.g. the prioritization scheme used) when initiated from multiple departments.

- A stepwise progression will be the most effective and least risky approach to consolidation

Most departmental CIO's interviewed feel that a planned, stepwise migration will be the most effective and least risky approach to consolidation. Not all departmental CIO's agree as to what the first steps should be but a common starting point will need to be established. There are a number of different strategies which can be used in a stepwise progression but logically it makes sense to tackle the least risky and highest value steps first. In addition, the process whereby trust is built up through a "crawl, walk, run" approach executed over a moderate timeframe will serve to engage those who believe that consolidating IT will be a challenge.

- Domain specific functions should probably be left within individual departments

Although not a unanimous finding, more individuals than not thought that consolidation of infrastructure made sense but that consolidation of some of the more program specific functions did not make sense. The primary reason given was the level of interaction with departmental personnel required and the requirement to be responsive to departmental needs and desires. Furthermore, they were concerned that depending on how the allocation schemes were managed, they could end up with individuals doing work on the systems supporting their programs and services, without the necessary knowledge to accomplish the work and potentially requiring retraining by the business.

15.3 *External State CIO Discussions*

During this engagement, individuals from a number of other states were contacted to discuss their experiences with consolidation or attempted consolidation. The rationale for selecting the states focused on a number of factors including the level to which consolidation had been achieved, public information that was available about their efforts, their availability, and their perceived candidness (both positive and negative) about their experiences. In addition, although we looked for candidates that had been successful in consolidation, we looked for those states which had experienced problems through the consolidation process. This was done in a calculated manner so that we might not only learn the types of issues that might develop, but also so that we might understand how individual states persevered to resolve the issues inhibiting consolidation.

Furthermore, the goal was not to undertake a comprehensive analysis of how other states conducted their consolidations, but to learn what states did well. An initial analysis revealed that the number of different approaches to consolidation (as well as related facets) encompassed many different variations. The scope of this engagement was modified to perform limited research which has been represented below. Those consulted are listed in table 15.2 below.

Agency	Individual Consulted
State of Michigan	Ms. Teri Takai
State of Texas	Mr. Dustin Lanier
State of Delaware	Mr. Tom Jarrett
State of North Dakota	Ms. Lisa Feldner
State of Virginia	Mr. Lem Stewart
State of Missouri	Mr. Dan Ross

Table 15.2 – External Resources Consulted

15.4 *Themes Arising From External State CIO Discussions*

During the discussions with external state CIO's, a number of common themes surfaced. Most of these were not unanimous, but there was broadly-based consensus on these themes. Once these common themes are left behind, there are wide variations in the manner in which consolidation occurred in each of the states; that is there was no one way to affect consolidation and most have been successful within the framework of the consolidation they have undertaken. Not only will the functions targeted for consolidation vary, but so will the approach to the consolidation.

The common themes surfacing from the discussions are as follows.

- Communications are a critical element enabling consolidation

Virtually all CIO's agreed that communications are a major part of any consolidation effort. Such communications must be addressed on multiple fronts including education of the Governor and the Legislature with respect to funding and consolidation issues, addressing concerns of Executive Directors who will lose some level of autonomy with respect to their spend, addressing personal concerns of the

employees, and ensuring that those who are reporting on consolidation activities deliver consistent and accurate messages. It is important not only to communicate, but also to communicate on a frequent basis. If you look at a number of different states which have undertaken consolidation, many have appointed Public Information Officers, Legislative Liaisons, and similar positions dedicated exclusively to focusing on communications.

- The number of problems that will develop will be reduced through planning

Some of the states consulted indicated that they had many problems because they used "ready, fire, aim". This is to be expected as consolidation of 20+ individual organizations into effectively a single organization requires extensive planning to avoid problems. It will be important to develop and follow a high level plan which initially targets addressing as many issues as can be identified to minimize addressing these issues during consolidation activities minimizing "stops and starts" through consolidation resulting in less confidence in the overall process. Although the planning effort need not be perfect, it is important to plan the process out and be able to present such information so that those involved with the process believe there to be a plan in place.

- Funding issues remain a focus area for consolidation

There are a number of issues related to funding that must be addressed, preferably prior to consolidation. Among these are issues related to how services are funded, how assets which have been procured with different colors of money are managed, levels of accounting detail required to comply with federal regulations, disposition of assets over $5,000 procured with federal money, managing the various "colors of money", and so forth. As such, it will be of value to develop funding strategies as to how procurement activities will be addressed in light of federal requirements. With respect to saving funds, most CIO's indicated that they have experienced some savings, but they counsel steering away from these claims and letting the savings develop organically.

15.5 *External State Department Director Discussions*

As a part of the research that the EADT undertook, an effort was made to reach out to selective Executive Directors (or departmental personnel) in some states whose IT services had been consolidated from their respective departments to a more consolidated entity. The reason for such an effort was to at least gain a passing perspective on the experiences that departmental personnel have had from the consolidation experience. The EADT also recognized that it is easy for a group of CIO's to speak to the value of the consolidations they have championed and executed within a state, but it is equally important to understand the customer perspective with respect to a consolidated Information Technology organization. The process involved speaking to Directors (or Elected Officials) from two (2) different states (and different departments within those states).

Agency	Individual Consulted
State of Michigan	Mr. Ed Dore
State of Michigan	Ms. Phyllis Mellon
State of North Dakota	Mr. Eric Hardmeyer
State of North Dakota	Mr. Al Jaeger

Table 15.3 – Departmental Personnel Consulted

In discussions with departmental personnel, the general message from departmental representatives was that the consolidated structure works. In general, departmental personnel observed that it may not be as responsive as a local organization, nor may the consolidated structure be as cost effective (although this was variable) but that generally the consolidated organization was able to maintain service at a level which allowed the various departments and program areas to execute their core responsibilities. In addition, the

EADT would like to underscore the temporal nature of this information. Those departmental representatives we held discussions with all agreed that initially there were many challenges but things have been getting better as of late. As such, if we would have held the discussions two (2) years ago, we would have likely received a much more negative view of consolidation and if we held the discussion two (2) years hence, we might have received a more positive view of consolidation. This is not that surprising and it is anticipated that the State of Colorado will also experience challenges as it consolidates however we are attempting to provide as much planning around the activity to minimize the challenges.

Furthermore, most individuals talked with indicated that they wished the actual consolidation had been carried out somewhat differently. In some cases, these preferences were pragmatic and could have reduced some of the challenges that other states experience and in some cases, they represented purely stylistic differences. The general concern that departmental representatives raised is that the consolidation should be done cooperatively with the departments, limiting the more dictatorial approaches to consolidation. Furthermore, the approach was important. There was so much resistance to the consolidation from some employees that some departments brought in outside consultants to wade through the claims of those undertaking consolidation and those departmental forces fighting consolidation. In the end consolidation was undertaken and some departments were forced to divest themselves of certain personnel, but the more adversarial the approach, the more employee problems will likely occur.

Some of the general themes of the discussions are highlighted below.

- Δ Service is sufficient and improving

When questioned about the level of service they receive, most believe that they probably had more responsive service before consolidation however, they also acknowledge that the service they receive is sufficient to support program operations and that service continues to improve. The fact that service is sufficient and continues to improve demonstrates that organizations may initially struggle with some aspects of service provisioning initially but as long as there is a commitment to enterprise service and meeting the service needs of the departments, that people of good conscience can work through these challenges.

- Δ Some functions have to continue to be resident with the departments

Some of the departmental personnel we met with insisted that they had some functions that they wanted and needed to remain within the department. In some cases, these individuals continue to report to departmental personnel and in other cases, they report to a centralized organization but are resident at the departmental locations. The primary example of this is desktop support, but some departments also maintained applications development staff as well, dealing primarily with domain applications. The primary reason for housing some Information Technology personnel in the departments is the dynamic nature of certain types of work which are problematic if handled remotely.

- Δ Communications are important

Similar to the input from CIOs, the need to communicate during times of organizational change is important. This is exceptionally important from the perspective of departmental management because they are likely to face the lion's share of questions and concerns from their personnel. Although there are enterprise level communications schemes that can be employed, it is also important to brief departmental management at a deeper level to ensure they are in a position to support and address issues raised by their personnel.

- Δ The capabilities of the enterprise are greater than the capabilities of the department

One individual cited "safety in numbers" although when probed about the meaning of this statement, their interpretation was really that departments continue to face funding challenges to acquire the number of individuals they need where as the perceived importance of enterprise initiatives enable not only more attention from funding sources, but also that an enterprise can provide greater organizational capabilities than a department. This is an important concept and likely accurate. By way of a specific example certain types of programmers were in short supply in the departments and it was difficult to secure funding to add to their numbers. In the enterprise organization, there were a greater number of resources available reducing the reliance on the limited number of programmers that a department could acquire and enabling the department access to a greater number of resources.

- Δ Cost of IT is higher than expected in some areas, but lower in others

Once enterprise wide standards are developed and implemented, the cost of IT often is higher than expected even though savings have been touted. This happens for a variety of reasons. For example individual departments may not always execute their information technology functions consistent with best practices resulting in a lower TCO (Total Cost of Ownership) but also assuming more risk than desired. As such, there is the potential that departments will see some increases in technology costs in the short run, especially as technology platforms are normalized. In some cases, IT costs were reduced because the cost of given technologies (especially software) could be distributed across multiple organizations.

15.6 *Other States Distribution of Responsibilities*

During this engagement an attempt was made to determine how functional distribution of a selection of information technology functions was managed throughout four of the states that were reviewed. The information obtained is captured in the table below. In some cases, the information presented was obtained by inference and in others, it was either stated either verbally or in was found in documentation. Characterization of these functions proceeded loosely along one of four (4) models as follows:

CC = Centralized Control, Centralized Execution
CD = Centralized Control, Distributed Execution
DC = Distributed Control, Centralized Execution
DD = Distributed Control, Distributed Execution

The breakdown of the disciplines and how each state appears to have handled them is included below in chart 15.4. It should be noted that the entries in the table 15.4 are believed to be correct. The reason for potential errors is that the research methodology used embodied discussion of best practices and organization during which many of the distributions were revealed. In addition, we spent limited time with the resources from Delaware and Missouri and as such have not included these in the chart below.

Discipline	Michigan	Texas	North Dakota	Virginia
Procurement	CC	CC	CC	CC
Strategic Planning	CC	CC	CC	CC
Desktop Support	CD	DD	DD[12]	DD
Project Management	CD	CD	CD	CD
Technology Standards	CC	CC	CC	CC
Asset Management	CC	CC	CC	CC
Applications Development	CD	DD	CC[1]	DD
Network Engineering	CC	CC	CC	CC
Program Management	CC	CC	CC	CC

[12] Indicates general model; some variances

Discipline	Michigan	Texas	North Dakota	Virginia
Quality Assurance	CD	DD	CC	DD
IV & V	CD	DD	DD[8]	DD
Business Continuity	DD	DD	DD	DD
Enterprise Architecture	CC	CD	CC	CC
Data Governance	N/A	CD	CC	CC
Data Center Operations	CC	CC	CC	CC
Data Center Management	CC	CC	CC	CC
Disaster Recovery	CC	CC	CC	CC
Network Management	CC	CC	CC	CC
Capacity Planning	CC	CC	CC	CC
Change Management	CC	CC	CC	CC
Configuration Management	CC	CC	CC	CC
Security Management	CC	CC	CC	CC
Help Desk Services	CC	CC	CC	CC
Business Analysis	CD	DD	CC	DD
Human Resources	CC	DD	CC	CD
Service Level Management	CC	CC	CC	CC
Service Level Negotiation	CC	CC	CC	CC
Proposal Management	CC	CD	CC	CC

Table 15.4 – Functional Distribution Chart

In some states, there is a defined model determining what functions are the responsibilities of the centralized organization, what functions are the responsibilities of the departments, and what functions are joint responsibilities and it remains the purview of the State Chief Information Officer and other executive bodies (Governor's Office, Legislature) to determine how diligent they will be in getting departments to line up behind established standards and policies. The approach to getting various departments to comply with various standards and responsibility allocation models runs the gamut from absolute to providing a value proposition and enticing departments to utilize centralized services.

15.7 *Additional Research*

As a part of this activity, the EADT conducted research on what other states did from a variety of sources including industry pundits, state websites, and various industry organizations (e.g. NASCIO). While several high level consolidated sources exist, there is no comprehensive consolidated source of individual states efforts to consolidate their Information Technology infrastructure. Some of the summary findings of this research are listed below. The EADT, given the nature and size of this engagement, did not cast a wide net for this research by delving into the practices of each of the states and their consolidation efforts, but rather tried to quickly converge on several states who had achieved measurable and significant results from their consolidation efforts. The summary findings of this research are presented below.

- To date, more states have addressed physical consolidation as compared to application consolidation by a count of 32 to 26.[13]

- Although many states have undertaken progress towards consolidation there are a limited number of states which have achieved comprehensive consolidation progress. Having said this, there are a

[13] Issue Brief: Review of State Information Technology Consolidation Efforts, NGA Center for Best Practices, February 2006

number of foundational states which have aggressively pursued and achieved more consolidated information technology management structures.

- Savings from consolidating procurement has been considerable in most states who have undertaken such consolidation. Florida saved $10M in 2004 in what ended up being considered to be a failed effort; Michigan saved $25M in 2002 and 2003 and $47M in 2004. Pennsylvania has saved $60M since 2004 using best value (not necessarily lowest cost) as the discriminator for procurement decisions. The five (5) best practices related to procurement involve using electronic portals, consolidated contracts, best value purchasing, pooled vendors, and solution oriented bids. The greatest paybacks have been from the first three (3) best practices.[14]

- Most states undertaking consolidation do so using a multi-phased approach rather than attempting to address all areas of consolidation concurrently. The general strategy is to target those highest value return target first and then proceed to successively lower value return targets. Regardless of what is chosen, the organization must prepare itself to operate in a centralized manner before starting consolidation. This is also consistent with Information technology systems best practice implementations.

- States have been able to reduce the number of individuals supporting information technology through consolidation efforts largely through reducing the number of technologies requiring support, more effective use of shared resources, and justification of more extensive management tools because they serve a larger number of users. By way of example the State of Michigan, prior to consolidation, had 1 Information Technology employee for every 26 State of Michigan employees and 1 Information Technology employee for every 5,211 constituents. Through consolidation, the State of Michigan reduced the Information Technology staff 15% and consultants by 66%, changing the ratio to 1 Information Technology employee for every 31 State of Michigan employees and 1 Information Technology employee for every 5,744 constituents. The State of Texas through their network consolidation realized a 36% in Wide Area Network (WAN) design and management staff. Kentucky reduced their infrastructure management staff 15% through consolidation of infrastructure statewide.

- The State of Michigan, through consolidation, has been able to provide essentially the same level of services to State of Michigan departments with 66.5% of the staff and 75.3% of the budget that it previously had when Information Technology operations were decentralized. Total interdepartmental grant spending was reduced from $466 million in 2003 to $351 million in 2005, for a net reduction of $115 million (24.7%). Major components include: $65 million in contract savings (rate reductions, cost avoidance / savings over the life of contracts); savings of $10 million annually through replacement of long term contractors with state employees; and $2.3 million savings annually through reduction in voice and data phone rates. IT employee staff was reduced from 2,064 to 1,762 (15%), and contractors from 1,764 to 469 (64 %), for a total reduction of 34 percent. $24 million in total was saved due to early retirement. [15] The Commonwealth of Pennsylvania, validated by an independent Gartner study saved $15.9 million in 2004 and $29.5 million in 2005 estimating that the commonwealth will save more than $320 million over a 10 year period through indirect cost savings and cost avoidance. The State of Michigan encountered extreme financial pressures through much of the consolidation period further driving the need to consolidate.

- The exact approach to consolidation varies considerably. For example in Virginia, the Information Technology Organization (VITA) has operational, technical, and some procurement authorities.

[14] Fact Sheet: Information Technology Procurement Reform, NGA Center for Best Practices, December 2005
[15] Implementation of Consolidated IT Services, Michigan Division of Information Technology, 2006

Financial authority remains distributed and the State CIO reports to the Information Technology Infrastructure Board. In Pennsylvania, the Information Technology Organization has technical and operational control, but must collaborate with departments on financing and procurement. On the other end of the spectrum is Illinois which has limited centralized authority but acts as an advocate on behalf of the various State of Illinois departments.

- A collaborative management style is a key factor in states with exemplary information technology governance. The key elements of collaborative management include involving staff personnel in making decisions and building teams to facilitate sharing information and making decisions.[16]

- Although consolidation has proceeded in most states, the most common identified challenges[17] to consolidation identified by those undertaking such consolidation and participating in the NASCIO survey were (in descending order)

  - Workforce resistance 80.0%
  - Seeking exemptions from state statues / regulations 37.1%
  - Backlash when consolidation did not meet business needs 34.3%
  - Unexpectedly high costs 25.7%
  - Seeking exemptions from federal statues / regulations 20.0%
  - Failure to identify and adhere to service levels 17.1%

- Consolidation activities around specific disciplines have varied widely from state to state. In the 2005 NASCIO survey[6], the following responses were collected with respect to the progress that the responding states had made in consolidating certain functions.

IT Function	Count	Completed	Partial	Proposed	No Activity
Application Development	35/35	5.5%	37.1%	14.3%	42.9%
Asset Management	35/35	8.6%	54.3%	14.3%	22.9%
Billing/ Pricing Models	35/35	28.6%	31.4%	11.4%	28.6%
Payment Engine	35/35	45.7%	25.7%	2.9%	25.7%
Communications Services/Telephony	35/35	57.1%	34.3%	0.0%	8.6%
Data Center	35/35	31.4%	45.7%	8.6%	14.3%
Desktop Management	35/35	8.6%	25.7%	20.0%	45.7%
Directory Services	35/35	17.6%	52.9%	14.7%	14.7%
Disaster Recovery	35/35	5.7%	62.9%	8.6%	22.9%
E-mail Services	35/35	8.5%	62.9%	14.3%	14.3%
Enterprise Architecture	34/34	14.7%	55.9%	14.7%	14.7%
Enterprise Single Sign On	35/35	2.9%	22.9%	37.1%	37.1%
ERP/ Financial/ HR	34/34	20.6%	52.9%	8.8%	17.6%
Governance Structure	35/35	37.1%	42.9%	8.6%	11.4%
GIS	34/34	8.8%	50.0%	5.9%	35.3%
Help Desk	35/35	5.7%	51.4%	17.1%	25.7%
Identity Authentication Management	35/35	5.7%	40.0%	25.7%	28.6%
Imaging	34/34	2.9%	29.4%	20.6%	47.1%
Network	35/35	34.3%	51.4%	5.7%	8.6%

[16] Information Technology: Control Structures are Only a Part of Successful Governance, California State Auditor, February 2003

[17] NASCIO's 2005 survey of state IT consolidation and shared services initiatives, NASCIO, February 2005

Portals	35/35	42.9%	34.3%	5.7%	17.1%
Procurement	35/35	42.9%	37.1%	8.6%	11.4%
Project Management	35/35	11.4%	40.0%	20.0%	28.6%
Security Services	35/35	14.3%	51.4%	`4.3%	20.0%
Servers	35/35	8.6%	57.1%	17.1%	17.1%
Wireless	35/35	14.3%	34.3%	20.0%	31.4%

Table 15.5 – Progress Made on Functional Consolidation

Note that the State of Colorado did not participate in this survey.

- The Gartner framework for determining the nature and distribution of an Information Technology organization within an enterprise boils down to two (2) primary factors: 1) pressures for corporate integration and 2) pressures for local responsiveness. The EADT believes it is possible to have a reasonably responsive and more centralized model so long as streamlined procedures and accountability are fundamental underpinnings of any implemented governance structure and service provided through that governance structure.[18] A formal, phased process for consolidation has been presented in this document and this phased work structure will allow the State of Colorado, along with the governance structure, to evaluate further consolidation both at the phase and initiative level.

[18] How to Best Position the IT Organization in Your Enterprise, Gartner, March 2007

16 Existing Initiatives

As a part of the consolidation planning activities, it was necessary to undertake an analysis of initiatives that have been initiated, planned, in-progress, or completed. The purpose of these reviews were to understand how these initiatives may or may not fit into the overall consolidation plan and what supporting information may be available which can be used to support development of a consolidation plan.

The EADT has broken down the various initiatives into five (5) different categories that are consistent with the objectives stated within the State of Colorado Information Technology Strategic Plan which in turn supports the Colorado promised as espoused by Governor Bill Ritter Jr. The primary reason for this is to demonstrate what activities are being undertaken in support of the State of Colorado Information Technology Strategic Plan.

In addition, each initiative is defined to be in support of consolidation or not in support of consolidation. This classification is subtle. An initiative is defined to support consolidation if the output of the initiative is used to drive further consolidation. If the outcome of the initiative is simply a consolidated function, it does not drive consolidation per se, but is actually a consolidation activity. It is important that this in no way assesses the value of the activity, but simply categorizes these initiatives as either supportive of consolidation or not supportive of consolidation.

Secure and Protect IT Assets

The State of Colorado has a number of assets which require protection. These include the obvious hardware and software which the State of Colorado owns and which is the mechanism through which program services are delivered, but even more important is the data entrusted to the State of Colorado which it must protect on behalf of its constituents, business partners, and other governmental entities.

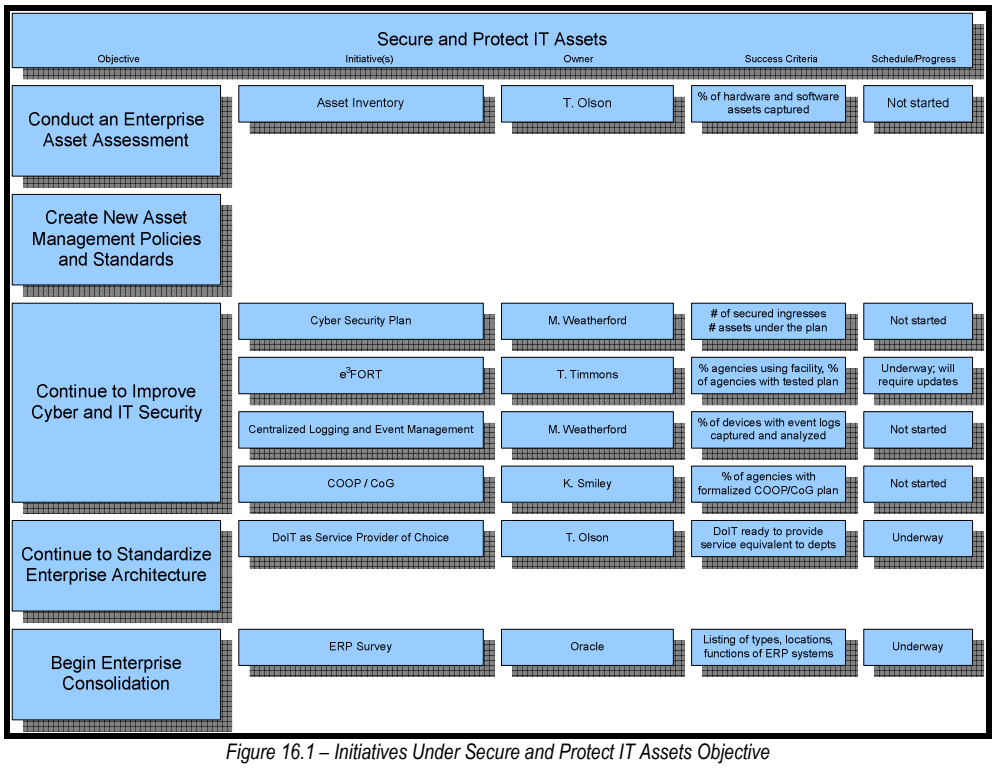

Figure 16.1 – Initiatives Under Secure and Protect IT Assets Objective

Asset Inventory

Purpose or Goal	Collect a listing of all assets connected to a network
Deliverable	Asset inventory
Status	Not started
Analysis as Relates to Consolidation	This will be a required activity before consolidation is undertaken as the consolidation service entity will require knowledge of what assets are to be placed under management for staffing and costing.

Table 16.2 – Asset Inventory Initiative

The asset inventory has not started as of yet. The goal of the asset inventory is to get a listing of network attached devices (and the software they host if applicable) throughout the State of Colorado. Although this will be completed in the future, it is probably reasonable that this activity be delayed as a part of an orchestrated plan. This will need to be completed as a prelude to determining staffing levels for a centralized service organization.

Cyber Security Plan

Purpose or Goal	Secure state of Colorado resources
Deliverable	More secure infrastructure
Status	In progress.
Analysis as Relates to Consolidation	State of Colorado cyber-security will benefit from consolidation although the initiative is not a direct enabler of consolidation. Going forward, cyber security will be addressed in a more proactive manner with cyber security personnel at the table to perform reviews of security plans before implementation of new systems or programs. Furthermore, integration between enterprise architecture and security will be critical as many of the issues confronted in securing resources and data are addressed through both a variety of mechanisms.

Table 16.3 – Cyber Security Initiative

Most of the work undertaken to this date has targeted the securing an unconsolidated infrastructure. The Cyber Security Plan is yet to be refined to address securing a more consolidated infrastructure. This can not be done in the short run because the nature of the consolidated infrastructure has not been determined. The EADT would recommend that this initiative be partitioned into two different initiatives – an infrastructure independent initiative (standards, processes, logging, encryption requirements, testing defintions and schedules, and credential management) and an infrastructure dependent initiative (firewalls, IDS's, routers, VPN's, etc.). In addition, the State of Colorado should undertake a risk assessment to define which resources are at risk and then develop plans to mitigate those risks in the short term. To this, end, investment in a limited amount of physical security infrastructure may be required with the goal being to deploy security infrastructure to address the largest risk areas. The key to this is to avoid overbuying security infrastructure which may very well not be needed after consolidation. Currently, each agency designs and funds their security infrastructure.

The EADT believes the security function to be one of the more advanced functions with respect to the level of documented standards and process. The State of Colorado CISO is aware of the potential savings

associated with implementing security on a consolidated infrastructure and as such has addressed this through working to define a minimum complement of security technology investments and avoiding investing in more technologies than are projected to be necessary. The EADT also believes that the State of Colorado should retain this discipline regardless of whether a managed service provider is engaged or not. The core reason for this relates to owning core security responsibilities including incident management, various types of security testing, and working with the Enterprise Architects to design and implement security solutions for entities, infrastructure, and data.

eFOR³T

Purpose or Goal	Provide a facility that individual State of Colorado agencies can use to recover their systems in the event of a disaster
Deliverable	Ready facility
Status	In progress (16 MOU's with agencies in place, 7 agencies with equipment on the floor)
Analysis as Relates to Consolidation	Although this was a well thought out initiative the overall strategy for facility and service consolidation will likely dictate whether this is a permanent or transitory facility. State of Colorado agencies should continue to move towards developing disaster recovery plans until a formal declaration of a service provisioning strategy has been determined.

Table 16.4 – eFOR³T Initiative

The eFOR³T initiative involves using the 6,500 sq. ft. facility contracted for by the State of Colorado Secretary of States office as a recovery center for other State of Colorado Departments This initiative makes sense in the short term to address the potential need for recovery but the longer term plan for a recovery center may change depending upon how the consolidated services are implemented. There are no specific schedules or requirements for using the facility. As of the briefing on this initiative 16 MOUs (Memorandum of Understandings) have been signed with six (6) agencies not signed and no commitment to sign. Of the 16 with MOUs in place (Personnel and Administration, Regulatory Agencies, Public Safety, Human Services, Public Health and Environment, Law, Agriculture, Natural Resources, Local Affairs, Corrections, Health Care Policy and Finance, Statewide Internet Portal Authority, Judicial, Labor and Employment, Commission on Higher Education (Separate addendum under CCHE signed by: Colorado School of Mines, Colorado State University, Fort Lewis College, Mesa State College, Metropolitan State College, University of Colorado System, University of Northern Colorado, Western State College) only 7 actually have equipment on the floor. It is not known how many of these have executable disaster recovery plans. There is enterprise architecture oversight and no plan for any economies of scale (e.g. server virtualization) to optimize the space at the facility. There is currently a 5 year agreement in place, but the term can be extended beyond this time. There is a formal governance structure comprised of T. Timmons (SoS), M. Locatis (GOIT), T. Olson (GOIT), J. Lynn (DPS), and a B. Dimoff (ViaWest) representative. Metrics of success are:

- Δ Number of agencies with physical presence at the facility
- Δ Reduction in the number of autonomous disaster recovery sites
- Δ Number of agencies with executable disaster recovery plans using the site

A number of operational metrics are also being monitored including:

- Network utilization
- Environmental status
- Electrical capacity
- Occupied floor space
- SLA challenges and responses
- Utilization of managed services
- Helpdesk calls and response time

There are no enterprise wide disaster recovery standards at this time, but these will have to be developed as part of the operational plans supporting the CoOp and CoG.

Centralized Logging and Management

Purpose or Goal	**The purpose of this activity is to establish a mechanism through which various logs can be inspected and events captured, analyzed, and escalated as necessary.**
Deliverable	Centralized event logging and analysis mechanism which can be applied to a variety of infrastructure and application components.
Status	Funding has been provided to enable a minimal set of functionality related to event logging and analysis. Further investment in this should be delayed until such time as the technology platforms have been determined and the nature of the consolidated service provider has been determined.
Analysis as Relates to Consolidation	This is an element of the Cyber Security plan. Longer term there will have to be a determination made as to whether this function will report to the State of Colorado management or to a managed service provider. Regardless of who does it, it is a function that is required and can be built even if infrastructure is consolidated.

Table 16.5 – Centralized Logging and Management Initiative

Centralized logging and management is an activity that establishes tools to monitor the logs of various types of devices (routers, servers, firewalls, etc.) and then analyzes the logs, correlating the events in the logs to determine if an attack has occurred or is in progress. Furthermore, the tools can then respond to certain attacks by initiating remedies consistent with the nature of the attack.

CoOp / CoG

Purpose or Goal	**Ensure that the State of Colorado has a Continuity of Government plan, each State of Colorado departments has a supportive Continuity of Operations plan, and that the necessary operational plans (e.g. disaster recovery plans) are in place to support the Continuity of Operations Plan. This includes only a quantitative review of**

	such plans and not a qualitative review. The initial scope is restricted to Executive Branch departments not including institutions of higher education.
Deliverable	CoOp (Departmental) and CoG (State of Colorado) plans
Status	This initiative is moving forward with the first iteration of departmental CoOp plans expected to be delivered in the Jan 2008 timeframe. The project is funded using tools, and training from Bold Planning. Once the initial plans are in place, various exercises (table top, functional, and finally multi-agency).
Analysis as Relates to Consolidation	While the core aspects of this activity are centered on maintaining the business of government both at the state and the departmental level and are thus minimally affected by consolidation, some of the more operational plans supporting CoOp and CoG activities will be affected by consolidation.

Table 16.6 – CoOp / CoG Initiative

The CoOp initiative is designed to identify the various priorities of government programs and services, prioritizing them, and ensuring that each of the departments are prepared to continue those programs as soon as possible after an event that disrupts their normal operation. The scope of this activity is all State of Colorado programs and services. This activity will need to coordinate with disaster recovery activities (likely through eFOR³T) undertaken by the various departments to ensure the recovery of systems is coordinated with the Continuity of Operations plan.

DoIT as Service Provider of Choice

Purpose or Goal	**Improve the Division of Information Technology's ability to service it's customers**
Deliverable	Improved DoIT service organization
Status	In Progress
Analysis as Relates to Consolidation	Although this has been undertaken, there are additional aspects for readying the organization that will require addressing. Among these are collecting the requirements for service from the departments they will support.

Table 16.7 – DoIT as the Service Provider of Choice

This initiative is a catch all for multiple different activities which are designed to improve DoIT's capability to service its customers. Activities undertaken within this initiative include

- A re-organization designed to flatten the structure of the organization
- A help desk study designed to not only define specific processes related to opening and managing tickets, and get the necessary metrics out of the system designed to report on service metrics
- Development of a service catalog
- Creation of a mainframe user group
- Storage infrastructure review

- Email services for a number of departments

To this point, there has been limited departmental involvement in this task but such involvement will come as a part of an orchestrated plan.

ERP Survey

Purpose or Goal	Conduct a survey across the State of Colorado to determine the types, locations, and functions that exist
Deliverable	Listing of ERP systems deployed and used, as well as the functions used, across State of Colorado departments
Status	In Progress
Analysis as Relates to Consolidation	Not a direct enabler of consolidation but a laudable goal nevertheless. Such an initiative would normally take place during business process consolidation.

Table 16.8 – ERP Survey Initiative

This initiative is a prelude to eventual ERP consolidation across the State of Colorado and is designed to identify and define all existing ERP systems in use throughout the State of Colorado, the various functions provided through those systems, the owners of those systems, and the software used to support those functions.

Optimize Spending for IT Decisions, Projects, and Technology

The State of Colorado acquires a large number of IT assets and services each year and at this time, that spend is not optimized. The State of Colorado has traditionally enabled spend at the departmental level and as such, spend is not aggregated to take full advantage of volume purchasing. In the past, projects have been arbitrarily financially constrained so that even the allocated funds were at risk. Activities in this category are designed to ensure that State of Colorado spend on information technology is optimized.

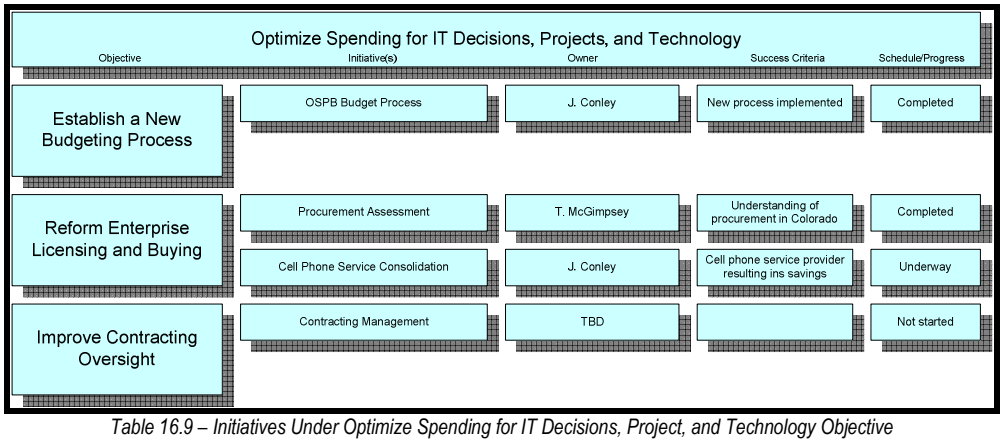

Table 16.9 – Initiatives Under Optimize Spending for IT Decisions, Project, and Technology Objective

OSPB Budget Process

Purpose or Goal	Define a budgetary process where the Governor's Office of Information Technology can review and approve budget requests
Deliverable	Formal process for budget request processing

Status	Completed for 2007-2008
Analysis as Relates to Consolidation	Although this will be required as a part of the overall program and IT governance moving forward, the process itself may change when defined within the context of the PMO and enterprise architecture governance.

Table 16.10 – OSPB Budget Process Initiative

A new budgeting process has been developed as a part of the development of this fiscal years budget. All budget requests are submitted to OSPB who in turn provides these to GOIT. Once GOIT receives them, they review them and assign priorities (see below) to the various requests, consulting with the individual departments as necessary. They are then returned to the OSPB who then processes them and forwards them to the JBC. GOIT requests that either a complete group of or none of the requests within a given priority are funded. The general priority strategy used is

- Safety, Health, or Statutory requirements (highest)
- Efficiency
- New Programs (lowest)

Cell Phone Service Consolidation

Purpose or Goal	**Consolidate cell phone service across the State of Colorado onto a minimal set of providers.**
Deliverable	Cellular services provided across a minimal set of vendors reducing overall costs
Status	Underway
Analysis as Relates to Consolidation	Not a direct enabler of consolidation but would normally be addressed as a part of phase II consolidation activities. The savings achieved from the effort may be an enabler of consolidation activities.

Table 16.11 – Cell Phone Service Consolidation Initiative

The goal of this activity is to consolidate cell phone service into a lesser number of providers and realizing savings across the enterprise. Although the goal is to consolidate to a single service provider coverage requirements may force consolidation to a larger number of providers but the goal is to minimize the number of vendors and save money.

Procurement Assessment

Purpose or Goal	**Determine how the State of Colorado and its constituent departments procure goods and services across the state.**
Deliverable	Formal report documenting findings
Status	Completed
Analysis as Relates to Consolidation	The findings from this activity will be important as it will be necessary to both streamline and align procurement activities with to be developed standards and processes.

Table 16.12 – Procurement Assessment Initiative

A thorough assessment of procurement was undertaken within the State of Colorado. The overall goal of the effort was to understand the business processes to acquire goods and services. This procurement assessment is now complete although completion of the initiative has not led to any actions at this point. The assessment was undertaken through initial questionnaire to which ½ of the agencies (Human Services, Public Health & Environment, Labor & Employment, Natural Resources, Corrections, Revenue, Public Safety, Regulatory Agencies and Economic Development) responded. In addition, 6 higher education institutions also responded. Additional follow ups were conducted. A number of conclusions were reached through the effort. Among those were that the State of Colorado did not have a system sufficient for measuring all spend as they should have, nor did they have an accurate and detailed asset typing system initially populated at procurement time. COFRS granularity to measure procurement is limited. There is no electronic catalog of goods or services at this time. State of Colorado fiscal rules dictate some processes. WSCA pricing is a good place to start but many agencies are able to improve upon this pricing using WSCA negotiated rates as a start. The P(Purchasing)-Card is used for too many expenditures and lacks accountability. Because there are so many different types of hardware and services procured, the State of Colorado is left with the inability to provide commitments to vendors to achieve better pricing. There is no vendor performance reporting instituted for State of Colorado vendors. Basic BIDS site is useful but limited in that there are no easy ways to find specific services or goods except through the category search. There is also no formal asset management discipline.

Contracting Management

Purpose or Goal	Determine how the State of Colorado develops contracts with respect to terms, enterprise requirements, and authority.
Deliverable	Formal report documenting findings
Status	Not started
Analysis as Relates to Consolidation	The findings from this activity will be important as it will be necessary to both standardize and align procurement activities with to be developed standards and processes.

Table 16.13 – Contracting Management Initiative

The contracting management initiative has not been initiated as of the writing of this document.

Effectively Manage IT Projects

Colorado has traditionally had challenges in managing some IT projects for a variety of different reasons. The goal of activities in this category is to improve the overall oversight and management of projects so that the number of project challenges will be minimized.

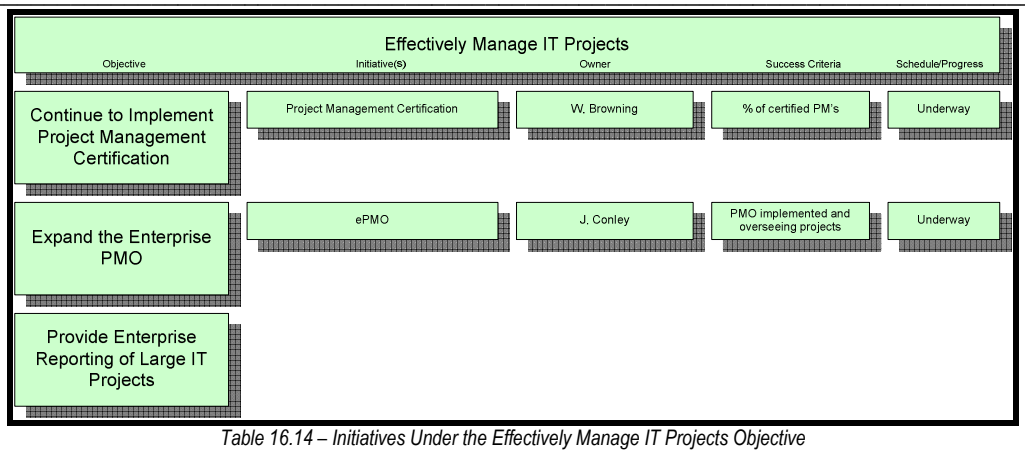

Table 16.14 – Initiatives Under the Effectively Manage IT Projects Objective

Project Management Certification

Purpose or Goal	**Ensure that certified project managers, with domain expertise, are available to manage State of Colorado projects.**
Deliverable	Number of certified project managers available in the state; projects identified as certified requiring additional levels of oversight.
Status	In progress
Analysis as Relates to Consolidation	Although this is valuable and should assist in the proper execution of projects, it is does not directly facilitate consolidation.

Table 16.15 – Project Management Certification

The goal of this initiative was to develop a core competency of certified project managers. The exact distribution, skills sets, and usage of these project managers have yet to be determined. The EADT would make the following recommendations.

ePMO

Purpose or Goal	**Provide a centralized organization responsible for oversight of Information Technology work within the State of Colorado**
Deliverable	Program management office structures and processes, integrated with other governance structures
Status	In progress
Analysis as Relates to Consolidation	This will be an important part of the overall governance structure as relates to processing State of Colorado work and minimizing the risk associated with undertaking such work. Some additional work will need to be completed in not only defining PMO owned and communicated processes but also integrating these processes with other governance entities.

Table 16.16 – ePMO Initiative

A structure for the Enterprise Program Management Office has been developed along with the core set of responsibilities, but at this point, the processes defining how work flows between various entities have yet to

be defined. The structure makes use of seven (7) committees called EGC's (Executive Government Committees)

Improve Enterprise Service Delivery

State of Colorado Information Technology disciplines have traditionally been implemented and managed in a distributed manner. The goal of activities within this category include assuming enterprise wide ownership of selective services and then delivering these services from the enterprise in a consistent and consolidated manner.

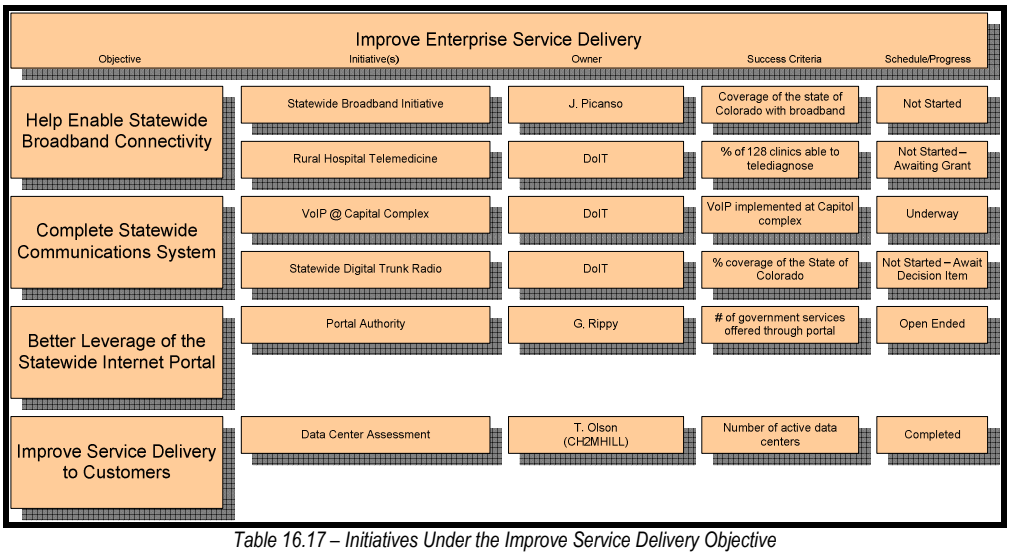

Table 16.17 – Initiatives Under the Improve Service Delivery Objective

Statewide Broadband

Purpose or Goal	**Extend the coverage of broadband services to a greater % of the State of Colorado**
Deliverable	Greater broadband coverage
Status	Not started
Analysis as Relates to Consolidation	Not a direct enabler of consolidation but a laudable goal nevertheless.

Table 16.18 – Statewide Broadband Initiative

This initiative involves complete roll out of the State of Colorado Network including the last mile access for businesses throughout the State of Colorado. To date, this initiative has neither been funded nor scoped. The goal is to ensure that Internet access can reach into all areas of the State. In some cases, the MNT will provide the basis for this access and in others local providers will provide the broadband access. In at least one case, a local municipality will provide that access. Members of the Colorado Department of Transportation and the Department of Higher Education are participating in this as well.

Eventually formal GIS layers should be developed for the various types of coverage (fiber, wireless, and DSL/Cable) so that the State of Colorado has an easily referenced overview of all the broadband coverage throughout the State of Colorado.

Rural Hospital Telemedicine

Purpose or Goal	**Ensure that remote State of Colorado medical facilities can exchange digital data to enable**

	remote diagnoses, consultation, and exchange of medical records
Deliverable	Implementation of network connectivity to remote medical facilities
Status	Just started
Analysis as Relates to Consolidation	Not a direct enabler of consolidation but a laudable goal nevertheless.

Table 16.19 – Rural Hospital Telemedicine Initiative

This initiative is currently underway with the first step involving filing a grant application. The scope of the initiative is to enable approximately 128 hospitals and clinics to get connected through the MNT via last mile connections so that graphical information (e.g. X-rays, scanned documents) and textual information can be shared between other medical professionals which may be located in other parts of the state. To date the FCC has not approved the grant request.

VoIP @ Capital Complex

Purpose or Goal	**Provide a standardized VoIP offering to those facilities within the State of Colorado Capital Complex, North Campus, the 690 Kipling facilities, and West 2nd facility resulting in a converged voice and data network initially implemented at the Capital Complex. The Capital Complex contains 20+ facilities.**
Deliverable	Implemented VoIP system
Status	In progress
Analysis as Relates to Consolidation	Not a direct enabler of consolidation but a laudable goal nevertheless. Such an initiative would normally take place during infrastructure consolidation.

Table 16.20 – VoIP at the Capital Complex Initiative

The goal of this initiative is to provide a VoIP core using the Capital complex (Capital, Human Services, Education, Natural Resources, Revenue, Judicial, etc.) as the initial deployment area. The solution is Cisco based and is designed to be completed in late (December) 2008. Other departments are not in scope within this effort as it is limited to the capital complex. There may be attempts to look at integrating other systems into the core at a later point or these systems may remain autonomous until such time as the infrastructure needs updating or replacing. Once this has been installed, additional services based on the same architecture and technologies will be extended throughout the State of Colorado agencies. This project is currently being sponsored by the State of Colorado CIO and the Executive Director of the Department of Personnel and Administration.

Statewide Digital Trunk Radio

Purpose or Goal	**Extend the coverage of the existing 800 Mhz radio system**
Deliverable	Extended coverage for the radio system
Status	Not started
Analysis as Relates to Consolidation	Not a direct enabler of consolidation but a laudable goal nevertheless.

Table 16.21 – Statewide Digital Trunk Radio Initiative

The Statewide Digital Trunk radio effort is largely designed around expanding the coverage areas of the 800 Mhz radio system as well as re-branding of the radio. There is a $14 M DoIT decision item which will come before the JBC for fiscal 08/09. This decision item is to support the final rollout of the system. At this point 95% of the State of Colorado has been covered by the Digital Trunk Radio system.

Portal Authority

Purpose or Goal	Provide a common access point for State of Colorado constituents, businesses, and other governmental entities
Deliverable	State of Colorado portal and services to enable agencies to use the portal
Status	In progress
Analysis as Relates to Consolidation	The State of Colorado portal is a construct that can facilitate not only consolidation, communications related to consolidation efforts and related activities but also improved security across the State of Colorado.

Table 16.22 – Portal Authority Overview

SIPA, the Statewide Internet Portal Authority has been in operation for some time as of the writing of this document and is not truly an initiative. About 40% of the State of Colorado agencies have adopted the Portal as their primary Internet presence. Agencies are under no requirements or mandates to use the portal but may do so as they see fit for some or all of their Internet presence and applications. The portal operates on a self-funded model largely driven through the sales of driver's license data but also on a share of revenues obtained from other applications (e.g. renewals). As such, agencies may use the portal, in a governed manner to support not only their applications but also their static Internet content in a managed manner.

A third party provider, NIC and its wholly owned subsidiary, Colorado Interactive, operates the portal even though the infrastructure resides at the DoIT data center. The portal authority operates with a formal board responsible for allocating resources and prioritizing initiatives using the portal. There are two primary enterprise services – Content Management and Electronic Payments provided by the portal. Work is underway for collecting trans-departmental requirements for a business portal providing one stop shopping for business to government interactions. Other goals of the portal have been deferred and can be addressed as a part of longer term consolidation. These include single sign on and email consolidation. The portal authority does maintain a reserve of funds. The contract with NIC can be terminated with 30 days notice if the State of Colorado so desires. Testing of portal content and applications is handled through a 3rd party provider.

There is an opportunity here which should be addressed early in the 2nd phase of the consolidation and this is to move all state agencies to the State of Colorado portal even if this only takes place through links. There are two compelling reasons for this. First, it will allow the State of Colorado to consolidate network ingresses from the Internet thereby reducing the number of network links the state agencies use to connect to the Internet. Second, since the numbers of ingresses are reduced, more effective security mechanisms can be implemented and at a lower cost since there are a smaller number of WAN links to the Internet. As such, migrating to the portal will both save costs and provide increased security for State of Colorado resources.

As consolidation of Information Technology disciplines proceeds, the State of Colorado portal will be a key component that will help facilitate consolidation, especially for Internet presence and application access.

Data Center Assessment

Purpose or Goal	Inventory State of Colorado data center facilities
Deliverable	Identification of State of Colorado data centers
Status	Completed
Analysis as Relates to Consolidation	This is an enabler of consolidation as the information gleaned from this activity will be used to consider options for facilities consolidation.

Table 16.23 – Data Center Assessment Initiative

The Data Center Assessment, undertaken by CH2MHILL was designed to identify raised floor facilities which support at least one server. The assessment did not take into account departmental requirements or planned expansions or contractions of equipment. In addition, it did not take into account most wiring closets. It also considered the various communications pipes into the various locations. There were a total of 38 different facilities discovered, 33 of which were within the Denver metro area. The effort considered primarily floor space and environmental requirements.

Improve Collaboration and Innovation

The State of Colorado is desirous of not only establishing itself as a leader in the development and deployment of various technologies throughout the State designed to address constituent needs. This leadership will be developed through public / private partnerships. The goal of the activities in this category is to drive innovation through collaborative methods which will result in collective benefit to the State of Colorado and its constituents.

Improve Collaboration and Innovation				
Objective	Initiative(s)	Owner	Success Criteria	Schedule/Progress
Continue Strategic Planning				
Establish Centers of Excellence for Key Competencies	GIS Strategy	J. Gottsegen / L. Lewis (CH2MHILL)	GIS recommendations	Completed
	Identify Management for 1st Reponders	M. Casey	% of first responders with credentials	Underway
Build an Executive Policy Board				
Involve the Private Sector in Developing Innovation				

Table 16.24 – Initiatives Under the Improve Collaboration and Innovation Objective

GIS Strategy

Purpose or Goal	Define strategies for GIS management throughout the State of Colorado
Deliverable	Report covering State of Colorado recommendations and strategies
Status	Completed

Analysis as Relates to Consolidation	Not a direct enabler of consolidation but a laudable goal nevertheless. This would be addressed as a part of logical (business function) consolidation.

Table 16.25 – GIS Strategy Initiative

The GIS strategy was undertaken by CH2MHILL and is now complete. Participation by the State of Colorado was undertaken by Leah Lewis (DNR, Water Resources) and John Gottszagen (DOLA). A report was produced making specific recommendations some of which are expected to be implemented in a subsequent phase which has yet to be defined. The activity did not address consolidation of infrastructure (except for a portal) or consolidation of functions, however it did address governance. The five activities covered within the scope of the initiative include

- Δ Software licensing review
- Δ Software analysis
- Δ Governance model
- Δ Software inventory control
- Δ Data dissemination

There is no master purchase agreement with the State's primary GIS software vendor ESRI. There is a recommendation to move enterprise GIS oversight into GOIT, potentially under a GIO (Geographic Information Officer). There is a long term vision to create a portal through which data and maps are accessible to the public. This would be in addition to the portal being created through the USGS (United States Geological Survey). Certain types of layers would require specific authentication (e.g. they would not be publicly accessible). Examples of this include key infrastructure layers. There are no plans at this point to take the GIS centralization effort beyond the State of Colorado agencies. In 2002 a study was undertaken depicting more than $800,000 a year savings by standardizing data purchases throughout the state. The State of Colorado does not make use of a SDE (Spatial Data Engine) and uses Microsoft SQL as the primary repository for data as well as flat files (e.g. shape files). There is no comprehensive inventory of statewide GIS resources either at the organizational or infrastructure level. The 2002 work defined a series of standards for statewide GIS but the work never had the executive sponsorship required to actualize it. Some agencies continue to adhere to these standards where as others do not. The State of Colorado maintains 600-700 separate layers across the various agencies. Some work out of the 2002 effort also defined the various layers and the organizations that had responsibility for those layers.

There is an opportunity here with quick paybacks and limited investment. These include the development of a GIS section within the State of Colorado Portal which would facilitate collaboration on the following items. An individual (perhaps the State of Colorado GIS Coordinator) would have to own the collaborative authority ensuring that the following opportunities are capitalized on. These opportunities include a) a mechanism where statewide entities can make requests for certain types of data and a mechanism to communicate such requests to GIS using entities across the state, b) a mechanism where statewide entities can look at the inventory of existing data, by coverage, by entity, c) a mechanism where training efforts throughout the state can be published so that entities can take advantage of training opportunities, and d) a mechanism where State of Colorado standards, naming standards, processes, and best practices adopted by the larger organization are defined

Identity Management for 1st Responders

Purpose or Goal	Define a method of authenticating first responders
Deliverable	Definition of requirements and a formal plan to roll out authentication mechanisms and constructs for first

	responders
Status	In progress
Analysis as Relates to Consolidation	Not a direct enabler of consolidation but a laudable goal nevertheless. This would be addressed as a part of logical (services) consolidation. In general, is an enabler of a federated authentication scheme which would be used across the enterprise.

Table 16.26 – Identity Management for 1st Responders Initiative

This is an initiative to provide identity management (assurance), initially for first responders entitled IA²PM (Identity Assurance Access and Protection Management). It will be expanded in the future to include State of Colorado employees and then potentially, State of Colorado constituents although there is considerable work and logistics that must be addressed to expand it to the latter audience. The initiative is expected to embody both physical and logical management of credentials along with the infrastructure to support it (e.g. certificate authorities, people repositories, tools, encryption standards and technologies, processes for verification, authentication, revoking of credentials, etc.). There are many logistical efforts (e.g. how to issue a physical token, where to issue from (e.g. touch points), off hours support for authorization and authenticationproblems, etc.) associated with this initiative increasing dramatically as the population of authorized individuals grows. The concept will be to use standard "something you have and something you know" philosophy to authenticate. Funding for this is being provided through a grant and is designed to address a plurality of standards (e.g. HSPD-12 / FIPS201) related to identity management. The scope and schedule for this initiative have yet to be determined although the initial activities center on a current state assessment followed by risk assessments. Some aspects of this initiative should be closely tied with enterprise security management.

16.1 *Mapping to Consolidation Efforts*

The existing initiatives have been divided into three (3) different categories. Those categories are initiatives supporting organizational consolidation (e.g. from an organizational perspective), initiatives which support consolidation over the longer term (and probably should be deferred), and initiatives which can continue but which do not actually drive consolidation. In most cases, the actual consolidation initiatives listed below would be addressed later in the framework.

Initiatives Supporting Organizational Consolidation (short term)	Consolidation Initiatives	Additional Initiatives
Data Center Assessment	GIS Strategy	Identity Management for 1st Responders
Asset Management	Statewide Digital Trunk Radio	Rural Hospital Telemedicine
e-FOR³T	Statewide Portal Authority	Cyber Security Plan – Phase II
OSPB Budget Process	VoIP @ the Capital Complex	
ePMO	Statewide Broadband	
Project Manager Certification	Centralized Logging and Event Management	
Contracting Management	Cyber Security Plan – Phase I	
DoIT as Service Provider of Choice	COOP / CoG	
	ERP Survey	

Table 16.27 – Initiative Mapping to Consolidation Efforts

17 Benchmarks

Although there are no specific standards for numbers of specific types of personnel, a number of benchmarks have been developed from various types of organizations. These benchmarks are designed to be guidelines only and are not designed to be prescriptive in terms of their numbers. In table 17.1 below, selective Information Technology functions have been benchmarked across a variety of organizations. Unfortunately there is no typical organization and the amount of automation, the provisioning strategies, the depth of processes and the level of process regimen all have a profound impact on the ratios.

Organizational Benchmark[19,20]	Discriminator(s)	Impact
1 Support individual per 50 PC's	Amount of automation	More automation → greater ratio
1 QA individual per 3 developers	Amount of automation Provisioning strategy	More automation → greater ratio COTS → greater ratio
1 Server admin (Windows) per 35 servers	Amount of automation	More automation → greater ratio
1 Server admin (Unix) per 11 servers	Amount of automation	More automation → greater ratio
1 Business analyst per 10 developers	Testing responsibilities Requirement gathering	Testing included → lower ratio No requirements → greater ratio
1 Support individual per 40 users	Amount of automation	More automation → greater ratio
1 Project manager to 6 developers	Amount of process regimen, complexity of the project	More process regimen → greater ratio More complex project → lesser ratio

Table 17.1 – Organizational Benchmarks

Also provided below in table 17.2 is a benchmark covering IT employees by organization size (using both revenue and total number of employees) benchmark. Once again, this can vary greatly depending on the organizational structure, the functions residing in IT, and the depth to which certain functions are executed.

Organization Size[21]	25th Percentile	50th Percentile (median)	75th Percentile	Organization Count
All Organizations	1:11	1:27	1:52	103
By Annual Dollar Volume				
Less than $200 Million	1:11	1:19	1:34	25
$200 Million to $500 Million	1:19	1:36	1:61	20
$500 Million to $1 Billion	1:11	1:31	1:53	17
$1 Billion to $5 Billion	1:20	1:36	1:82	20
$5 Billion or More	1:10	1:15	1:25	20
By Total Number of Employees				
Less than 500	1:8	1:18	1:34	16
500 to 999	1:14	1:25	1:40	14
1,000 to 4,999	1:11	1:23	1:45	38
5,000 to 9,999	1:10	1:25	1:53	15
10,000 or more	1:23	1:40	1:112	20

[19] Benchmarks Can Help Determine Staff Size, Gartner Research, February 2005
[20] CIBER experience
[21] Workforce.com Report Ratio of IT Staff to Employees, Mercer Consulting, ITAA, and people3 (A Gartner Company) Jan 2003

Table 17.2 – IT Staff Size to Total Organization Size Ratios

Finally in an attempt to use more (but not exact) apples-to-apples comparison, the EADT chose four states from whom information about total organization size, IT organization size, constituents and land area were available. All of the states below have already gone through some level of consolidation except Colorado. The two states highlighted were chosen because they have similar land areas. The employee counts for both Michigan and Colorado are pre-consolidation. We already know that Michigan has further reduced their Information Technology staff to about 1,762 since consolidation. The diagram below shows that if the State of Colorado IT employee numbers are correct (and they are believed to be low) Michigan was slightly more efficient pre-consolidation and would be considerably more efficient post consolidation. These comparisons are not offered to drive any activity and there is the potential that these benchmarks can be flawed. Without going into in-depth analysis of each of the organizations, such benchmarks can be problematic; nevertheless such back-of-the-envelope comparisons can be of value.

State	Square Miles	Total Employees	IT Employees	Ratio	Constituents	Ratio
Missouri	69,709	50,340	~1,400	36:1	5,817,211	4155:1
Colorado	104,185	25,812	1,076	24:1	4,301,261	3997:1
Michigan	97,990	54,685	2,084	26:1	9,938,444	4769:1
New York	54,520	154,389	2,562	60:1	18,976,457	7407:1

Table 17.3 – State IT Staff Benchmarks

The number of employees in each state was obtained from the 2006 US Census Bureau State Government Employment and Payroll and exclude Higher Education and Hospitals in each State. IT employees were estimated or captured through press releases, individual interviews, or published documents. Constituents in the state were captured through population estimates from the 2000 US Census. Although there are different ranges for the dates of the information (e.g. population versus state employees) the methodology was used consistently across all states. This was done because no ready source of all data types was available within the same timeframe.

The State of Colorado numbers were provided by the State of Colorado Department of Personnel and Administration and are not believed to be comprehensive. This would further lower the ratio, potentially showing Colorado to be even less efficient.

18 State of Colorado Departmental CIO Discussion Notes

Embodied within the research part of this engagement were discussions with State of Colorado departmental CIO's. The tables below reflect the information gleaned from these discussions arranged by State of Colorado department. When DND is shown in the tables it reflects a subject that was not discussed as a part of that discussion.

Ron Huston	**Human Services**
Question	Response
1) Have you been able to review the State of Colorado strategic plan?	Yes
1a) Do you agree that the objectives set forth in the State of Colorado Strategic IT Plan are laudable objectives?	Yes they are laudable, logical, and generally achievable
1b) How would you set about accomplishing those objectives?	Develop a broadly-based, consensus oriented approach; define the what, not the how, and address the goals in a manner consistent with pealing back the layers of an onion; phased approach with formal hand offs to successive phases
2) Do you believe in the value of IT consolidation?	Yes
2a) Why or why not?	Benefits are economies of scale, pooling of resources, dealing with issues such as the retirement bubble, etc. If full consolidation is attempted, it will take a long time to occur. Should review the more complex consolidations from a business perspective.
2b) Are there any information technology functions you believe should be consolidated? If so, which ones?	Shared services, core infrastructure, various services, and some applications
2c) What would be your approach (e.g. order) to Information Technology consolidation (e.g. department by department, infrastructure, applications, support, or a different approach)?	Functional consolidation model would be preferred
2d) Do you believe in the concept of standardization of technologies?	Yes at both the industry and vendor level. There could be implications for training if existing vendors are replaced.
3) Do you have an opinion as to why previous efforts to move to a more consolidated Information Technology Management model in the State of Colorado have not been successful?	First, the approach was not broadly-based. Second, there was no executive buy-in to consolidate the Information Technology discipline
4) Have you studied other states' experience in consolidation?	Yes, especially Texas and Michigan
4a) Do you find the claimed value they obtained reasonable?	Reasonable benefits were claimed, although it is impossible to tell if that is the whole story. The service component often is not addressed.
4b) What is your perspective of how Information Technology is structured in the State of Colorado?	Developed over time to meet the needs of the agencies; tendency to fund things based on "sexiness"

4c) What challenges do you envision with the State of Colorado with respect to consolidating more information technology disciplines?	Resistance, loss of control, standardizing and institutionalizing processes, and the lack of credibility of a centralized service provider. Where will the funding for consolidation come from?
5) What current challenges are facing your Information Technology organization in providing service to your department?	Resource starved (lost 40 resources which have never been replaced without commensurate loss of business), funding starved as well.
5a) Have you encountered challenges in obtaining the funding desired? Do you have examples?	Yes, significant; many examples.
5b) Do you believe compensation is a barrier to acquiring the talented information technology individuals the state requires?	Yes, it is a barrier; have lost some key people; some have provided letters as to the compensation they have received.
5c) What is the single greatest challenge you see for your organization to service the department you support?	There are many conflicting needs for the department with respect to the resources available to meet those needs.
5d) How do you currently determine how to prioritize Information Technology work (projects) within your department?	Utilizes a formal process involving a balanced scorecard and a committee comprised of business individuals to drive to consensus on priorities
5e) Do you have an enterprise architect position or a process to ensure that systems are designed and integrated in a consistent manner?	Not individual; a team discipline
6) Do you believe your core business functions (e.g. procurement, finance, human resources, etc.) are different from other State of Colorado departments? If so, how?	No they are not the same, but they could be. There are no common interpretations for example with respect to hiring rules.
6a) What common services do you envision the State of Colorado needs that should be standardized at the enterprise level?	Every service should be looked at with respect to standardization with the potential to change specific agency processes when necessary
7) What changes do you envision could be made that would benefit the Statewide Information Technology organization?	Do not support consolidating applications as these should remain close to the business unit. All other infrastructure services are fair game. Also, services (e.g. email) would be reasonable targets for consolidation. Should develop a formal training plan for the individuals in the state to maintain a qualified workforce. Should look at offering a 24 hour help desk.
7a) How could you benefit from these changes?	Allow more focus on the business
7b) What concerns would you have about a consolidation process?	Concern that the existing organization may not be able to service the agencies adequately. They must have a demonstrated ability to deliver service equal to or better than agency resident Information Technology departments.
7c) How would you plan a consolidation process?	Convene group of experts to develop plan; also look at centers of excellence, merging functions where possible
8) Do you provide any unique functions to your business users that are not common across other State of Colorado departments?	There are a number of Human Services applications which are specific to the Department of Human Services, but also a number of common functions
9) How would you ensure performance of services using a consolidated staff?	There are problems in terminating non-performers with the existing system which is a fundamental

	challenge of the classified system. Try to use service levels, but there must be accountability behind the service levels. Must look at the civil service rules. Retirement bubble is forming. Believe that it may not be possible to return financial penalties to departments.
10) What role if any would you like to have in the Enterprise Architecture evaluation?	Lead Enterprise Architecture and activities
11) What role if any would you like to have in how Information Technology is re-structured to better serve the citizens of Colorado?	Lead Enterprise Architecture and activities
12) What would you say is your greatest strength?	Leadership and the ability to eliminate barriers to achieving objectives.

Table 18.1 – Department of Human Services Discussion

Steve Swanson	**Human Services**
Question	Response
1) Have you been able to review the State of Colorado strategic plan?	Yes
1a) Do you agree that the objectives set forth in the State of Colorado Strategic IT Plan are laudable objectives?	Yes they are laudable; some easier to achieve than others
1b) How would you set about accomplishing those objectives?	Bite off smaller chunks and then develop a plan to accomplish the objectives; there needs to be critical thinking related to the planning and the ordering
2) Do you believe in the value of IT consolidation?	Yes, but not blanket consolidation; should use an evolutionary approach
2a) Why or why not?	Some value in consolidation
2b) Are there any information technology functions you believe should be consolidated? If so, which ones?	Telecommunications (voice, data), tools, security, help desk. Would shy away from some domain specific functions.
2c) What would be your approach (e.g. order) to Information Technology consolidation (e.g. department by department, infrastructure, applications, support, or a different approach)?	Plan the effort thoroughly, examine multiple methods, and then arrive at a strategy developing a plan consistent with the strategy.
2d) Do you believe in the concept of standardization of technologies?	Yes from both an industry standard and a vendor standard perspective
3) Do you have an opinion as to why previous efforts to move to a more consolidated Information Technology Management model in the State of Colorado have not been successful?	The two basic reasons were lack of understanding of the magnitude of the effort and a shortage in resources allocated to such a task; also the culture in the State of Colorado must change if it is to be successful in consolidation or even if operating under today's model
4) Have you studied other states' experience in consolidation?	No
4a) Do you find the claimed value they obtained reasonable?	N/A
4b) What is your perspective of how Information Technology is structured in the State of Colorado?	N/A
4c) What challenges do you envision with the	N/A

State of Colorado with respect to consolidating more information technology disciplines?	
5) What current challenges are facing your Information Technology organization in providing service to your department?	Greatest challenges are the shortage of resources (both human and financial resources). Workload continues to increase without commensurate resources.
5a) Have you encountered challenges in obtaining the funding desired? Do you have examples?	Yes, many examples.
5b) Do you believe compensation is a barrier to acquiring the talented information technology individuals the state requires?	Yes; the State is not building a workforce. There is a gap between old and new employee retirement benefits and this is creating a gap between long timers and new employees since most new employees are not long term hires. Another barrier to long term employment is lack of training for the workforce limiting individual advancement.
5c) What is the single greatest challenge you see for your organization to service the department you support?	Resource availability
5d) How do you currently determine how to prioritize Information Technology work (projects) within your department?	Informally; no formal business strategic planning process in place. Some discussion with business leaders on some activities
5e) Do you have an enterprise architect position or a process to ensure that systems are designed and integrated in a consistent manner?	Not a role, a discipline performed by multiple individuals. No single accountable individual
6) Do you believe your core business functions (e.g. procurement, finance, human resources, etc.) are different from other State of Colorado departments? If so, how?	Yes; vendors tell them so. Human resources is different by department but accounting and procurement are likely the same
6a) What common services do you envision the State of Colorado needs that should be standardized at the enterprise level?	Payroll, benefits
7) What changes do you envision could be made that would benefit the Statewide Information Technology organization?	DND
7a) How could you benefit from these changes?	DND
7b) What concerns would you have about a consolidation process?	Just to ensure that service does not degrade from the activity
7c) How would you plan a consolidation process?	See answers to # 2c above
8) Do you provide any unique functions to your business users that are not common across other State of Colorado departments?	Yes; they have 42 different systems that are used to support core functions and a number of additional administrative and management systems
9) How would you ensure performance of services using a consolidated staff?	Using a formalized set of metrics, service levels, and a formalized priority structure help accountable through a customer roundtable and surveys
10) What role if any would you like to have in the Enterprise Architecture evaluation?	DND
11) What role if any would you like to have in how Information Technology is re-structured to better serve the citizens of Colorado?	Would participate in helping to define approaches so that customer expectations are kept consistent
12) What would you say is your greatest	Experience (25 Years Government experience)

strength?

Table 18.2 – Department of Human Services Discussion

Kim Heldman	**Department of Transportation** **Department of Natural Resources**
Question	Response
1) Have you been able to review the State of Colorado strategic plan?	Yes
1a) Do you agree that the objectives set forth in the State of Colorado Strategic IT Plan are laudable objectives?	Yes; nothing too surprising in the objectives
1b) How would you set about accomplishing those objectives?	DND—Through collaboration with the CIO's and with the many very gifted subject matter experts who already work for the state. I believe the best approach is a combination of outside, objective expertise (consultant resources) combined with the knowledge and experience of those who work in the trenches of State government.
2) Do you believe in the value of IT consolidation?	Yes, there is definite value. Consolidation will be easier to achieve in some areas than in others. Infrastructure is a quick win. Similar comments for help desk, and desktop support.
2a) Why or why not?	There is value to some types of consolidation. Standardized platforms would greatly increase our ability to capitalize on procurement savings. Enterprise wide applications such as email and standard Office applications being administered and supported within a centralized structure will increase efficiency and reduce our costs.
2b) Are there any information technology functions you believe should be consolidated? If so, which ones?	Infrastructure, help desk (from the perspective of support of common enterprise level software packages), desktop support. Must be very careful with applications because of the affinity in knowing the business. The same comments hold true for Natural Resources.
2c) What would be your approach (e.g. order) to Information Technology consolidation (e.g. department by department, infrastructure, applications, support, or a different approach)?	Standardize the infrastructure first; some challenges in Natural Resources to standardization. Natural Resources has 5 different IT shops. First and foremost, you need a governance structure and must develop SLA's or MOU's to explain to the users—those who are ultimately going to be impacted by this change—how levels of service will be defined and delivered. Next, you must standardize the platform. Then I believe you're ready to begin a department by department approach to consolidating hardware and applications onto that standard platform.
2d) Do you believe in the concept of standardization of technologies?	Yes, we have already standardized hardware and software at CDOT. The benefits include reduced training costs, increased cross training opportunities, and the ability to backfill positions.

3) Do you have an opinion as to why previous efforts to move to a more consolidated Information Technology Management model in the State of Colorado have not been successful?	Lack of funding and lack of authority. There wasn't a solid project plan in place and discovery of information was haphazard at best (i.e., there were no definitions to the questions so each agency interpreted the questions and answered them differently),
4) Have you studied other states' experience in consolidation?	No
4a) Do you find the claimed value they obtained reasonable?	DND
4b) What is your perspective of how Information Technology is structured in the State of Colorado?	Each agency has it's own IT structure and therefore there are many different platforms, applications, and support structure.
4c) What challenges do you envision with the State of Colorado with respect to consolidating more information technology disciplines?	Obtaining funding, determining SLA's and MOU's that will satisfy the differing agency needs, and supporting the needs of the 23+ unique missions of the departments within the State.
5) What current challenges are facing your Information Technology organization in providing service to your department?	In Natural Resources, decentralization and silos of Information Technology
5a) Have you encountered challenges in obtaining the funding desired? Do you have examples?	Some challenges in getting funding for staff, funding for cyber security policies, funding for storage, funding for applications (like document imaging, SharePoint, network monitoring tools, etc).
5b) Do you believe compensation is a barrier to acquiring the talented information technology individuals the state requires?	In Transportation, close to 50% of the staff can retire. There is constant attrition as new staff is hired and then quickly leave for a position where they are compensated at a higher level. Transportation and DNR cannot compete in some specific markets including, Aspen, Eagle county, etc.
5c) What is the single greatest challenge you see for your organization to service the department you support?	Hiring and retaining the necessary personnel required to support Information Technology.
5d) How do you currently determine how to prioritize Information Technology work (projects) within your department?	In Natural Resources, each organization prioritizes their work. In Transportation, the process is being developed.
5e) Do you have an enterprise architect position or a process to ensure that systems are designed and integrated in a consistent manner?	Transportation has a person, but Natural Resources does not. Will get an external person when required.
6) Do you believe your administrative business functions (e.g. procurement, finance, human resources, etc.) are different from other State of Colorado departments? If so, how?	Transportation has some unique business functions due to our Federal Funding model. Procurement is broken in the State. There are process constraints introduced by different rules and different interpretations of the rules. Each agency interprets the rules differently. Some IT procurements within CDOT take months to complete. The same interpretation problem is true for Human Resources. One example is one agency may require that an IT Pro IV be a supervisor where another agency believes staff authority is enough to justify an IT IV position.

6a) What common services do you envision the State of Colorado needs that should be standardized at the enterprise level?	Timekeeping, ERP (including HR, finance, and accounting), email, project management, disaster recovery, file storage, document management (document imaging).
7) What changes do you envision could be made that would benefit the Statewide Information Technology organization?	Personnel issues loom large. The ability to acquire and hold onto qualified personnel while displacing non-performers is an important issue. Additionally, making it much easier to procure goods and services (and reducing the timeframes to get them procured) would be a great benefit.
7a) How could you benefit from these changes?	The ability to procure goods and services in a timely manner would help us be more efficient. Our project timelines are constantly changing due to delays in the procurement process. Hiring personnel is also an issue. We lose good candidates due to the length of time it takes to get through the process. And, the ability to only see the top three candidates is inefficient. Twice in my experience at the state I have hired the number one candidate out of the HR process and they did not work out and had to be let go during the probationary period.
7b) What concerns would you have about a consolidation process?	Communication must be one of primary deliverables of this process. People fear what they don't know. If we aren't communicating with them, they're making things up in their imaginations that aren't anywhere near reality. Fear is a morale killer. They more they know and are aware of what's happening (before it happens), the more productive they'll be. My concern is that productivity will plunge as the consolidation plan rumors get out there and people will be more worried about losing their jobs (and perhaps using State time to seek out new employment) as opposed to concentrating on their jobs.
7c) How would you plan a consolidation process?	I would definitely use a hybrid-collaborative approach by soliciting feedback and ideas from State staff and by bringing in objective third-parties to introduce out-of-the-box type thinking.
8) Do you provide any unique functions to your business users that are not common across other State of Colorado departments?	Support for industry specific applications that no other agency uses.
9) How would you ensure performance of services using a consolidated staff?	SLA's; the existing DoIT structure does not provide good service and does not have a good reputation.
10) What role if any would you like to have in the Enterprise Architecture evaluation?	Would be glad to participate; the more involvement the smoother the effort. Should also utilize the existing organizations (PMUG, etc.).
11) What role if any would you like to have in how Information Technology is re-structured to better serve the citizens of Colorado?	Would be happy to be involved with ERP, organizational change management efforts, personnel, project management; also would be happy to help with consideration of infrastructure (Transportation does not use MNT)

12) What would you say is your greatest strength?	My personal greatest strength is my leadership skills. (Leadership skills as expressed in the ability to get people working together toward a common vision and building consensus around the vision). CDOT IT's greatest strength is it's exceptional people, their technical skills, and their knowledge of the business functions of this agency.

Table 18.3 – Department of Transportation, Department of Natural Resources Discussion

Mike Whatley	**Department of Regulatory Agencies**
Question	Response
1) Have you been able to review the State of Colorado strategic plan?	Yes
1a) Do you agree that the objectives set forth in the State of Colorado Strategic IT Plan are laudable objectives?	Yes; optimistic that we can achieve many of these. There are significant hurdles however.
1b) How would you set about accomplishing those objectives?	We need a clear and demonstrated set of goals along with measurements and communication of progress. In short, people don't believe right now. We need demonstrated example of success. DoIT does not have an encouraging track record.
2) Do you believe in the value of IT consolidation?	Yes
2a) Why or why not?	There is value in redundancy (e.g. across the enterprise) but also in standardization.
2b) Are there any information technology functions you believe should be consolidated? If so, which ones?	All of the fundamental services such as security, network, email. We have many firewalls, networks, email systems, blackberries, and we need to combine like services.
2c) What would be your approach (e.g. order) to Information Technology consolidation (e.g. department by department, infrastructure, applications, support, or a different approach)?	DND
2d) Do you believe in the concept of standardization of technologies?	DND
3) Do you have an opinion as to why previous efforts to move to a more consolidated Information Technology Management model in the State of Colorado have not been successful?	Largely because of the fits and starts of prior attempts. This has caused a lack of confidence. There is incredible talent in the state; for the most part vendors are not needed. Also, there has been no long bill or legislative support resulting in lack of centralized support in the past. Also, IT has been treated as an expenditure rather than an investment.
4) Have you studied other states' experience in consolidation?	Only in North Carolina and Utah and only as relates to GIS consolidation efforts.
4a) Do you find the claimed value they obtained reasonable?	There are varying degrees of success in delivering services. Who delivers service is irrelevant. The quality of the service is important. Also want cheaper, better service.
4b) What is your perspective of how Information Technology is structured in the State of Colorado?	The existing structure is driven by the way that the state does business. A question to ask is what services does the state deliver which drives us this

	way?
4c) What challenges do you envision with the State of Colorado with respect to consolidating more information technology disciplines?	There is need for an effective change management plan and a good communication plan. Also, some staff is losing focus because of the preannouncement through published articles. Nobody likes to be blind-sided. Timely information is essential in managing the change to address staff issues proactively.
5) What current challenges are facing your Information Technology organization in providing service to your department?	The business may have to change to get there. Somewhat new in position. There will be resistance to change.
5a) Have you encountered challenges in obtaining the funding desired? Do you have examples?	Not too much, the agency is mostly cash funded.
5b) Do you believe compensation is a barrier to acquiring the talented information technology individuals the state requires?	Yes that is a problem. The market is better and as the market improves it becomes harder to hire the right individuals.
5c) What is the single greatest challenge you see for your organization to service the department you support?	Quality of vendors we are outsourced with. The staff is fabulous. There is some concern in going with DoIT. Very concerned quality of service is not good. Also, there are a number of individuals with a lot of knowledge getting close to retirement. Institutional knowledge is hard to replace.
5d) How do you currently determine how to prioritize Information Technology work (projects) within your department?	Groups of stakeholders and IT work together.
5e) Do you have an enterprise architect position or a process to ensure that systems are designed and integrated in a consistent manner?	Not per se; the approach is handled by team using knowledgeable staff
6) Do you believe your administrative business functions (e.g. procurement, finance, human resources, etc.) are different from other State of Colorado departments? If so, how?	Classification system is archaic. Most administrative applications are the same as is email, infrastructure, etc.
6a) What common services do you envision the State of Colorado needs that should be standardized at the enterprise level?	Employee systems, financial systems (currently COFRS), etc. Some state agencies have to create enterprise systems because they are not addressed from the enterprise perspective.
7) What changes do you envision could be made that would benefit the Statewide Information Technology organization?	The general assembly needs to be educated with respect to investment in IT.
7a) How could you benefit from these changes?	Would change the culture of how IT is perceived and funded.
7b) What concerns would you have about a consolidation process?	That it will take funds to complete the consolidation as well as people. Where do we get these resources?
7c) How would you plan a consolidation process?	DND
8) Do you provide any unique functions to your business users that are not common across other State of Colorado departments?	Some domain functions.
9) How would you ensure performance of services using a consolidated staff?	Define specific metrics to measure; define specific costs to provide the service. Leverage efficiencies in

	providing service wherever possible. There is no baseline today of existing service. Need a plan with steps of service.
10) What role if any would you like to have in the Enterprise Architecture evaluation?	Interested in participating anyway possible. Wants to help ensure the success of the consolidation. DORA can provide a person good with software development.
11) What role if any would you like to have in how Information Technology is re-structured to better serve the citizens of Colorado?	Help to educate staff and not just do consolidation to them.
12) What would you say is your greatest strength?	Strategic thinker who can manage relationships. Can also help to "sell" the concept and activities at multiple levels.

Table 18.4 – Department of Regulatory Agencies Discussion

Jim Lynn (+Russ Arch, Major Woods)	**Department of Public Safety**
Question	Response
1) Have you been able to review the State of Colorado strategic plan?	Yes
1a) Do you agree that the objectives set forth in the State of Colorado Strategic IT Plan are laudable objectives?	Yes and achievable. There need to be follow-on actions to ensure the plan is implemented.
1b) How would you set about accomplishing those objectives?	Need to set a plan that encourages people to come to the table and act as a group
2) Do you believe in the value of IT consolidation?	Yes
2a) Why or why not?	Value in consolidation; some concern whether the state should be in the data center business. There is also the question whether we have the collective will to see it through. All of the agencies are different. Also how high of a priority is this to do (e.g. is there funding?). Cash funded agencies are unique. There are however unique requirements per agency that need to be considered while planning for consolidation, like backgrounds checks for employees.
2b) Are there any information technology functions you believe should be consolidated? If so, which ones?	Infrastructure, email, security, data centers (if the state stays in that business) data protection. Also, help desk management
2c) What would be your approach (e.g. order) to Information Technology consolidation (e.g. department by department, infrastructure, applications, support, or a different approach)?	OIT may be pushing faster than we can move; staffs in agencies are limited. Would set standards, policies, etc. Would start small and then build trust through repeatable execution.
2d) Do you believe in the concept of standardization of technologies?	Yes; both hardware and software; industry and vendor
3) Do you have an opinion as to why previous efforts to move to a more consolidated Information Technology Management model in the State of Colorado have not been successful?	Lack of trust, lack of support from governor and the lack of collective will to see it through. Also, the previous efforts were not accompanied with a well thought out plan. Need to do this in an evolutionary manner with wins and well defined service levels
4) Have you studied other states' experience in	Yes; have looked at Georgia. The public safety

consolidation?	organization lost a lot of control which was problematic. Have also looked at challenges of Phil Bates, prior Utah CIO.
4a) Do you find the claimed value they obtained reasonable?	DND
4b) What is your perspective of how Information Technology is structured in the State of Colorado?	DND
4c) What challenges do you envision with the State of Colorado with respect to consolidating more information technology disciplines?	DND
5) What current challenges are facing your Information Technology organization in providing service to your department?	Challenges in managing systems used in law enforcement because state core systems are not configured to easily exchange data with other states. Also, video conferencing is important but there is no standard for that either.
5a) Have you encountered challenges in obtaining the funding desired? Do you have examples?	Can't get funding for email. Contract management is also an issue. The existing state template does not protect the state; there is need for a contract management team.
5b) Do you believe compensation is a barrier to acquiring the talented information technology individuals the state requires?	Funding is too low for staffing. At this point, it has not greatly affected staffing because there is low turnover. However, the agency is susceptible to loss because it is hard to find talent at the existing compensation levels. Some positions require a supervisor components and individuals are moved into ranks without appropriate supervisory skills.
5c) What is the single greatest challenge you see for your organization to service the department you support?	Extremely short of staff given the work that must be done. Also, there is limited flexibility to compensate staff. There is disparity between the IT staff and the business staff. Can't attract the quality of staff needed.
5d) How do you currently determine how to prioritize Information Technology work (projects) within your department?	The process is currently very reactive to demand, although some initiatives are driven through the departmental strategic plan
5e) Do you have an enterprise architect position or a process to ensure that systems are designed and integrated in a consistent manner?	Have recently introduced enterprise architecture
6) Do you believe your administrative business functions (e.g. procurement, finance, human resources, etc.) are different from other State of Colorado departments? If so, how?	Not too much different. DoIT wants $235,000 a year for email and if they are not cost effective than Public Safety will do it. There is need for a common set of administrative systems.
6a) What common services do you envision the State of Colorado needs that should be standardized at the enterprise level?	DND
7) What changes do you envision could be made that would benefit the Statewide Information Technology organization?	Show true leadership. Somewhat frustrated with follow through. There are too many times when a bunch of ideas are generated but there is no follow through. If we say we are going to do it, let's do it. Let's not try to do 5 things, but rather do one and do it well. The state needs a success. Do not re-invent

	the wheel here.
7a) How could you benefit from these changes?	DND
7b) What concerns would you have about a consolidation process?	DND
7c) How would you plan a consolidation process?	DND
8) Do you provide any unique functions to your business users that are not common across other State of Colorado departments?	The overall functions provided are the same as other agencies, but the service delivery and security requirements are unique at times.
9) How would you ensure performance of services using a consolidated staff?	We need SLAs to set expectations and then to manage to them.
10) What role if any would you like to have in the Enterprise Architecture evaluation?	Want to help achieve as many of the strategic initiatives as possible.
11) What role if any would you like to have in how Information Technology is re-structured to better serve the citizens of Colorado?	Want to be involved as much as we can. Can help with communications so as to provide a sufficient level of information to allay fears.
12) What would you say is your greatest strength?	We need leadership; can assist in providing this leadership

Table 18.5 – Department of Public Safety Discussion

John Picanso	**Department of Agriculture**
Question	Response
1) Have you been able to review the State of Colorado strategic plan?	Yes
1a) Do you agree that the objectives set forth in the State of Colorado Strategic IT Plan are laudable objectives?	Agree completely with the goals; very supportive
1b) How would you set about accomplishing those objectives?	Defining performance measurement; work towards common services (payroll, hr, etc.). Must address strategy from both a political and leadership perspective. We do need to find money to make money and need start up funds. Consolidate common services.
2) Do you believe in the value of IT consolidation?	Yes
2a) Why or why not?	There are a number of benefits of consolidation. Need to emphasize standards and have vendors follow the states' standards.
2b) Are there any information technology functions you believe should be consolidated? If so, which ones?	Disaster recovery, telecommunications, server hosting, email and calendaring. Would start with infrastructure but probably not go the whole way in consolidating all departmental functions.
2c) What would be your approach (e.g. order) to Information Technology consolidation (e.g. department by department, infrastructure, applications, support, or a different approach)?	Would not consolidate by department but by function. Would start with infrastructure but probably not go the whole way in consolidating all departmental functions, but would services and selective business functions. Would standardize on the portal for constituent and business services. Would use SLAs to enforce performance. Also a skills assessment should be undertaken
2d) Do you believe in the concept of	Yes; both industry and vendor

standardization of technologies?	
3) Do you have an opinion as to why previous efforts to move to a more consolidated Information Technology Management model in the State of Colorado have not been successful?	Approaches used were often justified on critical basis. All elements (political, organizational, funding, governance, service) of consolidation were not embraced. Using benchmarks from other organizations is valuable. A lot of negative press generated over IT; should be careful because although everything is not done right many things have been. State CIO must step in to adjudicate troublemakers.
4) Have you studied other states' experience in consolidation?	Yes; reviewed work done by NASCIO. Worked some with T. Takai. We do need to establish a baseline in Colorado so we can show definitive improvement. We have not been able to historically quantify what has been done.
4a) Do you find the claimed value they obtained reasonable?	Yes in general
4b) What is your perspective of how Information Technology is structured in the State of Colorado?	IT is well structured in Colorado and evolved to meet the needs of the agencies; would counsel against complete consolidation leaving the most domain specific functions close to the business, but would centralize everything of a commodity nature. Agility from a centralized service organization is one of the most important attributes of the organization.
4c) What challenges do you envision with the State of Colorado with respect to consolidating more information technology disciplines?	Service, organizational dynamics, funding. The desire is to focus on my business and allowing more utility services to be handled externally.
5) What current challenges are facing your Information Technology organization in providing service to your department?	The requirements for IT personnel are not consistent with business requirements compromising ITs ability to succeed
5a) Have you encountered challenges in obtaining the funding desired? Do you have examples?	Yes; the State needs to address how budget items are processed and how to sustain funding for needed Information Technology work. Operates on lean FTE budget but would like more to address more business work. The business is getting much more complex and as such IT will get more complex.
5b) Do you believe compensation is a barrier to acquiring the talented information technology individuals the state requires?	Yes; resource availability is market driven and the state needs to be able to match market compensation. Funds to support a sustainable IT organization need to be allocated.
5c) What is the single greatest challenge you see for your organization to service the department you support?	Concern that a centralized organization may not be agile enough to respond to the needs of the agencies. JBC has a limited amount of money and they are focused at the high level. When driving down to detail things are lost.
5d) How do you currently determine how to prioritize Information Technology work (projects) within your department?	Work is managed through a formal pipeline. There is no formal portfolio management but business users do prioritize work. As of this interview there are 111 tasks and 22,000 hours of work for projects on the pipeline.
5e) Do you have an enterprise architect position	No; some work of this nature is handled through

or a process to ensure that systems are designed and integrated in a consistent manner?	consultants and some through John and other internal resources
6) Do you believe your core business functions (e.g. procurement, finance, human resources, etc.) are different from other State of Colorado departments? If so, how?	No; even if there are subtle differences, they need to be standardized according to the 80/20 rule.
6a) What common services do you envision the State of Colorado needs that should be standardized at the enterprise level?	Procurement, portal, help desk, email, server hosting.
7) What changes do you envision could be made that would benefit the Statewide Information Technology organization?	Skills assessment and database help desk, portal with stronger service levels for service.
7a) How could you benefit from these changes?	Focus more on the business
7b) What concerns would you have about a consolidation process?	Just to ensure that service does not degrade from the activity
7c) How would you plan a consolidation process?	See answers to # 2c above
8) Do you provide any unique functions to your business users that are not common across other State of Colorado departments?	There are some functions specific to the Department of Agriculture but not that many. No way to please everybody with a tool; need to select a tool and standardize on it.
9) How would you ensure performance of services using a consolidated staff?	Use both benchmarks and SLA for services and for the availability, etc. Such SLAs must have both accountability and remediation.
10) What role if any would you like to have in the Enterprise Architecture evaluation?	Would participate wherever necessary, especially in EA governance
11) What role if any would you like to have in how Information Technology is re-structured to better serve the citizens of Colorado?	Have done this in prior life; let someone else learn it.
12) What would you say is your greatest strength?	Both skilled as a communicator and as a technical leader

Table 18.6 – Department of Agriculture Discussion

Harley Rinerson	**Department of Military Affairs**
Question	Response
1) Have you been able to review the State of Colorado strategic plan?	Yes
1a) Do you agree that the objectives set forth in the State of Colorado Strategic IT Plan are laudable objectives?	Yes they are laudable; generally motherhood and apple pie based; not wrong in any sense, just generic. Some are more achievable than others.
1b) How would you set about accomplishing those objectives?	Correct problems with attracting skills sets in state government; move employees to at will status from classified. Achieve buy-in for some centralized themes. Outsource service the state can not effectively provide. Consolidate data centers; could use eFOR3T as interim location. Need to institutionalize training. Should make CIO's → MIS directors and have 1 CIO, but current CIO's must be involved in the planning. State CIO should have input to performance review of departmental CIO's
2) Do you believe in the value of IT consolidation?	Yes, but not complete consolidation

2a) Why or why not?	Some cost savings; see the state heading towards efficiency versus effectiveness.
2b) Are there any information technology functions you believe should be consolidated? If so, which ones?	Network services such as firewall management; hardware acquisition and standardization; some challenges in doing the same with software. Also consolidation to 3 or so facilities should be undertaken. DoIT can not current provided the needed services. Consolidating electronic mail to a non-open source solution will incur a short term cost.
2c) What would be your approach (e.g. order) to Information Technology consolidation (e.g. department by department, infrastructure, applications, support, or a different approach)?	Set certain consolidation themes and then move towards consolidating those areas. Would take whatever action necessary (e.g. terminating CIO's) to achieve the goals
2d) Do you believe in the concept of standardization of technologies?	Yes, although most standardization is at the industry level, not the vendor level (e.g. non vendor specific). The state does not even enforce the standards they do have.
3) Do you have an opinion as to why previous efforts to move to a more consolidated Information Technology Management model in the State of Colorado have not been successful?	There was lack of organizational buy-in and the fact that IT has traditionally been implemented in silos has been. In addition, most individuals in IT do not see it in their benefit to consolidate.
4) Have you studied other states' experience in consolidation?	AZ only. Believes there must be an incentive for people to join in the process.
4a) Do you find the claimed value they obtained reasonable?	Yes in general
4b) What is your perspective of how Information Technology is structured in the State of Colorado?	Funding by department, silos, annual funding makes it hard to manage.
4c) What challenges do you envision with the State of Colorado with respect to consolidating more information technology disciplines?	Breaking the culture doing things in a silo-based fashion. Also, to be effective it would be important to be able to move funds between agencies. Just general resistance.
5) What current challenges are facing your Information Technology organization in providing service to your department?	Poor documentation in agency; service relies on heroic efforts of individuals, cyber-security is lacking
5a) Have you encountered challenges in obtaining the funding desired? Do you have examples?	Not so much; relies heavily on open source applications and services; would have problems if vendor products used
5b) Do you believe compensation is a barrier to acquiring the talented information technology individuals the state requires?	Yes as well as training and the structure of the compensation system. The state needs to offer some incentives that make it competitive with private industry. Also, government service does not compete with service provided by private industry
5c) What is the single greatest challenge you see for your organization to service the department you support?	Depth of personnel; since the organization is small, the loss of an individual can affect service for a period of time
5d) How do you currently determine how to prioritize Information Technology work (projects) within your department?	Not much product work; more of a support organization; most projects infrastructure or service related. The CIO prioritizes most activities.
5e) Do you have an enterprise architect position or a process to ensure that systems are designed	No

and integrated in a consistent manner?	
6) Do you believe your core business functions (e.g. procurement, finance, human resources, etc.) are different from other State of Colorado departments? If so, how?	No not really; although at some point we need to look at how accounting is handled within the state; state; there are 15,000+ JVs in COFRS. COFRS and the employee systems need to be replaced. In general, these functions should be standardized.
6a) What common services do you envision the State of Colorado needs that should be standardized at the enterprise level?	Procurement, catalog of services (ITIL), and a look at common systems which can be used across the enterprise – no specifics
7) What changes do you envision could be made that would benefit the Statewide Information Technology organization?	Move employees to at-will from classified. Personnel rules need to be changed. Also, there needs to be a formal training plan for individuals.
7a) How could you benefit from these changes?	Would allow state to build a competent and sustainable workforce.
7b) What concerns would you have about a consolidation process?	Just to ensure that service does not degrade from the activity
7c) How would you plan a consolidation process?	See answers to # 2c above
8) Do you provide any unique functions to your business users that are not common across other State of Colorado departments?	No; provides general services only
9) How would you ensure performance of services using a consolidated staff?	Using a formalized set of service levels along with enforceable penalties for missing service. Need service that the departments can rely on.
10) What role if any would you like to have in the Enterprise Architecture evaluation?	Would be happy to advise through the process; very busy with many items (HS, DEM)
11) What role if any would you like to have in how Information Technology is re-structured to better serve the citizens of Colorado?	Would be happy to advise through the process; very busy with many items (HS, DEM)
12) What would you say is your greatest strength?	Ability to get things done; security. Utilize the CIO's to lead the effort.

Table 18.7 – Department of Military Affairs Discussion

Paul Lewin	**Department of Corrections**
Question	Response
1) Have you been able to review the State of Colorado strategic plan?	Yes
1a) Do you agree that the objectives set forth in the State of Colorado Strategic IT Plan are laudable objectives?	Yes they are laudable
1b) How would you set about accomplishing those objectives?	Convene committee structures and determine what organizations are doing what best. Try to avoid purely top down driven consolidation. Get staff involved in the process.
2) Do you believe in the value of IT consolidation?	Yes
2a) Why or why not?	Some value in consolidation especially from financial perspective. Should look at centers of excellence.
2b) Are there any information technology functions you believe should be consolidated? If so, which ones?	Computer support, technology standards, support structures and services. Corrections uses an inmate staffed help desk for tier 1 support.
2c) What would be your approach (e.g. order) to	Plan the effort thoroughly, examining what agencies

Information Technology consolidation (e.g. department by department, infrastructure, applications, support, or a different approach)?	do well and don't do well. Develop a formal strategy and plan. In step 1 set the standards and processes, in step 2 start the consolidation.
2d) Do you believe in the concept of standardization of technologies?	Yes
3) Do you have an opinion as to why previous efforts to move to a more consolidated Information Technology Management model in the State of Colorado have not been successful?	The basic reason is that there was no one to do the consolidation. Also, the devil is in the details meaning that conceptually its fine but needs extensive planning. Previous approaches were too theoretical. Would be valuable for GOIT to learn more about the agencies before making changes.
4) Have you studied other states' experience in consolidation?	Yes, New Mexico specifically; some disciplines such as procurement were standardized with great effect.
4a) Do you find the claimed value they obtained reasonable?	Yes
4b) What is your perspective of how Information Technology is structured in the State of Colorado?	Works the way it is but could be better in many ways.
4c) What challenges do you envision with the State of Colorado with respect to consolidating more information technology disciplines?	N/A
5) What current challenges are facing your Information Technology organization in providing service to your department?	The Corrections department is growing and without the necessary capability to grow the IT organization commensurately. Corrections laid off people when they should have been hiring. Model is backwards (worse economic times → lay offs → increase in prison population, better economic times → hiring → decrease in prison population)
5a) Have you encountered challenges in obtaining the funding desired? Do you have examples?	Yes, especially with respect to personnel. Believes they have lost their technological edge because of loss of people.
5b) Do you believe compensation is a barrier to acquiring the talented information technology individuals the state requires?	Yes; the organization has trouble keeping up with the speed of business. Also, the compensation structures can be barriers to acquiring and holding onto qualified individuals.
5c) What is the single greatest challenge you see for your organization to service the department you support?	Meeting the needs of the business in a timely manner.
5d) How do you currently determine how to prioritize Information Technology work (projects) within your department?	Priorities are set by the organization (business units) through executive mandate.
5e) Do you have an enterprise architect position or a process to ensure that systems are designed and integrated in a consistent manner?	No
6) Do you believe your core business functions (e.g. procurement, finance, human resources, etc.) are different from other State of Colorado departments? If so, how?	Not generally. There are of course some Corrections Department specific applications which need to be addressed.
6a) What common services do you envision the State of Colorado needs that should be standardized at the enterprise level?	Maintenance, payroll, radios, collaborative tools, project management tools.

7) What changes do you envision could be made that would benefit the Statewide Information Technology organization?	Purchasing, standardization, resource utilization. Should probably develop a geographic state resource map showing IT services by location by agency. Also agencies should work together to collaborate more and do things less independently.
7a) How could you benefit from these changes?	Combine services with other agencies
7b) What concerns would you have about a consolidation process?	Just to ensure that service does not degrade from the activity
7c) How would you plan a consolidation process?	See answers to # 2c above
8) Do you provide any unique functions to your business users that are not common across other State of Colorado departments?	Inmate phone system, medical, enterprise resource planning and manufacturing, housing system
9) How would you ensure performance of services using a consolidated staff?	Service levels would work if there was accountability behind them.
10) What role if any would you like to have in the Enterprise Architecture evaluation?	Would be willing to serve on some of the governance committees; need team players on these committees. Wants to ensure that proper alignment exists between authority and responsibility.
11) What role if any would you like to have in how Information Technology is re-structured to better serve the citizens of Colorado?	Would like to be involved at a number of different levels related to consolidation including financing
12) What would you say is your greatest strength?	Finding good people, vision, solutions architecture and management

Table 18.8 – Department of Corrections Discussion

Diane Kress	**Department of Education**
Question	Response
1) Have you been able to review the State of Colorado strategic plan?	Yes
1a) Do you agree that the objectives set forth in the State of Colorado Strategic IT Plan are laudable objectives?	Yes they are laudable, but the devil is in the details; this has been lacking previously
1b) How would you set about accomplishing those objectives?	Should gather as much data as possible. Consolidate what can be consolidated; some things can not be consolidated. For example, Oregon requested an opinion on consolidating some infrastructure used in support of FERPA and was counseled to not consolidate infrastructure to personnel not directly under the control of the DoE
2) Do you believe in the value of IT consolidation?	Yes there is value in bringing things together for the benefit of the larger organization. DoE does not use DoIT somewhat because they believe they can not be at DoIT.
2a) Why or why not?	Cost savings are associated with consolidation, but potentially at a cost of service. There is a concern that there is no way to hold a centralized service organization financially accountable to providing good service. Also, there is concern that consolidation may be undertaken based on false information and premises.

2b) Are there any information technology functions you believe should be consolidated? If so, which ones?	Procurement, believes that all technology consolidations should undergo a cost/benefit analysis. Also contracting.
2c) What would be your approach (e.g. order) to Information Technology consolidation (e.g. department by department, infrastructure, applications, support, or a different approach)?	Start with doing a pilot perhaps in the Governors office and prove it works there. Extend on a discipline by discipline basis and eventually application by application basis as possible. Would not consolidate applications but would consolidate platforms. DoIT if the service provider would have to have new people. DoIT always wants more money at the end of the year and is always under funded.
2d) Do you believe in the concept of standardization of technologies?	Yes from both an industry standard and a vendor standard perspective. Should grandfather existing standards.
3) Do you have an opinion as to why previous efforts to move to a more consolidated Information Technology Management model in the State of Colorado have not been successful?	Not sure, but believes that top down approach will not work. GOIT should have to do the same cost / benefit analysis that everyone else does. Also believes that prior efforts were based on false information. CIOs and departments should be involved to be successful.
4) Have you studied other states' experience in consolidation?	Yes, especially Oregon.
4a) Do you find the claimed value they obtained reasonable?	Believe in what they claim to have accomplished; unsure as to other impacts
4b) What is your perspective of how Information Technology is structured in the State of Colorado?	Silos designed to be responsive and that Federal funding requires it. There are many Federal rules that constrain us.
4c) What challenges do you envision with the State of Colorado with respect to consolidating more information technology disciplines?	Concern over reduction in service the agencies receive, Federal funding constraints, and that the legislature is not prepared to fund Information Technology adequately.
5) What current challenges are facing your Information Technology organization in providing service to your department?	Funding which affects both staff and resources and the agenda of the commissioner
5a) Have you encountered challenges in obtaining the funding desired? Do you have examples?	Yes
5b) Do you believe compensation is a barrier to acquiring the talented information technology individuals the state requires?	The have been fortunate to get talent, but it is problematic to hold onto them. The compensation levels and structure don't mirror reality. No retirement issue for them as they attract individuals who want to be in this line of work. Generally start people out at basic level.
5c) What is the single greatest challenge you see for your organization to service the department you support?	Resource availability (applications and individuals)
5d) How do you currently determine how to prioritize Information Technology work (projects) within your department?	Informally all though most prioritization happens because of specific mandates.
5e) Do you have an enterprise architect position or a process to ensure that systems are designed	Not a role, a discipline performed by multiple individuals. Utilizes consultants as necessary.

and integrated in a consistent manner?	
6) Do you believe your core business functions (e.g. procurement, finance, human resources, etc.) are different from other State of Colorado departments? If so, how?	Some; HR is probably different, but some others are fine. State of Colorado financial data warehouse is useful. Employs 60% at will, 40% classified. Financial data warehouse has reduced special systems
6a) What common services do you envision the State of Colorado needs that should be standardized at the enterprise level?	Time keeping, web site content management, content management
7) What changes do you envision could be made that would benefit the Statewide Information Technology organization?	Standardized contracts and procurement; WSCA is a joke – can almost always procure cheaper but is used as a start
7a) How could you benefit from these changes?	Lower costs, simpler procurement
7b) What concerns would you have about a consolidation process?	Just to ensure that service does not degrade from the activity
7c) How would you plan a consolidation process?	See answers to # 2c above
8) Do you provide any unique functions to your business users that are not common across other State of Colorado departments?	Quite a number of unique functions related to education
9) How would you ensure performance of services using a consolidated staff?	Using a formalized set of service levels but there must be accountability to those service levels. Concerned there would be no way to exact financial penalties from DoIT.
10) What role if any would you like to have in the Enterprise Architecture evaluation?	Would like to be involved in the planning.
11) What role if any would you like to have in how Information Technology is re-structured to better serve the citizens of Colorado?	Would like to participate in planning especially with specific initiatives such as data warehousing.
12) What would you say is your greatest strength?	Communications; will champion a message

Table 18.9 – Department of Education Discussion

Bob Roper (+Chad)	**Department of Justice**
Question	Response
1) Have you been able to review the State of Colorado strategic plan?	Yes
1a) Do you agree that the objectives set forth in the State of Colorado Strategic IT Plan are laudable objectives?	DND
1b) How would you set about accomplishing those objectives?	DND
2) Do you believe in the value of IT consolidation?	Yes; a strong advocate of consolidation
2a) Why or why not?	Value obtained from it; will deliver value if don't right; currently supports 64 counties and 100 locations
2b) Are there any information technology functions you believe should be consolidated? If so, which ones?	DND
2c) What would be your approach (e.g. order) to Information Technology consolidation (e.g. department by department, infrastructure,	Complete assessment of each IT shop to find out what they do and how they do it. Normalize and standardize and then integrate business and IT

applications, support, or a different approach)?	
2d) Do you believe in the concept of standardization of technologies?	Yes; strongly
3) Do you have an opinion as to why previous efforts to move to a more consolidated Information Technology Management model in the State of Colorado have not been successful?	The prime reason is that the former governor did not empower the State CIO. Also, there was not enough attention as to how the IT shops in the state operated. There is incredible talent in the state – vendors are not needed.
4) Have you studied other states' experience in consolidation?	DND
4a) Do you find the claimed value they obtained reasonable?	DND
4b) What is your perspective of how Information Technology is structured in the State of Colorado?	Distributed by department supporting departmental operations. Also, the quality of the IT shops varies greatly.
4c) What challenges do you envision with the State of Colorado with respect to consolidating more information technology disciplines?	DND
5) What current challenges are facing your Information Technology organization in providing service to your department?	Performance of the help desk against defined metrics. In consolidation there is fear of loss of control. It will be important to deliver good service.
5a) Have you encountered challenges in obtaining the funding desired? Do you have examples?	DND
5b) Do you believe compensation is a barrier to acquiring the talented information technology individuals the state requires?	There is a retirement bubble forming. Will lose 40% of personnel in the next 3-4 years.
5c) What is the single greatest challenge you see for your organization to service the department you support?	The users want more service than they are currently being provided. Challenge is to provide quality services in the quantity required.
5d) How do you currently determine how to prioritize Information Technology work (projects) within your department?	Committees of line staff and policy staff
5e) Do you have an enterprise architect position or a process to ensure that systems are designed and integrated in a consistent manner?	DND
6) Do you believe your administrative business functions (e.g. procurement, finance, human resources, etc.) are different from other State of Colorado departments? If so, how?	Although there is a fear to join together it is best to do that standardizing on administrative business functions. Can't give up staff because they run so lean and mean.
6a) What common services do you envision the State of Colorado needs that should be standardized at the enterprise level?	DND
7) What changes do you envision could be made that would benefit the Statewide Information Technology organization?	Better network pricing; does not use MNT 2x the cost of other providers
7a) How could you benefit from these changes?	DND
7b) What concerns would you have about a consolidation process?	There is some question as to the level of trust of GOIT specifically around providing the same level of service. With DoIT it takes months to get circuits ordered. The help desk is a nightmare.

7c) How would you plan a consolidation process?	DND
8) Do you provide any unique functions to your business users that are not common across other State of Colorado departments?	We have our own CMS, jury selection system, accounting system, etc etc etc.
9) How would you ensure performance of services using a consolidated staff?	SLA's with a real penalty. They would need to surrender budget to Justice. Need an SLA where the penalties for missing it hurt.
10) What role if any would you like to have in the Enterprise Architecture evaluation?	Would be glad to serve in an advisory role. Also would like to set accountability through definition of service metrics.
11) What role if any would you like to have in how Information Technology is re-structured to better serve the citizens of Colorado?	DND
12) What would you say is your greatest strength?	DND

Table 18.10 – Department of Justice Discussion

Joe Lambert (+Smith, Flick, Helton)	**Department of Labor and Employment**
Question	Response
1) Have you been able to review the State of Colorado strategic plan?	Yes
1a) Do you agree that the objectives set forth in the State of Colorado Strategic IT Plan are laudable objectives?	Yes so long either the same services are available for less money or better services are available for the same money.
1b) How would you set about accomplishing those objectives?	Bite off smaller chunks and then developing a plan to accomplish the objectives; there needs to be critical thinking related to the planning and the ordering
2) Do you believe in the value of IT consolidation?	Yes, provisionally, believe it will take a long time to arrive at it
2a) Why or why not?	Some value in consolidation
2b) Are there any information technology functions you believe should be consolidated? If so, which ones?	Address the low hanging fruit first. Those are electronic mail, telephony, security,
2c) What would be your approach (e.g. order) to Information Technology consolidation (e.g. department by department, infrastructure, applications, support, or a different approach)?	Attack the quickest wins first and build upon success.
2d) Do you believe in the concept of standardization of technologies?	Yes
3) Do you have an opinion as to why previous efforts to move to a more consolidated Information Technology Management model in the State of Colorado have not been successful?	Not terribly well thought or planned out. In some cases, there were no business drivers or at least these had not been well defined.
4) Have you studied other states' experience in consolidation?	Some; Texas
4a) Do you find the claimed value they obtained reasonable?	N/A
4b) What is your perspective of how Information Technology is structured in the State of Colorado?	N/A

4c) What challenges do you envision with the State of Colorado with respect to consolidating more information technology disciplines?	The biggest issue is determining how consolidation will be funded.
5) What current challenges are facing your Information Technology organization in providing service to your department?	Lack of available general funds, lack of resources. Also from a department specific perspective the organization is transitioning from the mainframe to .NET. The organization is reactive instead of proactive.
5a) Have you encountered challenges in obtaining the funding desired? Do you have examples?	Yes; primary shortage encountered is for personnel and although there is spending authority there are arbitrary limits on FTE's.
5b) Do you believe compensation is a barrier to acquiring the talented information technology individuals the state requires?	Compensation is an issue; although there is low attrition rates, compensation offered requires entry level personnel to be hired and then trained. This has a negative effect on the productivity and once trained, they leave.
5c) What is the single greatest challenge you see for your organization to service the department you support?	The staffing is only one deep and relies on single individuals. If something happens to them, than it is will affect the business. No real time to cross train.
5d) How do you currently determine how to prioritize Information Technology work (projects) within your department?	Vertically aligned business units set the priorities although in practice resolves to squeaky wheel. In some cases staffs are allocated to dedicated areas.
5e) Do you have an enterprise architect position or a process to ensure that systems are designed and integrated in a consistent manner?	No real discipline; the lack of state standards causes further problems. Also some processes missing. Can't ever get far enough ahead of the game to do architecture.
6) Do you believe your core business functions (e.g. procurement, finance, human resources, etc.) are different from other State of Colorado departments? If so, how?	In most cases no. Most business processes are not formalized and in some cases institutionalized. In many cases, there are no statewide policy decisions on how things are to be done. Starting some work on ITIL.
6a) What common services do you envision the State of Colorado needs that should be standardized at the enterprise level?	Database reporting, data warehousing, standardized query capabilities, help desk, electronic mail, enterprise problem management
7) What changes do you envision could be made that would benefit the Statewide Information Technology organization?	24 hour help desk; enterprise licenses, secure network
7a) How could you benefit from these changes?	DND
7b) What concerns would you have about a consolidation process?	Just to ensure that service does not degrade from the activity
7c) How would you plan a consolidation process?	DND
8) Do you provide any unique functions to your business users that are not common across other State of Colorado departments?	They have a number of systems specific to labor and employment.
9) How would you ensure performance of services using a consolidated staff?	SLAs which are accountable commensurate with financial penalties. Ensure they are renewable.
10) What role if any would you like to have in the Enterprise Architecture evaluation?	Would be happy to be involved but want to stress the need for constant and accurate communications.
11) What role if any would you like to have in how Information Technology is re-structured to better serve the citizens of Colorado?	Would be glad to help with project management, security, server virtualization, tool selection, and outsourcing

12) What would you say is your greatest strength?	Experience in operating stable and mature platforms and data exchange between systems.

Table 18.11 – Department of Labor and Employment Discussion

Brett Mueller	**Department of Revenue**
Question	Response
1) Have you been able to review the State of Colorado strategic plan?	Yes
1a) Do you agree that the objectives set forth in the State of Colorado Strategic IT Plan are laudable objectives?	Great goals; strategic planning is important. Believe the goals to be achievable. The state has a fragmented strategy. There are some challenges being faced in implementing some of these goals (e.g. broadband)
1b) How would you set about accomplishing those objectives?	We need discipline in moving towards the same goal. We need to establish a plan and then follow the plan. We need to coordinate how we go about consolidation.
2) Do you believe in the value of IT consolidation?	Yes, the existing business model is broken. There is excess capacity. Probably should measure the baseline.
2a) Why or why not?	Because it can, if done properly, reduce costs, improve services, and improve amount of work (throughput)
2b) Are there any information technology functions you believe should be consolidated? If so, which ones?	Infrastructure, email, VoIP, common data model. Counties have no skin in the game. Need some competition between counties. Whoever does the service gets the fee. Also when we consolidate services, the costs must be competitive (e.g. MNT). Should also look at various business silos and consolidate business functions across agencies.
2c) What would be your approach (e.g. order) to Information Technology consolidation (e.g. department by department, infrastructure, applications, support, or a different approach)?	Identify key goals; rank them according to value and execute. Utilize a common methodology. Utilize common data services. Consider an outside service provider. Base decisions on the following value points – quality, efficiency, capacity – capability, revenue attainment – cost reduction.
2d) Do you believe in the concept of standardization of technologies?	Yes; this is needed at the hardware and software level. Software includes application software as well.
3) Do you have an opinion as to why previous efforts to move to a more consolidated Information Technology Management model in the State of Colorado have not been successful?	There was a problem in that the budget was not ever controlled. Also we did not have disciplined IT leadership. Also, there did not seem to be any executive support of IT or technology. In the current environment the governor and legislature are supportive.
4) Have you studied other states' experience in consolidation?	Some
4a) Do you find the claimed value they obtained reasonable?	Somewhat; a paradigm shift must occur in IT
4b) What is your perspective of how Information Technology is structured in the State of Colorado?	There is considerable redundancy and inefficiency from the top down

4c) What challenges do you envision with the State of Colorado with respect to consolidating more information technology disciplines?	Legislative budget cycles, we do not have a competitive environment to make us more efficient. Mike needs to be given a flexible budget structure.
5) What current challenges are facing your Information Technology organization in providing service to your department?	Resource allocation. Aging staff; 20-25% is eligible for retirement in the next 3 years. 50% of leadership will turnover in the next 5 years.
5a) Have you encountered challenges in obtaining the funding desired? Do you have examples?	Problem in getting staffing and forced to hire contractors especially for J2EE.
5b) Do you believe compensation is a barrier to acquiring the talented information technology individuals the state requires?	We need to be competitive but we are not currently. The IT worker pool is shrinking. We need good leaders to deliver good service.
5c) What is the single greatest challenge you see for your organization to service the department you support?	Resource allocation. We also need a strategic plan for each agency with sponsorship from the governor.
5d) How do you currently determine how to prioritize Information Technology work (projects) within your department?	We use the business plan.
5e) Do you have an enterprise architect position or a process to ensure that systems are designed and integrated in a consistent manner?	Not per se; no single person performs the function. It is done through several people.
6) Do you believe your administrative business functions (e.g. procurement, finance, human resources, etc.) are different from other State of Colorado departments? If so, how?	Not really. Also, individuals departments can do work cheaper than DoIT right now.
6a) What common services do you envision the State of Colorado needs that should be standardized at the enterprise level?	DND
7) What changes do you envision could be made that would benefit the Statewide Information Technology organization?	We need data architects and a common data model. We also need to highlight IT accomplishments.
7a) How could you benefit from these changes?	DND
7b) What concerns would you have about a consolidation process?	Individuals throughout the organization are afraid of change. Also, no change is free. There will be time, money and effort required.
7c) How would you plan a consolidation process?	Get the good thinkers together; get the CIO's together to brainstorm. Hold a strategic planning meeting offsite facilitated for the CIO's.
8) Do you provide any unique functions to your business users that are not common across other State of Colorado departments?	DND
9) How would you ensure performance of services using a consolidated staff?	We need to ensure the legislature does not prevent change. Service provisioning has to be equitable.
10) What role if any would you like to have in the Enterprise Architecture evaluation?	Thought leadership
11) What role if any would you like to have in how Information Technology is re-structured to better serve the citizens of Colorado?	Development of a strategic deployment architecture, explanation of technology,
12) What would you say is your greatest strength?	DND

Table 18.12 – Department of Revenue Discussion

Brian Morrow	Department of Local Affairs
Question	Response
1) Have you been able to review the State of Colorado strategic plan?	Yes
1a) Do you agree that the objectives set forth in the State of Colorado Strategic IT Plan are laudable objectives?	Generally achievable; DOLA's IT plan has a lot of these as well.
1b) How would you set about accomplishing those objectives?	Develop trusts with customers and build relationships. Started 16 years ago and have operated this way.
2) Do you believe in the value of IT consolidation?	Yes if the consolidation makes sense – where it adds value.
2a) Why or why not?	Because the one issue is the potential impact on customer service which should not be compromised
2b) Are there any information technology functions you believe should be consolidated? If so, which ones?	Procurement, email, software standards such as Oracle, Citrix. Would use more Microsoft but it is too expensive. We need to get to a place where we have superior price agreements.
2c) What would be your approach (e.g. order) to Information Technology consolidation (e.g. department by department, infrastructure, applications, support, or a different approach)?	Identify areas to consolidate then entertain ideas using a collaborative approach. The state is more of a conglomerate than an enterprise. Don't always buy the lowest bidder. Consolidate common functions in a way that builds trust.
2d) Do you believe in the concept of standardization of technologies?	Yes; one vendor for most things is fine
3) Do you have an opinion as to why previous efforts to move to a more consolidated Information Technology Management model in the State of Colorado have not been successful?	Lack of confidence in GOIT. GOIT tends to be very volatile, anathema to sustainable consolidation. There are also administration considerations and new goals. Also, there is no consistency from CIO to CIO.
4) Have you studied other states' experience in consolidation?	No
4a) Do you find the claimed value they obtained reasonable?	N/A
4b) What is your perspective of how Information Technology is structured in the State of Colorado?	Similar entities working together bottom up is better than enterprise oversight from the top down
4c) What challenges do you envision with the State of Colorado with respect to consolidating more information technology disciplines?	Federal funding of various stovepipes.
5) What current challenges are facing your Information Technology organization in providing service to your department?	
5a) Have you encountered challenges in obtaining the funding desired? Do you have examples?	
5b) Do you believe compensation is a barrier to acquiring the talented information technology individuals the state requires?	Not really; have lost only 1 person in 8 years. The department is forced to recruit personnel with lower levels of experience and then train them. Loyalty is created with DOLA personnel.

5c) What is the single greatest challenge you see for your organization to service the department you support?	The required workload is 3x more than can be handled by the current staff.
5d) How do you currently determine how to prioritize Information Technology work (projects) within your department?	Priorities are set by an executive management group made up of IT and program personnel.
5e) Do you have an enterprise architect position or a process to ensure that systems are designed and integrated in a consistent manner?	Not per se; some staff performs this role as an aggregated group.
6) Do you believe your administrative business functions (e.g. procurement, finance, human resources, etc.) are different from other State of Colorado departments? If so, how?	Most administrative business functions are probably similar; COFRS is both antiquated and very inefficient. Budgeting is believed to be unique because of the programs
6a) What common services do you envision the State of Colorado needs that should be standardized at the enterprise level?	Accounting, ERP
7) What changes do you envision could be made that would benefit the Statewide Information Technology organization?	DND
7a) How could you benefit from these changes?	DND
7b) What concerns would you have about a consolidation process?	Afraid that IT would be managed from a position of power when the real goal of IT is to serve the business. The further the service is away from the agency, the poorer the service. Service is so bad from DoIT that DPA won't use them.
7c) How would you plan a consolidation process?	Should define objectives and then show progress against initiatives.
8) Do you provide any unique functions to your business users that are not common across other State of Colorado departments?	Some program functions
9) How would you ensure performance of services using a consolidated staff?	Set performance measures using a balanced scorecard and then measure against them.
10) What role if any would you like to have in the Enterprise Architecture evaluation?	Would like to participate in the planning process as well as part of the standards organization.
11) What role if any would you like to have in how Information Technology is re-structured to better serve the citizens of Colorado?	Assist with Oracle standards and processes and potential build out of new facility.
12) What would you say is your greatest strength?	Relationship building; very customer oriented; listens and learns from those around him

Table 18.13 – Department of Local Affairs Discussion

Todd Olson	**Department of Personnel and Administration**
Question	Response
1) Have you been able to review the State of Colorado strategic plan?	Yes
1a) Do you agree that the objectives set forth in the State of Colorado Strategic IT Plan are laudable objectives?	Agree with the overall objectives
1b) How would you set about accomplishing those objectives?	Plan, plan, plan – do it the right way.
2) Do you believe in the value of IT	There are true opportunities to save money, and

consolidation?	gain knowledge from experience of other. In addition need to consider the timelines that are required for effective consolidation
2a) Why or why not?	There are a number of services that can be handled better if consolidated, like helpdesk
2b) Are there any information technology functions you believe should be consolidated? If so, which ones?	Backbone enterprise level services like, data centers, networks and helpdesk. ERP could be another target, although we should look at it with caution.
2c) What would be your approach (e.g. order) to Information Technology consolidation (e.g. department by department, infrastructure, applications, support, or a different approach)?	It should start with infrastructure and support for the infrastructure
2d) Do you believe in the concept of standardization of technologies?	There should be a effort to standardize technologies for effective management and utilization of resources.
3) Do you have an opinion as to why previous efforts to move to a more consolidated Information Technology Management model in the State of Colorado have not been successful?	OIT had no power to make it happen; also there was no buy-in and no support
4) Have you studied other states' experience in consolidation?	Looked into Montana and Virginia
4a) Do you find the claimed value they obtained reasonable?	Legislation in Montana was very good. Montana also has 400 applications on CITRIX which worked very well. They built legislation and thought people would come – but did not work out that way.
4b) What is your perspective of how Information Technology is structured in the State of Colorado?	Should be structured to provide an enterprise view systems. Should have infrastructure consolidated, but departmental applications might be a challenge.
4c) What challenges do you envision with the State of Colorado with respect to consolidating more information technology disciplines?	It could turn into a challenge to balance requirements between the enterprise and departments.
5) What current challenges are facing your Information Technology organization in providing service to your department?	Can't control departmental IT activities. There needs to be good communications out to the people using the service. There need to be agreed upon metrics for services levels and reporting.
5a) Have you encountered challenges in obtaining the funding desired? Do you have examples?	There is inadequate funding for staff and so the staff is insufficient.
5b) Do you believe compensation is a barrier to acquiring the talented information technology individuals the state requires?	Yes; many resources have been lost because of private companies compensating at a higher level. Also, a lot of experience is going out the door with retirement eligible individuals.
5c) What is the single greatest challenge you see for your organization to service the department you support?	Consistency in customer service
5d) How do you currently determine how to prioritize Information Technology work (projects) within your department?	Squeaky wheel; an executive management team has been tried but that did not work. Problems exist in charging and funding for services.
5e) Do you have an enterprise architect position or a process to ensure that systems are designed	Not a single position

and integrated in a consistent manner?	
6) Do you believe your administrative business functions (e.g. procurement, finance, human resources, etc.) are different from other State of Colorado departments? If so, how?	There are some unique systems, but not to the extent of other departments who have worked on GUIs and some other database extracts for their unique needs.
6a) What common services do you envision the State of Colorado needs that should be standardized at the enterprise level?	Infrastructure services and standards should be standardized
7) What changes do you envision could be made that would benefit the Statewide Information Technology organization?	DND
7a) How could you benefit from these changes?	DND
7b) What concerns would you have about a consolidation process?	DND
7c) How would you plan a consolidation process?	DND
8) Do you provide any unique functions to your business users that are not common across other State of Colorado departments?	There are no unique functions, and there are number of common functions across departments
9) How would you ensure performance of services using a consolidated staff?	Metrics
10) What role if any would you like to have in the Enterprise Architecture evaluation?	Would like to support Enterprise Initiatives and rollup activities aligned with enterprise class initiatives from DOIT into overall enterprise activities.
11) What role if any would you like to have in how Information Technology is re-structured to better serve the citizens of Colorado?	DND
12) What would you say is your greatest strength?	DND

Table 18.14 – Department of Personnel and Administration Discussion

Carol McDonald	**Department of Law**
Question	Response
1) Have you been able to review the State of Colorado strategic plan?	Yes
1a) Do you agree that the objectives set forth in the State of Colorado Strategic IT Plan are laudable objectives?	Yes they are laudable; some easier to achieve than others; will be easier to support if they can give input to the process
1b) How would you set about accomplishing those objectives?	Develop a plan and get buy-in from the departments; should set up sharing between agencies; problem for AG in that they are independent but yet participate in the larger organization
2) Do you believe in the value of IT consolidation?	Yes, but the processes associated with the consolidation should be lightweight. Also, AG is its own entity and needs communications channels into Treasury, Judicial, and Secretary of State.
2a) Why or why not?	Consolidation of buying power will reduce costs; problems will result if consolidation occurs the way it did with email consolidation.
2b) Are there any information technology functions you believe should be consolidated? If so, which ones?	There are a number of issues for Law with respect to data (political, statutory) issues. Procurement, Security, Help desk would be good to centralize

2c) What would be your approach (e.g. order) to Information Technology consolidation (e.g. department by department, infrastructure, applications, support, or a different approach)?	Define some functions as centralized and some as distributed resulting in a federated model. Would determine these by where best serviced from. Should use a collaborative model
2d) Do you believe in the concept of standardization of technologies?	Yes
3) Do you have an opinion as to why previous efforts to move to a more consolidated Information Technology Management model in the State of Colorado have not been successful?	The basic problem was a lack of buy-in and that decisions were often made before the data was available. Punitive approach does not allow for growth and establishes us vs. them mentality. DoIT needs a success.
4) Have you studied other states' experience in consolidation?	No
4a) Do you find the claimed value they obtained reasonable?	No
4b) What is your perspective of how Information Technology is structured in the State of Colorado?	DND
4c) What challenges do you envision with the State of Colorado with respect to consolidating more information technology disciplines?	Service provisioning; adequate planning
5) What current challenges are facing your Information Technology organization in providing service to your department?	Providing the courts the things they need such as case management, VoIP, etc. Providing the necessary ad-hoc support to the attorneys.
5a) Have you encountered challenges in obtaining the funding desired? Do you have examples?	Yes, especially because attorneys want to keep everything.
5b) Do you believe compensation is a barrier to acquiring the talented information technology individuals the state requires?	To some degree
5c) What is the single greatest challenge you see for your organization to service the department you support?	DND
5d) How do you currently determine how to prioritize Information Technology work (projects) within your department?	No formal process
5e) Do you have an enterprise architect position or a process to ensure that systems are designed and integrated in a consistent manner?	No
6) Do you believe your administrative business functions (e.g. procurement, finance, human resources, etc.) are different from other State of Colorado departments? If so, how?	Not too much, some differentiators with respect to time keeping. One of the biggest problems is that the financial system does not keep up with what is required.
6a) What common services do you envision the State of Colorado needs that should be standardized at the enterprise level?	Payroll, benefits
7) What changes do you envision could be made that would benefit the Statewide Information Technology organization?	DND
7a) How could you benefit from these changes?	DND
7b) What concerns would you have about a	Just to ensure that service does not degrade from

consolidation process?	the activity; also there are some functions that would be problematic to service centrally. Concerned that consolidation may result in lesser service to a group that demands immediate service. Also concerned over loss of control, loss of service.
7c) How would you plan a consolidation process?	DND
8) Do you provide any unique functions to your business users that are not common across other State of Colorado departments?	Many specific to Law (court, case management, time keeping, etc.)
9) How would you ensure performance of services using a consolidated staff?	SLAs with accountability
10) What role if any would you like to have in the Enterprise Architecture evaluation?	Assist with the asset management and would be happy to be involved with the effort
11) What role if any would you like to have in how Information Technology is re-structured to better serve the citizens of Colorado?	DND
12) What would you say is your greatest strength?	DND

Table 18.15 – Department of Law Discussion

Bob O'Doherty (+ Bill Ferguson)	**Department of Public Health and Environment**
Question	Response
1) Have you been able to review the State of Colorado strategic plan?	Yes
1a) Do you agree that the objectives set forth in the State of Colorado Strategic IT Plan are laudable objectives?	Yes; need process orientation to achieve
1b) How would you set about accomplishing those objectives?	Address low hanging fruit. Define core platforms and then outsource unique technologies. Would standardize certain technologies and then ensure all purchases are made consistent with those technologies.
2) Do you believe in the value of IT consolidation?	Yes; if responsive and predictable; believe there is some concern the legislature handicaps consolidation by the way it allocates consolidated funds
2a) Why or why not?	Some value in consolidation; there are too many redundant functions throughout the state. The core issue is one of agility versus cost. Some concern whether cost savings at the expense of agility is worth it.
2b) Are there any information technology functions you believe should be consolidated? If so, which ones?	Server management, electronic mail, help desk (may be consolidated control but decentralized implementation), other infrastructure disciplines
2c) What would be your approach (e.g. order) to Information Technology consolidation (e.g. department by department, infrastructure, applications, support, or a different approach)?	Crawl, walk, run. Focus on low hanging fruit such as server administration and email. Where possible, create a base infrastructure and migrate in a stepwise progression towards consolidation. Use an incentive based model to achieve the migration (offer incentives for agencies to come aboard). Also look at a model like SIPA to provide certain services.

	Would tend to keep domain specific services in the agencies.
2d) Do you believe in the concept of standardization of technologies?	Yes if they result in better, cheaper, faster.
3) Do you have an opinion as to why previous efforts to move to a more consolidated Information Technology Management model in the State of Colorado have not been successful?	DoIT has historically not performed well enough to meet agency needs and that has traditionally been focus of consolidation. They tend to be slower, more expensive, and less reliable.
4) Have you studied other states' experience in consolidation?	Yes
4a) Do you find the claimed value they obtained reasonable?	No; experience by Public Health agencies in Florida, Iowa, and Kansas has not been good. They lost control of what they could provide and experienced worse service.
4b) What is your perspective of how Information Technology is structured in the State of Colorado?	Good the way it is from a responsiveness perspective. Although there may be value from consolidation do not want to lose responsiveness.
4c) What challenges do you envision with the State of Colorado with respect to consolidating more information technology disciplines?	With respect to Public Health and Environment, some resources have to be allocated to specific grants and may not be shared. Other agencies using grants to fund IT services may have the same restrictions.
5) What current challenges are facing your Information Technology organization in providing service to your department?	Trying to be responsive to the business units; current server room is full, supporting mobile computing (e.g. work @ home)
5a) Have you encountered challenges in obtaining the funding desired? Do you have examples?	Managing grant funding; most funding comes from grants. Also need to improve emergency response preparedness.
5b) Do you believe compensation is a barrier to acquiring the talented information technology individuals the state requires?	For some types of resources, yes. Especially for network, systems administrators, and security personnel. Not so much of a problem with development personnel.
5c) What is the single greatest challenge you see for your organization to service the department you support?	Trying to be responsive to the business units
5d) How do you currently determine how to prioritize Information Technology work (projects) within your department?	There are formal infrastructure meetings weekly to review projects on the list. With respect to business unit centric issues there are specific team meetings to review priorities and work.
5e) Do you have an enterprise architect position or a process to ensure that systems are designed and integrated in a consistent manner?	No; enterprise architecture services provided by Bill (Ferguson) and Bob (O'Doherty)
6) Do you believe your administrative business functions (e.g. procurement, finance, human resources, etc.) are different from other State of Colorado departments? If so, how?	Similar in general; need to be standardized where possible. Think that procurement should be streamlined. Also, the RFP process is too long and involved.
6a) What common services do you envision the State of Colorado needs that should be standardized at the enterprise level?	Electronic mail, procurement
7) What changes do you envision could be made that would benefit the Statewide Information	The state needs to move to more of a commercial model with respect to Information Technology.

Technology organization?	Service needs to be predictable (time and money) for agencies. Pay for services
7a) How could you benefit from these changes?	DND
7b) What concerns would you have about a consolidation process?	Just to ensure that service does not degrade from the consolidation
7c) How would you plan a consolidation process?	See answers to # 2c above
8) Do you provide any unique functions to your business users that are not common across other State of Colorado departments?	Some unique health applications (e.g., disease reporting, birth records)
9) How would you ensure performance of services using a consolidated staff?	Ensure that the centralized agency is funded in a way to provide consistent and reliable services. Eliminate the end of fiscal year adjustment. Develop accountable service levels.
10) What role if any would you like to have in the Enterprise Architecture evaluation?	Help develop the model. Would like to have veto power over certain types of decisions (but really don't expect that) and be a part of brainstorming activities.
11) What role if any would you like to have in how Information Technology is re-structured to better serve the citizens of Colorado?	see answer 10
12) What would you say is your greatest strength?	Working to introduce standardization of hardware and software, defining standardized procurement, and facilities management. Finding grant money to pay for infrastructure.

Table 18.16 – Department of Public Health and Environment Discussion

Doug Tracey	**Office of the Public Defender**
Question	Response
1) Have you been able to review the State of Colorado strategic plan?	Yes
1a) Do you agree that the objectives set forth in the State of Colorado Strategic IT Plan are laudable objectives?	Yes
1b) How would you set about accomplishing those objectives?	DND
2) Do you believe in the value of IT consolidation?	In some areas, network, some types of business systems, and policies. Have to be careful of latency issues with respect to service. There might be constitutional obstacles for consolidation that need to be considered.
2a) Why or why not?	To some degree; there are some challenges in mixing data and security issues around the data and functions.
2b) Are there any information technology functions you believe should be consolidated? If so, which ones?	Network, procurement and software
2c) What would be your approach (e.g. order) to Information Technology consolidation (e.g. department by department, infrastructure, applications, support, or a different approach)?	DND
2d) Do you believe in the concept of	Standardization of software and technology is very

standardization of technologies?	important. Standardization of technologies is good but standardizing up to the vendor level can be challenging. End user standards committee is a good example of standardization working, these standards are used within the department. General administration is easier to standardize however business specific requirements might be difficult to standardize.
3) Do you have an opinion as to why previous efforts to move to a more consolidated Information Technology Management model in the State of Colorado have not been successful?	The legislature was not interested in it and there was no political reason for it. There was no constitutional requirement for it.
4) Have you studied other states' experience in consolidation?	No, Colorado is one of top five in Public Defender systems and the system is struggling across the country.
4a) Do you find the claimed value they obtained reasonable?	N/A
4b) What is your perspective of how Information Technology is structured in the State of Colorado?	DND
4c) What challenges do you envision with the State of Colorado with respect to consolidating more information technology disciplines?	Judicial is much more progressive than other areas in the state.
5) What current challenges are facing your Information Technology organization in providing service to your department?	The network does not meet the business needs and needs to be redesigned. Operational environments are outdated.
5a) Have you encountered challenges in obtaining the funding desired? Do you have examples?	6 IT staff supports 21 offices. Internal funding not a problem right now especially with focus on Disaster Recovery and Security. Securing funds from the state can be a challenge and external decisions effect the overall funding requirements.
5b) Do you believe compensation is a barrier to acquiring the talented information technology individuals the state requires?	Not a problem right now; we are efficient. The bigger obstructions are those decisions that are made external to the organization.
5c) What is the single greatest challenge you see for your organization to service the department you support?	DND
5d) How do you currently determine how to prioritize Information Technology work (projects) within your department?	There are priorities around infrastructure based on lifecycle replacement.
5e) Do you have an enterprise architect position or a process to ensure that systems are designed and integrated in a consistent manner?	DND
6) Do you believe your administrative business functions (e.g. procurement, finance, human resources, etc.) are different from other State of Colorado departments? If so, how?	Use COFRS the way it is; use HR systems as they are.
6a) What common services do you envision the State of Colorado needs that should be standardized at the enterprise level?	DND
7) What changes do you envision could be made	The Multi-Use network needs to meet expectations.

that would benefit the Statewide Information Technology organization?	Network services can be obtained $100,000 to $300,000 per annum cheaper than through the MNT
7a) How could you benefit from these changes?	DND
7b) What concerns would you have about a consolidation process?	DND
7c) How would you plan a consolidation process?	DND
8) Do you provide any unique functions to your business users that are not common across other State of Colorado departments?	DND
9) How would you ensure performance of services using a consolidated staff?	DND
10) What role if any would you like to have in the Enterprise Architecture evaluation?	Would like to be a part of standards committee; also anything related to legislation
11) What role if any would you like to have in how Information Technology is re-structured to better serve the citizens of Colorado?	Would like to be part of processes involving fiscal analysis
12) What would you say is your greatest strength?	Are not large enough to have IT expertise to provide overall IT input, however can provide input in specific areas like portals.

Table 18.17 – Office of the Public Defender Discussion

John Wagner	**Department of Public Health Care & Financing**
Question	Response
1) Have you been able to review the State of Colorado strategic plan?	Yes
1a) Do you agree that the objectives set forth in the State of Colorado Strategic IT Plan are laudable objectives?	Yes laudable, but will take time, certainly not in one year's timeframe
1b) How would you set about accomplishing those objectives?	Start by defining standards first as a means to simpler consolidation
2) Do you believe in the value of IT consolidation?	There are some plusses associated with consolidation
2a) Why or why not?	Some value is obtained
2b) Are there any information technology functions you believe should be consolidated? If so, which ones?	Data centers, some services
2c) What would be your approach (e.g. order) to Information Technology consolidation (e.g. department by department, infrastructure, applications, support, or a different approach)?	Undertake it in small steps focusing on infrastructure and facilities first; applications are outsourced at HCP&F
2d) Do you believe in the concept of standardization of technologies?	Brands of hardware are fine; WSCA pricing not really competitive. Also, standard operating environments (e.g. Microsoft/.NET) are fine as well. There should be a process of exceptions for departments with unique requirements.
3) Do you have an opinion as to why previous efforts to move to a more consolidated Information Technology Management model in the State of Colorado have not been successful?	Too big of a challenge to do at one; need to agree to take small steps
4) Have you studied other states' experience in consolidation?	Some; must be careful of unique needs and exceptions that could derail consolidation.

4a) Do you find the claimed value they obtained reasonable?	Some; states are experimenting but most states do seem to be making it work. Inhibitor in some states is centralized management.
4b) What is your perspective of how Information Technology is structured in the State of Colorado?	More needs to happen to implement good IT services in Colorado; Having strong interagency agreements with performance measures and trying to outsource some functions
4c) What challenges do you envision with the State of Colorado with respect to consolidating more information technology disciplines?	Ability to hold organizations accountable for services.
5) What current challenges are facing your Information Technology organization in providing service to your department?	Lack of staff. There is a need to augment staff and have been using vacancy savings to get work done but at a slower rate because of higher charges for external support
5a) Have you encountered challenges in obtaining the funding desired? Do you have examples?	Yes, an example was the resources to purchases and install the HR systems EDSYS
5b) Do you believe compensation is a barrier to acquiring the talented information technology individuals the state requires?	Yes, the department pays near the bottom of the scale and it is hard to get qualified candidates for these levels of compensation, Though we have been very successful.
5c) What is the single greatest challenge you see for your organization to service the department you support?	Continued attrition of staff; will lose 10% per year
5d) How do you currently determine how to prioritize Information Technology work (projects) within your department?	Policy defines what is the highest priority inclusive of federal and state legislation
5e) Do you have an enterprise architect position or a process to ensure that systems are designed and integrated in a consistent manner?	Not per se; there is a infrastructure team and application development managers that coordinate outsourced development to meet department needs.
6) Do you believe your administrative business functions (e.g. procurement, finance, human resources, etc.) are different from other State of Colorado departments? If so, how?	The functions are probably very similar, the timeframes to complete and volume are quite different.
6a) What common services do you envision the State of Colorado needs that should be standardized at the enterprise level?	Communications, data center and purchasing HW & SW standards.
7) What changes do you envision could be made that would benefit the Statewide Information Technology organization?	There continue to be a number of different, independent initiatives which need to be pulled together
7a) How could you benefit from these changes?	If departmental CIO's were aligned, we could get more done in a more consistent way instead of being fractionalized. Common standards would allow more in this area.
7b) What concerns would you have about a consolidation process?	Need a plan for consolidating. Existing CIO's are responsible to their program areas and those are our priorities. Concern these may be lost in a centralized organization.
7c) How would you plan a consolidation process?	Using small steps
8) Do you provide any unique functions to your business users that are not common across other	There are unique systems for HCP&F, but also have some similar systems as DHS. We must assure our

State of Colorado departments?	systems maintain federal certification at all times.
9) How would you ensure performance of services using a consolidated staff?	SLA's if they can be enforced. Currently there is no way to do this. Would have to be able to go elsewhere if services fail for DoIT.
10) What role if any would you like to have in the Enterprise Architecture evaluation?	Will offer time as possible.
11) What role if any would you like to have in how Information Technology is re-structured to better serve the citizens of Colorado?	DND
12) What would you say is your greatest strength?	IT contracts management and 20 years vendor experience

Table 18.18 – Department of Public Health Care and Financing Discussion

Trevor Timmons	**Secretary of State**
Question	Response
1) Have you been able to review the State of Colorado strategic plan?	Yes
1a) Do you agree that the objectives set forth in the State of Colorado Strategic IT Plan are laudable objectives?	Yes; they are both good short and long term strategies although not all are achievable
1b) How would you set about accomplishing those objectives?	Standardize the enterprise through the setting of enterprise standards
2) Do you believe in the value of IT consolidation?	Yes
2a) Why or why not?	Consolidation will reduce costs, improve efficiency, and enables the State agencies to be more effective. This would enable this department to do a better job.
2b) Are there any information technology functions you believe should be consolidated? If so, which ones?	Electronic mail, enterprise network management, security, online payments, blackberry services.
2c) What would be your approach (e.g. order) to Information Technology consolidation (e.g. department by department, infrastructure, applications, support, or a different approach)?	Address given functional areas with quick successes building credibility throughout the process. Probably would not suggest server or facility consolidation but would consolidate security. Electronic mail consolidation because business requirements were not collected. Need to make sure that there are better communication conduits so that all organizations know what is going on across the organization. Suggest consolidation of email first and then security. Easier to give up data center than control of services.
2d) Do you believe in the concept of standardization of technologies?	Yes although there will be an impact here because there will be certain training and support requirements that will cost money to achieve. Should not have 1 standard but acknowledges that less is more. Also should be done through standardized replacement of technologies.
3) Do you have an opinion as to why previous efforts to move to a more consolidated Information Technology Management model in the State of Colorado have not been successful?	Lack of consistent focus, IT driving the business also presents problems. No funding to support consolidation.

4) Have you studied other states' experience in consolidation?	Limited; did talk to Michigan IT as relates to HAVA
4a) Do you find the claimed value they obtained reasonable?	DND
4b) What is your perspective of how Information Technology is structured in the State of Colorado?	DND
4c) What challenges do you envision with the State of Colorado with respect to consolidating more information technology disciplines?	Trusting service delivery from a consolidated service organization especially with respect to expectations. There have been many unexplained outages and Kronos goes down 1-2x per month during peak times.
5) What current challenges are facing your Information Technology organization in providing service to your department?	SCORE and the departmental accounting systems both are consuming lots of hours to support. Tried to involve counties and vendor. Because of this it is important to get off home grown systems.
5a) Have you encountered challenges in obtaining the funding desired? Do you have examples?	Not really (a cash funded agency)
5b) Do you believe compensation is a barrier to acquiring the talented information technology individuals the state requires?	It is starting to be a problem, especially as the market heats up. They have some flexibility, but not much upward mobility.
5c) What is the single greatest challenge you see for your organization to service the department you support?	Resource availability and the fact that the IT department is not staffed to the level needed to support the organization.
5d) How do you currently determine how to prioritize Information Technology work (projects) within your department?	Work is managed according to attributes with mandated work taking priority and managed through a formal pipeline. There is a quarterly meeting with division directors. IT suggests the priorities and they validate.
5e) Do you have an enterprise architect position or a process to ensure that systems are designed and integrated in a consistent manner?	Not a role, a discipline performed by multiple individuals. No single accountable individual, although the senior development manager is the most responsible.
6) Do you believe your administrative business functions (e.g. procurement, finance, human resources, etc.) are different from other State of Colorado departments? If so, how?	Standardized benefits, human resources, time tracking. Some other systems are different such as procurement.
6a) What common services do you envision the State of Colorado needs that should be standardized at the enterprise level?	Content management, web content management, scanning, project management
7) What changes do you envision could be made that would benefit the Statewide Information Technology organization?	Have them assume some responsibilities (e.g. electronic mail management)
7a) How could you benefit from these changes?	Would allow the IT organization to focus on other things.
7b) What concerns would you have about a consolidation process?	Loss of control, reduction in service,
7c) How would you plan a consolidation process?	See answers to # 2c above
8) Do you provide any unique functions to your business users that are not common across other	Not sure; there are some functions unique to the Secretary of State

State of Colorado departments?	
9) How would you ensure performance of services using a consolidated staff?	Utilize a formal set of metrics and service levels but there must be consequences for missing those service levels and service metrics. Kronos is currently down at least once a month when needed. Not sure that service levels will work within the state (e.g. no way to hold anyone accountable)
10) What role if any would you like to have in the Enterprise Architecture evaluation?	Would be willing help determining what to focus on with respect to initiatives and to participate in the informational dissemination process. Will try to participate with executive branch agencies.
11) What role if any would you like to have in how Information Technology is re-structured to better serve the citizens of Colorado?	Citrix Work Group
12) What would you say is your greatest strength?	Leadership

Table 18.19 – Secretary of State Discussion

In addition to these structured discussions, a discussion was held with the State of Colorado Chief Information Security Officer. The nature of this discussion revolved around work underway to address securing State of Colorado resources, positioning of the security office within the organization, work on policies and procedures developed by the security organization, and integration with the Enterprise Architecture practice moving forward.

19 External CIO Discussion Notes

Embodied within the research part of this engagement were discussions with State CIO's and personnel from other states. The tables below reflect the information gleaned from these discussions arranged by state. For some of these discussions, only selective subject matter was discussed relevant to a particular aspect of consolidation. As such, when DND is shown in the tables it reflects a subject that was not discussed as a part of that discussion.

Michigan (T. Takai)		
Michigan	Assets	Assets were placed under the control of MDIT, but there was much work to figure out how to do this. This was largely because of the models under which the assets were acquired and will have to be worked out on a case-by-case basis.
	Consolidation	The effort should be thoroughly planned before embarking on consolidation activities. The number of activities that need to be undertaken to effect a consolidation is immense and a plan is one of the ways to minimize haphazard execution. In general, the less radical the change, the smoother the change will be. All efforts of this nature are going to encounter problems; that is a given. By using a more evolutionary approach, it gives state employees who are used to a more static culture to adapt to the changes over a longer period of time. Used a phased consolidation. Defined core objectives of consolidation as follows: 1.) Centralized, strengthened IT policy making including standards 2.) Integrated strategic planning 3.) Improved management of IT projects 4.) Establishment of agency services and two way customer interaction 5.) Centralized IT procurement and contract management 6.) Development of a consolidated infrastructure Undertook infrastructure consolidation too quickly without a thorough plan.
	Service	Service is provided by state employees, not third party provider. Uses fee for service model. Network support was outsourced to AT&T. In some cases, the state used cross functional teams comprised of both enterprise and departmental personnel to provide service. Formal guidelines were addressed to define replacement of hardware on regular cycles. Accurate billing was a challenge and had to evolve over time. Service rates are updated on a regular basis. There are no financial penalties for missing service, but do meet with EDs to address service deficiencies. The state auditor audits their service and ensures compliance with federal regulations. The audits utilize sampling and are non-comprehensive to this point. Counsel is to make sure well defined exit strategies are developed for any managed services agreements. The State of Michigan does leverage managed service providers for a limited number of applications.

	Employees	Reduction in the number of employees was not directly driven by consolidation but the number of overall IT employees did decrease. When they started the effort 20-25% of the state's IT employees were retirement eligible. No formal retraining was undertaken as a part of the consolidation. They found during consolidation that many managers lacked managerial skills and were promoted to keep them around. Some employees moved from classified to at-will status, but not all. The compensation structure of the state did not mirror the local labor markets. CIO positions were re-posted rather than automatically assuming that each CIO retained their position. Reduced consultants throughout the state because of the cost. Commitment was to retain the personnel but there were no commitments that the nature of their job would not change. A purposeful process to in-source consultants was undertaken.
	Organization	The organization is essentially centrally controlled but many aspects of the organization remain distributed. Many enterprise functions (e.g. procurement, administration, planning, outreach, project management, contracting, personnel, finance, etc.) are centralized. Other aspects of the organization remain decentralized but under the centralized control. MDIT broken down into 7 offices. MDIT holds all contracts and procurement responsibilities.
	Communication	It is most important to keep communications consistent, accurate, and flowing throughout the process. Communications must be maintained to executive leadership (Governor, Legislature, OSPB, etc.) and to the State of Michigan employees. Tremendous momentum can be built through communications; conversely, lack of communications can greatly impair the progress and support for the effort. Don't preach savings; although they may come, setting those expectations can cause problems. Developed specific branding for consolidation and the centralized organization. Uses a PIO.
	Governance	Utilizes an Enterprise Architecture Board which handles strategic planning, standards, reference and platform architectures, etc. No formal board to which the State CIO reports. Individual agency IT organizations remained but with a bounded set of responsibilities. The state CIO reports directly to the governor. The state when moving towards consolidation leveraged a set of existing and new governance structures. The state police organization was one of the most challenging organizations to consolidate. Assets are owned primarily by the CFO in terms of the process and mechanics, but updates to the database are handled by the infrastructure organization. The state underestimated the effort required to effectively manage their assets. The state defined specific hardware and software standards. Projects are generally sponsored jointly between a given ED and the state CIO. Projects are prioritized by the various departments, not MDIT. Information Officers (IO) are the senior IT officials in the departments and sit on the executive committee in the agencies. Budgets are retained in the

		individual departments.
	Funding	Need to work out funding issues in advance if possible. There are many places where assets and in fact personnel are paid for directly by grants and programs. The federal government did need to review and approve the formal rates structures for rated services to ensure they were not too high. In some cases, but not all, the resource allocation model was also reviewed. No seed funding was provided to jumpstart the consolidation but the state acknowledged this greatly extended the duration of the consolidation effort. They do have a problem in investing in specific types of activities or infrastructure which is not supported by an agency business case. As such, they wish they had added a surcharge which could have been aggregated and then expended on various items supporting the enterprise. They have a legislative liaison which helps to mitigate some unfunded mandates. They sometimes are brought in on the front of grant writing to weigh in on costs (but sometimes they are not consulted). The legislature did not receive any funding back. Once a budget is approved for the department, requisite funds are transferred to the office of the CIO and MDIT. There is no ROI analysis.
	Other	The CISO is appointed as the Director of Enterprise Security and also formally appointed as the Emergency Management Coordinator for the Michigan Dept of IT. He activates the EOC during emergencies. Their operations group is called the Risk Management and Compliance Group and includes the following functions: PCI compliance, IDS monitoring, Incident Response, Threat and Vulnerability Management, Spam filtering, Event Correlation, Physical Security (including background checks for the DIT Forensics. They hold a daily call at 7:30 for all security staff in all agencies to ensure everyone is up to speed on current security posture. Each agency has a security liaison – similar to the State of Colorado's Chief Information Security Officer role. They distinguish between security and acceptable use violations. Security violations are clear cut and defined by policy. Acceptable use violations are a little grayer and while defined by policy, require a specific request by HR for investigation. The reason is that there are obviously a lot of acceptable use situations and it would require a LOT of work to look into everything. They have defined this with policy too and seem to have a very good relationship with their HR folks as their investigations for acceptable use end up acquitting as many people and convicting due to the robust forensics program. Can not add nodes to network without MDIT involvement. Consolidated GIS into a sizable geospatial technologies office (CGI). 50%/50% funding general and fee for service including both local and private customers. The staff is comprised of 34 people with a land area about 7% less than Colorado. CGI has developed credibility for providing services from the ground up over time. When CGI was brought in DIT, staff was added to

		the existing staff from other agencies. CGI has been expanding with traditional IT skills (sys admin, db admin, .net, other programming), not necessarily traditional, straight GIS skills. Some of the staff that was added during the consolidation ended up being more subject matter experts that work with geospatial technologies (e.g., wildlife biologists) and were subsequently returned to their original agency. CGI is moving to Oracle Spatial as their backend and MS VirtualEarth (I think) as their API for providing web map services. They are starting to utilize project management best practices more with a group of project managers overseeing projects/tasks with a matrix org. structure. CGI have 4 areas or divisions of specialty. They produce the Michigan framework (and provide it for download) as the stewardship of "framework" data layers in the state. The framework has a strong transportation / roads focus (MDOT and their Dept. of Natural Resources are the 2 largest geospatial consumers among state agencies) that uses transactional approaches to updated the data. Road data supports multiple agencies' needs. Developing the data model and getting agreement among the several agencies that maintained road data and would utilize the resulting framework data was not easy. Obtaining buy-in for the CGI structure and for utilizing CGI services was also fairly painful, but state agencies appear to be on board now. Feedback from customers of CGI indicated that consolidation was not handled in the most tactful manner leading to some ruffled feathers, which still persist today. For ex., some of the people that went back to their original agency did so because of some of the ill will. CGI has not really tried to work with local governments and has not developed good relationships with locals. Similarly, they don't seem to make too much of an effort to interface with feds. Oracle spatial may not be the best solution for them and tends to be cumbersome in its storage of spatial data (this was from an ESRI employee), but CGI's approach to their transportation data has been slow to come up to current data structures. The GIS organization relies on MDIT services for most things although they have started to develop a project management competency.

Table 19.1 – Michigan Research Notes

Virginia (L. Stewart)		
Virginia	Assets	When consolidation started, Virginia had 100 data centers and 1,500 locations statewide. All assets were initially transferred to the consolidated agency and then later to the managed service provider. Legislation prevents ownership of IT assets by agencies. Moving to leasing model for assets eliminating funding of refreshes.
	Consolidation	Consolidation initiated by the Legislature with the law spelling out what is centralized and what is not (Higher Education was included). State of Virginia consolidated small departments first, medium departments second, and large departments last. Would reverse that order if they had to do it all over again largely

		because they had very small support staffs in small agencies. Overall process took 11 months to complete once started. General approach was to centralize utility functions (e.g. infrastructure) and leave domain functions distributed. Would still leave some domain functions in place but would centralize ALL enterprise resources including developers working on enterprise components or services. Did consolidate some functions even across counties. Created a project management discipline for all projects over $100,000. Addressed integration and consolidation first and then focused on transformation, creating an IT utility in the first phase.
	Service	Established a public/private partnership where the vendor (Northrup Grumman) invested funds in the State of Virginia. Private partners initially submitted unsolicited proposals which eventually matured into an RFP process. Arrangement required vendor to undertake no layoffs and need no investment. Managed service provider encouraged to use locations in remote part of state to jumpstart some economic development. 65% of employees accepted offer with managed service provider and lost no seniority gaining minimum 5% raises; employees could not be laid off for one year. Lost a lot of senior people who retired and then worked for managed service provider losing a lot of knowledge. Will eventually end the employees managed by the service provider. Utilizes a fee for service model letting departments pay for services used. Would recommend outsourcing the more administrative functions (e.g. payroll, etc.). Contract is for 10 years. Service provider has some risk. Usage of services is not mandated but is highly recommended and the managed service provider is positioned as the service provider. Partnership delivered $272 million total capital investment in the state, created new jobs, provided technology refreshes, and established new infrastructure facilities in Chesterfield and Russell Counties. Recommends that service provider have “skin in the game”; not simply an order taker. Service provider delivers consolidated help desk. Recommends making sure that well defined exit criteria and strategies are a part of any contract.
	Employees	Did not layoff any individuals and addressed reductions primarily through attrition and moving individuals back to department program areas. Did map out required employees for key services. Used rule that if a person touched infrastructure they moved regardless of % of infrastructure responsibilities figuring out how to adjust later. Key individuals to retain were identified early on. Working on a succession plan for key employees; currently vulnerable to personnel losses. Departmental CIO positions were eliminated. Employees accepting positions with the managed service provider remained where they were, but report to the managed service provider (e.g. they were not relocated). Less employees were required than expected but many lost. Employees contributed to ideas on how the package with the managed service provider should be built. State of Virginia is moving towards more telecommuting and providing

		the infrastructure to support it (e.g. laptops)
	Organization	Consolidated parts of the organization related to infrastructure, but left others parts in the departments. Would recommend enterprise application development be consolidated as well as all other enterprise disciplines. Would not consolidate domain applications. Centralized staff is reasonably limited.
	Communication	Don't preach savings; although they may come, setting those expectations can cause problems especially since the existing state of Information Technology management may require investments. Important to educate lawmakers, executive leadership that there will be a cost to normalize and standardize on specific technologies and ensuring license compliance. Formal training needed to be provided to departmental management to communicate with staff. You can expect that there will be plenty of "noise" from employees as the process proceeds because of traditional loyalty to department and not enterprise. Legislature needs to be educated on a wide variety of issues related to IT. Recruited a PIO.
	Governance	CIO reports to the ITIB (Information Technology Infrastructure Board). New projects over $100,000 have to be approved. A centralized list of projects is developed and then distributed to the Governor and the Legislature. In 2005, oversaw 36 major projects with a net investment value of over $850 million with no major failures.
	Funding	Executive Directors don't care that much about technology but they do not like losing some of their discretionary spend which traditionally could have been moved from IT to programs. Some departments won (paid less) and some departments lost (paid more) for the same services. Utilized Austin Matthews for some financial reviews and federal regulations. The state needed $300M to modernize and got a private contractor to provide this in exchange for service contract. Recommend caution in pooling money in CIO office – it provides a tempting target for legislators.
	Other	Some belief that federal issues were not as bad as suggested.

Table 19.2 – Virginia Research Notes

North Dakota (L. Feldner / M. Ressler)		
	Assets	Infrastructure assets were consolidated to ITD as a part of the consolidation.
	Consolidation	Infrastructure and management of the infrastructure consolidated by legislative mandate. Applications development and architecture services were also consolidated but not by legislative mandate. Some parts of the organization have not fully complied with legislative mandates. Initial approach was to force consolidation; secondary approach appreciated by individual departments involved defining value proposition for consolidation.
	Service	Service is provided through centralized organization ITD which has moderate range of offerings. No centralized desktop support although this is provided to a couple of organizations

		(e.g. Governors office). ITD does provide Enterprise Architecture services.
	Employees	Some trouble in attracting and retaining employees in North Dakota. Demand from departments have historically and currently exceed ready supply and could provide a challenge for the consolidated organization (ITD).
	Organization	Utilizes a consolidated organization (ITD) that provides all infrastructure services and also provides (such to a departments desire to use them) application development services.
	Communication	DND
	Governance	There are a number of committees that are used to manage information technology work, information technology investment, and technology standardization throughout the State. An example of this is the State Information Technology Advisory Committee chaired by the CIO, responsible for providing consultative input to ITD related to technology deployment and providing consulting during the annual business planning for ITD. Enterprise Architecture is used to ensure business and Information Technology alignment. The enterprise architecture organization is multi-tiered and comprised of the following specialties (or domains): Application Integration Team, Application Software Team, Communications Team, Data / Information Team, Desktop Team, Document Management Team, E-Government Team, Network Team, Security Team, Servers and Storage Team. Technology standards are published by domain team.
	Funding	DND
	Other	Utilizes a website through which constituent departments can interact with ITD

Table 19.3 – North Dakota Research Notes

Texas (D. Lanier)		
	Assets	
	Consolidation	Consolidate as makes sense to achieve business value. The culture in Texas did not allow them to effectively consolidate all aspects of information technology management. As such, the more domain specific functions were retained in the individual departments where as the more utilitarian functions (e.g. infrastructure) were consolidated. Noted that infrastructure management was generally poor when TxDIR stated taking over functions. Vendor consolidation did not occur as vendors complained to legislature. Texas had an extreme fear or consolidation. Wanted to also maintain the culture of "freedom to innovate" and "freedom to fail" which are believed to be linked. Although most applications run on infrastructure managed by the TxDIR (IBM), some agencies remain in charge of some infrastructure that their applications run on. ERP applications were consolidated, domain applications were not.
	Service	Signed agreement with IBM; can be extended to other states. Wanted to avoid "death by 1000 change orders". Developed formal service bands, service catalog, and formal service. There

		are financial penalties but these are rebated as "credits" for future services. Agencies provide quarterly planned consumption levels for various types of services from the service catalog. Funds were moved from agencies paying less to agencies paying more under the new model (culturally challenging). IBM worked to initially acquire state IT infrastructure assets and with the plan to move to a pure services model going forward (and using IBM assets).
	Employees	Most infrastructure employees transferred to IBM at their own will. Used an employee friendly model where employees desiring not to move to IBM were accommodated in program areas or other areas of departmental IT. 80%-90% of infrastructure individuals accepted IBM package. In general, younger employees took the deal with IBM and older employees stayed with the state although the IBM contract allowed for not only an initial raise to market levels (at least 5%) but also a 1:1 transference of years of service and benefits associated with the seniority. Employees not dedicated to infrastructure remain in the agencies under the direction of an IRM (Information Resource Manager)
	Organization	Organization TxDIR is structured primarily around infrastructure management services and selective information technology disciplines.
	Communication	DND
	Governance	Texas uses a federated governance model for IT with certain responsibilities and authorities assigned to the centralized agency (TxDIR) and the certain responsibilities and authorities remaining within the purview of the 43 departments. Agencies contain IRM (Information Resource Managers) as highest ranking departmental IT officials. There is no formal architecture board or discipline at the state level although there are many standards and processes which have been defined and which are expected to be followed (e.g. the Texas Project Delivery Framework).
	Funding	DND
	Other	DND

Table 19.4 – Texas Research Notes

Missouri (D. Ross)		
	Assets	Extremely large effort to determine what assets to consolidate and what not to consolidate, beyond what most people would think. Similar issue with individuals. Assets delineated as IT assets if the asset attaches to a network, IT owns it.
	Consolidation	A formal consolidation plan was developed along with a high level strategic plan. Service provided internally using metrics based SLA's. No prior empirical knowledge of prior service levels makes it hard to challenge current service versus historical service. Consolidated only data center and services and network. Two departments not included in the consolidation effort (Transportation, Conservation). Savings offered as a part of consolidation – a mistake. After 1 year gave up $3.5 million

		and 30 positions; believed they have saved $11 million total, but could be more. Just finished consolidating e-mail. Consolidation is moving slowly but surely.
	Service	Centralized organization provides a PMO which carries a 4% surcharge. Others services do not carry surcharges, seems – often short funds. Should add a 10% surcharge to other services. State does not use chargeback. Believe this to be of value since no agency can challenge charges. Agreement with EDs that service would degrade. Has been challenged since consolidation, but could not be authoritatively challenged because of lack of proof. They are building a new data center. Would consider outsourcing to managed services and have done this with networks.
	Employees	IT employees were all left in the departments although the data centers have been consolidated. Department employees are managed by the departmental IT Director. Employees were migrated as functions consolidated – recommended this strategy. Departmental CIO's changes to IT Directors and all IT Directors made at will employees. All other employees left classified. Salaries normalized across organization. 10 of 14 directors replaced since consolidation initiated. New employees can be hired up to midpoint by agency directors, above that requires CIO approval. Has full time administrative staff to deal with funding. All senior level positions in centralized organization were posted.
	Organization	Build relationships with procurement to oversee all procurement so that procurement organization acts as watchdog. CIO does not report to Governor but to the Administration Commissioner – a mistake. Recommend that no initial cuts be taken in funding or personnel; some of these will develop by attrition over time, but don't start there. Application development staff and some other functions remained in the departments.
	Communication	Communications are important and you can not communicate too much. Is important all the way through the process. Utilizes a lobbyist to help educate the Legislature.
	Governance	Common, statewide architecture in place. Developed through Enterprise Architecture. There are statewide standards for many things and control points associated with enforcing those standards. When new programs or initiatives are required, IT works with the agencies and those monies are put into the IT budget. Looking at using key business leaders to help with the Legislature; will help with extensibility of the model.
	Funding	Funding was moved from the various departments to the State of Missouri CIO. Would be very advantageous to develop method of "washing money" to eliminate color of money issue. The state has been working with a flat budget since 2005. Must be very careful about moving spend to a centralized organization. Large pot of money attracts legislator's attention and they want to start re-allocating it to programs thereby reducing the funds with which service is provided. Funding gaps have developed over time and CIO must go to legislature for

		funds. There is an account set up for each type of grant (managing color of money), but the departments still report back to the feds using all of the accounting and support from centralized agency. Facility management has the ability to "wash" money so it loses its color. Started with 121 different funds.
	Other	Developed new accounting codes for assets, services, etc. to ensure that spend going forward was accurately tracked. Not able to establish old spend. Define what the objectives of consolidation are before starting

Table 19.5 – Missouri Research Notes

Delaware (T. Jarrett)		
	Assets	DND
	Consolidation	There are groups that define specific standards and expenditures must meet these standards. Data centers, enterprise applications, email, network services, web portal, purchasing, security, and level 2/3 help desk were consolidated. Domain applications (especially in larger agencies), GIS, and departmental email administration were not consolidated.
	Service	DND
	Employees	The entire classified system, with respect to IT employees has been moved to a pay for performance system (at will). The IT wrote their own compensation structure for IT employees. They performed a contractor inventory and greatly reduced contractors using the money to compensate employees at higher levels. New positions were created and then people had to apply and compete for the jobs. 79% of the people kept their jobs and 21% left. The brought in resume writers to help people apply for jobs. In most cases, CIO's were moved to IT Managers, with 1 position moved to an IT Director. Most employees moved to pay for performance received 10-20% pay hikes with some receiving more in an attempt to normal state pay scales and market pay scales. IT at the state levels are the only ones compensated at market rates and at will. Agency IT employees remain civil service based. Some fear from employees to transition to at will. Drafted legislation ensured that jobs were protected. Changed model to ensure about $4,000 in training funds per year per person.
	Organization	IT remains distributed with each department retaining their own IT organization, but authority for expenditures exists only in the CIO position. This includes education. Business cases are the de facto method through which IT investments are weighed and approved. Have been able to build confidence with Legislature through ongoing execution. IT is run as a business.
	Communication	DND
	Governance	There is a Technology Investment Council responsible for addressing strategic issues and strategic planning for the state. Doesn't meet that frequently.
	Funding	80% of IT is generally funded with the remaining 20% funded through additional means (e.g. special funds). Uses primarily a

	fee for service model for most enterprise services provided.
Other	DND

Table 19.6 – Delaware Research Notes

Section X Glossary

20 Definition of Acronyms

.COM	Reference to Internet Commercial Sites
.NET	Microsoft Object Environment
AG	Attorney General Office
APPC	Application Program-to-Program Communications
ARB	Architecture Review Board
BIDS	Colorado Procurement
BPM	Behavioral Pharmacy Management
C^2P	Colorado Consolidation Plan
C^4ISR	Command Control Communications Computer Intelligence Surveillance and Reconnaissance
CC	Centralized Control, Centralized Execution
CD	Centralized Control, Distributed Execution
CDLE	Colorado Department Labor and Employment
CDOT	Colorado Department of Transportation
KRONOS	Time Keeping System
CIMOM	Common Information Model Object Manager
CIO	Chief Information Officer
CISO	Chief Information Security Officer
CITRIX	Windows Remote Access Software
CMMI	Capability Maturity Model Integration
CMS	Centers for Medicaid Services
COFRS	Colorado Financial Resource System
CoG	Continuity of Government
CoOP	Continuity of Operations Plan
COTS	Commercial Off the Shelf
CTO	Chief Technology Officer
DBA	Doing Business As
DBMS	Data Base Management System
DC	Distributed Control, Centralized Execution
DCIO	Deputy Chief Information Officer
DD	Distributed Control, Distributed Execution
DITP	Departmental Information Technology Planning
DMAS	Virginia Department of Medical Assistance Services
DMTF	Distributed Management Task Force
DND	Did Not Discuss
DoD	Department of Defense
DORA	Department of Regulatory Agencies
DPA	Department Of Personnel
DRM	Data Reference Model
EADT	Enterprise Architecture and Enterprise Design Team
EDs	Enterprise Development System - Vendor
EDSYS	Employee Data System
$eFOR^3T$	Enterprise Facility for Operational Readiness, Response & Transition Services

EGC	Executive Governance Committee
ePMO	Enterprise Program Management Office
ER	Enterprise Resource
ERP	Enterprise Resource Planning
ESB	Enterprise Service Bus
ETL	Extract, Transform, and Load
FEAF	Federal Enterprise Architecture Framework
FERPA	Family Education Rights and Privacy Act
FIPS	Federal Information Processing Standard
FISMA	Federal Information Security Management Act
FTE	Full Time Employee
GIO	Geographic Information Officer
GIS	Geographic Information Services
GLBA	Gramm-Leach-Bliley Act
GOIT	Governor's Office Information Technology
HAVA	Help America Vote Act
HCPF	Health Care Policy and Finance
HIPAA	Health Insurance Portability Accountability Act
DEM	Department of Emergency Management
HSPD	Homeland Security Presidential Directive
HTML	Hyper Text Mark Up Language
HW/SW	Hardware/Software
IA²PM	Identity Assurance Access and Protection Management
IDS	Intrusion Detection Systems
IP	Internet Protocol
IRM	Information Resource Manager
IT	Information Technology
ITD	Information Technology Department
ITIL	Information Technology Infrastructure Library
ITSM	Information Technology System Management
IV & V	Independent Verification and Validation
J2EE	Java 2 Extended Edition
JAS	Java Application Server
JBC	Joint Budget Committee
JV's	Journal Voucher's
LAN/MAN	Local Area Network / Metropolitan Area Network
MDIT	Michigan Department of Information Technology
MNT	Multi-Use Network Telecommunications
MOU's	Memorandum of Understandings
NASCIO	National Association of State Chief Information Officers
NOC	Network Operations Center
OMB	Office of Management and Budget
OSPB	Office of State Planning and Budgeting
OWL	Ontological Web Language
P-Card	Purchasing Card
PCI	Payment Card Industry
PESTLE	Political, Economic, Social, Technical, Legal, and Environmental
PH & E	Public Health and Environment
PIO	Public Information Officer
PMLC	Project Management Life Cycle

PMO	Project Management Office
PMUG	Project Management User Group
QA	Quality Assurance
QoS	Quality of Service
RFP	Request For Proposal
RPO	Recovery Point Objectives
RTO	Recovery Time Objectives
SCIO	State Chief Information Officer
SCORE	Statewide Colorado Registration and Election
SDE	Spatial Data Engine
SDLC's	Software Development Life Cycles
SES	Senior Executive Status
SIPA	Statewide Internet Portal Authority
SLA	Service Level Agreement
SMP	Symmetric Multi-Processing
SOAP	Simple Object Access Protocol
TABOR	Tax Payer's Bill of Rights
TCO	Total Cost of Ownership
TEAF	Treasury Enterprise Architecture Framework
TPC	Transaction Processing Council
TxDIR	Texas Department of Information Resources
UML	Uniform Modeling Language
VEC	Virginia Employment Commissions
VITA	Virginia Information Technology Agency
VoIP	Voice over Internet Protocol
WAN	Wide Area Network
WBEM	Web Based Enterprise Management
WBS	Work Breakdown Structure
WSCA	Western States Contracting Alliance
WSDL	Web Service Definition Language
XML	eXtensible Markup Language