

## CHAPTER 8 – FUTURE STRATEGIES

---

“We in the State of Colorado envision a government that provides the highest quality service possible for its citizens – a government that uses information and technology as strategic assets in meeting the mission of state agencies. We must, therefore, continue to forge a transformation within state government to change the way we do business. This will require continual reform of the executive branch’s management practices and operations to provide service to the public that matches or exceeds the best service available in the private sector.”

Marc Holtzman, NCC Co-Chair

The strategic vision for the State of Colorado projects a time when every state agency will transform itself into a truly-digital enterprise. As Colorado looks to the future, we find that many state agencies have already made great technological advances. Day after day, more state agencies, employees, and citizens rely on information technology (IT) to accomplish their missions and satisfy their service and information needs. Progress to this point has been relatively easy compared to the challenges ahead. No longer is IT used in pockets of isolation to accomplish separate and distinct tasks. Agencies can no longer succeed as stand-alone, independent entities. State agencies must integrate IT into every facet of their operations as they meet mission-critical needs, the needs of their customers, and the needs of other state agencies.

The State of Colorado’s leaders are faced with fast-paced decisions required in the digital economy. At the same time, the State must abide by statutory and regulatory requirements unique to state government. While these requirements are important and necessary to guarantee the integrity of our actions for our citizens, we must recognize that they impose constraints on the ability to procure products and services, recruit IT professionals, and proactively make technological adjustments to meet dynamic state priorities. To this end, there is a need for concerted leadership to present a united voice to help Colorado find its place in the digital environment.

In championing issues that extend beyond any one agency and that affect the entire state community, NCC is positioned to define the critical facing the state government enterprise.

This chapter outlines major strategies that the State must prioritize and invest in to deliver better quality and integrated products and services to our citizens. Unlike the other chapters, these initiatives are not associated with explicit recommendations. The strategies include:

- ◆ Integrated Service Community;
- ◆ Enforcement of Technology Standard;
- ◆ e-Government Enterprise Infrastructure;
- ◆ Enterprise Knowledge Management;
- ◆ Colorado Seven-Year Implementation Timeline; and
- ◆ Future Projects.

### INTEGRATED SERVICE COMMUNITY

In projecting the potential for the future of e-government, it is clear that there is a need for a unified voice in championing issues that extend beyond any one agency and affect the entire State. Colorado must extend its e-government capabilities to vendors, business partners, state employees, local governments, and nonprofit organizations. In shaping a more fluid interface with industry, various levels of government and the public, we seek to facilitate the development and sharing of information, knowledge, policies and best practices among these groups. We also strive to provide state workers with enabling technologies and efficiencies with which to do their job more efficiently. The two primary electronic framework strategies to achieve this integrated service community objective are as follows:

**Extend the State's integrated portal through a secured extranet to enhance service delivery based on outcomes through customer relationship management technology.**

In addition to meeting the needs of its citizens, Colorado must extend its data network to meet the demands of its vendors, business partners, and other stakeholders. When connected to the State's secure network, vendors, and business partners will be able to do business with the State in a secure electronic environment. Additionally, through secure electronic links with other governmental entities, the State will be able to provide a full spectrum of government services to citizens, organized in a way that caters to a citizen's needs.

For example, a new resident of Colorado might log onto the Internet and access the state portal to apply for a Colorado driver's license, find out information about starting a business in the State, and also find out which local school is zoned for his or her residence.

Extending the State's intranet opens up the door to the wealth of knowledge housed at state and local governments and nonprofit organizations. The real value in information brokerage will be in facilitating the location of information and presenting it to the users. Users should also be able to locate and access specific information from a variety of public websites including agencies, city and county governments, public health facilities, and schools and universities.

Implementation of this strategy should provide outcome-based services and enable employees. This strategy focuses on citizens, because the services being provided will be personalized to meet the citizen's needs and will allow for a simple and convenient means of obtaining information and services. This strategy improves the relationship between citizens and government, making it as seamless as possible for them to do business with the State and other local government entities. The technology associated with this strategy provides citizens with a virtual community where obtaining services from state and local governments is easily accessible from one location.

**Create a self service capability for employees taking advantage of the State's intranet, Internet, and Kiosk technologies.**

Providing self service capabilities to employees includes making sure the site is accessible 24 hours a day, seven days a week. Providing customer service and

personalized services should make users more comfortable with the site. Providing self-service capabilities through a variety of methods will likely make the users' activities easier to complete and more efficient.

Extending services to increasing numbers of state employees expands the e-government community. Services such as selecting annual benefits, changing addresses, and checking the status of different types of applications should be accomplished through the State's Internet, intranet, and kiosks. These services should be available to state employees 24 hours a day, seven days a week.

Not all state employees have access to a computer at work or home; therefore, it may be necessary to deploy the self-service capabilities through multiple means. State employees who work in remote locations or out in the field need to have the same or similar access to the self-service capabilities as those with computer access. Kiosks and integrated voice response (IVR) are alternative methods of delivering these electronic self-services. Kiosks could be made available in common areas such as cafeterias located in state office buildings, or in other centrally located public places. With IVR, a state employee would only need access to a telephone to enjoy the benefits of the self-service capabilities; therefore, the State should consider these technologies where appropriate.

With regard to e-transformation criteria, this strategy should enable employees and create efficiencies for the State and its employees. It should enable employees by giving them self-service access to information anytime, anywhere. Efficiencies are also created by the implementation of this strategy. Previously, state employees were charged with completing tasks such as benefit selection, changing employee addresses, and answering general questions about processes and procedures. With this access to self-service functionality, state employees will spend less time completing administrative tasks, thereby providing more time to complete problem solving or "knowledge work" activities.

The timeline for implementation of this strategy is long term. As the State builds its technology infrastructure and integrates applications, planning this strategy should begin. This strategy should be implemented over a number of years.

# ENFORCEMENT OF TECHNOLOGY STANDARDS

Colorado currently operates in a silo-based technology environment, whereby individual agencies have determined and set policies and procedures based on their individual needs. It is becoming increasingly important for the State to manage technology infrastructure from a “statewide” perspective. Statewide policies and standards should give the State the ability to serve citizens more efficiently and effectively. Moreover, consistent, integrated statewide standards provide a framework that will enable state employees to work with less ambiguity. These standards help ensure that development work will be consistent and transferable across agencies and projects. Further, employees themselves are better prepared to work in multiple agencies.

This “enterprise model” stresses consistency in technology standards, business processes, common structures, collective procurement, and shared technology where appropriate, most commonly as they relate to shared infrastructure, applications, and data. Consistency in each of these areas should result in more efficient use of resources; more responsiveness to all citizens, vendors, and employees; and a reduction in the overall ratio of government personnel to citizens served.

## e-GOVERNMENT ENTERPRISE INFRASTRUCTURE

Many of the State’s systems are narrowly focused, not fully interoperable, support only a single function or organization, and require users to assemble information from incompatible sources. As information generation capabilities become more complex and as citizen’s service expectations rise, we must begin to manage information for the users, while integrating and modernizing the infrastructure.

Our focus therefore must be to lay the foundation for Colorado’s technology systems to operate seamlessly in a government-wide enterprise architecture that provides models and standards that will support this philosophy. Additionally, we must develop a statewide and integrated approach to the management of desktops, computing capacity, networks, and IT human resources

(HR) that will support its Internet access strategy. Such strategies will provide efficiencies for the State and our employees with useful technology tools. The three primary electronic framework strategies to achieve this objective are:

### **The development and implementation of a statewide process for the integration of desktop management.**

The State should change the way its desktop infrastructure is managed. Instead of functioning as 23 different agencies, the State should adopt a statewide approach to the desktop. This approach includes developing desktop standards (discussed above), instituting seat management provided by a third party, and deploying thin client technologies as appropriate. Developing desktop standards should include integrated desktop procurement, consolidated help desk support, and statewide desktop management. Clearly, these desktop standards will be closely linked to Internet access strategies.

Colorado should develop these desktop management strategies, operations, and measurement procedures to reduce costs while making IT more efficient. IT effectiveness and value will also improve through increased end-user productivity.

### **The development and implementation of a statewide process that manages computing capacity.**

Colorado should change the way the computing capacity is structured and move towards a statewide computing infrastructure. Computing capacity infrastructure should be adaptable, scaleable, cost-effective, and ensure that services are available 24 hours a day, seven days a week as the State provides more online services to constituents, vendors, and employees. The State’s current IT infrastructure is not designed to satisfy the complex availability requirements associated with newer versions of applications such as Enterprise Resource Planning (ERP) systems. In order to meet these challenges, the State should move towards a statewide computing environment by consolidating data centers, servers, and data. The State should also strongly consider outsourcing routine applications.

With the distributed data architecture that currently exists, the State would find it difficult to effectively share information in a real-time basis. E-government’s escalating need for information completeness and consistency will drive the State to control data centrally.

In addition to information quality, effective e-government also demands high information availability.

Distributed data architectures include complex database recovery, backup, and restore procedures that impose significant operating risk for organizations providing e-government services. As Colorado's constituents, vendors, and employees come to depend on e-government services, IT infrastructures must effectively reduce unavailability risk while simultaneously managing rapid technological change.

**The development of a HR plan to provide for the acquisition, retention, and training of the core service skills necessary to implement and maintain e-government technologies and legacy systems.**

Government agencies at all levels are having difficulty recruiting and retaining IT staff because of the restrictions and unique set of challenges they face. Government Colorado Chief Information Officers (CIOs) and IT managers have additional constraints regarding the constituencies they serve, salary structures, civil service rules, and governance policies and procedures under which they operate. A report by Giga Information Group summarizes the federal and state CIO challenges as follows:

- ◆ Wide range of stakeholders including legislators, news media, unions, special interests, citizens, state employees, and vendors;
- ◆ Noncompetitive compensation due to civil service rules and inflexibility;
- ◆ High security liability and public safety issues; and
- ◆ Bureaucracy including autonomous IT shops and difficulty sustaining multi-year efforts due to changes in administration and budget cycles.

In order to address these issues, the State should make significant changes in its personnel retention and training policies. For example, Colorado should institute a statewide approach to staffing issues that includes multiple solutions beyond addressing salaries. While having a competitive salary structure is important, the State should offer a complete package that includes retraining, a variety of bonuses, flexible benefits (such as telecommuting), and selective outsourcing. In addition, the State should look to buying or leasing rather than building applications and shifting toward applications that offer self-service functionality.

Whenever possible, the State should retrain existing employees instead of hiring new staff. Retraining staff will provide benefits such as improved morale and retention of institutional knowledge. As the State moves away from legacy systems to other platforms, retraining will become even more critical and cost-efficient.

Bonuses also play a key role in recruitment and retention in both the private and public sectors. The State should offer retention bonuses to keep employees for a certain period of time and should pay bonuses out incrementally. Other incentives should include sign-on, performance, and referral bonuses.

The State should also selectively outsource certain functions to maintain flexibility while increasing in-house staff skills in the areas of project management, leadership, and business training. The State should transform the role of the IT professional from doer to planner, manager, and broker by adopting the following management practices:

- ◆ Selectively outsourcing non-core business processes (e.g., help desk, data centers, training, and equipment maintenance) that do not violate statutory restrictions on outsourcing;
- ◆ Hiring and training people in project management, relationship management, contract negotiation, strategic planning, risk analysis, budgeting, forecasting, and financial analysis;
- ◆ Consolidating and coordinating disparate IT units;
- ◆ Shifting to packaged applications to minimize customization, speed installation, and reduce the complexity and labor intensity of choices;
- ◆ Considering self-service, web-enabled applications such as computer-aided training, purchasing, and other functions; and
- ◆ Expanding flexible workplace arrangements such as telecommuting and flextime, to attract and retain IT professional talent and create a virtual workplace.

By implementing an HR plan that focuses on recruiting, retaining, and training, the State will ensure that it has the qualified staff needed to manage its technology infrastructure. The critical-skills HR plan should be implemented in the near term.

# ENTERPRISE KNOWLEDGE MANAGEMENT

In order to extend Colorado State Government to the public and business partners the State should integrate its core applications to develop an enterprise knowledge management environment. This transformation will rely on the implementation of a statewide, document management solution, tools, data warehouse and data mart technologies, and business intelligence tools. The three primary electronic framework strategies to achieve this enterprise knowledge management objective are:

## **Deploy a document management solution to support core functional and service delivery applications through utilization of imaging and automated workflow technologies.**

A statewide integrated document management system for state government processes that are paper-dependent should allow state employees to work more effectively by giving them access to important information that is not captured during the data entry process. This information will typically be in the form of original source paper documents that must be accessed periodically. By integrating workflow technologies with document imaging, state employees will be able to access important information instantaneously, significantly improving efficiency and effectiveness. In addition, certain imaged documents should be made available to the public over the state portal, further enhancing the citizen-focused e-government services offered by the State.

## **Implement a statewide data warehouse and data mart technologies with the appropriate security to provide knowledge management repositories available across the State.**

Statewide decision-makers, be they legislators or executive branch officials, need the right information at the right time to make informed, intelligent decisions. They cannot wait for queries to be made to legacy systems or for the gathering of information from disparate applications within various state departments. The need for increased efficiency is forcing states to make better use of the quantities of data stored in multiple, non-integrated databases.

The State should implement data warehouses to improve the decision support system by creating a single point of access for business critical information. All data relative to a subject should be stored in one system. Access to the data should be simple enough for

users to access it themselves without relying on programmers. While the data warehouses should be located in the computing centers of excellence, the extended networked community should be able to draw on these repositories through the use of web-based business intelligence tools. Some of the benefits of data warehousing are the ability to:

- ◆ Access quality data that is up-to-date and consistent;
- ◆ Make informed decisions by accessing statewide and cross-functional information;
- ◆ Minimize dependency on application development teams to create reports or extract information from existing systems;
- ◆ Produce consistent reports with improved performance and accuracy;
- ◆ Rely less on legacy mainframe systems; and
- ◆ Empower end-users to respond directly to constituents.

## **Deploy business intelligence tools and geographic information systems to provide decision-makers with better data analysis, query, and automated performance measurement capabilities.**

The State should deploy a statewide set of business intelligence (BI) tools that facilitate analysis of information, thereby allowing its employees to concentrate on what decisions to make rather than how to get to the information. BI tools have evolved to include enterprise performance management (EPM) and balanced scorecard applications. These tools allow state managers to proactively analyze their operations by combining financial and non-financial data, rather than simply measuring historical performance as illustrated by traditional financial reports. Colorado's implementation of BI tools is a long-term strategy.

The State should implement EPM applications to help managers optimize their organizations and track their performance toward defined goals and objectives. EPM applications should include balanced scorecard, activity-based management, benchmarking, budgeting, and consolidation tools. These tools will give managers a view of the organization's strategies, goals, and objectives, and provide a framework for the integrated management of the organization.

The balanced scorecard tools will give managers the ability to view business unit performance towards established goals through four views—financial, customer, internal business, learning, and growth. By setting specific and measurable goals in each of these areas, managers will be able to gauge how well their organization is performing and make modifications for improvement. Managers will also be able to establish cause-and-effect relationships between goals and see how the performance of the business unit in any one of the four areas may impact the overall performance of the unit.

Citizens should be able to receive quick summary information about subjects that concern them and obtain more detailed information if they wish. The BI tools should give users a greater ability to help themselves, and avoid standing in line or waiting on the phone for help.

The State's employees should also benefit from these BI tools. The EPM tools should enable managers to proactively manage the State's business instead of reacting to situations as they arise. The balanced scorecard tools should give all employees a view of how their own personal goals are aligned with the goals of their business units and how their own performance impacts the unit's established goals. Employees should be able use this information to take action and meet their goals early in the business cycle, when those actions will have the greatest effect.

The State's implementation of BI tools is a long-term strategy. BI tools are only effective after data has been gathered in other information systems. Once the State

has implemented its financial and HR systems and has built data warehouses to collect and summarize information, BI tools will enable employees and citizens to view and manipulate this information.

## **COLORADO SEVEN-YEAR IMPLEMENTATION TIMELINE**

The implementation timeline presented below is designed for multiple strategies to be implemented at the same time instead of as sequential events. The timeline is intended to establish a schedule to implement the State's portal strategy-which should continue over the following seven years covered in this report. Extending the State's portal to stakeholders to form an integrated service community should also be implemented in parallel with the State's e-government framework.

As the State develops the e-government infrastructure, they should continue to add applications and citizen focused services. The State should also simultaneously begin implementing the technology and network infrastructure during the first three years. Business management systems should be implemented between 2002 and 2003 to provide the core processing and computing environment for governmental transactions. Statewide decision support tools designed to provide data manipulation and business intelligence capabilities should be implemented between 2004 and 2007. The seven-year timeline is shown in Figure 8-1.

**Figure 8-1: Seven-Year e-Transformation Timeline**

<b>Citizen Focused, e-Government Strategies</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>
<b>1. Enabling Electronic Framework for e-Government</b>							
S1.1. Electronic Framework	✓	✓	✓	✓	✓	✓	✓
S1.2. Standards for Internet Presentation of Services	✓	✓	✓	✓	✓	✓	✓
<b>S2. Extended Integrated Service Community</b>							
S2.1. Extend the State’s portal to Vendors and Service Provider Stakeholders	✓	✓	✓	✓	✓	✓	✓
S2.2. Self-Service Capability for Employees	✓	✓	✓	✓	✓	✓	✓
<b>S3. Technology Governance for Citizen Focused e-Government</b>							
S3.1. Decision and Priority-Setting Process	✓						
S3.2. Technology Standards	✓						
S3.3. Project Management Program	✓						
S3.4. Quality Assurance Program	✓						
S3.5. Technology Tactical Plan	✓						
<b>S4. e-Government’s Enterprise Infrastructure</b>							
S4.1. Desktop Management	✓	✓					
S4.2. Computing Capacity Management	✓	✓					
S4.3. Integrated Network	✓	✓	✓	✓			
S4.4. Human Resource (HR) Plan	✓	✓					
S4.5. Integrated Security Infrastructure	✓	✓					
<b>S5. Enterprise Knowledge Management</b>							
S5.1. Integrated Financial Management		✓	✓	✓			
S5.2. Web-Enabled HR Management		✓	✓	✓			
S5.3. Document Management Solution					✓	✓	✓
S5.4. Data Warehouse and Data Mart		✓	✓	✓			
S5.5. Business Intelligent (BI) Tools					✓	✓	✓

## FUTURE PROJECTS

The NCC teams identified 45 additional projects that would address the four goals of the NCC initiative. The highest prioritized projects are listed in the previous chapters of this document. These remaining projects need prioritization and need additional research to identify the specific tasks. Two additional categories,

Government Business Practices and Government Organization, have been added for projects that did not fit into the previous sections of this chapter. The table below identifies these additional projects.

## **e-Government Enterprise**

### **Infrastructure**

Eliminate Unnecessary  
EMPL / CPPS Reports  
IT Staff Training  
Procurement for Microsoft  
Telecommunication Rates

### **Government Business Practices**

Best Practices (as a stand alone project)  
Buy Colorado  
Children's Trust Fund  
Commute Agreements  
Financial Modernization Bill  
  
Fleet Utilization Definition  
Government Partnering  
Grant Consolidation / Coordination  
Handling Workers Compensation Internally  
Implementation Plan for Licensing Agencies  
Lease / Purchase of Durable Equipment  
Ports of Entry  
Professional Memberships  
Review of All 707 Licenses for Appropriateness  
State Land Board Portfolio  
Training  
Warehouses  
Weights and Measures

## **Enforcement of Technology Standards**

Commodity Standards and Planning  
IT Budget Issues (OIT, OSPB)  
Payroll  
Policies and Standards (IMC)

### **Government Organization**

Commodities Buying Patterns  
Community Corrections Reorganization  
DPS Salaries / Troopers  
Fire Safety Reorganization  
Department of Personnel / GSS Printing Service  
Inspection / License Reorganization  
OEM Relocation  
State Libraries  
Statutory Review of Organizational Structures

## **Enterprise Knowledge Management**

Records Management  
Records Storage / Surplus

### **Integrated Service Community**

Air Pollution Online Pilot Project  
Cash Management Tools  
Default Values in EMPL and CPPS  
Direct Mail of Advises and Warrants  
Freight Price Agreements  
  
Online Auction  
Vendor Partnering – Global  
Vendor Partnering – Office Supplies