State of Utah

Business Plan

For

Archival Preservation of Geospatial Data Resources

Version1: December 30, 2008

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1.   INTRODUCTION

Geospatial, or location based information, is ubiquitous and now necessary throughout government and non-government business processes. The *Governance of Geospatial Resources* white paper recently published by NASCIO states that "Geographic Information Systems or GIS technology has been employed in state government for decades". Utah first introduced GIS into state government in 1981. Since that time, countless GIS data files have been created to analyze issues, develop plans, make decisions, or provide services to the public. Over the nearly three decades of GIS use in the state, the focus of the community has been on creating and maintaining the most current and accurate data and very little thought or effort has gone into preserving that information or the resultant products.

The *Utah Geospatial Infrastructure (UGI) Strategic Plan* was completed in September of 2008. The Strategic Plan recognized the UGI is "necessary to acquire, process, distribute, use, maintain, and preserve digital spatial data and services." Included in this definition is the requirement to implement a process to maintain and preserve digital geospatial data resources within Utah across all state and local agency partners. Many individual agencies have no process currently in place for geospatial data preservation but do agree there is value in doing so.

There is increasing interest by states across the nation, in addressing digital geospatial data preservation. The State of Utah is working with the states of North Carolina and Kentucky along with the Library of Congress to implement processes for archival preservation of this data. This coincides with the National States Geographic Information Council (NSGIC) and the Federal Geographic Data Committee (FGDC) approach to encourage and assist state strategic planning efforts.

The Division of State Archives and Records Service (State Archives) along with the Automated Geographic Reference Center (AGRC) begun a partnership to lead the effort of preserving digital geospatial data for Utah. The intent is to do this through joint policy development, infrastructure provisioning, training, technical assistance, and implementation.

The mission of the Division of State Archives and Records Service (State Archives), a division of the Department of Administrative Services (DAS), is to:

- Assist Utah government agencies in the efficient management of their records,
- Preserve those records of enduring value, and
- Provide quality access to public information.

The mission of the Automated Geographic Reference Center (AGRC) is to:

- Encourage and facilitate the effective use of geospatial information and technology for Utah.
- Manage the State Geographic Information Database (SGID) as an asset for all geospatial data users for Utah.

The intersection of these missions, based in statutory requirements, brought the AGRC and State Archives together. This activity has become a priority for Utah because of the increasing recognition of the value of geospatial data and the realization that much of it is currently at risk.

State Archives and the Department of Technology Services recently completed an *Electronic Records Management Business Case* where many of the following business drivers were identified:

- Records preservation: Preservation of all aspects of government projects and decisions including data, software, processes, products and documentation.
- Loss of Investment: Electronic records document business processes and decisions that the state has paid for; their loss would require resources to redo the work. Some losses may not be recoverable.
- eDiscovery: Increasing demand for finding and retrieving information in legal matters, and increasing penalties for not being able to produce it.
- Government Records Access and Management Act (GRAMA): There is constant demand for information the public is entitled to.
- Efficiency: The demand for efficiency drives technological advances, which drive the state to be able to define policies, standards, procedures, and tools to better manage electronic records.
- Online Storage Costs: Records stored in an active online environment without regard to the business value of the information equals higher cost.
- Duplication of storage costs: Savings realized when sharing storage and other infrastructure by multiple agencies for data holdings.
- Archival Professional Guidelines: Sets standards for which records stewards must be compliant.
- Increasing Use of Technology: There are ever-increasing amounts of records being created in or converted to electronic formats.
- E-record Vulnerability: Essential electronic records are at risk in disasters and other emergencies.
- Transparency: The emphasis on transparency in government and online public access to records results in a need for adequate records management solutions.

The costs to implement this activity are minimal in comparison to the funds initially expended to develop this data. This plan defines a project that can move forward using currently available low cost solutions. This process will define an enterprise solution that will help to alleviate the need for each agency to maintain the computer systems and storage necessary to preserve their data independently. Regardless of cost, there is a legal and social responsibility to perform this activity.

2.   GOALS

Through the planning process to develop the *Utah Geospatial Infrastructure Strategic Plan*, discussions concluded that there needed to be a capability to manage digital geospatial data. This includes developing a process that will identify, inventory, evaluate, and preserve valued digital geospatial information. Requirements for data

inventory, maintenance and preservation were addressed in the *UGI Strategic Plan* with detailed objectives identified here.

Programmatic Goal: Implement a process to archive digital geospatial data resources in Utah across all state and local agency partners.

Objective 1: Establish scope and duration of effort.
> **Success Factors:**
> a. Finalize plan of action and milestones
> b. Establish criteria for completion

Objective 2: Support the State Archivist's responsibilities to administer the state's archives and records management program including digital geospatial data (UCA § 63A-12-101).
> **Success Factors:**
> a. Create retention schedules for all record groups of digital geospatial data. A "record group" is a set of records that have some functional relationship.
> b. Establish standards, procedures, and techniques for effective management and care of digital geospatial data.
> c. Ensure preservation of historically significant geospatial data and records with continuing value.

Objective 3: Establish procedure and mechanism for inventory of state and local government digital geospatial data and projects.
> **Success Factors:**
> a. Establish the list of core data elements to capture during the inventory effort.
> b. Establish "metadata" management approach for storing and reporting on inventory findings (e.g. RAMONA).
> c. Use GIS to show status of inventory results and to help discover data resources.
> d. Establish database of contacts for inventory effort in conjunction with "metadata" management approach.

Objective 4: Compliance with, and ease of fulfilling, Government Records Access and Management Act (UCA 63G-2).
> **Success Factors:**
> a. Ensure public access to archived digital geospatial data.
> b. Provide assistance to any government entity to meet GRAMA requirements.

Objective 5: Assist the geospatial technology community to preserve their digital geospatial data and projects.
> **Success Factors:**
> a. Enable preservation at a single point.
> b. Ensure against temporary or permanent loss as a result of the distributed nature of digital geospatial data.
> c. Provide preservation of temporal versions of digital geospatial data.
> d. Provide assistance to meet requirements for Continuity of Operations.

Objective 6: Increase awareness across sectors and stakeholder groups about the archival preservation program to expand participation.

>**Success Factors:**
>a. Develop training program to assist records officers.
>b. Develop training program to assist geospatial technology professionals.
>c. Arrange presentations to explain purpose and make appeal for their participation.
>d. During the inventory process, determine need for door-to-door vs. group training and schedule accordingly.

3. BENEFITS

For nearly thirty years, state and local agencies in Utah have steadily implemented geospatial technologies into their work processes and projects. This has resulted in a huge amount of digital geospatial data, programs, and products. Agencies are often asked, or even required, to make old data available. There is also a need to be able to repeat a process from a previous decision or product using data and programs contemporary with the event. By having a commitment and a systematic approach to preservation, these needs are easily met.

There are risks to the state by not preserving digital geospatial resources. As identified in the State's ERM Business Case, "The primary risk is cost, due to loss of critical information, the necessity to recreate information that is no long available, or the amount and quality of storage purchased for records of questionable value. The business risk to the state may be in the form of legal actions due to an agency's inability to produce a record during an e-Discovery request."

Utah is committed to addressing this issue. Doing nothing to preserve our digital geospatial resources is no longer an alternative. There are many benefits to this on-going activity which include:

- Standardized preservation of geospatial resources.
- Standardized approach by state and local agencies for retention policies and categorization of resources.
- Development of tools to ease the discovery of geospatial resources.
- Improved access to digital geospatial resources to aid originators of data, GRAMA requests, researchers, and the public.
- Assistance in continuity of operations and disaster recovery for state and local agencies.
- Actual dollar savings due to coordinated approach to archiving geospatial resources using standardized formats and a shared computer environment and storage.
- Ability to compare data not only to see changes in the data itself, but in the processes used to create data and improvements in quality and completeness.

4.   REQUIREMENTS AND COSTS

4.1   Inventory of Existing Infrastructure and Suitability Assessment

AGRC has been developing a Continuity of Operations Plan (COOP). Much of the infrastructure for that plan has now been implemented. Although COOP is still in the early stages of testing and evaluation, we believe it has the potential to also work for the preservation of geospatial data resources. The existing infrastructure contains the following components:

- Database Server (vector data)
- Imagery Server (raster data)
- License Manager (for ArcGIS products)
- FTP Server (that contains an export from the database)

4.2   Data Requirements

Data contributed to the State Geographic Information Database (SGID) and subsequent archiving will be loaded into the SGID framework. This process will ensure current, temporal, and archive versions of data are secure and accessible.   This data will remain live, on-line, and read-only in the database. As technology allows, various GIS formats and computer aided design (CAD) formats of data will also be tested and integrated into the archival system. AGRC must ensure these data are secure and in a well managed computing environment.

These data must meet the core requirements for managing electronic records State Archives identified in their ERM Business Case:

- **Accessible**—the records must be available for appropriate use for the duration of the retention period.

- **Authentic**—the records must be what they claim to be and have integrity, that is, have not been changed, deleted or otherwise altered.

- **Reliable--**the data within the records is at all times retrievable (i.e., no loss of data is acceptable).

- **Secure--**all of the people allowed to view records according to the classification of the records, and in some situations, only those people, should have access.

4.3   Technology Requirements

The computing environment for this plan will take advantage of the Spatial Data Infrastructure components currently being implemented by AGRC. The architecture for this infrastructure will take advantage of the primary computer center located in Salt Lake City and the remote computer center located in Richfield, Utah. Both of these centers are operated by the Utah Department of Technology Services.

Components of a State SDI
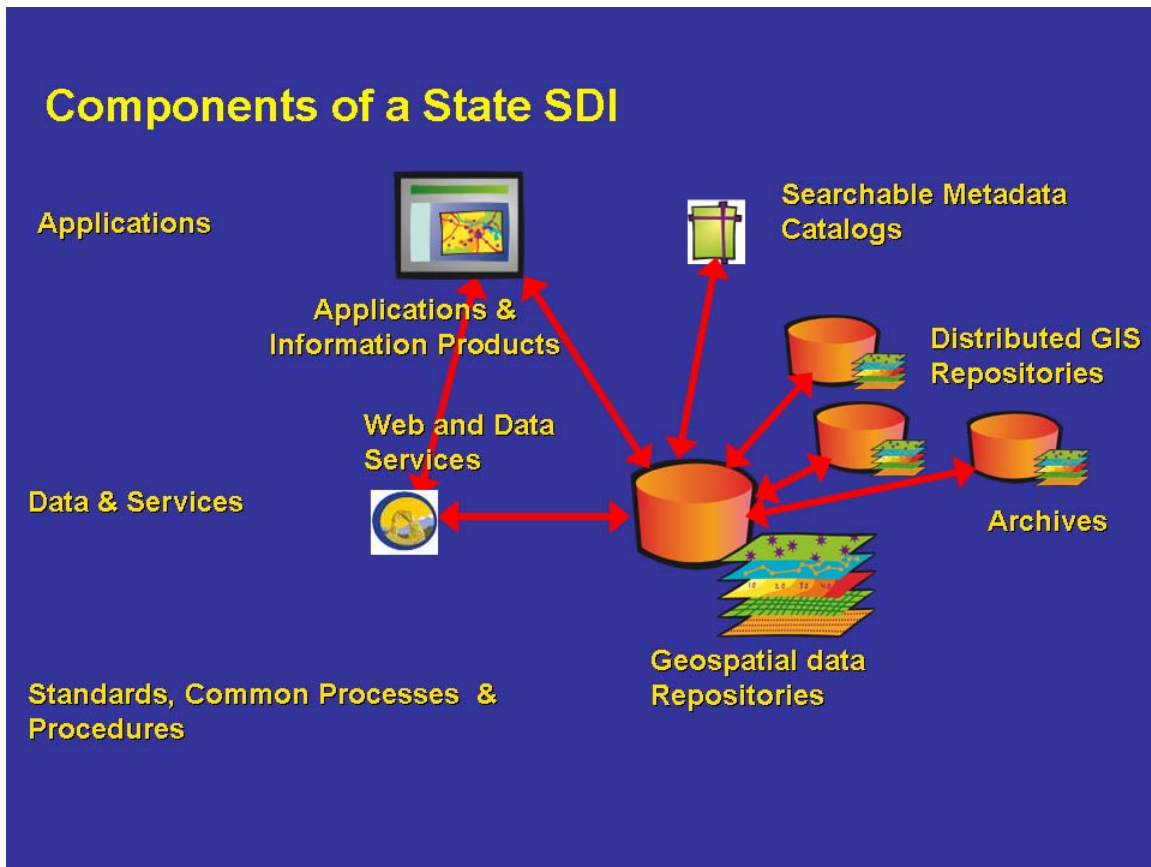
The infrastructure needs to contain the following components;

- Database Server – HP/Compaq DL380G5 Series Server
- ArcGIS Server Enterprise Standard – SQL Server

- Imagery Server – HP/Compaq DL380G5 Series Server
- This is an extension to ArcGIS Server Enterprise Standard

- License Manager – Sun Sunfire T1000 Server
- All Server type products use an .ecp file. Concurrent use licenses for ArcGIS Desktop and desktop extensions require a license manager

- FTP Server – HP/Compaq DL380G5 Series Server ~ 1TB on board storage
- There is no ArcGIS software on this server. This server contains geospatial data files in a few different formats for users to download

- As appropriate, all servers will run Windows 200X server standard.

4.4   Resource Requirements

The staffing resource requirement will have two aspects: the initial startup commitment and an ongoing requirement. The initial startup commitment will be approximately 200

hours and an ongoing requirement of .25 part of an FTE (500 hours per year at State approved rate).

4.5 Standards

Geospatial data preservation issues fall within the realm of a national information policy and a national data management strategy. Working in partnership with library and archival communities, government data producers need to standardize and adopt organizational policies and practices to govern the creation, use, retention, dissemination, preservation, and disposition of geospatial data to ensure their authenticity and integrity for as long as required by federal, state, and local laws and ordinances; rules and policies; and regulations, and for the health, safety, welfare, security, and prosperity of citizens.

While Utah is producing high-quality geospatial data, the policies and procedures governing its long-term retention remain to be developed both at the state and national levels. National bodies such as the Federal Geographic Data Committee (FGDC), federal agencies such as the Library of Congress and the National Archives, along with national councils associated with geospatial data production, delivery, and preservation should work together to further develop the following policy areas:

- Promote the use of the approved metadata standard in the geospatial community through publicity, workshops, and the creation of tools.
- Promote the adoption of non-proprietary standards for the creation and exchange of geospatial data such as GML and Open Geospatial Consortium specifications.
- Research the use of Library of Congress, the National Archives, and the FGDC guidelines and best practices for the logical and physical storage of digital information.

5.   ORGANIZATIONAL APPROACH

5.1 Plan Sponsorship

This program will be managed the Utah Division of State Archives with support from the Department of Technology Services and the Automated Geographic Reference Center.

5.2 Project Governance

Oversight is provided by the current structure governing State Archives and AGRC. This includes participation by existing groups that include the State Records Committee, the Geospatial Information System Advisory Committee (GISAC), and regional and sector based organizations in Utah.

5.3 Organizational Outlook

The current state of affairs supports this plan. No changes in sponsoring organizations or governance are required for implementation. This plan implements what is currently required by statute.

6.   IMPLEMENTATION PLAN

6.1   Implementation Details

The Gantt chart below illustrates the proposed schedule for this project. The project should become operational and the processes be in full production by September 30, 2009. Each component in Objective 5 includes installation, testing and operations. This schedule will work for most agencies and most geospatial resources. Although the current computing environment will accommodate most of the data and projects that agencies wish to archive, the project may initially be constrained by storage capacity for larger data sets.

6.2 Phasing and Milestones

Programmatic Goal

Implement a process to archive digital geospatial data resources within Utah across all State and local agency partners.
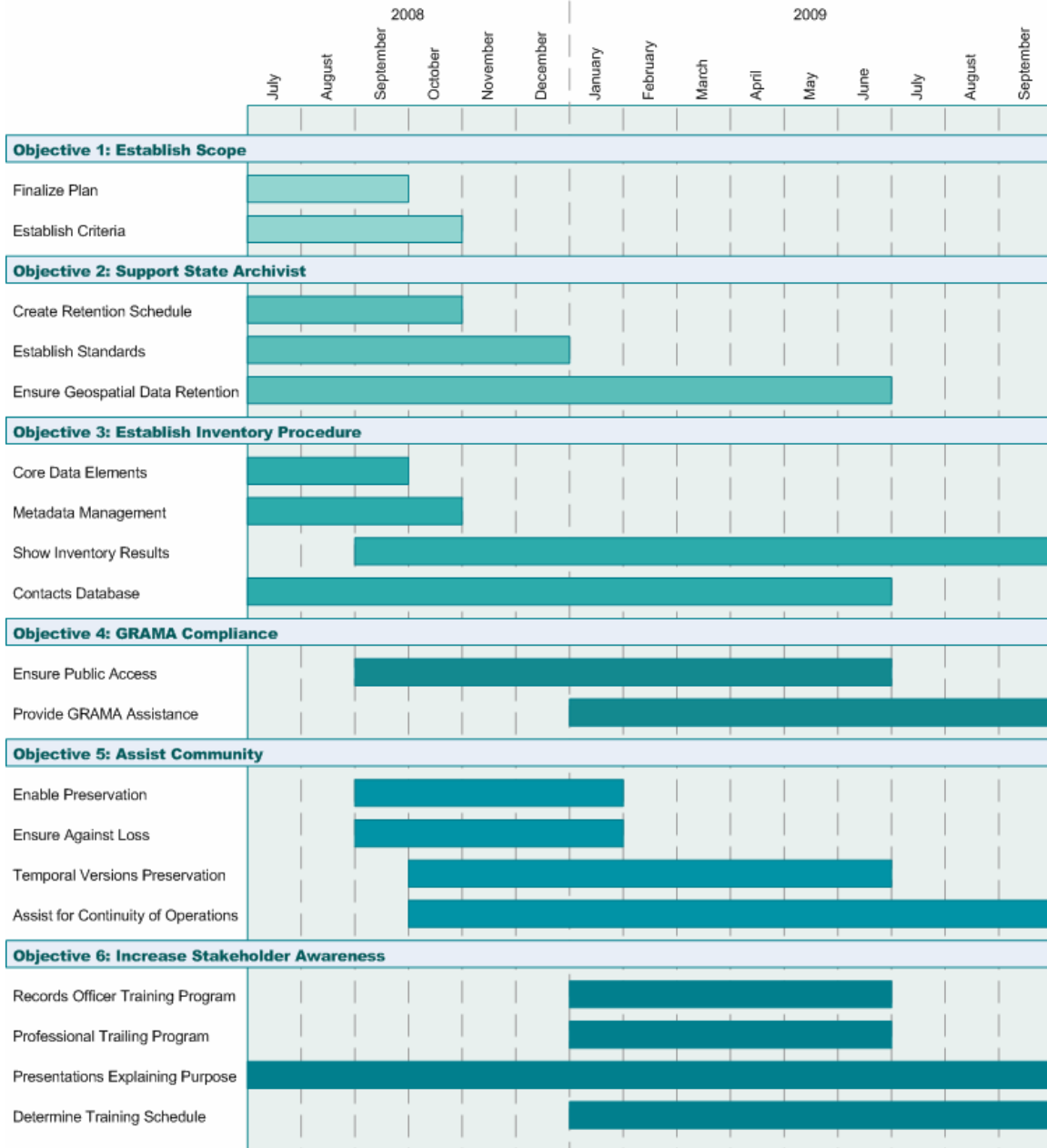
6.3   Budget Plan

The startup costs for these systems could be a shared cost between AGRC and State Archives.   Preliminary startup cost estimates, excluding the costs of State personnel for this solution, and an estimate for ongoing costs, are provided.

Geospatial Archiving Solution: Cost estimates developed at AGRC are as follows:

Startup Costs:
- Licensing $30,000.00
- Servers $ 584.32/server/month, 3 Servers ~ $22,000.00/year
- Storage N/A Insufficient Sizing Data
- Staff time (Computing environment = 200 hours @ $73 = $14,600)
            (Project initiation and admin = 1000 hrs @ $73 = $73,000)

Ongoing Costs:
- Licensing/Support $8,000.00
- Server Admin, included in the cost per month
- Storage N/A Insufficient Sizing Data
- Server Replacement, included in the cost per month
- Staff time (500 hours @ $73 = $36,500 per year)

Computing Environment:
Startup $30,000 plus storage costs
Ongoing $8,000 plus storage costs

Archives Personnel:
An ongoing GIS Archivist II part-time salary and benefits estimate:
Salary $16,800
Benefits $18,700
  Total $35,500 per year

AGRC personnel:
Startup
         - Computing environment = 200 hours @ $73 = $14,600
          - Project initiation and admin = 1000 hrs @ $73 = $73,000
Ongoing = 500 hours @ $73 = $36,500

Partner agency personnel:
Dependent on size of organization.

6.4   Measuring Success, Feedback, and Recalibration

Below is a preliminary scorecard for the defined programmatic goal and associated objectives. This scorecard provides a quantitative mechanism for determining what level of progress has been achieved over time. These "success factors" can be modified and extended as appropriate. On a predefined schedule, we recommended that the set of tasks

be reviewed and the checklist updated to reflect task completion. Totaling the number of checklist points enables a percentage estimate to be made against the target total, for checking status.

Programmatic Goal: Implement a process to archive digital geospatial data resources within Utah across all state and local agency partners.			
OBJECTIVES	**Total Points**	**Current Score**	**CHECKLIST OF SUCCESS FACTORS**
Objective 1: Establish scope and duration of effort.	10		❑ Finalize plan of action and milestones ❑ Establish criteria for completion
Objective 2: Support the State Archivist's responsibilities to administer the state's archives and records management program including digital geospatial data (UCA § 63A-12-101) .	15		❑ Create retention schedules for all record groups of digital geospatial data. ❑ Establish standards, procedures, and techniques for effective management and care of digital geospatial data. ❑ Ensure preservation of historically significant geospatial data and records with continuing value.
Objective 3: Establish procedure and mechanism for inventory of state and local government digital geospatial data and projects.	10		❑ Establish the list of core data elements to capture during the inventory effort. ❑ Establish "metadata" management approach for storing and reporting on inventory findings (e.g. RAMONA). ❑ Use GIS to show status of inventory results and to help discover data resources. ❑ Establish database of contacts for inventory effort in conjunction with "metadata" management approach.
Objective 4: Compliance with, and ease of fulfilling, Government Records Access and Management Act (UCA 63G-2)	15		❑ Ensure public access to archived digital geospatial data. ❑ Provide assistance to any government entity to meet GRAMA requirements.
Objective 5: Assist the geospatial technology community to preserve their digital geospatial data and projects.	20		❑ Enable preservation at a single point. ❑ Ensure against temporary or permanent loss as a result of the distributed nature of digital geospatial data. ❑ Provide preservation of temporal versions of digital geospatial data. ❑ Assist to meet requirements for continuity of

OBJECTIVES	Total Points	Current Score	CHECKLIST OF SUCCESS FACTORS
Programmatic Goal: Implement a process to archive digital geospatial data resources within Utah across all state and local agency partners.			
			operations.
Objective 6: Increase awareness across sectors and stakeholder groups during inventory process about the AGRC program to expand participation	10		❑ Develop training program to assist records officers. ❑ Develop training program to assist geospatial technology professionals. ❑ Arrange presentations to explain purpose and make appeal for their participation. ❑ Determine need for door-to-door vs. group training in Inventory application and schedule accordingly.
TOTAL POINTS	80	0	

We will use the following summary table to score our overall progress. Partial progress on a particular checklist item can get partial points. When a success factor is complete, full points can be counted. This will give some indication of the current level of success, on an ongoing basis. A quarterly reporting schedule is shown in the table, below, and should be accompanied by a narrative report.

Progress Matrix	Total Points	June 08	Sept. 08	Dec. 08	March 09	June 09	Sept. 09	Dec. 09	March 10
Programmatic Goal: Implement a process to archive digital geospatial data resources within Utah across all state and local agency partners.	80								
Running Totals	0								

END NOTES:

1) Governance of Geospatial Resources: "Where's the Data? Show Me" - Maximizing the Investment in State Geospatial Resources, NASCIO http://www.nascio.org/committees/EA/download.cfm?id=103

2) Utah Geospatial Infrastructure Strategic Plan, Utah GIS Advisory Council http://gis.utah.gov/index2.php?option=com_docman&task=doc_view&gid=78

3) Electronic Records Management Business Case, Utah Division of State Archives

APPENDICES

Appendix 1: GeoMAPP / Library of Congress project information