



State of Utah  
Automated Geographic Reference Center

## **Business Plan**

**For an:**

# **Statewide Online Inventory of Geospatial Data Resources**

Prepared by:



**Version 1  
December 31, 2008**

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# 1 Executive Summary

Geographic Information System (GIS) data sets represent the GIS assets that are most valuable and difficult to create. As such, it is imperative that existing data sets be discoverable so that they can be shared and so that they are not needlessly re-created. In this manner, the returns on GIS data investments are maximized as the data are used and re-used by a wide variety of organizations to support a diverse range of planning and decision making activities.

In Utah, there are a large number of governmental organizations that produce and manage GIS data at the state, county and local levels. In addition, the federal government as well as private and non-profit partners create and manage data that is of interest to Utah governmental entities. With so much activity, it is increasingly difficult to discover the existing digital geospatial data that exists.

The Online Geospatial Data Inventory Tool (OGDIT) initiative described in this document aims to create a comprehensive inventory of the geospatial data assets that cover Utah. Over time, such a tool will serve as a one-stop-shop for discovering Utah GIS data whether those data are freely shared, or are available for a fee. Given the Automated Geographic Reference Center's (AGRC) longstanding role in managing the State Geographic Information Database (SGID) it is recommended that they be responsible for carrying out the development and management of this resource. The initiative described below will create a resource that:

- Is available to all Utahns
- Is comprehensive and includes as many GIS data holdings as possible
- Is user friendly in nature
- Contains tools for querying the holdings in the database
- Contains tools for registering data by data managers
- Is actively managed and kept current

## 2 Program Goals

### ***2.1 Context and Relevance to the Strategic Plan***

During September, 2008, Utah completed a Utah Geospatial Infrastructure (UGI) Strategic Plan. The first programmatic goal from the Strategic Plan was: “*Collaboratively maintained statewide data resources are usable, dependable, and relevant.*” The fourth specific activity under that programmatic goal was “**Create and maintain an online inventory**” of existing data resources in Utah. Clearly, part of making statewide data resources “usable” is ensuring that they are “findable” and an online data inventory will help ensure that they are. The importance of this goal was amplified in October, 2008, when the state conducted a workshop that included a prioritization exercise amongst ten proposed programmatic activities that should follow the completion of the Strategic Plan.

### ***2.2 Specific Goals & Success Factors for this Initiative***

**Programmatic Goal:** Conduct a statewide inventory of geospatial data resources within Utah and across sectors and major stakeholder groups.

**Objective 1:** Establish a detailed scope and duration of effort.

**Success Factors:**

- a. Finalize plan of action and milestones
- b. Establish criteria for completion

**Objective 2:** Establish the list of core data elements to capture during the inventory effort

**Success Factors:**

- a. Build a dictionary of data elements, with feature descriptions, attributes, and domains (if applicable) that would comprise the online inventory and would comply with the ISO 19115 Standard and retention schedules created by the State Division of Archives
- b. Determine need for feature aliases (one man's cemetery is another man's graveyard) and develop alias capability as deemed appropriate
- c. Determine need for content metadata (e.g, FGDC Metadata) and criteria for assessing data quality

**Objective 3:** Establish a technical and management approach for storing, querying and reporting inventory content

**Success Factors:**

- a. Assess the capabilities and efficacy of existing online inventory tools such as NSGIC's "Ramona GIS Inventory" tool; Assess the costs of constructing a custom tool
- b. Select an inventory tool, or a custom development approach for capturing, storing, searching, and reporting on geospatial data resources and promote self-registry and input to the inventory application by participants
- c. Ensure that selected tool can use GIS to illustrate status of inventory results, and to help discover data resources
- d. Ensure that selected tool can be easily integrated into the Utah GIS Portal and can leverage that tool's user registration framework
- e. Ensure that the tool and inventory database are supported and maintained into the future and on an ongoing basis.

**Objective 4:** Establish database of contacts for inventory effort and an approach for making initial contact and maintaining the currency of the inventory.

**Success Factors:**

- a. Leverage existing AGRC knowledge base, including users registered to the Utah GIS Portal, to identify contacts with geospatial data holdings and/or knowledge of such holdings

- b. Establish means of contact (e.g. email, telephone, etc.) and track contact attempts, both successful and unsuccessful

**Objective 5:** Increase awareness across sectors and stakeholder groups during inventory process to expand participation with the SGID.

**Success Factors:**

- a. For each sector and major stakeholder group (e.g., state agencies, federal land managers, tribes, counties, municipalities, universities, etc.), determine the most effective approach for reaching out to each group to gain cooperation and participation in the effort
- b. Arrange presentations to explain purpose and make appeal for their participation
- c. Determine need for door-to-door contact vs. group training in the online inventory application (e.g., Ramona GIS Inventory) and schedule accordingly
- d. Determine methodology for information capture from door-to-door inventory efforts (e.g., via on-site surveys, telephone interviews, etc.) and develop the necessary materials

### 3 Program Benefits and Justification

The primary benefit of this initiative will be to enhance the availability of geospatial data in Utah by making it easier to find and share existing information. Once the online inventory is fully populated with data from state government, counties, municipalities and other sources it will serve as a “one stop shop” for those seeking to discover geospatial data in Utah. Such a one-stop-shop will obviate the need for the time consuming process of individually contacting distinct GIS programs located in counties, agencies or municipalities.

Such a system will lead to several benefits:

- **More efficient searching for data:** Current mechanisms require time consuming searches that may span multiple agencies or organizations. If someone currently requires data that is managed at the county level, they may have to contact 29 individual GIS program to determine statewide data availability. With an online inventory fully implemented as a “one stop shop”, this effort can be greatly reduced to contacting the online inventory.
- **State government requires access to geospatial data from partners:** The UGI Strategic Plan identified that state government is a significant consumer of data that originates from other levels of government. Not only will the online inventory make the process of searching for data easier, but it will also increase state government’s success in finding and obtaining required data to support state government planning and decision making. Through this initiative, the state will be able to provide reciprocal benefits to data contributors by providing access to other data *they* may need.
- **Geospatial data utilization will increase:** The cost of creating and maintaining geospatial data represents the largest proportion of GIS costs. The more that

geospatial data are utilized – whether by the data manager, or other partners – the greater the return on the investment. By catalyzing broader availability and broader utilization of geospatial data resources the online inventory will help ensure that existing data provide benefits to the broadest base of users.

- **Integration with Geospatial One-Stop (GOS):** The federal government, through the Federal Geographic Data Committee’s (FGDC) Geospatial One-Stop program is attempting to build a similar online inventory that is national in scope. As appropriate, the Utah online inventory can be designed so that individual Utah data sets can also be registered with GOS if the user chooses.

The justification for having Automated Geographic Reference Center (AGRC) lead this effort is its long history and core mission of managing the Statewide Geographic Information Database (SGID). This resource contains the state’s framework data holdings and provides access and download to a huge quantity of state developed GIS data, as well as some data such as county parcels which are not maintained by the state. Creating and managing the online geospatial inventory would be a logical extension of AGRC’s current role in managing the SGID, and would enhance the SGID by providing a true statewide outlook that spans multiple levels of government.

## 4 Program Requirements and Costs

### 4.1 *Inventory of Existing Infrastructure and Suitability Assessment*

The Utah AGRC has adequate server capacity and in-house relational database management (RDBMS) expertise to pursue a project of this nature. The core decision is whether an existing tool – such as the Ramona GIS Inventory – should be used or whether the development of a new system, specifically for Utah’s needs should be pursued. In either case, Utah has adequate computer capacity and staff expertise to either deploy an existing solution or to pursue the development of a new one whether with in-house development or contractor support.

### 4.2 *Data Requirements*

The online geospatial data inventory tool (OGDIT) is primarily a **data management tool**. As such, there are minimal data requirements for the construction or acquisition of the tool itself. However, the tool that is developed or acquired needs the ability to **interface** with two important classes of existing data:

1. **Metadata:** Many existing data sets contain metadata which describes the contents and pedigree of the data. Indeed, it is not enough to know that a data set exists; users should be able to identify the basic characteristics of the data set. Existing standards exist for metadata including a widely used standard from the FGDC<sup>1</sup>. At a minimum, the OGDIT requires an ability to read and access existing metadata. At a maximum, the OGDIT might contain tools for creating and managing metadata as part of the registration process.

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<sup>1</sup> See: <http://www.fgdc.gov/metadata/geospatial-metadata-standards> for further information on the FGDC metadata standard.

2. **Geographic reference data sets:** The strongest online inventory tool will have the ability to support geographic queries for data sets. For instance, a user should be able to “drag a box” that defines a specific area of Utah and see which data are available in that box. Similarly, the inventory should report views that show data availability on a map. For instance, orthoimagery tiles might be differentially shaded based on the data of the aerial photography or the resolution of the imagery. Thus, the OGDIT will require access to existing geospatial data sets such as county boundaries, image tile borders and other reference layers.

### 4.3 Technology Requirements

The primary technology requirements for the construction of the OGDIT include:

- Server housing a relational database management environment
- Web server that can publish the application, and provide integration with the existing Utah GIS Portal
- Access to geospatial web services (or geospatial data) for reference layers

Commercial (e.g. SQL Server, Oracle, .NET/IIS) and/or Open Source (e.g. PostgreSQL, MySQL, Apache, etc.) environments are equally suitable for the development and deployment of this type of application.

### 4.4 Human Resource Requirements

The following estimates the staff support that will required for key tasks and alternatives in deploying an OGDIT for Utah:

Task	Estimated Level of Effort
<b>Deployment of an Existing Tool</b>	
Assessment of existing inventory tools (e.g. Ramona GIS Inventory) for suitability in Utah.	100 hours
Deployment and configuration of an existing inventory tool for Utah	100 hours
<b>Development of a New Tool</b>	
Requirements gathering and specification for a new tool	100 hours
Development of a new tool using in-house resources	500 – 1,000 hours
Management and testing of a contractor developing a new tool	100-200 hours
<b>Initial Population of the Inventory Database</b>	
Populating the inventory with current SGID contents	100 – 200 hours
Active outreach (phone and on-site) to data custodians throughout the state to encourage their contributions to the inventory.	2,000 hours (1 FTE)

### 4.5 Standards

Four relevant standards and existing “inventory models” should be considered:

1. The NSGIC sponsored Ramona GIS Inventory tool  
See: <http://www.nsgic.org/hottopics/ramona.cfm>
2. The FGDC Geospatial One Stop (GOS) portal  
See: <http://www.geodata.gov>

3. FGDC Content Standard for Geospatial Metadata (GSDGM)  
See: <http://www.fgdc.gov/metadata/geospatial-metadata-standards>
4. ISO 19115 Geographic Information - Metadata  
See: [http://www.iso.org/iso/iso\\_catalogue/catalogue\\_tc/catalogue\\_detail.htm?csnumber=26020](http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=26020)

## **4.6 Budget Requirements**

The budget requirements will vary greatly depending on whether Utah chooses to deploy an existing tool such as the Ramona GIS Inventory over constructing a new tool built specifically to meet the state's needs. Further, the latter approach can be pursued by either using in-house programmers, or contracting the work out. Both the approach for deploying an existing tool and creating a new tool using in-house resources would require mostly AGRC staff time. While the Ramona GIS Inventory is freely available, if a new tool was contracted to be developed, budget resources would be necessary. It is estimated that \$50,000 - \$100,000 would be adequate to develop a robust OGDIT using outside, contracted application development.

## **4.7 Assessing Risk**

The technological requirements are well understood and the deployment of an existing, or development of a new OGDIT should proceed with minimal risks, assuming that adequate staff and budget resources are available. The principal risks involve efforts to populate the OGDIT in a comprehensive fashion and to keep the OGDIT current as new holdings, or improvements to existing data become available. Specifically:

1. **Populating the OGDIT:** Ultimately, the AGRC will control only a limited number of the holdings that will appear in the OGDIT. Rather, the AGRC will need to work with the GIS stakeholder community to actively encourage data managers at a variety of agencies and levels of government to register their data sets. Unless the OGDIT contains holdings that are reasonably comprehensive its utility will be highly limited. Stakeholders must work together to promote this initiative and ensure local decision makers approve participation. Without broad participation, there is the risk that initial efforts to populate the OGDIT will be unable to achieve a critical mass and utilization of the inventory will never be widely adopted.
2. **User friendliness:** If the tool is to gain wide acceptance and utilization, it is critical that it be developed to be easy-to-use for registering data as well as querying and reporting results. In short, people need to be able to post their data with minimal effort, and users of the site need to be able to find what they're looking for simply and unambiguously. Several tools, including the FGDC GOS, are hindered by these types of utilization issues. For instance, GOS often delivers query results that are too extensive and the best candidate data sets do not find their way to the top of the candidate list.
3. **Keeping it current:** As with the "user friendliness" risk, people will not utilize and return to the site unless it proves useful and efficient in helping them find what they need. Even if the OGDIT is successfully populated at the outset, its utility will wane if the data holdings are not kept current. Once deployed, the

AGRC needs to acknowledge the requirement to keep it current. This will include monitoring the holdings to check for aged records, active education and communication with the stakeholder community to encourage updating, and tools that will make the updating process simple for data managers. Ultimately, the inventory will stay current when stakeholders find value in it and use it, and it will be important to obtain feedback from the user community so that it can be improved over time.

## **5 Organizational Approach**

### **5.1 Who is behind this effort?**

Because of their statutory responsibility for the SGID, the AGRC is leading the effort with the support of other participants and advocates for the UGI Strategic Planning process including the Geographic Information System Advisory Committee (GISAC) and the Utah Geographic Information Council (UGIC).

### **5.2 What is the current state-of-affairs?**

Currently, AGRC does a reasonable job of indexing and listing the data sets in the SGID, and it provides linkages to the metadata of individual data sets through the Utah GIS Portal. At present there is neither a capability to register new data sets, nor to query for available data. Instead, a variety of web-page based indexes (e.g., “by name”, “by category”) present static lists of what is available. Nevertheless, through the current SGID pages on the Utah GIS Portal the AGRC has demonstrated ownership of, and expertise with the process of data indexing and making metadata available. This existing work positions the AGRC well to develop and foster a next generation OGDIT.

## **6 Implementation Plan**

### **6.1 Implementation Details**

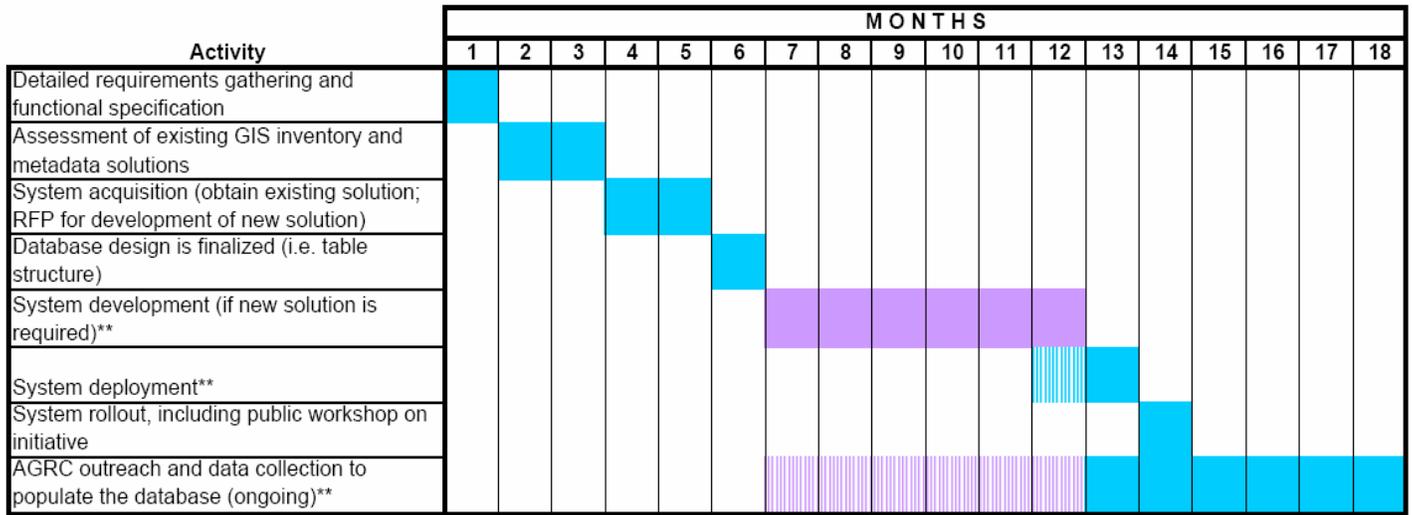
Key decisions that need to be made at the outset of implementation include:

1. Use an existing tool vs. develop a new tool
2. If using an existing tool, which one (e.g. Ramona GIS Inventory vs. ESRI Geospatial Portal Toolkit, etc.)?
3. If developing a new tool, which environment (e.g. commercial vs. Open Source RDBMS? Programming environment? Etc.)
4. If developing a new tool, in-house programming vs. contracting?
5. Appropriate AGRC staff allocation decisions to ensure there is appropriate outreach and effort aimed at initially populating the database

### **6.2 Phasing and Milestones**

The following provides an overview of the major phases and phase durations for developing and deploying the OGDIT. As per the “key questions” identified above, the timeline below reflects the *possibility* that a new system will be constructed. If that is the

case, then the timeline will need to be extended (see purple items) to accommodate the development of the new system.



\*\* System development is an optional item pending decisions about whether an existing solution may meet Utah's needs. If a new system is not required, then this timeline can be collapsed to 13 months. If an existing solution is chosen, it is likely that the deployment phase would be extended to at least two months to accommodate a need for Utah-specific configuration and/or customization.

### 6.3 Marketing Outreach

One of the key goals of the OGDIT initiative is to achieve broad participation from across the Utah GIS stakeholder community. Thus, it is important that there be active outreach and communication throughout the stakeholder community as this initiative is started. Existing organizations such as UGIC should be enlisted as they can play a key role in disseminating information on the project. Equally, since UGIC represents many of the users of the system, they should be actively consulted in helping to determine the functional specifications and in shaping the effort.

To assist in outreach, the AGRC should anticipate developing collateral material that will describe the initiative as well as the anticipated roles for collaborators. Materials should include:

- Written documents
- Web page on the Utah GIS Portal
- Workshops and/or training sessions

In addition, it needs to be acknowledged that there are two distinct classes of users that each may require materials that are uniquely targeted to their needs and interests:

1. End users who are searching for data
2. Data managers who need to be encouraged to post their holdings

## 6.4 Measuring Success and Feedback for Recalibration

The programmatic checklist provides a quantitative mechanism for determining what level of progress has been achieved over time. Below is a preliminary scorecard for the defined programmatic goal and associated objectives. It is recommended that the set of tasks be reviewed and the checklist updated to reflect task completion on a periodic basis.

As with the implementation timeline presented above, the programmatic checklist reflects some of the current uncertainty about whether the state will deploy an existing solution or develop a new solution. It is assumed that any checklist items that identify sub-tasks that pertain to the option that was **not** selected will be ignored.

Major Activities	Sub-tasks & Success Factors	Complete?
Detailed requirements gathering and functional specification	Initial draft from AGRC	<input type="checkbox"/>
	Review and input from UGIC	<input type="checkbox"/>
Assessment of existing GIS inventory and metadata solutions	Review/assess Ramona GIS Inventory	<input type="checkbox"/>
	Review/assess ESRI Geospatial Portal Toolkit	<input type="checkbox"/>
	Review/assess GOS	<input type="checkbox"/>
	Identify, review/assess other solutions	<input type="checkbox"/>
System acquisition (obtain existing solution; RFP for development of new solution)	Acquire existing solution	<input type="checkbox"/>
	RFP for development of a new solution	<input type="checkbox"/>
	Identify in-house development resources for new solution	<input type="checkbox"/>
Database design is finalized (i.e. table structure)	Database design is published via the Utah GIS Portal	<input type="checkbox"/>
System development (if new solution is required)	Beta release of new solution	<input type="checkbox"/>
	Beta comments received from testers	<input type="checkbox"/>
System deployment	Existing solution installed on AGRC hardware	<input type="checkbox"/>
	Existing solution configured and customized to Utah specifications	<input type="checkbox"/>
	Initial production release of system (whether existing or newly developed)	<input type="checkbox"/>
	Develop "user manual" documentation	<input type="checkbox"/>
System rollout, including public workshop on initiative	Deployment of links and user manual on Utah GIS Portal	<input type="checkbox"/>
	Conduct 2 "rollout workshops" introducing the system	<input type="checkbox"/>
AGRC outreach and data collection to populate the database	Work with state agencies to inventory data and populate database comprehensively for state holdings	<input type="checkbox"/>
	Visit every county to explain initiative and collect information on county holdings	<input type="checkbox"/>
	Participate in UGIC and regional user group meetings to describe initiative	<input type="checkbox"/>
	Develop "monitoring routines" to actively track the update frequency of data holdings; actively encourage update for aged records	<input type="checkbox"/>
	Achieve 90% participation by county and local government GIS programs	<input type="checkbox"/>