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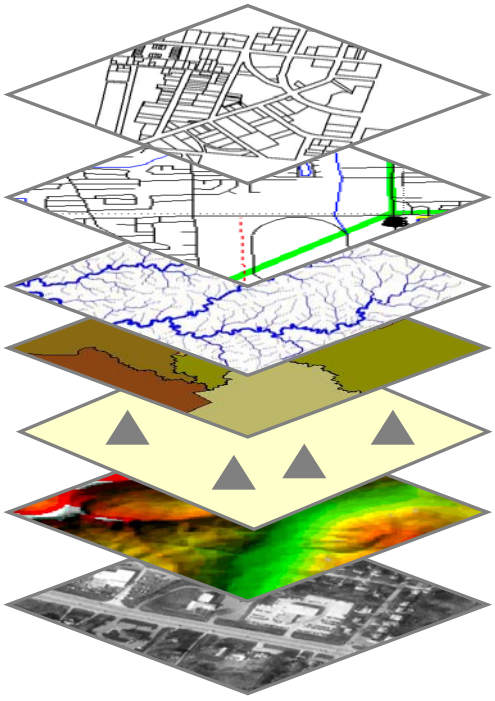
STATUS OF THE MONTANA SPATIAL DATA INFRASTRUCTURE, MONTANA LAND INFORMATION ACT, AND RELATED ISSUES



A REPORT TO THE 60TH MONTANA LEGISLATIVE SESSION AS PROVIDED FOR BY MCA 90-1-404(L) AND MCA 5 -11-210

Compiled by the Montana Department of Administration, Information Technology Services Division

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Executive Summary

The use of Geographic Information Technology (GIT), whether Geographic Information Systems (GIS), Global Positioning Systems (GPS), Remote Sensing or other specialized areas is rapidly expanding throughout the state. This expansion is seen in both traditional areas like natural resources and emergency response, and in new areas like economic development and health care. GIT, whether delivered via the internet or more traditional map products, provides a very visual approach to supplying the geographic component that is inherent in almost every state business process or important state issue. Within this rapidly changing GIT environment, a number of relatively recent developments serve to support future progress in this important technology:

- Coordinated development, through the Montana Spatial Data Infrastructure (MSDI)
- Planning, as directed by the Montana Land Information Act (MLIA)
- Funding, through the Montana Land Information Act (MLIA)
- Governance, through the Montana Land Information Advisory Council (MLIAC)

Explosive growth in GIT and the need to integrate with a federally mandated enterprise architecture will require the State to adopt and employ new technologies such as web services, federated approaches to the collection, maintenance and distribution of data, and service oriented architectures. The Montana Spatial Data Infrastructure (MSDI) serves as the foundation for base geospatial data in Montana. Reliable MSDI theme stewardship and leadership, along with long-term stable funding for collection, maintenance, integration, enhancement and dissemination is needed for all MSDI themes. To assist MSDI development, use of the Montana Land Information Act (MLIA) funding is proceeding under Administrative Rule established in September 2006, and a 2007/2008 Land Information Plan, with the first round of grants to be awarded in May, 2007. MLIA funds will not meet all the funding requirements of the MSDI and a federated enterprise GIT community must identify additional funding sources.

Introduction

The use of Geographic Information Technology (GIT), whether Geographic Information Systems (GIS), Global Positioning Systems (GPS), Remote Sensing or other specialized technologies is rapidly expanding throughout the state. This expansion is seen in both traditional areas like natural resources and emergency response, and in new areas like economic development and health care. GIT, whether delivered via the internet or more traditional map products, provides a very visual approach to supplying the geographic component that is inherent in almost every state business process or important state issue.

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Changing GIS Environment:

In contrast with its relatively obscure beginnings and limited focus, geospatial technology is now experiencing rapid changes - as are information management systems in general. These technological developments are in turn spurring significant growth in the demand for geospatial applications and their derived products by a wide variety of users. These factors present a unique set of challenges and opportunities to the technical specialists in this field and to the clients they serve.

As the technology has advanced, there has also been a shift in the way data is collected and shared. This new system can be characterized as “federated”, where a series of independent entities form a cohesive data sharing system. This federated system, however, will require a great deal of coordination, collaboration, communication, and leadership with a focus on service

Geographic Information Systems are moving from isolated islands or pockets of technologies to a more integrated approach. Formerly, individual GIS specialists were responsible for collecting data and creating and hosting various products. More recently, GIS efforts are much more collaborative and rely on the results of other projects. They can easily access the state’s Cadastral mapping system or

the National Map, for example, via their computer. The potential exists for data to be shared among users at all levels – local, state, tribal, and federal – in a system where everyone shares and contributes information and their connectivity enables them to create a better source of information overall.

GIS technology has, and will continue to, evolve over time. GIS has been changing at a fundamental level, from a database and data sharing approach to a knowledge approach. In order to work collaboratively with federal, state, tribal and local entities, it will be necessary to adapt to new technologies such as web services and distributed data, and a service oriented architecture (SOA).

Summary:

Explosive growth in GIT and the need to integrate with a federally mandated enterprise architecture will require the State to adapt and employ new technologies such as web services, federated approaches to collect, maintain and distribute data, and service oriented architectures.

Montana Spatial Data Infrastructure

The federal government, in cooperation with state, regional, local and private sector interests has identified seven geospatial "framework data layers" for the nation. Framework layers follow themes identifying geographic features or characteristics, relating to national, state or regional interests and needs. Geographic features may be either natural or manmade. These layers represent the primary spatial or geographical themes and can be overlaid upon each other to provide varying levels of detail. The seven layers include:

- Cadastral (or land parcel)
- Elevation
- Geodetic Control (a set of known positions with precisely determined locations from which other locations can be referenced)
- Government Units (boundaries of entities such as cities, counties or reservations)
- Hydrography (surface water features)
- Orthoimagery (aerial photographs and/or satellite imagery)
- Transportation

In addition, the state has added six framework layers:

- Geology
- Hydrologic Units (sub-watersheds and drainages)
- Land Cover (Vegetation)
- Soils (Inventory and Classification)
- Wetlands
- Critical Infrastructure and Structures

Together, these 13 layers constitute the Montana Spatial Data Infrastructure or MSDI. Some of these layers are comprised of multiple sub-layers or themes. For example Government Units include school districts, legislative districts and municipal boundaries while Critical Structures include police stations, schools, and dams. However, within these layers and sub-components, most of the data needed to compile the base map for almost any application is included.

These data layers are in various states of development and the initial completion, dissemination and ongoing maintenance and enhancement of the MSDI has been identified as a top priority by the entire GIS community. In April of 2006, MLIAC prepared a directive on Theme Stewardship to offer an operational structure in which MLIAC can meet the goal of consistent, accessible, complete geographic data statewide called for the in Montana Land Information Act (Appendix A). The Directive identifies a methodology for the acquisition, formatting, dissemination and maintenance of each of the data layers and for coordination with the National Spatial Data Infrastructure (NSDI).

Summary:

Reliable theme stewardship and leadership, along with long-term stable funding for collection, maintenance, integration, enhancement and dissemination is needed for all MSDI data layers.

Montana Land Information Act

The MLIA was passed by the 2005 Legislature with the stated purpose of:

"The purpose of this part is to develop a standardized, sustainable method to collect, maintain, and disseminate information in digital formats about the natural and artificial land characteristics of Montana. Land information changes continuously and is needed by businesses, citizens, governmental entities, and others in digital formats to be most effective and productive. This part will ensure that digital land information is collected consistently, maintained accurately in accordance with standards, and made available in common ways for all potential uses and users, both private and public. This part prioritizes consistent collection, accurate maintenance, and common availability of land information to provide needed, standardized, and uniform land information in digital formats."

The administrative rule related to MLIA was finalized in September 2006.

As per Administrative Rule, a Land Information Plan will be published by January 15, 2007. Also by January 15, 2007 grant criteria and instructions for submitting grants will have been completed, with grant applications due by February 15, 2007. Submitted applications will be prioritized by May 1, 2007, and finalized based upon available funding by May 15, 2007.

Funds collected from July 1, 2005 to June 30, 2006 from the 1 dollar fee on document recordation generated approximately 1.3 million dollars, with 25% of each dollar retained by the counties where the documents were recorded.

The efficiency and success of the MLIA, Administrative Rule, and the grant program in general, can not be determined until the state proceeds through the first round of grants.

Summary:
The implementation of MLIA is proceeding under the administrative rule established in September 2006, and a 2007/2008 Land Information Plan, with the first round of grants to be awarded in May, 2007

Montana Land Information Advisory Council

The Montana Land Information Advisory Council (MLIAC) is established by the Montana Land Information Act (MLIA) and replaces the Montana Geographic Information Council originally created under a 1997 Governor's Executive Order. The Council's stated statutory duties are:

90-1-406. Land information advisory council -- duties -- advisory only. (1) The council shall:

(a) advise the department with regard to issues relating to the geographic information system and land information;

(b) advise the department on the priority of land information, including data layers, to be developed;

(c) review the land information plan described in 90-1-404 and advise the department on any element of the plan;

(d) advise the department on the development and management of the granting process described in 90-1-404(1)(e);

(e) advise the department on the management of and the distribution of funds in the account;

(f) assist in identifying, evaluating, and prioritizing requests received from state agencies, local governments, and Indian tribal government entities to provide development of and maintenance of services relating to the GIS and land information;

(g) promote coordination of programs, policies, technologies, and resources to maximize opportunities, minimize duplication of effort, and facilitate the documentation, distribution, and exchange of land information; and

(h) advocate for the development of consistent policies, standards, and guidelines for land information.

(2) The council functions in an advisory capacity, as defined in 2-15-102.

The Council meets quarterly on the first Thursday of the month in March, June, September and December. Since their first meeting in September 2005, the Council has concentrated on advising on MLIA Administrative Rule, and implementing the MLIA process. The Council has had an active MLIA Land Information Plan Subcommittee and will be forming a MLIA Grants Subcommittee. The Council has also participated in a strategic planning effort

through a Federal Geographic Data Committee grant administered by ITSD, and has been actively pursuing stable agency stewardship for MSDI themes.

Summary: The MLIAC has been established in accordance with the MLIA and is carrying out its responsibilities under the act.

GIT Common Operating Picture

The staff of the Department of Administration and the Montana Land Information Council have dealt with a number of challenges in implementing the Montana Land Information Act in these first few years of existence. Funding issues, roles and responsibilities, and planning issues are just a few of the issues that will need to be addressed in the coming years. In response to an MLIAC request known as the "Common Operating Picture", the State CIO commissioned a four member committee to research the present structure and to make recommendations regarding future vision, roles and responsibilities. That committee submitted the following sixteen recommendations to the CIO as well as presenting them to MLIAC and other groups:

1. Create a Geospatial Information Office for the State and hire a Geospatial Information Officer (GIO) who will report directly to the Governor's Office, with responsibility and oversight for managing the geospatial information efforts across all State agencies. The GIO is a new position that who acts as the final arbitrator for all decisions related to State GIS processes and operations.

2. Through a federated, enterprise approach, the GIO should strive to seamlessly merge, where applicable, geography systems and applications into the appropriate business processes of agencies in all areas of government and the private sector.

3. The GIO should ensure that, where appropriate, there are multiple pathways through the State's data forest to help public and private consumers of information find the data they seek.

4. GIO should have oversight responsibility for the stewardship of all MSDI layers.

5. Data enhancements and applications for MSDI usability and access may be done by any agency under the direction of the GIO

6. The NRIS should be the GIS Clearinghouse for the State of Montana. In this capacity the NRIS performs a GIS Data Library function by being the primary gateway (Montana GIS Data Portal) for spatial information access by state and local agencies, and the public.

7. Any public or private entity may provide GIS data through the Montana GIS Data Portal. However, the primary responsibility for providing MSDI data access through the portal is that of the Data Steward.

8. The NRIS GIS Data Portal function is not limited to GIS natural resource information, but should include all GIS data resources relevant to Montana.

9. The GIS data archival responsibility should remain with the NRIS, except where that function is performed by the data source entity. Regardless of the management responsibility and unless an exception is granted by the GIO, data content should be stored in the Data Warehouse.

10. GIS Application development services should be phased out of the NRIS. Application services in this context means application services other than those performed to provide data access.

11. The DOA, ITSD Data Center should serve as the primary GIS Data Warehouse. All GIS, non-source data content will be stored at the ITSD Data Warehouse. Exceptions may be granted by the GIO.

12. The DOA, ITSD, GIS Service Bureau, including the State GIS Coordinator, should be realigned to report to the GIO.

13. The State GIS Coordinator should be the lead in working with all federal, state, local, private and tribal entities to coordinate, develop and maintain data and standards for GIS information.

14. When GIS data becomes "historical" in nature, it should be transmitted to the Historical Society for records preservation.

15. MLIA Council should work with the GIO and ITSD to develop guidelines to help agencies determine when contracting in-house is appropriate and when work should be out-sourced to the private sector.

16. The MLIA Council should actively support efforts to secure and ensure the funding and other resources necessary to carry out these recommendations.

The entire GIS Common Operating Picture for GIS document can be accessed at http://itsd.mt.gov/policy/councils/mliac/mliac.asp.

Summary:

Although a great deal of progress has been made in the initial implementation of the Montana Land Information Act, a great deal of work remains. Future efforts will be focused on implementing the recommendations contained in the Common Operating Picture.

Appendix 1 - Draft Montana GIT Strategic Plan

Appendix 2 - Draft 2008 Montana Land Information Plan