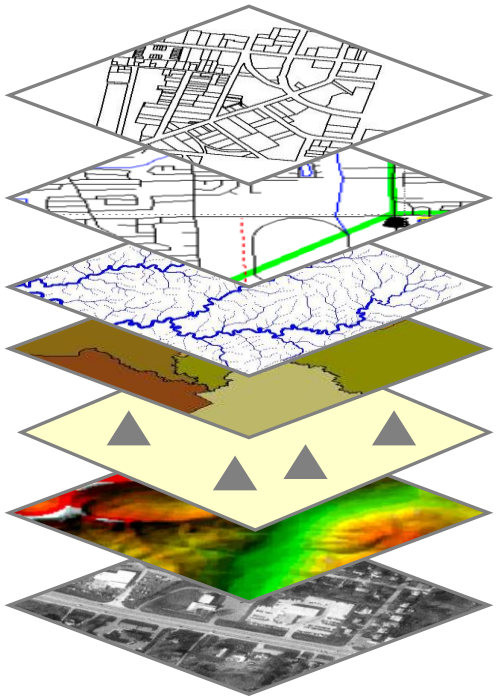
STATUS OF THE MONTANA SPATIAL DATA INFRASTRUCTURE, MONTANA LAND INFORMATION ACT, AND RELATED ISSUES



A REPORT TO THE 62nd MONTANA LEGISLATIVE SESSION AS PROVIDED FOR BY MCA 90-1-404(L) AND MCA 5 -11-210

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

The geospatial paradigm has shifted. Although the State of Montana has used spatial analysis in natural resources agencies for years, reliance on geospatial information as an underlining business asset has spread to most other segments of both the public and private sectors. Agriculture, law enforcement, real estate, energy companies, transportation, environmental organizations, etc. all depend on GPS and GIS technology to meet the today's demands.

The Montana GIS community has responded to this need by almost every private business, citizen, and Federal, state or local government organization in Montana by:

- Completing a Cadastral (parcel) Return on Investment (ROI) study that demonstrates an 11:1 or $9,000,000/year ROI;
- Coordinating development and deployment of the Montana Spatial Data Infrastructure (MSDI);
- Performing annual statewide geospatial planning, as directed by the Montana Land Information Act (MLIA);
- Funding a total of over $4,000,000 for State, local and tribal governments spatial projects through the Montana Land Information Act (MLIA);
- Directing efforts through governance by the State of Montana Geographic Information Officer (GIO) and the Montana Land Information Advisory Council (MLIAC);
- Implementing the Montana Geographic Portal under the Montana State Library/Natural Resource Information System (NRIS);
- Creating the Montana Base Map Service Center (BMSC) within the Department of Administration/Information/State Information Technology Services Division (ITSD);
- Forming a statewide Montana Geographic Federation; and
- Implementing a multi-year, State of Montana Enterprise License Agreement (ELA) for GIS software and support.

Under the direction of the MLIA Council, the State GIO and the BMSC, the Montana Spatial Data Infrastructure (MSDI) serves as the foundation for geospatial opportunities in Montana. Reliable theme stewardship along with long-term, stable funding remains the most decisive issues for each of the critical base-layers.

Introduction

The use of Geographic Information Technology (GIT) is rapidly expanding throughout Montana. This expansion is occurring in traditional areas, like natural resources and emergency response, and new areas, like agriculture, energy, economic development and health care. GIT provides a visual approach to supplying the geographic component that is inherent in almost every private sector or public sector business process. Further, it has become even more significant to the decision-making process for almost every important state issue.

Cadastral Return on Investment

In 2009 the Montana Land Information Advisory Council (MLIAC) and the State Geographic Information Officer requested a study of the value and costs associated with Montana's cadastral data and systems. Cadastral data are land records that identify the owner, location, boundaries, description, and property rights. This data is usually associated with property tax appraisal/assessment, but cadastral web sites are widely used in many business processes, from pipeline and road construction, to selling real estate, to finding a place to hunt.

It is also important to note that most cadastral visitors also used other base map services (e.g., Orthoimagery, man-made structures, roads and government boundaries). This makes perfect sense; if you do not have a background behind the parcel information providing relative location to known objects (What road is the parcel next to? Who owns the adjacent land?), simply showing the parcel boundary is generally of little help.

The study measured web traffic at two sites: the first provides individual parcel data and the second downloads entire county or statewide files. By measuring the actual current usage (time /visit) of the individual parcel web site, it is possible to conservatively estimate the expense (or value to the organization acquiring the information) to obtain the information. That is, the cost of a person's time must be the absolute minimum value of the information to the user or their organization, or they would spend resources doing something else and not 'waste' time searching the Cadastral information. State web site visitors spend $6M annually in time to collect individual parcel data; approximately two-thirds of which is by non-government (i.e., citizens and businesses) entities.

The second web site allows users to download entire county or statewide files. The value of these files was estimated by making a comparison to a private firm that sells similar cadastral data in other states. Their minimum fee is $300 per county for basic cadastral data. Combining these rates with Montana's download statistics produces a minimum of $4.1M in annual benefits.

The total cost of building the cadastral was approximately $3.3M. Annually, the cadastral data and systems are generating more than $10M ($6M + $4.1M) in economic value for users at a cost of $800,000 in maintenance and support costs, or a net Return on Investment (ROI) of $9,000,000/year; and a ratio of over 11 to 1.

With so many citizens and public/private organizations relying on this and other base map data and delivery systems, continued reliable and robust data availability is paramount. When funding sources (yearly MLIA and Federal grants) do not match this dependency picture, governments', citizens' and businesses' reliance on this information to make decisions and to provide services is built upon a house of cards.

Summary:

The value to the Montana economy of the MSDI layers is at least $9,000,000 per year, yet funding to house and maintain this critical infrastructure depends on the yearly approval of grants.

A Consolidated Approach to MSDI Funding

The FY2010-2011 spending authority for DOA/ITSD is approximately $2.2 million per year, and includes the functional subject areas of statewide imagery, GIS coordination and MLIA grant management, MSDI stewardship, ITSD hosting, GIS management (GIO) and the ESRI Enterprise License Agreement (ELA). In order to rectify the problems associated with the current funding model, the MLIA Council advises the DOA to take the following actions:

Action 1
The MLIA Council urges the Department of Administration to recommend, advocate and seek funding for an increase in the State ITSD budget of $200,000 annually, with those funds being deposited annually in an imagery account.

Estimated Impact:

- This would produce the necessary $600,000 every three years required for the state partnership in the Federal Department of Agriculture's National Aerial Imagery Program (the Federal government pays approximately 85% of the total cost of new statewide imagery acquisition). This would free up funds previously used for imagery to fund tribal, state and local government projects that benefit from these one-time only grant dollars.

Action 2
The MLIA Council urges the Department of Administration to recommend, advocate and seek funding for an increase in the State ITSD budget of $600,000 to be directed towards funding MSDI Theme Stewardship

Estimated Impact:

- This allocation would provide stable, reliable funding for regular development and maintenance of the MSDI data layers. Annual allocations to theme stewards would be based on FY11 estimated MLIA grant requests and initially set at a total of $600,000. These funds would be administered by the GIO, with advice from the MLIA Council.
- This allocation would free-up MLIA grant monies to fund GIS projects that enhance and compliment MSDI efforts and could benefit from the one-time only grant funds available through MLIAC.

Action 3
The MLIA Council urges the Department of Administration to recommend, advocate and seek funding for an increase in the State ITSD budget of $335,000 to be directed towards funding the functional subject areas of data archival (1 FTE) and data publishing (2 FTE),

Estimated Impact:

- Reliable and professional archival programs can be developed to adequately protect historically significant MSDI data; and
- Publication of MSDI data through web services and other applications will provide increased discovery and access to data by business and citizens.

These actions would effectively move current programs (statewide imagery, GIS coordination and MSDI stewardship) and add new functionality (archival and publishing) funding to a more reliable ITSD Rates/State budget. These actions directly address the problems identified above by dedicating stable funding to MSDI thereby freeing up MLIA funds for one time only enhancement projects that could directly benefit from grant dollars.

All funds should be directed to the DOA/ITSD, Base Map Service Center (BMSC). Under the direction and supervision of the Montana Geographic Information Officer (GIO), these funds would be used to replace MLIA grant funding presently consumed by State organizations to fund critical MSDI theme layers (e.g., cadastral), GIS general statewide coordination duties, data hosting and archival costs (e.g., imagery) incurred by ITSD and the Montana State Library (MSL), and to produce web-based services, specifically intended to make the MSDI information more readily available to public and private spatial information consumers. Appropriations to fund these actions may require using a mixture of General Fund (GF), ITSD Enterprise and other rates, or other funding sources determined appropriate by the Department.

In addition, the recommendation is that the GIO, with the advice of the Council, develop rules for the distribution of these funds that at a minimum, requires receiving organizations to develop a workplan that includes goals, objectives and measurable tasks, and to report achievement of their goals, objectives and tasks to the GIO and the Council at least once per year.

Funding proposal justification:
This funding request is supported by the conclusions found in the ROI study, "Montana's Cadastral Layer Business Impact" As is demonstrated in this study, the total ROI for the Cadastral theme since its inception can be minimally estimated at $40 million and now annually, at over 9 million. One could justifiably and conservatively estimate the return on investment of multiple themes, when used in multiple critical applications, to be far beyond the annual estimated cadastral ROI. If an annual MSDI ROI estimate of 20 million dollars were used, this request for new funding would be less that 10% of that figure.

Conclusion:
A state's digital geographic infrastructure is as important to core state business processes as the Interstate System is to moving commercial goods across the county. A state's ability to compete with other states for development, tourism, safety and citizen amenities depends on these data. While Montana has been a leader in spatial data development, it has done so without the stable funding needed to maintain and improve. Applications are being developed on the data that depend upon the stability of the databases over time. Yet many MSDI efforts rely on year-to-year grant funding to survive. This house of cards scenario puts Montana at a substantial risk.

Montana Spatial Data Infrastructure

The federal government has identified seven geospatial "framework data layers" for the nation. Framework layers follow themes identifying geographic features or characteristics related to national, state or regional interests and needs. Geographic features may be either natural or manmade. 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, states or reservations)
- Hydrography (surface water features)
- Orthoimagery (aerial photographs and/or satellite imagery)
- Transportation

In addition, the State has added seven Montana specific framework layers:

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

Together, these 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. However, within these layers and sub-components is included most of the data needed to compile the base map for almost any application.

These data layers are in various states of development. The entire GIS community has identified the completion, dissemination, and ongoing maintenance of the MSDI as a top priority. 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, and complete geographic statewide data called for in the Montana Land Information Act. The Directive identifies a methodology for the acquisition, formatting, dissemination and maintenance of each of the data layers. The funding issue has slowed progress.

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 that Rule, the Department will again publish this year's Land Information Plan (Appendix 2), and grant criteria/instructions by January 15, 2011.

The downturn in the housing market has caused a reduction in the MLIA collections since FY2009. Nevertheless, the Department has awarded over $3,410,000 since the inception of the MLIA grant process in FY2008. Besides these awards, $300,000 in MLIA funds were set in reserve for use in matching the state's contribution to the 2009 National Agricultural Imagery Program (NAIP) imagery program. The imagery was successfully acquired in early 2010.

Although the grant process was relatively successful during the first few "rounds," the GIO and the BMSC continued to develop local government and tribal outreach programs. Several video conferencing workshops were held across the state, some specifically aimed at local government and some at tribal nations. Although the number of grant applications has increased, the GIO, BMSC and the Council all agree that more should be done. We will continue to reach out through staff visits, specialized video conferencing workshops, and working in partnership with the Montana Association of Geographic Information Professionals (MAGIP).

Summary:
The implementation of MLIA is proceeding under the administrative rule (September 2006) with five updates of the Land Information Plan and rounds of grants awards ($3,410,000).

Montana Land Information Advisory Council

The Montana Land Information Act (MLIA) established the Montana Land Information Advisory Council (MLIAC) as a replacement for 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 the Department on the MLIA Administrative Rule and implementing the MLIA process. The Council has had an active MLIA Land Information Plan Subcommittee and a MLIA Grants Subcommittee. The Council has also participated in a strategic planning effort through a Federal Geographic Data Committee grant, been actively pursuing stable agency stewardship for MSDI themes, and commissioned the Cadastral ROI study.

Summary:
The MLIAC was established in accordance with the MLIA. Further, the Council is carrying out its responsibilities under the act.

GIT Common Operating Picture

The staffs 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. Funding, roles and responsibilities, and planning issues are just a few of the concerns. In response to an MLIAC 2006 request, the State CIO commissioned a four-member committee to research the present structure and make recommendations regarding future vision, roles and responsibilities. Through the Council, the committee submitted the following sixteen recommendations to the CIO:

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 acts as the final arbitrator for all decisions related to State GIS processes and operations. **DONE**

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. **IN PROCESS**

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. **IN PROCESS**

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

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

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. **DONE**

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. **IN PROCESS**

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. **DONE**

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. **DONE**

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. **DONE**

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. **DONE**

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

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. **DONE**

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

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. **NOT STARTED**

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

To access the complete "GIS Common Operating Picture for GIS" document, follow the link to http://itsd.mt.gov/policy/councils/mliac/default.mcpx.

Appendix 1 – Montana Cadastral Layer's Business Impact

Montana Cadastral ROI Study

November 2009

Link: http://itsd.mt.gov/policy/councils/mliac/December_2009/default.mcpx

Appendix 2 – FY2010-2011 Montana Land Information Plan

Montana Land Information Plan

Effective January 15, 2010 to January 14, 2011

December 2009

Link:
http://itsd.mt.gov/policy/councils/mliac/December_2009/default.mcpx