

An Excerpt from the Nebraska GIS Strategic Plan, "Building a Spatial Data Infrastructure for Nebraska - December 2006"

***DATA SHARING AND DISTRIBUTION.** Develop structures, standards, and processes that facilitate easy access to, integration, and usability of publicly available geospatial data.*

Why it is a Priority. A key component of any coordinated GIS development strategy must be the development and maintenance of mechanisms to facilitate the sharing of widely needed geospatial data. In the aftermath of the September 11th terrorist attack, the importance of reliable, efficient mechanisms for geospatial data sharing became very evident. In times of an emergency, responders need quick access to the most accurate and current data available, and in data formats that can be quickly and easily integrated.

There are several essential elements to such a data-sharing strategy. These include the easy ability to discover the existence of data and how it may be accessed. Most GIS experts would suggest that 80 to 90% of GIS implementation costs are commonly related to geospatial data development or acquisition. One of the surest ways to reduce the level of investment required for geospatial data development is to locate existing geospatial datasets, developed by someone else, that will meet some or all of your data needs. Geospatial data clearinghouses are a key component of the evolving spatial data infrastructure. Data clearinghouses are intended to provide a systematic approach for cataloging and locating available geospatial data for a particular area or region.

The documentation of the data to facilitate its proper use is another essential element of facilitating data sharing. If someone gets a geospatial dataset from someone else it is difficult to determine the appropriate use of that data if it is not documented with metadata (data about the data). Likewise, when there is a substantial public investment in the development of a database, the parallel development of metadata is important to preserve the public investment in that data. Without adequate metadata documentation, when the key staff members who originally developed a given database leave the organization, it is sometimes difficult to justify continuing to use that database. Without adequate documentation to explain how database figures or coding were derived it is difficult to defend policy or regulatory decisions based on that data. Standardized metadata also provides the basis for potential users to find available geospatial data through geospatial database search tools that have been developed around metadata standards.

The recent evolution of GIS technology in the area of Internet Map Services (IMS) is providing a relatively new and powerful approach for sharing geospatial data. IMS technology allows one entity to "serve up" one or more geospatial databases via the Internet. Other interested entities can then selectively link to one or more of these "served" geospatial databases and engage in a "live" interaction and analysis with various IMS "served" databases that may be on their computer or served from multiple servers in multiple locations around the world. This means that each database users does not need to find and get a their own copy each database on their computer, but instead can link to databases in multiple locations and display and analyze interrelationships via the Internet. An excellent example of how IMS technology can be applied to share data on a national level is *The National Map* (<http://nationalmap.gov/>) which accesses a selected subset of geospatial datasets from state, federal, and local government agencies.

Current Status. The Nebraska GIS Steering Committee has long recognized facilitating data sharing and distribution as one of its priority goals. Two factors have proven to be significant impediments to achieving this goal. The most significant is the lack of available dedicated resources for this enterprise-level effort. The other major impediment is the reality that most state and local agencies have not documented their geospatial datasets with formal metadata. This metadata

documentation is necessary ingredient for listing and searching for geospatial datasets on the geospatial data clearinghouse.

Geospatial Data Center and Clearinghouse at NDNR. The Nebraska Department of Natural Resources (NDNR) has had a long history of being a leader in support of geospatial data sharing and distribution. Working in cooperation with the GIS Steering Committee, the NDNR has established a Geospatial Data Center with the intent to provide an enterprise-level Clearinghouse to find and access available Nebraska geospatial data. Both parties have agreed to provide leadership and program oversight for the cooperative activities of the Data Center and Clearinghouse. Both parties also agree that NDNR will be the trustee of the Data Center and will have operational responsibilities. It is further agreed that working closely with NDNR, the Steering Committee is the party responsible for defining overall Data Center policies and direction. The Steering Committee will also have the responsibility for taking the lead in pursuing any additional resources needed to insure adequate support for Data Center-related functions and for taking an on-going, active role in assisting NDNR to explore opportunities for partnerships and collaboration as a means to enhance the services available through the Data Center.

The Geospatial Data Center and Clearinghouse infrastructure is now in place, what is now needed is more participation from other state and local agencies to populate this geospatial clearinghouse. A major obstacle to broader participation is the fact that much of the geospatial data developed and held by state and local agencies is not currently documented by FGDC-compliant metadata. The clearinghouse software relies upon standardized metadata documentation to enable its search function.

Metadata Documentation. To gain the maximum return on the public's investment in geospatial data, it is critically important that this data is documented with formal metadata. Metadata documentation greatly increases the likelihood that the developing agency will be able to reliably use the data after the original data developer is no longer available to that agency. Metadata also is the foundation upon which data clearinghouses conduct their searches for available geospatial data. Metadata is also critical information to enable users, other than the original data developer, to make proper and appropriate use of the data. An informal survey of state and local agencies has found that a high percentage of existing geospatial data is not documented with metadata.

To address this situation, the GIS Steering Committee developed and adopted metadata standard calling on state and local agencies to document their geospatial data with FGDC-compliant metadata. This standard has since also been adopted by the Nebraska Information Technology Commission (http://www.nitc.state.ne.us/standards/data/metadata_standard_20050923.pdf), including an implementation timeline requiring completion by the end of 2006.

NITC Geospatial Metadata Standard. *All state agencies and entities that receive state funding used, directly or indirectly, for geospatial data development or maintenance shall ensure that geospatial data it collects, produces, maintains, or purchases and which is used for policy development, implementation, or compliance review is documented with metadata compliant with the latest version of the Federal Geographic Data Committee (FGDC) Content Standards for Digital Geospatial Metadata.*

In an attempt to further heighten an awareness of the importance of accomplishing this metadata documentation, the GIS Steering Committee also worked with the NITC to adopt this as one of its Shared Services action items for 2006.

Metadata and State Geospatial Data Catalogue. *Document existing state agency GIS/geospatial data with formal metadata and encourage the listing of available geospatial data in Nebraska Geospatial Data Center Clearinghouse Catalog.*

To further encourage metadata documentation, the GIS Steering Committee has also tried to help make metadata training available. The Steering Committee encouraged and supported a UNL Libraries grant application to provide three (3) two-day metadata training sessions across the state. Unfortunately, that grant application was not successful, but the Steering Committee still worked with UNL Libraries and USGS in 2006 to provide one (1) two-day training session in Lincoln. The Steering Committee is also supporting a regional multi-state grant application to provide additional metadata training in Nebraska and surrounding states in 2007.

Nebraska Geospatial Data Sharing Web Services Network. With the evolution of GIS technology, it is increasingly moving to be web-enabled technology where a typical user can, via the Internet, directly access geospatial data from multiple data providers across the globe. This will be tomorrow's primary means of geospatial data sharing and distribution. Some state and local agencies are already beginning to provide some of these online data and mapping services. In an effort to facilitate the coordinated, enterprise-level development of these online data sharing services for Nebraska, the NITC and the GIS Steering Committee have cooperatively adopted the following 2006 Shared Services action item.

Internet Mapping Services. *Develop a plan for the coordinated delivery of Internet mapping services by state agencies, with the objectives of making GIS services and existing GIS/geospatial data readily available to a broader array of agencies, improving data access and services to the public, minimizing unnecessary duplication of effort, providing data and system backup, and where appropriate, provide for a coordinated security system, including the possibility for limited data access and password protection.*

In response, a Geospatial Enterprise Data Exchange Working Group, consisting of state and local agency representatives, has developed a project charter that outlines the concepts and implementation phases ([http://www.calmit.unl.edu/gis/Data Exchange Network-Proj_Charter-8-25-06.pdf](http://www.calmit.unl.edu/gis/Data%20Exchange%20Network-Proj_Charter-8-25-06.pdf)). The project participants envision the development of a Nebraska enterprise-level, geospatial data exchange network and related services. This data exchange network will enable agencies to access, in an automated on-demand mode, up-to-date data from multiple participating (state, local, regional, and federal) public agencies. Because some of the data of interest will be sensitive, security and permission protocols will be integrated into the overall network design. To encourage maximum participation and utility, this data exchange network will have both an open public access/view and a private-secure access/view component. When fully developed, this data exchange network will support a wide-range of GIS/geospatial applications that require regular, dependable access to up-to-date data from multiple sources and provide the technical support to maintain these services and assist public entities to access and build applications based on these enterprise services.

An initial grant has been secured from USGS to cover some of the anticipated hardware and software needs and efforts are currently underway to further define implementation details and steps. Additional funding will be required for technical personnel to support implementation and to sustain this enterprise-level effort.

Where We Are Going.

Metadata. To protect the public's investment in geospatial data and to secure the maximum return, the GIS Steering Committee should continue to lead the effort to encourage and facilitate the documentation of geospatial data with formal metadata. The NITC standards implementation

deadline is now past. The Steering Committee should follow up with individual agencies to assess their progress and encourage further metadata documentation and the listing of data in the Nebraska Geospatial Clearinghouse. The Steering Committee should also assist in organizing, publicizing, and recruiting folks to participate in metadata training sessions.

Nebraska Geospatial Data Sharing Web Services Network. The Steering Committee should continue to work with the Office of the CIO to promote and facilitate the development of an Enterprise Geospatial Data Exchange Network for Nebraska. This effort holds great promise for facilitating data exchange between state and local public entities and to spatially enable a wide range of public agency Internet applications. Additional details need to be defined for the initial implementation phases. Funding needs to be found to help provide technical resources to support the initial implementation phases and then longer-term funding to support on-going maintenance costs. Not only will this concept provide for quick and reliable data exchange among current GIS users, but it also promises to provide an easier entry level into GIS functionality for public agencies who currently do not have access to this technology.