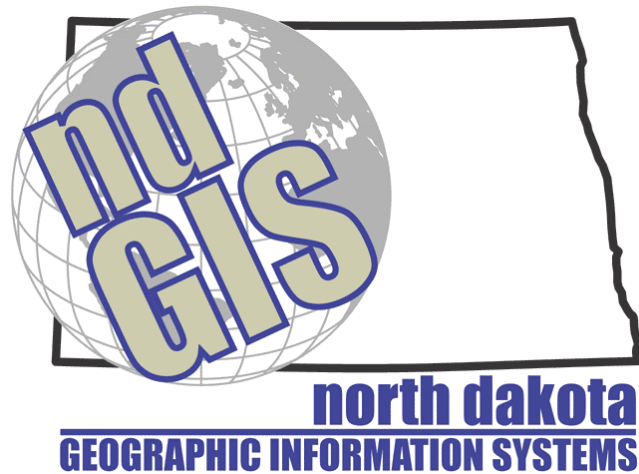


State of North Dakota

GIS Program Strategic Plan – 2011-2013



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1. EXECUTIVE SUMMARY

1.1 Overview

The GIS Program is driven by the North Dakota GIS Technical Committee (GISTC) with the focus of the work being the development and maintenance of the GIS Hub which is funded by the North Dakota Legislature and is the foundation of the GIS Program. The GIS Hub is a database and web infrastructure which supports state agency GIS and is used to disseminate geospatial data to other levels of government and to the public.

In addition to the continued operation and development of the GIS Hub, the GISTC provides the coordination for state agency GIS activities, data development, and interaction with local and federal government.

1.2 Business Case

Key drivers include

- Efficient delivery of geospatial data
- Reduced project start-up costs due to existing infrastructure and data
- Leveraging skills and expertise of state agency GIS personnel

1.3 Strategic Goals

The following strategic goals have been identified by the GISTC to implement its vision and achieve its mission:

<i>Strategic Goal #1 – Enhance and develop GIS data</i>
Improve existing data sets, and after identifying desired data sets, develop plans to acquire that data.
<i>Strategic Goal #2 – Improve GIS data distribution</i>
Provide enhanced means of distributing vector and raster data through the GIS Hub while improving reliability and access.
<i>Strategic Goal #3 – Improve Statewide GIS coordination</i>
Streamline the flow of data, ideas, activities, standards, technology, training, and priorities within the state at all levels of government, the academic sector, the private sector, and the public.
<i>Strategic Goal #4 – Promote view of GIS being a critical information asset</i>
Geographic information is critical in emergency preparation and mitigation. Because GIS data is costly to develop and maintain, it should be protected in case of power failure, fire, flood, etc.

1.4 Key Recommendations

- The GISTC needs to provide an “Executive GIS Update” for department heads and elected officials to maintain awareness of the needs and goals of the GIS Program
- Continued reduction in storage cost is a mission-critical item to allow new and improved data sets to be stored on the GIS Hub
- The GISTC needs to promote the GIS Hub and how it can be utilized throughout the state
- Maintain and grow the GIS Program budget to accommodate rising storage requirements and to meet growing demand of data services

2. CURRENT SITUATION

2.1 Mission Statement

The State of North Dakota's GIS Hub will provide the essential infrastructure to share core geographic datasets through an accessible data warehouse among stakeholders with browsing ability to the general public. The Hub will leverage the State's existing data, infrastructure and expertise to implement the core elements of this enterprise solution.

2.2 Business Case

The success of the GIS Program, which includes the accompanying success and usage of the GIS Hub, will enhance the image of the state to the public and government organizations through:

- Applications and data supporting economic development
- Efficient delivery of geospatial data
- Compliance with federal regulations, requirements, and best practices

With the GIS Hub being the centralized infrastructure for storing and disseminating geospatial data, and with the coordination provided by the GISTC, cost savings will be realized through:

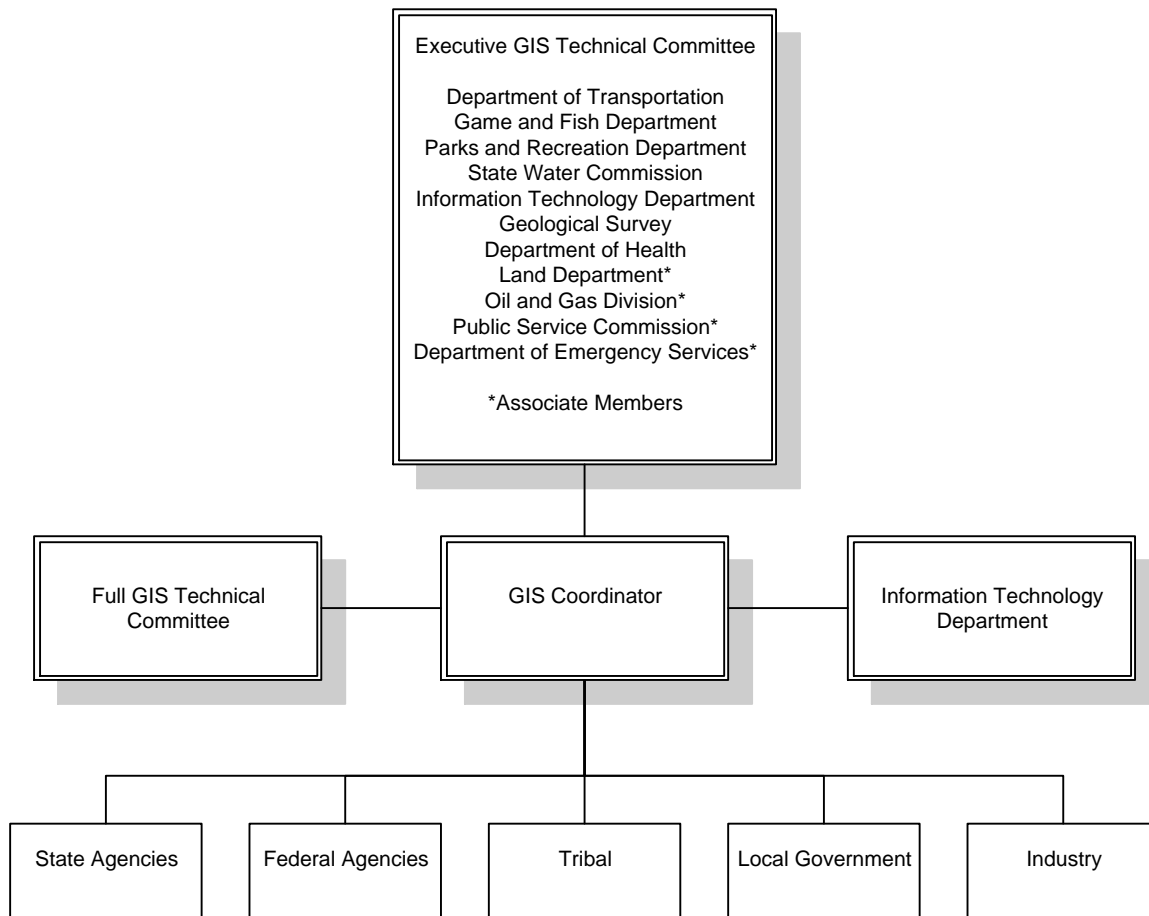
- Coordination of training
- Labor savings associated with creating, maintaining, and distributing data
- Application standardization and code re-use
- Reduced project start-up costs due to existing infrastructure and data

Through coordination by the GISTC and leveraging the GIS Hub infrastructure, future costs will be avoided through:

- Leveraging skills and expertise of state agency GIS personnel
- Elimination of data redundancies
- Application development/platform re-use opportunities

2.3 Who We Are

The North Dakota GIS Technical Committee (GISTC) was established by Executive Order 1995-05 and reaffirmed with Executive Order 2001-06. The GISTC meets monthly and consists of eleven state agencies, four of which are non-voting associate members. The associate members provide additional guidance and agency insight to the GISTC; their addition reflects the growing use of GIS within the state agencies. The “full” GISTC consists of all other interested state, local, federal, tribal, and the private sector and meets annually.



2.4 Who are our Stakeholders?

The state agencies are the primary users and developers of the North Dakota GIS Hub. When setting priorities the state agencies are the first priority followed by local government and the private sector.

Role of the state agencies: State agencies utilize and develop GIS in support of their unique and mandated business needs and objectives. Agencies as a whole provide a supporting role to the GISTC and to the GIS Hub in developing and sharing their data.

Role of the GIS Hub: The GIS Hub supports state agencies in the development of their GIS and the dissemination of common interest data to other levels of government and the public.

Role of the GISTC: The GIS Technical Committee was established by Executive Order 2001-06. The primary role of the GISTC is to service the GIS Hub and provide a collaborative environment that supports state agencies' GIS. A secondary role is to coordinate among federal, state, tribal, local government and the private sector.

2.5 Accomplishments

Previous Bienniums (2001-2011)

- GIS Hub goes into production in 2002
- Special Achievement in GIS award from ESRI to the GISTC
- U.S. Geological Survey grant for sharing GIS Hub data with The National Map
- Free GIS software for all K-12+ schools
- GIS Users conferences see continued growth in content and attendance
- Development of the first GIS Program Strategic Plan
- Associate member agencies are added to the GISTC
- GIS Professional Services Contract Pool allowing for structured work order process
- Record use of GIS Hub web services in response to flooding (highest ever in May 2011)
- Coordinated training has saved state agencies over \$70,000 in training costs alone
- Completed statewide coverage of digital elevation model data
- Statewide hydrologic unit boundary data was certified
- \$25,000 grant from the U.S. Geological Study to enhance GIS Hub data distribution
- Release of the Hub Data Portal which is used to search for data and applications
- Core GIS Hub database infrastructure upgraded for failover and redundancy

2.6 Where are we now?

The core of the GIS Program is the GIS. The GIS Hub is an infrastructure comprised of geospatial data storage, data services, and application interfaces. This infrastructure accommodates generic and agency-specific uses. Multiple RDBMS/ArcSDE instances contain general purpose and agency-specific GIS data. The data services include but are not limited to Esri-format and OGC-standard format. General purpose GIS applications sponsored by the GISTC are used to allow other levels of government and the public to access GIS Hub data.

Data on the GIS Hub can originate from local, state, tribal, and federal sources. Of the more than 200 layers on the GIS Hub, each one is assigned a data steward. Data stewards are responsible for maintaining the data locally and ensuring it is loaded onto the GIS Hub. Before loading the data into production, the Data Oversight Committee, consisting of a subset of the GISTC membership, reviews the data.

2.6.1 Compared to Other States

NSGIC Criteria*	Status	Status Description
1. A full-time, paid coordinator position is designated and has the authority to implement the state's business and strategic plans.	Completely in Place	A GIS Coordinator position is within the Information Technology Department
2. A clearly defined authority exists for statewide coordination of geospatial information technologies and data production.	Completely in Place	The GIS Technical Committee is established by Executive Order 1995-05
3. The statewide coordination office has a formal relationship with the state's Chief Information Office (CIO).	Completely in Place	The GIS Technical Committee is chaired by the GIS Coordinator who reports indirectly to the CIO
4. A champion (politician or executive decision-maker) is aware and involved in the process of geospatial coordination.	Completely in Place	The CIO fills this role; the CIO oversees the Information Technology Department budget which includes the GIS Program
5. Responsibilities for developing the National Spatial Data Infrastructure (NSDI) and a State Clearinghouse are assigned.	Completely in Place	Data stewards have been established; the GIS Hub is used to distribute data.
6. The ability exists to work and coordinate with local governments , academia, and the private sector.	Completely in Place	This is in place informally and more formally, is in place via the Full GIS Technical Committee
7. Sustainable funding sources exist to meet project needs.	Completely in Place	General Funds are appropriated by the Legislature and are managed by the GIS Technical Committee, the GIS Coordinator, and the Information Technology Department
8. GIS Coordinators have the authority to enter into contracts and become capable of receiving and expending funds.	Completely in Place	Acting with and/or under the authority of the Information Technology Department, the GIS Coordinator has this authority
9. The Federal government works through the statewide coordinating authority.	Completely in Place	This is done via the USGS Liaison, working with the GIS Technical Committee and the GIS Coordinator

* In May 2004 the National States Geographic Information Council (NSGIC, see www.nsgic.org for more information) released a set of criteria for effective statewide GIS coordination. (http://www.nsgic.org/states/statemodel_git.pdf). These criteria are now part of the Fifty States Initiative (http://www.nsgic.org/hottopics/fifty_states.cfm)

2.6.2 Key Data Sets (Framework Layers)

Statewide Framework Layer*	Status Description (Non-existent=Red; Incomplete=Yellow; Complete=Green)
Geodetic Control	This data exists within a state agency and is not yet available via the GIS Hub
Cadastral	This is present within some cities and counties
Orthoimagery	Local, regional, and statewide imagery data exist. Pixel resolution ranges from 3 inches to 2 meters.
Elevation	Local, regional, and statewide elevation data exist. Nearly 1/3 of the eastern part of the state is covered by LiDAR
Hydrography	24K and 250K hydrography is available statewide
Administration Units	This includes PLSS, cities, counties, fire districts, legislative districts, water districts, and others
Transportation	Statewide road, railroad, and airport data exists with data sources from local, state, and federal agencies.
Structures	School data is being developed, hospital, fire stations, and other data is available internally
Land Use	Landuse/Landcover data from the USGS, FWS, and USDA is present

* See <http://www.fgdc.gov/framework/> for more information.

2.6.3 Strengths

Small group of dedicated individuals working well together

- The GIS Program is driven by the GIS Technical Committee (GISTC)
- The GISTC meets on a monthly basis, rotating the meeting locations between each of the agencies
- GIS expertise at the state agencies are shared at these meetings and is used to help develop and manage the GIS Hub and its data holdings

The GIS Hub utilizes existing infrastructure

- The Information Technology Department (ITD) hosts the GIS Hub infrastructure
- ITD provides hosting services and system administration

Good ties to non-state agencies

- Through the GISTC, we have ties to industry, academia, other levels of government, and other states

Legislative Support

- General funding from the Legislature is used to maintain and develop the GIS Hub
- GIS Hub funding is part of the ITD budget

2.6.4 Challenges

Continued and Expanded Funding

- Data development
- Increasing and maintaining GIS Hub reliability
- Increasing and maintaining GIS Hub functionality

Data Storage

- The GIS budget may be able to support certain data acquisitions but the budget required to store that data may be insufficient
- Improvements to data storage rates have occurred over the years but limitations continue to be present

Application Replacement

- Sufficient resources for application development, including replacement of aging tools and researching new tools and methods are required to remain in step with new technology and newer software versions
- Some agencies may be unable to fund timely replacement of their applications which in turn creates the pressure to maintain older technology on the GIS Hub

Shared Infrastructure

- Less flexibility than having an entirely dedicated infrastructure, e.g., version dependencies, outages
- Some costs can be higher than having an entirely dedicated infrastructure

People Resources

- Individuals from state agencies have been very active in data development and maintenance activities since the inception of the GIS Hub.
- Their work in data and in other activities associated with the GIS Program can conflict with their primary agency-related work duties. As a result, GISTC schedules can and will be impacted.

System Upgrades

- Often agency business functions rely on third-party extensions that need to be upgraded by the third party provider. These schedules are beyond the control of the agency and the GISTC. However, since many of these types of third-party extensions are essential to agency business operations, they may delay the update of the GIS Hub to the latest version
- Sequencing upgrades of new versions of GIS software used on the desktop within the agencies and on the GIS Hub can be an issue when there is a new software release

Awareness and Utilization

- Many state agencies have data that could be placed into a GIS to provide them immediate benefit but they are not aware of that and/or lack the resources to utilize GIS
- At all levels of government within North Dakota there are “have” and “have not” agencies in terms of GIS knowledge and resources

Statewide Coordination

- The adoption and use of common standards, up-to-date training, and the development of statewide projects, and counties just starting out with GIS would benefit with statewide county coordination.
- Local and tribal government will play a key role in statewide data collection efforts. Issues that are related to these efforts such as standards, maintenance, compilation, and work flow need to be resolved using the limited financial and people resources available.

2.6.5 Opportunities

Marketing our Services

- With the increasing availability and types of web services we need to make it easier to find the GIS Hub services and make more people aware of them
- Work with state agencies and their data to help them become aware of how GIS can be of assistance to their programs and business needs

New Technology

- Commercial and open source solutions are increasing in availability and functionality. These systems need to be utilized wherever it provides more functionality to the user and reduces cost to the GIS Program.
- Mobile GIS is increasingly present for both data creators and data consumers. The state agencies use mobile GIS where there is a business case; the GIS Program needs to promote the use of data consumer applications.

Data

- The Department of Emergency Services (DES) is developing an emergency services dataset. Their “seamless base map” project will include road centerlines and address points derived from aerial photography. This project will provide an opportunity for the state to work with local government in the development and maintenance of this data. The GISTC will provide support to the DES as required.
- The state has no statewide parcel dataset. Such a dataset would greatly benefit economic development and public safety. Lessons learned in the development and maintenance of the road centerlines and address points will be applicable to the development of a parcel dataset. The state through the GISTC could provide a vision for the development and maintenance of a parcel dataset while recognizing and other concerns that local government may have. A state champion needs to be identified for this dataset if it is to become a future project.
- The state should work more closely with local and tribal government to define priority areas, update frequency, and funding mechanisms for high-resolution aerial imagery. Several cities and counties have been very generous working with the state to share their data; more of this sharing may be possible if the state through the GISTC were to take a more active role.
- North Dakota is one of many states that are reliant upon the National Agriculture Imagery Program (NAIP). This data is extremely useful and wildly popular with GIS users across the state. Future NAIP collections may require collaboration from the state and/or collaboration amongst the stakeholders in the state to purchase satellite imagery.

2.6.6 Threats

Increasing Costs

- This is the increase in hosting and service fees charged to the GIS Program
- Storage is the primary cost leader

Flat or Declining Budget

- We have been fortunate over the past bienniums but the time could come where we will be asked to submit a hold-even or reduced budget.
- A hold-even or reduced budget, coupled with rising costs, will have a number of impacts including removing the ability to store data that perhaps we could afford to purchase.

Increased Storage Needs

- High-resolution elevation data, e.g., LiDAR and its derived products consume huge amounts of storage. Maintenance plans for LiDAR data will eventually be developed; that will create the need for even more storage.

- Statewide and regional high-resolution aerial photography, consume very large amounts of storage. Distribution of imagery is commonly accomplished by pre-processing the data into tiles, consuming even more storage.

Why do we need the Hub if we have Google?

- Education and awareness of the benefits of having one's own imagery and the fact that some of the data seen in the commercial services comes from states and local government will mitigate this to a certain extent, but many end-users will always be drawn to these easy-to-use and extremely available applications.
- As commercially available web services continue to be more prevalent, robust, and useful, North Dakota and other states may be challenged to demonstrate why their state's web services are better than the commercial services.

3. VISION AND GOALS

3.1 Vision Statement

It is the vision of the GISTC that the GIS Program will continue to grow in value to state agencies and other levels of government which in turn increases the level of service and cost effectiveness to the citizens of the North Dakota. The core of the GIS Program is the GIS Hub which will continue to develop through a focus on improved and new data sets and secondarily, through improved and new functionality and applications.

3.2 Strategic Goals and Objectives: 2011-2013

The following strategic goals have been identified by the GISTC to implement its vision and achieve its mission:

- *Strategic Goal #1 – Enhance and develop GIS data*
- *Strategic Goal #2 – Improve GIS data distribution*
- *Strategic Goal #3 – Improve Statewide GIS coordination*
- *Strategic Goal #4 – Promote view of GIS being a critical information asset*

Using the strategic goals as a guide, as a first priority the GISTC will focus its efforts on the needs of North Dakota state government but it will also strive to align its goals with that of the National Spatial Data Infrastructure (NSDI) and to use the Fifty States Initiative as an overall guide. The GISTC is aware of the need to build the NSDI which “assures that spatial data from multiple sources (federal, state, local, and tribal governments, academia, and the private sector) are available and easily integrated” (http://www.fgdc.gov/policyandplanning/a-16/index_html). The GISTC acknowledges the Fifty States Initiative which defines the criteria, characteristics,

and activities that identify effective state coordination councils who are working with other levels of government to build the NSDI (<http://www.fgdc.gov/policyandplanning/50states/50states>).

<i>Strategic Goal #1 – Enhance and develop GIS data</i>	
Improve existing data sets, and after identifying desired data sets, develop plans to acquire that data.	
Sub-Goals	Objectives
1. Encourage development of sound methodologies and plans for acquisition of spatial data	<ul style="list-style-type: none"> a) Review & prioritize framework data sets to be improved and developed b) Adopt FGDC currency and accuracy guidelines for framework data c) Acquire NAIP aerial photography or equivalent statewide imagery on a regular schedule d) Acquire local and regional high-resolution aerial photography as it becomes available e) Define maintenance schedule of existing data f) Identify datasets and data stewards that reside in non-GISTC agencies
2. Focus on key data development and improvement needs	<ul style="list-style-type: none"> a) Utilize road centerlines from the Dept. of Emergency Services when they become available b) Utilize address points from the Dept. of Emergency Services when they become available c) Determine the need for a statewide, maintained parcel dataset strategy, the business case, and whether or not a project champion exists d) Improve PLSS e) Update utilities f) Vectorize landuse/landcover data sets g) Develop a historical imagery strategy h) Determine the need for a statewide, maintained high-resolution elevation strategy, the business case, and whether or not a project champion exists i) Develop statewide data goals using input from stakeholders from across the state

Strategic Goal #2 – Improve GIS data distribution	
Provide enhanced means of distributing vector and raster data through the GIS Hub while improving reliability and access.	
Sub-Goals	Objectives
1. Enhance State Agency Access to Data	<ul style="list-style-type: none"> a) Deploy ArcGIS Server replication to share data between agencies and the GIS Hub b) Develop abstraction of data services, e.g., client/server independence c) Allow database authentication via directory services if enterprise security needs are met d) Develop processes and workflow that allow agency data stewards to directly manage their public data while avoiding the database locking problems and avoiding interruptions to web services e) Provide a mechanism for real time data loading and display
2. Develop Agency Management of Data Services	<ul style="list-style-type: none"> a) Provide access to the GIS Hub data services tier to allow designated agency GIS coordinators to create, stop, start, and delete their own data services. Agency applications that use these services will be hosted on the agency's web servers b) Determine levels of access to test and production
3. Investigate Greater use of Open Source	<ul style="list-style-type: none"> a) Continue to monitor the development of open source server and desktop tools and their applicability to state government b) Set up PostgreSQL in the test environment
4. Improve Reliability and Access of GIS Hub	<ul style="list-style-type: none"> a) Replace the existing Hub Explorer with the Esri ArcGIS JavaScript API b) Replace remaining ArcIMS HTML Viewer web sites with JavaScript API c) Complete the conversion from ArcIMS to ArcGIS Server ending with a complete removal of ArcIMS d) Make data download access only through the Hub Data Portal e) Develop a GIS Hub data model for all primary data sets f) Complete the full conversion to FME Server g) Develop ability to download raster data, similar to what is available for the vector data.

	<ul style="list-style-type: none"> h) Develop the methodology to allow web-based data upload to the Hub for future projects i) Review the applicability, reliability, and installation requirements of the GeoPortal Extension j) Develop mobile-friendly strategy
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Strategic Goal #3 – Improve Statewide GIS coordination	
Streamline the flow of data, ideas, activities, standards, technology, training, and priorities within the state at all levels of government, the academic sector, the private sector, and the public.	
Sub-Goals	Objectives
1. Provide Outreach	<ul style="list-style-type: none"> a) Continue to assist in the GIS in K-12 program as required b) Grow the GIS Users Conference by increasing involvement by Higher Education and considering moving the location on a rotating basis c) Continue existing partnerships and pursue new opportunities with the federal government, which include The National Map, the NSDI, and the Geospatial One-Stop d) Explore the development of Memorandums of Understanding with local and federal government entities regarding data sharing and development. This is a key function in emergency management and planning. e) Update the GIS Program brochure f) Explore the need to develop and implement a statewide GIS coordination model
2. Promote and Establish Training	<ul style="list-style-type: none"> a) Continue bringing in Esri and other trainers for seminars, workshops, and formal training b) Determine the interest in establishing a GIS Users Group
3. Develop Standards	<ul style="list-style-type: none"> a) Design standards to assist in sharing of data and to serve as a guide for new projects, and in accordance with goals of the NSDI, these standards would be developed in partnership with local government. b) Develop and establish standards such as those for address, road centerline, and parcels, matching national standards as closely as possible

	c) Ensure metadata consistency across data sets, in particular, field and domain definitions.
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Strategic Goal #4 – Promote view of GIS being a critical information asset

Geographic information is critical in emergency preparation and mitigation. Because GIS data is costly to develop and maintain, it should be protected in case of power failure, fire, flood, etc.

Sub-Goals	Objectives
1. Enhance Disaster Recovery	a) Define critical applications and data sets and verify if the supporting systems are sufficient b) Complete service level objectives for database and web services c) Determine what is involved with setting up the procedure for recovering critical data sets d) Set and publish service level objectives for managing expectations of disaster recovery e) Submit disaster recovery plan and resource needs as part of the 2013-2015 budget request f) Investigate cloud storage and cloud servers
2. Improve Backup and Recovery	a) Develop data redundancy plan to allow recovery options for accidental data deletion for file-based and database-based data
3. Build Awareness	a) Provide an annual "Executive GIS Update" meeting

3.3 Strategic Goals and Objectives: 2013-2015

The goals for the 2013-2015 Biennium will be similar to those of the 2011-2013 Biennium. Additions may include:

1. Additional FTE for GIS Hub support activities
2. State agencies pay hosting fees for agency-specific data (if over 50GB) and data services

4. REQUIREMENTS

4.1 Executive Support

One of the key needs of the GIS Program is budgetary support at the highest levels of state government. Agency executives need to uniformly know what the GIS Program has done for their agency and the state and where the GIS Program is going. The GISTC needs to provide an “Executive GIS Update” for department heads and elected officials to avoid any misunderstandings or doubt regarding the needs and goals of the GIS Program. Although an annual update is preferred, this update should at minimum be done prior to entering a legislative session.

4.2 Coordination and Oversight

The GIS Coordinator, as a member and chair of the GISTC is primarily responsible for balancing the needs of the GISTC as a group, the individual GISTC member agencies, and the Information Technology Department. Statewide needs brought to the attention of the GISTC also need to be considered and included in the work done by the GISTC. It is important that the various needs are met while providing the autonomy needed by state agencies in order that they can accomplish their primary missions.

GIS users around the state have ample opportunity to exchange ideas and share information via the NDGIS listserv, Twitter, the annual Full GISTC meeting, and the biennial NDGIS Users Conference. Greater coordination, primarily data development and knowledge transfer, could be accomplished if North Dakota had a GIS Users Group. There is also a potential benefit of having a State Coordination Council that would focus on data development and data sharing.

4.3 Staffing

Sufficient staffing for the support and development is required for optimal growth of the GIS Hub. Those states with the most successful GIS programs have multiple people assigned to that program. An additional person would improve response time to agency requests for application maintenance and development, conduct research and development on new or evolving GIS technologies, implement GIS Hub upgrades, and load new and updated data. If it is not possible to obtain additional people resources, ITD Professional Services Contract Pool can be used as a means to grow and maintain the GIS Hub, though likely at a slower pace than if there were additional people.

To remain useful and viable, periodic reviews of the GIS Hub infrastructure and workflow are necessary. The GISTC foresees the need to bring in the vendor(s) of the software used on the GIS Hub on a regular but infrequent basis to review the current status, make recommendations, and implement upgrades.

4.4 Technology

4.4.1 Capacity

Continued reduction in storage cost is a mission-critical item to allow new and improved data sets to be stored on the GIS Hub. Storage must also be reliable, redundant, and perform well. The Information Technology Department provides multiple levels of storage that meet these requirements but additional storage cost reduction is required for programs such as GIS that have huge datasets.

Events such as flooding have strained the existing server resources. The GIS Program needs a method by which additional servers with software can quickly be brought online to meet these needs. Temporary licenses from Esri will be required and virtual server(s) hosted by ITD will need to be quickly set up.

4.4.2 Applications

The explosion of consumer devices consuming web content creates the need for the state to develop data services and applications that are “friendly” to the various platforms and that can be utilized by developers. Guidance should be provided to the state agencies, to make them aware if they aren’t already, of typical consumer expectations.

4.5 Outreach

In addition to assisting in the development of workshops, classes, and seminars, the GISTC needs promote the GIS Hub and how it can be utilized throughout the state. Training and increasing the awareness of the GIS Hub consists of two primary factors: 1) finding and using the GIS Hub data services (download and web services) and 2) utilizing the GIS Hub as a means for finding and distributing statewide data hosted elsewhere.

5. IMPLEMENTATION

5.2 Budget

The GIS Program budget supports the goals and activities as set forth by the GISTC. This budget supports both on-going operational expenses such as the fees paid to ITD for hosting servers, applications, and applications, for basic maintenance activities, and for annual licensing fees paid to external vendors. The budget also supports one-time implementation costs such as the purchase of new software, development of new applications, and data development.

The amount set aside for data development is typically a small amount compared to the total cost of developing any given data set. For this reason, the data development budget is restricted to purchasing or developing relatively inexpensive data sets that will have wide-spread use amongst

the state agencies. As much as possible data development funds are expended in association with other contributors in order to maximize state dollars. Examples of collaborative data development include local or regional high-resolution imagery with local and federal government.

GIS Budget	2009-2011		2011-2013	
	Requested ¹	Appropriated	Requested ¹	Appropriated
Total Ongoing Operational Costs	\$645,796	\$645,796	\$911,086	\$911,086
Total Implementation & One-time Costs	\$68,882	\$68,882	\$125,979	\$125,979
Total:	\$714,678	\$714,678	\$1,037,065	\$1,037,065

¹Initial budget request to Legislature

5.3 Marketing the GIS Program

With the proper resources, the GIS Program will remain stable and will grow as long as it is capable of providing the agencies the necessary tool base to meet their business functions. However, the GIS Program requires support from many different areas because funding for the development of the ND GIS Hub supports and is peripherally supported by the agencies. Therefore, it is important to keep the executive agency leadership and the legislature informed of the inter-relationships between the ND GIS Hub and agency GIS operations so that proper funding can be maintained. In order to provide the necessary information the following steps should be taken on a continuing basis:

- Provide an annual “Executive GIS Update” meeting to inform senior agency leadership and elected officials of the activities, direction, and needs of the GIS Program. One of the goals of these meetings would be to develop champions of the GIS Program. At least one of these meetings should precede the beginning of the budgetary cycle to ensure that GIS budget needs are well known and understood.
- Maintain a GIS Program brochure to be distributed to legislators, agencies, and the public.
- Educate those less familiar with GIS the key differences and compatibilities with public applications such as Google Earth.
- Continue working with local and tribal government organizations and the private sector, giving them a better understanding of the capabilities of the GIS Hub. Implement new functionality and improve existing as suggested by governmental users of the GIS Hub to further their support for continuation of the GIS Hub.
- The GIS Coordinator should provide an update on GIS Program activities, direction, and needs to the State Information Technology Advisory Committee (SITAC) on a frequent basis.

6. APPENDICES

6.1 Development of the Plan

The State GIS Coordinator developed this Strategic Plan in conjunction with the North Dakota GIS Technical Committee (GISTC).

6.2 History

In mid-January 2000, North Dakota's Chief Information Officer (CIO) was contacted by two representatives from the GISTC asking that ITD study the need for a centralized GIS hosting service for North Dakota state agencies and their partners. The GIS Hub would provide a means of sharing the GIS information being stored locally at each agency. The CIO agreed that GIS is an important technology for state government and that ITD should take a lead role in GIS.

ITD retained a consulting firm to study how GIS was used in state government. The report's findings were presented to the GISTC, the Director of Office and Management and Budget, the Governor's Chief of Staff, and the Legislative IT Committee. At the request of the GISTC, the CIO agreed to request funding from the Legislature to fund the GIS Program. In April 2001 the Legislature provided funding to construct the GIS Hub, a database and web infrastructure hosted by ITD for hosting and sharing state agency GIS data.

6.3 List of Acronyms

API – Application Programming Interface is a description of how data and information is stored in memory so that one computer system can interact with another.

ArcIMS – ESRI Internet Map Server: software that delivers maps and information through the Web

ArcSDE – ESRI Spatial Database Engine: software used to access spatial data stored in a relational database management system

Esri – Environmental Systems Research Institute: software company based in Redlands, California which produces commercial GIS software, commonly known as ArcGIS.

FGDC – Federal Geographic Data Committee: responsible for coordinating the development, use, sharing, and dissemination of geospatial data across the nation

FME – Feature Manipulation Engine: Server software used by the GIS Hub for data downloading, produced by Safe Software.

GIS – Geographic Information System: computer-based system used to manage and integrate spatial data, maps are a common by-product

GISTC – North Dakota GIS Technical Committee: consists of eleven state agencies acting as a clearinghouse of state GIS activities and responsible for disseminating spatial data

ITD – North Dakota Information Technology Department

NAIP – National Agriculture Imagery Program: the program is administered through the Aerial Photography Field Office of the US Department of Agriculture (USDA) Farm Service Agency. NAIP imagery is intended to support USDA agriculture management programs.

NSDI – National Spatial Data Infrastructure: technologies and policies used to promote sharing of geospatial data throughout government, administered by the FGDC

NSGIC – National States Geographic Information Council: national organization of states with a goal of efficient and effective government through effective use of geospatial information technologies

OGC – Open Geospatial Consortium: non-profit organization which leads the development of standards for geospatial and location-based services.

PLSS – Public Land Survey System: method for subdividing and describing land in the US. Regulated by the US Department of the Interior's Bureau of Land Management