

Nebraska Spatial Data Infrastructure Strategic Initiative

Action Items 2014-2016

Objective

To develop and foster an environment and infrastructure that optimizes the efficient use of geospatial technology, data, and services to address a wide variety of business and governmental challenges within the state. Geospatial technologies and data will be delivered in a way that supports policy and decision making at all levels of government to enhance the economy, safety, environment and quality of life for Nebraskans.

Description

Geospatial technologies incorporate geographic information systems (GIS), global positioning systems (GPS), remote sensing such as imagery and Light Detection and Ranging (LiDAR), and other geographic data and information systems. We use GIS as a tool to capture, store, manipulate, analyze, manage, and present all types of geographical data.

Information about people, places and events can be integrated by location (geography) by using these technologies. It represents nearly all spatial information used by government organizations and their partners to manage resources and various services on behalf of Nebraska's citizens. Coordination among and between government organizations and their partners to efficiently collect, use and maintain this information using geospatial technologies has steadily improved decision making over the past several decades. But economic pressures, increased environmental issues, and a rapidly increasing amount and complexity of information required for effective decisions make it necessary to dramatically improve the way geographic information is managed. Because of this, solutions are sought to find statewide data and services that meet our goals while providing quality and accurate data that meets state and federal standards.

The major components of this initiative include:

- Facilitating the creation, maintenance, analysis and publishing of quality Nebraska Spatial Data Infrastructure (NESDI) data and information systems.

The NESDI comprises of geospatial data layers that have multiple applications and are used by a vast majority of stakeholders. These layers meet quality standards and have data stewards to maintain and improve the data on an ongoing basis. They are consistent with the Federal National Spatial Data Infrastructure (NSDI) "7 framework layers" and provide additional layers of particular importance to Nebraska. The current priority layers for the state include: imagery, elevation, street centerlines, point addressing, and land records.

- Survey and Geodetic control
- Transportation (roads, rail, air, etc.)
- Cadastre/parcels
- Elevation
- Aerial imagery
- Hydrography
- Political and administrative boundaries
- Addresses
- Soils
- Groundwater features
- Watershed boundaries
- Land use/land cover

- Encourage data sharing and provide widespread access to data and services through NebraskaMAP.gov.

NebraskaMAP is the public's access to geospatial data in Nebraska. It is responsible for being the authoritative clearinghouse for state government data. It started as a metadata portal and currently provides more than 242 geospatial metadata files and access to server web mapping services for use in other state agency base map applications. This initiative will enhance NebraskaMAP into a multi-use enterprise platform by providing and sharing NESDI data either through direct download, API and REST services, or accessing through web and mobile services.

- Develop and implement NESDI layer standards and guidelines.

The GIS Council has led intergovernmental efforts leading to the development and formal adoption of geospatial related guidelines and standards. Metadata standards have been developed specific to Nebraska needs while maintaining compliance with the metadata standards from the Federal Geographic Data Committee (FGDC). As an example, the Land Record Information and Mapping Standards were adopted on January 27, 2006. These standards provide guidelines for public entities responsible for maintaining property parcel maps. Additional standards are currently being developed for street centerlines, addresses, imagery, elevation, and data sharing.

- Facilitate technical assistance and education outreach opportunities for furthering the adoption of the NESDI and geospatial applications.
- Achieve sustainable and efficient allocation of resources to support the implementation and wise governance of GIS services and geospatial data.

Benefits

By encouraging the appropriate utilization of geospatial technology and to assist organizations to make public investments in the technology and geospatial data can provide many investment returns and benefits. The following are just a few anticipated benefits from this initiative:

- Improved access to complete, high-quality geospatial data layers that are authoritative and peer reviewed.
- Meeting public access needs through NebraskaMAP as a one-stop shop to Nebraska SDI data, maps, and GIS web services. Reducing overhead by *"Creating it Once, Sharing it Many."* Having one authoritative data and web services clearinghouse will reduce redundant data and services across multiple agencies.
- Increased state and local collaboration and formal approach to data stewardship.
- Improved maintenance of regional and local geographic data as a result of common standards, procedures, and stewardship practices.
- Access to data and technology will be more consistent, with less regional disparity.
- Multi-jurisdiction geographic information management will be more efficient and better coordinated, particularly in response to natural disasters, homeland security and other statewide emergencies.
- Improved consistency of public policy implementation across agencies from using consistent and similar data.
- Opportunities for leveraging and sharing resources and funds for future data and technology needs.

Nebraska Spatial Data Infrastructure Strategic Initiative Action Items (Recommendations for 2014-2016)

1. Action: Formalize the definition of the Nebraska Spatial Data Infrastructure (NESDI) and data stewardship

GIS assists in solving complex issues by providing the ability to understand spatial relationships among various spatial data sets. In many cases, the spatial analysis capabilities of a GIS can identify trends from among many datasets to solve problems. Selected datasets have such widespread utility in a GIS that they have been identified as “Framework Datasets” and due to their significance are accorded special attention by the GIS community. Traditionally, these data sets have been developed independently for a relatively narrow range of purposes however; the use of geospatial data and the range of applications it is used for is growing rapidly. This places increasing demands on individual data in terms of accuracy and completeness, and especially upon those inherent spatial relationships among datasets.

This action item will begin to better define the NESDI and identify the necessary relationships among the various NESDI data layers. The document will provide an illustration of the “Big picture” of Nebraska’s framework including a:

- Common understanding of framework
- Context for prioritizing the components of the framework
- Context and justification for future funding requests
- Basis for ID of potential stewards and stewardship roles and responsibilities

The context of the framework themes will be explored at the local, state, regional and national levels. This will benefit the overall coordination, development, revision and promulgation of the relationships among various GIS framework data standards. It will aid in development, implementation and revision of stewardship guidance and procedures for the various GIS framework themes. In addition, it will provide additional direction on NESDI governance, management practices, policy development, and outreach with the statewide community.

Lead: State GIS Coordinator, GIS Council Representatives

Participating Entities: GIS Council, NESDI Data Stewards

Timeframe: 2014

Funding: None

Status: New

2. Action: Geodetic and Survey Control Inventory and Assessment

Considerations for geodetic and survey control needs to be taken into account for good quality data to exist in the future for several of the NESDI framework layers. Particularly, if multiple data sets are used in combinations for analysis and decision making. Some of our current data sets were created for a specific purpose with given budgets. As the adoption and use of the data has grown there are other needs for the data. This also has an implication on the level of spatial accuracy needed for the data to be useful. A careful examination of our current survey and geodetic control data will be inventoried and assessed across the state based on various criteria for its use in the development of other NESDI framework layers. Identify methods and linkages through NebraskaMAP to communicate and provide access to relevant data to users and stakeholders.

Lead: State GIS Coordinator, GIS Council Representatives

Participating Entities: Nebraska Department of Natural Resources, Nebraska Department of Roads, State Surveyors Office, various Licensed Land Surveyors, Federal Partners including NOAA – National Geodetic Survey and Army Corp of Engineers

Timeframe: 2014-2016

Funding: None

Status: New

3. Action: Nebraska Statewide Elevation Program

Surface elevation databases are a critically important geospatial database for a wide range of GIS applications and as such have been determined to be a priority database for development by the GIS Council. Elevation databases have been determined by the Federal Geographic Data Committee (FGDC) to be a Framework Database because their use by a wide cross-section of geospatial data users. LiDAR (Light Detection and Ranging) is a proven remote sensing technology that enables the efficient collection of highly accurate surface elevation data for large geographic areas. This dataset serves as a basis for other derived geospatial data products in it's relationship to the overall NESDI. More importantly strengthens the geodetic control context for the development of other framework layers. Pursuant to the objectives outlined in the Strategic Plan, the GIS Council is responsible for identifying and coordinating the use of digital elevation LiDAR technologies to develop enhanced surface elevation data for Nebraska. This involves: a) an assessment of the current status and perceived adequacy of existing Nebraska surface elevation data, relative to the perceived short and intermediate-term needs; b) an exploration and documentation of the likely costs and benefits of utilizing LIDAR technology to collect enhanced surface elevation data for large geographic areas of Nebraska; c) recommendations related to possible future Nebraska LIDAR initiatives including technical standards, possible lead agencies, funding strategies, and timelines; and d) identify methods and linkages through NebraskaMAP to communicate and provide access to relevant data to users and stakeholders.

Lead: State GIS Coordinator, GIS Council Representatives

Participating Entities: Nebraska Department of Natural Resources, Nebraska Department of Roads, Nebraska Natural Resource Districts, Public Power Entities, Federal Partners including Army Corp of Engineers, USGS, USDA-NRCS, and USDA-FSA.

Timeframe: Implementation timeline determined by Business Plan

Funding: Business plan underway to determine total project costs.

Status: Continuation with revisions

4. Action: Nebraska Statewide Imagery Program

Imagery is a required spatial data framework layer needed for a multitude of mapping applications. It is important that imagery is accurate, current, and easily accessible to end users. This dataset serves as a basis for other derived geospatial data products in its relationship to the overall Nebraska Spatial Data Infrastructure (NESDI). The acquisition of updated, orthorectified (corrected for camera tilt and the slope of the earth's surface) imagery requires a significant public investment, but if done collaboratively, on a regular periodic basis, these costs can be minimized and shared across a broad user community. It is expected that this effort will largely be integrated into the larger Nebraska GIS Strategic Planning process. Efforts will be made to learn from, and build on, existing collaborative imagery acquisition efforts such as the Nebraska-Iowa Regional Orthoimagery Consortium (NIROC) and the USDA Farm Services Agency – National Aerial Imagery Program (NAIP). Research and develop recommendations for standards, policies, infrastructure, and funding to support collaborative efforts by state, local and federal agencies to periodically acquire updated orthoimagery. Identify methods and linkages through NebraskaMAP to communicate and provide access to relevant data to users and stakeholders.

Lead: State GIS Coordinator, GIS Council Representatives

Participating Entities: Nebraska Department of Natural Resources, Nebraska Department of Roads, Nebraska Natural Resource Districts, Public Power Entities, City and County Governments, Federal Partners including USGS, and USDA-FSA.

Timeframe: Implementation timeline determined by Business Plan

Funding: Business plan underway to determine total project costs.

Status: Continuation with revisions

5. Action: Street Centerline-Address Database

Develop and maintain a statewide seamless street centerline and address referencing system used for various transportation, public safety (ie, NexGEN 911), economic development and other related applications. Initiate assessment of current street centerline data. Implement a data model and workflow guidelines for QA/QC of existing and future maintenance of street centerline data. Develop data model for address points and use of data in relationship to street centerlines and other NESDI framework layers. Further develop partnership efforts that support NexGEN 911 or combinations thereof who needs to be involved in the process of using street centerline and address point data. Research and develop recommendations for standards, policies, infrastructure, and funding to support collaborative efforts by state, local and federal agencies to periodically acquire updated a seamless street centerline-address database. Identify methods and linkages through NebraskaMAP to communicate and provide access to relevant data to users and stakeholders.

Lead: State GIS Coordinator, GIS Council Representatives

Participating Entities: GIS Council, State Government Council, Nebraska Department of Roads, E 9-1-

1 community

Timeframe: Implementation timeline determined by Business Plan

Funding: Business plan underway to determine total project costs.

Status: Continuation with revisions

An interagency working group of the GIS Council developed draft guidelines for the integration of street centerline-address data from multiple sources into a composite statewide dataset. The staff of the NebraskaMAP project, with limited funding available from NEMA and the State Patrol, developed an initial composite statewide dataset following these draft guidelines. This initial composite dataset was completed in early 2010 and it involved the integration of data from the Public Service Commission's E911 efforts, Douglas, Sarpy and Lancaster Counties, and the Department of Roads. This dataset is approaching 4 years old and more current data has been developed from all of the original data providers. All of the original data providers are willing to share their more recent street centerline-address data. There are future needs of geospatial data for use in NexGEN 9-1-1. This brings about challenges to finalize a broadly accepted data model, identify a lead agency, find the funding required, and the development of the interagency agreements necessary to support the ongoing maintenance of this critical dataset.

6. Action: Statewide Land Record Information System

Develop an integrated statewide land records system capable of providing reliable online access to this critical data, maintaining restricted privacy access as necessary, and supporting a variety of applications by multiple agencies. Develop guidelines for a common geodatabase model that can provide public data for use in a multitude of state government applications. Implement a geodatabase model to maintain baseline data. Work with local governments, state agencies, and the private sector to develop a collaborative plan, standards/guidelines, and the infrastructure necessary to encourage and facilitate the ongoing integration of separately-maintained state, city, and county land records. Develop data workflows with local county assessors to obtain parcel (spatial and attribute) data for use in various state government applications. Revise the current NITC Land Record Information and Mapping Standards that have been adopted with the goal of enabling the integration of local government land records into a statewide dataset. Identify methods and linkages through NebraskaMAP to communicate and provide access to relevant data to users and stakeholders.

Lead: State GIS Coordinator, GIS Council Representatives

Participating Entities: GIS Council, State Surveyors Office, Department of Revenue, County Assessors, and various licensed Land Surveyors

Timeframe: Implementation timeline determined by Business Plan

Funding: Business plan underway to determine total project costs.

Status: Continuation with revisions

7. Action: NebraskaMAP - A Geospatial Data Sharing and Web Services Network

Enhance NebraskaMAP beyond its current geoportal status to an enterprise-level geospatial platform. Provide necessary communication and mechanisms for public and private access to peer-reviewed Nebraska SDI data, maps, and GIS web services. NebraskaMAP started as a

metadata portal to inventory and provide linkages to several data sets. Enhancements will involve expanding services to upload, review and share NESDI data either through direct download, REST services, or accessing through web services. This system would also provide conduit to authoritative data sets, linked and shared base maps to reduce data storage costs, and a coordinated security system, including the possibility for limited data access and password protection for specific data sets.

Lead: State GIS Coordinator, GIS Council Representatives

Participating Entities: GIS Council, State Agencies, State Government Council

Timeframe: Implementation timeline determined by Business Plan

Funding: Business plan underway to determine total project costs.

Status: Continuation with revisions

Nebraska Spatial Data Infrastructure Strategic Initiative Action Items (COMPLETED)

Action: Statewide Geospatial Infrastructure Strategic Planning.

Develop an enterprise-level, statewide, GIS/geospatial infrastructure strategic plan for the geographic area of Nebraska. The planning process involved the broader GIS user community (state, local, and federal agencies, tribes and the private sector) and sought to identify parallel needs and plans for geospatial data, standards, online distribution networks and services, coordination, funding, and policies.

Lead: NITC GIS Administrative Manager, GIS Council Representatives

Participating Entities: GIS Council, various statewide stakeholders

Timeframe: 2012

Funding: This effort was initiated through the NITC GIS Council Strategic Planning Committee. Resources to support the planning process has been made possible through a cooperative grant effort called the Fifty States Initiative implemented between the Federal Geographic Data Committee (FGDC) and the National States Geographic Information Council (NSGIC). The grant provided \$50,000 to hire a consultant, Applied Geographics, Inc. to facilitate and develop the strategic planning process and report.

Status: Completed